THE

# NATURALIST:

A QUARTERLY JOURNAL OF

## *Natural History for the North of England*

EDITED BY

W. A. SLEDGE, Ph.D., B.Sc.,

THE UNIVERSITY, LEEDS,

*with the assistance as referees in special departments of*

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PRINCIPALLY FOR THE NORTH OF ENGLAND

*Edited by*
**W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds**

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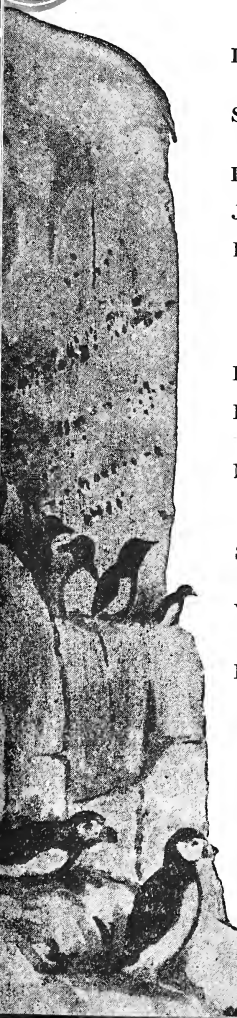

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## YORKSHIRE NATURALISTS' UNION

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The Committee desire to have the spring (March to late May) and the autumnal (end of July to mid-November) migration periods covered completely by competent ringers. Preference will be given to Y.N.U. members as far as possible. Charges continue at the rate of 3/- per night per person. Will those willing and able to take charge for periods please agree them with the Hon. Secretary as early as convenient, giving, if possible, alternative dates and periods? This will enable those who can give time out of the holiday seasons to make their plans and to fill blanks. Visits by those who are not registered ringers, short period and week-end occupation, etc., can then be arranged for other helpers who should also apply early. Visits are often difficult to arrange at short notice. With six occupants the cottage is considered full.

G. H. Ainsworth (144 Gillshill Road, Hull),
*Hon. Secretary.*

# THE NATURALIST

## FOR 1951

## LATE GLACIAL AND POST GLACIAL TIME IN YORKSHIRE

A. RAISTRICK, Ph.D.

*Presidential address to the Yorkshire Naturalist Union, Bradford, December 2nd 1950.*

THE question of the nature and duration of post glacial time in the North of England is one which has a great appeal to all Yorkshire naturalists, and one which cannot be adequately considered except in relation to the whole glacial sequence. The contribution of Yorkshiremen to the understanding of Pleistocene geology have been many and varied, and I would like at the beginning of my address to remind us all of the many pioneers of glacial geology who have been intimately associated with our Union and many of them with this city in which we are now meeting—Dakyns, Tiddeman, Kendall, Dwerryhouse, Lamplugh, Jowett, Muff, Monkman, Woodhead, these and others are names which spring to mind, but they do not by any means exhaust the list.

Through their work and that of a younger generation, the details of the ice cover over our county, of the distribution of its boulder clays and the movement of different ice streams, have been laid before us in detail. The picture so patiently assembled has the marks of permanence and acceptability in its spacial outlines, but when we turn to the time element, we fail to find the same agreement. Somehow or other the chronology presents a problem which has received many diverse and sometimes contradictory explanations. I have no delusion that I can offer any acceptable solution, I can only lay before you the thoughts I have and the opinions I have formed for myself.

If as a background we consider the succession of events during the Pleistocene and post-Pleistocene in Yorkshire we can select a few points of reference which will be acceptable to all without controversy as to the actual observations. The succession of deposits on the Yorkshire coast has long been a classic, and starts with a well established fauna in the material of the Sewerby Beach, sealed under our lowest boulder clay. The mammals present here are essentially warmth-loving, and include *Elephas antiquus*, *Rhinoceros leptorhinus*, and *Hippopotamus amphibius*. The glacial beds which follow are the Basement (North Sea drift), the Purple Clays (the Drab clay, etc., of Bisat), and the Hessle Clay, with many divisions of sand among them. The orthodox view regards these clays as the evidence of more than one glaciation, and looks among them for the remains of one or more interglacial periods.

I might as well declare my completely unorthodox position at the beginning of my address, and confess that I regard it as a privilege to take my stand alongside Carruthers in regarding these various clays as the product of one very complex, single glacial period. To this I shall return later. The whole question of glacial time and glacial correlations is beset with difficulties, but these are more of interpretation than of observation. The Continental workers have now given us a succession for Denmark and North-west Germany, in which three Inter-glacials are clearly established and distinguished. This succession is substantiated by a large number of borings, particularly around the lignite areas in Germany. An abundance of plant and animal remains give a close record of the climatic sequence and I shall lay particular stress on this. The succession is as follows :—

| | |
|---|---|
| WEICHSEL | |
| Baltic End moraine | Glacial |
| Period of retreat | Warmer |
| Brandenburg moraine | Glacial |
| 3rd Inter-glacial ' Brasenia peats ' | Sub-arctic<br>Boreal<br>Temperature<br>Boreal<br>Sub-arctic |
| WARTHE glaciation | Arctic |
| Middle Inter-glacial ' Eems '-zone | Warm-temperature to cool-temperature at close |
| SAALE glaciation | Arctic |
| 1st Inter-glacial ' Holstein clays ' | Boreal to cool-temperature |
| ELSTER glaciation | Arctic |

Two groups of large mammals are associated with these deposits. The ' Old ' group is a warm assemblage, *Elephas antiquus*, *Rhinoceras merckii* and *Hippopotamus* being indicators ; these are found up to the basal members of the Warthe glaciation. The ' New ' and later group is essentially cold-loving, with *Elephas primigenius*, *Rhinoceros tichorhinus*, *Ovibos moschatus*, etc., these are present in the deposits of Warthe and post-Warthe age and in the still later Weichsel, where such animals as the elk and bison also are present.

To form a foundation for what I want to say of late-glacial time, I must suggest a glacial correlation with this country, which after long and careful perusal of all the evidence I have found in the field and in literature, I am prepared to accept as a correct or near-correct picture. Here I am treading an unorthodox path, though it is one which is foreshadowed in the work of Lamplugh and by W. B. Wright* but which has been made plain by R. G. Carruthers, with whom I have had the privilege of frequent and detailed discussion for nearly twenty years.†

Carruthers has cleared many obstacles from the way by concentrating attention on climatic variations as being a factor more likely to be widely recognised than any detail of stratigraphy. Climatic variations are likely to be of wide extent, Continental at least, and therefore likely to provide a comparable series of changes in widely separated and differing deposits.

We need first to remember that in the Ice Age, Britain was mainly in peri-glacial relation to the Continent and that some periods of ice-cover in Denmark may be represented here by tundra or sub-arctic ice-free conditions, in which the principal evidence will turn on the presence of an arctic fauna and flora and the production of solifluxion deposits.

We have three remarkable records available from recent studies in this country, the Thames gravels, the Hoxne ' interglacials ' and the Pin Hole Cave deposits, Derbyshire, which can be ranged side by side, using mainly the climatic sequence given by the authors of the three accounts :—

| | *Thames Valley* | *Hoxne* | *Pin Hole Cave* |
|---|---|---|---|
| | — | — | Glacial |
| | ' Cooler than to-day ' | — | Temperate |
| (WEICHSEL) | Sub-artic | Peri-glacial | Glacial |
| | Cold (like Lapland) | Sub-arctic | Cold |
| | Temperate | Temperate | Temperate |
| | Cold steppe | Cold | Cool-temperate |
| | Cool-temperate | — | Cold |
| (WARTHE) | Sub-artic | Sub-artic | Glacial |
| | Warm-temperate | Temperate | Temperate |
| (SAALE) | Arctic | Arctic | Arctic |
| | (Chalky B.Cl.) | (Chalky B.Cl.) | (Chalky B.Cl.) |

If we try to place the Continental sequence against this it fits comfortably as indicated in the diagram. This would make our glaciations in England the equivalent of the Saale glaciation,‡ and in this I would include all our Yorkshire boulder clays, Basement to Hessle. The Warthe would be represented by a peri-glacial climate, with a few valley-head glaciers and snow fields in the north-west, and possibly the Scottish re-advance in South Scotland. The Weichsel may be represented by the ' cirque ' glaciation of the Highlands of Scotland.

The position of the various remains of *Hippopotamus* fit in with this interpretation. The Saale glaciation everywhere on the Continent was terminated by a very rapid warming up of the climate and aggradation of all the rivers, with much production of gravels. These river terraces and gravels contain *Hippopotamus*, *Elephas antiquus* and *Rhinoceros merckii* at most localities, close on top of the well-washed and partly weathered Saale clay. In our country we have the *Hippopotamus* remains at Armley in the oldest river terrace (which Edwards suggested might correlate with the 100 ft. terrace of the Vale of York), associated with *Elephas*, and at Overton, near York. *Hippopotamus* and *E. antiquus* also occur together in ancient river gravels at Allenton, near Derby, resting above the weathered top of the main glacial clays equivalent to the Great Chalky Boulder

*In part in many places in *Tools and the Man*. 1939.

†Carruther's views are expressed in his papers in the *Proceedings Yorks. Geol. Soc.* XXVII, 1947, pp. 43-58 and (1948) pp. 129-172, and in a paper on correlations, now printing.

‡The Saale was a complex ice sheet with three distinct ' ground moraines ' in it separated by sands, clays and gravels, remarkably like our whole English succession.

clay, and *Hippopotamus* with *E. antiquus* and *Rh. merckii* is found in comparable gravels on the boulder clay in the Bedford and the Warwick Ouse basins and in the Thames valley gravels at the expected horizon. There are other occurrences of *Hippopotamus* with *El. antiquus* in Yorkshire, notably in Kirkdale Cave, Victoria Cave and Raygill Cave. These are found, like the bones in the Sewerby Beach, beneath the boulder clay (though the evidence at Victoria Cave is not very satisfactory) and these animals belong to the pre-Saale, Continental 1st Interglacial.

Glacial periods are characterised by a low sea level, and periods of deep erosion in the river valleys, and I would suggest that the buried channel ' at least 30 feet below the present flood plain ' of the Aire at Leeds* belongs to the erosion of the Warthe glacial period.

During and after the Warthe period the newer group of mammals appeared and they are well represented in our county, in such deposits as those of Kelsey Hill, Bielsbeck, Brandesburton, Harswell, Overton, Burstwick and others where the association is *Elephas primigenius* with *Rhinoceros tichorhinus*, bison, horse, etc.

In the Thames Valley sequence, a Coombe Rock solifluxion material marks a later cold period, and a clay which ' may be frost-flow . . . etc.', is found at Allenton in Derbyshire, just above the *Hippopotamus* horizon. Above these the fauna changes and *El. primigenius*, *Rh. tichorhinus*, *Ovibos*, and reindeer are the common elements. The periods described as ' glacial ' in both the Hoxne and the Derbyshire sections are marked not by boulder clays with erratics but by clays and cave earths which result from weathering in a glacial climate and could be formed near the edge of an ice sheet or in a peri-glacial area. The Coombe rock and the ' glacial ' period in the Derbyshire and Hoxne sections is therefore regarded as Warthe in age, with older fauna below and newer above.

The Weichsel glaciation of the Continent is marked by a much reduced extension of the ice, its maximum being traced by the Brandenburg moraine, and a second position following a short time of retreat, by the End Moraines of southern Scandinavia. The time when the ice retreated from this last position is taken to mark the beginning of post-glacial time. The whole period of the Weichsel in Denmark is represented by a mixed sequence of solifluxion gravels and clays, peats and lake muds, and these have been zoned by the flora and fauna contained in them, and form the three lowest zones of the peat-zone succession which continues through post-glacial time. The three zones are :—

| | FLORA | FAUNA |
|---|---|---|
| III. Upper Dryas clay, or Younger *Salix herbacea* period | *Salix herbacea*<br>*Dryas octopetala*<br>*Betula nana*<br>*Empetrum nigrum* | Bison<br>Lynx<br>Reindeer<br>Ptarmigan |
| II. Allerød, or Late Glacial Birch period | Juniper-birch scrub with *Empetrum* heath<br>*Arctostaphylos U-U* | Elk |
| I. Lower Dryas clay, or Older *Salix herbacea* period | *Salix herbacea*<br>*Sax. oppositifolia*<br>*Rubus chamaemorus*<br>*Lycopodium selago* | Arctic Hare<br>Arctic Fox |

Of these the two Dryas clays are definitely cold to artic, and the Allerød a warmer interlude. In this country the deposits of these periods have been recognised recently, in the Windermere silts, the lake filling at Neasham, County Durham, and at many places in Ireland. Can we recognise them in Yorkshire, and in any other nearby deposits? First, they are definitely represented by the upper layers of the Pin Hole Cave, Derbyshire, where a temperate period lies between two glacials. The archaeological material here begins to fall into place. The late Saale gravels and the post-Saale interglacial deposits yield flint implements of the Lavalloisian and Clactonian types, associated with *Hippopotamus*. These are separated by glacial or solifluxion beds from the later Mousterian II of the Brasenia interglacial. The Weichsel is associated with Aurignacian and

*Edwards, W. A Pleistocene Strand Line in the Vale of York. *Proc. Yorks. Geol. Soc.* XXIII, 1937, p. 113.

followed by the Magdelanian reindeer hunter culture. The Pin Hole Cave succession is :

| | | |
|---|---|---|
| Glacial | Stalagmite | |
| Temperate | Developed Aurignacian | |
| | Upper Aurignacian | Weichsel |
| Cold | Mousterian III | |
| Glacial | Slab layer | |
| Cold | | |
| Moderately warm | Mousterian II | Interglacial 3 |
| Cold | | |
| Glacial | Slab layer | Warthe |
| Moderately warm | Mousterian I = Clactonian | Interglacial 2 |

Some of the Yorkshire caves can take up the story, particularly of the fauna. The basal layers in Elbolton Cave, Wharfedale, are crowded with artic fox and artic hare, and above them come reindeer and ptarmigan, the typical faunas of the late glacial zones I and II. In the Kelco caves, Settle, the late Aurignacian implements are present at the base and in Victoria, Dowkerbottom and other caves, the reindeer fauna is well represented. A careful revision of the records of these cave remains convinces me that we have ample evidence in them of the Weichsel faunas. In Kinsey Cave, Settle, there are the remains of lynx, bear, etc., typical of the zone III, and lynx also occurs in the Moughton cave remains and in Dowkerbottom cave*. The Azilian harpoons and other bone implements follow above the horizon III, exactly where we should expect it, in Victoria, Skyrethornes, Attermire, and other caves.

Evidence of the floras is present in the peats and muds of Linton Mires, and it is desirable that in the light of our newer knowledge of the late glacial periods, these deposits should be re-examined, along with a detailed investigation of the lower silts, etc., at the base of the Malham Tarn Moss peats. The Linton succession is as follows :—

| | | *Peatzone* |
|---|---|---|
| Black peaty soil | | |
| Brown peat | Lower Atlantic | VII |
| Light Brown peat | | VI |
| Light Brown peat | | |
| Fibrous peat | Boreal | VI |
| Sedge peat | | IV |
| Shell marls | *Potamogeton, Characeae* | |
| Silty peat | *Hypnum*, Sedges, *Menyanthes*, etc. | III |
| Coarse silt | | |
| Marly clay | | ? II, I |

This is a glacial lake, formed behind morainic debris when the ice retreated from the upper Dale, and would start as a depression holding a considerable body of stagnant and decaying ice. After the melting of this ice, the lake deposits occupy a period extending at least up to Neolithic times. If the glaciation is Saale, then there is a good chance that the lower silts and clays not yet investigated may contain evidence of the Warthe cold period.

The presence of the zones I, II and III in the silts of Windermere and Neasham, and part of their flora at Linton is evidence that we experienced in the north the Weichsel tundra conditions separated by the warmer Allerød. I am going to suggest that it was during this time that a most interesting element of our West Yorkshire flora reached its maximum spread, and that some of our high-Alpine or sub-Artic flora that has been regarded as a possible glacial survival on nunatak, did in fact enjoy a fairly widespread habitat during the time of the zones I, II and III. Dr. Woodhead, whom we honour as one of our great pioneers in the study of peats and of past floras, recognised the existence of arctic tundra conditions on the Pennines between the retreat of the glaciation and the beginning of the Boreal period. The evidence which was so elusive on the high summits, is to be found in the sediments of the lowland lakes. The Lower Dryas clay, zone I, had a rich flora with *Saxifraga oppositifolia, Salix herbacea, Rubus chamaemorus*, and *Lycopodium selago*, with abundant *Chara* in the lakes. Zone II with its warmer climate

* Jackson, J. W. Lynx remains from Yorkshire Caves. *The Naturalist* No. 891, April 1931, pp. 115-116.

allowed the development of very open juniper-birch scrub and parkland, with *Empetrum* heath, while the later Dryas clay time, zone III, allowed the *Dryas octopetala, Betula nana, Salix herbacea* to spread widely even on the lower ground. I suggest that this part of late glacial time gave this flora the opportunity to spread and establish itself in such a way that it has remained as a definite, and by no means rare, element of our present upland and upper Dales flora.

I have too little knowledge of botany to trespass further in this direction, but I would suggest that if my views of glacial time are even approximately correct, then what we in Yorkshire have called ' post-glacial time ' is really ' post-ice-cover time ' and will include much of the later glacial time of the Continent. We need no longer hesitate about the spread of arctic and sub-artic floras and faunas over a wide area, as there are two or possibly three arctic tundra periods available. The search for inter-glacial deposits comparable with the Continental inter-glacials need no longer be confined to the sporadic and meagre sand and gravel patches within our series of boulder clays, but should be looked for in the older part of what we have called ' post-glacial,' and in our deeper lake deposits, older river terraces, and cave earths. The newer techniques of pollen identification may have a great application in this work, and where else would be a more apropriate locale for such work? We have had in our Union some of the outstanding pioneers in these studies, I need only mention Woodhead, Smith and Rankin, and our county can still be proud of the quality of the workers both amateur and professional who are devoting themselves to the problems of the glacial and post-glacial stratigraphy and palaeobiology. These workers, with such fine ecological studies as the recent work by Pearsall on our moorland floras, Jessen's great monograph on Ireland, and the papers of Godwin and his co-workers on the peat and forest succession in Britain, have a new taking-off point for an effort to re-assess our late-glacial and post-glacial history. Carruthers has given us a welcome jolt towards a re-consideration of the glacial events and has issued a challenge, and the time seems ripe for a determined effort to explore some of the deeper buried successions in our silted-up lake areas, and to re-examine cave and river terrace deposits. I am sure the challenge of recent work will be accepted.

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## SPURN BIRD OBSERVATORY NOTE

### COMMUNAL ROOSTING OF MIGRANT LONG-EARED OWLS

During an autumn visit we noticed at about 20.30 hours on October 28th, 1950 a Long-Eared Owl (*Asio otus*) perched on the flat roof of an old pill-box near Spurn Point. As we approached to obtain better views the owl flew away over an area of buckthorn and elders, through which we followed in the hope of contacting the bird again.

When we were about two and a half yards from one clump of leafless elders it suddenly appeared to burst into life as eleven owls, which we had not previously noticed, scattered in various directions. This clump of bushes was isolated from the rest, was only eight to ten feet across and about eight feet in height. The startling effect of eleven owls bursting from so small an area at such close quarters can be easily imagined. A much more extensive patch of higher elders exists only a few yards away. The owls had obviously not been roosting in the one clump nor anywhere nearby for any length of time. Droppings were comparatively few and only half a dozen pellets were found. One or two Long-Eared Owls had been seen on most days during the previous week. Only two were in the area on the day following this incident.

Two or three of the eleven owls were subsequently found perched at various points nearby and the ear tufts clearly seen. Those identified were Long-Eared Owls and it is reasonable to suppose that all the birds roosting in such close proximity were of that species.

Coward mentions that parties of as many as a score of birds have been observed on migration ; but neither he nor the *Handbook of British Birds* mentions communal roosting of Long-Eared Owls.

A. W. Goodin.
R. F. Dickens.

## FRIENDLY SWANS

W. JOSEPH

Swans have a reputation for aggressiveness, which causes many people to fear them ; but they are by no means as wicked as they are presumed to be. It is true that they often have an unfriendly approach, and they certainly do look vicious when they advance with open wings and beaks, and with outstretched necks, hissing like serpents. This threatening attitude, displayed as it sometimes is without apparent reason, is in my opinion, only the swan's belief in safety-first measures. It is a warning that it is not to be trifled with, and is its preparedness to meet anything that might prove to be of a hostile nature. Of course, as everyone knows, it is folly to go near swans during the breeding period, for the cob will then attack anyone, when he is capable of inflicting very serious injuries.

These birds, however, at normal times will very quickly become friendly and trustful, especially if they are fed regularly and never frightened.

For a few weeks, I stayed in a cottage built on the foreshore of the Chichester Channel, where numbers of swans breed and live in a wild state. I have watched them, fed them, and made friends with them. I became particularly intimate with a family consisting of father, mother and seven cygnets, all of whom were most responsive to my advances, more especially the father. In a surprisingly short time they learnt to come to my whistle or my shout of " Swans, swans, swans !" Sometimes they would be completely out of sight, or looking no bigger than white specks across the far side of the channel, but a call from me would bring an answering chorus from the birds, who would soon appear—a fact that suggested they possessed acute hearing.

As soon as they arrived they would leave the water and accompany me up the path to the cottage door where they would wait till I brought them their food. The cob became so friendly and trustful that he soon followed me into the room and would wander round picking up stray crumbs. Occasionally, when I sat at the table to have my own meal, he would stand beside me looking expectant. His wife was too shy to come in, though I did all I could to encourage her to join her husband. She would only stand just inside the door with her young. I became so fond of the father, that I gave him the pick of the tit-bits, with the result that often when I returned from a walk, I would find him standing outside the cottage door, while his family waited in the background. He was so affectionate that I allowed him to take food from between my lips ; a trick that one of the cygnets quickly learnt to imitate. So gently did they take it, that never once did I receive the slightest injury. This family visited me at all times of the day and while I talked to them they would nibble gently at my legs, hold my fingers in their beaks, or tug at the hem of my skirt.

The cob had a temper and was terribly jealous where rival birds were concerned. No other swans were allowed to approach within the precincts of the cottage. The moment one appeared in sight, it was immediately driven off. On one occasion, a strange cob, braver than the rest, refused to go away but persisted in making repeated attempts to reach the water's edge near the cottage. This perseverance so enraged my cob that he attacked the stranger with extra violence, beating him with his wings until he finally drove him out to midstream. Not content with this, he took his rival by the back of the neck and held his head under the water, apparently in an attempt to drown him. It was a nasty sight. The bird fought valiantly, and it was a great relief to me when I saw him free himself and seek safety in flight .The victor returned looking pugnacious and self-important, but for a short time I felt throughly disgusted with him.

I fed my family with a variety of food oddments. Every day when their rations were finished they would slowly make their way back to the water, but every few steps they would stop and look round to see if I had re-appeared with anything else to offer. This was because, often, when they had reached the water's edge, I would call them back just for the fun of seeing them hurriedly return up the path, and always in the same formation which never varied—the cob leading, followed by the young, with their mother bringing up the rear.

Once, I was away all day from early morning and I wondered if the swans would feel disappointed at missing their usual food. To my surprise, when I returned shortly after six p.m. I was greeted by a great trumpeting from the family, all of whom were waiting on the doorstep. Whether this was a welcome or a

scolding for my apparent neglect, I had no means of finding out. It would have been very interesting to know, and also to discover how long they had waited for me. However, they were quickly compensated for their patience and were fully replete when they retired for the night.

It was with a genuine feeling of sorrow that I left that affectionate swan family when I had to return to town. Would they remember me when I visited the place again? I felt dejected too, when I realised how disappointed they were going to be when their regular meals were not forthcoming. How long would they wait for my return? How long before they lost hope? I would never know.

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## JUG HOLES CAVE AND ITS BATS

A. L. PILL, F.R.G.S.

WHEN we consider the innumerable caves and derelict mining levels piercing the carboniferous limestone of Derbyshire it is surprising to find how few are frequented by bats. None known to the author boasts a stronger colony than Jug Holes Cave near Matlock, the members of which are whiskered bats, (*Myotis mystacinus* Kuhl.). Yet the amenities there do not at first sight appear superior to those elsewhere.

By amenities are meant such factors as humidity, temperature and obstacles to intruders. As to the first the relative humidity is so high in winter that the fur of the bats becomes sodden with the water that oozes in through the roof. Equability of temperature is the rule rather than exception in the majority of large caves unless they have a second connection with the surface. Actually in Jug Holes Cave there is an annual variation over the range 7·5—9·0° C. Natural obstacles are, however, another matter. For, on passing through the cave entrance one climbs down a twenty foot deep shaft and crawls for several yards along low passages before reaching the chamber occupied by the bats. The bats do not negotiate this shaft directly, but spiral round and round gaining or losing height as the case may be.

In the chamber the roof rises here and there to over ten feet. Only on very rare occasions, however, do the bats aspire to the safety of such heights. Instead they range themselves either singly, or in clusters seldom exceeding a dozen, along the walls or lower points of the roof.

A feature of this roof are the numerous blind cavities which pierce it. Many of them are bulbous in cross section and have a narrow platform at their base due to the smaller diameter of their entrances. Solitary and occasional pairs of bats have been found suspended from the edges, walls and ceilings of these in the normal manner. In April 1950, however, an apparently uninjured member of the colony was found to be lying on its side in one of the platformed cavities, to which it was returned without undue trouble after examination. The docility of the specimen was all the more remarkable because the whiskered bat can bite at the handler quite fiercely, fortunately with negligible damage.

If the bat had an illness it was something entirely different from that prevalent during the previous Spring. Several of the colony then sneezed whilst being handled, but were otherwise quite lively. These attacks held all the elements of the human sneeze, even to the jerk of the head and the appearance of moisture at the nostrils.

Although observations at irregular intervals extending over a period of more than two years have shown that immature male bats have been added to it the colony has never numbered more than 79, nor prior to October 1950 when two females were unexpectedly found whilst banding, had any of this sex ever been encountered in the cave.

The mean wing span of two typical specimens which together weighed 8·9 grammes was 8·6 inches, but taking the colony as a whole the average wing span will be somewhat less.

# In Memoriam

W. P. WINTER, B.Sc., F.G.S.
(1867-1950)

SCIENTIFIC students of nature look below the surface of observed events and are constantly trying to trace effect to cause, and to extract a coherent meaning from the whole magnificent procession of outdoor natural phenomena. W. P. Winter was one of these and now, when at the close of his life it is realised how deep a mark he left on the natural history of his adopted county, it is pertinent to ask how his first enthusiasm for nature was aroused. Born at Cheltenham, he lived within

easy reach of the Cotswold country and his father took him on long walks in a district of unusual variety and charm. Later, Dr. Wright, a well known geologist led him to take a special interest in both geology and botany, two subjects which were to remain of outstanding interest to him throughout his life. After taking his degree, he became a master at Cheltenham Grammar School and there two constant features of his character asserted themselves, his love of Nature and his success in passing this enthusiasm to others. Both were shewn in the popular outdoor excursions in natural history which he organised. It was on one of these that he first met his future wife, who now survives him and for whom special sympathy is felt in the loss she has sustained after so many years of married life.

In 1900 he came to Yorkshire to become science and mathematical master at Salt's School, Shipley. Soon after coming to Shipley he became a member of the Bradford Naturalists' Society and of the Bradford Scientific Society. He joined the Yorkshire Naturalists' Union in 1905 and the Yorkshire Geological Society in 1915. In all these Societies his ability was soon recognised. Before long he was

made President of the two Bradford Societies in turn. In the difficult days of the Second World War the Naturalists' Society again elected him to their Presidency. He held this position for four years and his wise guidance did a great deal to hold the Society together.

He was elected President of the Yorkshire Geological Society in 1937 and his valuable Presidential Address on a subject seldom considered, " Geology in Schools," was printed in the Society's proceedings.

In the Yorkshire Naturalists' Union he became a familiar and highly regarded figure at the meetings and at his death was the sole Honorary Life member of the Union. His value to the Union may be indicated by the fact that he was a member of the Executive, of the Geology Section, of the Plant Galls Committee, of the Ecology Committee, and for a long period Chairman of the Arachnida Committee.

At the time when Winter joined the two Bradford Societies, they were working in close association and most of the expert naturalists of the district belonged to both. Winter was one of these and he joined at a time of great activity. Two exceptional projects were carried out in these years. One was the publication of the Bradford Scientific Journal, which appeared from 1904 till 1912, and attained an unusually high standard for a local journal. Winter was from the first a member of the editorial board, being responsible for botany. On this subject he wrote many articles, exhibiting a special power of making the subject interesting to the general reader. The other main work of these years was the inception and popularisation of the Botanic Garden in Lister Park, Bradford, a work in which he played an important and formative part. This scheme had a scientific basis showing originality and in its practical execution proved to be a notable piece of landscape gardening. The garden not only illustrated the general principles of the classification of plants and their economic uses but was also planned so as to exhibit various aspects of the geology of Yorkshire. With this fundamental structure it became possible to relate the plants to their habitats, *e.g.*, to show the different floras of gritstone and limestone. Thus it was possible to show the ecology of plants, a subject then unfamiliar to most botanists. It is impossible not to link these ideas with Winter's early training in both botany and geology, and to trace to him a large share of the credit for the outcome of this scheme which in the end became so notable a feature of the city of Bradford. Many of Winter's botanical articles in the Journal described the various ideas and features of the Botanic Garden. He also gave a series of talks in the garden, for which he received a special resolution of thanks from the Bradford Scientific Society in 1906.

Contributions on other subjects made by Winter to the Bradford Scientific Journal deserve mention. An article on the ' Spiders of the Bradford Area ' marked the extension of his interests to the Arachnida, a subject on which he thenceforward contributed much and became an acknowledged authority. In 1911 he wrote articles on Shipley Glen which later in pamphlet form were widely read in the district. Winter was especially gifted as a draughtsman and in 1909 he contributed an admirable plate of drawings to a paper on ' Dart and Hover Flies ' and also wrote a beautifully illustrated ' Note on the Cockchafer.'

When the two Bradford Societies held their joint jubilee in 1925 he edited ' Fifty Years of Local Science,' an interesting account of what the Societies had accomplished in that period.

Winter's outstanding personal qualities were kindness, courtesy, and helpfulness. He was never so happy as when guiding the development of younger naturalists and his greatest reward was to see their growing interest in the study.

Gifted in many ways, versatile and also thorough, widely read and a keen student of Nature, Winter made an impression on the life of his time and circle which will not soon be erased. Above all, like many true naturalists he had a fundamental humility. If he had spoken the line ' In Nature's infinite book of secrecy a little I can read ' it would have been with an emphasis on the word ' little ' for he always realised, rich as were his accomplishments and achievements, that he could only illuminate a small page of that ' infinite book ' of which our greatest poet wrote.

A. M. S.

## CHARLES FRANCIS PROCTER
(1877-1950)

THE Vertebrate Section of the Yorkshire Naturalists' Union has suffered a severe loss in the unexpected death of C. F. Procter at the age of seventy-three. He joined the Union in 1920, and more recently held a number of appointments including Presidency of the Vertebrate Section and the Treasurership of the Yorkshire Wild Birds and Eggs Protection Acts Committee. He was also an active member of the Hull Scientific Society.

In private life Procter was a plumber and in 1917 left York to found his own firm in Hull. In the course of time he was appointed Chairman of many Trade Associations, and those who attended his funeral on November 8th will realise how well he was known and respected in his home City. He was also a well-known Freemason and had held the highest offices in his Lodge.

It is, however, with the man himself and his interests that we are here concerned. Procter was a keen sportsman and his early life in Hull furnished him

*Photo by]* *[Mitchell & Cooper*

with unusual opportunities for indulging in his love of shooting. This lead to a study of the Geese, Ducks and Waders of the Humber Estuary, and in collaboration with Mr. Stanley Duncan and others he acquired in the course of years an accurate knowledge of the species to be met and their habits. This led to a widening of his interests and a genuine regard for all forms of vertebrate life.

Procter's approach to Ornithology was not sentimental. He believed that man, having been placed ' in dominion ' over the animal kingdom had a right to exact his toll so long as this did not exceed the capacity for the natural increase of the species. In the case of rare birds, with a precarious foothold in the County, he was a staunch Protectionist and as such did much to protect certain small nesting colonies in the Holderness district.

The writer first met Procter when he was an energetic member of the York

and District Field Naturalists' Association and thereafter formed a close friendship which existed to the end. Ornithological and fishing expeditions were made to many parts of Ireland, Scotland and Wales. He possessed a great power of expression, which often stood him in good stead as an after-dinner speaker, but angling experiences, in which a certain latitude is permitted by immemorial custom, gave him ever greater scope, and the other visitors to the fishing hotels soon gave up the competition and relapsed into spellbound silence.

Procter possessed a great thirst for knowledge and this, coupled with a retentive memory, enabled him to talk with distinction on a great variety of subjects. He also possessed a real love for humanity and a great zest for life. His kindly presence will be much missed at future meetings of the Vertebrate Section, but most of all by his wife and family. He leaves a son, well known to Yorkshire Naturalists, and two daughters.

E. Wilfred Taylor.

## EDWIN HAWKESWORTH
(1870-1950)

For nearly sixty years, from his election as a member in 1891, Edwin Hawkesworth was a staunch supporter of the Yorkshire Naturalists' Union and during his earlier years took an active part in its administration and in the conduct of its field meetings. His main interests were geological and he will always be remembered for his enthusiastic leadership of the Leeds Geological Association for a quarter of a century. He did not contribute many original papers to scientific literature but he was always keen to ensure that no local discoveries went unrecorded. He was a regular participant in the field meetings of the Union and acted as secretary of the Geological Section for some years. For fourteen years he carried out the onerous duties of Honorary Treasurer and his election to the Presidential Chair in 1926 was a fitting acknowledgment of long service to the Union and to the cause of amateur science in the county. He was a keen collector but was insistent that his specimens should be made use of and the Leeds Museum has benefited by his generosity. Even when advancing years and ill-health cut him off from actively participating in the work of the Union, he continued to give his valuable advice as Deputy-Chairman of the Leeds City Council's Museums Sub-Committee. His passing at the age of eighty places another name on the Roll of Honour of the Union. Our sympathy goes to his widow and family.

H. C. V.

## FIELD NOTES

**Sabine's Gull in Yorkshire.**—A juvenile Sabine's Gull, *Xema sabini* (Sabine) occurred at Wintersett Reservoir, near Wakefield, on September 19th, 1950, and remained until September 29th. A very tame bird, it was watched through binoculars at 20-30 yards range on several days whilst at rest, and within 10 yards distance on the wing. The bird was also seen on September 23rd by E. Ellis and on the 24th by P. E. Davis, and later by R. F. Dickens and K. Fenton.

On September 21st I examined the bird through a x25 telescope at 15-20 yards distance. The forehead, superciliary stripe, lores, and most of the ear-coverts were white. A line from below the eye and below the ear-coverts, the crown, nape, hind-neck, and sides of upper breast were grey-brown, with some hind-neck feathers narrowly edged white. The upper parts were grey-brown with white edges to the feathers. The wing-coverts were grey at base darkening to grey-brown with white edgings. The rump, upper tail coverts, and tail were white with a black terminal band. The fork in the tail was only conspicuous with the tail closed in ordinary flight, and was not readily noticed with the tail fanned out, or with the bird at rest. The underparts were white. When the bird raised its wings whilst at rest, a faint grey edge could be seen to some of the under wing-coverts. The primaries were very dark, and several had white tips. The secondaries were white. The legs appeared brownish, and the bill and the eyes dark. In flight the gull was very conspicuous, and was distinctly smaller than the Black-headed Gulls (*Farus ridibundus*) around. It fed along-shore more like a wader than a gull. A call heard on September 24th sounded like " Zip " repeated several times.

The period was one of high winds and I understand that the species occurred at least at two other places further south about the same time.

Mr. Ralph Chislett informs me that since the publication of Nelson's *Birds of Yorkshire* the species has only been reliably recorded in the county in the autumns of 1908, 1910, 1911 and 1926, in each case on the coast.—JOHN CUDWORTH.

**The Long-tailed Skua, *Stercorarius longicaudus*, at Helmsley.**—On September 23rd, 1950, in Duncombe Park, one of my dogs picked up a dead bird which proved on examination to be a male of the above species.

The small size and narrow bill are distinguishing characteristics, also the greyer mantle. The majority of recorded Yorkshire examples have been in first juvenile plumage and have not shown the white cheeks and neck of this bird, which while not in fully adult plumage, exhibits most of the adult characteristics including the two long central tail feathers, one of which may be described as a streamer.

The specimen was exhibited at the meeting of the Yorkshire Naturalists' Union held in Leeds on October 21st and has been presented to the Yorkshire Museum.—ADAM GORDON.

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**Bryology Section at Jackdaw Crag Quarry.**—The quarry is situated near Tadcaster and during the war was re-opened for quarrying Magnesian limestone. The area comprises a small natural outcrop of rock and some woodland but mostly consists of grassy mounds formed by colonisation of tipped material. Some fifty years ago it yielded many good records but in the few hours spent there on September 23rd the lists compiled by three members show little out of the ordinary. In the process of colonisation the mounds would offer sites for bryophytes but in the natural succession of vegetation they are now occupied by flowering plants, chiefly grasses, and little of the original moss flora survives. Generally the area is too dry for hepatics, but on barer patches *Lophozia turbinata* is still in quantity as it was in Mr. W. Ingham's time and will continue so judging by the large number of perianths. The fruiting period according to Macvicar is March-June, but a number of spore capsules were seen shedding spores. *Pellia Fabbroniana*, the dominant thalloid, was conspicuous by its new autumnal branching; *Preissia* is present in small amount and a little of what appeared to be *Aneura sinuata* var. *major*. Two of the taller mosses, *Dicranum Bonjeani* and a form of *D. scoparium* with straight leaves, were growing in similar positions amongst the grass on some of the mounds. A few of the commoner Barbulas, *unguiculata*, *fallax*, *convoluta* and *rigidula* were conspicuous in barer places, the latter with gemmae on both capsular and non-fruiting plants. *Dicranella varia* in similar situations had capsules in various stages and on the wood edge *Brachythecium rutabulum* and *Eurhynchium confertum* were conspicuous in fruit. *Encalypta streptocarpa*, known to have fruited here, was in its more usual non-fruiting form. Reference to this was made in the 1949 Pateley Bridge report and since that appeared my attention has been drawn to a paper in the *Bryologist*, 1929, by L. B. C. Trotter, who describes the finding on the Mendip Hills in October of plants bearing an unusual kind of moss gemmae budded off from short-celled brown filaments growing from leaf axils. The quarry plants were examined and although the short-celled filaments were present in quantity I was not fortunate enough to see the gemmae. *Thuidium tamariscinum* was present but one member records the rarer *T. Philiberti*, found here in 1899 by W. Ingham. *Hypnum chrysophyllum* was seen in a few places.

H. WALSH.

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## BOOK REVIEWS

**Wild Animals in Britain** by **Frances Pitt.** Third Edition. Pp. viii + 120 with four colour plates and 100 photographic illustrations. Batsford, 12/6.

The first edition of this book, one of the best known of Miss Pitt's works, was published twelve years ago. Its popularity is well deserved. It has all the attributes of a good book on natural history which can be read both with profit and enjoyment by readers at all levels; for it combines accuracy and intimate first-hand knowledge with an attractive style and excellent illustrations. It has been said quite rightly that "a child could understand her fascinating account, a scientist could ill afford to despise it". Alterations to the previous edition seem trifling but it is not easy to see how, within the limits set, this book could be much improved.

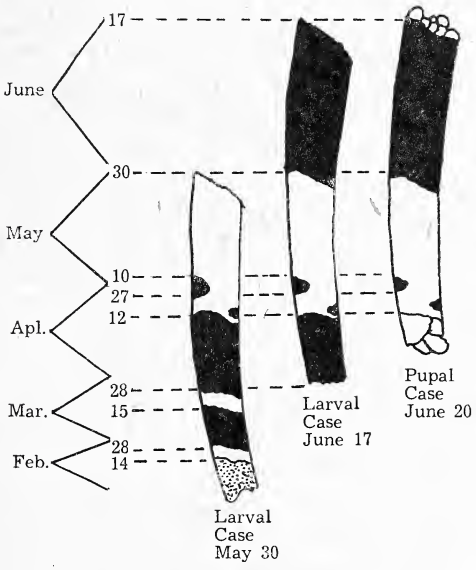
# NOTES ON THE GROWTH AND DEVELOPMENT OF A CADDIS LARVA, *Limnephilus vittatus* (Fab.)

H. WHITEHEAD

A LITTLE more than two hundred years ago Réaumur published his *Histoire des Insectes* in six quarto volumes. Fortunately, Miall has rendered part of this rare and delightful work available to English readers in translation in *The Natural History of Aquatic Insects* (1895). We read there accounts of observations and experiments made on caddis larvae and how the protective coverings made from fragments of vegetable and mineral matter are fastened together by fibres of silk ; the final product being the familiar caddis case.

Since Réaumur's time naturalists have doubtless repeated his experiments with many variations. As far as I know accounts of experiments and observations similar to those detailed below have not appeared in print.

Some small caddises in cases made of fine sand were taken from a pond at Moortown, Leeds, in February, 1943. These were placed in a saucer with stems and




leaves of starwort. The caddises found difficulty in crawling over the slippery surface of the saucer, so a little fine, white, clean silversand was scattered over the bottom. A few days afterwards each case had a narrow ring of white silversand round the rim. The cases were evidently being enlarged to accommodate the growing larvae. This suggested an experiment. If the larvae were supplied at intervals with materials of contrasting colours it should be possible to get a record of their rate of work in case building, and from that to make a rough estimate of the rate of growth of the larvae. On February 14th small fragments of broken white porcelain were throughly washed, placed in a saucer of water and three larvae and a sprig of starwort added. A fortnight afterwards a ring of white porcelain fragments had been cemented round the margins of the three cases. These caddises were transferred on February 28th to a second clean saucer provided with broken red brick treated in the same way as the white porcelain and by March 15th a red ring had been added to the upper and wider end of the case. This method of supplying material for alternating red and white rings was continued. One larva died on May 30th, but the other two lived and grew. The second larva sealed the case preparatory to pupation on May 30th, and the imago emerged on June 15th. The third larva did not seal its case until June 20th and the winged insect appeared on July 27th. There was no difficulty in identifying the imagoes as *Limnephilus*

*vittatus* (Fab.). In the observations and experiments described in this note all the larvae were identified in the imaginal state as *L. vittatus*. The third specimen was kept in a saucer supplied with aquatic plants (chiefly starwort), placed in a room without fire and facing north from February 14th to July 7th, *i.e.*, 123 days. A record of the growth of this case is shown in diagrammatic form in the illustration. The outlines of the areas of coloured fragments have been carefully drawn under a camera lucida.

The first drawing was made on May 30th ; the dotted portion represents part of the case made while the larvae was living in the pond, *i.e.*, prior to February 14th. The white portions represent the porcelain and the black the red brick. The second drawing was made on June 17th, and it will be noticed that a portion of the narrower, posterior end had disappeared. As the larva grows in length and girth the tube has to be made longer and wider. As the case becomes too long and heavy for its inmate, portions of the posterior end are bitten off. The third sketch shows the state of the case on June 20th. It had again been shortened and large pieces had been fixed to the two ends of the tube in preparation for pupation. Spaces had been left between the sealing fragments which were too small for the incursion of enemies but large enough to permit currents of water, necessary for respiration, to flow through the tube. Before sealing, the two ends of the tube had been fixed by cement to a leaf of starwort. The length of the pupal case was 13 mm. and the greatest internal diameter 2 mm.

The diagrams show that comparatively little growth took place before April, but after then the rate increased during May and June. The objection may be raised that as the experiment was carried out under artificial conditions, the rates of growth shown may not be the same as those of the same species kept in a pond. It may be pointed out, however, that the dimensions of both pupae and imagoes correspond with those left to grow in the pond, and also that the dates of emergence of the winged insects come well within the period in which imagoes have been taken in Yorkshire—viz. from May to September.

Larvae of *L. vittatus* are easily reared. The only food given was pieces of starwort upon which the caddises browsed. Using a low power of the microscope one easily sees flocculent matter on the surface of the leaf being swept into the mouth by the first pair of legs, the second pair sometimes assisting . Food is passed between the vigorously working mandibles. Each femur and coxa of the first pair of legs is well provided with a row of stiff hairs on the inner surface. Each mandible has a bunch of long hairs on the inner side. These hairs are useful in sweeping the leaf surface. A little of the flocculent matter, taken up in a pipette and examined under the high power, consisted of very small unicellular algae, small diatoms and a few minute Protozoa—a relatively vegetarian diet.

How is the case sealed up and what happens inside after sealing? A tube of transparent material is necessary to settle these questions. Glass capillary tubes of suitable size were offered to larvae evicted from their cases made of sand grains. Although they were easily persuaded to enter, they refused to remain within. The inside walls were too slippery and the glass tubes were heavier than cases made of sand grains. Miall describes how T. H. Taylor succeeded in getting a larva of *Phryganea grandis* L. to make tubes of small pieces of mica and the respiratory movements of the larva were observed. The change to the pupal state is not mentioned. As fragments of broken cover slips would be more transparent than mica, I supplied some to naked larvae of *L. vittatus*. Pieces of glass were immediately used to make a rough covering for the body. Later the craftsmanship improved and a well-made case of glass was built, the roughly made part being cut adrift.

The method was as follows. A piece of glass would be taken between the first pair of legs and held in position on the edge of the tube. If the fragment did not fit satisfactorily it was turned round and tried in other positions ; if unsuitable the piece was rejected and another one tried. When a suitable piece of glass was found it was held in position by the feet and the mouth was applied to the inner surface of the glass fragment. Silk in a semi-fluid condition was poured from a duct opening at the tip of the labium. The head was moved about in many directions until strands of silk were laid irregularly on the surface of the glass. Then by bigger sweeps of the head the fibres were carried to and fixed on to adjoining pieces of glass forming the tube. When firmly fixed in position any spaces between fragments were filled with drops of fluid silk which soon hardened.

In order to see details of the way in which the fibres were laid, all that was necessary was to dissect out a suitable group of fragments and stain the fibres in Ehrlich's haematoxylin. Another method giving satisfactory results was to supply fragments of pure limestone to the young larva. On the completion of the case and after the extraction of the larva, the case was dropped into dilute hydrochloric acid. By this means the mineral portion of the case was dissolved and the silk lining remained.

The case of glass permitted observations to be made on metamorphosis, though growth of unicellular algae on both sides of the glass made it difficult to see details. I was unable to see all the stages of metamorphosis in one individual but the following account, based on observations made on ten larvae, gives a general idea of the changes taking place. A fully grown larva attaches its case to a stem or leaf of a plant by means of a blob of cement at each end. The wide (anterior) end is then closed by glass fragments, spaces being left between to allow circulation of water. The larva then turns round inside the case and closes the narrow (posterior) end in the same way. This work is done inside the case and takes about six hours for each end. The larva again turns round, the head now being at the wide end of the case. In about four days, the time depending chiefly on temprature, the larva sheds its skin in a more or less fragmentary condition, passing it backwards and packing it at the posterior end. The outline of the pupa can now be made out and the eyes take the form of those of the winged insect and become pigmented. In a typical example the pupa measured 8 mm. in length and occupied the middle portion of a case 13 mm. long. The larval exuviae at the posterior and a small clear space at the anterior could easily be made out. During the whole of the pupal period rhythmic movement of the body, especially the abdomen, ensures a circulation of water through the case and this enables respiration to be carried on. The caddises under observation remained in the pupal condition for a period of from five to seven days. Pupae usually broke out of the case during the night or very early morning. One example, fortunately, chose 6 p.m. for the process. The pupa, provided with a strong pair of mandibles, tore away some of the fibres sealing the anterior end of the case. The end now opened like the hinged lid of a box and the active pupa emerged. The pupa swam by means of the long middle pair of legs to the side of the dish and thrust its head and thorax out of the water. The abdomen remained immersed and the rhythmic breathing movements alternated with periods of rest. The final emergence was no leisurely process. Violent convulsions of the body took place, the pupal skin split along the back and the soft bodied imago crawled out. The biting jaws, so necessary for escape from the case, and the long oar-like legs for swimming, had been discarded and left behind ; the head and body half in and half out of the water seem almost symbolical of the amphibious life of its late owner. The process of extension of the wings and the drying of the body preparatory to flight is similar to that occurring in most Lepidoptera.

In concluding these notes I should like to draw attention to the very remarkable changes in form of the middle limb during the life of an individual caddis. The middle limb of the larva is short and strong and possesses a well developed claw suitable for dragging the body and case over submerged plants and sandy patches on the floor of the pond. The same leg in the pupal stage has doubled its length and possesses a row of fine hairs on each side of the tarsus ; thus becoming an oar-like limb for swimming. In the insect's last and winged state the tarsus has numerous strong bristles and the terminal joint has a pair of hooks. The limb is now well fitted for climbing and running over branches of trees.

It would be difficult to find a finer example of changes of structure and function in a single organ in one short life of one animal.

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**Glossary of the British Flora,** by **H. Gilbert-Carter.** Pp. xviii + 79. Cambridge University Press, 8/6.

This book explains the derivation, meaning and correct pronounciation of generic, specific and varietal names of all British plants. An authoritative work supplying the information was badly needed and, as Canon Raven says in his preface, no one was better qualified to write it than Mr. Gilbert Carter. Though it is too much to hope that in future botanists will adopt a uniform pronunciation, it is nevertheless valuable to have this decisive answer to their difficulties and correction of their mistakes.

# SUPPLEMENTARY NOTES ON MYRIAPODA

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## 1. MARINE MYRIAPODA

In my paper "*Hydroschendyla submarina* (Grube) in Yorkshire, with an Historical Review of the Marine Myriapoda" [*The Naturalist*, 1948, 149-152], an attempt was made to include a complete bibliography to this aspect of the biology of Myriapods. Dr. Otto Schubart of São Paulo, Brazil, who is working on the bibliography of the Myriapoda, has kindly sent me the following list of publications which I did not mention.

Archey, G. (1936). 'Revision of the Chilopoda of New Zealand (Part 1).' *Rec. Auckland [N.Z.] Inst.* 2, (1), 43-70.

Bagnall, R. S. (1916). 'Report on the Field Meeting of the Natural History Society for 1911.' *Trans. Nat. Hist. Soc. Northumb.* (N.S.) 4 (2), 344-365.

Carpenter, G. H. (1895). 'Araneidea and Myriapoda collected by the Royal Irish Academy Fauna and Flora Committee.' *Irish Nat.* 4, 254-258.

Ellingsen, E. (1897). 'Mere om norske Myriopoder, 1.' *Forh. Vidensk. Selsk. Krist.* 1896 (4), 1-12.

Evans, W. (1901). 'Zoological Notes: Scottish Myriapoda.' *Ann. Scot. Nat. Hist.* 10, 184.

Hammer, P. (1931). 'Tusindbeen (Myriopoda).' *Danms. Fauna.* 35, 1-175.

King, L. A. L. (1912). 'Clyde Marine Fauna, Supplementary List.' *Biol. Ass. West Scotland.* 1911, 60-97.

Porat, C. O. von (1894). 'Zur Myriapodenfauna Kameruns.' *Bih. svensk. Veternsk Akad. Handl.* 20 (4) 1-90.

Templeton, R. (1836). 'List of Irish Myriapoda, selected from the papers of the late John Templeton.' *Loudon's Mag. Nat. Hist.* 9, 12-13.

Verhoeff, C. W. (1941) 'Asiatische Beiträge, II Türkische Chilopoden, III Mitteilung betreffend ostasiatische Diplopoden.' *Rev. Fac. Sci. Univ. Istambul.* B. 6, 85-117.

Waterson, A. R. (1936). 'Diplopoda and Chilopoda' in Forest, J. E. and Watson, E. V. 'The Natural History of Barra, Outer Hebrides.' *Proc. Phys. Soc. Edinb.* 22, (5) 271.

## 2. THE ENEMIES OF MYRIAPODA

To my article on this subject [*Naturalist*, 1949, 137-141] was appended a bibliography of the parasites and predators of Myriapods. The first part of this has recently been very considerably amplified by Professor Paul A. Remy [*Naturalist*, 1950, 103-108]. Dr. Otto Schubart now draws my attention to two references to the relationship between Formicidae, of the sub-family Ponerinae and Myriapoda. Wheeler, W. M. and Mann, W. M. [1914, *Bull. Amer. Mus.* 33. 10-11] suggested that *Emeryella schmitti* Forel feeds almost entirely upon Diplopoda, and Mann, W. M. [1934, *Nat. Geogr. Mag.* 66, 178, pl. 6] illustrated an ant of this species carrying a millipede on its back.

Dr. Schubart in his letter (3/9/1950) adds that he found in the Montiqueira mountains of Brazil an *Ectatoma* (*E. schubarti* Borbmeier) which likewise feeds only on Diplopods, showing a preference for Strongylosomidae and Leptodesmidae. This he recorded in his paper 'Diplopodes de Monte Alegre' [1945, *Pap. Avulsos Dept. Zool. S. Paulo* 6, 283-320]. He visited this nest on successive years, and eventually foind another near by. But he has not seen the species during his journeys in other regions of Brazil.

With regard to my conclusions as to the significance of parasites and predators in controlling the numbers of Myriapod populations, Mr. Mark Williamson suggests that perhaps a clearer distinction should have been drawn between the effects of density dependant, and density independant factors.

Finally, when preparing my original paper, I omitted to refer to some interesting correspondence under the title 'A Luminous Centipede' [*Nature Lond.* 1895, 53, 131; 1902, 65, 223] in which Miss R. H. Thomas described a centipede, according to R. I. Pocock [1895, *Ibid* 53, 131; 1896, 53, 223] probably *Linotaenia*

*crassipes* [=*Scolioplanes crassipes* (C. L. Koch)], which discharged a luminous defensive fluid over a number of attacking ants.

H. K. and S. G. Brade-Birks [1920, *Ann. Mag. Nat. Hist.* (9) **5**, 1-30] also state that attack by ants is one of the stimuli which are known to cause light production in *Geophilus carpophagus* Leach.

## 3. MIGRATION IN MYRIAPODS

Since the publication of my paper on ' The Significance of Migration in Myriapods ' [1949, *Ann. Mag. Nat. Hist.* (12) **2**, 947-962], Professor R. V. Chamberlin [1949, *Psyche* **56**, 184-186] has recorded a mass migration of a new African millipede, *Zantekius weberi*, in the Belgian Congo near Bembi, at the junction of the Vele and Bomokandi Rivers (3° 38′ N. 26° 8′ E.). The animals were discovered on March 2nd, 1948, and were evidently present in many thousands.

The late Major Stanley S. Flower in his ' Notes on the Millipedes, Centipedes, Scorpions, etc., of the Malay Peninsula and Siam ' [1901 *J. Straits Br. Asiat. Soc.* **36**, 1-48] made the following interesting observation : ' The late Mr. Whitehead in his book *Kinabalu* p. 17, describing his visit to Malacca, writes, " On the way down from Mount Ophir I saw a wonderful gathering of pale yellow Millipedes, about six inches long, they were in a mass, one on top of the other, which must have numbered several hundreds, and reminded me of a huge dish of macaroni." And I myself saw enormous numbers on the island of Kosichang, in the Gulf of Siam, when visiting it on the 27th and 28th of August, 1897. . . . At the end of February, 1898, I was again at Kosichang, *not one single Millipede was to be seen* abroad, but we found a few by searching in damp spots, underneath timber, old tins, etc.' This record was not quoted by Dr. Otto Schubart [1940, *Tabul. biol. Den Haag*, 18, 216-229]. Major Flower apparently attributed the phenomenon to a mere local increase in numbers during the wet season. In view of the large numbers, ' they were crawling about in hundreds and hundreds,' the presence of several species including *Thyropygus*, *Orthomorpha*, (=*Paradesmus*) and *Zephronia*, and the fact that the animals were ' all about the ground under the shade of the trees and in the hot mid-day sunshine ' it would appear likely that this was a typical case of mass migration. It brings the total of instances recorded from the tropics to six, and is the only record from Asia.

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**British Water Beetles**, Vol. II, by **Frank Balfour-Browne.** Pp. xx + 394, 1 plate. Ray Society, British Museum (Natural History), London. 27/6.

British coleopterists will welcome the appearance of this book, published ten years after its precursor. It completes the Dytiscidae, partly studied in Vol. I, by treating of the Colymbetines and Dytiscines, and also covers the Gyrinidae. There is a discussion of each group followed by a detailed treatment of each species in turn. There are diagnostic tables not only for the imagines but also for the larvae by which these can be run down to the genus at least. So far as the reviewer has checked the imaginal tables, they are simple and convenient to work with ; in accordance with modern practice, where necessary they make full use of the genitalia and of the characters of the lower surface, and here the numerous figures are most helpful. These are particularly of assistance with that difficult genus *Cyrinus*, and students will welcome the author's discussion of the subject which does much to clear up a position which has become increasingly confused and muddled. Entomologists in particular will welcome Professor Balfour-Browne's views on the repeated changes in nomenclature which are doing much to make modern taxonomy something of a nuisance, to say the least ; and members of the Y.N.U. will be gratified to note that there is at least one prominent worker who draws some of his data from the pages of *The Naturalist*. Even more than in Vol. I there is much information relating to the biology and ecology of the insects studied, and thus the work will be of interest to the general biologist as well as to the coleopterist. In every way the book will add to the reputation of our foremost student of the water-beetles. The printing, paper and binding are of the usual high standard which we expect in the publications of the Ray Society.

G. B. Walsh.

## THE YORKSHIRE NATURALISTS' UNION EIGHTY-NINTH ANNUAL REPORT

**The Eighty-eighth Annual Meeting** was held in the Keighley Technical College Annexe, on Saturday, December 3rd, 1949, on the invitation of the Keighley Natural History and Literary Society. The Annual Report for 1949 was presented there and is printed in *The Naturalist*, 1950, pp. 21-38.

**The Presidential Address**, ' The Changing Surface of the Tree,' was given by the President, Miss Lorna I. Scott, M.Sc., F.L.S. This is printed in *The Naturalist*, 1950, pp. 1-10.

**The Presidency** for 1951 has been offered to and accepted by Henry Whitehead, B.Sc., of Leeds.

**The Excursions** for 1951 will be held at :

V.C. 61. Howden, May 12th to 14th.
V.C. 62. Yearsley Dam, June 16th.
V.C. 63. Deanhead Valley, June 30th.
V.C. 64. Thorp Arch, July 14th.
V.C. 65. West Burton, June 2nd.

**Membership**—Thirty new members have joined the Union and the following three Societies have become affiliated : Bradford Micro Circle, Biological Society of University College, Hull, and the Upper Wharfedale Field Society. It is with much regret that the death of the following eight members is announced : F. A. Daniel, Capt. S. E. Evans, M. C. Foster, Mrs. Greevz Fisher, W. Don Fisher, E. Hawkesworth, C. F. Procter, and W. P. Winter. Thirteen others have also ceased membership.

### FRESHWATER BIOLOGY

(H. Whitehead).—Successful field meetings have been held during the year and three of these have been reported in *The Naturalist* for 1950, viz. : Malton, May 27th-29th, pp. 166-7 ; Ripon, June 10th, p. 171 ; and Winterburn and Hetton, June 24th, p. 173.

The attention of those interested in Freshwater Biology is drawn to a paper by Dr. T. T. Macan, ' Survey of a Moorland Fishpond ', *Journ. of Animal Ecology*, Vol. 18, No. 2, pp. 160-186, November, 1949. The paper relates to the fauna and flora of Three Dubs Tarn in the Lake District.

Members of the Freshwater Biology Committee have sent in the following reports :

(Chris. A. Cheetham).—A feature that has been increasing these last two or three years and which the September and October heavy rainfall has made still more noticeable is the sudden rise and fall of the stream-flow. This is in large measure due to the mechanical gryping or ditching on our moorlands. The old water-holding areas, bogs or mosses, kept up the regular flow of spring-heads and water supplies to houses and villages. Now the rainfall is drawn away quickly from the hillsides and into the streams, giving sudden heavy freshets which as quickly run off. Fishermen say that a freshet of this size used to mean a good fishing stream for a week or more, whereas now the flow has fallen in a day or two. At the beginning of January a very sudden and heavy flood in Austwick Beck appeared to almost scour the stream-bed clear of mosses and water weeds ; it suggested that larvae living in these plants would have perished and that mayflies, caddis and stoneflies would have been destroyed. As the year passed on this appeared to have happened ; later on, however, a general lack of insects of all classes showed that some other factors had been at work.

The hot summer of 1949 and the spring drought of 1950 induced cattle to walk into the stream and to eat the pondweeds, watercress, etc., that are normally free from their attentions and this helped on the flood-waters in the scouring-out effort. On Austwick Beck, 1950, has been very different from 1949 ; last year the stonefly *Protonemura meyeri* (Pictet) was present in hundreds, but this year only single specimens were found at the same time in early May. A caddis *Sericostoma personatum* Spence, that was so plentiful in June, 1949, has only been seen as odd

specimens some four or five times this year. The mayfly *Ephemera danica* Müll., so very numerous on June 1st, 1949, was not seen until June 10th, 1950, and then only a few appeared, though strangely odd specimens occurred into late September.

The Perlas were possibly nearer in quantity to the previous year than any other group. Amongst caddisflies *Odontocerum albicorne* Scop., though few in number, has been taken throughout the season. Species of the genus *Rhyacophila*, so plentiful previously, were only caught very occasionally. *Mystacides azurea* L. was seen at odd times and a variety with white antennae, var. *albicornis* Mos. was taken on two occasions.

(P. F. Holmes).—As regards the insects hatching out of Malham Tarn, my impression has been that it has been quite a good year for them and nothing has been noticeably depleted in numbers. There was a tremendous hatch of *Chironomus plumosus* L. at the end of May to beginning of June, such as I have not seen before ; caddises have been up to normal, with huge numbers of *Phryganea* in August as usual, and *Oaenis horaria* (L.) was swarming in vast numbers at the end of July. Dragonflies (*Aeshna* and Demoiselles) have perhaps been scarcer than last year ; alderflies well up to scratch.

As regards the streams : (*a*) the outflow from the Tarn dried up completely for a spell last summer, except for isolated pools, though we did siphon water over the sluice for farmers. I was surprised therefore to find *Perla* and *Perlodes* hatching out there in May and *Isoperla* quite common. (*b*) Upper Gordale Beck, most species normal. I only witnessed a small hatch of *Ephemera danica* Müll. but was not there frequently and larvae are common.

The Tarn only varies in depth by 8 in. at the extremes and so I do not think drought affects the fauna.

(E. Thompson, Dewsbury).—The season failed to bring us the hosts of aquatic insects we had the previous year and few records have been made. Our streams have run at a high level for most of the year but good collecting days have been hard to find.

Only two good mass hatchings of mayflies have been seen : at Coxley on April 16th, a good rise of *Baetis rhodani* (Pict.) ; later, on May 22nd, one of *Ephemera danica* Müll. One thing of interest was the appearance of the alderfly, *Sialis fuliginosa* Pict.

An addition to our freshwater fauna was the Planarian, *Dendrocoelum lacteum* (Müll.) taken from the moat at Thornhill, which is now open to the public. Though common in many places it is our first record in this area.

Each year more interest is being shown by members of our local Society in the life of ponds and streams.

(G. Fryer).—During the year work has been in progress on the Huddersfield Ashton Canal, which is now closed to navigation. Lock gates have been removed and replaced by concrete walls over which water now cascades. It is claimed that water is saved by this method.

From the point of view of the freshwater biologist this is regrettable as some very interesting habitats have been destroyed. The lowering of the water level of the canal has not had much influence upon its fauna, but the draining of the ' bywashes ' has had disastrous effects. The ' bywashes ' or artificial streams contained a very rich fauna, far richer both in number of species and of individuals than any natural streams of comparable size in the locality. It was hoped to make an ecological survey of a ' bywash ' and work was started but the draining operations brought the investigation to an untimely end. However, as certain unusual features are to be found in the ' bywashes ' it may be worth while giving an account of the conditions prevailing before the alterations were made.

The selected ' bywash ' was readily divisible into three zones according to the rate of flow of the water at the surface, estimated by timing a floating piece of wood over a measured distance. The velocities given were fairly constant, but increased after heavy rain.

Zone 1 was 23 ft. long and 5 ft. wide with a water velocity of about 3·8 ft./sec. This zone had a smooth artificial bottom, a negligible vegetative covering and practically no animal life. Zone 2 was 57 ft. by 7 ft. with water velocity 2·1 ft./sec. The bottom was stony and of a more or less natural formation. There was some vegetation, chiefly encrusting mosses with odd clumps of starwort. This zone harboured a rich fauna. In zone 3 the flow was rapid, attaining a velocity of 7 ft./sec. The length of the channel was 35 ft. and width 2·5 ft. and the bottom

consisted of a series of shallow steps covered with dense masses of the moss *Fontinalis*. There was a rich fauna, though not so rich as that of zone 2.

The fauna of zone 2 consisted of typical stream dwelling organisms, rich both in species and in individuals. There was a large proportion of sedentary and filter feeding animals including larvae and pupae of *Simulium* (Diptera) and the net-spinning Trichoptera *Hydropsyche* and *Polycentropus*, the Lamellibranch, *Sphaerium corneum*, and small growths of the Polyzoan *Plumatella*. Suspended matter in the water derived from the canal may account for the presence of these animals. The scavangers, *Gammarus* and *Asellus*, were abundant. The Stone Loach (*Nemachilus barbatula* L.) was found here and as it does not occur in the canal its presence is difficult to explain.

Zone 3, where the water flow was very rapid, had several features of interest. *Simulium* larvae occurred in thousands. Other inhabitants of this region were larvae and pupae of the Anthomyid fly *Calliophrys*, larvae of an Elmid beetle (*Elmis* sp.) though adults were not seen. *Hydropsyche* larvae, a few Gastropods, specimens of *Vorticella*, many Bdelloid Rotifers and a number of ciliate protozoa were found amongst the moss. The presence of *Vorticella*, rotifers and ciliate protozoa is unusual in a swift stream.

A noteworthy feature of the ' bywash ' was the fluctuations in temperature as compared with the relatively stable temperature conditions experienced in natural streams. This was due to the fact that in the canal the surface water from which the ' bywash ' was derived, was warm in summer and in winter must have been little above freezing point.

Large incrustations of the freshwater sponge (*Ephydatia fluviatilis* L.) were found during the course of removal of the lock gates of the canal. The sponges occurred chiefly in deep water and the fact that no *Zoochlorellae* were seen is probably due to the lack of light.

Algae established themselves very quickly on the concrete blocks over which the water pours. Algal growths were noticed on the edges of the blocks a week after being placed in position.

The sudden spell of hot weather on May 31st and June 1st resulted in a fairly extensive ' water bloom ' in the canal throughout most of the Colne Valley and a similar phenomenon was observed at Holme Mill Pond, Marsden. Minor ' blooms ' occurred in the canal during the early part of August. More puzzling was the fairly extensive ' bloom ' in part of the canal on August 27th, for there had had not been much sunshine either on that or the few previous days ; the weather had been dull and wet, conditions unfavourable to the production of a ' water bloom '.

## MAMMALS, REPTILES, AMPHIBIANS AND FISHES COMMITTEE

**Mammalia** (Mrs. Hazelwood) : Mammal records are scanty. Observations of mammals tend to be more casual than sustained and since most species are crepuscular or nocturnal in habit, this is understandable. It means, however, that there are many omissions of species which must occur more or less abundantly.

CHEIROPTERA.—Mr. P. Baldwin has responded to my appeal for bat records with a note of Long-Eared, Noctule and Pipistrelle Bats at Methley. In Methley Hall there is a large colony of Noctules. Over a hundred have been counted leaving at dark.

At Helmsley the Long-Eared, Barbastelle and Daubenton's Bats are present in their usual numbers whereas the Noctule has not been seen.

RODENTIA.—Rabbits seem generally to be on the increase after two mild winters. Grey Squirrels are scarce at Helmsley but Mr. Garnett reports an upland colonisation at Rosedale Head which is above the 1,000 ft. line.

INSECTIVORA.—Mr. Dean believes that the Water Shrew has increased noticeably and Hedgehogs are generally reported to be abundant, a fact confirmed by the numerous road casualties.

CARNIVORA.—Several correspondents report a great increase in the number of weasels. Badgers and Foxes show no sign of diminution, fifty-three of the latter being accounted for in one year by the Holmfirth Fox Club.

Both Grey and Common Seals have been seen off Spurn. Otters are numerous in the Holderness area and a belated record of this species comes from Methley where one was seen in 1948, an unlikely locality between the polluted Aire and Calder.

**Reptilia** (Mrs. A. Hazelwood) : All Lizards captured at Spurn this year were *L. vivipara*. The same species is reported as numerous on the Helmsley moors where they are markedly dark in colour.

A late Adder was brought into Leeds Museum from Hunslet Cemetery which is within the city boundary.

**Amphibia** (Mrs. A. Hazelwood) : The only records concern the spawning of Frogs. Spawn was first observed at Newsome near Huddersfield on February 27th, near Honley on March 7th, and near Hebden Bridge on March 5th. White tadpoles, either of Frog or Toad, were seen at Castle Carr on May 27th.

A Frog was reported from Fountains Fell (2,193 feet) on August 21st.

**Pisces** (Mrs. A. Hazelwood) : Mr. Utley reports an unusual movement of Barbel and Chub up the River Swale near Great Langton. About fifty of either species were seen passing up a ' rapid ' within half an hour while many more waited below.

Mr. Fryer records an occurrence which may be more usual than the lack of observations would suggest. Two Bream attacked first one and then two Pike, which were basking in the shallows near spawning Roach. Annoying predators when they are replete is a common pastime among birds and even mammals, but is a novel aspect of fish behaviour.

A Ray's Bream was washed up at Spurn on October 25th, 1949.

I am once more indebted to the following observers, most of whom are perennially faithful : J. P. Utley (Northallerton), G. Ainsworth (Hull), Rex Procter (Leeds), W. E. L. Wattam (Huddersfield), E. W. Taylor and Adam Gordon (York), F. Dean (Mytholmroyd), A. Butterfield (Glusburn), G. Fryer (Huddersfield), P. Baldwin (Methley), and H. Whitehead (Leeds). More members, I am sure, could help by providing notes of all orders. Please inform me of any unusual occurrence as soon as possible.

## ORNITHOLOGY

**Interim Report** (R. Chislett) : The Annual Report for 1949 was this time published as a supplement to *The Naturalist*. Further reprints were made available for ornithologists anywhere.

After passing the report at the meeting on March 18th, members heard Mr. E. W. Taylor describe the Phase Contrast Microscope and its uses with the aid of a talking film. Later, Mr. Bennett showed films of shore birds.

As an instance of the value of our reports, members will be interested to know that the Finnish ornithologist, Dr. J. Koskimes, in his exhaustive publication on *The Life of the Swift in relation to the Weather*, quoted from several of our reports and listed them in his bibliography. Such would not have been possible had the reports remained in the form used prior to 1940.

In early June Messrs. Garnett and Ainsworth acted as hosts to three American ornithologists who were in Europe to attend the International Ornithologists' Congress held in June in Sweden. They had particularly asked to be shown the cliff breeders and were shown the birds of Bempton and Speeton, afterwards visiting Spurn. The weather was perfect, and all their requirements were met and the Americans expressed their thanks in generous terms.

A cold early spring was followed by a long dry period in which nesting birds did well. Little Ringed Plovers bred and young were reared.

Autumn has been windy and wet, adversely affecting work at Spurn. The Point trap has been rendered inoperative by military necessity. Efforts to off-set these set-backs are being made at the time of writing, and on October 22nd a new record of 90 birds ringed in the day was set up for the Warren trap. Among the 11 species included were Pied and Red-breasted Flycatchers, Black Redstart and Ring-ousel and a Blackbird that bore a Swedish ring ; and 44 Starlings put into the trap together.

The high winds were also probably responsible for the first recorded appearance in the county for more than 20 years of the Sabine's Gull, which was watched at Wintersett reservoir on several days in September by John Cudworth and others.

Good progress has been made with the proposed new volume of *The Birds of Yorkshire* and it is hoped to complete it during the coming winter.

The attention of members is invited to a meeting to be held at the Yorkshire Museum, York, at 2-45 p.m. on Saturday, February 3rd, 1951. It will be under

the joint auspices of the British Trust for Ornithology and of the Committee for Ornithology of the Yorkshire Naturalists' Union. The speaker will be Mr. W. B. Alexander, M.A., whose subject will be ' Changes in the Distribution of British Birds.'

The detailed Annual Report for 1950 will be considered at the meeting of the Vertebrate Section to be held in March, 1951. It is requested that all notes be in the Secretary's hands very early in January to enable the manuscript to be in the printers' hands in time for proofs to be circulated before the meeting.

## CONCHOLOGY

(Mrs. E. M. Morehouse).—During the past year four new records have been made for Yorkshire. One by Mr. A. Smith of York, *Assemania grayana* Leach on the mud at Hessle, near Hull, ' mostly under cover and not exposed to light, there was a good overgrowth of common sea-shore plants.' This species is known as far as The Wash.

Three records were made by Dr. Butler, of the Zoological Dept. of Manchester University, when at Spurn (they were forwarded by Dr. J. W. Jackson). These are *Hydrobia ulvae* Penn. from Welwick Salt Marsh, also under stones on the shore ; *Hydrobia ventrosa* Mont. from Walker Butts Bank Dyke (brackish), base of Spurn Peninsula ; *Phytia myosotis* Drap. from Welwick Salt Marsh, also salt marsh near Spurn Point.

Mr. E. Arnold Wallis found *Succinea pfeifferi* Ross. in a little bog in Cornelian Bay, and in a small marsh in Jackson's Bay, north of Scalby Beck. These are the first records for the Scarborough area. Another interesting find is *H. hortensis* var. *citronozonata* Taylor, three specimens of which were found in the Holbeck Gardens.

Mr. J. H. Lumb sends a new record for the Bradford area, viz. : *Agriolimax agrestis* var. *trestis* Moq from Royd's Hall Wood.

Mr. Eric Thompson records *Anadonta cygnaea* L. from Thornhill Moat and remarks it is the only habitat for it for miles around. The moat dates back to the Civil Wars and is very secluded. With the *Anadonta, Planorbis umbilicatus* Müll. and *Ancylus fluviatilus* Müll were taken.

In Croxley Dam a colony of *L. auricularia* is thriving and doing well.

From a marsh at Bottomboat, near Wakefield, *P. carinatus* Müll., *P. contortus* L., *L. glabra* Müll. were found as well as some very fine *L. stagnalis* L.

From a mining subsidence at Swillington a friend of Mr. Thompson took *Valvata piscinalis* Müll.

Mr. G. W. Pitchford has sent the following records : *P. rupestris* Drap. in abundance on a stone wall approximately 200 yards from Millthorpe Bridge ; also *P. rotundata* Müll. on stones by the River Rawthey.

At a joint meeting at Aberford of the York Naturalists' Society and the Doncaster Scientific Society the lane and fields beside the beck were followed. Feeding on horseradish in the lane was a fine series of *H. hortensis* Müll., including *v. lilacina* Taylor and *v. undulata* Taylor. On a log in the beck a fine clean specimen of *P. jenkinsi* Smith was taken.

## ENTOMOLOGY

**Coleoptera** (G. B. Walsh).—The season has been a poor one for Coleoptera as was to be expected after the heat and drought of 1949 and with the wet of the summer months of 1950. Mr. E. G. Bayford reports that in the spring *Coccinella septempunctata* Linn. and *Adalia bipunctata* (Linn.) were common in the Barnsley area, but that they almost disappeared during the summer ; observations made by the Recorder in the Scarborough district were much the same. The poor quality of the summer is reflected by the fact that there are no new county records, and only one for V.C. 62, one for V.C. 63, and two for V.C. 64.

E.W.A.—E. W. Aubrook. H.M.R.—H. M. Russell.
J.H.F.—J. H. Flint. G.B.W.—G. B. Walsh.
W.D.H.—W. D. Hincks.

*Cicindela campestris* Linn. (64). Commonly, 26/3/50, Washburndale (J.H.F., H.M.R.) ; a very early date.

*Clivina collaris* (Herbst) (64). Banks of the River Wharfe, Ben Rhydding, —/4/50 ; (61) commonly, banks of River Ouse, Cawood, —/5/50 (J.H.F.).

*Bembidion punctulatum* Drap. (65). Banks of River Swale, Gunnerside, —/5/50 (J.H.F.).
*B. obliquum* Sturm. (64). Common, muddy banks of lake, Wothersome near Thorner, —/8/50 ; favours very wet places on the margins of lakes (J.H.F.).
*B. prasinum* (Duft.) (65). Banks of River Swale, Gunnerside, —/5/50 (J.H.F.).
*B. redtenbacheri* Dan.,K. (65). With the last.
*B. atrocoeruleum* Steph. Common, with the last, —/5/50 (J.H.F.).
*B. decorum* (Panz.) With the last.
*B. quadrimaculatum* (Linn.) (64). Adel Moor, Leeds, —/2/50 ; Lindley Reservoir, Washburndale, —/3/50 (J.H.F.).
*Agonum micans* (Nic.) (64). Golden Acre, Leeds, —/5/50 (J.H.F.).
*Dromius meridionalis* Dej. (62). Hackness, —/4/50 (J.H.F.).
*Hydraena nigrita* Germ. (63). Woodsome Lees, near Huddersfield (E.W.A.).
*H. pygmaea* Wat., G.R. (63). With the last.
*Choleva fagniezi* Jeannel (64). Adel Moor, Leeds, —/2/50 (J.H.F.).
*Quedius* (s.g. *Arphirus* Tott.) *boops* (Grav.). C. E. Tottenham (1948, *Ent. mon. Mag.*, lxxxiv, pp. 241-258) has shown that the *boops* complex consists of at least five species. *Q. boops*, therefore, disappears from our lists, and all our specimens will need to be re-examined and re-named in the light of this new knowledge.
*Pselaphus heisei* Herbst. (64). In grass tufts, Askham Bog, —/3/50 (J.H.F.).
*Cantharis* [*abdominalis* Fabr.] var. *cyanea* (Curt.) (62). Several specimens at hawthorn blossom, Hackness, —/4/50 (J.H.F.). This species is widely distributed in the Scarborough district.
*C. cryptica* Ashe (62). Eston Nab and Lonsdale, both in Cleveland ; Raincliffe Wood, Hayburn Wyke (G.B.W.).
*Malachius bipustulatus* (Linn.) (63). Dakin Brook Bridge on Denaby-Cawthorne Road, 17/5/50 (E.W.A.).
*Phloiophilus edwardsii* Steph. (62). Castle Howard, 23/9/50 (W.D.H.). This is a rare Yorkshire insect, but is not uncommon in Raincliffe Wood (62).
*Limnius tuberculatus* Müll.P.W.J. (64). Moorland stream, Denton Moor, Ilkley, —/9/50 (J.H.F.).
*Dermestes murinus* Linn. (64). Several in dead magpie, Bishop Wood, Selby, —/5/50 (J.H.F.).
*Heterocerus fenestratus* (Thunb.) (62). Castle Howard, 28/5/50 (E.W.A.). A rare species in Yorkshire.
*Brachypterolus pulicarius* (Linn.) (63). Common, River Calder, near Kirkleas, Brighouse (E.W.A.).
*Telmatophilus caricis* (Ol.) (62). Castle Howard, 23/9/50 (W.D.H.).
*Pseudotriphyllus suturalis* (Fabr.) (62). Castle Howard, 23/9/50 (W.D.H.).
*Scymnus redtenbacheri* Muls. (63). Storthes Wood, near Huddersfield (E.W.A.).
*Chilocorus renipustulatus* (Scriba) (64). Askham Bog, 29/5/50 ; Jackdaw Crag Quarries, Stutton, near Tadcaster, 20/5/50 (H.M.R.).
*Exochomus quadripustulatus* (Linn.) (64). Common on conifers, Bishop Wood, Selby, —/5/50 (J.H.F.).
*Meloë proscarabaeus* Linn. (64). Several at Leathley, 26/3/50 (J.H.F.).
*M. violaceus* Marsh. (64). Blubberhouses Moor, —/4/50 (J.H.F.).
*Hypophloeus linearis* (Fabr.) (61). Allerthorpe, in burrows of *Pityogenes* in pine branch, 5/5/50 (W.D.H.).
*Aphodius tenellus* Say (63). Close Moor, Stanedge (above Marsden), 24/9/49 (E.W.A.).
*Grammoptera holomelina* Pool (64). Three specimens, Lumby, near South Milford, —/5/50 (J.H.F.).
*Pogonocherus hispidulus* (Pill. & Mitt.) (64). Askham Bog, 29/5/50 (H.M.R.).
*Leiopus nebulosus* (Linn.) (64). In flight in late evening, Thorner, —/9/50 J.H.F.).
*Phymatodes testaceus* (Linn.) } Taken in timber in a furniture factory, the
*Pyrrhidium sanguineum* (Linn.) } latter not infrequently, at Leeds. Both are almost certainly importations of no faunistic significance.
*Alosterna tabacicolor* (Deg.) (62). Lowdales, Hackness, 4/6/50 (H.M.R.) ; this is fairly common in the Scarborough district.
*Macroplea mutica* (Fabr.) var. *curtisii* (Lac.) (61). Long Bank Dyke, Kilnsea, very common, 2/5/50 (W.D.H.).

*Donacia simplex* Fabr. (64). Birkin, near Monk Fryston, —/8/50 (J.H.F.) ; Scarcroft Fishpond, near Leeds, 16/8/50 (H.M.R.).
*Clytra quadripunctata* (Linn.) (62). Hackness, —/4/50 (J.H.F.).
*Galerucella lineola* (Fabr.) (64). Golden Acre Park, Leeds, 12/5/50 (H.M.R.).
*Lochmaea crataegi* (Forst.) (64). Jackdaw Crag Quarries, Stutton, near Tadcaster, 20/5/50 (H.M.R.).
*Phyllobrotica quadrimaculata* (Linn.) (64). Askham Bog, 15/7/50 (H.M.R.).
*Cassida flaveola* Thunb. (62). Hackness, —/4/50 (J.H.F.).
*Pissodes castaneus* (Deg.) (64). Bishop Wood, Selby (J.H.F.).
*Acalles roboris* Curt. (64). Common in flood refuse, Harewood Bridge, —/2/50 (J.H.F.).
*Ceuthorhynchus quadridens* (Panz.) (64). Barlow, 3/5/50 (W.D.H.).
*Phytobius quadrituberculatus* (Fabr.) (64). With the last.
*Scolytus scolytus* (Fabr.) (63). Ravensknowle, 11/8/50 (E.W.A.).
*Pityogenes chalcographus* (Linn.) (62). Several in flight, Hackness, —/4/50 (J.H.F.).

**Lepidoptera** (E. Dearing).—The unusually wet season appears to have produced an adverse effect upon Lepidoptera recording throughout the county, and many districts are not yet covered by a reporter. The regular correspondents,—W. E. L. Wattam, of Huddersfield ; G. B. Walsh, of Scarborough ; F. Hewson, of Bradford ; E. W. Aubrook, of Huddersfield ; C. A. Cheetham, of Austwick ; S. M. Jackson, of Selby ; and D. M. Jesper, of Harrogate—have supplied notes from which this report is compiled.

All the usual species of butterflies and the commoner moths have been noted, but these are excluded from this report. Records of the more common species are useful when assessing distribution and relative abundance and notes on them are gratefully received.

### Records

Correction to 1949 Report : for *Lithophane semibrunnea* read *Lycophotia porphyrea* (Schiff.).

157 *Hadena oblonga* (Haworth) (61). Spurn, 1/7/50 (S.M.J.).
162 *Procus strigilis* (Clerck) (61). Light southern form, Spurn, 1/7/50 (S.M.).
178 *Agrotis clavis* (Huebn.) (61). Spurn, 1/7/50 (S.M.J.).
299 *Leucania litoralis* Curtis (61). Spurn, 1/7/50 and 8/7/50 (S.M.J.).
330 *Hadena bicruris* (Hufn.) (63). At light, Little Horton, Bradford, 2/7/50, new to Bradford area (J. Briggs).
331 *H. cucubali* Schiff. (63). One larva on Bladder Campion between Low Moor and Bierley, Bradford, 3/8/50 (J. Briggs).
340 *Lacanobia suasa* (Schiff.) (61). Spurn, 1/7/50 (S.M.J.).
342 *Heliophobus albicolon* (Huebn.) (61). Spurn, 1/7/50 (S.M.J.).
428 *Sterrha fuscovenosa* (Goeze) (61). Spurn, 1/7/50 and 8/7/50 (S.M.J.).
447 *Scopula emutaria* (Huebn.) (61). Two, 1/7/50 and com. 8/7/50, Spurn (S.M.J.). There is no previous record of this species in the Y.N.U. records for Yorkshire.
489 *Eupithecia subfulvata* (Haworth) (63). At light, 4/8/50, Gaisby, Shipley, new to Bradford area (F.H.).
493 *E. succenturiata* L. (63). At light, Gaisby, 26/7/50 (F.H.).
591 *Nycterosea obstipata* (Fabr.). One at light, 31/7/50, Dalton, and one on wet paint, 3/8/50, Dalton (E.W.A.). There are only two previous records of this species for Yorkshire, for York in 1860 and again in 1868.
730 *Acherontia atropos* (L.) (62). Apparently widely distributed at Scarborough (G.B.W.).
733 *Daphnis nerii* (L.) (62). Newby, Scarborough (A. Thornes).
749 *Drymonia ruficornis* (Hufn.) (61). Two larvae from a wood near Skipwith Common, 29/7/50 (S.M.J.).
810 *Callophrys rubi* (L.) (64). Common, 14/5/50, Austwick Moss (C. R. Haxby and J. Briggs). Farnley Moor above Otley, 3/6/50 (P. C. Quin).
823 *Colias croceus* (G. in Fourc.) (63). Only one noted this year, at Lower Park Berry Brow, Huddersfield, 29/7/50 (W.E.L.W.).
829 *Thymelicus sylvestris* (Poda) (64). Two between Farnley and Leathley, 25/6/50 (F.H.).

**Ephemeroptera** (John R. Dibb).—Solely through the co-operation of Mr. H. Whitehead I am enabled to submit a short report for the 1950 season. Conditions have not been good for mayflies, largely due to the prevalence of cold winds.

For the undermentioned records we are indebted to the following :

C.A.C.—Chris. A. Cheetham (Austwick).
E.T.—Eric Thompson (Dewsbury).
H.W.—H. Whitehead (Leeds).

*Ephemera danica* Müll. (63). Coxley, near Dewsbury, 22/5/50, Good mass hatching (E.T.). Although this species has undoubtedly occurred before in the area this is the first official record for V.C. 63 for the Y.N.U. (64) : Odd specimens appeared at Austwick from 10/6/50 until late September (C.A.C.). Winterburn Beck, 24/6/50, ♂♂ and ♀♀ (H.W.).

*Paraleptophlebia submarginata* (Steph.) (61). North Grimston, 29/5/50, ♂ (H.W.). New to East Yorkshire.

*Cloëon simile* Eaton (62). Castle Howard Lake, 28/5/50, ♂♂, ♀♀ abundant (H.W.). New to North-east Yorkshire.

*Rhithrogena semicolorata* (Curt.) (61). North Grimston, 29/5/50, nymph. (H.W.). New to East Yorkshire.

*Ecdyonurus venosus* (Fabr.) (61). North Grimston, 29/5/50, ♂ sub. (H.W.). New to East Yorkshire.

Attention is drawn to the valuable paper entitled ' Descriptions of some Nymphs of the British species of the Genus *Baëtis* (Ephem.) ' by T. T. Macan in *Trans. Soc. Brit. Ent.*, 10 (3), 1950.

**Diptera** (Chris. A. Cheetham).—The season may be said to be the worst on record ; it was August 23rd before I saw a Tipulid in numbers (*T. paludosa* Mg.), but later on *T. pagana* Mg. seemed normal.

An interesting addition to the Yorkshire list is *Hydrellia maura* Lw. It was bred by Mr. P. F. Holmes from leaves of *Potamogeton* from Malham Tarn. Another addition, *Dicranomyia 10-maculata* L. was bred by Mr. K. G. Payne from a fungus *Merulius tremellosus* gathered in Buttercrambe Woods. The following vice-county additions are from Mr. Payne :

(61).—*Ctenophora pectinicornis* L., North Grimston.
(62).—*Ula sylvatica* Mg., Castle Howard.
*Eumerus strigatus* Fln., Langwith Common.
(64).—*Gastrophilus intestinalis* De G., Copmanthorpe.
*Tanyptera* (*Xiphura*) *atrata* L., Askham Bog.
*Dictenidia bimaculata* L., Copmanthorpe.
*Dioctria atricapilla* Mg., Acaster Ings.
*Neoitamus cyanurus* Lw., Copmanthorpe.
*Physocephala rufipes* F., Copmanthorpe.
*Neottiophilum praeustum* Mg., Copmanthorpe.

He also caught both species of *Hexatoma* (*Peronocera*) and his captures have confirmed my view that the statement found in recent books saying both are found on shingle beds in rapid streams is incorrect ; it is so with *lucidipennis* Curt. but *fuscipennis* Curt. occurs where the stream is free from shingle. We have it from Nunnington, Terrington Carr, Cauckless Bank and Clifton Ings ; there is a record in *Victoria County History* for Bolton Bridge, but I think this must be *lucidipennis* Curt., for it is fairly plentiful on shingle in the Wharfe at Grassington and other stations are Coverdale, and in Teesdale at Langdon Beck ; at all these places it is on shingle banks.

**Hemiptera, Neuroptera, etc.** (J. M. Brown) : There seems little to report as the result of a poor season, my own observations being confined to my garden. Insects of various orders appear to have been scarce. Grasshoppers have been very few in number. Four dragonflies on different days were seen hawking over the garden, the nearest suitable water for the nymphs being some considerable distance away. This is the first time I have seen dragonflies in the garden. A second unexpected visitor was a *Gerris* which was laboriously crawling on the concrete path far away from suitable water.

A notable water-bug, new to Yorkshire, is *Cymatica coleoptrata* (F.) taken from the Pocklington canal near Pocklington V.C.61, on 3/5/50 by W. D. Hincks, this being the farthest north for this species.

*Nepa cinerea* L. (64). Moortown Pond, Leeds, 21/10/43.

*Velia currens* Fieb. (62). Scalby (Scarborough), 6/43.
*Notonecta glauca* L. (62). Scarborough Cliff, 6/5/42.
*Corixa nigrolineata* (Fieb.) (64). Bramhope Pond, Leeds, 30/3/50.

J. H. Flint sends the following notes on the last two years collecting.

HEMIPTERA—All V.C. 64

*Gerris gibbifer* Schum. Commonly, Golden Acre Park, Leeds, 1949/1950.
*G. odontogaster* Zett. Golden Acre Park, Leeds, 4/49, Bramhope Ponds, 8/49.
**G. lacustris* L. Golden Acre Park, commonly, 1949/1950.
*G. costae* H.S. Golden Acre Park, 4/1949.
*G. thoracicus* Schum. Gledhow Valley, Leeds, 7/1949.
*Corixa praeusta* Fieb. Gledhow Valley, 7/49 ; Scarcroft Pond, 5/50.
*C. nigrolineata*, Fieb. Gledhow Valley, 7/49 ; Golden Acre Park, Leeds, 8/49 ; Stairburn Moor, 4/9/49.
**C. castanea* Thoms. Bramhope Ponds, 8/49.
*C. sahlbergi* Fieb. Bramhope Ponds, 8/49.
**C. distincta*, Fieb. Bramhope Ponds, 8/49.
*C. striata* L. Bramhope Ponds, 8/49.
*C. punctata* Illig. Golden Acre Park, Leeds, 5/1/50.
*C. lateralis* Leach Golden Acre Park (lake) Leeds, 11/5/50.

ODONATA

*Aeshna grandis* (L.) (64). Commonly, Fairburn, 13/8/50 ; Commonly, Birkin, nr. Monk Fryston, 13/8/50.
*Sympetrum striolatum striolatum* (Charp.) (64). Commonly, Fairburn, 13/8/50 ; Commonly, Birkin, nr. Monk Fryston, 13/8/50.
*S. danae* (Sulz.) (64). Commonly, Wigton, nr. Leeds, 9/50.
*Agrion virgo* (L.) (62). Hackness, 4/6/50.

**Trichoptera** (H. Whitehead).—Reports on the season's collecting have, with a notable exception, been unfavourable. Cold winds prevailed during some of the Union's excursions and Mr. Cheetham, who has kept careful notes on the appearances of caddises in the Austwick district says that several species which were plentiful last year have been poorly represented in 1950. Mr. P. F. Holmes writes that there has been a normal hatch of caddises at Malham Tarn. He has sent in a list of 36 species taken during 1948-9. This list includes three species new to Yorkshire—*Mesophylax impunctatus* McL., two ♂♂ taken at house lights, May 28th and June 4th, 1949. Mosely, ' British Caddisflies ', says ' A very rare or local species, recorded in Scotland.' *Agraylea pallidula* McL., Malham Tarn, 3/9/49, ♂. *A. multipunctata* Curt., Malham Tarn, common, 20/5/49 to 3/9/49. It is hoped to publish Mr. Holmes' full list, together with records of Ephemeroptera and Plecoptera as a separate paper in *The Naturalist*.

Four new vice-county records have been made. One for V.C. 64, *Stenophyla alpestris* Kol., Malham Tarn, inflow stream, two ♀♀, 25/5/49 and one ♂ 16/6/49. Three records for V.C. 61, *Hydropsyche angustipennis* Curt., *Hydroptila forcipata* Eaton, and *H. mclachlani* Klap. All three taken at North Grimston, 29/5/50. The Hydroptilas were taken as pupae in the stream, and hatched out. I am indebted to Mr. D. E. Kimmins for identifying the imagoes.

**Hymenoptera** (W. D. Hincks).—It seems hardly necessary to say that the present season has been an exceptionally poor one for insects generally. In the Hymenoptera, however, by far the largest British order of insects, there are always plenty of interesting species to be found whatever the climatic conditions may be.

The Entomological Section were fortunate in selecting ten days of perfect weather for their visit to Spurn and Hymenoptera were quite plentiful, although early June is not the best time of the year for most hymenopterous groups. Other collecting trips have been made during the year, with varying success, to Askham Bog and Barlow (64), Allerthorpe and Skipwith (61) in May ; Allerthorpe, Riccaldale (62) and Howden (61) in early September ; and to Castle Howard and Hovingham (62) in late September. The results of these excursions include a considerable number of Hymenoptera but as active collecting only ceased at the end of September there has not been time yet to examine this material. Mr. J. H. Flint reports the capture of a worker Hornet (*Vespa crabro* L.) by Mr. Baldwin at Methley in September.

The following list includes the additions to the county and vice-counties for 1949, no list having been published last year, together with such additions for 1950

as have been determined so far. Most of the Spurn material will be included in the Section's report which is now nearing completion, except that a few specially interesting additions to the British fauna and to the county list are brought forward below.

I am indebted to Mr. John Wood (J.W.) for again sharing with me the burden of collecting and setting many hundreds of Hymenoptera, some only a millimeter or two in length, or even less ! Mr. W. A. Thwaites, of Masham, has also supplied some valuable material. Mr. H. Britten (H.B.) has kindly given me records of Hymenoptera taken by himself and his son (H.B. jnr.) and I am indebted to him for the determination of specimens. To Messrs. G. J. Kerrich (G.J.K.), J. F. Perkins (J.F.P.) and A. W. Stelfox (A.W.S.) my thanks are due for invaluable help with the determinations. Where no authority is given after the collector's initials I am responsible for the identifications.

It may be mentioned that the list gives no indication of the considerable number of specimens examined and determined, as only new county and vice-comital records are included. Four species are new to the British List (‡), 46 to the county (†), and 32 to the vice-counties (*).

## Additions to the Yorkshire Hymenoptera 1949-50

### Tenthredinidae

**Tenthredo moniliata* Klug. (62). Gormire, 17/6/49, 1♀ (W.D.H.).
†*Aneugmenus temporalis* (Thomson) (62) Mulgrave Woods, 24/6/36 (H.B. jnr., H.B.).

### Braconidae

†*Rogas gasterator* (Jurine) (63). Greenfield, 2/7/49, 1♂ (H.B. jnr., H.B.).
**R. circumscriptus* Nees (62). Hole of Horcum, 12/6/37, 1♀ (H.B. jnr., H.B.).
†*Acaelius subfasciatus* Haliday (61). Allerthorpe, 12/9/50, 1♀ (W.D.H.).
†**Pentapleura pumilio* (Nees) (64). Leeds, Lime Hills, 4/5/46, 1♀ (W.D.H., A.W.S.) ; (*63). Keighley, Old Cut River, 25/7/47, 1♀, 14/8/47, 1♀ (J.W., A.W.S.).
**Ephedrus plagiator* (Nees) (61). Allerthorpe, 12/9/50, 1♀, 2♂♂ (W.D.H.).
**E. brevis* Stelfox (63). Bingley, St. Ives, 13/5/44, 11/5/46, 18/5/46, 1/6/46, 8/6/46, 6♂♂, 15♀♀ ; (63). Elam Wood, 25/5/46, 2♀♀ (J.W., A.W.S.).
[*E. picticornis* Stelfox. *Nat.*, 1946, p. 38, must be deleted, the records apply to *E. brevis*.]
**Monoctonus caricis* (Haliday) (63). Worsbro', 21/5/49 (W.D.H.).
†*Aphidius urticae* Haliday (63). Worsbro', 21/5/49 (W.D.H.).
**A. sonchi* Marshall (63). Worsbro', 21/5/49 (W.D.H.).

### Ichneumonidae

†*Stenichneumon culpator* (Schrank) (64). Askham Bog, 1♂, 27/7/46 (W.D.H., J.F.P.).
†*Barichneumon heracleanae* (Bridgman) (61). Spurn, 1♀, 19/8/49 (W.D.H., J.F.P.).
†**B. ridibundus* (Gravenhorst) (64). Thorner, —/7/37 (W.D.H., J.F.P.) ; (*63). Bingley, St. Ives, 26/8/44 (J.W., G.J.K.).
**Ichneumon gracilentus* Wesmael. (62). Whitby, 1♀, 11/2/35 (H.B. jnr., H.B.).
†*Exephanes hilaris* (Gravenhorst) (61). Spurn, 1♀, 20/7/48 (W.D.H., J.F.P.).
**Platylabus rufus* Wesmael. (63). Keighley, Holmehouse Wood, 1♀, 12/9/42 (J.W., J.F.P.).
†*P. iridipennis* (Gravenhorst) (63). Bingley, St. Ives, 1♀, 29/7/46 ; Keighley, a variety, 31/7/46 (J.W., J.F.P.).
†**Ectopius* (*Platylabus*) *exhortator* (Fabricius) (64). Brayton, 1♂, 22-23/6/43 (W.D.H., J.F.P.) (*63). Keighley, 1♀, 5/6/42 ; Holmehouse Wood, 1♀, 1/10/44 (J.W., J.F.P.).
†*Stenolabus vitratorius* (Gravenhorst) (61). Allerthorpe, 1♀, 30/6/45 (W.D.H., J.F.P.).
†*Cyclolabus pactor* (Wesmael.) (63). Bingley, St. Ives, 25/8/45, 7/9/46 (J.W., J.F.P.).
†*C.* (*Platylabus*) *tricingulatus* (Gravenhorst) York, 1♀, em. 24/7/30, willow herb (W. G. Clutten, J.F.P.).
‡*Listrocryptus spatulatus* Brauns. (61). Spurn, 25/7/48, 1♀ (W.D.H., J.F.P.). A genus and species new to the British List.

†*Phygadeuon sodalis* Taschenberg (61). Spurn, 18/8/49, 1♀ (W.D.H., J.F.P.).
†*Iselix nitida* (Gravenhorst) (63). Worsbro', 21/5/49, 1♀ (W.D.H., J.F.P.).
†*Hemiteles gravenhorstii* (Ratzeburg) (61). Spurn, 18/8/49, 1♀ (W.D.H., J.F.P.).
†*Gelis ochracea* (Foerster) (63). Worsbro', 21/5/49 (W.D.H.).
‡*Cryptus arenicola* Thomson (61). Spurn, 18/7/48, 1♀, (W.D.H., J.F.P.).
†*Agrothereutes ornatulus* (Thomson) (61). Kilnsea, 22/7/48, 1♀ (W.D.H., J.F.P.).
†*Trychosis legator* (Thunberg) (61). Spurn, 23/7/48, 1♀ (W.D.H., J.F.P.).
†*Ephialtes dilutus* (Ratzeburg) (61). Spurn, 15/5/49, 1♀ (W.D.H., J.F.P.).
†*E. buolianae* (Hartig) (61). Allerthorpe, 2/7/45, 1♀ (W.D.H., J.F.P.).
†*Conoblasta fronticornis* (Gravenhorst) (63). Keighley, Newsholme Dene, 17/7/48, 29/8/48 ; Bingley, St. Ives, 19/6/48, 3/7/48 (J.W., H.B.).
†*Conoblasta heterocera* (Thomson, C. G.) (63). Colden Valley, 1/8/47, 1♀ (J.W., H.B.).
†*Lissonota trochanteralis* Dalla Torre (64). Aberford, 30/7/47, 1♀ (J.W., H.B.).
†*Exetastes femorata* (Desvignes) (61). Spurn, 17/7/48, 1♀ (W.D.H., H.B.).
†*Collyria calcitrator* (Gravenhorst) (62). Deep Grove, N.E. Yorks., 20/6/36 (H.B. jnr., H.B.).
†**Hybophanes scabriculus* (Gravenhorst) (63). Keighley dist., common (J.W.) ; Mulgrave Woods (*62), 3/8/36 (H.B.).
†*Pion* (=*Catoglyptus*) *crassipes* (Holmgren) (61). Common at Spurn, 7/48 (W.D.H., J.F.P.).
†*Zootrephus suspiciosus* (Brischke) (62). Whitby, 15/7/36 (H.B. jnr., H.B.).
**Diplazon nigritarsis* (Gravenhorst) (63). Greenfield, 9/7/49 (H.B.).
**Agrypon flaveolatum* (Gravenhorst) (62). Hole of Horcum, 4/8/37, 1♀ (H.B. jnr., H.B.).
‡*Eulimneria fuscicarpus* (Thomson, C. G.)? (61). Common at Spurn, 7/48 (W.D.H., J.F.P.). Mr. Perkins tells me that the determination of this species is not quite certain until Thomson's type has been examined.

### Cynipidae

†*Anacharis ensifera* Walker (63). Bingley, St. Ives, 17/6/44, 1/8/44, 2/6/45, 9/6/45, 7/7/45, 28/7/45, 16/8/45, 25/8/45, 13/7/46 (J.W.).
†**A. eucharioides* (Dalman) (63). Keighley dist., very common from 10/6 to 16/10 (J.W.) ; (*64). Leeds, Oakwood, garden, 13/8/38, 20/6/42, 16/8/42 (W.D.H.).

### Chalcidoidea

†*Habrolepis dalmanni* (Westwood) (61). Allerthorpe, 12/9/50, 1♀ (W.D.H.).
†**Callitula pyrrhogastra* (Walker) (62). Skelder, 20/3/36, 1♀ (H.B. jnr., G.J.K.) ; (*64) Ilkley, 27/7/47, 1♀ (G. W. R. Bartindale, H.B.).
†*Asaphes vulgaris* Walker (63). Worsbro', 21/5/49 (W.D.H.).
†*Tetrastichus rhosaces* (Walker) (64). Several spns. bred from larvae of *Cassida rubiginosa* Mueller, Knaresbro', Scotton, 27/9/49 (A. E. Winter, G.J.K.).

### Mymaridae

†*Polynema britteni* Hincks (63). Keighley, Holmehouse Wood, 21/8/49, 1♀ (J.W.).
**P. fuscipes* Haliday (*63). Keighley, Newsholme Dene, 23/7/48, 1♀ ; 23/7/49, 2♀♀ (J.W.) (*64). Askham Bog, 30/7/48, 1♀ (J.W.).
**P. eucharisformе* Haliday (63). Keighley, Newsholme Dene, 10/7/48, 1♀ ; 23/7/48, 1♀ (J.W.).
**P. atratum* Haliday (recorded previously as *P. gracile* Nees, *Nat.*, 1947, p. 38, 1949, p. 33. Nees' name now used for *P. longulum* Foerster, *Nat.*, 1947, p.38. See Hincks, *Trans. Soc. Brit. Ent.*, **10** (4) 1950. (*61) Allerthorpe, 12/9/50, 1♀ (W.D.H.) (*62). Castle Howard, 23/9/50, 1♀ (W.D.H.).
This common species is now recorded from all five vice-counties and is the first Fairy-fly to have this distinction.
†**Anaphes fuscipennis* Haliday (64). Barlow, 7/9/49, 1♂, 1♀ (W.D.H.). (*62). Castle Howard, 23/9/50, 1♀ (W.D.H.).
†**Anagrus ustulatus* Haliday (65). Masham, 19/10/47, 1♂ (W.D.H.). (65). Jervaulx, 13/10/47, 2♂♂ (W.D.H.). (*63). Worsbro', 21/5/49 (W.D.H.).
†*Erythmelus goochi* Enock (65). Masham, 5-8/10/48, 1♀ (W. A. Thwaites).

PROCTOTRUPOIDEA

†*Exallonyx niger* (Panzer) (62). Whitby, 20/10/36, 1♀ (H.B. jnr., H.B.).
†*E. ater* (Nees) (62). Mulgrave Woods, 21/10/36, 1♀ (H.B. jnr., H.B.).
†*E. microcerus* Kieffer (62). Whitby, 12/8/36, 1♀ (H.B. jnr., H.B.).
†*Cryptoserphus laricis* (Haliday) (62). Whitby, 15/11/35, 1♂ (H.B.). (62). Hole of Horcum, 7/5/38, 1♀ (H.B.).
†*Phaenoserphus elongatus* (Haliday) (62). Hole of Horcum, 23/7/37, 1♀ (H.B. jnr., H.B.).
†*Hoplogyron rufonotatus* Kieffer (62). Sleights, 17/5/36, 1♀ (H.B. jnr., H.B.).
‡*Triplatygaster contorticornis* (Ratzeburg) (62). Mulgrave Woods, 26/1/38, em. 29/3/38, ♀♀, ex Spruce cones (H.B. jnr., H.B.). This species is an addition to the British List (K. & H., 1945).

ACULEATA

**Anteon lucidus* (Haliday) (62). Hole of Horcum, 28/7/37, 1♂ (H.B. jnr., H.B.).
**Priocnemis minor* (Zetterstedt) (62). Goathland, 14/9/35, 1♀ (H.B. jnr., H.B.).
**Spilomena troglodytes* (van der Linden) (62). Hole of Horcum, 26/7/37 (H.B. jnr., H.B.).
**Crossocerus tarsatus* (Shuckard) (62). Hole of Horcum, 26/6/37 (H.B. jnr., H.B.).
**C. varus* Lepeletier (62). Hole of Horcum, 26/6/37 (H.B. jnr., H.B.).
**Rhopalum clavipes* (Linnaeus) (62). Hole of Horcum, 26/6/37 (H.B. jnr., H.B.).
**Halictus rufitarsis* Zetterstedt (62). Whitby, 12/10/36, 1♀. (62). Hole of Horcum, 31/8/37, 1♂ (H.B. jnr., H.B.).
**Sphecodes crassus* Thomson, C. G. (62). Whitby, 21/6/37, 1♀ (H.B. jnr., H.B.).
**Andrena tarsata* Nylander (62). Hole of Horcum, 26-27/6/37, ♂♀ (H.B. jnr., H.B.).

## PHENOLOGY

(W. E. L. Wattam) : The response to the Record Forms has again been disappointing. Twenty-nine forms were sent out and to date eleven have been returned, viz. : one for V.C. 61 (S.E. Yorks.), Miss E. Crackles ; one for V.C. 62 (N.E. Yorks.), Mr. J. P. Utley ; five for V.C. 63 (S.W. Yorks.), Mr. A. Malins Smith, J. G. and E. Thompson, Mr. F. Murgatroyd, Mr. G. Fryer, and myself ; four for V.C. 64 (Mid-West Yorks.), Mr. C. A. Cheetham for Austwick Field Club, Miss E. M. Brown, Mr. A. Thompson and Mr. W. F. Fearnley for Wharfedale Naturalists' Society. No returns have been received for V.C. 65 (N.W. Yorks.).

As regards the wild fruit crops for 1950, there is a general consensus of opinion that Hawthorn, Sycamore, Elder, Alder, White Beam (*Sorbus aria*) and Mountain Ash are the dominants. Mr. Cheetham and Mr. Utley are both agreed as to the excellent crop of Hazel Nuts, and Mr. A. Malins Smith states it is very good in the Bradford area. Reports upon the Beech are agreed that it is poor. In the Huddersfield district a good crop of the four-lobed involucres has been produced, but most are barren of matured seeds. Holly is reported as having fruited well : most certainly in the Huddersfield district berried trees are more abundant than has been the case for many years. Reports are agreed that the fruit crop of the Ash is practically nil. Mr. A. Malins Smith, commenting upon this tree, states that in the Bradford area ' a curious phenomenon was very noticeable this year. This was the occurrence of numerous bare twigs, of varying lengths, all over the tree among the leafy twigs, this following a very heavy crop of fruit in 1949. I have noticed this in former years in an occasional tree which had borne a very heavy crop of fruit in the previous year. This year many such trees were noticed. It seems as though in some years the Ash crops so heavily as to damage many twigs in a particular tree. The damaged lengths ultimately die.' The fruiting of the Oak (*Quercus Robur*) is very good in the Huddersfield district and also at Austwick, and good at Bradford. The fruit crop of the Horse Chestnut has been reported generally as medium. No special notes have been received as regards shrubby plants. I might add that at Huddersfield, Bramble and Dewberry have produced excellent crops. Bilberry, Black Crowberry and Wild Raspberry have produced only medium crops. Fruit crop of Cloudberry is nil, the wintry weather in May destroying all blossom. The fruit crops of *Rosa canina* and *R. mollis* (previously wrongly reported by me as *R. tomentosa*) have been excellent. The fruit crop of *R. arvensis* has been poor.

Mr. A. Malins Smith writes : ' Among the cultivated fruits chance frosts destroyed the promise made by the abundant bloom on Plums and Pears, which had poor fruit crops. The same cause rendered the Apple crop very variable, this probably depending on variations of shelter at the time of flowering.'

After a mild winter, spring gave a promise which was not fulfilled, the wintry temperatures of May nullifying to a great extent that early promise, and in the Huddersfield district impeding normal vegetative growth. June brought a touch of summer, but from the end of July onwards vicious gales and torrential rainfalls were the prevalent type of weather. September produced one fine day at Huddersfield and a rainfall of nearly six inches. Towards the close of July a conspicuous feature in many woodlands in the Huddersfield district was the rapid apical bud growths by Beech, Oak and Sycamore, far beyond the normal growths general in that month.

Tabulated data for the first three years (1948 to 1950) compiled from the Phenological Returns for each vice-county of the average date of the first flowering of the listed plants.

| Plant. | 1948 to 1950. |
|---|---|
| Hazel (*Corylus Avellana*) ... ... ... ... ... | Jan. 12th to Feb. 14th. |
| Coltsfoot (*Tussilago Farfara*) ... ... ... ... | Jan. 1st to Jan. 10th. |
| Wood Anemone (*Anemone nemorosa*) ... ... ... | March 15th to April 1st. |
| Wild Hyacinth (Bluebell) (*Scilla non-scripta*) ... | April 9th to 25th. |
| Lady's Smock (Cuckoo Flower) (*Cardamine pratensis*) | April 16th to 23rd. |
| Garlic Hedge Mustard (*Alliaria officinalis*) ... ... | April 9th to 19th. |
| Horse Chestnut (*Aesculus Hippocastanum*) ... ... | April 17th to May 10th. |
| Hawthorn (*Crataegus Oxyacantha*) ... ... ... | May 2nd to May 12th. |
| White Ox-Eye (*Chrysanthemum Leucanthemum*) ... | May 18th to June 8th. |
| Dog Rose (*Rosa canina*) ... ... ... ... ... | May 29th to June 26th. |
| Foxglove (*Digitalis purpurea*) ... ... ... ... | June 4th to 12th. |
| Greater Bindweed (*Convolvulus sepium*) ... ... | June 13th to 23rd. |
| Harebell (*Campanula rotundifolia*) ... ... ... | June 11th to July 3rd. |
| Ling (*Calluna vulgaris*) ... ... ... ... ... | July 2nd to 16th. |
| Ivy (*Hedera Helix*) ... ... ... ... ... | Sept. 10th to 28th. |
| Beech (*Fagus sylvatica*) ... ... ... ... ... | May 19th to June 11th. |
| Oak (*Quercus Robur*) ... ... ... ... ... | April 24th to May 15th. |
| Ash (*Fraxinus excelsior*) ... ... ... ... ... | April 14th to May 6th. |

## BOTANY

(Chris. A. Cheetham).—The year's botanical report should be placed under two headings ; first the wonderful display of flowers that most of the plants have made this year, and secondly the abnormal vegetational growth that has followed the rains of July and August. Possibly the hot summer of 1949 and the following mild winter must be remembered as the first cause in making the extraordinary amount of bloom ; the lack of moisture in early spring delayed growth of vegetation but the flowers seemed to profit by it. The small annuals on bare ground, Spring Whitlow Grass, Three-fingered Saxifrage, Parsley Piert, and the Dovesfoot and Small-flowered Cranesbills came up in mass and in some instances they made a second growth later in the year. Then Primroses, Celandines, Ground Ivy and Wild Thyme caught the eye and were followed by the bushes of Gorse, Blackthorn, Hawthorn and Bird Cherry. All these carried more flowers than one can previously remember. The Harebells carried a good show of bloom which was out very early but the Grass of Parnassus was very late and failed in some places that had been dried up in 1949, whilst in other wetter places it made more growth than it normally does. Generally speaking orchids were poor. After the rain came in July many plants made growth which in some cases was twice the normal size ; this was noticeable in the small Bedstraws, Selfheal, Bugle and especially so in Meadow and Wood Cranesbills, Betony, Bush Vetch, Valerian and many of the grasses and ferns. With the exception of the Ash most trees carry a good crop of fruit and the Rowan has a wonderful appearance at the time of writing this in early September.

This autumn I notice that seedlings of *Cardamine impatiens* are very plentiful in my garden. Single plants have been seen for the last few years but it is some years since seedlings of this plant filled flower beds to such an extent as to be

used for a salad cress. This plant has long been noted as uncertain in its appearance in known habitats. Has a previous hot summer provided fruitful seed plants?

**Plant Records** (W. A. Sledge) : The records listed below include the more important ones from long lists sent in by several recorders. Many more have been withheld as their inclusion would have unduly lengthened the list and the records excluded, though often of considerable local interest, appeared to be insufficiently important in relation to the county or vice-counties as a whole.

*Viola hirta* L. × *V. odorata* L. (63). Hawkeswood near Kiveton Park ; J. Brown det. D. H. Valentine.

[*V. canina* L. (64). In the Report for 1943 this species was recorded from Walkingham Hill near Farnham. The record interested me because of the extreme rarity of this species in Mid-West Yorkshire. I have only once seen it in this vice-county. An opportunity of visiting the locality did not occur until this year and the plants were soon located. They had markedly yellow spurs and somewhat bluer flowers than *V. Riviniana* but the growth habit and stipules were against *V. canina* as was the habitat, dry limestone pasture with scrub. Specimens were submitted to Dr. Valentine for an independent opinion and he confirmed their identity as a form of *V. Riviniana* Rchb.]

*V. Lloydii* Bor. (61). Arable fields, edge of disused aerodrome site, near Langwith Common ; R. Lewis det. R. D. Meikle.

*V. lepida* Jord. (61). Cleared woodland on wold side near road between Burdale and Thixendale ; R. Lewis det. R. D. Meikle.

*Hypericum elodes* L. (62). Strensall Common ; F. Murgatroyd and M. M. Sayer. Confirming an old record.

*Rosa tomentosa* Sm. var. *scabriuscula* Sm. (64). In disused quarry, Scotton Banks, 1949 ; R. Lewis det. R. Melville.

*Epilobium pedunculare* R. Cunn. (65). Stream side between Hurst and Holgate Farm, Swaledale ; G. F. Horsley.

*S. squalidus* L. × *viscosus* L. (× *S. londinensis* Lousley) (61). Waste ground, Hull ; Miss E. Crackles. (63). Waste ground, Sheffield ; J. Brown.

[*Lactuca hastata* (63). The record of this from Bingley on the authority of Kew, listed in last year's report, has now been withdrawn by Kew. The plant is *L. macrophylla* A. Gray, as had previously been supposed.]

*Calystegia sylvestris* (Willd.) R. & S. (61). Appears to be quite widespread in the Withernsea and Hull areas ; R. Lewis. (62). Catton ; C. M. Rob.

*Polemonium caeruleum* L. (65). Still at Poulter Carr, Topcliffe, from where it was recorded, as an introduction, in Baker's Supplement (1854) to Baines' *Flora of Yorkshire* ; C. M. Rob.

*Mentha alopecuroides* Hull (62). Thornton-le-Dale ; H. Rowntree.

*Scutellaria minor* Huds. (61). Skipwith Common ; K. G. Payne. Not previously recorded from here and a very scarce species throughout the county.

*Polygonum aequale* Lindm. (61). Waste tips, Hessle, 1946 ; A. K. Wilson and R. Lewis det. A. E. Wade.

*Epipactis palustris* (L.) Crantz (61). Kelleythorpe Marsh, Driffield ; R. Lewis.

*Orchis Fuchsii* Druce × *O. praetermissa* Druce (61). Boggy ground near railway between Broomfleet and Staddlethorpe, 1948 ; R. Lewis det. V. S. Summerhayes.

*Luronium natans* (L.) Raf. (63). Hill Top reservoir, Slaithwaite near Huddersfield (*vide Nat.*, 1950, 160) ; G. Fryer.

*Juncus compressus* Jacq. (61). Bank of River Derwent near Kirkham Priory. Second record for East Yorks. ; R. Lewis.

*Scirpus maritimus* L. (64). Ponds at Hob Moor, York ; F. Murgatroyd and M. M. Sayer. Apparently of very recent origin : not known to York naturalists.

*S. Tabernaemontani* C. C. Gmel. (61). Kelleythorpe, Driffield ; W.A.S. (64). Ulleskelf Mires ; W.A.S. The only previous record for the West Riding is the old one by Dr. H. F. Parsons given in Lees' *Flora*.

*Carex serotina* Merat. (61). Skipwith Common ; L. F. H. Merton and W.A.S. Confirming an old record by Dr. Parsons.

*Alopecurus aequalis* Sobol. (63). Margin of Harthill reservoir near Sheffield ; J. Brown.

*Cynosurus echinatus* L. (63). Rubbish dump, Arbourthorne, Sheffield ; J. Brown.

*Calamagrostis Epigeios* (L.) Roth. (61). Edge of Pocklington Wood overlooking Millington Beck, with *C. canescens* (Web.) Roth. ; R. Lewis.

[*Deyeuxia neglecta* (Ehrh.) Kunth (62). A search for this in the old locality at Castle Howard (*vide Nat.*, 1949, 155) by C. M. Rob and E. C. Wallace failed to reveal the plant. It may now be regarded as extinct in North-east Yorkshire.]

*Avena fatua* L. var. *glabrata* Peterm. (61). Roadside between Halsham East End and Roos near Withernsea, 1949 ; R. Lewis det. C. E. Hubbard.

*Bromus Thominii* Hard. (61). Roadside between Halsham East End and Roos, 1949 ; R. Lewis det. C. E. Hubbard.

*B. lepidus* Holmb. (61). With the preceding also between Driffield and Kelleythorpe ; R. Lewis.

*Ceterach officinarum* DC. (64). One plant on a wall in Clapham village ; W.A.S. (65). Wall at Newby Wiske ; C.M.R.

*Tolypella glomerata* Leonh. (62). Brompton ; H. Rowntree per C. M. Rob.

*Chara vulgaris* L. var. *crassicaulis* Kutz. (62). Stream, Keld Head, Pickering ; C.M.R.

*C. globularis* Thuill. var. *capillaris* (Thuill.) Zanev. (62). River Derwent, Kirkham Abbey ; H. Rowntree per C.M.R.

*C. delicatula* Ag. (62). With the preceding ; H.R. per C.M.R.

**Ecological Committee** (Miss D. Hilary) : Mr. A. Malins Smith sends the following report on the recolonisation of the burnt area on the heather moor at St. Ives, Bingley.

On October 4th, 1950, our Secretary, with the help of Mr. and Mrs. A. Thompson, made a survey of the burnt area of ling at St. Ives. The results may be summarised thus :

1. Ling is dominant, as it has been from the first, spreading almost entirely by seeds. In many parts it now forms a closed association and more new seedlings are colonising the parts still bare.

2. The tree phase, first noticed last year, has advanced further and there are many young birch trees and seedlings.

3. Other plants markedly on the increase are *Juncus squarrosus*, *Nardus stricta* and species of *Carex* (probably *C. nigra*).

4. Cryptogams present are *Campylopus pyriformis* (fairly plentiful), *Orthodontium gracile* var. *heterocarpum*, *Gymnocolea inflata*, and young growth of lichen.

5. Species now absent are *Empetrum nigrum*, *Agrostis tenuis*, and *Scirpus caespitosus*. The rhododendron seedlings seen last year have disappeared, while bracken and bilberry only occur on the edge.

Mr. Cheetham reports that the heather beetle attack on Austwick Moss is spreading and he has also noted another attack on Burn Moor, above Bentham.

Mr. Wattam, referring to observations made by Mr. Malins Smith in his Phenological Report, upon the seeds of *Epilobium angustifolium*, suggests that our members should be asked to keep observations upon the numbers of germinations of seeds noted in gardens and waste ground and the establishment of the plant, vigorously or otherwise, and report to the meeting next year.

**Bryology** (H. Walsh) : Although new records are few the members have been active. The usual two field meetings have been held and the section has been represented at all the general excursions. A list of mosses met with in Teesdale by Mr. G. A. Shaw and records of all the Sphagna found at Austwick Moss by Mr. A. Thompson have appeared in *The Naturalist*.

MOSSES—NEW V.C. RECORDS

*Bryum atropurpureum* W. & M. var. *gracilentum* Tayl. (64). Tong Park, near Baildon ; J. Appleyard (*Nat.*, 1950, 126).

*Eurhynchium praelongum* Hobk. var. *Stokesii* Brid. (61). North Grimston ; A. Thompson, Y.N.U. Ex., 1950.

Other records of interest are :

*Fissidens exilis* Hedw. (63). Bared clay in pasture field, Luddendenfoot ; H. Walsh. Only one previous record for 63 appears in the Yorkshire List (1945), but reference to the Halifax Flora (1904) shows it to have been recorded by J. Nowell in 1860 ; H. T. Soppitt, 1898, for Todmorden ; and J. Needham for Crimsworth Dean. This is a small moss liable to be overlooked.

*Fissidens viridulus* Wahl. var. *Lylei* Wils. (62). Malton, Y.N.U. Ex., 1950 (J.A.). A small moss with only one previous record for north-east Yorkshire.

*Grimmia apocarpa* Hedw. var. *alpicola* H. & T. (64). Stonework of reservoir, Y.N.U. Ex., Winterburn, 1950 (A.T.). One previous Yorkshire record.

*Leptodontium flexifolium* Hampe (63). On a grit and limestone outcrop, Eaves Wood, Heptonstall ; H. Walsh. This was recorded for Eaves Wood in 1854 by J. Nowell ; three or four other records for 63 not given in the Yorkshire List, (1945), but recorded in the Halifax Flora (1904), are all for Todmorden and date from 1837-1888.

*Ulota phyllantha* Brid. (62). Castle Howard, on Elder, Y.N.U. Ex., 1950 ; J. Appleyard. Only few Yorkshire records near the coast. The characteristic leaf gemmae were present.

*Physcomitrella patens* B. & S. (64). Gouthwaite Reservoir, c. fr. late autumn, 1949 ; G. A. Shaw.

*Funaria ericetorum* Dixon (63). Bradfield, Y.N.U. Ex., 1950, c. fr. ; J. Appleyard. We have about six records for Yorkshire and the only previous 63 record is mentioned in the Y.N.U. Ex. Circ. 73 for Saddleworth.

*Cinclidium stygium* Swartz (64). New position on Malham Moor, south edge of open water on Gt. Close Mire ; G. A. Shaw.

*Philonotis caespitosa* Wils. (63). Catty Well, Clough, Wainsbzth, near Halifax ; J. Appleyard. Confirmed by the B.B.S. referee. The Yorkshire List gives two records, 64 and 62, but the B.B.S. Cen. Cat. (1926), gives 63.

*Catoscopium nigritum* Brid. (65). c. fr. Teesdale, *Nat.*, 1950, 59 ; G. A. Shaw. Previously recorded for two positions in Yorkshire.

*Pylaisia polyantha* B. & S. (64). c. fr. near Hetton, Y.N.U. Ex., 1950 ; G. A. Shaw.

*Eurhynchium pumilum* Schp. (63). Sun Wood, Shelf ; J. Appleyard. Although recorded for 63 in the Cen. Cat. and Yorkshire Mosses, the situations are not definite ; it is included in Mr. W. H. Burrell's list of Leeds Mosses, *Nat.*, 1917, and recorded for Todmorden by J. Nowell, 1854.

ERRATUM 1949 REPORT (p. 37) :

*Webera annotina* Sch. var. *bulbifera* Cor. Riverside, Jumples, Wheatley, near Halifax, was confirmed by the B.B.S. referee, but later corrected to :

*Bryum atropurpureum* W. & M. var. *gracilentum* Tayl. This variety produces bulbils similar to the above and the recent record for 64 noted in this report suggests it is increasing its distribution. This year it has been found in greater amount in the Wheatley Valley. We have no previous record for Halifax.

## HEPATICS—NEW V.C. RECORD

*Marchantia polymorpha* L. *forma aquatica* Nees. (61). Kelleythorpe Marsh, near Driffield, Y.N.U. Ex. Rep., 1950 ; R. Lewis.

Other records of interest :

*Gymnomitrium obtusum* (Lindb.) Pears. (65). Cronkley Scars, *Nat.*, 1950, 59 ; G. A. Shaw. Only recorded for this V.C. and previously noted for same locality in 1934.

*Lophozia Floerkii* (W. & M.) Schiffn. (64). Halton Heights Plantation, Eastby, near Skipton. Leaf edges with gemmae ; G. A. Shaw. Although a plentiful hepatic in 63 and 64 this appears to be the first mention of plants with gemmae ; that this condition is rare is generally agreed and MacVicar expresses doubt as to plants with gemmae being correctly named. Dr. E. W. Jones agreed with the naming.

*L. Floerkii* (W. & M.) Schiffn. (62). Osmotherly, near Northallerton ; J. Appleyard. Records for the North Riding are few ; this makes four for 62.

*Saccogyna viticulosa* (Sm.) Dum. (63). Catty Well Clough, on rocks near the stream ; Wainshall, near Halifax ; J. Appleyard. Yorkshire records are few. J. Nowell's records for Todmorden are from the Lancashire side but previous records for 63 made by C. Crossland, published in the Halifax Flora (1904) and not noted in Yorkshire Hepatics (1946) are : 1901, Ogden Clough ; Crimsworth Dean and Saltonstall Moor-edge, near Catty Well.

*Cephalozia media* Lindb. (63). Rough hillside pasture above High Greenwood, Hebden Valley, 1949 ; H. Walsh. The only previous 63 record is based upon

MS. of W. Watson for Hebden Bridge. This was recorded in the 1935 Supplement to the Census Catalogues and not noted in Yorkshire Hepatics, 1946.

*Lepidozia pinnata* (Hook.) Dum. (64). Wath, Pateley Bridge; E. C. Wallace. A rare Yorkshire hepatic and the only undoubted recent record (1912) was also from near Pateley Bridge at Guys Cliff.

*Scapania cuspiduligera* (Nees) K. Mull. (64). Ingleton; J. Appleyard.

**Mycology** (Miss J. Grainger): The present year has been one of quiet activity and steady progress. The study of micro-species is gaining ground and more microscopes are seen at the autumn as well as the spring foray. The excellent address delivered by the chairman at Malton on 'Some Common Pyrenomycetes on Beech' will, when published, form a valuable help to workers in the 'wood and bark' section. The year has seen the publication of *The Genus Lactarius*, the third monograph from the able pen of Mr. A. A. Pearson. Reprints are available.

The correlation between the study of fungi and the control and prevention of crop diseases was dealt with by Dr. J. Grainger in a well-attended lecture for farmers at Malton.

Our chairman, Mr. J. Webster, was responsible for turning up truffles both at Castle Howard and Hovingham. These interesting edibles have not been discovered at our forays for many years.

## BOOK REVIEWS

**Wild Flowers of the Chalk and Limestone,** by **J. E. Lousley.** 'New Naturalist' Series, volume 16, Pp. 254, with 52 colour and 29 monochrome photographs, 20 maps and 15 diagrams. Collins, 21/-.

The Editors of the **New Naturalist** series have with every new book a difficult choice to make. On the one hand their avowed aim is to interest the general reader, *i.e.*, to produce a popular book, on the other hand their devotion to accuracy and to the dissemination of the results of modern research may lead them to choose a subject and an author whose work can only be comfortably tackled by specialists. The present work will, we think, prove to be popular, without being at all lacking in the scientific essentials. Mr. Lousley, as Treasurer and Secretary of the Botanical Society of the British Isles, and himself a referee for the Society in the naming of certain difficult groups, is at home with all the recent advances in field botany in this country. His survey of our country's flora, however, is confined to a limited field, namely the flora growing on soils derived from chalk and limestone. The soils over these rocks bear a special flora of calcicole or lime-loving plants but the author is aware of the difficulty of distinguishing between calcicole and other plants. Since certain examples occur of a plant's being calcicole in one country and not so in another, *e.g.*, *Rubia peregrina* calcicole in England, indifferent in Ireland (p. 203), it is not safe to take any one plant as an infallible indication of a calcareous soil. He is therefore wise in coming to the conclusion that the total plant covering as judged by an experienced botanist is the best test of such a soil.

Mr. Lousley is too good a general botanist to let his rather restricted title prevent him from discussing such topics as the depth to which the roots of downland plants penetrate and the reasons therefore, or from devoting a whole chapter to the ecology of the plants of the chalk. About this one can only say that the subject is so large and so relevant that any single chapter must prove inadequate for its proper development. An indication of this inadequacy is seen in the very brief reference (p. 35) given to *rendzina* soils and the ('B') horizon; so brief that it must prove bewildering to readers who have no previous knowledge of modern soil studies.

Having however devoted preliminary chapters to these wider aspects, the main part of the book resolves itself into a botanical itinerary of the chalk and limestone soils of the British Isles. Beginning in the south-east with the newer rocks, the author conducts us first west and then north and so encounters the older limestone formations and finally gives a chapter to the interesting flora of the carboniferous mountain limestone of the west of Ireland. It would be difficult to imagine a more capable or interesting guide to such an itinerary than the author. For not only is his knowledge wide and accurate but he enters with infectious enthusiasm into the pleasures of the sport of wild flower hunting. Thus we are told with gusto of the railway journey in which the Lizard Orchid was being con-

veyed on a warm summer evening in the limited space of a railway compartment and gave off its goat-like scent so intensely, to the surprise of our author, as to cause great embarrassment to him by its effect on his fellow passengers. There are various instances of this kind and it is these human touches which lighten the narrative and help to give it a wide appeal.

There is no doubt that the rarity of a plant carries great weight with the author. Very few indeed, if any, of the rare plants of chalk and limestone remain unnoticed, whatever characteristics other than rarity they may possess. There is a good deal of the collector in most field botanists and the thrill to a rarity is widespread among them. Thus this is a touch of Nature which will make the author akin to many readers.

A formidable difficulty to be overcome by those who try to follow in the author's footsteps is the difficulty of naming the plants. The author very rightly does not try to avoid the necessity of using Latin names but boldly flings at us such names as *Dianthus gratianopolitanus* and *Tetragonolobus siliquosus*. There is no doubt that the name Cheddar Pink for the former is just as distinctive and falls more gratefully on English ears. On a wider view however, the naming of plants cannot be put on a satisfactory basis without Latin nomenclature and a student who faces its difficulty boldly will soon find the difficulty disappear. Even in scientific naming bewildering changes have taken place in recent years and your reviewer who, for many years, has used almost all the books recommended here for the identification of plants finds many of the names in this book unfamiliar. Readers who are seriously tackling this difficulty of nomenclature will be well advised, as recommended by the author, to get the British Ecological Society's *Check List* which gives as much finality in naming as can be got at present.

In the course of the botanical itinerary the main points brought to our notice are (1) a description of the more interesting species and in special instances the characters which distinguish them from their allies, (2) peculiarities of distribution especially of course of the rarer species and (3) the history of the discovery of these latter about which the author shows specialist knowledge.

One topic, the destruction of our flora, is bound to crop up in such a book as this. The author is a strict preservationist and deplores every species lost from our British List. It is possible to take a more complacent view by considering that our flora is always undergoing changes of which some are bound to be losses. These are compensated for by gains which undoubtedly occur and we can perhaps congratulate ourselves that so few species have been entirely lost since our flora began to be studied. Yet wanton destruction is to be deplored and every effort to introduce methods of protection deserves support.

The book is copiously illustrated by plates, maps and diagrams which all add to the usefulness and attractiveness of the volume. In accordance with the general policy of the Series, plates in colour predominate. Some of these reach a high degree of success and of these I especially like plates 20, 25 and 38. It seems as though ' chlorophyll ' colour, the basic green of the plant world, is one of the most difficult to render in a coloured plate. At any rate a number of these plates go wrong in one of two directions, either producing it as *blue*-green, as in plates 7a, 30 and 43 or rendering it as yellowish or yellow brown as in plates 2, 13 and 21.

The curt dismissal of the chalk of Lincolnshire as ' of little importance to the botanist ' is, to one familiar with it rather surprising. At any rate, to mention only one point, it provided two important localities in the fascinating story of the northward spread of the Lizard Orchid.

A few inaccuracies occur : in the legend to colour plate 5, the words ' right ' and ' left ' should be transposed ; in the list of plates, plate 41 is said to represent *Epipactis atropurpurea* while on the plate itself *E. atrorubens* is given. Although these names are synonymous, this might be confusing to the general reader. These are, however, small blemishes on a book which deals with a fascinating subject in an attractive way and which will assuredly add to the popularity as well as to the sound reputation of the *New Naturalist* series.

A. M. S.

**The Coming of the Flowers,** by **A. W. Anderson.** Pp. 267, Williams and Norgate, Ltd., 10/6.

Behind the introduction from all parts of the world of the multitudes of well-known horticultural plants grown in our gardens and greenhouses there lie many

stories of adventure. The plants themselves are now far better known than the men whose names they so often immortalise. How many of us, familiar with *Forsythia, Tradescantia, Bougainvillea, Menziesia, Douglasia* or the many specific names commemorating the discoverers of now well-known plants, know much, or indeed anything, about the lives of the men whose names they bear? These men were often colourful characters who led adventurous lives ; many were famous, one or two were infamous, one indeed who was no mean naturalist was also a pirate described—and not by Mr. Anderson—as ' an associate of some of the most desperate and abandoned buccaneers and rovers that infested the seas of both hemispheres.' How many would recognise this romantic character amongst the commemorative names of horticultural treasures?

Mr. Anderson's aim in this collection of more than fifty short essays is thus to tell us something about the men whose exploits have enriched our gardens and collections. He has succeeded in producing a very agreeably written miscellany of history, adventure and biography which can hardly fail to give a good deal of instruction as well as enjoyjment to anyone interested in flowers.

W. A. S.

**An Introduction to the Principles of Plant Physiology,** by **W. Stiles.** Pp. 701, with 5 plates and 58 line drawings. Methuen & Co., 60/-.

At the time when the first edition of this book appeared there was available no general text dealing with plant physiology which could be considered in the least up to date ; the comprehensive account which was then given of general physiological principles was therefore at that time very welcome indeed. During the few years since the end of the World War II a number of texts has appeared, dealing mainly with specialised topics and written by specialists, and three general texts have been published, so that a good deal of the more modern aspects of plant physiology are now fairly adequately treated. Nevertheless this new edition of Professor Stiles's book must be counted a very welcome addition, partly on account of the comprehensive treatment, partly because of the easy exposition which will recommend itself to students, and partly because of the very readable style. Professor Stiles has succeeded in instilling into his book his own enthusiasm for his subject.

A good deal of the matter in the first edition has been extended and brought up to date at the time of writing (1948). This is particularly true of the section dealing with water relations. The treatment of the more biochemical aspects is hardly so satisfactory, though this should not be overstressed since Professor Stiles avows his intention to keep the biochemical treatment down to a minimum.

The work is divided into four books dealing with (i) general physiology (ii) metabolism (iii) development (iv) irritability and movement. The few general references given at the end of each chapter will be of help to students, while more advanced readers will find extremely useful the references at the end of the text. The number of these (*ca* 1200) is a tribute to the scholarship of the author.

Though much of the more modern work is discussed, the second edition nevertheless remains what the first was—one of the outstanding texts on what may be called the classical approach to physiology. Professor Stiles is to be commended upon his resistance to the prevalent tendency to discard the groundwork of his subject and treat only of the lofty spires.

R.D.P.

**The Flamingos of the Camargue,** by **Etienne Gallet** (translated from the French by Sumner Austin). Pp. 127 with 53 plates from photographs. Basil Blackwell, Oxford, 15/-.

Mons. Gallet's account of the nesting of the flamingo in the Camargue may truly be regarded as the lifting of the veil on one of the great mysteries of the European avifauna. No bird more readily identifies itself ; few are better known, even by the layman. Yet about few European species do we know so little. Its oddity of shape, its magnificent plumage, its gregarian habits, the wide open spaces it frequents, have all conspired to make it a most intriguing and magnificent bird. Nevertheless, despite all this its nesting habits have long remained a mystery, and our knowledge of them has been incomplete and, at best, fragmentary. It was not, in fact, until 1883, that Abel Chapman, in the Spanish *marismas*, finally exploded the story, handed down from Dampier, that the flamingo

incubated its egg on its mud-mound, not in a normal posture, but like a rider on horse-back ; and it was not until 1903 that, in the Bahamas, that great American, Dr. Frank Chapman, published any detailed notes on the nesting habits of the birds. Since then, apart from the brief visits of C. McCann and Salim Ali to the huge colony in the Great Rann of Cutch, little has been added to our knowledge of this enigmatic bird.

The flamingo has a wide range, from the Kirghiz Steppes and Afghanistan to the Galapagos, but in Europe is regularly found only in the deltas of the Guadalquiver and the Rhône. Here its nesting-status has long been in doubt. Abel Chapman had no definite evidence of a successful colony in South Spain, while in the Camargue our knowledge was even more unsatisfactory. Positive evidence was entirely lacking. It had therefore been generally assumed that the flamingo in its European stations maintained its numbers by migration from Central Africa (a great collecting ground, but *not* a known nesting station) and India.

Now, at last, Mons. Gallet has revealed the truth. Since 1914 he records sixteen nestings in the Camargue, of which a dozen have been successful. In the period, to 1947, some 18,000 chicks have been reared. To these figures, in the present reviewer's own knowledge, must be added two further prosperous colonies, in 1948 and 1950.

This is a staggering disclosure, for it must be remembered that not only is the Camargue one of the most visited of all European bird stations, but also that an occupied flamingo city, which Frank Chapman called ' the greatest sight in all the bird-world,' consists of many thousands of densely-packed, large and conspicuous birds. It can be seen from miles away—and heard too. Yet it has escaped notice. We may well ask how much else has escaped the exploring ornithologist's eye, if such a scene can pass undetected. Only those who have experienced the heat, mud, mirage and mosquitoes of the flamingo's nesting haunts can appreciate the answer.

Mons. Gallet wisely kept the secret to himself, and here at last he has told the story. No man is better qualified to do it, for no man has ever had such opportunities to study this enigmatic bird. He has lived with his birds daily, and at night too, until to-day he may, in the reviewer's personal experience, be said to think like a flamingo.

This book is a great contribution to our knowledge of a most mysterious bird. But it is much more than that. It is a joy to read. How stimulating it is to-day to turn the pages of an author who, given a poetic subject, is not afraid to let the beauty of it colour his prose and interpretation. Mons. Gallet is sensitive to the wonder of the awe-inspiring spectacle he has been fortunate enough so often to study, and, while he has never avoided the scientific approach, he has always been filled with ' wonder, love and praise.' He always sees his flamingos in their proper perspective—against the world of salt-death in which they mysteriously thrive and against the wide horizons not only of their lagoons, but also of the great world of nature in that strange corner of Europe.

His photographs are magnificent, illustrating all phases of the flamingo's life and habitat. They have been taken with an eye as artistic as the pen that describes their subject matter. The plate (p. 90) which depicts the beginning of panic in a flamingo colony must surely be ranked amongst the great nature-photographs of all time.

Mr. Sumner Austin's translation is admirable. Clearly he has found the change from Sadlers Wells to the ballet of the flamingos a congenial one. He and Messrs. Blackwells are to be thanked for making this interesting book available in the English language.

G. K. Yeates.

**Avocets in England,** by **P. E. Brown.** Pp. 40, including 32 plates. Occasional Publication No. 14 of the Royal Society for the Protection of Birds (82 Victoria Street, London). 3/9 post free.

Part I relates the history of the recolonisation of parts of Suffolk from 1947 onward, by a species that disappeared about a century ago. Part II deals with the breeding-cycle as studied from 1947. The drawings by C. F. Tunnicliffe, and

the photographs by T. M. Fowler, E. J. Hosking, and A. W. P. Robertson are all excellent and cover most of the possible attitudes of this lovely bird. J. K. Stanford provides a Foreword. The Society and its contributors are to be congratulated on a beautiful production, which would not have been possible without the loyal co-operation of its team of watchers. Its perusal is necessary to everyone aspiring to up-to-date knowledge of birds in Britain to-day.

R. C.

**An Album of Bird Portraits,** by members of the **Zoological Photographic Club.** $9\frac{3}{4} \times 7\frac{1}{4}$. 36 plates, approx. $8 \times 6$, by 36 members, with a short paragraph concerning each species, and a Foreword by I. M. Thomson (President 1950-1). Occasional Publication No. 15 of the Royal Society for the Protection of Birds.

This production is a credit to everyone concerned and any bird-lover will be glad to have a copy. To single out any picture for special mention would be invidious in such a fine collection. The Foreword strikes exactly the right note. For more than 50 years the Z.P.C. has had special associations with Yorkshire, from the day of Riley Fortune and Jasper Atkinson to the present time of the Honorary Secretaryship of G. K. Yeates. A ' Z.P.C. Annual ' has often been mooted ; perhaps this might be the forerunner of such a publication.

R. C.

**Isle of Skomer.** A Preliminary Survey of the Natural History of Skomer Island, Pembrokeshire, undertaken for the West Wales Field Society and edited by **John Buxton** and **R. M. Lockley.** Pp. 164, with 26 photographic illustrations and 3 maps. Staples Press, 18/-.

The sub-title of this work adequately states its scope, though interpolated into the discursive part of the book there are narrative chapters concerned with the more dramatic moments of a temporary colonisation which was organised during the spring and summer of 1946, as well as reference to the domestic arrangements necessitated by the arrival through the season of some three hundred paying guests whose actual share in the work of the survey is not precisely defined.

There are chapters on the flora, on the spring and autumn passages of migratory birds through the island in what proved to be a most unsatisfactory season from the point of view of the weather, on the breeding birds of the island, the small mammals and the Atlantic Seal and on the marine biology of the shoreline, the last chapter contributed by Mr. R. Bassindale on the results obtained by a working party from Bristol University. Seven appendices are concerned with the geology of the island, lists of the flora, birds, lepidoptera and marine fauna as well as the measurements and movements of Skomer Voles and Field Mice and the contents of Barn Owl pellets. There is a bibliography.

The collaboration of these two well-known writers has resulted in a somewhat impersonal narrative which differs in this respect from the ' island ' books of the last two decades, not always to its advantage. The survey, as honestly stated in the sub-title, is a preliminary and, faunistically, only a partial one. The price, even for these days, seems uncommonly high.

E. H.

**Fishing in Many Waters,** by **James Hornell.** Pp. 210 with 36 plates from photographs and 44 text figures. Cambridge University Press, 30/-.

This book has been published after the death of the author and has suffered therefrom. The diagrams are delightfully clear and the photographs first class, but if the author had been alive he would, I hope, have resisted the publisher's ' save trouble ' trick of putting all the photographs together at the end and so losing half their value to the reader. As some compensation the book is covered with a really attractive wrapper—a rare thing in these days.

This is an encyclopaedia rather than a book, about different types of fishing all over the world ; it contains enough material for ten books and far too much for one. Just now and again, however, the mass of detail about different devices, traps and poisons is forgotten and the author becomes good company as he takes the reader along with him to see the great eel fishing at Comacchio on the Po, to eat and drink and talk with the friendly Italians who run this fishing business and catch eels by the ton, or rather by the tons. In this chapter and that on the pearl

fishing in Japan, government or museum slang is forgotten. Eels are ' eels,' fish are no longer ' fishes.' In reading these chapters I forgot that ' In Africa the stupefying of fishes by decoctions of various plants is both common and widely distributed,' and entered with zest into the capture, cutting up and cooking of the eels and the diving of the Japanese ladies for the oysters, which might or might not harbour pearls.

I suspect that someone out of a museum has edited this book after the author's death and has turned his fish into ' fishes.' To my delight he has missed quite a lot of ' fish.' Would he dare to lean over a fishmonger's slab and put the question, ' What fishes have you got to-day? ' I should like to hear the answer in Billingsgate.

There is much interesting material in this book and we are the losers from the fact that the author did not start sooner to write about his wide and unique experiences, unshackled by his official duties or the editorial comments of people who have forgotten their English.

ANTHONY BUXTON.

**Identification of Snakes of the Gold Coast,** by **Frank Leeson.** Pp. x + 142, with 23 plates and 65 text figures. Crown Agents for the Colonies, London, 18/-.

This is a manual for the determination of snakes, in the hand, in the Gold Coast Colony. It is intended for the use of medical officers and of field collectors and makes no mention of life-histories or of the recognition of snakes in the field. With the exception of an introductory chapter which contains some useful hints of preservation, the whole of the work is concerned with the external characters by which each species may be recognised and within these limits it is a careful guide, though where a specific anti-venine is desirable, the medical officer in need of a quick identification for the saving of life may feel the need for an abridged key to the deadly species, as for a glossary of native names.

The plates consist of photographs of dead specimens, whole or in part, and of drawings in half-tone, some in colour, of snakes or their salient recognition features. The text figures, in line and colour-line, are devoted to scale maps of the critical portions of various species.

One inaccuracy must be noted : the dust-jacket account—' blurb ' would hardly be respectful to such august publishers—states that ' Specific Lepidopsis is fully summarised in a series of Indices ' whereas it is restricted to one index concerned only with those snakes having colubrid-type heads.

The book is produced without suggestion of austerity.

E. H.

**Enchanted Streets,** by **Leonard Dubkin.** Pp. 152 with 7 illustrations by Edouard Sandoz. Hurst & Blackett, 12/6.

Leonard Dubkin was in early life a journalist in Chicago but failed in his profession, it is said, on account of his predilection for observing not those features of society which make news but rather the odd waifs and strays of the primeval world which linger in, or from time to time invade, such a metropolis. This book is concerned with the year's unemployment which followed and with the author's ultimate resolution to discontinue his efforts to secure a regular job and to write instead an account of the natural history of the city as he had observed it during and in between his quests for work.

It is unfortunate that his newspaper training should have afforded the author a by no means indifferent facility for descriptive writing which transcends the acuity of his observations and his learning. Thus of the dandelion : ' If the seeds are fertilised at ten o'clock one morning, at two o'clock of the same day the yellow flower is gone, and in its place is a cottony ball of little parachutes, each attached to a seed . . . When winter comes . . . the dandelion is to all appearances dead . . . when the sun has at last melted the snow and warmed the earth a little, twenty generations of dandelions will push little yellow flowers up into the air.''

Again, his method of killing the larger moths : ' I clip the moth's wings together so that it will not flap them, stick a pin through its body, fill the box with moth balls, and close it up tightly. Then I put the box in some drawer and forget it for a few weeks, at the end of which time the moth is usually [*sic*] dead.'

Of an earlier work by the same author one eminent reviewer has acclaimed him ' akin to Richard Jefferies or Evelyn or Andrew Marvell.' Or, someone. He is not in any way akin to Jefferies whose scrupulous observation was in no regard objectively at fault and whose mind ever rebelled at, never accepted, the trammels of urban life. Jefferies was sometimes obscure, sometimes naive, but never meretricious.

As a record of the realisation of a city dweller that a knowledge of what is called natural history can provide not only a wealth of interest, but also a foil to the preoccupation of wresting a livelihood in the concrete jungle of the city, the book has a value which would be done a disservice by an over appraisal of the merits of the author as a naturalist.

The book suffers from inadequate proof reading. It is not free from spelling mistakes and the punctuation is at times of the pepper-pot variety. The illustrations are trivial. E. H.

**This Way to Greenacres,** by **Maribel Edwin.** Pp. 264 with illustrations by Joan Kiddell-Monroe. Longmans, Green & Co., 8/6.

This is the story of a pet hare which escaped from captivity, and of the many adventures which befel both the hare and the boy and girl who set out to retrieve it. The English countryside provides the background, various animals figure prominently in the story and there is plenty of incident. Children are the best judges of children's books ; my boy, aged eight, quickly read it through and when asked for his verdict replied ' Super.'

**Stand and Stare,** by **Walter J. C. Murray** and **L. Hugh Newman.** Pp. 104 with 38 photographs in 31 plates. Staples Press, 7/6.

This is a pleasant little book in which a varied choice of subjects will appeal especially to the younger naturalist. Some excellent photographs are included, but it is a pity that that of the Eyed Hawk Moth does not show the characteristic feature. It is in the text that an unfortunate choice of terms sometimes provokes criticism. Male catkins are not ' barren ' and female catkins not, by contrast, necessarily fertile. Such terms make nonsense of the statement that ' one small branch bore not only barren and fertile flowers *but some which were both* ' (italics mine). Correction of points like this would add to the enjoyment of the book.

J. H. E.

**The UFAW Courier, No. 4.** Published by the Universities Federation for Animal Welfare, 284 Regent's Park Road, Finchley, N.3. Price 3d.

The current issue of this journal contains an entertaining article by Lord MacMillan on ' Cats in Court ' illustrated by Fougasse's inimitable drawings. Two papers read for UFAW at the Harrogate meeting of the B.M.A. in 1949 are reprinted ; one by Dr. Jean Vinter on ' The Care and Treatment of Laboratory Animals ' and the other by Professor A. N. Worden on ' Laboratory Animals in Medical Research.' There is also an article by Major Hume on ' Nature Conservancy : the pioneer work of UFAW ' in which some little-known historical details are given.

**The Farmer's Year Book and Diary for 1951.** (Obtainable from The Farmer, Goosegreen Farm, Bridgewater, Somerset, 6/6).

Contains a wealth of well-arranged farming and gardening information of all kinds in the form of tables of statistics, weekly notes, articles, dates of shows and sundry other references of value to all interested in agriculture.

**Film Strip. British Insects No. 1. The Purple Emperor Butterfly.** Photography and Notes by G. E. Hyde. Produced and marketed by Educational Productions Ltd., 17 Denbigh Street, London, S.W.1. 15/-.

There are 27 frames in this film strip showing the habitat and distribution, egg, caterpillar, pupa and imago of this fine species. The photographs are clear and together form a complete series covering all stages of the life-history, and the notes for use with the film strip supply all the required information about each stage depicted.

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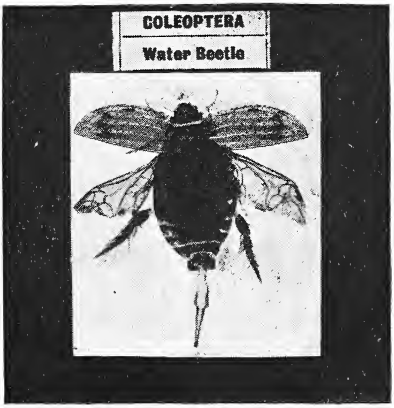


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# The NATURALIST



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Exchange copies of the following periodicals may be had on loan from The Editor of *The Naturalist*, The University, Leeds 2, on receipt of stamped addressed envelope:

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# YORKSHIRE NATURALISTS' UNION

### SPURN BIRD OBSERVATORY
### WARREN COTTAGE LETTINGS FOR 1951

The Committee desire to have the spring (March to late May) and the autumnal (end of July to mid-November) migration periods covered completely by competent ringers. Preference will be given to Y.N.U. members as far as possible. Charges continue at the rate of 3/- per night per person. Will those willing and able to take charge for periods please agree them with the Hon. Secretary as early as convenient, giving, if possible, alternative dates and periods? This will enable those who can give time out of the holiday seasons to make their plans and to fill blanks. Visits by those who are not registered ringers, short period and week-end occupation, etc., can then be arranged for other helpers who should also apply early. Visits are often difficult to arrange at short notice. With six occupants the cottage is considered full.

G. H. Ainsworth (144 Gillshill Road, Hull),
*Hon. Secretary.*

# STUDIES OF THE INLAND SPRING MIGRATION OF SELECTED PASSERINES IN SOUTH LANCASHIRE

T. EDMONDSON, A.R.I.C.

## 1. Introduction.

In 1938 extensive plans were prepared by several Leigh bird-watchers for a survey of the bird-life of a substantial area on the southern fringe of the industrial zone in Lancashire. Little progress was made before hostilities began and during the war years only the writer was able to visit this home area with any regularity. Since 1945 good progress has been made and it is hoped to begin reporting on the avian fauna in arbitrary categories. During recent years local bird-watchers have contributed to the national investigations of wader-tern migration sponsored by the British Trust for Ornithology. Observations have been made at Worsley Sewage Farm, Astley Flash and Leigh Flash. These two latter waters—flooded mining subsidences—are some three miles apart and are in many respects complementary. Many species occur equally frequently at both flashes, but the large, deep Leigh Flash has a regular winter flock of diving-ducks, whereas Astley Flash is the main resort of surface-feeding ducks and waders. For some years, I have suspected that the spring movements of certain passerines followed the same general pattern. The data I had, however, was rather too meagre to be analysed with exactitude, since very frequent watching is always a luxury for the strict amateur and also since I had developed the habit of taking annual holidays in early May. During 1950 I was able to visit the flashes sufficiently to obtain the migration patterns of five selected species for comparison. These observations and counts relate to the Yellow Wagtail, White Wagtail, Wheatear, Swallow and Sand Martin.

Normally Astley Flash and Leigh Flash are considered together, but in this paper I use records obtained only at Leigh Flash. The first reason is that winged insects are far more abundant there—the swarms of ' midges ' often have a high nuisance value—and consequently Swallows and similar birds are more regular in appearance. The second reason is that Wagtails and Wheatears are far more common in bulk at Leigh than at Astley. A double-track freight railway traverses Leigh Flash and the embankment thus separates a small, northern portion from the main water. This embanknemt always attracts passage Wagtails and Wheatears as also does the broad, sheltered cutting where the tracks diverge at the eastern end. The proportion of birds frequenting the remainder of the perimeter is generally quite small, but has not been neglected, since a complete circuit of the flash is normally made. The majority of the observations have been made on the evenings of weekdays, but some week-end visits have also been made, generally in the morning.

It should be mentioned that Leigh Flash is synonymous with Pennington Flash ; it is nevertheless preferable to use the name which is more indicative of geographical situation.

## 2. Summaries of Pre-1950 Records

Weather notes are omitted from this section since they were inconsistently noted in this period.

Yellow Wagtail (*Motacilla flava flavissima*).

1944-1950 (excluding 1946). The average of six arrival dates is April 10th, and the average date of the occurrence of the first wave of over 10 birds is April 15th. Males invariably arrive first and predominate in the first wave but the rate of equalisation of the sexes has not been recorded.

1947. No pronounced waves after the first.

1948. The numbers seen on successive visits were as follows :

April 16th, 26 ; 18th, 16 ; 21st, 50 ; 22nd, 30 ; 23rd, 30 ; 29th,100.

The occurrence of three waves during the latter half of April is suggested.

1949. The figures in this year were :

April 17th, 12 ; 19th, 50 ; 21st, 60.

Thus a broad wave was still increasing in strength when observations were discontinued.

The Yellow Wagtail nests commonly in the area and particularly in the small locality where passage flocks halt. It is therefore often difficult to distinguish between passing and potential nesting birds once May has arrived. My earliest record of a full clutch is May 5th.

As might be expected, considerable variations in plumage have often been observed but I have not yet seen any specimen of any other established race.

WHITE WAGTAIL (*M. a. alba*).

1942-1943. A few records between mid-April and mid-May, but visits were infrequent and it was generally thought to be scarce.

1944. As many as 12—last week in April.

1945. As many as five—very few observations.

1946. As many as 12—latter half of April.

1947. Fairly constant (average of five) from mid-April to May 9th, but ten on May 11th when observations were discontinued.

1948. Somewhat surprisingly prior to the appearance of the first Yellow Wagtails on April 10th, White Wagtails were present as follows :

April 4th, one ; 6th, six ; 9th, one.

The more normal arrival dates in 1947, 1949 and 1950 were April 13th, April 13th and April 16th. From these few dates it appears that normally the Yellow Wagtail precedes the White Wagtail by four days. Subsequent to these early arrivals in 1948, a flock of 16 White Wagtails arrived with the first large flock of 26 Yellow Wagtails on April 16th. Thereafter migration was cyclic with peaks of nine on April 27th and 15 on May 2nd, both occurring in troughs of Yellow Wagtail movements. Observations were then discontinued.

1949. Six appeared with five Yellow Wagtails on April 13th and on April 17th the respective numbers were 10 and 12. During the next four days, the numbers of the White Wagtail decreased to nil, whilst those of the Yellow Wagtail increased to 60. Between May 3rd and May 10th, when there were no migrating Yellow Wagtails, there were constantly six to eight White Wagtails.

A tentative generalisation is that, of these two species, the white arrives a few days later than the yellow, but the first waves of each are coincident. Thereafter the respective sequences of peaks do not normally have the same pattern. Whereas in most years no large passing flocks of the yellow occur after the first few days in May, the white may still be moving in good numbers (compared with its usual numbers) until at least mid-May.

It has been noted that, with the White Wagtail also, cocks arrive before the hens but the sexes have not been consistently separated or their ratios determined.

The constant presence of one or two pairs of nesting Pied Wagtails (*M. a. yarrellii*) provides for a direct comparison and a useful field-lesson.

The few observations made here on the roosting habits of the White Wagtail suggest that it does not roost with the Yellow Wagtail. It seems to prefer small patches of reeds at the western end of the flash and twice I have watched parties settle down at dusk and a little later have seen them apparently asleep. There was a group of six in 1949 and one of 20 in 1950.

WHEATEAR (*Oenanthe o. oenanthe*).

Seen singly and in twos (occasionally in threes) during April and the first week in May. Neglecting two very early March dates, the average of five arrival dates is April 6th.

SWALLOW (*Hirundo r. rustica*).

Apart from the arrival dates of the vanguard, movements of this species were not recorded before 1948.

1948. On April 29th, a wave of 45 was coincident with a wave of 100 Yellow Wagtails.

1949. On April 19th, 40 Swallows occurred with 50 Yellow Wagtails. On May 5th, when the Wagtail movements had ended 100 Swallows occurred.

SAND MARTIN (*Riparia r. riparia*).

1947. Waves of 30, 100 and 80 birds occurred on April 20th, April 29th and May 9th respectively.

1948. There were 40 with 50 Swallows at Astley on April 30th, following waves of Swallows and Yellow Wagtails at Leigh on the previous day.

1949. Only one substantial wave occurred and that from April 19th to April 21st. On the former date there were at Leigh 250 Sand Martins, 40 Swallows and 50 Yellow Wagtails. Apart from this peak, there were always less than ten Sand Martins at Leigh between April 6th and May 10th.

From this rather meagre data on the spring movements of Swallows and Sand Martins, one may draw the following conclusions. The main movements occur between mid-April and mid-May. In some years, there may be only one large

wave and in other years there may be several lesser waves at intervals of from seven to ten days. Generally both species occur together but occasionally waves may occur independently. During the latter half of April, the peak movements of Swallows and Sand Martins generally coincide with those of the Yellow Wagtail.

### 3. The Comparative Study of 1950.

Counts of the selected species were made almost daily from mid-April to mid-May and are presented below in tabular form. Weather notes are given and the numerical notation of wind strength and temperature is as follows :

| | | |
|---|---|---|
| 0 | Calm | Hot |
| 1 | Slight | Mild or Warm |
| 2 | Moderate | Cool |
| 3 | Strong | Cold |
| 4 | Very Strong | Very Cold |

The asterisks indicate the occurrence of sweeping blizzards. Counts of the Swift (*Apus a. apus*) are also given for comparison. However, it is not intended to deal further with that species since its movements present a separate problem and cannot easily be correlated with those of other species.

| | *Weather Notes* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Date* | *Wind Direction* | *Wind Strength* | *Temperature* | *Yellow Wagtail* | *White Wagtail* | *Wheatear* | *Swallow* | *Sand Martin* | *Swift* |
| April | | | | | | | | | |
| 13 | W. | 1 | 1 | 4 | 0 | 0 | 0 | 0 | 0 |
| 14 | – | – | – | 0 | 0 | 0 | 2 | 4 | 0 |
| 15 | – | – | – | 5 | 0 | 1 | 1 | 0 | 0 |
| 16 | S.E. | 1 | 2 | 10 | 6 | 0 | 6 | 20 | 0 |
| 17 | W. | 1 | 1 | 20 | 3 | 0 | 0 | 2 | 0 |
| 19 | E. | 1 | 2 | 4 | 0 | 0 | 1 | 0 | 0 |
| 20 | – | 0 | 1 | 1 | 4 | 0 | 1 | 0 | 0 |
| 21 | N.W. | 2 | 2 | 50 | 0 | 1 | 2 | 0 | 0 |
| 24 | N.W. | 4 | 4* | 60 | 14 | 1 | 40 | 2 | 0 |
| 25 | N.W. | 3 | 3* | 40 | 2 | 2 | 50 | 10 | 0 |
| 27 | W. | 2 | 2 | 25 | 2 | 3 | 2 | 0 | 0 |
| May | | | | | | | | | |
| 1 | W. | 2 | 1 | 55 | 8 | 9 | 10 | 10 | 9 |
| 2 | W. | 3 | 2 | 140 | 32 | 16 | 60 | 160 | 4 |
| 5 | N. | 1 | 2 | 50 | 6 | 9 | 20 | 16 | 0 |
| 6 | N. | 1 | 2 | 50 | 4 | 4 | 30 | 120 | 40 |
| 7 | W. | 2 | 1 | 30 | 6 | 2 | 4 | 0 | 30 |
| 8 | N.E. | 2 | 1 | 10 | 0 | 2 | 15 | 80 | 20 |
| 9 | N.E. | 2 | 2 | 6 | 0 | 0 | 30 | 100 | 30 |
| 10 | E. | 2 | 1 | 0 | 0 | 0 | 0 | 80 | 30 |
| 11 | E. | 1 | 0 | 0 | 0 | 0 | 6 | 10 | 20 |
| 13 | E. | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 6 |
| 14 | E. | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 50 |
| 15 | N. | 2 | 3 | 6 | 0 | 0 | 60 | 40 | 30 |
| 16 | N.E. | 1 | 2 | 0 | 0 | 0 | 30 | 20 | 20 |

This table shows clearly the several interesting features of the movements of the selected species at Leigh Flash in the spring of 1950. Proceeding in chronological sequence, we first notice that on April 16th-17th in a period of mild weather with light, variable winds, the first small waves appeared of both Wagtails, the Swallow and the Sand Martin. A second broad wave of all four species then extended from April 21st to April 27th in a period of cold, strong west to north-west winds. The peak numbers occurred on April 24th and 25th when the very cold wind reached gale force with frequent sweeping blizzards. The third wave then began on May 1st reaching a maximum on May 2nd during a cool, strong, west wind. This peak was marked by abnormally high numbers of both species of Wagtails and by the incidence of a well-defined maximum in the numbers of Wheatears. In previous years the numbers of this species have been so small that its waves, if any, have been indistinguishable. Here it might be mentioned that Leigh Flash is some thirty miles from the Lancashire coast and that there are no substantial intervening wind-breaks. For the purpose of this analysis, I assume

that the density distribution of the broad migration front is fairly constant when it reaches South Lancashire from the south, but that there is a denser route along the coast. Strong westerly winds will tend to cause a lateral compression of the front with a noticeable density increase at favoured inland localities. There was such an occurrence at Leigh Flash on May 2nd, 1950. In support of this very simple hypothesis, I may refer to observations on the Common and Arctic Terns published elsewhere (*N.W.Nat.* XXII, p. 269-70). In the spring of 1947 exceptional numbers of Terns appeared at Leigh, their numbers being initiated and maintained by strong, westerley winds and being dissipated by easterly winds.

After this wave of May 2nd in 1950, it seems that the forces of Wagtails and Wheatears were then spent and no further waves were noticed. The wave of Yellow Wagtails died away rather slowly perhaps because some were potential, local, breeding birds whose territorial activities were discouraged by the inclement weather. Further to this point, from previous experience, I am reasonably certain that the small flock of Yellow Wagtails on May 15th was composed of birds about to nest locally and was a re-gathering caused by the cold, north wind.

As in previous years, waves of Swallows and Sand Martins occurred after the movements of Wagtails ended. In 1950, there were two further waves with peaks on May 9th and May 15th, both coinciding with cool or cold northerly winds. I am loath to attempt a specific correlation of the movements of these two species with weather conditions beyond suggesting that in inland localities northerly winds may encourage temporary ' build-ups ' at suitable feeding grounds. As a last point, it may be noted from the table that not only does the ratio of Swallows to Sand Martins vary but that either may predominate in no regular pattern.

### 4. Summary

An analysis of the records obtained by observing the spring passage of certain birds at Leigh Flash, South Lancashire is given. The species selected are the Yellow Wagtail, White Wagtail, Wheatear, Swallow and Sand Martin. These birds are chosen because the study of their movements is often neglected and also because the situation and the topography of the flash and its environs seem to induce easily-observable flocking. A section of this paper is devoted to an approximate analysis of scattered data prior to 1950, without reference to weather conditions. A further section is devoted to the regular observations of 1950, wherein an attempt is made to correlate the recorded movements with prevailing weather conditions. Neglecting the finer points of the analyses, which are given in the text, it is shown that there exists a marked migration of these species from mid-April to mid-May. Well-defined waves occur and in some years there may be as many as five or six at approximately weekly intervals. The waves of all species generally coincide, particularly if weather conditions exert pronounced effects, but the main movements expire at different times for different species. The Wheatear is exceptional in that its numbers are normally too low for any peak to be safely determined. In 1950, however, when it exhibited a pronounced wave, this coincided with those of the other four species.

## FRESHWATER ALGAL FLORA

Professor F. E. Fritsch and Dr. J. W. G. Lund are preparing a Freshwater Algal Flora of the British Isles. They would be glad to hear of any unpublished records or of records published in the proceedings of local natural history societies. If the record relates to a rare species or to one new for the British Isles, they would be obliged if material could be sent to Dr. J. W. G. Lund, The Ferry House, Far Sawrey, Ambleside, Westmorland.

## FLORA OF DERBYSHIRE

During the autumn of 1949 a committee was formed, under the chairmanship of Professor A. R. Clapham, to carry out a revision of the Rev. W. R. Linton's ' Flora of Derbyshire.' This work is now actively proceeding, and any readers possessing records, notes, or other information bearing on the Derbyshire flora are invited to communicate with Mr. R. H. Hall, 2 Hartington Terrace, West Road, Buxton, or Mr. A. L. Thorpe, Curator, Derby Museum.

# *BRACHYSPORIUM* IN BRITAIN

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THE generic name *Brachysporium* was proposed by Saccardo (*Michelia*, ii, p. 28, 1880) for two species, *B. obovatum* (Berk.) Sacc. (=*Helminthosporium obovatum* Berk.) and *B. coryneoideum* (de Not.) Sacc. (=*H. coryneoideum* de Not.). Now these co-type species have very little in common ; *B. coryneoideum* produces solitary and not readily detached phaeophragmospores as blown out ends of the apices of fasciculate conidiophores.

In Herb. I.M.I. Mr. E. W. Mason has chosen *Brachysporium obovatum* as lectotype species of the generic name *Brachysporium*. This choice together with the exclusion of *B. coryneoideum* has resulted in a well defined genus which includes five not uncommon British species, two of which are described as new below. They are all wood and bark hyphomycetes and some collections of all have been made in Yorkshire. Because of the close general similarity of the species it has been possible to give a detailed generic diagnosis. This is followed by descriptions of the species based upon all the collections available in Herb. I.M.I., a list of the hosts, the months in which collections have been made and the number of collections assigned in Herb. I.M.I. to each name. Each species is illustrated. All collections from Yorkshire which are preserved in Herb. I.M.I. are listed after each species description ; it will be noticed that the dates correspond precisely with those very pleasant post-war spring and autumn forays held by the Mycological section of the Yorkshire Naturalists' Union.

**Brachysporium** Sacc., emended Mason & Hughes ; generic description :

Lectotype species : *B. obovatum* (Berk.) Sacc.

*Colonies* effuse, black.

*Mycelium* mostly immersed, composed of very pale brown to brown, septate branched hyphae.

*Conidiophores* sparse or crowded, usually solitary, simple, erect, septate, thick-walled, dark brown, swollen at the base, bearing conidia in a dry bunch at the paler coloured or hyaline apex.

*Conidia* develop singly at the apices of successively produced growing points and are attached to the conidiophore by a very narrow, usually bent or twisted, hyaline to subhyaline separating cell ; they are more or less constantly 2-, 3-, or 4-septate in the different species, oval, obovoid, pyriform or fusoid, subhyaline to dark brown with the various cells usually unequally coloured. They become detached by a break across the separating cell, leaving corresponding minute frills on the conidiophore and truncate base of the conidium.

*Habitat* : rotten wood and bark of broad leaved trees.

**1.** ***Brachysporium obovatum*** (Berk.) Sacc. (Fig. A).

*Conidiophores* up to 400$\mu$ long, 6 to 8$\mu$ wide just above the basal swelling, tapering subulately to 3·5 to 5$\mu$ at the apex.

*Conidia* 2-septate, slightly constricted at the septa, obovoid or pyriform with a small subhyaline basal cell, a larger pale brown central cell and a still larger terminal cell which is pale brown to brown ; they measure 19 to 26 by 10 to 14 (mostly 20-23 × 10-12)$\mu$.

*Habitat* : 15 collections have been made on *Acer pseudoplatanus*, *Fagus sylvatica*, *Prunus avium*, *P. spinosa*, *Quercus* (British Oak) and *Sambucus nigra*.

| Jan. | | | Apr. | May | June | July | | Sept. | Oct. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Collections of *Brachysporium obovatum* from Yorkshire**

| *Date* | *Substrate* | *Locality* | *Herb. I.M.I. No.* |
|---|---|---|---|
| 10/4/1947 | *Sambucus nigra* | Thornton-le-Dale | 14473 |
| 11/10/1947 | *Prunus avium* | Swinton Park, near Masham | 19272(c) |
| 9/4/1948 | wood | Maltby | 27636 |
| 9/4/1948 | wood | Maltby | 27688(a) |
| 15/4/1950 | *Fagus sylvatica* | Swinton Park, near Masham | 40631(c) |

**2. *Brachysporium apicale*** (Berk. & Br.) Sacc. (Fig. **B**).

*Conidiophores* up to 300$\mu$ long, 7 to 9$\mu$ wide just above the basal swelling, tapering subulately to 3·5 to 6$\mu$ at the apex.

*Conidia* 3-septate, generally oval with two more or less equal central cells pale brown and the smaller terminal cells equal, subhyaline to pale brown ; they measure 15 to 24 by 8 to 12 (mostly 17-20 × 9-10)$\mu$.

*Habitat* : 25 more or less recent collections have been made on *Betula, Fagus sylvatica, Fraxinus excelsior* and *Quercus* (British Oak).

| | Feb. | | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Collections of *Brachysporium apicale* from Yorkshire**

| *Date* | *Substrate* | *Locality* | *Herb. I.M.I. No.* |
|---|---|---|---|
| 12/4/1947 | *Fraxinus excelsior* | Howldale | 13918(a) |
| 11/10/1947 | *Fagus sylvatica* | Swinton Park, near Masham | 19276(b) |
| 14/4/1950 | *Fraxinus excelsior* | Hackfall, near Masham | 40555 |
| 15/4/1950 | wood | Swinton Park, near Masham | 40683 |

**3. *Brachysporium bloxami*** (Cooke) Sacc. (Fig. **C**).

*Conidiophores* up to 350$\mu$ long, 6 to 8$\mu$ wide just above the basal swelling, tapering subulately to 3 to 4$\mu$ at the apex.

*Conidia* 3-septate, long obovoid with a small subhyaline basal cell bearing a series of three pale brown to brown cells, each successively larger towards the rounded apical one ; they measure 19 to 39 by 9 to 14 (mostly 23-29 × 10-12)$\mu$.

*Habitat* : 27 collections have been made on *Acer pseudoplatanus, Betula, Fagus sylvatica, Prunus avium* and *Quercus* (British Oak).

| Jan. | | Mar. | Apr. | May | June | | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Collections of *Brachysporium bloxami* from Yorkshire**

| *Date* | *Substrate* | *Locality* | *Herb. I.M.I. No.* |
|---|---|---|---|
| 17/4/1946 | *Quercus* | Arncliffe woods | 6952(a) |
| 11/4/1947 | *Betula* | Forge Valley | 13827(b) |
| 12/4/1947 | *Quercus* | Howldale | 14470 |
| 13/10/1947 | wood | Swinton Park, near Masham | 1930(a) |
| 25/9/1948 | *Acer pseudoplatanus* | Swinton Park, near Masham | 31996 |
| 25/9/1948 | *Quercus* | Hackfall, near Masham | 31995 |
| 26/9/1948 | *Prunus avium* | Swinton Park, near Masham | 31410(b) |

Mr. E. W. Mason has informed me of the interesting fact that Saccardo's description of *Helminthosporium velutinum* (the type species of *Helminthosporium*) in Saccardo's *Sylloge Fungorum* (iv, p. 402, 1886) and earlier in *Michelia* (ii, p. 641, 1882) was based upon Libert 854 on *Fagus sylvatica* wood [Herb. I.M.I. (slides) 5459 i, j. k, ex Herb. Hort. Bot. Brux.] which bears in part *Brachysporium bloxami*. It is not surprising, therefore, that Saccardo's description of *H. velutinum* shows such agreement with that of *B. bloxami* as delimited above. *Helminthosporium velutinum* is quite a different fungus.

**4. *Brachysporium masonii*** Hughes sp. nov.

*Coloniae* effusae atrae.

*Mycelium* immersum, ex hyphis septatis ramosis, pallide brunneis vel brunneis compositum.

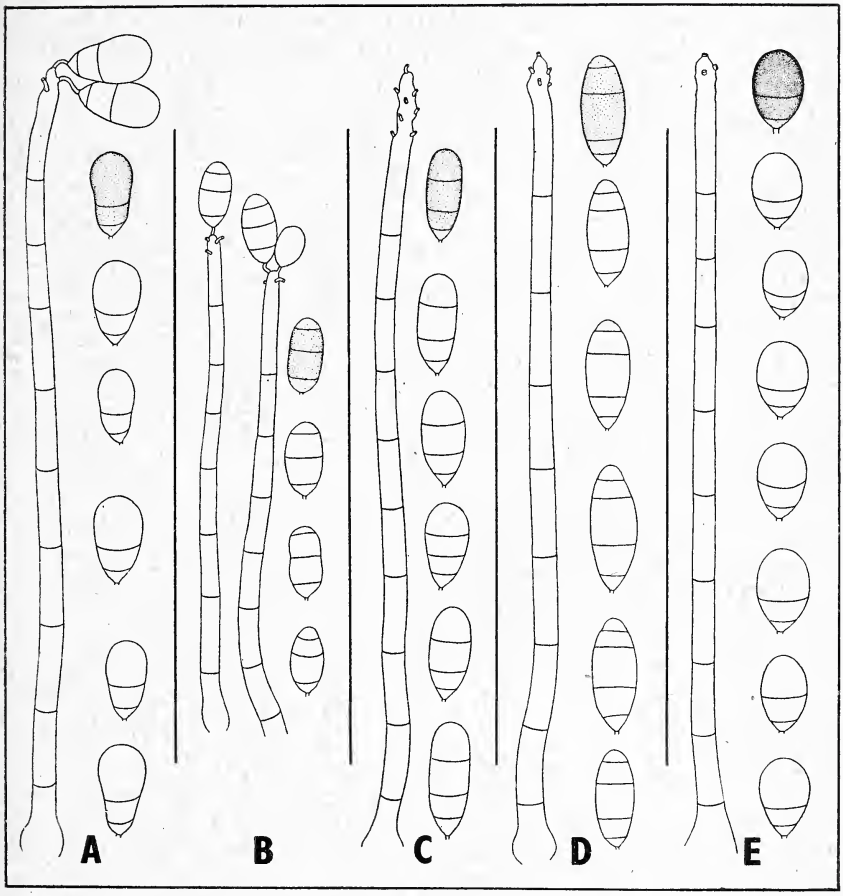
*Conidiophora* erecta, simplicia, septata, atrobrunnea, parte fertili subhyalina, usque ad 350$\mu$ longa, basi 7-8$\mu$ apice 4-5$\mu$ crassa.

*Conidia* 4-septata, ovoideo-fusoidea, 24-34×9·5-12 (plerumque 26-30×10-12)$\mu$ cellulis polaribus subhyalinis, cellulis interioribus 3, pallide brunneis vel brunneis, apicem versus cellulae ultimae conidiophoralis acropleurogena, quodque ad pedicellum minutum affixa.

*Habitat* in ligno putrido *Pruni avium, Quercus* ('British Oak') et ligno indeterminato in Anglia. Herb. I.M.I. 17539 in *Quercus*, Sellers Wood, Devon, 11/9/1947, est typus.

***Brachysporium masonii*** Hughes (Fig. **D**).

*Conidiophores* up to 350$\mu$ long, 7 to 8$\mu$ wide just above the basal swelling, tapering subulately to 4 to 5$\mu$ at the apex.




***Brachysporium*** spp., conidiophores and conidia, ×500 ;

**A**, ***B. obovatum***, from Herb. I.M.I 27688(a) on rotten wood, Maltby, Yorks., 9/4/1948.

**B**, ***B. apicale***, from Herb. I.M.I 15492(a) on *Fagus sylvatica*, Ranmore, Surrey, 25/5/1947.

**C**, ***B. bloxami*** from Herb, I.M.I 17308(a) on *Fagus sylvatica*, Cwm Woods, Aberystwyth, Cards., 7/8/1947.

**D**. ***B. masonii***, from Herb. I.M.I. 17539 on *Quercus*, Sellers Wood, Devon, 11/9/1947.

**E**, ***B. britannicum*** from Herb. I.M.I. 24930 on *Fagus sylvatica*, Boxhill, Surrey, 29/8/1948.

*Conidia* 4-septate (rarely 3- or 5-septate), oval-fusoid with a small subhyaline cell at each end and three pale brown to brown central cells of which the middle one is the largest ; they measure 24 to 34 by 9·5 to 12 (mostly 26-30× 10-12)$\mu$.

*Habitat* : 5 collections have been made on *Prunus avium*, *Quercus* (British Oak) and unidentified wood.

| Jan. | | Mar. | | | | | | Sept. | Oct. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Collections of *Brachysporium masonii* from Yorkshire**

| *Date* | *Substrate* | *Locality* | *Herb. I.M.I. No.* |
|---|---|---|---|
| 11/10/1947 | *Prunus avium* | Swinton Park, near Masham | 19272(g) |
| 13/10/1947 | wood | Swinton Park, near Masham | 19306(b) |
| 27/9/1948 | *Quercus* | Swinton Park, near Masham | 32062(b) |

**5. *Brachysporium britannicum*** Hughes sp. nov.

*Coloniae* effusae, atrae.

*Mycelium* immersum, ex hyphis septatis, ramosis, pallide brunneis vel brunneis compositum.

*Conidiophora* erecta, simplicia, septata, atrobrunnea, parte fertili subhyalina, usque ad 500$\mu$ longa, basi 6-8$\mu$, apice 3·5-5$\mu$ crassa.

*Conidia* 2-septata, obovoidea, 17-23 × 11-15 (plerumque 19-22 × 12-13)$\mu$, cellula basali truncata, subhyalina, cellulis superioribus plerumque atrobrunneis, opacis, apicem versus cellulae ultimae conidiophoralis acropleurogena, quodque ad pedicellum minutum affixa.

*Habitat* in ligno et cortice putrido *Betulae* sp., *Buxi sempervirentis*, *Fagi sylvaticae*, *Fraxini excelsioris*, *Quercus* sp. (' British Oak ') et *Sambuci nigrae* in Anglia, Cambriaque. Herb. I.M.I. 15345(a) in *Betula*, Richmond Park, Surrey, 18/5/1947, est typus.

***Brachysporium britannicum*** Hughes (Fig. **E**).

*Conidiophores* up to 500$\mu$ long, 6 to 8$\mu$ wide just above the basal swelling, tapering subulately to 3·5 to 5$\mu$ at the apex.

*Conidia* 2-septate, short obovoid or pyriform with a small subhyaline basal cell capped by two dark brown cells, the upper often darker than the central one and usually quite opaque; they measure 17 to 23 by 11 to 15 (mostly 19-22 × 12-13)$\mu$.

*Habitat* : 22 collections have been made on *Betula*, *Buxus sempervirens*, *Fagus sylvatica*, *Fraxinus excelsior*, *Quercus* (British Oak) and *Sambucus nigra*.

| | | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Collections of *Brachysporium britannicum* from Yorkshire**

| *Date* | *Substrate* | *Locality* | *Herb. I.M.I. No.* |
|---|---|---|---|
| 12/4/1947 | *Fraxinus excelsior* | Howldale | 13918(b) |
| 12/4/1947 | ?*F. excelsior* | Howldale | 14476 |
| 13/4/1947 | *F. excelsior* | Howldale | 14005 |
| 13/10/1947 | *Quercus* | Swinton Park, near Masham | 19247(j) |
| 10/4/1948 | *Fagus sylvatica* | Limb Valley | 27791(c) |
| 16/4/1950 | *Fraxinus excelsior* | Quarry Ghyll, near Masham | 40554 |

**Key to British species of *Brachysporium***

1. Conidia 2-septate
   - Conidia pale brown ... ... ... ... ... *B. obovatum*
   - Conidia dark brown ... ... ... ... ... *B. britannicum*
2. Conidia 3-septate
   - Conidia symmetrically septate ... ... ... *B. apicale*
   - Conidia asymmetrically septate ... ... ... *B. bloxami*
3. Conidia 4-septate ... ... ... ... ... *B. masonii*

I am very grateful to Mr. E. W. Mason for helpful criticisms and for correcting my Latin diagnoses.

# A RICH PLANT-BED IN THE MILLSTONE GRIT NEAR BLACKBURN, LANCASHIRE

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THE Millstone Grit has long been reputed to be poor in the remains of fossil plants. Indeed, when Kidston published his complete list of British Carboniferous Plant-incrustations known up to 1894, he stated with reference to the Millstone Grit Series (p. 225) ' fossil plants are very rare in rocks of this age. The specimens found in the sandstones are generally too imperfectly preserved to admit of satisfactory determination', and the associated shales are most frequently barren.' Since 1894, owing to Kidston's later work, and to that of Arber and of Crookall (1934) the list of Millstone Grit plants has been greatly extended, but the position so far as Lancashire is concerned has remained unsatisfactory. In the Geology of the Rossendale Anticline (Wright, 1927) for example, we find the statement (p. 128) that ' the Millstone Grits of Lancashire are notoriously poor in plant remains ' and this is followed (p. 129) by a short list of plants collected by Mr. S. W. Hester and determined by Dr. J. Walton.

It is of some interest, therefore, to record the presence of a shale bed very rich in plant remains which occurs in the Millstone Grit south-west of Blackburn. This plant-bed was originally found by Mr. J. Ranson, A.M.I.M.E., F.G.S., of Blackburn, and shown by him to Mr. Vernon Dean, of Accrington, and Mr. F. Hodson, B.Sc., F.G.S., of Burnley. I first collected from the plant-bed in company with Mr. V. Dean in 1943 and I subsequently collected more extensively on a number of visits during 1943 to 1945, both alone and in company with Mr. L. F. Marchant, B.Sc., of Gosport and Mr. E. D. Lacy, B.Sc., F.G.S., of Birmingham.

## LOCALITY AND HORIZON

The plant-bearing rocks consist of soft grey shales exposed in a very small tributary stream running into the River Darwen on its western side some few yards south of the railway bridge which crosses the Hoghton gorge between Hoghton Bottoms and Feniscowles, near Blackburn, Lancashire. There is a weir across the river near the tributary stream.

The shales are associated with the Revidge Grit (the local equivalent of the combined Fletcher Bank and Helmshore Grits of the Rossendale area). This grit forms the main part of the Middle Grits and is of Lower R2 age (Zone of *Reticuloceras reticulatum* mut. $\beta$).

The plant-containing beds are, of course, included in that part of the Upper Carboniferous formerly referred to as the Lanarkian Series but now known as the Pre-Yorkian Stage (Crookall, 1943).

## LIST OF PLANTS

*Pteridospermae*

*Neuropteris gigantea* Sternberg. Common.
*N. schlehani* Stur. Very Common.
*N. schlehani* var. *rectinervis* Kidst. Very common.
*N.* aff. *heterophylla* Brongniart. Rare.
*Neuropteris* sp.
*Alethopteris lonchitica* (Schlotheim). Fairly common.
*A. decurrens* Artis. Very rare.
*Alethopteris* sp.
*Mariopteris acuta* (Brongniart). Very common.
*Mariopteris* sp.

*Cordaitales*

*Cordaites principalis* (Germar). Fairly rare.
*Cordaites* sp.

*Unassigned Gymnospermous Seeds*

*Trigonocarpus parkinsoni* Brongniart. Common.
*Holcospermum* sp. Rare.

*Equisetales*

*Calamites* aff. *undulatus* Sternberg. Rare.
*Calamites* sp.
*Palaeostachya* sp. Very rare.

*Lycopodiales*

*Lepidostrobus* sp. (Record due to Mr. F. Hodson).

*Incertae sedis*

*Pinnularia capillacea* L. and H. (roots). Fairly common.

Longitudinally striated Fern or Pteridosperm stems (indet.).

Axis with indistinct transverse scars or ridges (indet.).

### Notes on the Plants

In the suite of plants collected from the Hoghton Beds *Neuropteris schlehani* and *Mariopteris acuta* are the chief Pre-Yorkian Zonal species. *Cordaites principalis*, *Neuropteris gigantea*, and *Alethopteris lonchitica*, though fairly common in the Pre-Yorkian, are of less value since they all occur more commonly in the overlying Yorkian. *Neuropteris heterophylla* and *Alethopteris decurrens* are rare in the Pre-Yorkian but common in the Yorkian. So far as I can ascertain by reference to the list of Coal Measure Plant Incrustations prepared by Crookall in 1933, the records of *Palaeostachya* and the seeds *Holcospermum* and *Trigonospermum parkinsoni* are new ones for the Pre-Yorkian, at least of Lancashire. Seeds of any kind appear to have been recorded but rarely from Pre-Yorkian beds. The seed *Trigonocarpus parkinsoni* listed above very probably belongs to the *Alethopteris lonchitica*, the type of foliage with which it is usually found. The axis with indistinct transverse scars or ridges bears a close resemblance to *Mariopteris* petioles figured by Kidston in 1924 (pl. CXLI).

### Acknowledgments

I should like to express my thanks to Messrs. Dean, Marchant and Lacy for assistance in collecting material, and to Dr. R. Crookall, of the Geological Survey, for help in the naming of the specimens.

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**Pests of Flowers and Shrubs**, by **G. Fox Wilson.** Bulletin No. 97 of the Ministry of Agriculture and Fisheries. H.M. Stationery Office, June 1950. 105 pp., 118 figs. Size 9½ × 6 in. Price 4/6.

This Bulletin is the second edition of a publication first issued in 1937. It deals in a clear and authoritative manner with some two hundred of the commoner insect and other animal pests of garden plants, giving their characteristics, the damage caused, life-histories and control measures. The work is very well illustrated by numerous excellent photographs and good text-figures, and the fact that the letterpress is from the pen of the late G. Fox Wilson ensures that it is both up-to-date and thoroughly practical.

For those who want a handy primer of insect life, whether they be horticulturists or field naturalists here is a book which can be thoroughly recommended. Because of their necessarily limited scope bulletins of this kind tend to leave the reader with the idea that most garden insects are unmitigated pests whilst the reverse is actually true of the majority of garden species. The nomenclature used is nearly up to date—but not quite ! One is sorry to see control measures given for the Tawny Mining Bee, *Andrena armata* (Gmelin in Linnaeus) (called *A. fulva* Schrank) which, in the north of England at least, is of the greatest importance in pollinating gooseberries ; its slight damage to sandy lawns and banks is seasonal and far less important.

In every way this bulletin is excellent value for its low price.

W. D. H.

## YORKSHIRE NATURALISTS' UNION (VERTEBRATE SECTION) COMMITTEE FOR ORNITHOLOGY

*Chairman* : R. M. Garnett.

*Recorders* :

North Riding—*East* : R. M. Garnett, Thornton-le-Dale.
*West* : J. P. Utley, B.Sc., M.B.O.U., 24 Neile Close, Romanby, Northallerton.

East Riding : G. H. Ainsworth, 144 Gillshill Road, Hull.
West Riding : R. Chislett, M.B.O.U., Masham.
York District : E. W. Taylor, C.B.E., M.B.O.U., 11 The Avenue, York.

*Hon. Secretary and Editor of Records* :
Ralph Chislett.

### Report for 1950

With ornithologists in the Union now too numerous to continue to be conveniently or factually named a committee, it has been suggested to me that they should assume the name of Ornithological Section after 1951, separate from but closely related to the rest of the Vertebrate Section, and that any details necessary to the change be worked out.

A mild winter was succeeded by a very cold April and early May ; with late frosts, and snow on April 25th at Spurn, and north-east as the direction of the prevailing wind in May. Dry weather followed, almost unbroken except for local and slight showers until mid-July. Thence winds were mainly westerly until October 20th, when an easterly change released pent-up migration across the North Sea. Winter set in with December, with snowfalls on the 3rd, and frost for most of the month.

Spring was exceptional. The mild March induced early breeding with some of the resident birds, but the bitterly cold April-May brought disaster to many early broods. L. Carr picked up dead thrushes, robins, chaffinches, etc., whose deaths he attributed to exhaustion from difficulty in finding food for nestlings, during temporary shortages caused by widely varying temperatures when many young also died. There were a few early arrivals of migrants, but average dates were late.

The effects of the change of wind from prevalently westerly to easterly for a few days from October 20th could be seen everywhere. October 22nd occurs repeatedly in the notes of many. When considering species in the ' Classified List ' this date should be kept in mind. Many species were affected—especially see under headings of Starling, Fieldfare, Redwing, Blackbird, Skylark ; and Sheld-Duck and Scaup-Duck ; and Woodcock. The released hordes included Pied and Red-breasted Flycatchers. A Blackbird at Spurn on October 22nd bearing a Stockholm ring was a clue to the possible origin of many. Blackbirds at Spurn have now been connected with all three Scandinavian countries and with Germany.

#### The Spurn Bird Observatory
(By G. H. Ainsworth and R. Chislett)

The observatory was manned continuously from early March to the year end, except for periods from March 17th to 31st, during most of June and July, and for ten days each in November and December.

Taking all things into consideration, the peninsula has been well watched, and the results recorded, as well as could be expected without a resident warden. Not all our visitors take their responsibilities equally seriously. Occasionally a figure is entered against a bird's name in the ' roll-call ' which ought to have reference in the ' log.' A figure ' one ' entered even in its proper column is not a scientific record of a difficult or unusual species, and should be amplified by diagnostic details in the book (' log ') provided. Another occasional source of disquiet comes from the use of rings out of sequence—to put and use them in order, with the ring read carefully when used, provides a double check on figures that are often easy to misread.

The fact that we have not surpassed the 1948/9 total of birds ringed is due entirely to military activities. During much of the year, sand was being shifted

all around the Point trap, which became buried in the autumn, so that only by a great effort (and military help) was part of the material salvaged and moved to the ' wire-dump ' area, where it has been re-erected. During September and October a gang of men worked near to the Warren trap, preventing by their presence many birds from entering our bushes. Despite these hindrances, in the year to October 31st, 1950, 1,714 birds were ringed of 63 species :—

| | | | |
|---|---|---|---|
| Jackdaw | 1 | | |
| Magpie | 2 | | |
| Starling | 68 | | |
| Greenfinch | 91 | | |
| Chaffinch | 132 | | |
| Linnet | 349 | | |
| Brambling | 15 | | |
| Siskin | 1 | | |
| House-Sparrow | 137 | | |
| Tree-Sparrow | 1 | | |
| Reed-Bunting | 42 | | |
| Yellow-Bunting | 22 | | |
| Snow-Bunting | 1 | | |
| Skylark | 24 | | |
| Rock-Pipit | 2 | | |
| Meadow-Pipit | 70 | | |
| Tree-Pipit | 1 | | |
| Yellow Wagtail | 1 | | |
| Blue-Tit | 8 | | |
| Great-Tit | 8 | | |
| Goldcrest | 1 | | |
| Spotted Flycatcher | 22 | | |
| Pied Flycatcher | 89 | | |
| Red-breasted Flycatcher | 1 | | |
| Tree-Creeper | 1 | | |
| Chiffchaff | 3 | | |
| Willow-Warbler | 128 | | |
| Wood-Warbler | 2 | | |
| Garden Warbler | 8 | | |
| Blackcap | 4 | | |
| Whitethroat | 86 | | |
| Lesser Whitethroat | 5 | | |
| *Carried forward* | 1326 | *Brought forward* | 1326 |
| | | Sedge-Warbler | 16 |
| | | Barred Warbler | 1 |
| | | Fieldfare | 2 |
| | | Song-Thrush | 10 |
| | | Redwing | 5 |
| | | Blackbird | 139 |
| | | Ring-Ousel | 4 |
| | | Wheatear | 2 |
| | | Whinchat | 13 |
| | | Stonechat | 6 |
| | | Redstart | 24 |
| | | Black Redstart | 6 |
| | | Robin | 20 |
| | | Wren | 27 |
| | | Hedge-Sparrow | 33 |
| | | Swallow | 23 |
| | | Sand-Martin | 2 |
| | | Cuckoo | 14 |
| | | Wryneck | 1 |
| | | Little Owl | 1 |
| | | Long-eared Owl | 1 |
| | | Merlin | 1 |
| | | Kestrel | 1 |
| | | Sparrowhawk | 3 |
| | | Turtle Dove | 1 |
| | | Snipe | 1 |
| | | Redshank | 1 |
| | | Dunlin | 2 |
| | | Ringed Plover | 8 |
| | | Little Tern | 19 |
| | | Moorhen | 1 |
| | | | 1,714 |

Details of a number of interesting recoveries will be found under the headings of the species concerned—Blackbird, Greenfinch, Linnet, Chaffinch, Hedge-Sparrow and Cuckoo, where also are particulars of recoveries of birds ringed by our members elsewhere. To mention that P. E. Davis ringed 1,302 birds, additionally to his considerable help at Spurn, will not be thought invidious.

Northward passage migration at Spurn continued into early June, and in little more than a month the tide was beginning to set southward again. Odd Wrynecks on May 10th and 12th were the first we have seen on the spring passage ; and balance the few birds that usually occur about the end of August ; but with such a species most will pass unseen. Ring-Ousels on May 9th and 15th passed at a time long after our moorland breeders had settled, and birds on October 22nd and 25th were correspondingly later after they had left. Our records show the passage of individual species in both spring and autumn, with their beginnings, waxings into waves, and wanings until the last stragglers disappear ; but herein it is impossible to do more than indicate such broadly.

During most of 1951 we hope to have three traps working. A large new trap is being built in the area of buckthorn just north of the ' wire-dump.' The trap will be driven from two opposite directions. The new box to be fitted has a plastic window, less easily breakable and more resilient than glass, with which it is hoped to avoid injury to the very occasional bird that may fly into the box with force, despite the baffle to be fixed before the box. A hut has been purchased and re-erected near to the site.

With the hutments near Warren Cottage now removed, it is hoped to erect a fence and to plant some shrubs, but the reduction in funds resulting from the new expenditure made necessary by military plans at the Point may impose delay.

Visitors from the U.S.A. have been welcomed and entertained, and parties from Natural History Societies from various towns have visited us. The Committee is grateful for the practical interest of many of our visitors who have not only helped with the ringing and observational work, but have given time and labour to any repairs or other work that needed to be done, have given books to the library, and helped in other ways.

Bookings for 1951 are already being made, and with three traps working, that year may well establish new records. Applications should be sent in early.

### The High Royd Ringing Trap

(G. R. Edwards)

276 birds were ringed despite difficulties in keeping the trap manned during crucial periods, 25 species were included. The largest numbers were Meadow-Pipit 66, Blue-Tit 51, Moorhen 24, Greenfinch 20, Pied Wagtail 19, Robin 16, Willow-Warbler 13 and Chaffinch 11. Numbers of some migrant species ringed have varied much from year to year, others have been more constant. Individual birds re-trapped in the years following that of ringing show that such birds pass along the Calder valley each year, and are no doubt typical of other species. Such applies particularly to the Willow-Warbler, Whitethroat, Yellow and Pied Wagtail, and Common Sandpiper. A Dunlin and a Redshank were new species to be captured.

A male Yellow Wagtail of May 1st, 1947, must have lived for four years when re-captured on April 23rd, 1950.

References to an interesting recovery of a Moorhen and other birds, and notes made at High Royd and elsewhere by members of the Halifax S. S. (Ornithological Section) will be found under the headings of species in the Classified List.

### The Ben Rhydding Ringing Trap

431 birds have been ringed in the year to September 30th, 1950, covering 29 species—Chaffinch 182, Greenfinch 32, Hedge-Sparrow 33, Robin 31, Blue-Tit 23, Blackbird 16, Great-Tit 14, Willow-Warbler 13, Whitethroat 12, and Redstart 10, with smaller numbers of other species. Four Bramblings and one each of Lapwing, Black-headed Gull, and Mallard were included. Several birds of resident species ringed from January to March were re-trapped from August to December. A Greenfinch ringed on February 9th was recovered at Tarleton near Preston on August 28th, and another ringed on February 5th was dead on Ilkley Moor on July 17th.

Many references to work by Wharfedale Naturalists will be found cited in the Classified List.

### Nesting Boxes in the Forests of N. E. Yorkshire

R. M. Garnett reports that 476 young birds were ringed in two areas—Tree-Creeper 5, Great-Tit 92, Blue-Tit 210, Coal-Tit 36, Pied Flycatcher 91, Redstart 42.

| | *Average clutch size (constructed from brood size plus eggs unhatched)* | *Average brood size* |
|---|---|---|
| Tree-Creeper ... | 2 nests 5·00 | 2 nests 5·00 |
| Great-Tit ... | 6 ,, 7·00 | 11 ,, 8·18 |
| Blue-Tit ... | 16 ,, 9·56 | 33 ,, 7·82 |
| Coal-Tit ... | 4 ,, 9·50 | 5 ,, 8·80 |
| Pied Flycatcher | 3 ,, 4·00 | 16 ,, 6·00 |
| Redstart ... | 7 ,, 6·29 | 10 ,, 6·10 |

### The Wildfowl Census by Members of the Harrogate and Wharfedale Societies

A census of wildfowl at all the six principal reservoirs and four private lakes in the area was organised by A. F. G. Walker on October 22nd, November 19th, and December 17th. Except for two items, comment would seem to be best withheld until the programme of counts has been completed when possibly an article in *The Naturalist* will be indicated.

Canada Geese, to the number of 57 were seen on November 19th to fly south from Ripley Lake, were intercepted and counted near Harrogate in transit, and again on arrival at Harewood Park Lake. I have long suspected the flocks of Canadas in and about Swinton Park, Ripley Park, Gouthwaite Reservoir, and Harewood Park to be inter-connected, with possible alternative and periodical headquarters. It is not unlikely that they travel further.

Another interesting item emerging from the three tabulations concerns the Whooper Swan, which on the three dates named occurred only and always at Gouthwaite Reservoir, apart from an odd accidental bird at Beaverdyke Reservoir on November 19th.

It is the function of a regional report to publish the facts concerning numbers, frequency, distribution and habits of birds of the region, at all dates and times, especially in relation to the physical geography and weather, as far as is necessary to keep abreast of change and discovery. Success depends mainly on confidence between active and competent observers, and those of their number who collate information and write the report, and upon financial ability to publish at the length desired. I believe these conditions exist in the Y.N.U., but they may not always do so. Rising costs may have harsh consequences, but not yet. This report has grown naturally with the Unions' ornithological membership, and with the work done. During the past five years material from Spurn has increased tenfold. Last year I found it impossible to keep the report to the length desired by the Editor of *The Naturalist*, and it appeared as a supplement. This year, slashing use of a blue-pencil—I almost wrote axe—has enabled some reduction. Next year pressure for brevity may recur, but there will be no sacrifice of essentials. During the year several members have sent notes and short articles to *The Naturalist* as events have happened, which could then appear in a less compressed form than would have been necessary here, and which now have only needed a referenced line from me. The matter for such notes however should be of self-sufficient importance, without relationship to the collective records of the year. Most of us rarely have such experiences, but—*verbum satis sapienti*.

To all who have contributed records and other material I offer the thanks of the Committee, of my colleagues and myself, both for matter that I have been able to use, and for the larger mass that has been 'axed.' It is also fitting that I thank the anonymous member who helped in another useful direction by transferring £100 British Transport 3% stock to the Union, the income therefrom to be used for ornithological purposes.

The names of contributors are :—G. H. Ainsworth, W. B. Alexander, H. E. Adamson, E. Aken, P. J. Allister, A. F. Airey, Ackworth School N.H.S., F. R. Allison, Miss M. E. Ackerley, Miss C. M. Brown, R. Brocklesby, A. Baldridge, Bradford N.S., Batley N.S., F. W. Bond, W. Bennett, A. A. Bateman, L. Broome, P. Baldwin, R. Bramhill, H. O. Bunce, C. E. A. Burnham, E. B. Burstall, J. P. Busby, R. Brown, G. J. Brown, W. A. Butterfield, S. and M. Barras-Smith, H. G. Brownlow, D. M. Bell, D. Brown, J. Brown, E. Baines, H. W. Bracken, Lord Bolton, J. E. Beckerlegge, R. S. P. Bates, R. W. Crosland, Miss F. E. Crackles, R. Crossley, J. Cudworth, C. A. Cheetham, J. Crossley, R. Crossley, L. Carr, V. S. Crapnell, K. C. Crosbie, G. Carr, A. L. and R. Chislett, B. Craddock, I. D. Dougill, W. G. B. Davies, P. E. Davis, R. F. Dickens, K. Dawson, F. Dean, T. S. Dillon, G. Dennison, A. C. M. Duncan, G. A. Ewbank, G. R. Edwards, J. C. S. Ellis, J. H. Elliot, G. R. Frost, K. Fenton, J. K. Fenton, G. Fryer, W. F. Fearnly, W. Flesher, H. Foster, L. Greenwood, R. M. Garnett, J. B. W. Gardiner, J. S. and F. C. Griffith, A. Gordon, W. Greaves, L. A. Greensmith, J. R. Govett, P. L. Gravett, F. G. Grey, E. Grace, A. W. Goodin, R. F. Graham, T. A. Graham, A. Gilpin, P. A. Humble, Harrogate N.S., O. C. Hill, J. H. Hyatt, H. Heald, E. Holmes, J. D. Hartley, R. Hewson, V. Huddlestone, G. E. Hyde, H. Hodgson, Halifax S.S., A. Hazelwood, N. M. Hepworth, P. F. Holmes, A. Haigh-Lumby, D. B. Iles, K. Ilderton, D. A. Illingworth, F. Jefferson, F. E. Kennington, J. M. Laws, M. Larkin, J. Lord, K. Longstaff, A. C. Laughton, H. R. Lowes, W. S. Medlicott, W. K. Mattinson, C. W. Mason, N. V. Mendham, D. J. May, R. W. Mackay, A. Macallister, M. F. M. Meiklejohn, I. Morley, J. M. McMeeking, B. Mitchell, A. C. Mitchell, H. Marjoram, J. C. Niven, J. B. Nelson, C. Nelson, N. Nicholson, A. E. Pullan, M. W. Pickering, A. Pilkington, H. J. R. Pease, Mrs.

O. M. Pennock, P. C. Quinn, D. Parr, R. M. C. Potter, J. R. Rawsthorne, K. Pickles, E. C. J. Swabey, J. R. Scott, K. E. L. Simmons, B. Speake, R. Slater, P. J. Stead, Miss C. Shaddick, A. R. Summerfield, K. G. Spencer, A. Thompson, E. W. Taylor, A. F. Taylor, R. Tottie, G. W. Temperley, J. P. Utley, D. C. Urquhart, A. F. G. Walker, A. B. Walker, K. Wheater, A. J. Wallis, H. F. Woods, F. Wilcock, D. F. Walker, A. H. White, D. I. T. Walker, M. Ward, H. J. Williamson, C. Webb, T. W. A. Wood, Wakefield N.S., G. K. Yeates, P. Young.

The numbers preceding the name of species that follow are those of Witherby's *Check List of British Birds*.

1. RAVEN.—The species has nested, successfully in one case ; and another nest was robbed (H.W.B.). Birds have been seen about the Craven Hills, and above the high ground in upper Yoredale and Swaledale, and near to the Westmorland border (Mickle Fell, Tan Hill, Mallerstang, etc.) on many occasions. J. P. Utley watched 22 birds sporting together above the Rawthey valley on August 19th.

2. HOODED CROW.—A bird at Spurn on May 4th was the last noted in spring, and 13 on October 22nd the earliest there of autumn. Numbers were normal in coastal areas ; with *c.* 40 at Spurn on March 11th (G.R.E.) ; and *c.* 30 on the Filey cliffs as early as September 25th (A.J.W.). A bird at Farnley Lake on December 13th was the farthest west reported (J.A.F.).

4. ROOK.—Winter flocks have been 'huge' near Ackworth (N.V.M.) ; and J. R. Scott used the same word to describe flocks arriving in upper Baldersdale on January 24th. Several hundred crossed to Lincolnshire from Cherry Cob on January 1st (H.O.B.). The maximum numbers at Spurn of *c.* 150 on April 1st and 11th were below those of average years. Action by agriculturalists has reduced our home breeding birds. A new nest was being built in Scarborough rookery on December 25th (A.J.W.).

5. JACKDAW.—At North Dalton in early November large numbers of Jackdaws outnumbered Rooks by two to one ; in the two previous winters Rooks outnumbered Jackdaws by five to one (W.A.B.). Courtship-feeding occurred at Thornton Dale on January 3rd (R.M.G.) ; but *c.* 2,000 at Pen Hill end on January 9th (J.P.U.) were probably continental birds.

7. MAGPIE.—Roosting birds at Ogden on January 11th numbered *c.* 50 ; and at Elland on December 16th *c.* 65 (G.R.E.). Fourteen birds at Robin Hood's Bay on May 12th caused surmise as to origin (A.B.W.).

10-11. JAY.—Odd birds have been seen about Halifax where the species has been rare ; and it is becoming established about Shipley (three nests found—D.B.H., W.D.H.).

14. STARLING.—Reported fresh recoveries of ringed birds affecting Yorkshire have been :—

Apperley Bridge, by R. F. Dickens, 4/12/47 ; re-trapped there, 18/6/50.
York, by Bootham School, 22/2/48 ; in Västergötland, Sweden, 5/5/49.
York, by Bootham School, 22/2/48, Meldorf, Schleswigg-Holstein, 7/4/49.
York, by Bootham School, 22/2/48, Groningen, Holland, 21/3/50.
Leeds, by F. R. Allison, 12/2/48, Hattula, Finland, 7/4/49.
Bebington, Cheshire, 23/1/49, Rotherham, 8/12/49.
York, by Bootham School, 31/1/50, Boston Spa, 3/1/51.

A. Gordon reported fewer breeding birds and winter flocks near Helmsley than normal.

Many thousands flew east over the Baldersdale Moors at dusk on March 16th ; and on August 11th J. R. Scott reported many thousands flying over and settling on the same moors—probably a roost exists somewhere. Large numbers roosted at Spurn in elders near the Point (*c.* 15,000) on June 22nd and 23rd (G.H.A.).

Although parties flew south for two hours continuously near Methley on October 11th (P.B.), the mass of immigrants did not come until October 22nd, after a change of wind to easterly. Then large flocks came off the sea at Teesmouth (A.B.) ; a large mass settled in the harbour area at Bridlington in early morning, many falling down chimneys ; and *c.* 40 were found dead on the sands. There were large flocks at Spurn on both October 22nd and 23rd, most of which had gone on the 24th. On October 23rd and the next two days the first autumnal flocks arrived on Malham Moor ; flocks of *c.* 100 birds, restless, feeding and moving for short distances, as is the way of fresh immigrants (P.F.H.). Immigration was still noted at Whitby on November 7th (A.B.W.).

17. GOLDEN ORIOLE.—The omission of mention of a fine male bird near the Chalk Bank at Spurn on April 23rd, 1949 by P. L. Gravett and three other members of the Hull S.S. was due to an oversight last year.

18. HAWFINCH.—In the early part of the year three Hawfinches fed frequently on holly berries in a garden near Masham (R.C.). M. F. M. Meiklejohn recorded courtship-feeding with birch catkins at Headingley, Leeds, on March 25th (see *British Birds* XLI p. 211). The species has been noted in several parts of Wharfedale, about Knaresborough, Roche Abbey, and other places. Breeding occurred as usual near Bolton Abbey (D.F.W., A.P.). A dead bird was found in Houghton Woods on May 7th (G.H.A.).

19. GREENFINCH.—At Malham Tarn House a Greenfinch was first noted on March 23rd at a lit window at 11-30 p.m. during pouring rain; on the 25th the song was heard (P.F.H.). At Spurn *c.* 100 on October 6th was the largest daily total for the species. Birds in the air at Swillington Ing on October 29th were estimated at *c.* 150, and were probably exceeded by those amongst the rushes, etc. (K.D.).

20. GOLDFINCH.—Reported from many districts. Seeds of Coltsfoot, *Myosotis*, willow-herb, and marguerite daisy were recorded as food. Largest parties—at Harewood 23 on November 24th (K.W.), Bingley 12 on December 24th (S.L.), and at Eske *c.* 20 on December 3rd (G.H.A.). A few passed at Spurn in spring and autumn including eleven on April 23rd (R.F.D., G.H.A.).

21. SISKIN.—A male was seen and heard on May 13th in Houghton Woods (R.W.M.), and a one-eyed juvenile was ringed at Spurn Point on July 10th (R.C., G.H.A.). A few winter parties have been reported in a number of areas, with larger flocks near Helmsley in December; and *c.* 50 near Rivelin, Sheffield on December 17th (A.F.T).

25. LESSER REDPOLL.—R. F. Dickens ringed a nestling at Esholt (West Riding) on June 25th, 1948, which was recovered at Farciennes, Hainaut, Belgium, on January 10th, 1950.

29. TWITE.—Two Twites at Eccup on March 24th (S. and M. B.-S.); *c.* 50 on saltings at Teesmouth from February 12th to March 15th (A.B.); three or four pairs at Grassholme on May 13th apparently breeding (M. Larkin); and *c.* 12 at Swillington Ing on November 12th, are noteworthy records.

30. LINNET.—Two birds ringed in 1948, and 16 ringed in 1949 were re-trapped at the Spurn B.O. in 1950. Ringed Spurn 3/8/50 (Juvenile), at La Rochelle Charente Inf., France 6/1/51. Migrants and/or residents were noted on the Spurn Peninsula throughout the year. At Filey, Linnets first appeared after winter absence on March 20th (H.J.R.P.), *c.* 50 birds were wintering at Cold Hiendley Reservoir on January 8th (K.B.).

31. SERIN.—'near North Otterington on December 8th a flock of eight birds, size as Siskins, general colour olive-green with brown streaks, yellow on head and breast, breast streaked brown, conspicuous lemon-yellow rump and underparts, tail forked, no distinctive markings on wings, bill short and thick at base, flight undulating, voice a low 'tiralee,' rather canary-like. Party seen again on 9th *c.* 4 miles south.' J. P. Utley.

32/33. BULLFINCH.—R. Slater saw a pair in a garden at Loftus on February 21st which he believed to be of the Northern race; which may also have been the case with an extremely bright bird seen by P. E. Davis at Spurn on December 27th.

40/41. CHAFFINCH.—A. Pilkington found a very low nest with four eggs near Rimington on May 23rd in the fork of butterbur stalks. G. Fryer reports an albino near Huddersfield in the early months.

A Chaffinch ringed at Kilnsea Warren on October 21st, 1950, was caught and released at Mappleton, Hornsea, on November 20th, 1950.

Large numbers were reported by pilots to be moving up the North Sea on January 24th; boats coming into the Humber had many on board (G.H.A.). The maximum numbers in autumn at Spurn occurred from October 6th to 28th. N. V. Mendham reported large flocks near Ackworth in the winter; and K. Brown *c.* 250 at Eccup on January 22nd.

42. BRAMBLING.—One in the middle of Brighouse during snow on February 1st fed on seeds of mugwort (J.C.S.E.). Bramblings (3) were last noted in spring at Spurn on April 21st (R.F.D.). The first of autumn occurred there on October 6th (G.R.E.). Birds were reported in many districts at both ends of the year, the largest numbers being in the north-east, and near Market Weighton from mid-November onwards.

43. Corn-Bunting.—J. C. S. Ellis found quite a number of singing males in mid-July near Penistone. Breeding birds appear to have been fewer than usual in some East Riding areas. A flock of *c.* 30 was seen at Sigglesthorne on December 3rd (F.E.K.). Twenty-five on March 7th (G.R.E.) was the only party of size reported at Spurn.

44. Yellow-Bunting.—During a cold spell on January 31st and February 1st flocks passed over Apperley Bridge (R.F.D.); and *c.* 25 occurred at Eccup on January 22nd, and *c.* 30 at Cowthorpe on January 29th; whilst the species was frequent about hedgerows on high ground in Wharfedale on March 5th (K.B.). N. V. Mendham reported flocks of up to 100 birds near Ackworth in winter. A cock sang persistently at Bretton on October 22nd (E. Grace).

50. Ortolan Bunting.—A bunting with olive-green head, pale yellow chin, rufous underparts, and brown back uttered high-pitched notes as it flew E.S.E. after being examined at 25 yards range through x8 binoculars at Shadwell, Leeds, on March 11th, 1950. The orbital ring was noticed but was not very pronounced (J. R. Govett).

55. Reed Bunting.—A nest at Gorple on May 20th was sited at over 1,000 feet altitude.

59. Snow Bunting.—*c.* 30 flew from Yorkshire into Westmorland at Nine Standards Rigg on February 2nd, where P. Young also saw *c.* 100 birds on the Westmorland side of Tan Hill on February 26th. A bird occurred at Swillington Ing on January 8th (K.D.). One at Ringstone Edge from January 8th to 14th (G.D., G.R.E.), and two at Ogden on November 19th (I.M.) were all that were reported from that area.

At Teesmouth *c.* 35 in January increased to *c.* 200 by February 12th, with *c.* 130 on March 5th when last seen. Two occurred on October 29th, and *c.* 60 on November 12th (A.B.). Several small flocks were seen on the Bransdale Moors from October 10th (A. Gordon). There were *c.* 50 above Goathland on October 29th (A.B.W.). On Filey Cliffs one on October 7th increased to *c.* 40 by November 26th (A.J.W.). At Spurn *c.* 100 in January and up to February 11th had moved away by March 6th (K. Fenton). In autumn the first were noted there, three birds, on September 29th (G.R.E.). A flock near Easington on October 31st fed on seed of *Atriplex littoralis* (F.E.C.).

61. House-Sparrow.—A bird ringed at Horsforth 3/8/47 was still there on 2/12/50 (P.E.D.).

62. Tree-Sparrow.—Small numbers winter about Loftus where the species is not seen in summer (R.S.). Breeding colonies exist at Horsforth (P.E.D.); and near Dewsbury in a disused quarry where G. Carr and E. Grace find the species abundant, with *c.* 40 at Ossett S.F. on December 17th. K. Longstaff noted *c.* 100 near Richmond on December 23rd, and J. R. Govett *c.* 150 at West Tanfield on October 22nd (significant date), and J. C. S. Ellis noted small flocks mostly in autumn near Penistone, and a few at Greenfield S. Works; and H. G. Hurrell some at Pontefract S. Works. A few birds occurred at Spurn in autumn with *c.* 20 on October 6th (G.R.E.) as the maximum.

69. Woodlark.—One pair reared young in an East Riding haunt (E.B.B.), and two birds were heard singing there. Breeding at other haunts was not proved. A Woodlark was seen at Spurn on October 21st (H. G. Brownlow). A bird fluttered against a lighted window at Cliffe Lodge in mid-December; after a night in a warmed out-building it flew away (E.B.B.). Two were in a ploughed field near Leeds on March 5th (J.R.G.).

70. Skylark.—Flocks occurred of *c.* 150 above Brantingham Dale on January 15th (K.F.), of *c.* 100 at East Keswick on January 29th (K.B.), of *c.* 80 at Mickletown on February 6th (P.B.), and of *c.* 100 on frozen stubble at Middleton (Leeds) on February 19th (K.B.). On October 22nd *c.* 50 flew west over Apperley Bridge in early morning (R.F.D.); and *c.* 300 flew south at Coxley (E.G.). There was an influx into the Scarborough area in October (A.J.W.); and considerable passage movement at Filey on October 23rd, 24th and 27th (H.J.R.P.). One bird at Spurn during the cold spring is recorded as being caught 13 times from February 21st to July 30th, 1950; and was released without being recorded on other occasions—he generally burst into song when a couple of yards above the hand that liberated him.

72. Shorelark.—Records were few this year—one at Spurn on February 11th (K.F.); and up to three at Teesmouth also in February (2nd, 12th, 19th, A.B.); and three on the Filey cliffs on November 26th (A.J.W.).

75. Tree-Pipit.—First noted on April 11th in the Vale of Mowbray (J.P.U.) ; and in the Bradford area on the 17th (J.B.N.). At Spurn, Tree-Pipits were noted on five days from April 20th to May 8th ; and on September 10th and 13th.

76. Meadow-Pipit.—A bird ringed at the High Royd trap on 1/9/48 was re-trapped there 16/4/50. P. F. Holmes recorded a Meadow-Pipit on Malham Moor on March 12th, several more from March 18th to 25th ; and large flocks on March 29th. The largest numbers of passage migrants occurred at Spurn from September 9th to 25th.

81. Rock-Pipit.—Six pairs were feeding young on June 7th between Staithes and Skinningrove (A.B.). Present all the year on the Sewerby-Bridlington foreshore (H.F.W.) ; with numbers exceptionally large in early October (W.A.B.), migrants probably included as well as birds of the year. H. O. Bunce recorded three on the Humber foreshore at Broughton, October 8th.

84/88. Yellow Wagtail.—First recorded on April 14th near High Force, Teesdale (P. A. Humble). Birds were still passing at Swillington Ing during the first week of May ; and there were many on May 2nd around Wintersett Reservoir. The first bird at Spurn came on April 22nd (R.F.D.). A pair were nest-building in a cornfield at Methley on May 8th (P.B.) ; and two pairs nested in oats at Esholt (J.B.N.). As last year one pair nested in the Vale of Pickering (R.M.G.). On September 10th P. Baldwin saw *c.* 100+ at Fairburn. The last at Spurn was recorded on September 28th (G.R.E.) ; the passage having begun on August 4th (J.C.). Single birds apparently of the type-race—Motacilla flava flava (Blue-headed Wagtail), with slate-blue crowns and whitish eyestripes, occurred at Swillington Ing, one on May 19th (K.B.) ; and on ploughed land at Flamborough (H.F.W.) one on May 12th.

89. Grey Wagtail.—Lister Park, Bradford (C.N.) and Newmillerdam, Wakefield (J.C.), provided breeding habitats for single pairs. Odd birds are often seen at sewage works in winter, but *c.* 15 at Dewsbury S.F. on November 26th (E.G.) was unusual. At Spurn, only on April 23rd (one, R.F.D.) and on October 4th (3, G.R.E.) was the bird recognised.

90. Pied Wagtail.—Birds ringed at High Royd on 31/3/48 and 29/9/48 were re-trapped there on 1/2/50 and 23/4/50 respectively. About 70 wintered at Horsforth S. Works (P.E.D.) ; and parties were common near Bradford (J.B.N.), and near Ackworth (N.V.M.). March 8th on Malham Moor (P.F.H.) ; and March 23rd on Flamborough cliffs (H.J.R.P.) ; were the earliest appearances for those places.

91. White Wagtail.—Passage across Yorkshire took place as usual with *c.* 10 near Otley on April 30th (C.N.), *c.* 12 near Barnoldswick on May 1st (A.P.), and up to ten at Swillington Ing on May 5th, when Yellow and Pied Wagtails abounded, as the most notable occurrences.

93/94. Tree Creeper.—Wharfedale Naturalists recorded a nest in Middleton Woods at ground level on May 6th in a cleft at the base of a four foot sapling. A bird at Spurn on July 9th was the first recorded there (see *Naturalist*, 1950, p. 158).

96. British Nuthatch.—Nested in many places, 12 pairs at Harewood (K.W.), one pair at Copgrove (C. Webb). A bird at Hardcastle Craggs on October 29th was the first for the Halifax parish (K.P.).

97/98. Great-Tit.—A bird ringed at Apperley Bridge 12/11/47 made its first re-appearance on 19/1/50 (R.F.D.). Wharfedale Naturalists caught a bird with elongated, curved mandibles.

99/100. Blue-Tit.—High Royd birds trapped 8/11/47, 20/9/48, and 31/10/48 were re-trapped on 3/12/50, 10/12/50, and 24/12/50 respectively (G.R.E.). Near Sheffield two pairs made holes three feet apart in the bank of a stream and nested in them—nesting-boxes had become scarce (L. Carr).

108. British Willow-Tit.—A few pairs were noted in the upper Dearne valley (J.C.S.E.) ; and a party by the Tees near Croft Spa on February 21st (J.D.D.). Noted in Raincliffe Woods, Scarborough, in March and May where probably more numerous than thought previously (A.J.W.). Two birds on Filey golf course on March 20th, and November 8th were thought to be of this species ; both black-capped tits are unusual there (H.J.R.P.).

114. Great Grey Shrike.—A single bird was seen at Withernwick on November 27th, and December 27th, 1949 (J.B.W.G.). Birds occurred in 1950—on January 18th at Danby Hall (R. Scrope per J.P.U.) ; about Whitby town, one from February 2nd for about 10 days (A.B.W.) ; at Sleights on February 19th (C.E.A.B.) ; near Castle Howard in March (C.R.) ; in Harwood Dale on March

28th (R.M.G.) ; and another there on October 23rd (M. Conder) ; at Spurn on October 20th, 21st, 28th, 30th, and three on the 29th ; near Whitby on October 29th (T. S. Dillon) ; at Skirlaugh on November 19th (F.E.K.) ; and one near Danby Wiske on December 1st (L. Wray in *The Field*) ; and one in Swillington Park on December 27th (A. Gilpin).

119. Red-Backed Shrike.—There was a probable occurrence in the Halifax district. A schoolboy recognised the *Handbook* illustration as the bird he had seen recently, and about which he had called at the Museum with a description. A schoolgirl in the same area (Dudwell) later described a bird seen with two young which seemed to indicate the same species ; of which the last Halifax occurrence happened at Dudwell in 1885, when bred (G.R.E.). A single juvenile at Spurn stayed from August 30th to September 9th (F.E.C.).

120. Waxwing.—Small numbers occurred from January to March in the areas of Harrogate, Leeds, Burley, Huddersfield, Bradford, Keighley, Lindley Bridge, Shelf, Masham, Sedbergh, Kelbrook, North Ferriby, and at Middlesbrough, Pickering and Filey. The largest parties reported were *c.* 18 at Pickering on January 31st (R.M.G.) ; *c.* 20 at Harrogate on January 11th (K.I.) ; and *c.* 35 north of Leeds on March 11th-13th (W.B.).

A few birds occurred in autumn at Thornton Dale (18 on December 29th), Middlesbrough (eight on November 5th), Croft Spa (two on December 21st) and Loftus (one on November 11th), and odd birds near Sheffield in November.

121. Spotted Flycatcher.—May 5th at Crimple (D. A. Illingworth) was the earliest date. None at Spurn until May 20th (H.J.W.), where the last passed on September 26th (W.B.A.). A bird breeding at Apperley Bridge had been ringed there in 1949 (R.F.D.).

123. Pied Flycatcher.—This species continues to extend its breeding areas around Harrogate, Ripley, Long Preston, Washburndale, Leathley, Castle Howard, and to Roundhay Park (Leeds), and other places. A male singing near Sheffield on March 26th (A. F. Taylor) was unusually early, but no more occurred for some weeks. Out of 115 boxes around Bolton Hall most were occupied by this species (Lord Bolton). Two female Pied Flycatchers ringed in 1948 nested in 1950 in boxes in N.E. Yorkshire (R.M.G.).

Pied Flycatchers passed at Spurn in very small numbers from May 6th to 28th. Two birds were at Teesmouth on May 7th (P.J.S.). The first of autumn at Spurn was seen on August 6th (J.C.) ; and from August 20th to 28th numbers were considerable (*c.* 75 on 23rd and 26th). A few birds continued to pass until September 16th, after which none was seen until September 22nd to 23rd ; and again from October 4th to 7th, with odd stragglers on the 13th, 21st and 22nd, the last date being the latest known for Yorkshire. I think it probable that these late October birds are of Scandinavian origin, and possibly the birds of late May too.

125. Red-Breasted Flycatcher.—K. Fenton saw a male at Spurn on October 5th, and a juvenile was caught on October 22nd (R.C., H.G.B.).

126/7. Goldcrest.—About Chevet and other woods near Wakefield E. Grace and G. Carr see numbers in winter, with only occasional pairs in summer. A bird appeared near Hunmanby Gap on April 4th (H.J.R.P.). April 22nd (R.F.D.) was the date of the last spring bird at Spurn ; where birds occurred from September 15th in moderate numbers, with maxima from October 22nd to November 2nd. About 12 were at Teesmouth on October 22nd (A.B.).

129. Chiffchaff.—The earliest occurred near Harrogate (K.I.) and at Bretton (J.C.S.E.) on March 25th. Only one was noted at Spurn in spring—on May 13th (R.C.) ; and one at Teesmouth on May 7th (A.B.). September 9th and 16th ; and October 26th (H.G.B.) were dates of autumnal records. Near Loftus single birds occurred on June 10th, and on September 12th, the only ones seen in the area (R.S.).

132/3. Willow Warbler.—A nestling ringed by P. C. Quinn near Shipley 11/6/49 was limed in Vizcaya, northern Spain 9/4/50 (R.F.D.). A nestling ringed at Horsforth 20/7/50 was killed at Bilbao, N. Spain 28/9/50 (P.E.D.). Two birds ringed at High Royd on 30/7/47 and 26/7/48 were trapped as they used the same route on 29/4/48 and 14/8/49 respectively.

The first occurred near Sheffield on March 26th (A.F.T.). The earliest bird at Bretton on April 1st was 10 to 15 days before the main arrival. (J.C.S.E). My first at Masham on April 19th was the latest I have known there. Willow Warblers generally were late.

First seen at Spurn on April 7th the maximum passage occurred in early May ; and there were 20-30 birds at Teesmouth on May 7th (P.J.S.). Southward passage at Spurn began on July 29th, and continued until September 24th, with maximum on September 10th (*c.* 50), and a straggler on October 12th (G.R.E.). W. A. Butterfield thought a bird at North Dalton on September 12th was possibly of the Northern race.

135. Wood-Warbler.—April 16th in Rise Wood (East Riding) was much the earliest date for the species (F.E.K.) ; the next being April 28th (J.P.U.) in the Vale of Mowbray. At Malham the first resident male was noted on May 30th, after one probably on passage on May 10th (P.F.H.). A very few birds were noted at Spurn—May 20th and 22nd, and August 22nd/23rd and September 10th.

145. Grasshopper Warbler.—A bird sang near the Spurn lighthouse on May 18th (R.C.) ; and of two birds at Teesmouth on May 13th one 'reeled' within 30 yards of the sea (A.B.). Birds were heard at a few places including Swillington Ing on May 5th (K.B.), Halnaby Hall on May 7th (J.P.U.), Manfield (Teesdale) on July 5th (A.B.), and Liverton in June (R.S.).

149. Reed-Warbler.—A bird was found dead at the Spurn light on May 27th. Colonies continue to extend in the reedy drains of Holderness (G.H.A.). A bird at Hornsea Mere on October 7th was late (F.E.K.). Scarborough Mere was occupied (A.J.W.).

153. Sedge-Warbler.—First noted at Kilnsea Warren on April 25th (R.C.). A bird ringed at Driffield on June 11th, 1949, by L. E. Bouldin was at Sidcup, Kent, in August, 1949.

155. Icterine Warbler.—A warbler in the wire-dump at Spurn on August 25th to 27th was thought to be of this species by W. A. Butterfield, H. O. Bunce and several others, from the 'intense yellow of the whole underparts,' size, build, 'blue-flesh' legs, and olive upperparts. A single bird was seen there on September 11th which R. F. Dickens and P. E. Davis described as extremely similiar to an Icterine Warbler they had examined in the hand a week before on the Isle of May.

159. Barred Warbler.—A juvenile was caught by J. Cudworth on July 31st at Spurn ; and a second bird was seen.

161. Garden Warbler.—The earliest was noted at Harewood on April 20th (K.W.). Odd birds were at Spurn on May 20th (H.J.W.) ; and from July 31st to August 24th.

162. Blackcap.—A Blackcap occurred in the garden of H. A. Bassington at Bridlington from March 20th to April 3rd (G.H.A.). One sang near Beverley on April 13th (R.W.M.). One at Harewood on April 20th (K.W.) was also early. On August 7th a bird sang 16 times in four hours at Ripley (A.F.G.W.).

Unusually, more Blackcaps were recorded at Spurn than Garden Warblers. In spring April 17th one (D. J. May), April 23rd three (R.F.D.) ; and odd birds in late May and early June. In autumn September 4th one (R.M.G.), September 15th one (R.C.), September 28th three (G.R.E.).

163. Whitethroat.—Ringed High Royd 22/8/49 recaptured 6/8/50 (G.R.E.). April 28th in the Vale of Mowbray (J.P.U.) was the earliest inland bird ; but one occurred at Spurn on April 18th (F. G. Grey), where passage birds were fewer. A bird on October 2nd (G.R.E.) was the last at Spurn, and one at Drighlington on October 1st the last inland (E. Grace).

164. Lesser Whitethroat.—A few pairs summer in moorland villages north of Helmsley, but no nest has so far been found (A.G., E.W.T.). Fairly common this year about North Dalton (A.B.), and Bridlington (G.H.A.). A very few birds passed at Spurn from April 21st to May 8th ; and from August 26th to September 16th.

173. Fieldfare.—Last noted in spring at Spurn on May 13th (R.C.) ; and three near Guisborough on May 14th (P. J. Stead). The species was very numerous in autumn with birds first reported at Eccup on October 7th (H. Hodgson) and Swillington (K.D.) ; and at Spurn on October 12th (G.R.E.). Most birds came after the wind had turned easterly on October 21st—October 22nd first arrivals at Malham (P.F.H.), and in the Vale of Mowbray (J.P.U.) ; October 27th largest flocks P. Young had ever seen in Belah Gill over the Westmorland border ; November 4th *c.* 700 at Walshaw Dene, Halifax (I.M.) ; November 5th large flock at Bretton (E.G.) ; November 6th above Pateley Bridge—'every tree alive with them, up to 70 in one tree, when *c.* 200 flew to another part every tree and bush was still full of them.' (K.I.) ; quantities in late 1950 about Wensley (Lord

Bolton) ; *c.* 400 in thorns in Swaledale (M. Larkin). These places suggest that most Fieldfares passed inland to Cleveland and possibly north of it. Small numbers were seen to come off the sea at Teesmouth on October 22nd (A.B.). There were no very large numbers at Spurn.

174. MISTLE-THRUSH.—Thirty-seven seen to enter a plantation at Ogden to roost on August 28th was rather unusual (I.M.). A Menston nestling ringed 10/5/50 was found dead six miles east at Cookeridge on 23/8/50 (P.E.D.). A bird occurred at Spurn on December 27th (P.E.D.).

175. SONG-THRUSH.—Ringed Ackworth as adult by N. V. Mendham 6/2/49, at Pilsley (Derby) 1/3/50. Ringed Apperley Bridge (adult) 19/1/48 re-trapped there 14/3/50 (R.F.D.). Ringed Apperley Bridge (adult) 5/9/49 at Seacroft, Leeds 20/4/50 (R.F.D.). Ringed Esholt (nestling) 18/7/48 found dead Horsforth 28/4/50 (R.F.D.). Ringed Spurn 7/4/49; recovered Mirandella, North Portugal 20/2/51.

178. REDWING.—Last noted at Spurn (four) on April 21st (G.H.A., R.F.D.) ; and first in autumn on September 27th (A. R. Summerfield). Birds were noted near Stokesley on October 4th (J.P.U.), over Leeds on October 12th (K.G.S.) ; but the same change of wind to east that affected Fieldfares also brought the majority of Redwings—October 21st *c.* 200 above Coniston (P.A.H.) ; October 21st-25th large numbers on rowans in Malham Tarn woods (P.F.H.) ; October 22nd many parties seen coming in from sea at Teesmouth (A.B.) ; and many passed over Idle (Bradford) in the darkness (S.J.) ; *c.* 250 at Eccup, the first there. November 6th—many above Pateley Bridge (K.I.). Thereafter Redwings became generally plentiful.

182. RING-OUSEL.—March 11th in Swaledale (I.D.D.), and March 17th in Coverdale (J.P.U.) are the earliest dates. Single birds were caught at Spurn on the late dates of May 9th and 15th, probably Scandinavians (R.C.) ; and a few others were seen about the same time. E. Grace saw one at Skipsea on April 11th. Birds were rather fewer in some breeding haunts but normal in others. In autumn single Ring-Ousels were caught at Spurn on October 22nd and 25th.

184. BLACKBIRD.—Bird ringed at Horsforth 8/1/48, there again in December, 1950 (P.E.D.). Male ringed at Apperley Bridge 24/1/48 re-appeared on 25/5/50 (R.F.D.). Male ringed at Spurn 12/4/47 re-appeared for the 18th time recorded on 13/9/50. Female ringed at Spurn 29/10/47 recovered Silkeborg, Jutland, Denmark 27/4/50. Ringed Spurn 29/10/49 recovered Vejle, Jutland 23/1/51. Nestling ringed in Västergötland, Sweden, 17/4/50, recovered Spurn, 22/10/50, and released (R.C.). The main autumnal influx at Spurn occurred from October 19th, with *c.* 200 there on October 22nd ; when there were 33 on the dunes at Teesmouth (A.B.), and at the same time a marked influx at Malham (P.F.H.), and at Ruswarp (A.B.W.); and a great influx at Filey (H.J.R.P.). The species continued to be much in evidence for some time but had mostly dispersed by November 5th ; either further down the coast or inland.

186/7. WHEATEAR.—March 9th near Reeth (I.D.D.), March 21st Malham (P.F.H.), 23rd at Flamborough, 25th at Gorple (G.R.E.), and at Spurn (R.M.G.) were the earliest records. On March 26th the species was seen at a number of inland localities including Masham. Three pairs nested successfully in slag and sea-walls at Teesmouth (A.B.). Birds continued to pass at Spurn until May 28th (Maximum 25 on May 1st) ; and by July 20th began to be seen again with maxima on September 3rd and 4th (R.M.G., G.H.A.) until October 8th, with occasional birds until the 16th (also one at Wassand W.A.B.), and a straggler on October 24th. At Teesmouth May 13th provided the maximum of 15 in spring ; and August 24th with 11 in autumn ; and the last was seen on October 22nd (A.B.). A loose flock of *c.* 6 above Meltham on May 6th were thought by J. C. S. Ellis to be of the Greenland race, as were single birds seen at Hull on September 9th by D. Brown, and at Spurn on October 4th by G. R. Edwards.

188/9. DESERT WHEATEAR.—The story of this bird at Gorple included in the 1949 report, and told in *British Birds* XLIII pp. 179-183, extended into 1950.

197. WHINCHAT.—May 1st at Spurn (R.C.), and May 2nd at High Royd (B.M.) were the earliest dates. A few birds passed at Spurn until May 30th ; and from August 20th to October 10th in rather larger numbers, with 15 as the maximum on September 10th (G.H.A., J.L.).

198. STONECHAT.—More occurred than for some years but there was no proof of breeding nearer than Durham. A female on January 1st near Leeds (K.B.) ; a pair near Penistone, January 12th (J.C.S.E.) ; one Batley, February 19th and

from June 4th to August 5th (H. Hodgson) ; a hen on March 5th near Bradford (C.N., F.B.), at Filey on March 8th (H.J.R.P.) ; and at Slaidburn, March 11th (J.C., P.E.D.) ; one Watergate, Methley, May 26th (P.B.) ; a male, Grassington, June 10th (H.H.) ; a male singing near High Force, June 25th (M. Larkin) ; and a bird on Harrogate Stray on October 15th (A.F.G.W.) and one at Swillington Ing on November 5th (P.E.D.) ; were the inland occurrences reported.

Spurn appears to be becoming a winter resort of the species—three birds (two ringed) were seen on several days from February 18th (P.E.D., R.F.D.) ; and from September 26th to December 31st Stonechats were noted almost daily with maxima of eight on October 3rd and seven on October 19th (four were ringed).

201. REDSTART.—At least four pairs bred in Houghton Woods (R.W.M.). Males were noted at South Cave on June 25th (D. Brown) ; and near Middleton-on-Wolds on August 28th (R.W.M.). The species is considered scarce as a breeder in the East Riding (G.H.A.) ; but L. Greensmith has proved breeding south of Market Weighton.

April 11th near Bridlington (E. Grace), and the 14th at Shipley (G. B. Miller), were the earliest appearances. After a male had reached Malham Tarn Woods on April 16th, no more appeared until April 30th ; and the majority came from May 2nd to 8th—all ten pairs and their progeny had gone by August 30th (P.F.H.) —a typical picture in brief. I saw a family party by high-lying woods near Masham on September 10th.

A few passed at Spurn from April 23rd (R.F.D.) to May 27th (W.A.B.) ; and from August 25th (W.A.B.) to September 20th (R.C.). A male and three females were on South Gare rocks, Teesmouth on May 7th (P.J.S.).

202. BLACK REDSTART.—At Spurn from April 1st (three) to 7th ; April 16th to 22nd ; May 2nd and 7th ; and in autumn regularly from August 11th, with brief intervals until October 31st, with one on November 26th (G.R.E.). A female at Scalby Mill on March 27th, and another (or juvenile) in the Castle grounds, Scarborough on October 25th (R.M.G.).

203. NIGHTINGALE.—Odd singing birds were heard in May near Maltby (R.B.), and east of Doncaster (G. E. Hyde) ; and near York.

205. RED-SPOTTED BLUETHROAT.—The red-brown tail, and crescentic line of demarcation across the breast below a buffish throat, of a bird at Spurn on October 28th, indicated juvenility (R.F.D., P.E.D.).

207/8. ROBIN.—Ringed High Royd 27/9/47 re-caught 13/11/50 ; another ringed 23/10/48 re-trapped October, 1949, January, April, October, 1950 (G.R.E.). A pair at Haxby built an open nest in a box bush (F.J.). Moderate numbers came to Spurn in autumn with maxima between October 21st and November 5th—*c.* 25 Spurn, October 28th, *c.* 15 Teesmouth, October 22nd (A.B.) ; and influx at Filey third and fourth weeks of October (H.J.R.P.).

211. HEDGE-SPARROW.—Ringed High Royd 23/7/48 and 26/9/48 recovered 9/12/50 and 28/4/50 (G.R.E.). An exhausted bird at a lit window of Malham Tarn House on evening of April 4th which recovered next morning was probably on passage (P.F.H.). Odd birds always present at Spurn, but numbers increased in late September ; there were fewest from May 16th to July 30th.

213. WREN.—A very few winter at Spurn. None were noted from May 13th to August 11th, and from August 13th to Sepember 19th.

218. DIPPER.—A Wharfedale nest was complete by March 9th (A.E.P.) ; but P. E. Davis noted in a similarly early nest no eggs appeared until a month later. The second laying of five eggs in one nest in Cleveland was complete by June 2nd (R.S.).

P. F. Holmes noted an upstream movement on the Gordale Beck in winter to the highest reaches which became deserted in late March. Two birds at Newmillerdam, Wakefield, on November 5th (A. C. Laughton), and one in Lister Park, Bradford, on December 29th (C.N.) had no doubt travelled in the opposite direction.

220. SWALLOW.—Early dates were—April 1st, Skipsea (E.G.) ; April 6th, Esholt (C.C.B.) ; April 7th Dewsbury S.F., and Bolton Bridge (H. Hodgson), and April 8th by the Nidd near Harrogate (K.I.), and at Skirlaugh (F.E.K.). Birds at Malham Tarn on April 14th and April 30th were both well in advance of the main arrival of the local residents on May 7th to 8th (P.F.H.).

Swallows were generally considered to be fewer this year. P. Baldwin estimated birds at Fairburn on September 10th at *c.* 1,000. October 21st at Walton, Wakefield (P.E.D.) ; and October 25th at Dewsbury S.F. (H. Hodgson)

were late dates. A nestling ringed by D.B.I. at Hawksworth 6/7/50 was found dead at Market Rasen 4/9/50.

Passage at Spurn exhibited the usual perplexities, with some moving south in May and up to June 4th (A.H.W.). September 10th was a day of maximum passage when between 2 and 3 p.m. 4,000-5,000 Swallows moved south (J.L.). The last bird occurred on October 28th. At Filey H. J. R. Pease noted a big passage on October 2nd.

222. House Martin.—April 12th Farnley (P.E.D.), and Harewood (K.W.); April 13th Malham Tarn (P.F.H.), April 14th Bolton Abbey (J.C.); and April 15th near Harrogate (K.I.); were early dates. At Malham no more appeared until May 8th when nesting-sites were visited. At North Dalton the main parties arrived on May 10th (W.A.B.).

The species bred in fair numbers. On Castle Farm, Upton, near Thirsk there were 30-40 nests (N.M.H.).

At Spurn four birds on May 2nd were the first. Passage House Martins were many fewer than Swallows; with *c.* 200 on October 3rd as the numerical maximum, when at Filey also there was a big passage south (H.J.R.P.). Two birds on October 18th were the last at Spurn; and one at Horsforth on October 15th (P.E.D.) the last inland.

223. Sand Martin.—April 7th at Fairburn, and Swillington Ing (K.B.), April 8th at Wigginton (F.J.) and Castle Howard (E.W.T.); and several at Masham on April 9th (W. A. Thwaites), were early dates.

After numbers had increased at Swillington Ing during the late April cold to several hundreds on May 4th, *c.* 350 left north-easterly at dusk on the 5th. On May 6th K. Brown counted 470 on E.N.E. passage. On May 7th passage was mainly E. On May 14th large numbers settled on the slag with wind N.N.E. On May 22nd 25 passed easterly.

The first came to Spurn on April 8th. September 5th was the time of the main autumnal movement; and passage ended on October 6th.

225. Swift.—Single birds occurred on April 30th at Thornton Dale (R.M.G.), Leathley (C.N.), Elland (E.B.), and Beeston (K.B.); but most breeding birds arrived during the next fortnight. Swifts passed north over Hull in parties of *c.* 6 all afternoon of May 19th (G.H.A.). At Swillington Ing *c.* 45 came from south on May 3rd. On May 6th with *c.* 250 hawking birds present, a drift north-easterly was noticed which continued on the 7th. On May 14th 240 passed North and East in 3½ hours with a N.N.E. wind; and probably *c.* 1,000 passed during the day. More than 1,000 passed over Hunslet on May 29th and 30th (K. Brown). Hundreds flew over the water at Swillington Ing on July 16th (J.R.G.).

There was a strong passage near Kirkstall in the afternoon of August 14th (J.C.S.E.). A bird hawked over Northallerton for 30 minutes on October 17th (J.P.U.). On November 4th a young Swift was found on the floor behind the door of a fried-fish shop near Huddersfield, in an exhausted condition; but revived after being warmed and fed on bread and milk, and flew away strongly when released on November 6th (E. C. J. Swabey). At Spurn Swifts were first noted on May 1st; and some birds were moving south on June 4th and July 10th. Maximum passage occurred from August 9th to 16th (*c.* 150 on the 10th), and on August 26th to 27th. Last noted on September 20th.

227. Nightjar.—Birds were heard in the breeding season about Eccup, Bingley, Wakefield, Wharfedale, Cliffe (E. Riding), and over ten in the Richmond area. I ringed two young near Masham on July 6th, and on August 5th at dusk watched the family of four hawking over the same ground.

232. Hoopoe.—A bird at Boltby showed its erected crest on May 10th to people who described it to N. H. Hepworth and whom he considered to be reliable.

234. Kingfisher.—From the number of records of birds seen and a smaller number of breeding records it is evident that the species has largely recovered from the disaster of early 1947.

236/7. Great Spotted Woodpecker. A bird flew to and from the sycamores behind Warren Cottage, Spurn, on May 2nd (R.C.).

238. Lesser Spotted Woodpecker.—Birds have been reported from Bolton Abbey, Malham Tarn Woods, Harrogate, Elland, Otley, Chevet Park, Bretton, Scarcroft, Beverley, Thornton Dale, Raincliffe Woods, Scarborough, Sutton-on-Forest, and Masham. Drumming was watched at Bretton on May 21st (E.G.) but nowhere was breeding proved except near Leeds (A.G. and H.R.L.).

239. Wryneck.—A bird was picked up freshly killed near Spurn Point on May 10th ; and I caught one in the Warren Trap on May 12th (R.C.). This was evidence of spring passage to balance the known end-August passage.

240. Cuckoo.—April 15th at Coxley (H. Hodgson) was the earliest inland date by a week. At Spurn the first came on April 17th (F.G.G.). The maximum during the spring passage was 12 on May 2nd and 3rd ; and in autumn 12 on July 31st (J.C.). A straggler occurred on September 17th (H.O.B.) with August 28th as the previous last date. J. P. Utley saw a young bird in the Vale of Mowbray on September 9th. *Two* eggs in a Hedge-Sparrow's nest at Cliffe were unfortunately robbed (E.B.B.). A young bird ringed on August 17th at Spurn was recovered three weeks later (7/9/50) near Herning in Central Jutland.

249. Little Owl.—A bird stood at the entrance to a hole on Bempton Cliff on June 24th (A.P.). Bred generally and not uncommonly. Odd birds occurred about Kilnsea and Spurn up to April 12th and after August 29th.

250. Long-eared Owl.—A single bird at Spurn from October 24th to 27th (K.E.L.S., R.C.) ; and twelve on October 28th near the Point, of which 11 were roosting in one bush (R.F.D., A.W.G.) ; with three on October 29th (see *Naturalist* 1951 p. 5 for details). Breeding Long-eared Owls now appear to be scarce. A dead and emaciated bird was found at Goldsborough in late March (A.F.G.W.).

251. Short-eared Owl.—The species was seen in spring in a number of moorland areas, west and east of the central plain, and was known to breed on both sides. Three were flushed at Skipwith Common on November 17th (R.W.M.). It was somewhat scarce at Spurn.

253. Tawny Owl.—After driving away Magpies from their nest, a pair of Tawny Owls were watched removing the dome of the nest in which they then reared three young (D.F.W.). An adult ringed 31/1/48 at Apperley Bridge was found dead nearby 21/3/50 (R.F.D.). Occurred near Spurn Point on September 10th (J.L., G.H.A.).

254. Barn Owl.—A pair in a stable loft in Thornton Dale had five eggs on June 30th ; and the three young left the nest on September 28th. The bird that fed the young had a tail-feather missing, enabling recognition, and no other bird fed them. Five mice or voles might be brought in half-an-hour (R.M.G.). Apparently fledgling periods can vary from 64 to 86 days with this species ; which the Thornton Dale birds would be well within, if the eggs were half incubated on June 30th.

259. Peregrine Falcon.—A young bird ringed Hällefors, Västmanland, Sweden, on 20/6/46 was recovered at Escrick, 11/11/47. Odd birds have been seen in a number of, mainly moorland areas. Both adults were shot at one breeding place (W.K.M.). Men who were questioned below another cliff claimed to be botanists, but the Peregrine's eggs had gone (H.W.B.). A second clutch produced two young but they disappeared before being ready for flight—air force, or falconry ?

[261. Hobby.—A falcon at Easingwold on November 8th resembled a large Swift. Although the date is late it is thought to have been a Hobby (E.W.T.).]

262. Merlin.—Ringed Gorple 25/6/44 by E. W. Watson, shot Rochefort (Charente) France 3/3/50. This rather long-lived Merlin was photographed as a nestling by E. J. Hosking. A nestling ringed near Ilkley 29/6/49 by P. E. Davis was found dead at Gildersome, near Leeds 28/10/50 (11 miles south-east).

Merlins have bred in Cleveland, and in V.C. 64 and 65 ; and occurred at Spurn in spring on April 27th and May 7th (R.C.), and in autumn on a number of dates. A bird passed over North Dalton on October 2nd (W.A.B.).

263. Kestrel.—Young ringed Troutsdale 2/6/49 by A. J. Wallis, at Swinderby, Lincs. on 2/1/50. Of 24 pellets near a nesting site on Fountains Fell, seven contained eggs that matched those of an Emperor Moth. The eggs did not hatch although untouched by digestive juices in appearance (P.F.H.). Maximum spring passage at Spurn nine on May 2nd (R.C.) ; in autumn *c.* 20 on September 23rd and *c.* 50 on October 11th (G.R.E.).

269. Common Buzzard.—Two pairs nested in Yorkshire rearing four and one young respectively (H.W.B.). Odd birds were seen in several moorland areas, including one or two that might have been *Buteo lagopus*.

271. Marsh Harrier.—This species was seen at Wassand on various dates from February 11th, when Miss Crackles saw two. Subsequently only a single bird, with yellow head was noted (H.O.B., J.W.B.G., R.W.M., F.E.K., etc.). This species also occurred there on October 1st and 15th (F.E.K.). A harrier at Spurn on October 17th was thought to be probably of this species (K.F.).

272. Montagu's Harrier.—A male showed his dark wing-bar at North Dalton on April 22nd (W.A.B.). No nest was found this year, but an adult and three juveniles were noted on September 19th ; and a juvenile on September 20th.

273. Hen Harrier.—January 11th a female at Ringstone Edge (A.M., G.R.E.), February 17th at Hornsea Mere (F.E.C.), March 5th at Spurn two birds (G.H.A.) ; December 7th a male and a female on the Guisborough Moors (P.J.S.) appear to be definite records. A female seen at Spurn Point on April 21st had a prominent area of white on the rump ; but so have hen Montagu's, which are not always easy to distinguish, and the date was not too early ; so that to be definite is hardly possible.

277. Sparrowhawk.—Odd birds occurred at Spurn at intervals ; three were ringed.

289. Common Heron.—A report that in one area a reward had been offered for Heron's heads was met by a request for evidence that was not answered. If the Wild Birds' Protection Acts are ignored we are ready to take legal action if witnesses and satisfactory evidence are available.

A Heron found dead near Austwick on 9/12/50 by Miss J. Crompton had been ringed as a nestling on 10/6/50 at Helleland, Egersund, Norway. Immigrant Herons are not very uncommon in winter, when the species may appear more numerous than the few Yorkshire heronries warrant.

No herons nested at Sleningford or Kiplin. At Scampston there were seven occupied nests on May 4th (R.M.G.) ; 23 at Healaugh on April 11th (W.B., H.J.W., C.N.) ; 24 at Gargrave on April 10th (W.B., H.J.W., C.N.) and 17 at Harewood on April 23rd (K.W., W.B., H.J.W.) ; and five at Moreby Park. Two broods were reared at Ripley Castle (A.F.G.W.), a new heronry, one pair were still feeding young on the nest on August 19th. At Wassand 22 nests were counted (C.F.P.). A bird flew in from sea at Whitby on April 25th (R. T. Gray per A.B.W.).

297. Bittern.—A bird was shot at Swillington Ing *in error* on February 9th—what a clumsy, out-of-date method of identification ! Odd Bitterns occurred at Hornsea Mere on February 12th (H.O.B.) ; November 2nd (K.F.), and 18th (F.E.C.).

300. Whooper Swan.—Reported at Gouthwaite on 18 dates by eleven people, with 16 on January 22nd and 25 on November 19th as the largest numbers—last seen March 19th, first of autumn one on October 15th. A bird at Yearsley Dane on October 11th (M. Corbould) was still earlier. Birds also occurred at Fewston, Leighton, Semerwater, Blackmoorfoot, Swinsty, Bolton Hall, Mickletown, and Swillington usually in small parties. Twenty-two were at Malham on January 7th ; and 32 on March 20th (P.F.H.). Twenty-seven birds called at Rivelin Dam on dates in December (A.F.T.). There were 12 in the Vale of Pickering on February 17th/18th (R.M.G., A.J.W.) ; and one at Spurn on December 26th (P.E.D.). A pair of the introduced birds nested at Harewood and were robbed (K.W.).

301. Bewick's Swan.—Reported from Coniston Cold, seven on January 6th (M.W.P.) ; 22 at Ringstone Lodge Res. January 4th to 7th (I.M.) ; one at Swillington Ing, February 12th (K.D.), and 19th (E.G.) ; seven over Askrigg Common on December 10th (M. Larkin), and on the Wharfe near Poole on the 25th (H.M.) ; and one at Semerwater on December 29th (K. Longstaff).

303/7. Grey Geese.—Reports of skeins and gaggles come from Wharfedale, Northallerton, near Market Weighton, Easingwold, North Dalton, Cliffe, and elsewhere, and seem to indicate little beyond travel between the Humber, Wolds, Teesmouth, etc., and at some seasons the west coast, with possibilities ranging from the Bristol Channel to the Solway and beyond, as a glance at Mr. P. Scott's records confirmed.

303. Grey-lag Goose.—Eight were identified at Spurn on December 7th (G.R.E.).

304. White-fronted Goose.—Five flew over the Baldersdale moors on February 2nd (J. R. Scott).

306. Bean Goose.—One was picked up on the Hessle foreshore on January 15th (A.D.B. per R. W. Mackay).

307. Pink-Footed Goose.—No doubt the vast majority of birds included as ' grey geese ' above were of this, the common species of the Humber and Wolds.

[311. Barnacle Goose.—K. Wheater reported *c.* 50 geese with white faces and black necks that visited Harewood Lake several times in the winter of 1949-50, from late September, 1949, until early March.]

In view of the rarity of this bird inland I feel bound to use square brackets in the absence of confirmation. They only paid brief visits and were not visible when I tried to see them.

312. Dark-breasted Brent Goose.—A single bird at Spurn on October 29th and 30th.

314. Canada Goose.—Bred in several places ; and numbers visiting Swinton Park, Gouthwaite, and Harewood, often exceeding 100 birds ; with rather smaller flocks at Ripley, Bretton, Nostell Priory, etc. On November 19th, 57 flew south from Ripley and were counted near Harrogate, and on arrival at Harewood (A.F.G.W.).

315. Sheld-Duck.—The breeding of a pair at Swillington Ing was an interesting event. Up to three birds were usually present throughout 1949. Of a pair often seen in the earlier months of 1950, only one was usually visible in May. On June 6th the pair appeared with 12 small young, gradually reduced to six by July 2nd, and to five young on the wing on July 30th (K. Dawson, B. Speake, K. Brown).

Sixteen Sheld-ducks arrived from East at Swillington Ing in the evening of May 31st and passed south-west (K.B.). A few other birds were seen inland —one at Gorple, January 1st (R.Cs.) ; three at Giggleswick, August 17th (P.E.D., J.C.) ; two at Marsh Ghyll (Wharfedale) on April 9th (J.P.B.) ; a juvenile (shot) at Staveley S.F. on September 18th (J.C.) ; and a juvenile at Gouthwaite on October 22nd (A.F.G.W.).

The species was usually recorded at Spurn with no flocks in excess of 15. Ten flew east past Stone Creek on August 10th (R.W.M.), and 20 were there on September 17th (G.H.A.).

317. Mallard.—Maxima—Eccup Reservoir *c.* 1,200 January 22nd (S. and M.B.-S.) ; Swillington Ing *c.* 1,000 January 2nd (P.E.D.) and 28th (K.B.) ; Hury Reservoir huge flocks January 9th and March 6th (J.R.S.) ; Hornsea Mere 476 drakes and 389 ducks on December 26th (F.E.K.). A drake (injured?) at Wassand submerged in a stream and swam under water (J.M.L.).

318. Gadwall.—At Swillington Ing, two on January 1st, 15th and 29th (K.B.) ; and an adult drake on October 15th (K.D.). At Wintersett J.C. saw two ' probables ' on July 24th.

319. Teal.—Maxima—Gorple *c.* 150 January 21st (K.G.S.) ; Swillington Ing *c.* 175 February 12th ; Gouthwaite *c.* 70 January 8th (C.N.) ; Hornsea Mere *c.* 100 October 7th (F.E.K.).

320. Green-winged Teal.—K. Brown picked out a drake with the characteristic white mark on side of breast, on January 15th at Swillington Ing, from *c.* 100 Common Teal (see *British Birds*, June, 1950).

322. Garganey.—A pair at Bottomboat near Wakefield on May 7th (G. Carr, E. Grace). One shot at Altofts in September (W. H. Kingswell per J.C.).

323. Wigeon.—Maxima—Stocks Reservoir *c.* 400 January 15th (J.K.F., P.E.D., J.C.) ; Swillington Ing *c.* 250 February 12th (K.B.) ; Gouthwaite *c.* 90 February 26th (A.F.G.W.) ; Forcett Park Lake, Richmond, *c.* 250 October 26th (A.B.) ; Eccup Reservoir *c.* 250 November 5th (C.N.) ; Gouthwaite *c.* 100 November 16th (R.C.) and December 28th (C.N.) ; Hornsea Mere *c.* 300 January 8th ; Spurn *c.* 500 December 30th (P.E.D.).

There were two at Swillington Ing on May 7th (D.A.I.), and two at Spurn on May 15th (R.C.). At Spurn and Teesmouth Wigeon first appeared on September 7th.

325. Pintail.—Several pairs occurred near Cherry Cob Sands in the early months of the year. Birds were generally present at Swillington Ing from January to March—maximum 13 on January 15th (K.B.). Two pairs gave courtship-display on March 26th (B.S.). At Eccup Reservoir the maximum recorded was 27 on February 16th (J.R.G.). At Hornsea Mere a duck on January 8th, and three drakes and a duck on November 25th were noted (G.H.A.). There were five drakes and three ducks on the Humber near Cherry Cob on December 24th (F.E.K. and J.M.L.). At Spurn four occurred on September 12th, and odd birds on three later dates. None were recorded elsewhere, excepting a drake on Castle Howard Lake on October 22nd (E.W.T.).

326. Shoveler.—Bred successfully at Swillington Ing (P.E.D.) ; and Ripley Lake (A.F.G.W.) ; near Bolton Hall (Lord Bolton) ; and probably at Fairburn. The species also occurred out of the breeding season at Swillington Ing

(36 on January 7th K.B.), Coniston Cold, Eccup, Malham Tarn, Lindley Reservoir, Bretton Park Lake, Ringstone Edge Reservoir, and Castle Howard Lake, and Spurn.

328. POCHARD.—Bred at Fairburn (J.C.) and Rise Park (F.E.K.). Winter maxima—Wintersett, *c.* 220 March 4th (J.C.), and *c.* 700 March 19th (N.V.M.); Malham Tarn *c.* 100 in early January (P.F.H.); Lindley *c.* 75 December 26th (C.N.); Blackmoorfoot 72 January 7th (J.C.S.E.); Swillington Ing *c.* 160 on February 5th (K.B., C.N.), and Hornsea Mere 27 on November 5th (G.H.A.).

330. TUFTED DUCK.—Bred by many waters as usual; and seems to increase. Maxima at Malham *c.* 100 March 20th, dwindled to 15 by May 15th (six pairs bred), and *c.* 110 August 29th (P.F.H.); and *c.* 135 Swillington, January 28th (K.B.).

331. SCAUP-DUCK.—It was unusual for this duck to be reported so frequently at inland waters. The only parties were 12 at Spurn on September 14th; 12 at Blackmoorfoot Reservoir on November 3rd, five ducks seven drakes (E. C. J. Swabey); *c.* 20 that flew into the Tees estuary during a snowstorm on December 3rd (A.B.); and five at Swinsty on October 22nd (R.S.P.B.). Odd birds and couples occurred at Wintersett, Ripley, Blackmoorfoot, Swillington Ing, Gouthwaite, Eccup, and Hornsea Mere.

332. GOLDENEYE.—Small numbers frequented most sizeable, fairly deep waters in the northern half of the county, during the winter months. Maxima—Hornsea Mere 50 (30 males) on January 15th (F.E.K.); and 26 at Gouthwaite on March 5th. Two immature drakes remained at Swillington Ing until May 7th (R.B.), and two at Wintersett from June 15th to July 28th (J.C.). The first of autumn occurred at Eccup on August 27th (S. and M.B.-S.).

334. LONG-TAILED DUCK.—Occurrences inland of this species are unusual. P. E. Davis and F. E. Kennington saw one at Eccup on October 22nd 'either adult in moult or an immature male.' A female allowed J. C. S. Ellis to approach within 30 yards on November 24th at a Pennine reservoir. The drake of a pair at Swillington Ing on December 24th in an ice-free corner was unmistakable (B. Speake).

337. COMMON EIDER.—A. Baldridge saw a male in breeding plumage off-shore at Redcar on May 30th; and a female occurred on November 26th probably the survivor of three on November 22nd on the Durham side, two of which were shot (C.C.H., P.J.S., A.B.). H. J. R. Pease saw two birds near Filey Brig on January 5th and 12th, and one on May 20th, and A. J. Wallis two males on November 26th and December 30th.

339. COMMON SCOTER.—In Filey Bay a flock increased from *c.* 20 on October 8th to *c.* 200 on the 27th (H.J.R.P.). The maximum at Spurn was *c.* 300 on July 31st (J.C.), with *c.* 100 on August 5th, September 10th, and November 1st, and at Teesmouth *c.* 600 on November 26th was an unusually large congregation.

Ten birds occurred on Semerwater on April 16th (J.P.U.); and at Gouthwaite (nine ducks, one drake) on September 28th (E. Grace); birds occurred at Blackmoorfoot (two) on December 21st (E.J.S.), Swillington (one) on October 15th (K.D.); and Withens Reservoir (one) on August 12th (A.M., R.Cs.).

340. VELVET SCOTER.—An adult male at Swillington Ing on January 29th showed his typical bill and white bar and spot (K.D.); as did one on a Pennine reservoir on July 8th (J.C.S.E.). Two immature males and a female stayed at Ogden Reservoir, Halifax, from January 10th to 17th (G.R.E., I.M.). One occurred at Spurn on August 11th (D. Parr).

342. GOOSANDER.—Reports of Goosanders are too numerous for more than mention of maxima—Hornsea Mere 36 on January 8th (H.O.B.) and 34 on February 17th (F.E.C.); Eccup Reservoir 34 on March 19th (A.F.G.W. and D.A.I.); Stocks reservoir 44 on March 19th (C.N.); Malham Tarn 30 on March 20th (P.F.H.). Numbers in autumn were smaller; but Eccup showed 25 on December 31st (S. and M.B.-S.). At Stocks Reservoir there was a *pair* of Goosanders on May 14th (J.K.F., C.N.)—I quite expect that someone will prove the species to have bred in Yorkshire before many years have passed.

343. RED-BREASTED MERGANSER.—The species occurs very rarely inland in Yorkshire, but K. Brown had good views of a female at Swillington Ing on May 7th. At Hornsea Mere two females consorted with Goosanders on January 8th (H.O.B., F.E.C.), and one was there on January 21st (F.E.C.). A bird at Spurn on August 14th was thought possibly to be oiled (G.H.A.).

344. SMEW.—An odd female was seen at Gouthwaite Reservoir on several dates from January to March 4th, with two seen on February 5th (R.F.D., P.E.D.).

In autumn two females were noted on various days, and on December 17th a male had joined them (A.F.G.W.) and remained until the year end. At Swillington Ing up to three birds occurred on various dates (K.D.), and a male was still there on March 15th (R.F.D., P.E.D., J.K.F.). Two females occurred at Malham on February 21st (A.P.); one at Swinsty on March 14th (K.I.); and a male at Lindley on December 21st (H.H.).

346/7. CORMORANT.—Numbers were maintained at the Ravenscar and Gristhorpe colonies (A.J.W.). *c.* 40 at Teesmouth on August 6th were probably from the Hunt Cliffe colony (C.N.). Odd birds occurred inland; and more at Spurn where the maximum was 13 on October 9th (G.R.E.).

348. SHAG.—More often seen at Flamborough this year in May and June than Cormorants. One flew into a cave on May 31st and stayed (K.F.); and on July 31st a pair frequently visited a cave below Bempton Cliffs (H. Hodgson). Breeding was not proved (A.J.W.).

349. GANNET.—Five birds were seen together at Bempton (A.J.W., R.M.G., G.H.A.). One bird sat on a nest (various dates), but on July 31st it was seen to be empty (H. Hodgson); and no proof of production of egg or young was obtained (A.J.W.). Birds passed up and down the coast normally.

355. MANX SHEARWATER.—A number occurred off Teesmouth on August 9th and 20th (A.B.). A single bird appeared off Filey Brig on September 3rd (A.J.W.); and off Spurn on October 3rd, 4th and 6th (G.R.E.).

368. FULMAR.—Bill-touching, accompanied by gutteral sounds was noticed on the cliffs at Danes Dyke on January 17th (F.W.). A few passed at Spurn from April 28th to September 28th; and one on November 19th (R.M.G.).

370. GREAT CRESTED GREBE.—In the breeding season *c.* 90 birds were noted on Yorkshire waters, and eventually *c.* 45 young were seen. Most birds on reservoirs had their nests stranded during the dry first half of the summer. A pack of up to 20 was seen in Bridlington Bay on February 19th (G.H.A., F.R.W.). At Malham Tarn, after the arrival of one bird on March 5th, there were 13 on May 4th of which three pairs nested (P.F.H.).

371. RED-NECKED GREBE.—An adult at Swillington Ing on January 22nd showed yellow at base of lower mandible; and tippets were forming (K.D.). A bird on Castle Howard Lake on February 19th showed the yellow-based bill (E.W.T.). Two birds at Swinsty Reservoir on February 20th had sharp borders to the white cheek patch and were thought to be of this species by J. P. Busby and M. Dodsworth—at that date some yellow on the bills should have been visible. F. Wilcock was of opinion that a grebe on October 25th, five on November 1st, and one on November 9th, at Bridlington were of this species.

373. SLAVONIAN GREBE.—One in winter plumage on October 30th at Castle Howard Lake, and on November 5th, had a straight bill (R.M.G., T. A. Graham); as had one at Eccup on October 20th (R.F.D.). Of two grebes at Eccup on October 22nd one was probably of this species (P.E.D., F.E.K.). There was a bird at Fly Flatts Reservoir on August 5th (R.Cr.), and a bird with a straight bill at Hornsea Mere on February 11th and March 5th (F.E.C., F.E.K.).

374. BLACK-NECKED GREBE.—A. J. Wallis reported a bird at Scarborough on January 2nd; and one found dead at Filey on February 12th. A single bird appeared at Swillington Ing on a number of dates in winter and summer (B.S., K.D. and others). The species also appeared at Eccup, one on February 12th (P.E.D., D.B.I.), and on October 22nd (P.E.D.); and one at Stocks Reservoir on November 7th (A.P.).

376. GREAT NORTHERN DIVER.—Two, Filey Bay, on February 12th (A.J.W.); one off Coatham Sands on March 5th (A.B.); and one off Spurn, May 30th was of large size and had a very stout bill (A.B.).

378. BLACK-THROATED DIVER.—A. Baldridge saw this species clearly at Teesmouth on February 2nd and October 22nd, as did P. E. Davis at Spurn on December 27th. A bird seen at Spurn on April 13th was ' probably black-throated.'

379. RED-THROATED DIVER.—Noted at Hornsea Mere on several dates in February; and at Spurn on many in autumn, winter and spring. Many divers pass too far out at sea for identification, and H. O. Bunce instances a Red-throated Diver he saw at Hornsea Mere at very close range, with a short straight (not tip-tilted) bill, that could not have been identified except at close range. This species occurs on the coast much the most commonly of the divers. It occurred at Teesmouth, three on February 19th, one on October 22nd, one on December 3rd (A.B.);

and *c.* 8 on December 28th most probably of this species (K.L.). At Filey H. J. R. Pease found an oiled bird on October 14th and eight others fishing fairly close inshore on October 19th, and F. Wilcock one at Bridlington on October 28th.

A Red-throated Diver remained at Eccup from January 21st to March 9th, when it died, and showed no sign of injury (S. and M.B.-S.).

380. Wood Pigeon.—Known as an immigrant, but *c.* 40 on October 28th were exceptional at Spurn.

381. Stock Dove.—A bird at Gorple had two eggs in the same hole on April 1st and August 27th (G.R.E.). Two young at Horsforth first flew on October 9th (P.E.D.).

383. Turtle Dove.—April 26th North Dalton (W.A.B.); May 1st Swillington (K.B.); and May 3rd Farnley (P.E.D.) were the early records. Bred in Grinkle Wood near Loftus (R.S.); and in Washburndale and at Rawdon (P.E.D., D.B.I.), and freely on the Harewood estate (K.W.); and in Cragg Woods (R.F.D.). Was seen in lower Wharfedale near Weeton (A.H.-L.).

386. Bar-tailed Godwit.—At Teesmouth the spring passage produced *c.* 130 on April 10th; and the autumnal *c.* 100 August 9th, August 24th, September 7th, with *c.* 50 October 22nd and only a few in December (A.B.). At Spurn numbers were much fewer, 21 on September 24th being the maximum (G.H.A.). Two occurred at Swillington Ing on July 16th (K.D.).

387. Black-tailed Godwit.—At Spurn only—one March 14th (R.M.G.), ten April 6th (J.C.), one September 12th (R.F.D.), and H. O. Bunce recorded six on August 26th.

388. Curlew.—Always present at Spurn with maximum 40 on July 31st (J.C.). At Teesmouth where it is always numerous maxima were *c.* 250 on March 13th; and *c.* 550 on August 9th (A.B.). A few Curlew can usually be found at Gouthwaite in winter (*c.* 25 December 28th, C.N.); and *c.* 50 were on Bowes Moor on October 11th (P.Y.). On March 11th *c.* 200 were together near Stocks-in-Bowland; and again on July 23rd; and *c.* 980 on August 17th (P.E.D., J.C., D.B.I.).

Curlew pellets on Malham Tarn Moss on April 21st, 1950, were composed of undigested remains of flower-heads of Cotton Grass (*Eriophorum vaginatum*); and some dung contained similiar matter. Similar pellets and dung were found on April 16th, 1949, when flower-heads were lying about as if picked by some animal (P. F. Holmes).

Many pairs now nest in the Vale of York, N.E. of the city (F.J.). A tendency to breed increasingly on lowlands has been evident for some years but is probably a return to a habit of the remoter past, never quite abandoned.

389. Whimbrel.—A bird at Spurn on April 28th was the earliest of spring, when only a few passed there or at Teesmouth. Autumnal maxima—Spurn ten August 5th, Teesmouth *c.* 45 August 9th. During both passages Whimbrels may occur inland—one Swillington May 12th flew N.E.; one over Rowley, May 15th (D.C.U.); Masham August 5th, Harrogate August 10th at 10 p.m. (A.F.G.W.).

393. Woodcock.—A nest held four eggs near Dalby on July 15th (F.J.). Three birds were 'roding' near High Force on July 23rd (M. Larkin). Late nests are not very abnormal, and may be second layings.

Ten scattered birds were flushed at Spurn on October 22nd; on which date nine flew in a party from besides a stream in Bretton Park into a wood (E. Grace)—no doubt all were immigrants. Three times E. B. Burstall had a woodcock settle within a few yards of him in Cliffe Woods on different days at dusk in spring.

395. Common Snipe.—*c.* 150 were at Swillington Ing on January 2nd (P.E.D., D.B.I.); where birds also congregated in late August (B.S.).

398. Jack Snipe.—Two occurred at Spurn on April 22nd (R.F.D.) and one on April 5th (R.C.); with one found dead on April 5th (W.A.B.). One remained near Pickering until April 13th (R.M.G.). Birds also occurred at Hornsea Mere, two on January 14th (R.W.M.), one Elland S.F., February 18th and March 15th (R.Cr.); one High Royd, October 30th and November 5th (G.R.E.); and one near Guiseley from December 16th which D. B. Iles caught and ringed—it was a male.

400. Grey Phalarope.—A bird at Gorple Reservoir for several days during October was described by the keeper as very tame (G.R.E.).

402. Turnstone.—Maximum at Spurn, *c.* 75 on April 15th (P.E.D.); and at Teesmouth 45 on September 3rd (A.B.); always some present. Birds occurred

inland—Wintersett, May 20th (J.C.) ; Swillington Ing up to three birds on several days in May (K.B., P.E.D.), and one on August 13th (K.D.).

403. Knot.—*c.* 8,000 at Spurn on March 4th (R.M.G.) ; and *c.* 3,000 at Teesmouth on March 5th (A.B.). Autumn passage was below average at both places. Fifteen flew over Haworth Moor on December 9th (A. A. Bateman).

404/5. Dunlin.—A bird ringed Oland, Sweden, 3/9/48 was at Middlesbrough –/1/49. No nest was reported but pairs were seen on several Pennine moors in spring. Wintering birds at Teesmouth and Spurn were normal, as were autumnal migrants ; and parties occurred at various times on various inland waters.

406. Curlew Sandpiper.—At Teesmouth *c.* 8 occurred on September 7th, with odd birds on the 3rd and on October 29th, a late date (A.B.). At Spurn occurred one on April 15th (J.M.M.), three September 23rd, and one September 24th, and one October 4th (G.R.E.).

407. Little Stint.—Occurrences were at Teesmouth two on August 24th and one on September 3rd, 7th and 14th (A.B.) ; two, Redmires, Sheffield, September 2nd (A.F.T.) ; and two, Wintersett, September 27th to October 2nd (P.E.D., R.F.D., N.V.M., J.K.F.).

415. Purple Sandpiper.—Teesmouth, three October 29th, one November 12th (A,B.). At Bridlington, present all winter—*c.* 30 February 18th, last May 9th *c.* 10 (F.W.) ; and a party was seen on November 15th (H.F.W.). Only one seen Spurn—February 19th (R.M.G.).

416. Sanderling.—Spurn maximum, *c.* 250 April 4th (R.F.D.). Teesmouth maxima, *c.* 310 May 13th, *c.* 450 August 9th (A.B.). Inland occurrences were—two, Dewsbury S.F., January 29th (H.H.) ; one, Fly Flatts Reservoir, May 21st (R.Cr.) ; Swillington Ing from May 12th to 24th varying from one to seven seen (K.B.) ; one, Wintersett, September 19th (J.C.) ; one, Dewsbury S.F., August 27th (E.G., G.C.) ; and Eccup, one, July 23rd (J.R.G.).

417. Ruff.—Ringed Soppero, Swedish Lapland 2/6/48, Redcar 23/10/48 (*British Birds*, 1950, p. 289). At Teesmouth numbers were larger in August and September than usual—11 August 31st, 12-15 September 7th (A.B. and P.J.S.). At Spurn only one was recorded—August 26th (W.A.B.) ; with two at Cherry Cob on September 7th (J.M.L.) ; and there was one on the foreshore at Sewerby on October 15th (W.A.B.). At Swillington Ing, three on May 8th and 22nd (K.B.) ; and two at Dewsbury S. F., from August 24th to September 1st (J.C., E.G., G.C. and H.H.), made up the unusually few inland records.

421. Common Sandpiper.—Ringed High Royd 10/7/48 recaptured there 6/6/50 (G.R.E.). The earliest was a bird at Masham on April 10th (R.C.). A few passed at Spurn up to May 18th (E.H.) ; and from August 5th to September 15th ; and at Teesmouth. Bred at Swillington Ing (P.E.D.), and probably at Wintersett (J.C.). Eleven at Elland S.W. on August 25th were in a party (R.Cr.). Last seen Elland, September 17th (R.Cr.).

423. Wood Sandpiper.—A bird at Swillington Ing on August 27th showed its speckled back and tail barred up to the rump (K.D.).

424. Green Sandpiper.—Apparently wintering birds were noted at Horsforth S.W. from January to March 19th (R.F.D., P.E.D.) ; near Croft Spa on February 16th (I.D.D.) ; at Swillington Ing on February 19th and 22nd (K.D.), and two at Keld Head on December 24th (R.M.G.). Single birds were seen at Swillington Ing on May 4th (K.B.) ; and between Hebden Bridge and Keighley on June 3rd (J.B.N.). Birds passed as usual from the coast inland from early July to late September, occurring at many places, including one at Eccup on November 5th (C.N.) and 9th (S. and M.B.-S.), and one in Wharfedale on November 23rd (H.M.).

428. Redshank.—Maximum, at Spurn *c.* 200 September 10th (J.C.) ; and at Teesmouth *c.* 230 August 24th (A.B.). J. Cudworth has noted a continuous decline in numbers and frequency of birds visiting sewage farms at Ossett and Dewsbury—in 1950 only odd birds on April 3rd and September 18th, whereas in 1944 Redshanks occurred daily from March to December—drainage may have affected breeding birds somewhere locally.

431. Spotted Redshank.—None recorded inland. One at Teesmouth on August 31st (A.B.) and at Spurn one September 6th (F.E.C.), two September 25th (W.B.A., R.C.), one October 12th and 15th (R.S.).

432. Greenshank.—Occurred in spring, two at High Royd S.W. on April 23rd (G.R.E.), one at Swillington Ing on May 13th, and two on the 15th (K.B.) ; and two on May 30th (P.E.D.). The usual passage produced birds from mid-

July to early October on the coast, and by Pennine reservoirs ; and some sewage farms.

435. Ringed Plover.—Bred at Teesmouth (A.B.) ; and one brood near Whitby (A.B.W.). Spring maximum at Teesmouth, *c.* 80 May 30th (A.B.) ; at Spurn, *c.* 100 February 18th (R.M.G.). Large packs occurred at Teesmouth in August—*c.* 550 August 24th, *c.* 200 September 7th (A.B.). At Spurn, *c.* 80 on September 4th and 11th was the largest number recorded. Very few remained at either place in December. As usual, parties were seen by many waters inland on various dates.

438. Little Ringed Plover.—Odd birds without wing bars occurred at Gouthwaite on June 24th (A.F.G.W.), and by a pool at the head of Gordale on June 12th (P.F.H.). A search of the gravelpits in Holderness was fruitless (F.E.K.). In the original district three, probably four pairs nested. Eggs were seen of two pairs ; young of three pairs ; and another pair behaved as if with young. Fledged young were seen for the first time. The disabled-wing trick was observed (K.D., W.B., P.E.D., K.B., B.S., R.F.D., R.C.).

440/1. Golden Plover.—*c.* 600 were at Haltemprice on February 15th ; and *c.* 800 on March 26th on Whinmoor, near Leeds (J.R.G.). Some birds were on the moors on February 17th and paired in their territory by the 23rd (P.Y.). A flock near Swihsty on April 20th had the black faces of the Northern race (K.I.). Flocks of birds of the year began to assemble round Barnard Castle in mid-July (M.L.). At Pool were *c.* 250 on September 23rd (P.E.D.) ; and *c.* 700-750 on Harrogate Stray on November 19th and 26th (A.F.G.W.).

444. Grey Plover.—First of autumn at Spurn on August 5th ; when *c.* 20 at Cherry Cob sands (F.E.K.) ; *c.* 250 on October 29th was the largest count of autumn. Smaller numbers occurred at Teesmouth with maximum of *c.* 50 on October 22nd (A.B.).

449. Lapwing.—Ringed as young Addingham 9/6/49, Widnes (Lancs.) 11/1/50 (R.F.D.). Ringed as young Farnley 21/5/49, Ballindine, Co. Mayo 8/1/50 (R.F.D.). Ringed as young Todmorden 8/6/48, Kells, Co. Meath 11/12/49 (A. Welch). The largest flocks occurred near Ainderby Quernhow *c.* 5,000, and near Londonderry *c.* 2,000, both in the Vale of Mowbray on January 11th—they were not feeding and left in the night (J.P.U.). At Spurn the maximum was *c.* 3,000 on February 18th (R.M.G.) when birds were passing southward all day (R.M.G.) ; another large southward passage down the peninsula and over the sea happened on March 3rd (R.M.G.).

450. Avocet.—Two birds were seen at Redmires Dam, Hebden Bridge by L. Greenwood during September (G.R.E.).

452. Oyster-catcher.—Nested in Airedale (C.N.), Wensleydale (R.C.) and Swaledale (A.B.) ; and birds seen at many places and dates. *c.* 153 were counted at Teesmouth on August 17th, and *c.* 400 on September 14th (A.B.). At Spurn the maximum was 30 on April 4th and 5th (W.A.B.).

456. Stone Curlew.—Two birds were seen on the Wolds in May in an area where one was seen in 1949. In the evening of August 13th K. G. Spencer and J. R. Govett saw a bird in flight northward near Leeds which, from head and wings and general shape they were convinced was a Stone Curlew. From August 14th to 25th a Stone Curlew skulked about the 'wire dump' area at Spurn, and was watched by J. Cudworth, J. B. Nelson, R. M. C. Potter and others.

462. Black Tern.—Birds appeared at Swillington Ing from May 12th to 25th, with three on the 23rd, and 20 on the 13th, which were seen about sunset to fly in a bunch to a good height and leave due east (K.B.). A male occurred at Wintersett on June 10th (J.C.), and on various dates from September 21st (one) to October 1st (six), and two on the 2nd (J.C., P.E.D.), and 4th (J.R.G.). At Hornsea Mere there was one on August 22nd (J.M.L.). J. K. Fenton found a fresh dead female at Eccup on October 29th ; and at Teesmouth there were one on August 9th, September 7th and 14th (A.B.).

Evidence for possible Black Terns at Spurn on August 10th and 23rd is inconclusive. Birds also occurred, one on September 7th (F.E.C.) ; and three on September 25th (W.B.A.).

467. Sandwich Tern. Ringed Makkum, Friesland, Holland 7/7/46, Teesmouth 7/8/48 (*British Birds*, 1950, p. 291). As is to be expected Sandwich Terns passed at Teesmouth and Spurn in similar numbers. The maximum at Teesmouth was *c.* 200 on August 24th (A.B.), and at Spurn on September 4th (R.M.G.).

Eight at Spurn on October 11th (G.R.E.) were the latest; with four on April 18th as the earliest (G.H.A.).

468. Roseate Tern.—K. Fenton saw two terns at Spurn on July 9th with 'beaks all black' which he considered to be of this species.

469/70. Common and Arctic Tern.—A pair of Common Terns on the Yorkshire side of Teesmouth had three eggs on June 15th and two on the 29th; both were robbed (A.B.).

A bird was seen at Spurn on April 7th (J.C.); and the last two on October 20th (R.C.), the maximum recorded as Common being *c.* 60 on October 7th (G.R.E.). At Teesmouth much larger numbers congregate in August—17th and 24th *c.* 400, with the last on October 23rd. Probably the line of flight takes many past Spurn too far at sea to be noticed.

A number of birds occurred inland—one believed Common over Dowley Gap Filter Beds, March 31st (S.J.); one Common at Wintersett on July 24th (J.C.); three over Ossett on July 29th, too high for identification; one Common, two doubtful at Swillington on May 21st and 22nd (K.B.), and one dead Arctic on September 21st between Poole and Otley. A Common Tern was picked up alive near Egton on September 7th after a gale (A.B.W.). An exhausted bird appeared at Malham Tarn on September 17th (P.F.H.), and *c.* 20 flew eastward over the hills from Stocks Reservoir (C.J.K.F.). At Wintersett up to three, including two Arctics, were seen on various dates from September 19th to October 8th (J.C., H.H., E.G., N.V.M., P.E.D.).

471. Little Tern.—Ringed Tentsmuir (Fife) 16/7/49—Teesmouth 20/8/49 (*British Birds*, 1950, p. 324). One at Malham Tarn on September 17th, after a southerly gale (P.F.H.). Eleven pairs attempted to nest at Teesmouth at two sites. Of the eggs at one site on June 29th, those of four pairs were swept away by tides. At the other site three pairs were probably successful (A.B.).

At Spurn the first two arrived on April 20th (R.F.D.), and had built up to *c.* 75 pairs by May 21st (E.H.); most had left before September 10th when the last two were seen (J.L.), and a straggler occurred on October 1st (G.R.E.).

G. H. Ainsworth reports that the Little Terns fared slightly better at Spurn, where 19 young were ringed, and no doubt some escaped notice. In his work to try to give the nesting birds a chance he was helped by Mrs. Ainsworth, boys from the Malet Lambert School, K. Fenton, John Goodall, A. McAllister, F. E. Kennington, and J. M. Laws; and one or two others who came at week-ends. Visitors however remain a menace, and help will be needed again in spring.

474. Sabine's Gull.—For details of the only record of this species in Yorkshire since 1926 see *Naturalist*, January, 1952, p. 11. The bird was watched at Wintersett Reservoir from September 19th to 29th, 1950, on many occasions at close range by John Cudworth; and was also inspected by R. F. Dickens, P. E. Davis, J. K. Fenton and E. Ellis.

477. Little Gull.—On February 19th, G. H. and Mrs. Ainsworth watched an adult from the North Pier, Bridlington. They were reminded by the blue-grey upper parts contrasting with the dark under-wing of a common blue butterfly. The bird was smaller than the Black-headed Gulls and had no dark wing-tips.

Although a Little Gull flew southward five minutes after being spotted at Eccup Reservoir on October 14th, 1950, it was easy for S. and M. Barras-Smith to note the dark underwings and its size compared with the many Black-headed Gulls present.

W. A. Butterfield reports at least four at Bridlington on October 15th, 1950.

478. Black-headed Gull.—Persecution causes this species continually to colonise fresh places—Bowes Moor, *c.* 1,000 pairs in two places (P.Y.), Haworth Moors, *c.* 500 pairs (C.N.), are examples. On the other hand old colonies like Skipwith (*c.* 35 pairs P.A.H.), and Altofts (21 nests J.C.) diminish.

Eccup roost had up to *c.* 3,000 birds from October 22nd to early December, when movement began up the Aire valley and the roost virtually disappeared (P.E.D.).

481. Common Gull.—At Malham Tarn large numbers roosted nightly from mid-September to early December—maximum *c.* 1,000 November 5th, (P.F.H.). Eccup roost had *c.* 800 October 22nd, *c.* 1,000 November 19th, very few December 17th (P.E.D.).

482. Herring Gull.—Ringed Lofoten Islands, Norway 3/8/47, Hessle, near Hull, 27/12/47 (E.P.L. in *British Birds*, 1950, p. 291). Maximum at Swillington

Ing, *c.* 650 on February 26th, having doubled since January 1st (K.B.). At Eccup peak months for roosting birds were January to February, August, and December when *c.* 1,000 generally present. None there May-June (S. and M.B.-S.).

484/5. Lesser Black-backed Gull.—Ringed by P. E. Davis at Roeburndale Gullery 22/7/50, found dead Skipton 11/10/50 ; and another ringed 27/7/50, found dead at Badminton, Gloucester in September. There was an adult and two juveniles at Gouthwaite from late June for some weeks which looked very much as if they had flown from a breeding place on the surrounding moors. About one eighth (say *c.* 125) of the thousand-pair strong colony on the Yorkshire-Lancashire border nested on the Yorkshire side—among the crabs and sea-fish brought to feed the young a pot egg and a golf-ball were included (P.E.D.). There have been many reports of both racial forms of this species inland on numerous dates.

486. Great Black-backed Gull.—The usual numbers passed along the coast (*c.* 600, Teesmouth, August 24th A.B.). Birds occurred inland—Swillington Ing 12, January 29th (K.D.) and 10, December 24th (B.S.) ; Eccup 18, December 12th (K.G.S.) ; and odd ones at several places.

487. Glaucous Gull.—An immature Glaucous at Scarborough during early January (A.J.W.). A gull at Swillington Ing on March 19th was only slightly larger than the Herring Gulls, and with wings that extended only slightly beyond tip of tail was thought to be a small Glaucous (K.D.) ; on April 7th at Swillington an immature Glaucous Gull with a heavy bill dwarfed the adjacent Herring and Lesser Black-backed Gulls (K.B.).

488. Iceland Gull.—A gull at Spurn on May 27th was sized between Common and Herring Gull, with pale ash-grey mantle, and tail faintly shaded light brown. D. A. Illingworth was ' fairly certain ' it was an Iceland Gull in its third or fourth summer.

489. Kittiwake.—The Boulby colony increased to *c.* 80 nests (R.S.). H. J. R. Pease noted a considerable passage south off Filey Brig on March 22nd, estimated at *c.* 600 per hour. The species was in full force on the Bempton Flamborough cliffs on the 23rd.

491. Great Skua.—F. Wilcox and G.H.A. examined the remains of one at Bridlington on February 19th. In the Spurn log W. A. Butterfield mentioned one seen harassing Sandwich Terns on August 25th the wings of which showed white at base of primaries—the white patch is usually much more prominent in this species, but not absent from the others ; and seen on a bird over the sea I have not always found the feature conclusive. A. Baldridge watched a Great Skua at Teesmouth on September 3rd with large white patches on wings—Arctic Skuas were present too and made sallies at the larger bird.

493. Arctic Skua.—Seen frequently at Teesmouth and Spurn from August 17th to October 7th ; four Spurn, September 4th, 9th and 14th ; Teesmouth 12 on September 7th, and seven on the 14th. Most were of the dark form.

494. Long-tailed Skua.—One was picked up dead at Helmsley in the autumn by A. Gordon, and shown at a meeting of the Y.N.U. (Vertebrate Section) on October 21st (E.W.T.).

495/6. Razorbill.—Seventeen oiled dead between Redcar and Teesmouth on May 13th (A.B.).

498/9. Guillemot.—Thirty-nine dead on May 13th between Redcar and Teesmouth (A.B.). Three oiled birds at Bridlington on February 19th were of the northern race, K. Fenton observed abnormal numbers of birds of the ' bridled ' variety at one point between Flamborough North and South landings, finding three or four in every group of 10 to 20 normal birds.

501. Black Guillemot.—A bird was found dead at Filey Brig on February 18th (P. A. Clancey). G. J. Brown recorded one at Flamborough about December 29th.

502. Little Auk.—One came down near Shipley Glen on February 10th and was taken to R.F.D. A bird at Eccup on April 12th sat the water for two hours without moving except to maintain position facing wind—a gale had blown for three days previously (S. and M.B.-S.). A dead bird (un-oiled) on March 5th ; and two (oiled) on May 10th were found at Teesmouth (A.B.).

503. Puffin.—Sixty-one dead, Redcar to Teesmouth, May 13th (A.B.).

504. Corncrake.—Nested near Rothwell ; and Horton-in-Ribblesdale where Mr. Metcalfe mowed round the site and enabled the young to hatch (C.A.C.). Called near Middlesbrough on May 17th ; and an egg was brought to the Dorman

Museum in summer (O.C.H., P.J.S.). Two, perhaps adult and juvenile, were seen between Appleton and Lastingham on August 30th (R.W.C.). Birds were heard calling in June near Bretton, Horsforth, Elland, and in Baldersdale. At Spurn birds were noted on May 13th (K.F.), September 24th (R.Cr.) and on September 30th (W.B.A.).

509. Water Rail.—Occurred about Sandbeck and Roche in January (R.B.); and at Swillington on January 2nd (D.B.I., P.E.D.); February 12th (K.D.), and October 11th (P.E.D., D.B.I.). One was shot near Huddersfield early in the year (G. Fryer); one seen at Thornton Dale in late March (R.M.G.); and one South Loftus in February (R.S.). Heard as usual during the winter at Hornsea Mere (F.E.C.). A wounded bird was brought to F.E.K. at Skirlaugh on March 21st. Odd birds occurred at Spurn in autumn and winter, and two north of Kilnsea on April 20th (G.H.A.).

510. Moorhen.—Ringed High Royd, 7/4/50, Gretna Green, Scotland 21/4/50. With ringed birds about the sewage beds throughout the year, this was the first indication that the Moorhen population was not sedentary (G.R.E.).

After Carrion Crows had tried to take young Moorhens from a pond near Well in summer, and been driven away; a crow was found drowned in the pond, and later another, under circumstances that made it impossible not to credit the old Moorhens with responsibility.

511. Coot.—Winter maxima—Hornsea Mere *c.* 300 February 17th and *c.* 250 December 27th (F.E.C.); Malham Tarn, *c.* 50 February 12th, and numbers built up gradually from 41 on August 6th to *c.* 200 November 5th (P.F.H.). *c.* 300 Fairburn, November 26th (P.A.H.). A Coot at High Royd is a rarity, and one on October 25th was only the third for the area in recent times (G.R.E.).

513. Black Grouse.—Bred near Stocks-in-Bowland where 13 occurred on March 19th (J.K.F., C.N.); and in Baldersdale (J.R.S.), broods being seen in both areas. Two males were seen between Settle and Malham Tarn, May 2nd (P.F.H.), and one in Dalby Forest on July 24th (W.S.M.).

520. Quail.—A bird was heard in a cornfield near Rowley on June 21st (D.C.U.). K. Fenton reports a pair on pasture land at Ruston Parva in the summer. A covey of seven was flushed at Balne, near Goole, on September 16th (P.B.).

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**British Birds** by **F. W. Frohawk**. Pp. 256, with the author's illustrations in black and white in the text of 121 species, and in 30 colour plates of 103 species. Ward Lock, 17/6 net.

The book aims to give 'every help towards speedy and certain recognition of all birds normally found in Britain.' It is well produced, contains a great deal of sound information, and can be recommended to beginners and others who wish to have such a book handy, at home, in the car, in the pocket or rucksack. Considering the authorship it is not surprising to find the plates and drawings more accurate and pleasing than those in any book so small that has appeared for a number of years.

The late F. W. Frohawk enriched ornithological literature with brush, brain, pencil, and pen for so long that it would be surprising if he could be up-to-date here in every particular. Rare migrants are excluded, as are the Black Redstart and Little Ringed Plover as breeders. The Canada Goose—a commoner resident in some districts than the Mute Swan—is omitted. The few cases where the facts of distribution to-day do not quite fit might have been avoided had the book been 'read' by a competent modern authority prior to publication.

A preface is signed by Mr. J. D. Macdonald, to whom also an introduction is ascribed by the title-page. The introduction lists eight so-called bird observatories, six of them incorrectly, and omits six that should have been included. Concerning the ringing of birds we are informed—'a light ring is slipped over the foot' (*sic*), and 'in this ring is contained information about the date, time and place of capture'—by 1951 a bath-chaired old lady should know better.

The general quality and useful scope of the book is not affected by the foregoing. There is an index of popular and scientific names. An appendix deals with record keeping, recognition, and tabulated information as to haunts, size, colour, wings, bills, legs, toes, habits, flight, nest, migration and song, in an original manner. R. C.

# THE ENTOMOLOGY OF SPURN PENINSULA

## INTRODUCTION

W. D. HINCKS

> ' You see, now, how varied is the scenery to which the diversion of the Entomologist introduces him ; that he is never out of his way : whether on hill or in valley ; on upland or plain ; on the heath or in the forest ; on the land or on the water ; in the heart of a country or on its shores:—still his game is within his reach.'—KIRBY AND SPENCE, *Introduction to Entomology*, **4**, 1826, 506.

FOUR visits each of ten days have been paid to the Peninsula by members of the Entomological Section, and it is thought that sufficient data have now been collected for the presentation of a preliminary survey of the insects and some other invertebrates. The original intention in organising these excursions was to undertake an ecological survey of the Peninsula, but it rapidly became apparent that the insect fauna of the limited area under consideration was much more numerous in species than was expected. Consequently, most of the time available, of necessity, has been expended in getting to know what insects are to be found on the Peninsula. Many small observations of an ecological nature have been made, however, which it is hoped will add considerably to the value and interest of the following reports. It has been necessary also to abandon the original plan of dealing with the insects area by area ; such a plan would involve much repetition with a consequent waste of space. In consequence a systematic arrangement of the matter has been adopted.

### DATES OF VISITS

(1) June 13th to June 23rd, 1947.
(2) July 16th to July 25th, 1948.
(3) August 12th to August 21st, 1949.
(4) June 2nd to June 12th, 1950.

Several day visits also have been made to Spurn during 1948-50 by Rev. T. B. Kitchen and the writer, often with a view to clearing up some problem left unsolved during the ' official ' expeditions. Where necessary, data from these visits are included in the reports.

### HEADQUARTERS

Members of the four expeditions have been fortunate in being able to occupy Warren Cottage on Spurn Peninsula as their Headquarters. Thanks are due to the Bird Observatory and Ringing Sub-committee of the Union for the opportunity of enjoying the amenities which the cottage provided and which contributed so largely to the success of the visits. To Mr. G. H. Ainsworth, Honorary Secretary of the Committee, special thanks must be given for much help in making the arrangements, for supplying the valuable data on the plant ecology of the Peninsula printed below, and for joining our party on several occasions.

### PERSONNEL

During the four visits to Spurn the following stayed at the Cottage for varying periods :

G. H. Ainsworth.
A. C. Braham (1), (2), (3), (4).
P. M. Butler (3), (4).
C. A. Cheetham (1).
J. Devine (1).
J. R. Dibb (1), (2).
W. D. Hincks (1), (2), (3), (4).
S. M. Jackson (3).
L. Jones (3).
T. B. Kitchen (3), (4).
H. M. Michaelis (3), (4).
J. H. Murgatroyd (2), (3).
R. Procter (the late), (1).
W. J. Sanders (1), (4).
S. Shaw (4).
J. Spittle (2), (4).
W. O. Steel (1), (2), (3), (4).
D. Walker (1), (2), (3).
G. I. Wells (3).
A. E. Winter (1), (3).

[The Entomology Section wish to express their thanks to S. D. P. Fisher, Esq., whose generosity has made possible the publication of this part of their report].

In addition several day visitors joined the party on a number of occasions. All those named have contributed to a greater or lesser degree to the work accomplished, either by preparing a section of this report or by the collection of materials. Particularly should be mentioned the good fellowship and fruitful co-operation that all members of the various parties shared so fully, leaving friendships and pleasant recollections which will long be rekindled whenever Spurn is mentioned or thought of.

WEATHER

On every expedition, except for part of the first, we were favoured by warm, dry weather. Indeed, in June 1950, the weather was perfect for the whole of our stay. The days at Spurn are usually marked by a certain amount, often considerable, of wind which tends to temper the heat of such an exposed and low-lying area. The evenings and nights are usually decidedly cool. The first week-end of the 1947 visit (June 13th-15th) was cold and wet and the wood fire of the cottage was much appreciated in the evenings. No detailed account of the weather was kept, but the general features were usually noted in our diaries.

COLLECTING

It was due to the kind help of Mr. G. H. Ainsworth that visitors were provided beforehand with a map indicating six different plant areas on the Peninsula. Information was also given as to the typical plants of each area. These data are included below in Mr. Ainsworth's report and have been of the greatest practical assistance to us in our work. The plan adopted was to take a packed lunch each day and after breakfast to visit one or other of these areas. Collecting was restricted to the chosen area so that the insects collected might be definitely recorded as from that particular association. Sometimes two areas were visited in one day and most areas were visited a number of times during the four expeditions. In addition, Welwick Salt Marsh (about seven miles away) was visited on three occasions and Long Bank Dyke, on the west side of Kilnsea village, several times. A single excursion was also made to the saltings north of Kilnsea. A few of the records from these localities are included in the reports where they appear to be of interest. They are distinguished by square brackets.

The map (Fig. 1) shows the distribution of the seven main areas as listed below :

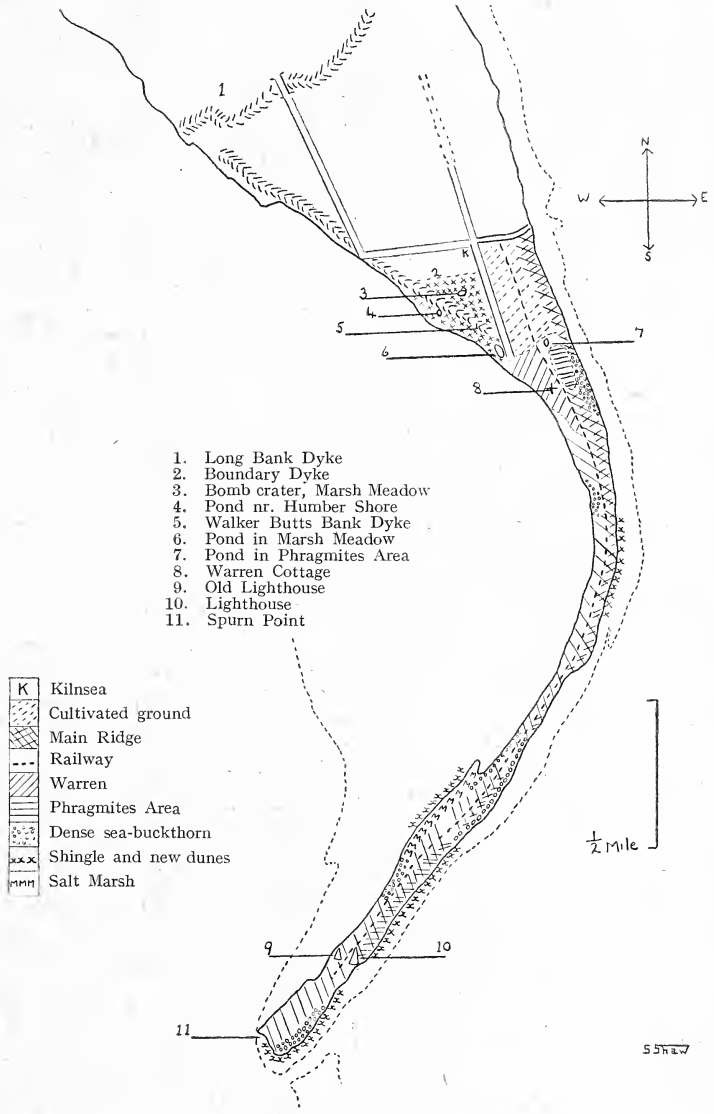
(1) Marram Dunes.
(2) Kilnsea Warren.
(3) Marsh Meadows.*
(4) Salt Marsh.
(5) Main Ridge.
(6) Humber Foreshore.
(7) Seashore.

It should be noted that for the purpose of the Survey the whole area was taken to be limited by the drain to the north of the Marsh Meadow and the fields to the north and east of the Warren, recently put into cultivation, were not examined.

All the members joining the expeditions (except the writer) restricted their collecting to their own particular groups, except that they co-operated very fully with others by passing on any specimens taken which were outside their own subject. It was inevitable, therefore, that certain orders should have been entirely neglected or very little collected. The Collembola and allied orders, Thysanoptera, Aphids and other groups requiring specialised methods, different from those applicable to general collecting, were little collected and are not included in these reports. It is hoped that such deficiencies may be made good on future occasions.

On visiting more distant parts of the Peninsula, when transport was not available, the return to Headquarters was not made until tea time, but generally it was found more convenient to have lunch in the cottage. For this reason, two areas were often visited per day and areas at or near Spurn Point, about three miles away, were seldom visited. After the evening meal, at the Kilnsea Café, on our return to the cottage, diaries were written up, specimens were mounted and often identified, text-books and microscopes having been brought by most members of the party. Discussions on the results of the day's collecting accompanied the mounting which often went on, of necessity, until the early hours of the morning.

* Omitted from key; indicated on map by crosses between 2 and 6.


SPURN PENINSULA
1. Long Bank Dyke
2. Boundary Dyke
3. Bomb crater, Marsh Meadow
4. Pond nr. Humber Shore
5. Walker Butts Bank Dyke
6. Pond in Marsh Meadow
7. Pond in Phragmites Area
8. Warren Cottage
9. Old Lighthouse
10. Lighthouse
11. Spurn Point
K Kilnsea
Cultivated ground
Main Ridge
Railway
Warren
Phragmites Area
Dense sea-buckthorn
Shingle and new dunes
Salt Marsh
½ Mile
N
W
E
S

On suitable evenings moths were collected, often in numbers, from the lighted windows of the cottage, with paraffin lamps, car lights, or at ' sugar.' Occasional evening or ' after dark ' excursions were made, usually, but not entirely, by the lepidopterists.

REPORTS

The reports will be divided as follows :

I. A Short Introduction to the Ecology of Spurn. G. H. Ainsworth.
II. Notes on the General Zoology of Spurn. P. M. Butler.
III. General Entomology of the Areas. W. D. Hincks.
IV. ' Orthopteroid ' and ' Neuropteroid ' Orders. W. D. Hincks.
V. Hemiptera. W. D. Hincks.
VI. Lepidoptera. H. N. Michaelis.
VII. Coleoptera, excluding Carabidae and Staphylinidae. W. D. Hincks.
VIII. Coleoptera, Carabidae. S. Shaw.
IX. Coleoptera, Staphylinidae. W. O. Steel.
X. Hymenoptera, excluding Aculeata. W. D. Hincks.
XI. Hymenoptera, Aculeata. S. Shaw.
Appendix on Bees. H. Inglesent.
XII. Diptera. W. D. Hincks.
XIII. Arachnida. A. C. Braham and J. H. Murgatroyd.
XIV. Other Invertebrates. P. M. Butler.
XV. Conclusions.

In preparing these reports hardly any attention has been paid to previously published records. It has been considered best to base the reports entirely upon our own observations. Individual reports have received the minimum of ' editing ' so that some lack of uniformity may be noticed. Collectors' names generally have been omitted except in certain instances and it should be borne in mind that in most cases the results achieved have been the result of close co-operation.

No attempt has been made to indicate the new county or vice-county records, except in the Hymenoptera, the report of which is written by the Y.N.U. recorder. In other cases it is left to the official Union recorder to bring forward the probably numerous additions. It is interesting to note in passing that several new genera and species, including some new to science, are added to the British List for the first time in the order Hymenoptera. Unless otherwise stated the nomenclature of the insects is that of Kloet & Hincks (1945) and of the plants that of Clapham (1946).

ABBREVIATIONS

M.=Marram Dunes (M.H.=Marram on Humber shore ; M.S.=Marram on Sea-shore).
W.=Warren (PH.=Phragmites area in Warren ; P.P.A.=Pond in Warren near Phragmites area).
M.M.=Marsh Meadow (P.M.M.=Pond in Marsh Meadow).
D.=Walker Butts Bank Dyke.
S.M.=Salt Marsh.
M.R.=Main Ridge.
F.=Humber Foreshore.
S.=Seashore.
L.B.D.=Long Bank Dyke, Kilnsea (outside area).
pa.=parasite.
pr.=predator.
ph.=phytophage.
a.=arenicole or psammophile.
!—common.
! !—abundant.

## I. A SHORT INTRODUCTION TO THE ECOLOGY OF SPURN

G. H. AINSWORTH

In the study of the entomology of a district it is necessary to examine the various factors influencing the species of insects which may be expected to be found there : climate, vegetation, soil, the influence of man ; all have their effect

on the flora and fauna. Therefore the following brief notes have been compiled on the ecology of Spurn.

The high chalk cliffs of Speeton, Bempton and Flamborough are succeeded at Sewerby by low cliffs of boulder clay of great stiffness, which sweep in a S.S.E. direction for forty miles. Strong winds blowing from N.W. to N.E. cause the tides to bite into the boulder clay cliff, dislodging the stones, gravel and sand. This detritus is driven southward by the flow of the sea and deposited at the southern extremity of the Yorkshire coast, forming a tongue of sand and gravel which, were it not for the flow of the fresh water draining from the Yorkshire rivers and the Trent, would block up the Humber mouth. This narrow tongue of sand and gravel, held together in the main by such plants as marram grass and sea buckthorn, is known as *Spurn*. The point of Spurn, which is at the end of a peninsula nearly four miles in length, lies in the longitude 0° 7′ 30″ East, and in the North latitude 53° 35′.

The struggle between the sea tide and the reflow of the Humber results in a gradual movement southward and westward, consequently constant supervision is necessary, for in the absence of protection in the form of breakwaters and concrete emplacements the water would break through, as it has done in former years, and leave a pear-shaped island three miles from the mainland. The East Riding coast from Bridlington southward has undergone great changes during the past five centuries, cliff erosion has resulted in many villages being swept away. The rate of this erosion of the land has been calculated to be on an average of $2\frac{1}{4}$ yards per year, and Kilnsea village (situated at the northern extremity of Spurn peninsula) which now is within a stone's throw of the sea, is shown on the earlier maps as being over half a mile from the sea. There has been over 670 feet of land erosion in 70 years at this point. On the other hand, most of the land adjacent to Spurn on the Humber side has been reclaimed from the Humber. Sea-dykes shut out the sea and prevent the flood tides covering a large section of the land between Spurn and Hessle.

Spurn itself, geologically speaking, is of recent formation, and has existed since the early struggles between the Humber and the North Sea. However, the first mention of Spurn was made in 1273 when an island of stones and sand thrown up at the mouth of the Humber was taken over by the Earl of Albermarle, and a town built thereon. There was no record of the island being connected to the mainland until the fourteenth century, when in the chronicles of Meaux Abbey, a description of Spurn is given as ' a sandy causeway hardly a bow's range in width, only slightly elevated above the surface of the surrounding waters, and strewn in all directions with yellow and rounded pebbles.' The shape must have been very similar to the Spurn of to-day, for we are told that the town of Odd-juxta-Ravenser was at the end of the peninsula, four miles from Easington and that the village of Kilnsea lay midway between the two. The town of Odd was washed away between 1356 and 1367 and there was nothing left of the place at the end of the fourteenth century. But the peninsula was still traversable by foot for half a mile from the shore and owing to the danger to shipping a beacon was erected there about 1428. Spurn Point must have been at some distance to the North-east of its present position, for calculations have shown that for the 200 years prior to 1875 the average rate of movement westward was 23 yards per annum, and the southward extension $13\frac{1}{2}$ yards per annum. No outline of Spurn is shown on Leyland's map, published during the reign of Henry VIII, but for the reasons given it must have existed, and in Laxton's map of Yorkshire published in 1577, Spurn re-appears and is called Spurn Head. Owing to the absence of protection the strong tides washed away parts of the peninsula at varying intervals, and it was not until 1852, when a serious attempt was made to safeguard this precarious road to the lighthouse (which had by this time been erected at the point) that Spurn Head ceased to be an island.

The Spurn peninsula, extending from Kilnsea village, can be divided for the purpose of this brief ecological survey into six regions :

1. The marshy meadow land situated on the right of the road leading from the village of Kilnsea to the Warren.
2. The Kilnsea Warren.
3. The main ridge, which is continuous for over three miles from the village of Kilnsea and which can be sub-divided into North, Central and Southern parts.

4. The salt marsh, flooded by the highest tides, which lies on the Humber side of the old chalk wall.
5. The mud flats of the Humber shore.
6. The seashore.

THE MARSH MEADOWS

The plants which are found in the Marsh Meadows are generally in contrast to those plants found in the other regions of the peninsula, being those characteristic of moist places, with a stiff clayey soil. Here are found several species of the family Juncaceae, such as *Juncus conglomeratus* L. (common rush), *J. inflexus* L. (hard rush), *J. articulatus* L. (shining fruited rush), *J. acutiflorus* Hoffm. in the wet shallow pools; and by the Humber shore *J. gerardii* Lois. In the brackish dykes the family Cyperaceae is represented by *Scirpus maritimus* L. A species of Sedge found here is *Carex flacca* Schreb. *Phragmites communis* Trin. (common reed) grows rather thinly here, but appears to be increasing. Other grasses such as *Deschampsia caespitosa* (L.) Beauv. (tufted hairgrass), *Briza media* L. (common quaking-grass) and *Cynosurus cristatus* L. (crested dog's-tail) are found in the drier places. *Angelica sylvestris* L. (angelica), *Blackstonia perfoliata* (L.) Huds. (Yellow wort), *Polygonum amphibium* L. (amphibious polygonum), *Oenanthe fistulosa* L. (water dropwort) and *Poterium sanguisorba* L. (salad burnet) grow in the moister areas, whilst on the raised clayey soil by the side of the dykes and on the higher mounds, such plants as *Petroselinum crispum* (Mill.) Nym. (wild parsley), *Matricaria inodora* L. (scentless may-weed) and *Prunella vulgaris* L. (selfheal) flourish. *Picris echioides* L. (bristly oxtongue) thrives in the shadier places and *Potentilla anserina* L. (silverweed) and *Trifolium fragiferum* L. (strawberry-headed trefoil) inhabit the stiff soil close to the Humber shore.

KILNSEA WARREN

The main ridge of Spurn protects the flat lower lying sandy Warren from the winds blowing off the sea, with the result that this locality is rich in its variety of plants. In consequence of the sheltered position of the Warren, it was here that many years ago the cottage known as Warren Cottage was built. It is this cottage which was taken over in 1945 as a research station for Bird Study and which has been used by the entomologists as the centre from which they have worked. During the war (1939-1945) this area was used as a camp for the artillery stationed on Spurn and a large part of the Warren area was covered with huts. Many of these huts have now been taken down, but are still lying about, making the place unsightly and preventing the planting of bushes and shrubs. The result of the wartime disturbance has, to some extent, affected the flora of the district. However, the list of plants found in the Warren is very lengthy, and only an account of the more common species will be given.

On the east side of the Warren is a large hollow where water collects to a depth of from 4 in. to 8 in. during the wet season. A large bed of *Phragmites communis* Trin. covers most of this area, and has spread during the past few years to and across the railway. Were it not for the efforts of the linesmen, the Common Reed would quickly cover the rail track. *Carex paniculata* L. (tussock sedge) grows here. *Juncus gerardii* Lois., *J. inflexus* L. (hard rush) and *J. articulatus* L. are found in the vicinity of the wet hollows. Another species of Cyperaceae found on the Warren is *Carex arenaria* L. (sand sedge). *Ammophila arenaria* (L.) Link (Marram grass) is the dominant member of the Gramineae. The widespread roots of the Marram bind the sand, whilst the grass itself assists in forming a barrier to the wind-blown sand which piles up around the tufts, forming small hillocks. The grass continues to spread, more sand is blown on to it and arrested by the Marram. Gradually, as a result, certain parts of the Warren have become covered with small sand dunes. It is here that the rabbit finds conditions suitable for burrowing and a colony of these animals has given the name to the locality. Rabbits, as well as man, are a biotic factor which affects a locality and by keeping down the various grasses by nibbling the young shoots, have enabled decumbent plants to obtain light and air and thereby to spread and obtain a hold in the Warren in the dune hollows. Shelducks use the rabbit holes as nesting sites, whilst the rabbit droppings play some part in the fertilisation of the sandy soil, which, though not naturally rich in humus is well supplied with lime from the large

quantity of shells washed up among the sand. The roots of other grasses, for example, *Bromus hordeaceus* L. (soft brome-grass), *Aira praecox* L. (early hair grass), *Anthoxanthum odoratum* L. (the sweet vernal grass), *Poa pratensis* L. (meadow-grass), *Poa annua* L. (annual meadow-grass), *Dactylis glomerata* L. (cock's-foot), *Holcus lanatus* L. (Yorkshire fog), *Festuca rubra* L. (red fescue) and *Agropyron repens* (L.) Beauv. (couch-grass or twitch) have obtained a hold on the Warren and assist to some extent to fasten the sandy soil.

Around the remains of the huts in the shelter of the Warren bank *Cerastium vulgatum* L. (mouse-ear chickweed), *Stellaria media* (L.) Vill. and *Cerastium tetrandrum* Curt. are plentiful. The seeds of *Atriplex hortensis* L. (orache) and *Senecio vulgaris* L. (groundsel) are in plentiful supply for the numerous finches that visit the Warren. *Vicia sativa* L. (common vetch), *V. lathyroides* L. (spring vetch) and *V. tenuissima* (Bieb.) Schinz and Thell. (slender vetch) are not uncommon on the Warren. The spring vetch is found on the drier banks, and the other two vetches on the damper soil. *Ononis repens* L. (rest-harrow) *Trifolium arvense* L. (hare's-foot trefoil), *T. striatum* L. (knotted trefoil), *Lotus corniculatus* L. (bird's-foot trefoil), are other species of Leguminosae growing on the Warren and it should be mentioned here that *Lupinus arboreus* Sims (tree lupin) seed was set, unfortunately without much success, around the area of the Heligoland trap to grow into cover for the migrant birds. R. D'O. Good has recently (1946) found *Trifolium suffocatum* L. another of the Leguminosae, growing near the Warren. *Tragopogon pratensis* L. (goat's-beard), *Sonchus asper* (L.) Hill (sow thistle), *Senecio jacobaea* L. (ragwort), *Rumex crispus* L. (curled dock), *Picris echioides* L. (oxtongue), *Epilobium parviflorum* Schreb. (hoary willow-herb), *Dipsacus fullonum* L. (wild teasel), *Knautia arvensis* (L.) Coult. (field scabious), *Agrimonia eupatoria* L. (agrimony), *Alchemilla vulgaris* L. (lady's-mantle), *Centaurea nigra* L. (knapweed), *Crepis capillaris* (L.) Wallr. (smooth hawk's beard), *Cichorium intybus* L. (chicory), *Erigeron acris* L. (fleabane), *Geranium molle* L. (dove's-foot cranesbill), *Erodium cicutarium* (L.) Ait. (common stork's-bill) and *Centaurium umbellatum* Gilib. (centaury) are all found in the vicinity of the Warren cottage garden and give some indication of the variety of the flora. The old garden, though it has been badly cut down and damaged during the past few years, contains one *Pinus sylvestris* L. (scotch pine), several *Prunus insititia* L. (bullace), a number of *Acer pseudo-platanus* L. (sycamores), and one *Sorbus aria* (L.) Grantz (white-beam). *Ligustrum vulgare* L. (privet) is dominant, many of the plants growing to a height of over ten feet. *Sambucus nigra* L. (elder) is growing in one corner of the garden, and it is proposed to plant very many more shrubs of this species as it affords both cover and, in the autumn, food for the migrant birds. A secondary growth of *Rubus fructicosus* L. (bramble), *Torilis anthriscus* (L.) Gmel. (hedge parsley), *Apium graveolens* L. (wild celery), and *Veronica officinalis* L. (speedwell) forms a very useful cover for the skulking birds. During the war years an attempt was made by the troops stationed in the huts on the Warren to cultivate the soil. Many of the brassicas ran to seed when the camp was abandoned, and have taken root in a number of places in the camp, which was situated close to the Warren cottage. These gardens are now covered with plants of the genera *Brassica* and *Atriplex*, *Senecio vulgaris* L. (groundsel) and *Atriplex patula* L. (orache) and *Anagallis arvensis* L. (scarlet pimpernel) grow in profusion through the brick paths made between the huts. *Claytonia perfoliata* Willd. is now quite common around the Warren.

### THE SALT MARSH

During the strong N.N.W. gales of 1849 a breach 320 yards wide was made in the land about half a mile north of the lighthouse. This breach during high tide of the ordinary spring tides held over 12 ft. of water at that time and it was decided to close the gap and to prevent further washing away at this point by the erection of a chalk wall. The movement of Spurn westwards is well illustrated at this point, for to-day this chalk wall is over 100 yards from the high tide of the Humber at its most southerly point and over 40 yards at the northern end. Sand dunes have formed near to the Humber, and the Humber water at high tides flow through an opening of this dune barrier at its northern end and covers the land between the dunes and the chalk wall. This is now a salt marsh with a channel about two feet deep and a yard wide running down the middle. The plants found

here have typically thick fleshy stems and leaves adapted to conserve water when the salt marsh dries. *Salicornia stricta* Dum. (glasswort), *Salsola kali* L. (saltwort), *Suaeda maritima* (L.) Dum. (herbaceous seablite), *Glaux maritima* L. (sea milkwort), *Arenaria peploides* L. (sea purslane), *Aster tripolium* L. (sea aster) and *Obione portulacoides* (L.) Moq. (shrubby sea purslane) are abundant. *Carex arenaria* L. (sand sedge), *Cochlearia anglica* L. (scurvy grass), *Cakile maritima* Scop. (sea rocket), *Calystegia soldanella* (L.) R.Br. (sea bindweed) are not uncommon near the wall. Here and there are plants of *Limonium vulgare* Mill. (common sea lavender) while in the drier places are found *Sedum acre* L. (yellow stonecrop), *Plantago coronopus* L. (buck's-horn plantain) and *Festuca ovina* L. (sheep's fescue). Many species of these plants are seeding during the autumn migration season and attract large numbers of birds.

### THE MAIN RIDGE AND THE SEASHORE

The main ridge, extending for nearly four miles from Kilnsea (which is only 17 feet above ordnance datum) consists of dune ridges of different ages. The soil being loose and porous, is apparently dry, but wells, which the War Department have sunk here, reveal that a good supply of fresh water lies underneath. The dominant plants along the main ridge are *Hippophaë rhamnoides* L. (sea buckthorn) and *Ammophila arenaria* (L.) Link (Marram). Where humus has been added to the soil by these plants dying, and especially in the dune hollows, or where the Buckthorn has been cut down—as it has been in places used as bases for the construction of concrete sea defences—plants such as *Carex arenaria* L. (sand sedge), *Eryngium maritimum* L. (sea holly), *Senecio jacobaea* L. (ragwort), *Calystegia soldanella* (L.) R.Br. (sea convolvulus), *Ononis repens* L. (restharrow) and *Tussilago farfara* L. (coltsfoot) grow in some profusion. It is interesting to note that when the old sand dunes at the Point were disturbed in the Spring of 1949, by being flattened by a ' bulldozer,' *Cakile maritima* Scop. (sea rocket) became dominant the following summer. In the following year sea rocket was comparatively scarce in this area and *Carduus tenuiflorus* Curt. (slender thistle) was abundant. In certain places dense growths of *Hippophaë rhamnoides* L. (sea buckthorn) with occasional *Sambucus nigra* L. (elder) and *Crataegus oxyacanthoides* Thuill. (hawthorn) covers large areas. In the late autumn the sea buckthorn is thick with bright orange-coloured berries—the area having the odour of a cider factory. The position of these areas is indicated on the accompanying map. Rabbits are abundant in these areas ; the marram has disappeared, in consequence of their efforts, from some places and plants such as *Cerastium tetrandrum* Curt. (mouse-ear chickweed) and *Sedum acre* L. (stonecrop) have become common in these patches. It is over this closely cropped ground that flycatchers and warblers hawk for flies, the birds taking up some point of vantage on the buckthorn growing around. The newer dunes which are being formed on the seaward side of the main ridge, between the narrow neck and the lighthouse have been aided in their growth by the sea-groynes, and also by certain barriers put up during the war for the defence of Spurn. These young dunes, which have become leached of salt, are now inhabited by *Obione portulacoides* (L.) Moq. (sea purslane) and *Cakile maritima* Scop. (sea rocket).

### THE HUMBER SHORE

The mud flats of the Humber mouth are rich in animal life subsisting on the food brought down by the water. Sewage and other refuse which flows into the Humber from various places along the banks is deposited towards the mouth, to some extent, when the flow of the fresh water is stopped by the flow of the tide. Green Algae, *Zostera*, and, within recent years, *Spartina townsendii* H. and J. Groves, hold the mud together. *Arenicola* (lugworms) are very abundant in the mud flats around Kilnsea, and *Perinereis cultrifera* (Grube) (ragworms) are found along the Humber shore. On the sand flats which border the estuary *Cardium edule* L. (common cockles) are found and on the rocks near Greedy Gut are clusters of *Mytilus edulis* L. (mussels). *Crangon vulgaris* L. (common shrimp) is very abundant. When the cutting running through the salt marsh dries, thousands of Shrimps are left on the mud—giving some indication of the vast numbers of shrimps which inhabit the mud flats proper.

In addition to the published historical information, I am greatly indebted to Professor D'Oyley Good of the Hull University College, for his kindly assistance in the checking of the names of the various plant species which I have given in these notes. I am also greatly indebted to the Y.N.U. Committee of the Bird Ringing and Observation Station without whose help the organisation of the Station would have been impossible.

## II. NOTES ON THE GENERAL ZOOLOGY OF SPURN

P. M. BUTLER

The area studied at Spurn is new land. The greater part of it has been formed by the accumulation of wind-blown sand, aided mainly by the marram grass (*Ammophila arenaria*). In course of time the dunes are stabilised by becoming completely covered with vegetation, a layer of soil is formed on the surface of the sand, and the marram disappears, as in the Warren area. On the Humber shore, land is being formed in a different way, by the gradual elevation and drying out of mudflats. Plants also play a part in this : *Spartina townsendii* has been planted on the mud with a view to reclamation, and in the salt-marsh area near the chalk wall *Obione portulacoides* and *Salicornia* sp. have helped to raise the level to near that reached by high water of spring tides. Each of the types of new land provides a set of environmental conditions very different from those normally found inland, and the common inland species of animals and plants are largely replaced by species adapted to live in the peculiar conditions. Phytophagous species of animals have to feed on the sand-dune and salt-marsh plants, and all the animals have to be able to live in the unusual physical environment.

On the North Sea side of the peninsula the sandy beach is fully exposed to wave action, and breakwaters have been constructed to hinder erosion ; on this shore new dunes are to be found only near the tip of the peninsula. Quieter conditions on the Humber shore have resulted in the deposition of estuarine mud, but the beach is sandy from about half-tide level upwards, and new dunes occur along a great part of this shore. The sandy beach provides little foothold for seaweeds, but *Fucus vesiculosus* L. and *Enteromorpha* sp. occur on pebbles near the chalk wall and on breakwaters on the North Sea shore. As would be expected, animals associated with rocky shores are mostly missing, though *Littorina saxatilis* (Oliv.) is common among pebbles on the Humber shore, and small numbers of *L. littorea* (L.) also occur ; a few barnacles, a small sea-anemone and a few hydroids were also found, and *Ligia oceanica* (L.) occurs on the breakwaters at high-tide level. A Staphylinid, *Diglotta mersa* (Hal.) was found well down the shore, associated with barnacles and *Enteromorpha*. Sandhoppers are abundant on the sandy shore, especially near high-tide level where an accumulation of tidal debris provides them with food. On the Humber shore the debris is in many places thrown by very high tides among the coastal belt of land plants, consisting mainly of *Arenaria peploides*, *Agropyron junceum* and *Elymus arenarius* ; it supports a varied population of springtails, staphylinids, small Diptera and other insects, as well as mites, and the woodlice *Porcellio scaber* Latr. and *Armadillidium vulgare* (Latr.). In the same association occur pseudoscorpions and the carabid, *Broscus cephalotes* (L.).

The newly-formed marram dunes, where the loose sand is mainly uncovered by vegetation, support a peculiar association of animals. The vegetarian species feed almost entirely on the marram, mainly underground, and all the species found here have to deal with great changes of temperature, extreme drought, and with the shifting sand. Insects from moister habitats blown into the new dunes by the wind die in large numbers, and their bodies may provide a source of food. The beginnings of humus formation are shown by the death of marram stems and leaves, forming tufts in which shelter can be obtained. Gradually the surface of the sand between the marram tufts becomes compacted, lichens playing a part in the process, and various other species of plants begin to become associated with the marram. In other places sea-buckthorn (*Hippophaë rhamnoides*) becomes associated with the marram at an early stage in the succession, and its dead leaves accumulating on the sand provide shelter as well as food for animals, such as the woodlouse *Porcellio scaber* and the millepede *Cylindroiulus oweni*. The sea-buckthorn also provides shade and protection from wind, and thus assists in the development of

mosses and a variety of flowering plants, as well as species of animals which cannot withstand the dry conditions of the new dunes, for example the woodlouse *Philoscia muscorum* (Scop.). Where the ground is firm enough colonies of the ant *Myrmica ruginodis* Nyl. are established. The snails *Helicella virgata* Da Costa, *H. caperata* Mont. and *Cepaea nemoralis* L. form an important part of the marram fauna. The number of species of animals increases as the vegetation becomes more varied, and the process is carried further in the Warren area, where a layer of turf has formed over the surface of the sand, and the marram has been replaced entirely by other plants. Most of the species of animals found in the Warren area are widely distributed inland.

The mud-flats of the Humber shore are the home of numerous burrowing animals, notably the worms *Nereis diversicolor* Müll. and *Arenicola marina* L. Crabs (*Carcinus maenas* (Penn.) are abundant, and judging from shells cast up on the beach, numerous molluscs must occur in deeper water. The small mollusc *Sabanaea ulvae* (Penn.) is abundant on the mud, especially among the tufts of *Spartina*. In the salt-marsh near the chalk wall the mud has dried out and is colonised by *Atriplex portulacoides*. This is the home of the mollusc *Phytia myosotis* (Drap.), and in the cracks in the mud occur the sand-hopper *Orchestia gammarella* (Pall.), the woodlouse *Armadillidium vulgare* and a number of carabids such as *Dicheirotrichus gustavii* Crotch, and *Pogonus chalceus* (Msh.). A patch of dried mud with cracks near the railway is colonised almost entirely by *Glaux maritima* ; it is probably converted into a shallow brackish pool in the winter. An advanced stage in the succession is seen near the northern end of the chalk wall, where the ground is covered with a sward of low plants, of which *Lotus corniculatus* is prominent ; this area is much grazed by rabbits whose burrows are numerous in an adjacent area of sea-buckthorn. The Marsh Meadow probably also represents a late stage in the mud-flat succession ; the vegetation has been modified by the grazing of cattle, and is very much like that of the Warren area.

The brackish water conditions of Walker Butts Bank Dyke are in some respects like those of the salt-marsh area near the chalk wall, but there is permanent water in the lower end of the dyke, near the sea, and the drying out of the upper end is seasonal, not tidal. The vegetation of the dyke consists largely of *Enteromorpha* and *Ruppia* at its lower end, and *Scirpus maritimus* in the part that becomes dry. Where the water is most permanent there is a large population of *Nereis diversicolor* and *Carcinus maenas*, which occur on the mud-flats of the shore. With these are the brackish-water crustacea *Palaemonetes varians* (Leach), *Gammarus zaddachi* Sexton, *Corophium volutator* (Pall.) and *Sphaeroma rugicauda* Leach, the mollusc *Hydrobia ventrosa* Mont., stickleback (*Gasterosteus aculeatus* L.), the dipteran *Stratiomys furcata* (F.) and a number of insects which also occur in fresh water, such as *Corixa stagnalis* Leach, and the water-beetles *Enochrus bicolor* (F.) and *Agabus conspersus* (Msh.), which though occuring in the ponds are most abundant in the dyke. The sandhopper *Orchestia gammarella* occurs in the dried mud. A considerable number of spiders, mainly *Aranea reaumuri*, occur along the dyke. The Boundary Dyke joins Walker Butts Bank Dyke at its lower end, where it has a similar fauna, but it is less subject to drying, and is probably less salt away from the sea. In the other inland water habitats the water is almost or entirely fresh, the only source of salt being wind-blown sand and spray. Permanent fresh water occurs in the bomb-crater in the Warren, the landmine crater in Marsh Meadow, and the pond in Marsh Meadow near the road. Each of these has its own peculiarities, but the fauna and flora of the ponds as a whole is very distinct from those of the brackish water dykes. Water-crowfoot (*Ranunculus* sp.) is the main plant, and the animals include toad tadpoles (*Bufo bufo* L.), the snail *Limnaea peregra* Müll., dragon-fly nymphs, and various fresh-water beetles and Corixids. The earthworm *Eiseniella tetraedra* (Sav.) is common in the mud of the banks. In the Warren there is an extensive swampy area overgrown with reeds (*Phragmites communis*). This tends to become deficient in oxygen and almost completely dries up in the summer, but larvae of the great crested newt (*Triturus palustris* L.) were found in small pools left in this area, and the snail *Limnaea truncatula* Müll. which can stand some exposure to air, also occurs here. The damp conditions in and near the swamp provide a suitable habitat for a number of moisture-loving terrestrial animals, such as the snail *Cochlicopa lubrica* Mull. and the woodlouse *Trichoniscus pusillus* Brandt.

Apart from operations to resist erosion, human activity has had little effect on

the fauna of the peninsula. The cultivated land next to the Warren is outside the area studied. Horses and cattle graze on the Warren and Marsh Meadow and must have some effect on the flora, as well as providing dung in which insects can feed. Some of the insects collected near the cottage, particularly moths caught at night, may have come from adjacent cultivated land. Gardening operations round the cottage have caused the introduction of a number of species of plants, with their associated insects, as well as some earthworms like *Allolobophora chlorotica* (Sav.) and the snail *Helix aspersa* Mull., which also occurs round the buildings at the end of the peninsula. The group of trees round the cottage has been planted. Accumulations of wood and other materials from huts pulled down at the end of the war provide shelter for moisture-loving animals, including several species of molluscs. The nests of humble-bees and field-mice were frequently found under the boards. Finally, round or inside the cottage there occur species that are normally associated with man, such as the house-mouse, rat, house-sparrow, housefly, and the moth *Endrosis sarcitrella* (L.).

## III. GENERAL ENTOMOLOGY OF THE AREAS

W. D. HINCKS

### 1. MARRAM GRASS AREAS

The dominant plant is of course the Marram Grass (*Ammophila arenaria* (L.) Link.). On the newer dunes the vegetation consists entirely of marram but in most places there is a greater or lesser admixture of other plants which accounts for the presence of a number of insects not attached in any way to the marram itself.

The main dunes are marked on the map though marram grass has a much wider distribution at Spurn than this would seem to show, for instance there is a quantity of it along the railway lines south of the Warren and elsewhere.

Much of our collecting was done in the marram conveniently situated on the Humber shore a few yards from the cottage. Indeed this spot proved to be the most productive of all the dunes examined, especially in June, 1947, when a considerable population of insects was found to be present in the grass-tufts. This was dislodged by parting and shaking the grass—without uprooting it—especially on the sloping sides of dunes when the insects came tumbling out and could be taken in small tubes or with an aspirator.

These dunes were never again quite so productive as in 1947 although they continued to yield some additions each year. Perhaps the thorough searching of the first visit almost exhausted the possibilities of the habitat but we certainly found insects more abundant in individuals and species on that occasion than on any other. The time of the year and the moister climatic conditions of 1947 might have been important factors.

The Humber marram in 1947 did not produce however, any adult *Euchlora* (*Anomala*) and very few *Cleonus* but both these typical marram species were abundant one hot day (18th June, 1947) on marram on the sea-side above the Lighthouse. In comparison with the dunes on the sea-side of the peninsula those on the more sheltered Humber shore proved to be generally much richer in insect life. Although no adult *Euchlora* were found on the Humber marram in 1947, some larvae occurred at the roots of the grass and several were found to be attacked by the predaceous larvae of *Thereva annulata* F. These flies, rare in July and absent in August, form one of the dominant features of the sandy areas, marram and otherwise, and literally swarm in mid-June. They were only just emerging in early June 1950. The flies themselves were also noted as the prey of one of the abundant Lycosid spiders of the marram areas (*Pirata piratica* Oliv.). These and other spiders are in turn preyed upon by the spider-wasps *Pompilus plumbeus* (F.) and *Episyron rufipes* (L.). Individuals of the first species simply swarm on the sandy areas of the peninsula in June and represent another prominent feature of the insect life at that time. Their numbers dwindle in July and August when they are replaced by smaller populations of other spider-wasps. It seems extraordinary that the great numbers of individuals of these Pompilids and Therevids should be able to support themselves here and that their hosts should be able to survive at all.

In early June, 1950, the dominant phytophagous beetle over the whole peninsula, including the marram areas, was *Phyllobius pyri* (L.) which was flying and walking about in incredible numbers. It is remarkable that during all visits made later in the year—from mid-June, 1947 onwards, this beetle was hardly noticed, no more than a few stray specimens being seen. Weevils of the genus *Phyllobius* are spring insects and even at the time of our 1950 visit *P. pyri* was dying off in vast numbers. The beetle seemed ill-adapted to life in such a medium as sand on which they were incapable of walking and seemed destined to die on their backs in the hot sun. To a smaller extent weevils of the genus *Sitona* were also a prominent feature of the beetle fauna at the same time. By the middle or end of June these weevils are gone and their places are taken by large numbers of *Philopedon plagiatus* (Schaller), a weevil well adjusted to the exigences of life in the marram areas.

Conditions of life on the dunes must be very exacting indeed. The loose shifting sand makes it difficult for insects to retain a foothold and exposure to winds adds to the instability of the ground. The surface is almost completely exposed to the fullest effects of the sun and in dry seasons the mortality amongst arenicolous insects is very high. In August, 1949, after a hot dry spell earlier in the year, little drifts of insect remains were found in small depressions around the roots of the marram, resulting from the action of the wind. These mortuaries were everywhere in the marram areas and contained many remains of ants, weevils and other arenicolous insects. The following is an analysis of the contents of one of these small depressions :

COLEOPTERA : 1, *Aphodius subterraneus* (L.) ; 1, *Sermylassa halensis* (L.) ; 3, *Longitarsus jacobaeae* (Wat.) ; 1, *Phylan gibbus* (F.) ; 1, *Otiorrhynchus ovatus* (L.) ; 2, *Philopedon plagiatus* (Marsham). HEMIPTERA : 1, *Heterogaster urticae* (F.) ; 2, *Euacanthus interruptus* (L.). HYMENOPTERA : many *Myrmica ruginodis* Nyl. DIPTERA : 1, *Syrphus* sp. CRUSTACEA : 1 woodlouse.

Several of the well-known arenicolous Coleoptera were found on the dunes, some of them in considerable numbers, but these specialised beetles were far fewer than on the more extensive sandhills of the Lancashire coast. Associated with them was a number of predaceous ground-beetles of the genera *Dromius*, *Risophilus*, *Calathus*, etc., and the abundant Coccinellids *Rhyzobius* and *Coccidula*. Phytophagous beetles, except for the epigeal arenicoles, were not numerous either in species or individuals and were usually present in the marram because of the admixture of other plants.

An interesting group of insects which was particularly prominent in the marram areas when it was carefully searched, consisted of a number of small wingless or brachypterous aculeate and parasitic Hymenoptera resembling ants in general appearance. Several Dryinids were fairly plentiful and extremely ant-like in movement and appearance. The wingless Ichneumonid genus *Gelis* was numerously represented by individuals of several species and the allied brachypterous *Hemiteles inaequalis* (Foerster) occurred with them. The ant-nest beetle, *Drusilla canaliculata* (F.) was rather common, running amongst the marram and several ant-like Chalcids and Proctotrupids formed part of the same association. Lastly the ants themselves (*Myrmica*) were abundant in the marram grass accompanied by the above mentioned insects. This subject will be dealt with in more detail in the Hymenoptera report.

Parasitic Hymenoptera, usually attacking the caterpillars of moths and sawflies, were taken fairly plentifully by sweeping marram but most of the species were doubtless casuals. A phytophagous Chalcid of the genus *Harmolita* which appears to be *H. hyalipenne* (Walker) was very plentiful. It is well-known as producing galls on couch-grass (*Agropyron repens* (L.) Beauv.). It was not noted what plant served as its host on the dunes but possibly it is the sea couch-grass (*A. junceum* (L.) Beauv.).

With the exception of *Euchlora* and *Cleonus* most of the marram insects are very small and lurk in the tufts of the grass where such shelter, shade and moisture as the environment offers is to be found. With the insects are found spiders and mites, plentiful in individuals though of few species.

(*To be continued*)

# AUTUMN FUNGUS FORAY
## Malton, 23rd—26th September, 1950

W. G. BRAMLEY

THE autumn Foray of 1950 will remain in the memory of most of those taking part as one of the poorest for many years. The weather turned out to be the worst the writer remembers, cold and wet, though fortunately most of the collecting time was dry. The preceding month had also been of like character and this was reflected in the scarcity of fungi, especially the agarics and larger Basidiomycetes. This was not restricted to the small area of our investigations for correspondence shows it to have been widespread throughout the country.

Thirteen members and friends had assembled at headquarters on the Friday. It was a pleasure to have with us once more Dr. Grainger, who since his removal to Auchincruive has been unable to join us for some time. Unfortunately we had not the company of our southern members and friends, but we hope to see them again collecting Yorkshire fungi in the near future.

On Saturday we visited Castle Howard with its famous avenues of limes and its lake. Leaving the latter, attention was paid to the trees and parkland, most of which was under arable cultivation. Agarics were few in number and baskets remained light. Some attention, chiefly by the Chairman, Mr. Webster, was paid to the micro-fungi, but even here it was mainly the Pyrenomycetes which were collected as the swampiness of the vegetation made the Hyphomycetes mostly unrecognisable. The following morning was not propitious and was spent indoors. After an early lunch Castle Howard was again visited when most attention was paid to the lake side. Light rain did not improve the already drenched vegetation. Later the party split, one half examining woods outside the park, whilst the remainder visited Buttercrambe where they found conditions slightly better.

Monday found us at Hovingham and the first impressions were that this was more fruitful ground. Two or three species of *Cortinarius*, *Craterellus* and several species of *Lactarius* and *Russula* were in evidence, but these thinned out as beech changed to oak. A little time was spent in searching for truffles and one species was found in small quantity when ominous sounds of thunder were heard. The storm quickly advanced down the valley and a general move was made for cover and by the time this was reached rain had started and soon became heavy. By the time the inner man was satisfied, there seemed to be no signs of the rain abating, so after ten minutes search by two of us in a nearby larch plantation, the cars were turned for Headquarters.

To comply with finance regulations the Union has to show that it is a non-profit making body. To this end a public lecture or demonstration is given annually. For many years it has fallen to the lot of the Mycological Committee to do this. Opportunity was taken of Dr. Grainger's presence for him to give to the local branch of the Farmers' Union some account of fungi as they affect the agricultural community. Some forty to fifty members of the Malton N.F.U. turned up to hear a most interesting and informative lecture.

It has often been noted in a poor season for fungi that interesting or rare forms often turn up. This Foray has proved rather an exception and nothing really striking was found. *Psalliota augusta* was new to most of us and proved to be more than the writer could manage at one meal. Hygrophori were very scarce. *Russula fellea* was the most abundant species of that genus at Castle Howard, whereas at Hovingham *R. ochroleuca* took its place and no *R. fellea* was noted.

Finally I have to thank all who collected and brought in material and helped with the identifications. Lists have been received from Mr. Webster (Pyreno- and Hyphomycetes), Messrs. Collinge and Broadbent, who assiduously collected Myxomycetes. To Miss Wakefield, Dr. Dennis and Mr. A. A. Pearson gratitude is expressed for their kindness in looking at material and giving help with its determination. Accession numbers refer to University Herbarium, Sheffield.

C.=Castle Howard. H.=Hovingham. M.=Malton.
Yk.=in herb. Yorkshire Museum, York.
† Not in Mason and Grainger. * Not in Mason and Grainger for V.C. 62.
‡ New to Britain.

### MYXOMYCETES

*Arcyria denudata* Wettstein
*Ceratiomyxa fruticulosa* Macbr.
*Comatricha nigra* Schroet.
*C. nigra* var. *elegans* Lister
*Craterium minutum* Fries
*Diderma floriforme* Pers.
*D. montanum* Meylan.
*Stemonitis fusca* Roth.
*S. fusca* var. *confluens* Lister
*Trichia varia* Pers.
*Tubifera ferruginosa* Gmel.

## PHYCOMYCETES

*Bremia lactucae* Regel, on *Sonchus*. C.
*Cystopus candidus* (Pers.) de Bary, on *Capsella*. M.
*Peronospora parasitica* (Pers.) Tul., on *Capsella*. M.
*P. trifoliorum* de Bary, on *Trifolium*. M.
*P. violae* de Bary, on *V. tricolor*. M.
*Phytophthora infestans* (Mont.) de Bary C.M.
*Plasmopara nivea* (Unger) Schroet., on *Angelica*. C.
*Protomyces macrosporus* Unger, on *Aegopodium*. M.

## ASCOMYCETES

### PLECTASCALES

*Elaphomyces granulatus* Fr. C. 1002.

### ERYSIPHALES

*Erysiphe graminis* DC., on *Arrhenatherum* and *Dactylis*, C.
*E. polygoni* DC., on *P. aviculare*, M. on *Heracleum*, C.H. on *Anthriscus*. C.
‡*Microthyrium culmigenum* Syd., on *Dactylis*. C. 883.
*Podosphaera oxyacanthae* (DC.) de Bary, on *Crataegus*. M.
*Sphaerotheca humuli* (DC.) Burr., an *Oidium* on *Senecio jacobaea* may belong here.

### DISCOMYCETALES

*Aleuria vesiculosa* (Bull.) Boud. C.
*Bulgaria inquinans* (Pers.) Fr., on *Quercus*. H.
*Calycella* (*Helotium*) *citrinum* (Hedgw.) Quel. C.
*Chlorosplenium aeruginosum* (Oeder) de Not., on *Tilia*. C. 998.
*Cilliaria scutellata* (Linn.) Quel. C.
*Coryne sarcoides* (Jacq.) Tul. C.
*Cudoniella acicularis* (Bull.) Schroet. C.
*Cyathicula coronata* (Bull.) de Not. C. 999.
*Dasyscypha* (*Erinella*) *apala* (B. & Br.) Dennis, on *Juncus*. C. Yk.
*D. brevipila* le Gal. (=*calyculiformis* Rehm.), on *Fagus*. C. Yk.
†*D. controversa* (Cooke) Rehm., on *Phalaris*. C.
†*D. carneola* (Sacc.) Sacc., on *Dactylis*. C. 937. 953.
**D. nidulus* (S. & K.) Mass., on *Epilobium angustifolium*. H.
*D. nivea* (Hedw. ex Fr.) Sacc., on *Quercus*. C.
*D. palearum* (Desm.) Mass., on Wheat straw. M.
*D. sulphureum* (Pers. ex Fr.) Mass., on *Urtica*. C.
*Galactinia badia* (Pers.) Boud. C.
*Helotium fructigenum* (Bull.) Fuckel, on *Fagus* cupules. C. Yk.
*H. herbarum* (Pers.) Fr., on *Epilobium*. H. Yk.
*Helvella crispa* (Scop.) Fr. C. Yk.
*Hyaloscyphella* tax. sp. 1 of Dennis, on *Larix*. C.H. (=*D. calycina* (Schum.) Fuckel).
*Leptopodia elastica* (Bull.) Boud. C. Yk.
*Mollisia atrata* (Pers.) Karst., on *Arctium*. H.
*M. cinerea* (Batsch.) Fr. C.H.
†*M. phalaris* Rehm., on *Phalaris*. C.
*Ombrophillus clavus* (A. & S.) Cooke C. Yk.
*Peziza aurantia* Pers. C.
*Polydesmia pruinosa* (B. & Br.) Boud. C.
*Pseudopeziza trifolii* (Biv.-Bern.) Fuckel, on *T. dubium*. M. Yk.
*Rhytisma acerinum* (Pers.) Fr. C.H.
*Tuber puberulum* B. & Br. H. 1003.

### HYPOCREALES

**Cromocrea gelatinosa* (Tode) Seaver, on *Fagus*. C. 1000.
*Dialonectria peziza* (Tode) Cooke, on *Fagus* and *Polyporus*. C.
*Hypomyces aurantius* (Pers.) Tul., on *Polyporus*. C.

### SPHAERIALES

**Anthostoma decipiens* (DC.) Nits., on *Ulmus*. M.
*Bertia moriformis* (Tode ex Fr.) de Not., on *Fagus*. C. 952.
*Chaetomium elatum* Kunze, on Wheat straw. M.C. 934.

SPHAERIALES—*continued*

†*Ceratostomella cirrhosa* (Pers. ex Fr.) Fr., on *Fagus*. C. 994a.
†*Diaporthe hederae* Wehm., on *Hedera*. C. Yk.
†*D. impulsa* (Cooke & Peck) Sacc., on *Sorbus*. C. 989.
*D. leiphaemia* (Fr.) Sacc., on *Quercus*. H.
*Diatrype disciformis* (Hoffm. ex Fr.) Fr., on *Fagus*. C. 984.
*D. stigma* (Hoffm. ex Fr.) Fr., on *Fagus*. C. 995.
*Diatrypella quercina* (Pers. ex Fr.) Cooke, on *Quercus*. C. 940.
†*Eutype flavo-virens* (Pers. ex Fr.) Tul., on *Fagus*. C. 951.
*Hypoxylon coccineum* Bull., on *Fagus*. C. 945. H.
*H. multiforme* (Fr.) Fr., on *Fagus*. C. 944, on *Betula*. H.
*Lasiosphaeria hirsuta* (Fr.) Ces. & de Not., on *Tilia*. C. 942. on *Fagus*. H. 983.
*L. ovina* (Pers. ex Fr.) Ces. & de Not., on *Fagus*. C.
†*Leptosphaeria fuckelii* Niesll., on *Phalaris*. C. 982.
*Ophiobolus rubellus* (Pers. ex Fr.) Sacc., on *Umbellifer*. H. 950.
†*Ophiostoma piceae* (Munch.) Syd., on *Quercus*. C. 935.
*Rosellinia aquila* (Fr.) de Not., on *Salix*. C. 936.
*Ustulina deusta* (Hoffm. ex Fr.) Petrak, on *Fagus*. C. 941. on *Sambucus*. H. 946.
*Valsa ambiens* (Pers. ex Fr.) Fr., on *Fagus*. C. 993.

## BASIDIOMYCETES

UREDINALES

**Coleosporium petasitis* Lev., II, III. H.
**C. senecionis* (Pers.) Tul., II, on *S. vulgaris*. M.
*C. tussilaginis* Tul., II, III. M.
*Melampsora rostrupii* Wagner, II, on *Populus alba*. C.
*Melampsoridium betulinum* (Pers.) Kleb., II. C.H.
*Phragmidium rubi* (Pers.) Wint., III, on *R. caesius*. M.
**Pucciniastrum pustulatum* Diet., II, III. C.H.
**Puccinia antirrhini* Ditt., II, III, on *A. majus*. M.
*P. baryi* Wint., II, on *Brachypodium*. H.
*P. caricis* (Schum.) Reb., OI, on *Urtica*. II, III on *Carex* sp. C.
**P. celakovskyana* Bub., II, III, on *Galium cruciata*. M.
*P. centaurea* DC., II, III, on *C. nigra*. M.
†*P. centaurea* DC., f. *scabiosa* Hasl., II, III, on *C. scabiosa*. M. Yk., S. and W.B.G.
†*P. cirsii-lanceolatum* Schroet., II, III. M.
*P. expansa* Link, III, on *S. aquatica* and *S. jacobaea*. H.M.
*P. leontodontis* Jacky, III, on *L. autumnalis*. M.
*P. lolii* Niels., II, III, on *Arrhenatherum*. C.M. *Festuca sp*. C. *Holcus*. C.M. *Lolium*. M.
*P. malvacearum* Mont., on *M. sylvestris*. M.
*P. menthae* Pers., III, on *M. aquatica*. C.
†*P. pygmaea* Erikss., II, on *Calamagrostis epigeios* Roth., C. W.G.B.
*P. taraxaci* Plowr., II, on *Taraxacum*. M.
*Uromyces alchemillae* Lev., III. H.
*U. dactylidis* Otth., III. C.H.M.
*U. fabae* (Pers.) de Bary, II, III, on *Vicia cracca*. M. W.G.B.
*U. polygoni* (Pers.) Fuckel, III, on *P. aviculare*. M.
*U. rumicis* (Schum.) Wint., II, III, on *R. conglomeratus*. M.

USTILAGINALES

†*Entyloma ranunculi* Schroët., on *Ranunculus repens*. H. Generally found on *R. Ficaria* but my specimens show both conidia and oospores conforming to this species and not to *E. microsporum* which is usually found on *R. repens*.
*Urocystis anemones* (Pers.) Wint., on *R. repens*. M.
*Ustilago longissima* (Sow. ex Schlect.) Meyen., on *Glyceria aquatica*. M.
*U. succisae* Magn. (pp *scabiosae* (Sow.) Wint.), on *S. succisa*. M.
†*U. utriculosa* (Nees.) Tul., on *Polygonum hydropiper*. M. Yk.
*U. violacea* (Pers.) Fuckel, on *Melandrium dioicum*. H.

AGARICALES

*Amanita excelsa* Fr. (=*spissa*). C.
*A. phalloides* (Vaill.) Fr. C.
*A. rubescens* (Pers.) Fr. C.
*Amanitopsis fulva* (Grev.) Rea. C.
*Armillaria mellea* (Vahl.) Fr. C.H.
*A. mucida* (Schrad.) Fr. C.H.
*Boletus badius* Fr. C.
*B. chrysenteron* (Bull.) Fr. C.H.
*B. edulis* (Bull.) Fr. C.
*B. impolitus* Fr. H.
*B. scaber* (Bull.) Krombh. C.
*B. subtomentosus* (Linn.) Fr. C.
*Cantharellus cibarius* Fr. C.H.
*Clitocybe nebularis* (Batsch.) Fr. H.
*C. odora* (Bull.) Fr. C.
*Clitopilus prunulus* (Scop.) Fr. C.
*Collybia butyracea* (Fr.) Bull. C.H.
*C. maculata* (A. et S.) Fr. C.
*C. radicata* (Relh.) Berk. C.
*Coprinus atramentarius* (Bull.) Fr. C.
*C. comatus* (Fl. Dan.) Fr. C.
*C. micaceus* (Bull.) Fr. C.
*C. picaceus* (Bull.) Fr. C.
*Cortinarius decoloratus* Fr. H.
*C. glaucopus* (Schaeff.) Fr. H.
**C. testaceus* Cooke. C.
*Craterellus cornucopioides* (Linn.) Fr. H.
*Flammula lenta* (Pers.) Fr. C.
*F. sapinea* Fr. C.H.
*Galera tenera* (Schaeff.) Fr. C.H.
*Hygrophorus coccineus* (Schaeff.) Fr. H.
*H. eburneus* (Bull.) Fr. H.
*H. laetus* (Pers.) Fr. C.
*H. pratensis* (Pers.) Fr. C.H.
*Hypholoma fasciculare* (Huds.) Fr. C.
*H. sublateritium* (Schaeff.) Fr. H.
**Inocybe cervicolor* (Pers.) Quel. C.
*I. fastigiata* (Schaeff.) Fr. C.
*I. geophylla* (Sow.) Fr. C.
*I. geophylla* var. *lilacina* Fr. H.
*Laccaria amethystina* (Vaill.) Cooke C.H.
*L. laccata* (Scop.) B. & Br. C.
*Lactarius blennius* Fr. C.H.
*L. mitissimus* Fr. C.
*L. plumbeus* Fr. C.
*L. rufus* (Scop.) Fr. H.
*L. subdulcis* (Pers.) Fr. C.H.
*Lepiota acutesquamosa* (Weinm.) Fr. C.
**L. castanea* Quel. H.
*L. cristata* (A. et S.) Fr. H.
*L. granulosa* (Batsch.) Fr. C.
*L. mastoidea* Fr. C.
*Lepiota procera* (Scop.) Fr. C.
*Marasmius acervatus* (Fr.) Pearson & Dennis H. (=*erythropus*)
*M. dryophilus* (Bull.) Karst. C.
*M. hariolorum* (DC.) Quel. C.
*M. oreades* (Bolt.) Fr. C.
*M. peronatus* (Bolt) Fr. C.H.
*M. rotula* (Scop.) Fr. C.
*Mycena adonis* (Bull.) Fr. C.
*M. epipterygia* (Scop.) Fr. C.
*M. galericulata* (Scop.) Fr. C.H.
*M. galopus* (Pers.) Fr. C.H.
*M. hematopus* (Pers.) Fr. C.
*M. inclinata* Fr. C. (=*prolifera* (Sow.) Fr.).
*M. lactea* (Pers.) Fr. H.
*M. pura* (Pers.) Fr.
*Naucoria escharoides* Fr. C.
*Panaeolus campanulatus* (Linn.) Fr. H.M.
*Paxillus involutus* (Batsch.) Fr. C.H.
*Pholiota adiposa* Fr. C.
*P. spectabilis* Fr. C.
*P. squarrosa* (Mull.) Fr. C.
*Pleurotus applicatus* (Batsch.) Fr., on *Fagus*. C.
*P. cyphelliformis* Berk., on *Epilobium*. H.
*P. dryinus* (Pers.) Fr. C.
*Pluteus cervinus* (Schaeff.) Fr. C.H.
*P. nanus* (Pers.) Fr. C.
*Psalliota augusta* Fr. C.
*P. sylvatica* (Schaeff.) Fr.
*P. xanthoderma* Genev. M.
*Psathyrella atomata* Fr. C.H.
*Psilocybe semilanceata* Fr. C.
*Russula atropurpurea* (Krombh.) Maire. C.
*R. cyanoxantha* (Schaeff.) Fr. C.H.
*R. emetica* (Schaeff.) Fr. C.H.
*R. fellea* Fr. C.
*R. nigricans* Fr. C.H.
*R. ochroleuca* (Pers.) Fr. C.H.
*Stropharia aeruginosa* (Curt.) Fr. C.
*S. albocyanea* (Desm.) Fr. C.
*S. inuncta* Fr. C.
*S. semiglobata* (Batsch.) Fr. C.H.M.
*Tricholoma personatum* Fr. C.
*T. rutilans* (Schaeff.) Fr. C.
*T. saponaceum* Fr. var. *squamosum* Cooke C.H.
*T. scalpturum* Fr. (=*argyraceum* (Bull.) Fr.). C.
*T. terreum* (Schaeff.) Fr. H.

APHYLLOPHORALES

*Acia uda* (Fr.) B. & G., on *Fagus*. C.H.
*Clavaria cinerea* (Bull.) Fr. C.
*C. dissipabilis* Britzl. C.
*Coniophora puteana* (Schum.) Karst., on *Tilia*. C.992. H.
*Corticium comedens* (Nees) Fr., on *Quercus*. C.

APHYLLOPHORALES—*continued*

*Corticium confluens* Fr. M.
*C. sambuci* (Pers.) Fr., on *Hedera*, *Tilia*. C.
*C. sulphureum* (Pers. ex Fr.) Fr. (=*Phlebia vaga* Fr. =*Hyphochnus fumosus* (Fr.) Bres.).
*Cyphella capula* (Holmsk.) Fr. M.
*Daedalea quercina* (Linn.) Fr., on *Quercus*. C.
*Fistulina hepatica* (Huds.) Fr., on *Castanea* C. on *Quercus*. H.
*Ganoderma applanatum* (Pers.) Pat., on *Fagus*. C.
*Grandinia granulosa* Fr., on *Fagus*. C.
*Hydnum repandum* (Linn.) Fr. H.
*Irpex obliquus* (Schrad.) Fr. C.
*Merulius rufus* (Pers.) Fr., on *Fagus* C. Yk.
*M. tremellosus* (Schrad.) Fr. C. 943.
*Mycoleptodon fimbriatum* (Pers.) Bourd. H.
*Peniophora cinerea* (Fr.) Cooke, on *Fagus*. C. on *Fraxinus*. H.
*Peniophora cremea* Bres., on *Fagus*. C. Yk.
*P. pallidula* Bres., on *Populus*. C. Yk.
*P. pubera* (Fr.) Sacc., on *Populus*. C. Yk.
*P. setigera* (Fr.) Bres., on *Tilia*. C. Yk.
*Phlebia merismoides* Fr., on *Fagus*. C.
*Pistillaria culmigena* Mont., on *Juncus*. C.
*Polyporus adustus* (Willd.) Fr. C.
*P. caesius* (Schrad.) Fr. C.
*P. giganteus* (Pers.) Fr. C.
*P. squamosus* (Huds.) Fr. C.M.
*Polystictus versicolor* (Linn.) Fr. C.
*Solenia anomala* (Pers.) Fr. C.
*Stereum hirsutum* (Willd.) Fr. C.H.M.
*S. rugosum* (Pers.) Fr. C.
*Trametes gibbosa* (Pers.) Fr., on *Fagus*. C. 996.
*T. mollis* (Sommerf.) Fr., on *Fagus* C.

FUNGI IMPERFECTI

COELOMYCETES

†*Ascochyta microspora* Trail, on *Petasites*. H.
†*Cytospora carphosperma* Fr., on *Tilia*. C. 939.
†*Thyrsidium botryosporium* Sacc., on *Fagus*. C. 948. H. 997.

HYPHOMYCETES

*Acrostalagmus cinnabarinus* Corda, on *Polyporus*. C.
*Cercospora mercurialis* Passer, on *Mercurialis*. C.
*Cladosporium herbarum* (Pers.) Link, on *Polyporus*. C.
†*Helminthosporium longipilum* Corda (conidial *Melanomma subdispersum* (Karst.) Berl. & Vogl.), on *Betula*. C.
†*H. turbinatum* B. & Br., on *Epilobium angustifolium*. H. 987.
†*Mastigosporium rubricosum* (Dearn. & Barth.) R. Sprague, on *Dactylis*. C.
*Monotospora sphaerocephala* B. & Br., on *Fagus*. C. 994b.
*Sepidonium chrysospermum* (Bull.) Fr., on *Boletus*. H.
†*Tetraploa aristata* B. & Br., on *Dactylis*. C. 956.
*Torula herbarum* Link, on *Umbellifers*. C.H.
*Trichothecium roseum* Link, on *Fraxinus* twigs. M.

## FIELD NOTE

***Ephemerum serratum* (Hedw.) Hampe. var. *augustifolium* B. and S., a new County Record.**—This is one of the smallest of our mosses and probably the absence of records reflects this feature. It is only noticeable on bare soil by the difference in colour caused by its presence. Stems and leaves are not developed, the whole plant consisting of a green algal-like protonema upon which buds appear and form a few bract-like leaves enclosing ultimately a sessile, roundish, spore capsule. In this state it was collected from two low-lying pasture fields in the Calder Valley near Mytholmroyd, V.C. 63, in October, 1950. As the type also occurs in the same area it has been possible to compare them. The differences are as stated in H. N. Dixon's *Handbook*, the smaller finely papillose spores of the variety being very distinct. This moss should be looked for where *Pleuridium axillare*, *Fissidens exilis* or *Fossombronia pusilla* appear.

Dr. E. F. Warburg has confirmed the record.—H. Walsh.

## BOOK REVIEWS

**Birds and Men,** by **E. M. Nicholson.** *The New Naturalist, No.* 17. Pp. 256, with 40 colour and 32 black and white plates. Collins, 21/-.

This book, as its title suggests, is concerned with the impact of civilisation and the works of man upon bird life. For such a subject no author better qualified than Mr. E. M. Nicholson could have been found, for he has played a big part in this country in steering British ornithological work away from the isolated recording of rarities into co-operative observation designed to throw clearer light on how birds live. If some have thought that Mr. Nicholson's teaching has savoured at times rather uncompromisingly of planning and ' science ' at the expense of many of the humbler delights of bird-watching as a hobby, untrammelled by the uncomfortable feeling that the observer must as a duty make some biological contribution, his keenest critic could not but agree that the results of his work as here presented make a contribution to our knowledge of birds both stimulating to the thinking naturalist and of absorbing general interest.

Apart from opening and concluding chapters on the general effect of man on nature, the book is divided into three parts : the birds of the farmlands ; of gardens, orchards and hedgerows ; and of towns and buildings. Each of these sections is followed by a series of life histories of the chief species involved. These are very well done indeed, with a width of ecological interpretation that lifts them far above the usual catalogue of facts into which such histories so often descend, and which in any case are best obtained from such sources as *The Handbook*. Mr. Nicholson's eye is clearly never shut, though his duties take him to 10 Downing Street or to the Potsdam Conference, though he is in such an unpromising bird-haunt as a slum or so fertile a one as a wood in May. His descriptions of the habitat preferences of his species reveal a penetrating insight, which only considerable personal experience could have given, and these form perhaps the most valuable part of the book.

His appreciations of the economic position of a number of his species are most stimulating. His assessment of the complicated economic status of the rook is is not only a brilliant précis of the existing data, but at the same time a well-timed warning of the pit-falls which await the unwary interpreter of such evidence. It is however, to be regretted that the editors of the series have apparently debarred the author from dealing with the effects of forestry on birds. It appears that this matter will be dealt with in a subsequent book on woodland birds. Nevertheless, it is a pity that such an obvious and important piece of man-created interference could not have had a real part in a book of this title. Reservoirs and sewage-farms also receive rather scanty treatment.

The present volume, as with all in this excellent series, is lavishly illustrated, and the black and white plates admirably fit the text. About the colour-photographs, or rather the quality of their reproduction, it is less easy to be enthusiastic. Some (*e.g.* little owl and swift) are delightful, but some of the others do not please—it seems that in this country we have yet to learn the technique of colour-reproduction with sufficient certainty to ensure that the excellent original transparencies are correctly reproduced. Messrs. Collins are, however, to be congratulated on their courage in these days of ever-rising costs in continuing to illustrate this series as handsomely.

G. K. YEATES.

**Flamingo City** by **G. K. Yeates, F.R.P.S.** Pp. 209, with 44 photographs (6 in colour), 6 × 9¼. Country Life Ltd., London. 25/- net.

To me, whilst reading, this book has been reminiscent of a certain music hall programme of long ago, in which, mingled with the performances of the earlier lesser artistes, came bursts of bag-pipe music, and humorous Scottish allusions, all leading to the appearance of the star-turn with a twisted stick. For Lauder substitute Flamingo. Having finished the book, with much enjoyment, the similarity subsided, for this is an all-star programme. The book treats of the Camargue, visited and revisited, and still with a fabulous store of ornithological riches to be explored (but not exploited one hopes). Hoopoes and Orioles, Bee-eaters and Rollers, Crested, Short-toed, and Calandra Larks, Purple Herons and Pratincoles, Avocets and Terns (whiskered and Gull-billed), flit in the picture between the pages, leading to the star of stars—the Flamingo. A map is followed by an appendix entitled, ' A Review of our Knowledge of the Flamingo,' in which the literature concerning the species, from Wm. Dampier to the Chapmans (Northumbrian and American), Salim Ali, and Gallet, is surveyed by the latest of Flamingoists. The book is beautifully produced.

Yeates' sustained vigorous prose, displays his avid appetite for ornithological lore, and the energy that rose superior to mistral cold and sweltering heat alike. He supplies good reading matter, and contributes to our knowledge to an extent that can only be ignored at our peril. When he becomes ' infuriated ' by bird behaviour, or awards the rank of species to a variety or possible race of Reed-Buntings, we smile contentedly, so solid are his merits. The Flamingo photographs are very beautiful, and most of the others, but one could wish the effects of fierce sunlight upon an Avocet's plumage had been handled as satisfactorily. For the colour photographs of Flamingo, Purple Heron, Pratincole, and Bee-eater I have nothing but the highest praise. R. C.

**Studies in Bird Migration,** by **Gustaf Rudebeck.** Supplement to *Vår Fågelvärld*. Berlingska Boktryckeriet, Lund 1950. Limp cover, pp. 148, price 11 Kr.

This book describes and interprets observations made by the author and his friends at Falsterbo (southern tip of Sweden) during the periods August 13th to October 22nd, 1942, July 25th to November 1st, 1943, and August 1st to November 12th, 1944. ' Connection between bird migration and weather,' especially of migrating raptores ; ' Differences in the rate of reaction upon Meteorological changes ' are headings of chapters that indicate aspects of the author's special concern. Other chapters discuss ' broadfronts,' ' routes ' and ' guiding-lines,' ' Migratory divides,' and other sides of the broad question, and are followed by lists of species that (1) rarely or never migrate towards the south-west in Europe, and (2) which entirely, or at least partly migrate towards the south-west. Certain species in list (1) are marked to denote more regular, but still rare, migrations in that quarter. Amongst such is *Muscicapa parva* (Red-breasted Flycatcher), a species that we of the Spurn Bird Observatory have been trying to remove from the category of ' irregular or accidental occurence ' to that of ' regular but rare occurrence '—five occurrences in all Yorkshire in *all* years up to 1945 ; and eight occurences since at Spurn alone !

After a few ' important ' species, mainly raptores and crows, have been discussed individually, the book ends with a tabular presentation of counts of daily passage by 70 species over the cited periods in 1942, 1943 and 1944, which, with a table of times and places, occupies some 60 pages. Here is Mr. Rudebeck's data. The tables show considerable specific diversities as to numbers, peaks, and dates in the three years. It is a pity that the similar data contained in the books of the Spurn Bird Observatory did not begin to be compiled on an inclusive scale until 1947, for comparisions would have been interesting. The occurrence of individual Chaffinches, Willow-Warblers, Blackbirds, etc., at Spurn that have travelled to and from Sweden has been proved several times recently by ringed birds recovered both in Sweden and at Spurn.

Mr. Rudebeck has made an interesting and thoughtful contribution to our knowledge. He accepted no data from those of insufficient ornithological attainment, or from those unlikely to think objectively. He insists on separate treatment of every bird since ' its ecological demands are no less specific than its morphological structure.' Migration is indeed, ' a hugh complex of problems ' with ' indefinite possibilities for new aspects and new investigations,' and with 'far-reaching consequences to the animals themselves,' concerning which our present knowledge only allows us ' to form a very vague picture of what is going on.' This book will help to make the picture a little less vague. R. C.

**Footnotes to Dawn Song** (1/-) ; **Dawn Song and All Day** (two numbers (1/6 each) ). 22 pp. in all. Published by the Bird Research Station, Glanton, Northumberland. Ornithologist : Noble Rollin.

In No. 1, Mr. C. Noble Rollin shows the relationship between the volume of ' song units ' and the weight of a bird's gonads, aided by experiments with male domestic fowls and a Song-thrush. Development of the reproductive organs could no doubt be related with any of the other manifestations of the breeding season, and was long ago related with the impulse of certain birds to migrate. Cyclic phenomena are not causes.

No. 2 is more interesting. Here Mr. Rollin bases his relation of the passage of dusk to the cessation of song by the Song-thrush, upon observations made by

many people on June 5th, 1949, from Surrey and Sussex northward to Aberdeenshire. Whereas singing ended in Yorkshire districts from 9-14 to 9-25 p.m., Surrey Song-thrushes ceased to sing from 8-43 to 8-50 p.m., and in Aberdeenshire one Song-thrush sang its last note at 10 p.m. ' The light available varied 114 minutes. The average singing day varied—a matter of 77 minutes.' Rather different results were obtained on April 21st and May 16th.

No. 3 deals with song output in different phases of the breeding seasons of Song-thrush and Blackbird, and aspects of Nos. 1 and 2 are summarised and discussed.

R. C.

**Nature Interlude. A book of Natural History Quotations.** Compiled by **E. F. Linssen.** Pp. 256. Williams and Norgate, 12/6.

This book is addressed to the naturalist, but what will be the nature of its appeal to him? His approach is supposed to be realistic and based on a knowledge of the facts of Nature. The poet has a different point of view. He is concerned with his own emotional reaction to facts. When his emotions are expressed in beautiful language and with the heightening given by poetic rhythm his words become memorable. Most naturalists who have felt the emotional thrill of their pursuit will find an added pleasure in reading such jewels of thought as are collected here.

The vague title of the book tells us little about its contents. Fortunately the sub-title is more explicit, especially if we keep in mind what Brian Vesey-Fitzgerald stresses in the Foreword that the book is not an Anthology. Quotations are short. Here they are often of only one line and the longest extends to fifty lines. They are not all from poetry, as prose, usually poetic prose, provides a fair share. They are aranged by subjects, the first section being on Animals, ranging from Mammals to Molluces ; the second on Plants and a third miscellaneous section on Nature.

Within this framework there is an astonishing variety. Approximately three hundred and fifty authors are quoted, ranging in time from the Old Testament and Homer to Aldous Huxley and recent contributors to Punch and in space from England as a centre to the Continent, America and the rest of the literary world.

The subjects of the quotations are equally varied. Here are a few : Axolotl, Lemming, Scorpion, Crossbill, Minnow, Greenfly, Oyster, Pineapple, Alga, Banyan and Cactoblastis.

The preface remarks that some fine point of natural history is often embodied attractively in a poem. This is true and is one of the most rewarding features of this book to a naturalist. Shakespeare's ' There the snake throws her enamelled skin ' and Pope's ' The spider's touch how exquisitely fine feels at each thread and lives along the line,' are such jewels shining with a light compounded of accurate observation and words of beauty. Occasionally however the poet goes sadly astray. Few field botanists reading ' I am a watery weed ' would guess that Blake was here beginning a poem on the Lily-of-the-Valley.

Proverbial wisdom, humorous verse, prose and true poetry are all included. Save that some of our more prosaic poets are given too much space, *e.g.* James Thomson who receives the largest share, the selection could not easily have been bettered, for poetry of the highest order is represented and names which the world acclaims as those of the greatest genius freely occur. Altogether this is a book to be read, pondered, and its signposts to further enjoyment followed.

A. M. S.

**Seaweeds and their Uses,** by **V. J. Chapman.** Pp. 287, with 20 half-tone plates and 52 text illustrations. Methuen and Co. Ltd., 25/-.

Few people are probably fully aware of the widespread and increasing use that is made of seaweed products for a wide variety of purposes in industry and in the home at the present time. Seaweeds have been used by man for many centuries and in the past have played a particularly important part in the lives of the peoples of Japan, China and Indonesia ; up to the outbreak of war in 1939 Japan was the main exporter of seaweed products, especially agar, on any commercial scale, and it was the cutting off of these supplies that turned the attention of the Allies to the importance of using their own resources.

Agar is a substance of carbohydrate nature which has gel-forming properties which render it an ideal solid substrate for the culture of micro-organisms in

medical and industrial work and it was particularly in this connexion that the loss of supplies was serious at the outbreak of war, but its particular gelatinous properties have also led to its use for innumerable purposes in the confectionery, pharmaceutical and other trades. Oarweeds are large plants but present difficulties in harvesting and transport. They give a good yield of alginic acid, which is also a carbohydrate derivative and has many of the gel-forming properties of agar in place of which it is gradually being used more and more. It also has salt-forming properties which have made it possible to use alginic acid as a source of synthetic textile fibres ; up to date these are not entirely satisfactory for many purposes, but are much used in the industry as subsidiary fibres which may be woven into fabrics and subsequently removed owing to their special solubility properties so as to produce special effects in fancy fabrics.

Professor Chapman, as Professor of Botany at Auckland University College, is in a country which is active in the utilisation of its seaweed resources. He opens his book with an introductory chapter on the seaweeds most widely used in commerce, and their distibution. He gives an interesting historical survey of the usages of seaweeds in the past and then deals specifically with seaweeds as sources of iodine, potash, agar, food for animals and man and finally with the most modern aspect of seaweeds in industry and the home in the form of algin. He closes with a survey of the world's seaweed resources. It is most interesting to have this matter collected together into so comprehensive an account and the book is written and illustrated is such a manner as to appeal to both the specialist and the general reader. L. I. S.

**The British Sheepdog,** by **Sydney Moorhouse.** Pp. x + 226, with 9 photographic plates. H. F. and G. Witherby Ltd. 12/6.

A most interesting and at times engrossing account of sheepdogs and sheep. The author begins with a history of the Border Collie and the origin and development of ' Sheepdog Trials.' Written in a lucid, friendly sort of style, the narration holds one's interest without the introduction of any artificial sentiment or excitement. After several chapters on the owners of the more famous dogs, their methods of handling and training, some account is given of sheep and their requirements. Altogether a delightful book which cannot fail to improve the education of almost all its readers. H. H.

**Practical Methods and Hints for Lepidopterists.** The Amateur Entomologist, Vol. IX, Pp. 42, with 6 plates and 47 figures. Amateur Entomolgists' Society, 1 West Ham Lane, London, E. 15, 5/-.

This volume of the Amateur Entomologist is dedicated to the late H. W. Head, to whom a sincere tribute is paid in the introduction.

In the succeeding pages the novice and the veteran lepidopterist can hardly fail to find some item that will be of considerable interest and assistance in his hobby. The work is devoted to that aspect which concerns the living insect, in particular the collection of caterpillars, the rearing and breeding of the imagines and the construction of the necessary equipment. It is in the latter that full scope is given to the ingenuity of the contributors and one is presented with an array of cages and types of materials for constructing them from which it should be possible to select examples to please even the most exacting breeder.

If there is one aspect that is likely to cause some dismay it will be the realisation of the skill which has undoubtedly been applied in the construction of some of the apparatus. One is bound to confess that not everyone has the gift of nimble fingers to manipulate woodwork so that the pieces fit or to achieve success with a soldering iron ! Even so there are plenty of simpler models which should present no difficulty. The instructions are accompanied by very clear diagrams.

In addition, however, to the actual instructions for the construction of the apparatus the reader is given many useful hints on the management of his charges and the peculiarities of behaviour which can be expected in certain cases. This may save a good deal of disappointment and prevent the loss of individuals or broods which may have been eagerly sought.

The reader will gain from the various articles the firm conviction that the various contributors have no doubt that elaborate equipment does not replace careful handling and attention at all stages of the rearing of Lepidoptera.

The concluding chapter on the construction of various types of beating tray will be of interest to students of other orders who often neglect this method of collecting.

This is a very useful publication and one which is likely to be widely consulted by all lepidopterists who aspire to the breeding of their own specimens.

**Collecting Flies (Diptera)** by **L. Parmenter.** The Amateur Entomologists' Society. Leaflet No. 5, Pp. 8, with 8 plates and 1 figure. A.E.S., 1 West Ham Lane, London, E. 15., 2/6.

**Collecting Psocoptera** by **Edward Broadhead.** The Amateur Entomologists' Society. Leaflet No. 21, Pp. 3 with 1 plate and 3 figures. A.E.S., 1 West Ham Lane, London, E. 15, 7*d*.

The information on collecting, killing, pinning, and mounting flies will be found very useful by the beginner. Valuable hints, which are obviously the result of wide practical experience in this order, add merit to the text. The bibliography is comprehensive and the insertion of the names and addresses of experts is also valuable. One is likely, however, to be confused when advised on page one to 'avoid over specialisation' and on page four to 'attempt to exhibit variation in colour and form.' The photographs and drawings are excellent in production but the value of several to beginners is debateable. They would probably have been better served by more illustrations of apparatus and appliances with sketches showing methods of pinning specimens.

The leaflet on Psocoptera is a concise and useful pamphlet describing the general appearances of this unfamiliar group, methods of collecting, preserving, and studying. The matter is clearly arranged and the illustrations are useful, simple, and accurate.

**A List of the Bryophytes of Northumberland,** by **J. B. Duncan.** Trans. Nat. Hist. Soc., Northumberland and Durham, Vol. X, Pt. I, pp. 1-80, 7/6.

The literature on Northumberland bryophytes is notably scanty. The last list of county mosses was issued in 1905, and no complete account of the hepatics has previously been published. Mr. Duncan's paper therefore fills a gap in the works dealing with regional bryophyte floras. The number of species and varieties of mosses (excluding Sphagna) here recorded totals 428, an addition of over 130 to the previous list. The information regarding the distribution of these plants may now be regarded as reasonably complete but there is room for further investigation of the hepatics which are still inadequately worked. There have been relatively few workers at the bryophytes of Northumberland and the results set out in this useful paper owe a great deal to the energy and patient investigations of the author.

**Vascular Plants of Bradford,** by **Frank Peverett.** Pp. 20. Published by the Bradford Naturalists' Society.

This typescript check-list enumerates 456 species of flowering plants and ferns growing within an approximate six-mile radius of Bradford Town Hall. It has clearly been compiled with much care and no single entry arouses suspicion of a faulty determination. On the other hand certain species which almost certainly occur within the area, e.g. *Juncus acutiflorus, Poa pratensis* and *Dryopteris dilatata,* are omitted. *Crataegus oxyacanthoides* is a notable species for the area but is presumbly introduced. Bradfordians of the future will find this a very useful list with which to compare their own records and observations on the local flora.

**UFAW. 24th Annual Report.** (Published by the Universities Federation for Animal Welfare, 284 Regent's Park Road, Finchley, London, N.3).

The Report indicates the wide scope of the work carried out by the Federation. A scientific ecological study of the Wild Rabbit has been carried out with a view to finding humane methods of control. Other subjects under study or observation are humane rat poison; the advantages of electric killing of whales over the explosive harpooning method; care of laboratory animals; electrocution, electric stunning and electric anaesthesia in the killing of cats, dogs and pigs; conditions in cattle markets with special reference to overstocking (too infrequent milking) of cows and the suffering of young calves; and the conditions of conveyance of livestock.

The Federation is helping to counteract the spring-time menace to birds from the activities of egg collectors by re-issuing the coloured poster (price 4*d*.) designed by Fougasse. This puts the bird's point of view with charming wit by caricaturing a diminutive man sitting on a nest and being inspected by a large frowning bird.

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# The NATURALIST



A QUARTERLY
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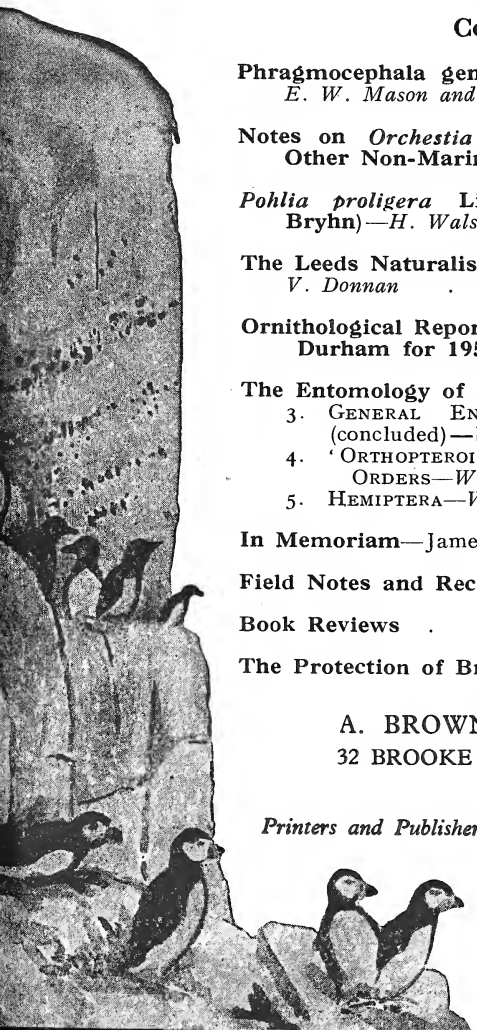

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# YORKSHIRE NATURALISTS' UNION

## PHENOLOGICAL COMMITTEE

Recorders please note that the Phenological Return for the current year should be posted to the Chief Recorder, W. E. L. WATTAM, 302 Newsome Road, Huddersfield, not later than the 1st October next.

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Copies of Mr. A. A. Pearson's Paper 'The Genus Lactarius' and second editions of 'British Boleti' and 'The Genus Russula' may be obtained, price 2/6 each, post free, from the Editor of *The Naturalist.*

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Copies of Dr. J. H. Fidler's 'Coleoptera of Askham Bog' (price 1/-) may be obtained, post free, from The Editor of *The Naturalist.*

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## NOTICE.

Exchange copies of the following periodicals may be had on loan from The Editor of *The Naturalist*, The University, Leeds 2, on receipt of stamped addressed envelope:

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*Irish Naturalists' Journal.*
*Transactions of the Lincolnshire Naturalists' Union.*
*Transactions of the British Mycological Society.*

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# YORKSHIRE NATURALISTS' UNION

## SPURN BIRD OBSERVATORY
## WARREN COTTAGE LETTINGS FOR 1951

The Committee desire to have the spring (March to late May) and the autumnal (end of July to mid-November) migration periods covered completely by competent ringers. Preference will be given to Y.N.U. members as far as possible. Charges continue at the rate of 3/- per night per person. Will those willing and able to take charge for periods please agree them with the Hon. Secretary as early as convenient, giving, if possible, alternative dates and periods? This will enable those who can give time out of the holiday seasons to make their plans and to fill blanks. Visits by those who are not registered ringers, short period and week-end occupation, etc., can then be arranged for other helpers who should also apply early. Visits are often difficult to arrange at short notice. With six occupants the cottage is considered full.

G. H. AINSWORTH (144 Gillshill Road, Hull),
*Hon. Secretary.*

# PHRAGMOCEPHALA GEN. NOV. HYPHOMYCETARUM

E. W. MASON AND S. J. HUGHES
*Commonwealth Mycological Institute, Ferry Lane, Kew, Surrey.*

## Introduction and Summary

In a previous publication (Hughes, *The Naturalist*, 1951, pp. 45-48) it was explained that, in Herb. I.M.I., *Brachysporium obovatum* (Berk.) Sacc. was being taken as the lectotype species of the generic name *Brachysporium* Sacc. and five species were described and illustrated. The excluded cotype species *B. coryneoideum* (de Not.) Sacc. (≡*Helminthosporium coryneoideum* de Not. in *Comm. Soc. Crittog. ital.*, ii, p. 80, 1864) is considered to be congeneric but not conspecific with *Arthrobotryum atrum* Berk. & Br. and with three other species described in this publication. These are not congeneric with *Helminthosporium velutinum* Link ex Fr., the type species of *Helminthosporium* or with *Arthrobotryum stilboideum* Cesati (*Hedwigia*, i, Tab. iv, f.1, 1854), the type species of *Arthrobotryum*, and need to be reclassified in another genus. However, no generic name is known to us that will comfortably include these species. The generic name *Phragmocephala* is proposed to contain them.

*Arthrobotryum atrum* is illustrated and redescribed from the type collection and five others. Up to the present, *A. atrum* has been confused in Herb. I.M.I. and following a revision of the historical collections (in Herb. R.B.G. Kew) and of recent collections in Herb. I.M.I. two distinct taxonomic species emerged. One is *A. atrum* and the other is described as a new species *P. cookei*, with which *A. atrum* var. *majus* Saccardo is probably identical. The differences between *P. cookei* and related species are enumerated. A number of records of *A. atrum* from Yorkshire and published in *The Naturalist* are in fact based upon *P. cookei* ; these are listed.

*P. minima* is illustrated and described as a new species ; *Monotospora setosa* Berk. and Curt., a North American fungus, is reclassified in *Phragmocephala* with a redescription and illustrations.

Every individual collection examined by the staff of the Commonwealth Mycological Institute is given an accession number whether preserved in Herb. I.M.I. or in some other herbarium. These accession numbers are quoted in this paper.

**Phragmocephala** Mason & Hughes gen. nov.

*Fungi imperfecti* phaeophragmosporae siccae Hyphomycetarum.

*Mycelium* immersum vel semi-immersum, ex hyphis septatis, ramosis compositum.

*Conidiophora* simplicia, erecta, septata, brunnea, solitaria vel ex stromate, fasciculata vel stilbacea.

*Conidia* singula in apice conidiophori producta, ovata vel pyriformia, inaequaliter colorata, transverse septata, ad septas non constricta, apice rotundata, basi plana, laevia ; illa conidia ovata, cellulis intermediis 2-3, atrobrunneis vel atris, polaribusque pallidioribus ; illa pyriformia, cellula superiore majore, atrobrunnea vel atra, cellulisque inferioribus parvioribus, pallidioribus.

*Habitat* in caulibus emortuis herbaceis, et in cortice lignoque emortuo arborum.

*Species typica : Phragmocephala cookei* n. sp.

*Species aliae :*

**Phragmocephala atra** (Berk. & Br.) Mason & Hughes comb. nov.
≡*Arthrobotryum atrum* Berk. & Br. in *Ann. & Mag. Nat. Hist.*, ser. 3, iii, p. 361, 1859.

*Phragmocephala minima* Mason & Hughes n. sp.

**Phragmocephala setosa** (Berk. & Curt.) Mason & Hughes comb. nov.
≡*Monotospora setosa* Berk. & Curt. apud Berk. in *Grevillea*, iii, No. 27, p. 101, 1875.

The four species of *Phragmocephala* described in this paper are illustrated together in Fig. 1 A-D.

1. **Phragmocephala cookei** Mason & Hughes n. sp. (type species).

Seventeen more or less recent collections were formerly considered to be identical with *P. atra* but further examination shows that they are distinct. *P. cookei* as described here is based upon them.

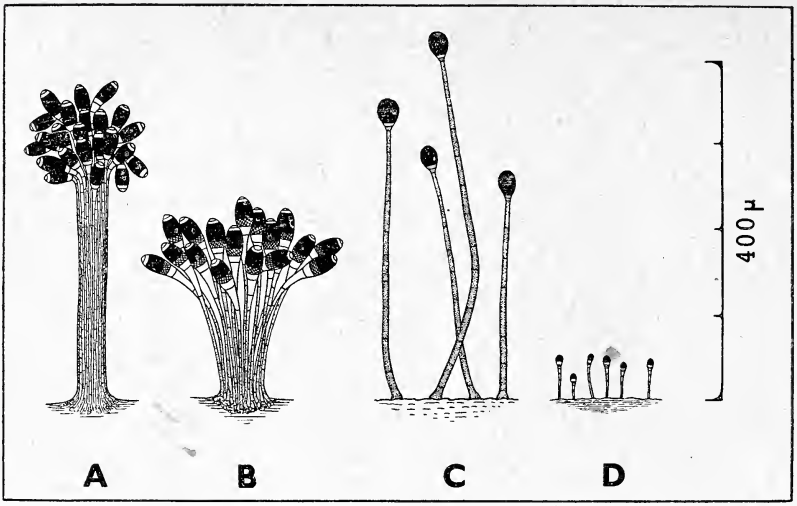


Fig. 1. **Phragmocephala** spp.: **A**, *P. atra*; **B**, *P. cookei*; **C**, *P. setosa*; **D**, *P. minima*.

Collections of *Phragmocephala cookei* from Yorkshire

| *Date* | *Locality* | *Substrate* | *Herb. I.M.I. No.* |
|---|---|---|---|
| 15/4/1946 | Mulgrave Woods | *Filipendula ulmariae* stems | *7047 |
| 16/9/1946 | Forge Valley | *F. ulmariae* stems | *7049 |
| 11/4/1947 | Forge Valley | dead wood (?*Alnus*) | *14480 |
| 18/6/1947 | Thwaite Hall, Cottingham | *Filipendula ulmariae* stems | 17593 |
| 11/10/1947 | Swinton Park, Masham | *Fagus sylvatica* cupules | *1921 (m) |
| 26/9/1948 | Masham | *Filipendula ulmariae* stems | *32232 |
| 26/9/1948 | Swinton Park, Masham | *Fagus sylvatica* cupules | *31600 (a) |
| 14/4/1949 | Bolton Percy | *Filipendula ulmariae* stems | 35646 |

* These collections were recorded sub *Arthrobotryum atrum* Berk. & Br. in *The Naturalist*, 1947, pp. 89, 162; 1948, p. 79 and 1949, p. 82, respectively.

[In the *Monotospora elliptica* Berk. & Br. folder in Herb. R.B.G. Kew, only a single unlabelled collection is preserved; it is *Phragmocephala cookei* (10980). Massee made the combination *Brachysporium ellipticum* (Massee, *Brit. Fungus Flora*, III, p. 414, 1893) but his description could hardly refer to *Phragmocephala cookei*. Furthermore, Berkeley & Broome's figure of *Monotospora elliptica* (Notices of British Fungi, No. 1909—*Ann. & Mag. Nat. Hist.*, ser. 5, vii, p. 130, 1881) is not at all reminiscent of *Phragmocephala cookei* and there is no certainty that this collection was ever considered to be *Monotospora elliptica* by Berkeley & Broome.]

**Phragmocephala cookei** Mason & Hughes sp. nov.

?=*Arthrobotryum atrum* var. *majus* Saccardo in *Michelia*, ii, p. 555, 1882.

*Mycelium* immersum, ex hyphis hyalinis vel subhyalinis, ramosis, septatis, 2-5$\mu$ crassis compositum.

*Stromata* convexa, plerumque superficialia, 45-150$\mu$ lata, usque ad 17$\mu$ alta, ex cellulis 5-10$\mu$ diam. composita.

*Conidiophora* fasciculata (10-80) sed libera, 4- —10-septata, 80-250$\mu$ longa, in stromatibus producta, basi parallela, 4-5$\mu$ crassa, crasso-tunicata, atrobrunnea, apicem versus divergentia, subhyalina, tenui-tunicata, gradatim usque ad 7·5-11$\mu$ crassa, expansa. Cellula superiore 25-90$\mu$ longa.

*Conidia* sicca, singula, in apice conidiophori producta, ovata, laevia, apice rotundata, basi plana (7·5-11$\mu$ crassa), 5- —7-cellulata (plerumque 6-cellulata),

27-46 × 16-22$\mu$, plerumque 35-40 × 18-20$\mu$, cellulis binis centralibus (conjunctim 13-18$\mu$ longis) atrobrunnneis vel atris, polaribusque successive pallidioribus.

*Habitat* in caulibus emortuis *Brassicae* sp., *Epilobii hirsuti*, *Filipendulae*

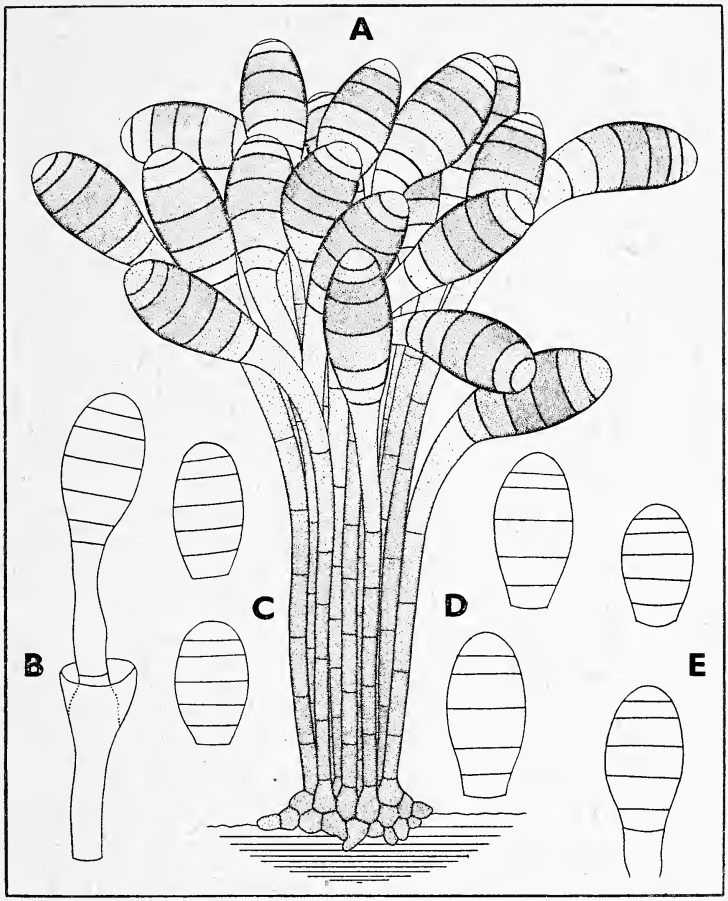


Fig. 2. **Phragmocephala cookei** : **A,** a conidiophore fructification from Herb. I.M.I. 5152, on *Urtica dioica* dead stems, Llanelly, Carms., 6/8/1946 ; **B,** conidiophore proliferating through a ruptured and collapsed conidial initial, from Herb. I.M.I. 25531(c), on *Fagus sylvatica* bark, Oxshott, Surrey, 7/3/1948 ; **C,** two conidia from single collection in *Monotospora elliptica* folder in Herb. R.B.G. Kew [10980] ; **D,** two conidia from the type collection, Cooke, *Fungi Britannici exsiccati* (Ed. 2) 642 sub *Helminthosporium stemphylioides* Corda ; **E,** two conidia from Herb. I.M.I. 19219(m), on *Fagus sylvatica* cupules, Swinton Park, near Masham, Yorks., 11/10/1947 ; all ×500.

*ulmariae*, *Lysimachiae vulgaris*, *Polygoni sieboldii*, *Urticae dioicae* et herbaceis ignotis ; in ligno ignoto (?*Alni*), et cupulis putridis corticeque *Fagi sylvaticae* in Anglia Cambriaque. Cooke, *Fungi Britannici exsiccati* (Editio Secunda) No. 642 sub *Helminthosporio stemphylioideo* Corda in caulibus herbaceis ignotis, prope Wellington, Salop, Anglia est typus.

The species is illustrated in Figs. 1**B** and 2**A** E.

Description of *Phragmocephala cookei*

*Phragmocephala cookei* forms fructifications on dead herbaceous stems, wood and bark of various hosts, and on cupules of *Fagus sylvatica* ; it is found in marshes, woodlands, neglected roadsides and waste ground.

The *colonies* apparently cause no discoloration of the substrate and groups of conidiophores form visible colonies of about 1 cm. across or they may stretch for 6 or 7 cms. along a herbaceous stem.

The *mycelium* is immersed and composed of hyaline to subhyaline, branched, septate hyphae 2 to 5$\mu$ wide which form convex stromata which are usually entirely superficial. These are 45 to 150$\mu$ wide and up to 17$\mu$ high, composed of dark brown, thick-walled cells 5 to 10$\mu$ in diameter. When developed on a smooth surface the stromata may be scraped away almost without trace ; on such a smooth substratum the margins of the stromata are clearly 1-cell thick and sub-fimbriate.

The *conidiophore* fructifications appear as black, shining sheaves, scattered or very crowded. The individual conidiophores are in groups of 10 to 80 ; at the base they are closely adpressed as in a synnema but they are not coherent, separating

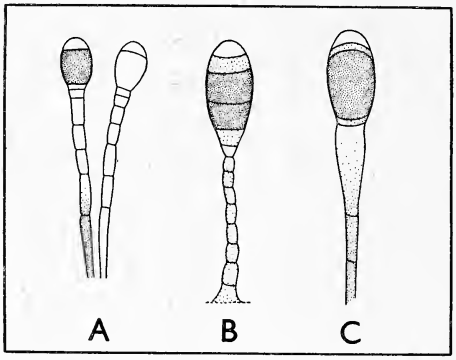


Fig. 3. Reproduction of parts of published figures : **A**, *Helminthosporium coryneoideum* after de Notaris (*loc. cit.*) ; **B**, *H. stemphylioides* after Corda (*loc. cit.*) ; **C**, *Arthrobotryum atrum* var. *majus* after Saccardo (*Fungi italici*, 760).

readily when squashed, and above, they are obviously loose. They thus appear more or less straight below and curved above, diverging outwards from the axis of the fascicle. The basal foot cell which forms part of the stroma is 4 to 8$\mu$ wide ; above this the conidiophores are 4 to 5$\mu$ wide, thick-walled and dark brown for about half or two thirds of their length and then they increase in width gradually to about 7·5 to 11$\mu$ and become thinner walled and paler towards the apex which is subhyaline. They are clearly 4- to 10-septate and 80 to 250$\mu$ long with the upper cell 25 to 90$\mu$ long.

The *conidia* develop singly as the blown-out apex of each conidiophore. At maturity they are oval, smooth, rounded at the apex, flattened at the base which is 7·5 to 11$\mu$ wide, 5- to 7-celled, nearly always 6-celled, measuring 27 to 46 by 16 to 22$\mu$, mostly 35 to 40 by 18 to 20$\mu$. The two central cells (13 to 18$\mu$ long measured together) are very dark brown to almost black ; the two lower truncate cells are successively paler towards the base and the two upper cells which are shorter than the others are similarly paler towards the apex. The second cell from the base is sometimes very dark brown and even almost black but usually it is just slightly paler than the two concolorous central cells. The conidia are detached from the conidiophore either by a break in the conidiophore wall immediately below the basal septum of the conidium or by an irregular tear about half way along the length of the upper, thin-walled cell of the conidiophore. However, there does not appear to be any organised method of conidial detachment.

**Phragmocephala cookei compared with other species**

*P. cookei* and *P. atra*.

*P. cookei* differs from *P. atra* (*a*) in its fasciculate conidiophores which are loose and shorter than those comprising the true synnemata of *P. atra* ; (*b*) in its 6-celled conidia with the two very dark central cells together measuring 13 to 18$\mu$ long, as opposed to the 5-celled conidia of *P. atra* in which the two dark cells (2nd and 3rd from the base) measure together 18 to 28$\mu$ long ; (*c*) in that the conidiophores increase gradually in width towards the apex and the upper cell is 25 to 90$\mu$ long compared with the less gradual increase in width of the conidiophores of *P. atra* in which the end cell is 9 to 24$\mu$ long.

*P. cookei* and *Helminthosporium coryneoideum* de Not.

*P. cookei* differs from *H. coryneoideum* (Fig. 3**A**) (*a*) in its smooth outlined conidiophores with a long apical cell compared with those described for *H. coryneoideum* viz. ' articulis ab imfimis, gradatim brevioribus.' Furthermore, slight constrictions at the septa of the conidiophores were figured by de Notaris, a feature not present in *P. cookei* ; (*b*) in its 6-celled conidia compared with the 5-celled conidia described for *H. coryneoideum* although it is not impossible that de Notaris may have missed the upper thinner septa ; but he did figure the early septation of the conidium and it is surprising if he missed one.

The fascicle of conidiophores figured by de Notaris is extremely reminiscent of *P. cookei* but because of a lack of complete agreement it is considered unwise to assign collections to *H. coryneoideum* which is however a perfectly good *Phragmocephala*.

*P. cookei* and *H. stemphylioides* Corda

*P. cookei* differs from *Helminthosporium stemphylioides* (Fig. 3**B**) (*a*) in its fasciculate conidiophores compared with the solitary and effuse ones described by Corda (Pracht-Flora europaeischer Schimmelbildungen. Leipzig and Dresden, 1839, p. 7) in his *H. stemphylioides*. Corda figured and described the cells of the conidiophores as concolorous, short, constricted at the septa and not increasing in width towards the apex ; (*b*) in the more darkly coloured central cells of *P. cookei* and in the wider basal septum of the basal cell of the conidium ; apart from these characters the conidia are strikingly similar.

*P. cookei* and *Arthrobotryum atrum* var. *majus* Saccardo

*A. atrum* var. *majus* (Fig. 3**C**) was stated by Saccardo to differ from the type ' in its larger conidia, 40-45 × 25, and in its stipe [its mononematous conidiophores] which are more loosely joined in a fascicle and are paler.'

Fig. 3**C** shows the two apical cells, the dark central cell[s] and a paler basal cell ; the long, pale, swollen apical cell of the conidiophore is very characteristic of *P. cookei*. The fasciculate nature of the conidiophores also lead us to the view that Saccardo's variety is probably identical with *P. cookei*.

Ferraris (*Flora italica cryptogama*, 1, Fungi, Hyphales, p. 192, 1910) gave the measurements of the conidia of Saccardo's variety as 35-45 × 20-25$\mu$.

2. **Phragmocephala atra** (Berk. & Br.) Mason & Hughes

Collections maintained as *P. atra*

(*a*) The type collection ' *Arthrobotryum atrum* B. & B. *Stachelminthia atra* B. & B. [on *Urtica dioica* stems]. Batheaston, Dec. 9th, 1858 [scripsit M. J. Berkeley] ' [in Herb. R.B.G. Kew ; 5610].

(*b*) ' *Arthrobotryum atrum* B. & B. [on *Urtica dioica* stems]. Batheaston, Jan., 1864, C.E.B. [roome], [scripsit Broome] ' [in Herb. R.B.G. Kew ; 5611].

(*c*) ' *Arthrobotryum atrum* B. & Br. On nettle. Wood at Charmy Down, Oct. 26/64 [scripsit F. Currey] ' [in Herb. R.B.G. Kew ; 5612].

(*d*) Rabenhorst, *Fungi europaei* 65, sub *Arthrobotryum Broomii* Rabenh. (nomen nudum) on *Urtica dioica*, Batheaston, C. E. Broome [in Herb. R.B.G. Kew ; 44937].

(*e*) Saccardo, *Mycotheca veneta* 1288 sub *Arthrobotryum atrum*, on rotten stems and branches. Italy, Jan. 1878. Spegazzini [in Herb. R.B.G. Kew ; 44938].

(*f*) ' No. 2458, Y.F. Flo. *Arthrobotryum atrum* B. & Br. on dead Nettle stems. Arncliffe-at-the-foot of Tittondale. Aug. 4th, 1907. Y.N.U. Exc. [scripsit Crossland with illustrations by Crossland] ' [in Herb. R.B.G. Kew ; 44936].

In Massee & Crossland's *Fungus flora of Yorkshire* (p. 347. 1905) there are two records of *A. atrum* but we have not seen the collections upon which they were based. Crossland's collection made in 1907 was not, apparently, recorded.

The description that follows is based upon the six collections cited above, some of which are illustrated in Figs. 1**A** and 4**A-C.**

Description of *Phragmocephala atra*

*P. atra* has been found forming fructifications on dead stems of *Urtica dioica*

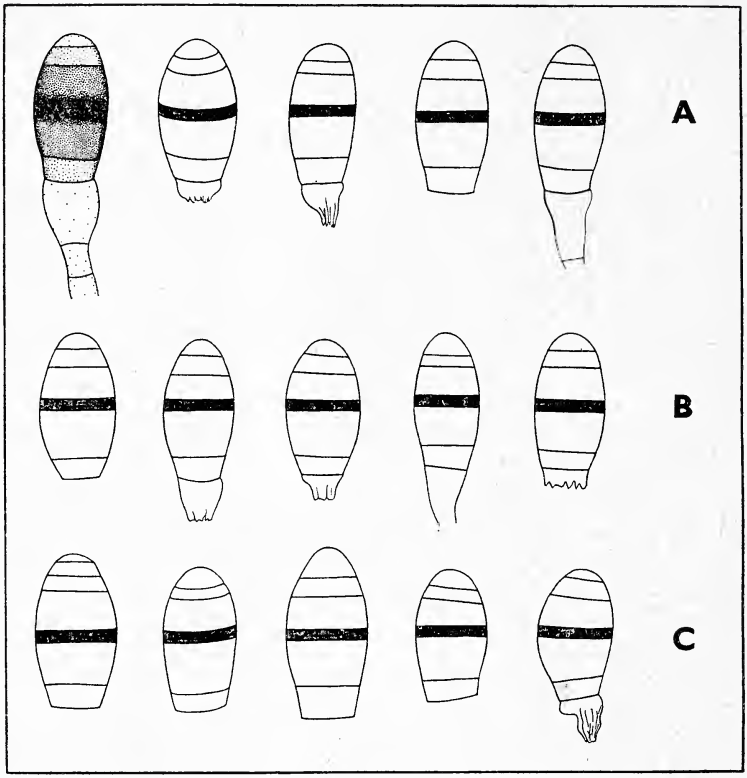


Fig. 4. **Phragmocephala atra** : conidia ; **A,** from the type collection of *Arthrobotryum atrum* in Herb. R.B.G. Kew [5610] ; **B,** from Charles Crossland's collection at ' Arncliffe at the foot of Tittondale,' 4/8/1907, in Herb. R.B.G. Kew [44936] ; **C,** from Saccardo, *Mycotheca veneta*, 1288 collected in Italy by Spegazzini, Jan., 1878, in Herb. R.B.G. Kew [44938] ; all ×500.

in Britain although the most recent collection known to us was made by Charles Crossland in Yorkshire in 1907.

The *colonies* cause no discoloration of the substrate, and synnemata are found scattered or crowded for at least 6 to 7 cms. along the length of a dead stem.

The *mycelium* is immersed ; no sections were cut to determine its structure.

The *conidiophore* fructifications are synnemata (Fig. 1**A**) which are erect, black, straight, up to 400$\mu$ long with a spreading base firmly attached to the substrate, with a more or less cylindrical body 25 to 65$\mu$ wide and an expanded head bearing a compact bunch of conidia. The conidiophores composing the solid synnemata are firmly attached to one another, dark brown below, parallel, septate

(sometimes obscurely), simple, 4$\mu$ wide, becoming free and divergent close to the apex where they are pale brown to subhyaline, thin walled and increasing in width, sometimes abruptly, to about 15$\mu$. The upper cell of the individual conidiophores varies between 9 and 24$\mu$ long and is sometimes wider than its point of attachment to the conidium.

The *conidia* develop singly as the blown out apex of each conidiophore. At maturity they are oval, smooth, rounded at the apex, with a flat base 9 to 13$\mu$ wide, 5-celled (very rarely 6-celled), measuring 30 to 44 by 18 to 22$\mu$. The second and third cells from the base are longest (18 to 28$\mu$ long measured together), very dark brown to almost black with a wide black band running around the circumference at the level of the transverse septum. The two upper cells (very rarely three) are brown to subhyaline, being paler towards the apex. The lower truncate cell is pale brown to brown. The conidia are detached from the conidiophore usually

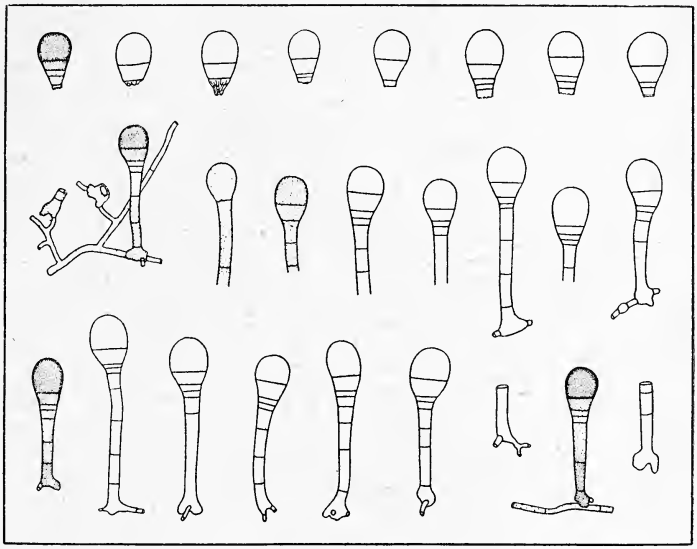

Fig. 5. **Phragmocephala minima** : mycelium, conidiophores, and conidia from the type collection, Herb. I.M.I. 40608(b) ; ×500.

by a break in the conidiophore wall immediately below the basal septum of the conidium but sometimes by an irregular tear of the wall of the wall of the thin-walled upper cell of the conidiophore. As in *Phragmocephala cookei* there seems to be no organised method of conidial detachment.

3. **Phragmocephala minima** Mason & Hughes sp. nov.

*Mycelium* immersum vel semi-immersum, ex hyphis brunneis vel subhyalinis, obscure septatis, ramosis, 2-3$\mu$ crassis compositum.

*Conidiophora* solitaria, recta, erecta, simplicia, usque ad 4-septata, 15-40$\mu$, plerumque 30-35$\mu$ longa, 2-3$\mu$ lata, pallide brunnea, basi ad 8$\mu$ inflata, lobata, apicem versus pallidiora, ad 3·5-4$\mu$ lata.

*Conidia* sicca, singula, in apice conidiophori producta, pyriformia, laevia, apice rotundata, basi plana, 2- —4(plerumque 3)-cellulata, 13-16 × 9·5-11·5$\mu$, cellula superiore majore (8-10$\mu$ longa), atrobrunnea vel atra, cellula penultima brunnea, cellulis inferioribus parvioribus, pallide brunneis vel subhyalinis.

*Habitat* in cortice *Fagi sylvaticae*, Swinton Park, prope Masham, Yorkshire, Anglia, 15/4/1950, Herb. I.M.I. 40608(b) (typus) et in cortice *Betulae* sp. Stepsbridge, Devon, Anglia, 15/9/1947, Herb. I.M.I. 19053.

The type collection is illustrated in Figs. 1**D** and 5.

*Phragmocephala minima* forms inconspicuous colonies on the periderm and bark of fallen logs of *Betula* sp. and *Fagus sylvatica*.

The *mycelium* is immersed or semi-immersed, and composed of pale brown to subhyaline, obscurely septate, branched hyphae 2 to 3$\mu$ wide.

The *conidiophores* arise solitarily and are scattered on the substratum ; they are straight, erect, unbranched, up to 4-septate, 15 to 40$\mu$, mostly 30 to 35$\mu$ long,

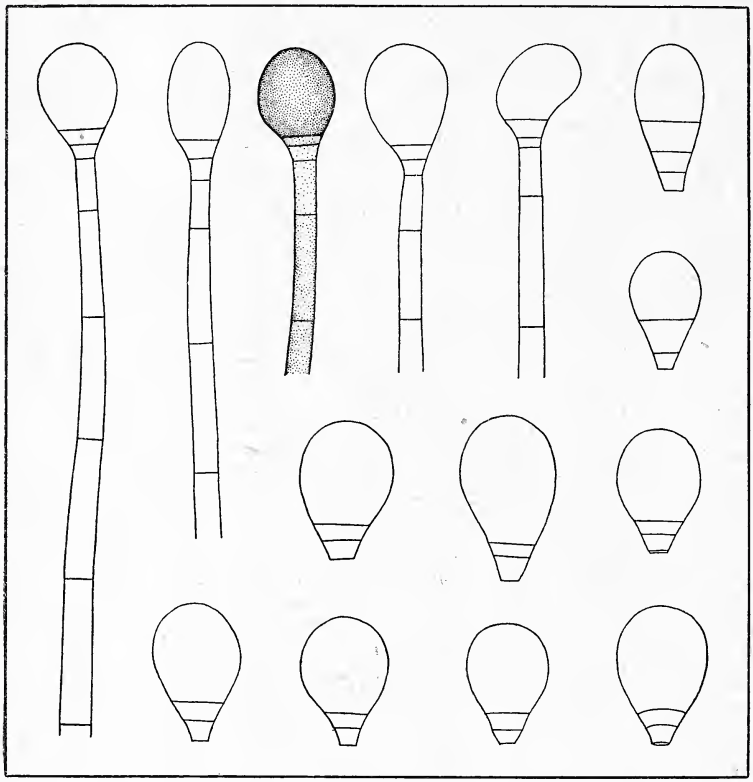

Fig. 6. **Phragmocephala setosa** : apices of conidiophores, and conidia from the type collection of *Monotospora setosa* in Herb. R.B.G. Kew [4298] ; ×500.

with a basal irregularly lobed foot cell up to 8$\mu$ wide, above which the conidiophore is 2 to 3$\mu$ wide, then increasing gradually upwards to 3·5 to 4$\mu$. They are pale brown to brown below and paler towards the apex.

The *conidia* develop singly and solitarily as the blown out apex of each conidiophore. At maturity they are pyriform, smooth, rounded at the apex with a flat base 3·5 to 4$\mu$ wide, 2 to 4 (mostly 3)-celled, measuring 13 to 16 by 9·5 to 11·5$\mu$. The upper cell is the largest (8 to 10$\mu$ long) and very dark brown to black ; the penultimate cell is brown and the basal ones pale brown to subhyaline.

The conidia are detached from the conidiophore by a break in the conidiophore wall immediately below the basal septum of the conidium or by an irregular tear of the cell wall of the upper cell of the conidiophore. But again there does not seem to be a regular means of dehiscence.

4. **Phragmocephala setosa** (Berk. & Curt.) Mason & Hughes.

Through the kindness of Miss E. M. Wakefield, Herb. R.B.G. Kew, we have been able to examine the type collection [4298] ; this is illustrated in Fig. 1C and 6 and described below.

The *conidiophores* are effuse, being produced solitarily and are up to 450$\mu$ long, about 10$\mu$ wide just above a swollen base, then tapering subulately towards the apex which is 4 to 6$\mu$ wide ; they are septate, thick-walled, straight or slightly bent, very dark brown below, pale brown towards the apex.

The *conidia* develop singly as the blown out apex of each conidiophore. At maturity they are pyriform, smooth, rounded at the apex with a flat base 4 to 6$\mu$ wide, 3 to 4 (mostly 3)-celled, measuring 22 to 42 by 16 to 25$\mu$. The upper cell is largest (18 to 33$\mu$ long), and very dark brown to black ; the lower truncate cells are successively paler towards the base, the upper being very dark brown to pale brown and the lower brown to pale brown. The conidium falls away cleanly from the apex of the conidiophore. Perhaps the conidiophore is capable of proliferating through the old scar and produce another conidium but we could not be sure about this.

*Habitat* : on rotten wood ; South Carolina.

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## NOTES ON *ORCHESTIA BOTTAE* (M. Edws.) AND OTHER NON-MARINE AMPHIPODA

G. FRYER

THE occurrence of the Amphipod *Orchestia bottae* (M. Edws.) at Huddersfield was recorded in *The Naturalist*, 1950, p. 148. As was pointed out at the time this Amphipod was unknown in Britain before 1942, and the Yorkshire record is the most northerly yet made in this country.

Two views have been put forward in attempts to explain the presence of *O. bottae* in Britain. Cain and Cushing (1948) regard it as a Mediterranean species which is spreading through Europe and which has recently immigrated to this country, a view apparentley subscribed to by Gurney (1949). On the other hand Reid (1948), writing about this and other Amphipods recently discovered in Britain, has expressed the opinion that ' it is not necessarily the range of some of these animals that is increasing, but our knowledge of their range.'

Bare facts concerning our knowledge of the distribution of *O. bottae* point to the first opinion as being the correct interpretation, for the species has for some time been known to occur in parts of Europe and in Syria and Tunisia, but observations carried out during the past winter would suggest that Reid's opinion should not be entirely discredited. The past winter, at least in the north of England has been, if not of very great severity, a much prolonged period of general cold, and one which would hardly be expected to be conducive to the well-being of Mediterranean organisms. Thus ground temperatures of freezing point or below have been recorded at Huddersfield on no fewer than 125 days between October and April. Nevertheless the little colony of *O. bottae* has persisted without any apparent diminution in numbers throughout this severe period. Specimens were to be found beneath stones even when snow lay on the ground. On such days the activity of the Amphipods was much reduced and they showed little inclination to jump as is their usual behaviour when they are disturbed when warmer conditions prevail. It is, however, only fair to add here that the temperatures prevailing beneath the stones, taken by the rather crude method of gently pushing a thermometer beneath them, were slightly higher than the ordinary ground temperature, increases of as much as 1·5°C. being noted. It might also be mentioned that Cain and Cushing (*op. cit.*) remarked that the severe spring of 1947 had apparently not affected a colony of this Amphipod on the River Thames.

While it is as yet too early to decide which theory will prove to be correct, Reid's suggestion must still be borne in mind, and it is not inconceivable that both explanations go some way towards the truth. Thus *O. bottae* may have originated in the Mediterranean region, from where it spread, but the spread may have been much more gradual than published records suggest, and the organism would thus have been able to acclimatise itself by easy stages to more rigorous climatic conditions than those to which it was originally accustomed. Irrespective of the controversy regarding its origin, students of the Crustacea in this country will no doubt welcome this addition to their rather meagre list of non-marine Malacostraca.

The problem of how exactly the Amphipod arrived at its present situation in Huddersfield remains a mystery, for the area in which it occurs is bounded on all sides by man-made obstacles which would appear to be unsurmountable to such an organism. Search of suitable habitats in other parts of the canal has so far failed to reveal its presence.

As little is known regarding the food of Amphipods in general it is worth while recording that in addition to the items previously listed *O. bottae* feeds also on insects, for a specimen was observed in the field feeding upon a ' Frog-hopper ' (Hemiptera Homoptera), which, while apparently quite fresh, was probably a sickly or injured individual, for the Amphipod is obviously not suited to the capture of such normally active organisms. It therefore seems certain that *O. bottae* is truly omnivorous as previously suggested. Specimens kindly observed in captivity by Mr. H. Whitehead, however, refused scraps of meat and raw potato.

In the past the freshwater Amphipods of this country have been much neglected, and recent discoveries show that much remains to be done in this field, not only in ascertaining the distribution of the known British members of the order, but even in bringing to light new species. Thus it is only very recently that *Gammarus lacustris* (Sars.) was found to occur in this country, the first finds being made in the north of Scotland and the Inner Hebrides. Since these discoveries its occurrence has been recorded by Hynes (1951) in certain lakes in North Wales, in Anglesey, at Glasgow, and in Ireland. It is quite possible therefore that this species will be found in Yorkshire if a search be made for it in suitable localities. Specific distinctions between it and *G. pulex* (L) are small, and reference should be made to the synopsis by Reid (1944) listed below for details.

Another species of the same genus, *G. tigrinus* (Sexton), which was only described in 1939 was at first believed to be confined to certain inland saline waters in various parts of England as far north as Cheshire. Quite recently, however, Hynes (*op. cit.*) and Spooner (1951) have recorded it from several other localities inhabiting quite fresh water, even including such large bodies of water as Lough Neagh in Ireland from where it has been identified among specimens collected as early as 1934. Like *Eucrangonyx gracilis* mentioned below this species is believed to have been introduced from the new world for its nearest relatives are found in North America.

*Gammarus daubeni* (Lillj.) occurs commonly around the British coasts as a brackish water species, but also occurs in freshwater. In Ireland it is the characteristic Amphipod of inland waters, replacing *G. pulex* in most places. Recently it has been found in freshwater in several localities in Scotland, Anglesey, and Cornwall. Workers investigating the lower reaches of the Yorkshire rivers might be on the look-out for this species with the view to adding to our knowledge of its inland distribution.

*Gammarus pulex* (L) itself is also worthy of intensive study, for, in spite of its abundance many aspects of its existence are imperfectly understood and would amply repay investigation. Spooner (*op. cit.*) reports that it has been found in subterranean waters in a number of localities from Yorkshire to Devon. Macan (1950) has recently published a very readable account of our knowledge of *G. pulex* and some of the problems it presents.

Another freshwater Amphipod which is a relatively recent addition to our fauna and which appears to have been introduced from America is *Eucrangonx gracilis* (S. I. Smith). This species was first reported in Middlesex in 1937, since which time it appears to have spread at a remarkable rate, being now known from many localities in the south of England, in the Midlands, and also in North Wales. This species may well turn up in Yorkshire at any time, and an early recognition of its presence should it occur is much desired as this would be of value in determining its rate of spread. In this instance we are perhaps experiencing the spread of an introduced animal in much the same way as botanists of the last century witnessed the spread of *Elodea canadensis*.

A second species of this genus, *E. vejdovski* (Stebb.) is a native of this country, but appears to be limited in its occurrence to a few wells in the south of England. It is a very small species, however, attaining a length of only 4 mm., so may occur elsewhere but have escaped detection. Like many subterranean Amphipods this species is eyeless, the visual organs being represented merely by irregular masses of pigment.

The Niphargids or Well Shrimps are fascinating creatures, three species of which have for some considerable time been known from numerous localities in caves and wells of southern and eastern England. Only very recently a fourth species, new to science and as yet undescribed, has been found in a cave near Buckfastleigh, in Devon. No member of the genus has ever been recorded from Yorkshire, so ' potholers ' and others frequenting subterranean limestone caverns or having access to wells in the limestone might well be on the lookout for specimens.

A further habitat which may perhaps be mentioned in connection with Amphipods is greenhouses where members of the tropical genus *Talitroides* have occasionally been found as introductions. These, like *Orchestia bottae* are terrestrial hopping forms belonging to the family Talitridae.

From the above notes, in which mention has been made of most of the non-marine Amphipods known to occur in Britain, it can be seen that much remains to be done in determining their distribution, and even when this task has been accomplished further investigations will be required for the habits and life histories of these creatures are still largely unknown.

Thanks are due to Mr. H. Whitehead for notes on his observations on *O. bottae* in captivity, and to the Tolson Memorial Museum (Huddersfield) authorities who supplied the temperature readings mentioned in the notes on *O. bottae*.

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## *POHLIA PROLIGERA* LINDB. (*WEBERA PROLIGERA* BRYHN)
## A Moss of a Semi-Industrial Area

H. WALSH

The many activities of man in urban and industrial areas provide various situations suitable for the growth of some mosses, the most successful of these being *Ceratodon purpureus* and *Bryum argenteum*, but others in less quantity are often present. Amongst these latter but not as yet generally distributed is *Pohlia proligera*, and the object of this paper is to draw attention to a moss that can successfully colonise a semi-industrial area and thus may become more widespread in south-west Yorkshire. Previous to 1900 we had no record in the Halifax Parish, which covers an area of 29 square miles. At present we have numerous records, especially in the semi-industrial district of Luddenden Foot. This moss, once established, possesses a method of propagation that tends to the formation of colonies gradually extending and occupying the available soil. This method of propagation is by the formation of small ' bulbils ' produced in large numbers amongst the leaves up the stem. Eventually these bulbils become detached, reach the soil and produce more plants. Only rarely are spore capsules developed and these have not been seen in the Halifax district. In this absence of spores it seems certain that the detached bulbils can be wind (and water) distributed and serve to spread the plant.

Until about 1905 this species was included with *Webera annotina* Schwaeg. of Dixon's Handbook, a moss similar in appearance but bearing a different shape of bulbil. Some doubt has been expressed by bryologists as to whether this difference of bulbil shape is constant, and it is of interest to note that of the large numbers of plants examined microscopically in this investigation all had the *proligera* type of bulbil. The species *annotina* does occur in the area in small amount, but appears to be confined to marshes in fields. Moss records for the Halifax Parish, which extends in the river Calder drainage area to the Lancashire border, date back to 1775, and since then a number of resident botanists have added to the list, but it was not until 1900 that J. Needham recorded *W. proligera* Bryhn near his

residence in Hebden Bridge, followed two years later by a second locality near the railway station. C. Crossland added two other records, Norland and Ogden, which were published in the *Halifax Flora* (1904) under the old name of *W. annotina* Schwaeg., but later corrected to *W. proligera* Bryhn in C. Crossland's moss herbarium, now lodged at Belle Vue Museum, Halifax. The absence of records for the aggregate *annotina* and *proligera* before 1900 must be taken with some caution. *P. proligera* has been collected by the writer from situations such as rock outcrops and clough sides far removed from human activities, and here it shows a preference for rock ledges and joints. It has also been found by stream sides, and under these conditions it rarely forms conspicuous colonies. Despite the absence of records the moss could have been present in these situations and only since about 1900 extended into urban areas. This view is supported by the list of mosses included in the *Flora of Pecket Wood*, C. Crossland and J. Needham, *The Naturalist*, 1904. Although absent from this list *P. proligera* is present along the main road that divided the wood, on the soil at base of walls, on walls, and on the fringe of the wood along Midge-hole road in easily observed positions. Another feature in support of recent extension is the discontinuous distribution, that is, present in places and then absent for long distances from similar situations. This is noticeable along canal tow paths. The habitat is generally stated to be sandy ground and on sandstone rocks, but its urban habitats are not conspicuously sandy, the soil often containing a proportion of fine cinders. The following are situations from which it has been collected. The soil between gritstone setts, particularly along the gutters of steep hillside roads, where it forms ribbons sometimes over a foot long ; these arrest soil brought down after heavy rain and the new soil is colonised, the moss forming patches on the setts. The cleaning of the gutters, generally in autumn, severely prunes these positions, but the material carted away may help to spread the moss. Other positions include unsett roads and paths which often have cinders as a repairing material, banks bordering these paths, wall bases and earth-filled joints of walls, canal tow paths and refuse tips.

In most of these urban positions the moss follows an annual rhythm, in late autumn the green colour fading to brown, remaining inconspicuous during winter, but in March and April new growth makes the moss conspicuous by its light green colour due to some extent to the presence of the numerous almost colourless bubils in the leaf axils. This colour is retained during summer and generally serves to distinguish it from *Ceratodon* and *Pohlia nutans*, with which, in its drier situations, it is sometimes associated. Extreme care has been taken not to confuse records with this latter and all records are based upon the presence of the characteristic bulbils. Archegonia have been noticed upon these plants.

An examination of the previous Yorkshire records shows a preponderance for the more industrial south-west (V.C. 63).

V.C. 63.
Hebden Bridge, 1904. Calverley, 1912. Leeds, 1917 (*Mosses of an Industrial City*, W. H. Burrell, *Naturalist*, 1917, 119-124). Huddersfield area : Dolly Clough, 1911 ; Hag Wood, 1921 ; Penistone, 1923 ; Meltham Moor, 1927 ; Holme Moss, 1928 ; Drop Clough, 1936.

V.C. 64.
Shipley Glen, 1905. Sawley, 1915. Bolton Woods, 1916. Long Preston Beck, 1929.

V.C. 65.
Baugh Fell.

V.C. 62 and 61. No records.

In the *Flora of Westmorland* (1939) Wilson states habitats as sandy or stony ground and gives few records. The *Flora of West Lancashire* (1907), Wheldon and Wilson, in addition gives sandstone quarries and roadsides, but the records are for the aggregate. An interesting reference occurs in ' A Bryophyte Flora of Cornwall,' F. Rilstone, *Trans. Brit. Bryol. Soc.* (1948), ' Abundant by roadsides, this species is especially partial to roadside ' water tables ' and the sand and gravel therefrom thrown on to the roadside banks. In such situations it is often very abundant, the leaf axils crowded with the narrow glove-like bulbils.'

The writer's interest in this moss began in 1945 and there are no data for the Halifax area for the intervening years since 1904.

# THE LEEDS NATURALISTS' CLUB, 1870-1950

JENNY V. DONNAN

## I. Introductory

In February, 1950, the Leeds Naturalists' Club and Scientific Association completed eighty years of continuous activity, and an account of its formation and development may be of interest.

For the first six or seven years there is a considerable amount of detailed information in the personal ' scrapbooks ' of the late W. Denison Roebuck. These include not only matters relating to the Club and natural history records, but also material of value to the student of the social history of the period. The Club has in its Library a number of manuscript books containing records made or collected by Roebuck relating to the mammalia and birds of the West Riding, entomology, and the visitation of Great Britain by locusts from 1826 to 1876.

The time of the Club's establishment is significant. Of the late sixties and early seventies of the 19th century, G. M. Trevelyan in his *English Social History* writes, ' In all ranks of life free debate of social customs and religious beliefs is taking the place of the settled creeds of the early Victorian era,' ' It is a liberal, outspoken age,' and ' Science and history were rapidly taking their place beside classics and mathematics in the academic world.' The franchise had been extended in 1867 ; the Education Act of 1870 provided primary education for all ; the professional and social emancipation of women was advancing.

## II. The Early Years

There are in print two accounts of the establishment of the Club—the first in the sketch included in the Annual Report for 1875 and the other in the note appended to the programme of the conversazione held on 28th February, 1920, the 50th anniversary of the formation of the Club. These differ in certain respects and neither is fully consistent with the original records.

On 28th February, 1870, a meeting of members of Leeds Young Men's Christian Association was held to consider the formation of a Rambling Club, and this meeting was addressed by Mr. James Brodie. The first draft of the Rules gives the title as ' The Rambling Club ' and confined membership to Y.M.C.A. members. The following month it was decided to extend the qualification to include as members others who might be approved by the Committee, subject to their paying a higher annual subscription. The title was altered to ' The Naturalists' Field Club ' at the first general meeting on 29th March, 1870, but the conditions regarding membership were retained.

A public meeting of members and friends on 12th April, 1870, was addressed by the President on the objects of the Club and illustrations of natural phenomena were given by means of the oxy-hydrogen light, which would seem to have been a great attraction. The Mayor of Leeds (Alderman Wm. Glover Joy) presided and joined the Club.

The connection of the Club at that time with the religious organisation is indicated by the records in the Minutes that the first general meeting was closed by the President with prayer and the public meeting by the singing of the Doxology. An examination of the records shows that none of the original Y.M.C.A. members who decided on the formation of the Club, with the exception of Mr. James Brodie, were still members when the first printed list was issued in 1876. Mr. Brodie was Secretary for 1870 and 1871, Joint Secretary until 1874, and remained in continuous membership for over fifty years.

Included in the persons who joined the Club in 1870, following the public meeting, were several who had a marked influence on the Club's development, and who certainly led it into a far wider field than was visualised by the promoters of the Rambling Club. I would refer specially to :

W. Denison Roebuck, whose name is a legend in the Club, was Secretary during the years 1872 to 1880, Treasurer from 1881 to 1884, Joint Secretary in 1885, and President in 1908 and 1909. His work in connection with the Yorkshire Naturalists' Union absorbed most of his energies after 1880, but he retained an active connection with the Club until his death in 1919.

James Abbott, a botanist of wide interests and a chemist by profession, was a member for many years and President in 1877.

John W. Taylor, a noted conchologist, was an active member of the Club for over fifty years.

Thomas Hick, a teacher at Harrogate and later a lecturer at Owens College, Manchester, President of the Club 1872-4, was a botanist of some distinction and wrote some notable papers on fossil-botany.

The Club's first excursion was to Meanwood and Adel, and the official record, the ingenuousness of which is delightful, reads :

> ' On Saturday, the 23rd April, 1870, the members and friends to the number of twenty met at the Congregational Church, Headingley Lane, and started promptly at three o'clock for Meanwood and Adel Church and Dam. Various flowers were picked up on the way and amongst the places inspected were Adel Church and Dam and the newly-discovered Roman remains near Adel Church. The weather was everything that could be desired and the members got back to Leeds about eight o'clock.'

One of the first records of the Club is that the cuckoo was seen and heard at Adel during this ramble.

The first notice of exhibits appears in the Minutes of a meeting held on 11th October, 1870. The following month, Mr. J. W. Taylor was appointed Recording Secretary.

In October, 1871, it was decided to commence a systematic record of the Natural History of the Leeds District, and twelve members undertook to assist. Mr. James Abbott undertook the recording of the flora of Meanwood and Adel and in June, 1872, he presented a manuscript list enumerating 400 plants of the Meanwood Valley from Woodhouse Ridge to Adel Dam. This list is in the Library and it would be of interest if a survey of the area could be made again and the present flora compared with that of nearly eighty years ago.

The Club's first conversazione was held in November, 1871. In conjunction with this, the Club held an exhibition of objects of natural history which remained open for the three following days.

In addition to its other activities, the Club had organised (in connection with the Science and Art Department) a course of thirty lectures on Botany during the winter of 1870-71, the teachers being T. Hick, B.A., and James Abbott, and the fee 5*s*. A similar course, under Mr. Abbott, was held the following year.

The meetings of the Club were held at the Y.M.C.A. until the end of 1871, but at the beginning of 1872 arrangements were made to meet at the Mechanics' Institute. For some time references to the Y.M.C.A. in the Club's announcements had been spasmodic and the change in the place of meeting appears to have severed finally the already tenuous connection of the Club with the Association. The inclusion in the list of subscribers to Lees' *Flora of the West Riding*, published in 1888, of the ' Leeds Y.M.C.A. Naturalists' Club ' indicates that at some time after the severance a new Club had been formed by the Y.M.C.A. From this time the Club's activities took the form which has continued until the present day—lecture meetings, meetings for exhibits (then described as conversational meetings) and excursions.

The title was altered in 1872 to ' Leeds Naturalists' Field Club and Scientific Association.' It has been stated that this followed the merging in the Club of a private scientific association consisting of James Abbott, James W. Davis, Thomas Hick, F. Arnold Lees and William Todd. The records show, however, that a proposal had been made that a separate scientific association should be formed as an adjunct to the Field Club, for the purpose of encouraging scientific pursuits, and that the outcome was a decision to extend the basis of the Club and alter its title.

A reflection of scientific controversies current at this time is found in a record of an animated discussion extending over two meetings on Mr. Abbott's preference for the term ' bioplasm ' used by Dr. Lionel Beale rather than ' protoplasm ' as used by Professor Huxley.

In 1872 representations were made to the Library Committee of Leeds Town Council regarding the lack of scientific works in the Free Library available for issue to students.

The 1873 Session was opened by a Social Tea which the circular announces ' will be provided in the best style by Mr. Rowley, of Woodhouse Lane ' at 2*s*. Having regard to the value of money at that time—several times greater than at present—the price gives some indication of the social position of the majority of the members.

About this time there was formed the Leeds Church Institute Ecclesiological and Naturalists' Society, which combined the study of natural history with that of the study of churches and the dissemination of sound information on various ecclesias-

tical matters. Lest the incongruity of the subjects be thought remarkable, it should be mentioned that the early excursions of the Club usually included a visit to any church of interest in the neighbourhood and, sometimes, a talk by the vicar or the curate.

The Leeds Botanical Society, established in 1861, cannot be regarded as a forerunner of the Club as its objects were the study of medicinal plants and the abolition of the unnatural practice of man-midwifery. This Society would appear to have been a development from *Dr. Skelton's Botanic Record and Family Herbal*—a magazine issued from East Parade, Leeds, from May, 1852, to August, 1855. A copy of the Rules of the Society is in the Club's Library.

## III. The Period of Consolidation

In 1873 Mr. L. C. Miall, then Curator of the Museum of the Leeds Philosophical and Literary Society, began his long connection with the Club. In April and May, 1874, the Club arranged a series of ' Lectures and Excursions illustrative of the Geology of the West Riding,' four lectures being given, and seven excursions directed, by Mr. Miall. An attractive syllabus in booklet form was issued. This effort, possibly the most ambitious in the long history of the Club, was a success. A proposal was made that a Geological Section of the Club be established but this did not eventuate. It would seem, however, that this course gave the impetus which led to the formation of the Leeds Geological Society later in the same year, with Mr. Miall as President.

In February, 1875, Mr. W. H. Hay, who had just returned from Canada, exhibited a Colorado Beetle and stated this beetle first came into Canada about 1871. Another interesting record relates to the finding on the banks of the canal between Armley and Kirkstall, by Mr. Abbott of *Potentilla norvegica*, which was sent to Kew to be named and had only once previously, in 1868, been recorded in Britain.

The Rules consisting of seven short clauses were revised in 1875 and a formidable code consisting of 57 sections was adopted. These new Rules were never printed, but the original copy in the handwriting of Mr. Roebuck—who was their inspirer—still exists. The title of the Club was amended by the deletion of ' Field 'and has since remained unaltered. It was at this time the Club adopted, though not without strong protests, the practice of requiring new members to be nominated at one meeting and elected at a succeeding meeting, a procedure which still continues. One member, who resigned from the Council as a protest, urged that difficulties should not be placed in the way of intending members. The fixing by rule of Wednesday as the meeting night brought forth the objection that botanical specimens collected on Saturday afternoon would not keep until Wednesday. Later, the meeting night was altered to Tuesday, and then to Monday.

Following a successful joint excursion to Riccall Common with the Hull and Goole Societies in August, 1875, the Club organised, in conjunction with the Richmond, Huddersfield and York Societies, an excursion to Boroughbridge and Aldborough on August Bank Holiday, 1876. The enthusiasm of the members is indicated by the fact that the programme gives the first train from Leeds to Boroughbridge as 5-0 a.m., and states that the Secretary of the Leeds Society will attend at the station at the departure of this and later trains to supply tickets.

A week earlier, Club members joined with the members of Bradford Scientific Association in an excursion to the Victoria Cave, Settle. This involved leaving Bradford at 6-50 a.m. and the programme, which was actually carried out, provided for a visit to Giggleswick Museum before breakfast. The Club then met on the evening following the Boroughbridge excursion to discuss that and the Victoria Cave excursions.

The Club became involved indirectly in a small controversy in this year (1876). A note was submitted at a meeting on the occurrence of *Maianthemum bifolium* at Hackness, which stated that the plant was first discovered there by Mr. Backhouse, of York who, knowing it to be a native of Norway, thought it possible the seeds might have been transported in ice to this country, and, thinking Hackness a likely place, went there with a view to finding it. This was reported to Mr. J. Braby by a member and evoked an angry letter from him to the effect that he had first found the plant in 1860, and that the discovery had been accepted by Sir W. J. Hooker and Dr. Arnott who had included it in the Eight Edition of the British Flora. In due course, the matter was ventilated in *Hardwicke's Science Gossip*. In Lees' *Supplement to the Yorkshire Floras* (1941), edited by Mr. Cheetham and

himself, Dr. Sledge says that *Maianthemum* is still at Hackness but has flowered poorly or not at all in recent years owing to the increased shade of surrounding trees.

The formation of a library was commenced soon after the Club came into existence. Various members gave books and Mr. Fairfax Wooler, of New Farnley, made several donations to enable books to be purchased. In 1879, as many as 220 volumes were circulated.

The membership, which was about 30 in 1870, had reached 157 by 1879. One lady joined the Club in 1877, but did not remain a member for long. The absence of lady members is rather surprising, particularly as botany was regarded as a ladylike hobby and two of the four members of the first Council of the Leeds Geological Society were ladies. An examination of the list of members shows that in 1879 most of them lived close to the centre of the town.

The interest of the public in natural history, probably due to the absence of alternative entertainments of a lighter character, is indicated by the exhibitions held by local societies. I have referred earlier to an exhibition lasting four days, arranged by the Club in 1871. In October, 1873, the Wakefield Society held a three-day exhibition and from the 10th to the 29th of the same month, the Huddersfield Society held an exhibition which was open each day from 10 a.m. to 10 p.m. An exhibition at Bradford in 1876, in which the Leeds Club assisted, was according to the advertisement such an ' enormous success ' that it was continued for a second day with an admission fee of 1*s*. In 1879, the Yorkshire Naturalists' Union held an exhibition at Leeds for a week. A feature of these exhibitions was the large number of microscopes available, often as many as 60 or 70.

I have devoted rather much space to the first ten years of the Club's history, as it gives a view of a society less complex than that with which we are familiar. The records show the members of that decade to have been a group of very earnest people to whom the study of natural history was something more than a hobby. Few of them were professional scientists, but many reached a high standard of attainment. That they had still something to learn, however, is evidenced by the following sarcastic comment in *The Yorkshireman* for 6th December, 1879 :

> ' At a meeting of the Leeds Naturalists' Club the other day, a pair of Pomerine Iknas were exhibited, which had been shot on the coast near Bridlington. These rare hawk-like birds have occurred in unusual numbers on the Yorkshire Coast this autumn, and the spare time of all true lovers of nature has been devoted to proving to survivors the folly of occurring again.'

## IV. The Changing Scene

We now enter the 1880's and find as we proceed a change in the characteristics of the Club. Mr. Roebuck resigned the Secretaryship in 1880, and, as time passes, references to persons who were active in the early years become fewer. Some retained membership while, like W. D. Roebuck and W. Eagle Clarke, transferring their activities to a wider field. In my opinion, the change is not unconnected with the interest in natural history among middle-class people which manifested itself by the fashion for cabinets for fossils and geological specimens and aquaria as necessary articles of furniture. Professional men appear in the membership in increased numbers and the register shows as time goes on, a greater proportion of the members residing in the suburbs, particularly Headingley and Roundhay.

This change did not involve any diminution in the Club's activities. Throughout the ten years, the Club met weekly and in some years there was no holiday break. The high standing of many of the lecturers shows the interest and capacity of the membership. During the first years of this decade few, if any, excursions were organised by the Club, but from 1885 there was an excursion practically each month during the season.

The membership of 177 in 1881 rose to 227 in 1882, dropped by about 50 in 1884 when the Photographic Section of the Club became a separate society on an independent basis by the resuscitation of the former Leeds Photographic Society, and then continued to increase until in 1889 it reached a figure of 280, the highest in the Club's history. There were still only a very few lady members, not more than three or four at any time during the ten years.

The 500th meeting of the Club on 13th February, 1883, was celebrated by a ' Meat Tea and Social Gathering ' at Powolny's Rooms. Shortly after this, the Secretaries ceased to record the number of the meeting in the Minutes and it would be a difficult task to calculate how many meetings have now been held.

The complicated code of rules adopted in 1875, having, in the words of the resolution, ' in several respects proved detrimental to the welfare of the Club,' new rules were adopted in February, 1884. The principles of the existing Rules, and in some instances the wording, are identical with those adopted over sixty-five years ago. The changes made in the interval relate to matters of detail only.

I have mentioned the decision of the Photographic Section formed in 1882 to establish a separate Society, and I should refer briefly to the formation of Sections. A Microscopical Section was formed in 1874 but was discontinued after holding eight fortnightly meetings. This Section was revived in 1878, when, in addition, Entomological, Vertebrate, Botanical and Physical Science Sections were established. These Sections operated with greater or less success for some years, but had all ceased to function by 1884.

Leeds Town Council in 1879 gave permission to members to investigate the Flora and Fauna of Roundhay Park, and to collect specimens. This privilege was continued for a number of years. One can hardly imagine such permission being given to-day—an evidence of changed conditions.

The venue of the meetings of the Club was changed to the Philosophical Hall in 1884. At this time the collection of the Fauna and Flora of the Leeds neighbourhood made by the Club since 1876 was handed over to Leeds Philosophical Society. Some years ago the Society handed over its Museum to the Corporation.

Difficulty having arisen regarding the availability of a room for meetings at the Philosophical Hall, the Corporation were approached and the Club was allowed the use of a room in the Municipal Buildings, without charge.

Considerable attention was given to the question of publishing a Fauna and Flora of the District. This question had been under consideration since 1871 when the first steps towards the collection of records were taken. By 1880 the manuscript lists for one sub-area were ready, but it was decided to defer publication until the material for the whole area was complete. A Publications and Editorial Committee was appointed in 1885 and as ' Contributions to a Fauna and Flora of West Yorkshire ' lists of flowering plants and Algae were appended to the Club's ' Transactions ' published in 1886. No further progress was made towards printing other sections of the proposed work.

It was towards the end of this period that the Annual Conversazione became an important social event. The attractions at the 1889 social held at the Philosophical Hall included, in addition to the President's address, an orchestra, a song recital, an exhibition of pictures, natural history and scientific exhibits, two lantern exhibitions and a formidable array of microscopes. Among the chief attractions were a Phonograph and a Graphophone. The conversaziones were continued on this scale for several years.

The ' Transactions ' published in 1886 to which I have made reference rank as Volume I of the Club's publications, but printed reports had been issued previously for the years 1875-6, 1876-7 and 1877-8. The report for 1875-6 included a sketch of the history of the Club since its formation and the 1886 volume a retrospect for 1878 to 1884, thus giving a continuous record from 1870 to 1885. The next publication (Volume II) was issued in 1892 and contained the ' Transactions ' for the year 1890, with notes on the papers and meetings, and lists of officers, for the years 1886 to 1889. A small pamphlet giving a list of papers, meetings and abstracts for 1898, issued in 1899, is numbered ' Volume IV,' but I have been unable to trace Volume III or to find in the records any reference to its issue. A supplement to the issue of *The Naturalist* for December, 1937, entitled ' Occasional Papers of the Leeds Naturalists' Club ' included contributions by Dr. Sledge, Mr. W. D. Hincks and Mr. J. R. Dibb, with an introduction by Mr. J. D. Firth. This supplement was reprinted as a separate pamphlet.

## V. Decline—and Recovery

The records for the 1890's are incomplete, and are scanty when compared with those for the preceding twenty years. This was a period of decline, the membership falling steadily from 280 in 1889 to 137 in 1899. Probably, this reflects the reduction of interest in natural history in the period due to the development of alternative attractions.

Weekly meetings were continued until 1894, but after that year the Club met once a fortnight.

In 1899, the Corporation withdrew the privilege granted to the Club to meet in the Municipal Buildings, the room used being required for an extension of the Central Library, and the Club returned to the Philosophical Hall until 1902. In 1902 and 1903 the place varied from meeting to meeting. From 1904 to 1908, the meetings were held at the Leeds Law Institute and then in 1908 the Club returned to the Leeds Institute after an interval of 24 years.

The constant changes in the place of meeting and the irregularity of meetings for a time may have contributed to the continued decline of the Club. The interest had fallen so low that in October, 1901, the Council convened a special meeting to dissolve the Club. A decision on the Council's recommendation was deferred. The membership continued to fall and by 1907 had reached 64, the lowest figure recorded since 1872. Then with W. Denison Roebuck as President and Mr. J. D. Firth as Secretary, there was a rapid improvement and the membership was stabilised for about ten years around the figure of 100.

It was to this period—1901 to 1907—that Mr. Roebuck referred in a memorandum written several years later from which I quote the following extracts :

> ' This (first) ten years (from 1870-1880) by reason of the quality of the membership, was successful in a measure which has never since been surpassed.'
>
> ' (Later) the management of the Club fell into the hands of members whose ideals tended more to the organisation of social functions and lecture syllabuses and to whom active natural history work was unimportant. During this period the active working naturalists gradually fell out, the Club made frequent changes of meeting place, much of its property got lost, and the Club itself was more than once on the verge of extinction. Then the old working members had to come to the rescue, with new ones of like mind and similar ideals, the old ideals of the Club, and eventually, by dint of hard and strenuous exertions, have brought the Club back to what it is now, nearer to its original level of excellence.'

After making allowance for some little bias, the picture drawn by Mr. Roebuck seems to be a true representation of the facts.

By 1908, the lady members had increased to twelve and the following year two ladies were elected on the Council. Miss M. V. Lebour was elected a Vice-President in 1912.

It was in 1912 that a change occurred which was to revive interest among the members and to afford to the Club an opportunity of useful activity for a long period. Professor W. Garstang was President that year and he and Professor J. H. Priestley offered the Club facilities for holding its meetings at the University. This offer was gratefully accepted and I would like to say how much the members have valued the privilege and the assistance given to the Club by the University.

The interest of Professors Garstang and Priestley, and the closer connection with the University, brought into the Club, and continues to bring, academic scientists whose help and guidance has been invaluable.

Miss M. Westerman, M.Sc., was President for 1918, the first of five women members who have been honoured by election to that office.

The Golden Jubilee of the Club was celebrated by a conversazione at the University under the Presidency of Professor Priestley, held exactly fifty years after the meeting on 28th February, 1870, at which it was established.

It has been said that ' The happiest nations have no history.' I feel that since 1920 the Club has been in that happy condition. We have had our ups and downs and difficulties to meet, as for example in arranging to carry on during the late War, but, if we have at any time risen to great heights, or fallen to great depths, we are too near to the events to appreciate their importance.

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***Geranium pusillum* L.**—On checking the chromosome number of *Geranium pusillum* L. it has been found that, in the material used, which came from near Huntingdon, 2n=26. The figure previously accepted for British *G. pusillum* was 2n=34 (Warburg, *New Phytol.*, **37**, 130, 1938), although counts on continental material made by Gauger (*Planta*, **26**, 529, 1937) and by Löve and Löve (*Arkiv. for Botanik* 31*a*, 1944) gave 2n=26. It is therefore desired to check the number in further representatives from different localities in Britain and I would be grateful to receive any specimens of *G. pusillum* which may be encountered by readers.—W. Jackson, Botany Department, Leeds University.

# ORNITHOLOGICAL REPORT FOR NORTHUMBERLAND AND DURHAM FOR 1950

Compiled from the records of members of the Ornithological Section of The Natural History Society of Northumberland, Durham and Newcastle upon Tyne and many other local observers, by GEORGE W. TEMPERLEY.

A key to the initials used in this Report will be found at the end of these notes. Abbreviations used : N.=Northumberland ; D.=Durham ; *B.B.=British Birds* ; *O.R.=Ornithological Report* ; *F.I.O.R.=Farne Islands Ornithological Report*.

The number preceding the name of each species refers to Witherby's *Handbook of British Birds*, where the full scientific name will be found.

Where reports are placed in square brackets it is implied that, being sight records only, some slight element of doubt may exist as to the accuracy of the identification, or that the bird was not truly wild.

Notes have been received from over 150 observers, but owing to lack of space only records from some 120 have been included in this Report. All notes and records are welcome as they are helpful in assessing the status and distribution of the various species in the two counties.

All notes should be addressed to G. W. Temperley, Hancock Museum, Newcastle upon Tyne.

Records of unusual interest dealt with below are : Serin (31), Great Grey Shrike (114), Red-backed Shrike (119), Blackcap in winter (162), Roller (233), Hobby (261), Golden Eagle (266), Osprey (284), Grey Phalarope (400).

## WEATHER CONDITIONS IN 1950

The year began with three unusually mild months and very little snow ; but in April and May temperatures were well below the average with a deficiency of sunshine. June was the only fine month of the year and from then onwards weather conditions were most unfavourable, with a succession of cold, wet days. Both hay and corn harvests were much delayed and crops suffered accordingly ; though perhaps not so seriously in the North-east as in some other parts of the country. December brought considerable snowfalls and was one of the coldest on record. During the year there were several periods of high wind, including the memorable Eastertide gale from the west from April 8th to 10th. There was little or no easterly wind during the autumn, with the result that the usual migration of passerine birds was little in evidence. On October 22nd, however, the wind suddenly veered to the east and during the nights of the 22nd and 23rd a 'rush' of immigrants and passage migrants took place on the coast. Winter visitors, which had previously been scarce, became suddenly plentiful, as the following Classified Notes very clearly show.

## BIRD RINGING

By permission of the Forestry Commission, The Natural History Society will in future be responsible for organising the ringing of nestlings in the nesting boxes put up by the Commission in its plantations near Hamsterley, Co. Durham, and in the Kielder district of Northumberland. It is hoped that in this way valuable information may be obtained about the movements of locally-bred birds.

## FARNE ISLANDS RINGING COMMITTEE

Ringing parties visited the Islands on June 29th, July 10th and 13th and a total of 1,469 birds was ringed. With the exception of one adult Kittiwake all were nestlings. The numbers were : Shag 12, Sandwich Tern 324, Roseate Tern 3, Arctic Tern 925, Kittiwake 200, Guillemot 4, Puffin 1. This compares with 836 birds last year. (*F.I.O.R.*, 1950.)

## NESTING-BOX EXPERIMENTS

In the Forestry Commission's plantations near Hamsterley, Co. Durham, 300 nesting boxes were again put up for the 1950 breeding season. Of these 108 were occupied compared with 87 in the previous season. The occupants were : Pied Flycatchers 40, Great Tits 29, Blue Tits 18, Redstarts 17, and Coal Tits 4. The following shows the number of young reared :

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pied Flycatcher | . | 40 | nests with | 235 | young, | average brood size | 5·9 |
| Great Tit | . | 27 | ,, ,, | 204 | ,, | ,, ,, | 7·5 |
| Blue Tit | . | 17 | ,, ,, | 140 | ,, | ,, ,, | 8·2 |
| Redstart | . | 16 | ,, ,, | 96 | ,, | ,, ,, | 6·0 |
| Coal Tit | . | 4 | ,, ,, | 35 | ,, | ,, ,, | 8·75 |

Several boxes occupied by Pied Flycatchers in 1949 were again used by the same species and some Redstarts also occupied the same boxes as last year. The first Flycatcher was seen on May 1st and the first Redstart on May 2nd. The Flycatchers were first seen building on May 12th and the Redstarts on May 20th. On June 17th one of the boxes was found to contain six Long-eared Bats. We are indebted to C. H. Longstaff for the above information. The brood-size figures should be compared with those published in *O.R.*, 1949.

### Waders on the South Northumberland Coast

Once again the rocks and beaches near St. Mary's Island and Seaton Sluice have been the winter haunt of several species of Wader. Up to a few years ago Waders were rarely seen in such a disturbed area. This year the following species have been reported : Bar-tailed Godwit, Curlew, Whimbrel, Turnstone, Knot, Dunlin, Little Stint, Purple Sandpiper, Sanderling, Redshank, Ringed Plover and Oystercatcher.

### The Wildfowl Census

A monthly census was carried out during the year, counts being made on the coast and on inland waters in each month with the exception of May and June. Much interesting information was obtained. The willing co-operation of all those taking part is gratefully acknowledged.

### Moult Migration of Shelduck

In May 1950 a circular was sent out to members living on the coast asking for information regarding the numbers and movements of Shelduck with a view to obtaining evidence of any moult migration from the north-east coast. Many members responded and the information collected was sent to Mr. R. A. H. Coombes of the International Wildfowl Research Institute. Except that the number of adult birds is at its highest between January and March and at its lowest during and after the breeding season, no signs of active migration were noted on the coast. Reports are asked for during 1951.

Valuable evidence in proof of a cross-country migration from the Solway was obtained by M. Philipson, of Haltwhistle, who, at 10-30 p.m. on July 8th saw a flock of *c.* 50 large duck, which from their size and shape could only have been Shelduck, passing overhead from west to east flying high and fast. On July 13th, at the same hour, he saw at least 100 passing over. They flew at about 1,000 ft. in close-packed V-formations and quite silently. On both occasions they followed the same line of flight to 100 yds. or so, coming from the direction of Gilsland along the northern abutment of Tyndale Fells through the Tyne Gap and entering the South Tyne valley just where the river bends to the east at Haltwhistle. Further observations should be made on different portions of this flight-route in 1951.

### Classified Notes

1. Raven.—On March 12th, on one of the Rothbury Hills sites, a nest with three eggs ; on April 16th near Catcleugh a nest with six eggs (A.R.H. and E.G.T.). On a site near Harbottle a nest with one fledged young and both adult birds present (R.C.). At another Cheviotland site four young were seen in a nest on April 27th (B.C.E.R.). On May 29th by the Dunsmoor Burn, Cheviots, an empty nest was found 35 ft. up in an alder. From the state of the nest it had probably contained young. A dead adult was lying at the foot of the tree and branches near the nest showed that it had been well peppered with shot (F.B.). It is many years since a nest in a tree was reported in Northumberland. On April 13th, on the Durham side of the Tees, a nest was seen containing five eggs and one newly-hatched chick (A.B.) ; it was not subsequently visited by the reporter but it was probably destroyed later, as this pair of birds, known by the hen lacking a primary, crossed over the border into Westmorland where it successfully reared a brood (H.W.).

On December 14th a pair was seen on Plenmeller Fell, south of Haltwhistle. The pair was flying up and down the ravines just above the bracken and heather, apparently hunting for dead ewes, which shepherds often toss into the hill burns. Ravens are rarely seen so close to Haltwhistle, their nearest nesting site is seven miles away over the Cumberland border (M.P.).

2. Hooded Crow.—Very scarce on the coast during the winter of 1949-50. Fewer than usual wintered in the Craster-Howick area. Maximum counted six. (W.S.C.). Two, usually in company with 10 Carrions, spent the winter at Cheswick (R.F.L.) ; but on April 20th ten were counted there (H.C.). Especially numerous in South Northumberland during January and February. Noticed amongst roosting flocks of Carrions at Prestwick Carr and Bothal ; one near Morpeth as late as April 10th (M.W.R.). On February 19th near ponds on Scaffold Hill N. six (D.G.). Several other reports of odd birds. One bird was present at Darlington Sewage Farm during January (A.B.). One on Holy Island on July 9th, a late bird (F.B.).

In autumn, first seen on the coast on September 9th at Cheswick ; later nine were present throughout the autumn (F.B.). First seen near Cullernose Point, N., on October 22nd ; increased to 12 birds by November 28th (W.S.C.). On November 19th at Druridge Bay, N., four with seven Carrions (H.S.T.). On November 19th at South Shields many were seen passing inland over the town. Later some were seen about rubbish heaps at Newton Garth Farm (H.M.S.B.). Inland—On November 7th a single bird amongst Carrions on the Coquet gravels at Holystone, N. (E.M.).

3. Carrion Crow.—In the early part of the year the Northumberland Agricultural Committee organised 'crow-shoots' at some of the chief winter roosting sites in South Northumberland when the following 'bags' were obtained : Gosforth Park 115 ; Blubbery Wood, Cockle Park 320 ; Bothal 180-200 ; Tranwell 250 ; Prestwick Carr 80 ; Mitford 60 ; Total *c.* 1,000 birds. (M.W.R.) In spite of this destruction, birds seemed as numerous as ever in the same roosts the following winter.

On April 16th, on a keeper's gibbet near Swinhoe Lakes, N., a brown bird of this species was seen (D.G.).

4. Rook.—In the spring a census of rookeries was taken over an area covering *c.* 97 sq. miles within a seven mile radius of Berwick-on-Tweed. 74 rookeries were found containing *c.* 7,850 nests, representing 81 breeding pairs per sq. mile. The largest rookery was at Grindon Rigg in Northumberland which contained 1,174 nests, the smallest, at Hutton Castle Barnes, Berwickshire, contained only two. About half the area lies in Northumberland where 44 of the 74 rookeries were situated ; these contained *c.* 5,750 nests, an average of 131 per rookery, as compared with Berwickshire's 30 rookeries with 2,104 nests, an average of 70 per rookery (R.F.L.). In 1945 *c.* 87 sq. miles of this area was covered by F.B. who found 62 rookeries containing *c.* 7,000 nests, an average of 81 breeding pairs per sq. mile (see *O.R.*, 1945).

On July 4th, near High Coniscliffe, D., a uniformly dark brown bird was seen with others of normal colour (W.H.K.).

7. Magpie.—Very numerous in the Northumberland-Cumberland border district (M.P.). ' Magpies in the lower Derwent district usually flock in the winter months and break up again in the spring. I take these flocks to be our local birds. I have seen flocks of over 20 birds ' (C.H.). On January 8th, near Whickham, D., a flock of at least 20 birds was seen in a hawthorn bush. The birds were continually rising from the bush, flying round it and alighting again (A.R.H.).

14. Starling.—There was a large roost in Cleadon village, D., in the winter of 1949-50 ; most of the birds using tall old hawthorns. It became established about mid-December and broke up about mid-March. 'At the end of January, by watching incoming flocks, I made a very approximate estimate of 23,000 birds ' (F.G.G.). Birds could be seen flying in to this roost from a distance of 12 miles (L.K.). The same roost was re-established in the autumn of 1950. A communal roost in Bents Park, South Shields, started as early as July 8th (F.G.G.). Maximum number *c.* 500 birds (J.C.C.).

On September 28th on Newcastle Town Moor, near Claremont Road, amongst a flock of *c.* 30 normal Starlings, one bird was seen to have the usual dark head, breast and wings, but a pale back, rump and underparts. These pale areas coincided with the pink areas in an adult Rose-coloured Starling. The bird was observed at five yards distance, but in dull light and without glasses. No pink colouring could be detected. Though looked for later, it was not seen again (J.A.M.). Pale and parti-coloured Starlings, though uncommon, occasionally occur.

18. Hawfinch.—In March and early April, in the grounds of the Training College, Darlington, single birds and a pair were several times reported; but breeding was not proved (A.B.).

20. Goldfinch.—Reported more frequently and from over a wider area. From April 16th for three weeks at least, at Craster Tower, Alnwick, a pair seen frequently, presumed breeding (J.M.C. and W.S.C.). In April at Blagdon, six seen, but no nests found (M.W.R.). In gardens at Haydon Bridge, N., on April 24th, eight; September 11th, seven (W.J.). On May 2nd a pair was seen at Thropton (R.C.) and on the 9th at Harbottle, Coquetdale (E.M.). From September 11th onwards small parties were seen about Alnwick; largest number 17 on November 1st (J.E.R.). Bred in a garden at Gainford, D. (W.M.B.). 'During July and August, present in my garden at Norton, Stockton-on-Tees, may have bred there' (D.S.).

21. Siskin.—Much fewer than usual recorded in the winters of 1949-50 and 1950-51. Flocks few and small. On January 13th at Alnwick, one; the only bird seen. On January 21st at Blagdon, four (M.W.R.). In early February near Warkworth a flock of 40—the largest reported (J.A.). On February 23rd at Alnmouth *c.* 12 (H.T.). During most of March several near Darlington (K.L.).

25. Lesser Redpoll.—A few pairs nested in the South Shields area (F.G.G.).

29. Twite.—On January 1st a flock of 30 birds was seen at Greatham Creek, Teesmouth, D. Identified by yellow bills, fish tails and the faint wing-bars seen when the birds were flushed (P.J.S.). On March 5th on Fenham Flats, N., one feeding at H.W.M. on driftage, mainly *zostra*. It allowed approach to within 3 yds. so all distinctive features were observed. It had no pink rump, so probably a hen; perhaps on passage. (F.B.) On April 18th on the southern edge of Colt Crag Reservoir, one cock (A.D.F.). On May 11th a pair was seen sitting on a roadside fence on the Middleton-in-Teesdale to Alston road, near the Durham-Northumberland boundary; they flew off across the moor (A.B.).

31. Serin.—On November 12th and again on the 19th and 26th, an adult cock of this species was under observation in a garden near Westoe, South Shields. It was first noticed by J.C.C. who made very careful notes on the spot, describing in detail its plumage, actions and song. He then reported the matter to H.M.S.B. who, after seeing the bird for himself, wrote: 'The little finch was undoubtedly a cock Serin. I cannot give so confident an opinion on the question of its origin, but it did not behave like an escaped bird.' When first seen on November 12th the bird appeared startlingly yellow, but by the 26th the plumage had changed to a green hue, due to dirt. This suggests that the bird when first seen had only just arrived. As there had been no previous record of the Serin in the north-eastern counties, it was at first thought possible that this bird might have escaped from an aviary. However, a few days later, on December 8th and 9th, a flock of eight birds was seen near North Otterington, Yorks., showing that this was not such an isolated case as it had first appeared to be (see *Naturalist*, No. 837, p. 56). A new record for Co. Durham has thus been established.

32-33. Bullfinch.—Single cocks, sub-species not ascertained, were seen on the Longstone, Farne Islands, on March 18th and May 1st (*F.I.O.R.*, 1950).

36. Common Crossbill.—One record only during the year. On April 12th an adult male, in beautiful red plumage, was seen feeding in some pine trees near the Holly Bush, Dipton Wood, Slaley, N. It was not seen on subsequent visits (A.J.C.). (For a record of breeding in these pine trees see *O.R.*, 1937).

42. Brambling.—Fewer reported than usual in the winters of both 1949-50 and 1950-51. Large flocks rare. Small numbers in flocks with Chaffinches occasionally seen. On May 1st, on the Longstone, Farne Islands, one (*F.I.O.R.*, 1950). Largest flock *c.* 100 near Morpeth on April 10th (M.W.R.).

43. Corn-Bunting.—On July 16th a cock was seen at Whittle Dene Reservoirs 'the first I have seen in this district' (A.J.C.). This species is rare in the mid-Tyne Valley. At a nest in the South Shields district 'injury feigning' on the part of the hen bird was noted when the young were about nine days old. The hen repeatedly fluttered over the long grass about five ft. away, flying to a near-by bush and returning to feign again, calling all the time (J.C.C.).

55. Reed-Bunting.—From February 18th throughout the summer and autumn, anything up to 10 pairs were seen in the Twelve Score Fields, near the Dunston Power-station, on the south bank of the Tyne (L.P.H.). Throughout

late June and July, at Gosforth Park, ten singing cocks were regularly noted round the lake (J.A.M.). Very numerous in Billingham marshes, Teesmouth (O.C.H.).

[58. Lapland Bunting.—On April 11th, near St. Mary's Island and Old Hartley, N., two hens ; thought to be of this species (A.D.F.).]

59. Snow-Bunting.—Unusually plentiful in the winters of 1949-50 and 1950-51. A flock of *c.* 30 wintered near South Shields Pier, D., feeding on the stony ground there and on the Bents Recreation Ground. First seen December 10th, 1949 ; last seen March 25th, three (F.G.G., L.K. & J.C.C.). On March 18th a flock of 50-60 on a newly drilled field at Frenchman's Bay, South Shields (F.G.G.). Many others reported from the coast, including eight on March 14th on Inner Farne (H.T.). Flocks were seen in Upper Coquetdale from November, 1949, to March, 1950. A party of *c.* 40 was regularly seen at the junction of the Buckham Walls Burn and the Coquet. Another party of 25 was on the Carlcroft Burn and remained until March 17th (E.M.).

First reported in autumn on the coast on October 11th at Berwick, four (R.F.L.) and inland on October 11th on Holystone Common, Coquetdale (E.M.). On November 17th, on the Brownsman, Farne Islands, a flock of 15 or 16 birds (H.T.). On the same date a party of *c.* 10 in a ploughed field near Frenchman's Bay, South Shields (F.G.G.) and on November 18th on the beach near Teesmouth a party of *c.* 70 (D.S.). Many smaller flocks reported thereafter.

In Upper Coquetdale, winter flocks have their favoured haunts : there is always a party between Blindburn and Fulhope, one round Ridlees Cairn and one on Dove Crag near Campville (E.M.).

62. Tree-Sparrow.—On January 21st north of Whittle Dene Reservoirs, N., *c.* 30 (A.M.). In October, on West Linkhall Farm, Doxford, N., a flock of *c.* 20 (J.M.C.). On December 17th and 21st, on Lemington Haughs, River Tyne, a flock of ten (W.A.W.). At Blagdon two pairs bred successfully in flower-pot nesting boxes (M.W.R.).

70. Sky-Lark.—On the night of January 24th-25th a large movement was observed from the Longstone, Farne Islands, when several were killed by flying against the lighthouse (*F.I.O.R.*, 1950).

During late September and early October, nearly every morning between 8-50 and 9-20 a.m. small parties, up to 20 birds, were seen crossing the Newcastle Town Moor flying S.W. between 10 and 50 feet above ground. Swallows and Martins have also been seen following the same line across the Moor (J.A.M.). On October 15th at St. Mary's Island, N., between 10 and 10-30 a.m. during a thick fog, many small parties were seen flying south ; probably *c.* 200 passed over (D.G.).

72. Shore-Lark.—None reported in 1950.

75. Tree-Pipit.—On April 12th near Fenham Flats, N., a flock of *c.* 50 was seen in a field : later it was observed in flight and perching on a hedge where the birds could be examined in detail : the plumage, short hind claw and call-note were noted (F.B.). Flocks of this species are very rarely seen.

81. Rock-Pipit.—On the Longstone, Farne Islands, a pair nested on some coal sacks and reared four young within a few feet of workmen engaged in repairing the bomb-damaged engine-house. They appeared quite oblivious of the daily noise of pneumatic drills (*F.I.O.R.*, 1950).

88. Yellow Wagtail.—First seen in the Teesmouth area on April 14th, in Cowpen Marsh (A.B.). On May 3rd at Darlington Sewage Farm *c.* 15 (A.B.). Near Haltwhistle three or four pairs have bred regularly for many years ; this year two cocks and a hen were seen at one site on April 22nd (M.P.). At Corbridge a pair bred in a field near the new ' round-about ' south of the bridge. The cock used the new stone wall as a perching post and fed on the new road verges (G.W.T.). Three pairs bred in the Widehaugh Nurseries on the Tyne near Hexham, one among young fir trees 3 ft. high (E.M.L. & R.T.G.). Nested again in the South Shields area (F.G.G.). During August a flock of *c.* 30 was seen several times on the Tees Marshes (D.S.).

89. Grey Wagtail.—About back to normal numbers on most rivers and streams. On January 30th in Jesmond Dene, three ; snow on the ground (W.A.W.). In Upper Coquetdale, at Carshope, first seen on April 7th (E.M.). A pair has been frequenting the banks of the Wear within Durham City (R.M.P.). On June 13th on River Allen, between Staward and Plankey Mill, four pairs (E.M.L.).

90. Pied Wagtail.—On January 24th a bird was seen on the roadway in a street behind Newcastle Quayside, *c.* 100 yards from the Tyne (W.A.W.). On

January 1st, at Harlow Hill, N., on ploughed land, a flock of over 30 (W.A.W.). In Upper Coquetdale first seen at Ridleeshope on March 7th, at Blindburn, March 8th (E.M.). On April 19th, on the Inner Farne, one (A.D.F.). On May 3rd at Darlington Sewage Farm 30/40 (A.B.).

A pair nested for the second year in succession in a greenhouse at Blagdon. The nest was placed on the rim of a flower-pot. The eggs were hatched on April 30th—an early date (M.W.R.). In the South Shields area a pair brought up three broods ; the only pair breeding in the area (J.C.C.).

91. White Wagtail.—On April 13th at Berwick, a hen ; on the 14th on the river Till, a cock ; on the 30th at Berwick, a cock and two hens and on May 2nd thirty of both sexes ; on the 5th, twelve and on the 8th, five (F.B.). On April 19th one at Hartley, N. (D.G.). On May 3rd at the Sewage Farm, Darlington, four (A.B.) and on September 18th, three (K.L.). On September 7th at Berwick, two adults in winter plumage (F.B.) and on September 8th one at Alnmouth (H.T.).

96. Nuthatch.—On February 20th, one was seen near Whickham, D. (L.G.H.). Reported from woods near Barnard Castle on January 8th and April 25th (F.A.). In a wood near Barnard Castle a pair occupied an old nesting hole of a Lesser Spotted Woodpecker ; plastering the surroundings of the hole with mud. It is not known whether breeding was successful ; but later in the season a Blue Tit was using the same hole (F.C.). During November and December one and sometimes two were seen on the Banks, Durham City. (J.C.C.). On December 29th at Lambton Park, D., one was heard (M.W.R.).

98. Great Tit.—More reports of sabotage ! ' Milk is paid for here in red plastic tokens which are put out on a window-sill with the empty bottles. A few weeks ago the milkman complained that one was missing and on another occasion a token was found on the ground below the sill. On November 22nd a Great Tit was seen to pick a token off the sill and fly off with it dropping it from its beak a few yards away ' (C.H., High Horse Close, Rowlands Gill, D.).

102. Coal-Tit.—On January 22nd at Gosforth Park Sanctuary, a flock of 20, with no Tits of other species in company. Usually they occur singly or in two's and three's in mixed flocks of other species (D.G.).

108. Willow-Tit.—On January 8th at Hurworth Burn Reservoir, D., a single bird was under observation for some ten minutes under good conditions ; all the distinguishing characters were noted as well as its call-note (P.J.S., A.B., J.H. & G.E.). On January 22nd at Gosforth Park a flock of 18 birds was seen : the birds kept to themselves and did not associate with other flocks present in the Park (D.G.). On March 4th on the Tees near Darlington, one identified (K.L.). Observed on a few occasions in the Clockburn Woods in the Derwent Valley, D. (L.G.H.). On August 14th at Whitworth Park, Spennymoor, D., a single bird was seen and identified by its note (M.G.R.).

111. Long-Tailed Tit.—Once more very numerous and widely distributed. Many family parties reported in late summer.

114. Great Grey Shrike.—In mid-January a single bird was seen at Dues Hill Farm, Holystone, Coquetdale, and on April 6th another was seen at Alwinton, still further up Coquetdale (B.C.E.R.). On April 9th one was seen in a garden at Barnard Castle, Teesdale ; it was trying to get at a couple of Blue Tits which were caught in a ' ringing trap.' It severely mauled the Tits, but did not secure them (J.H.W.). On May 7th one was seen on the Whitley Bay golf course ; it was clearly seen and its distinguishing features noted (Mr. Philipson).

119. Red-Backed Shrike.—On May 12th, on the roadside between Craster and Howick, N., a cock : ' The first I have ever seen here ' (W.S.C.).

120. Waxwing.—The widespread invasion of the winter of 1949-50 was fully reported in *O.R.*, 1949. Flocks were reported up to the middle of January, after which only odd birds remained, the last stragglers being single birds—one near Greencroft Tower, Lanchester, D., on April 16th (B.S.), one in gardens at Gosforth on the 18th (A.D.F.).

The first Waxwings in the winter of 1950-51 were seen on November 5th during a field meeting of members of the Natural History Society near Waren Mill, Budle Bay, N. : a flock of *c.* 10 birds were feeding on hawthorn berries near the shore. On the 11th a flock of *c.* 25 was seen at Whitley Chapel, south of Hexham (J.A.). On the 12th one was seen in Westoe Village, South Shields (J.C.C.). On the 19th four visited the garden of Campville, near Holystone, Upper Coquetdale (E.M.). On December 16th, 23 were seen near Lesbury, Alnmouth (H.T.) ; but after that

date only a few single birds were reported up to the end of the year. No birds were reported from S.E. Durham, but on November 5th there were eight in the Park at Middlesbrough, just over the border into Yorkshire (O.C.H.). It was evident that the invasion was on a much smaller scale than that of 1949.

121 SPOTTED FLYCATCHER.—Ascends Coquetdale to the tree limit, nesting as far up as Shillmoor and Carlcroft (E.M.). At least three pairs bred in the near neighbourhood of Newcastle Town Moor (J.A.M.). At Haydon Bridge a pair took possession of a deserted Chaffinch's nest containing four eggs close to the entrance to a house, and made its own nest on the top of the eggs. It laid five eggs, hatched four and reared two young (W.J.). On migration—on September 10th one was seen on the sea wall at Seal Sands, Teesmouth, in early morning mist (D.S.).

123. PIED FLYCATCHER.—Plentiful in the Alnwick woods and in the Forestry Plantations at Swarland: first seen there April 28th (J.E.R.). For the first time on record, two pairs bred close to Blagdon Hall, N., one in a nesting-box near the house, the other in an old stone wall in a wood. About six young were reared from each. The birds near the house were mobbed by House-Sparrows on first arriving. They had not previously been seen nearer than the River Wansbeck (M.W.R.). On May 7th on Chevington Burn, near East Chevington, N., a single cock was seen. It showed every sign of having established a 'territory'; but it was not seen subsequently. It has not been recorded as breeding in that area (M.F.).

On migration, Spring—on May 3rd on the Longstone, Farne Islands, one was seen in the morning flying round the lighthouse and during the day several more arrived (*F.I.O.R.*, 1950). On May 7th at Berwick, one cock (F.B.) and on Holy Island, a hen (F.B.) and a cock (R.F.L.). On May 8th a cock seen in Howick Village, N. (W.S.C.). Autumn—on August 25th one at Alnmouth (H.T.) and on the 27th one in a garden at South Shields (F.G.G.).

127. GOLDCREST.—On migration on Holy Island—April 14th, two; September 8th, four; October 21st, three or four. On November 2nd at Pier Field, Berwick, one was seen to fly in from an easterly direction, presumably from the sea, in a fairly thick fog (R.F.L.).

129. CHIFFCHAFF.—On April 7th one heard at the Grove, Hamsterley, D. (C.G.). Up to its usual numbers in Alnwick Park; first heard April 25th (J.E.R). On June 4th one heard singing in Gosforth Park (L.G.H.).

132. WILLOW-WARBLER.—First heard at Whitworth Park, Weardale, on April 14th (C.G.) and in the Alnwick district on April 17th (J.E.R.).

153. SEDGE-WARBLER.—On May 14th in Gosforth Park, 13 birds were heard singing; later the number fell to nine (J.A.M.).

On passage—on August 23rd from the rocks at Seahouses, N., a single bird was seen to fly in from the sea; it fluttered about the rocks and alighted amongst the weeds on the cliff (W.R.P.).

162. BLACKCAP.—Wintering birds—on December 21st, 1949, a cock visited the Bird Research Station at Glanton, N. (N.R.). On March 9th in Westoe Village, South Shields, D., a cock was trapped, ringed and released. On November 12th a single cock was again seen at the same place. No ring could be seen on its leg, so it was not the same bird (J.C.C.). On December 4th, a hen or first winter bird, was seen feeding on yew berries near the gates of Craster Tower, Alnwick (W.S.C.).

First seen in Alnwick district April 25th (J.E.R.). At the end of April a cock spent some days on the Longstone, Farne Islands (*F.I.O.R.*, 1950).

163. COMMON WHITETHROAT.—On August 17th in my garden at Norton, Stockton-on-Tees, two. Never seen here normally, probably on migration (D.S.).

164. LESSER WHITETHROAT.—Between May 5th and 13th at Rugley, Alnwick, one was seen and heard several times, but it did not remain (J.E.R.). An uncommon visitor to most parts of Northumberland. See previous *O.R.* records of un-mated cocks taking up territories.

173. FIELDFARE.—Less plentiful than usual in the winter of 1949-50. Scarce about Alnwick early in 1950 (J.E.R.). On April 14th a flock of 30 still on the River Till (F.B.).

First seen in autumn in Coquetdale at Grassleas on September 27th (E.M.). At Alnwick first seen on October 20th; more plentiful than for some years past. Largest flock 200 on December 3rd. Very numerous about Stockton-on-Tees at the end of the year (D.S.). Large flocks in the Haltwhistle area in autumn and winter (M.P.).

It is not often that this species visits town gardens, but on March 20th a single bird paid a hurried visit to a garden in Sunderland and took food that had been put out for tits and other garden birds (J.W.).

174. Mistle-Thrush.—Still scarce as a breeding species about Alnwick, but a fair number present in autumn feeding on the berries of white beam (J.E.R.). A pair bred in Craster Tower grounds, Alnwick—the first since the severe weather of 1946-47 (W.S.C.). Still a rare bird about Alnmouth, one seen on December 23rd (H.T.). Still scarce in mid-Tyne area (G.W.T.). Numbers improving in the Derwent Valley (C.H.), and in N.E. Durham (L.K.).

175. Song-Thrush.—At Haltwhistle, during the spell of hard frost April 23rd to 27th, four nests were found containing young a few days old, all dead ; probably the parents had been unable to find food for them (M.P.). As early as April 27th in a Swalwell garden a fledgling Thrush was seen (L.P.H.). At Blagdon a pair built a nest in a pear tree and laid four eggs, then built a fresh nest on the top of the first one, laid again and hatched four young (M.W.R.).

178. Redwing.—At Alnwick small parties were present up to March 5th, when 150 were seen—a few days later all had gone (J.E.R.).

Many reports of large flocks during the autumn and winter from both counties. On October 15th first seen flying south (L.G.H.). First seen at Alnwick on October 18th ; since then much more plentiful than in the previous year (J.E.R.). On October 21st at Berwick, several small flocks (F.B.). On December 28th near Alnmouth, many hundreds were seen flying west : they appeared to be coming in from the north and changing direction here (H.T.). Many large flocks in the Haltwhistle area in the autumn and winter (M.P.). Very numerous at the end of the year about Stockton-on-Tees (D.S.).

182. Ring-Ouzel.—First heard in Upper Coquetdale at Carshope on March 23rd (E.M.). Occurs in the Coquet Valley from Windyhaugh upwards (E.M.). Last record, one seen on the slopes of Cheviot in the last week of October (A.M.P.).

184 Blackbird.—On October 23rd on Ross Links, N., several first winter birds among the dunes ; almost certainly immigrants (F.B.). On November 17th on the Inner Farne, one cock (H.T.).

A bird ringed as full-grown at the Fair Isle Bird Observatory on October 11th, 1948, was recovered at Throckley, N., on February 1st, 1950 ; 330 miles to the south. A bird ringed as full-grown at South Shields by J.C.C. on August 27th, 1949, was recovered at Leswalt, Wigtown on November 9th, 1949 ; 145 miles to the west (*B.B.*, Vol. XLIII, p. 316).

186. Wheatear.—First arrivals—March 18th at Cheswick, N., one (R.F.L.) ; at Whitburn, D., one (F.G.) ; March 26th at Hepple, Coquetdale, one (B.P.H.). On several days during April, Wheatears were noticed passing the Farnes, the greatest number during the early hours of the 21st. A pair nested on the Inner Farne, for the first time for several years (*F.I.O.R.*, 1950). A pair nested successfully on the Durham coast very near to South Shields (F.G.G.).

On July 9th at Holy Island a juvenile was picked up with its breast and axillaries clogged with the prickly heads of *Acaena* fruits, a plant which has become naturalised on the links. When these were removed it flew away quite strongly (F.B.).

Artificial ' sun-bathing '—at East Chevington during the war an unsuccessful attempt was made to extinguish a burning pit-heap by the use of sand. There are now several small pockets of this sand. A Wheatear was flushed from one of these pockets, which was found to be quite warm and was, in fact, only a few inches below a smoking crack in the ashes. Within a few minutes it was twice observed to be squatting with half-spread wings and breast thrust close against the wall of the recess. On each occasion the bird flew away in a normal manner and did not appear to be injured in any way. This was on May 9th, the beginning of a cool spell after some very fine weather (M.F.).

187. Greenland Wheatear.—On April 17th at Greatham Creek, Teesmouth, D., one was seen with a Common Wheatear for comparison. It was a large and brightly coloured cock (P.J.S.). On April 30th at Berwick, a pair, on May 3rd a pair ; May 8th, two cocks ; May 17th, a hen ; 18th, a pair and 20th, a cock (F.B.). On September 14th on Beal Shore, N., a cock (F.B.). On May 24th, at Whitburn, D., four (L.K.).

197 Whinchat.—On migration—on May 7th at Holy Island, a cock on the dunes (R.F.L.). May 13th near Seaton Carew, Teesmouth, D., one (D.S.). On

September 8th at Holy Island, one at the Lough and two on corn stooks near the village (R.F.L.).

198. Stonechat.—More were reported from the Northumberland coast than for many years past. Most of these were seen in the months of October, November and December. The few birds reported earlier were : on January 1st, one at Old Hartley (A.D.F.) ; on April 8th a single cock near Druridge Bay and at the same place on May 13th and 14th a pair feeding four fully fledged-young (M.F.). On February 18th a pair on the links north of Bamburgh (T.F.H. & G.W.T.). On March 27th at Craster a pair (H.T.). At Alnmouth one or two seen occasionally, but not known to have bred locally—on July 25th three juveniles (H.T.), On May 5th one or two were seen on the Longstone, Farne Islands (*F.I.O.R.*, 1950). It is not possible to estimate how many birds were on the coast in the autumn, as many of the records may have referred to the same bird or birds seen by different observers. Inland records—on October 29th on the main Alnwick to Rothbury road, six miles west of Alnwick, a pair (H.T.). Not a single bird seen on the Weardale moors about Wolsingham (R.M.). In Haltwhistle area none seen for four years (M.P.). On the Durham side of the Tees in the Barnard Castle area, three pairs bred (M. Larking per Ralph Chislett). The pair reported as breeding in the South Shields area last year did not return this year (J.C.C.), but single birds were seen on February 4th, and November 15th (L.K.). A single cock was seen by the River Tees near Blackwell, Darlington (A.B.).

201. Redstart.—Reported as numerous by several observers. First seen in Alnwick area April 30th (J.E.R.). At the end of May a few were seen on the Inner Farne (*F.I.O.R.*, 1950). On June 4th near Harlow Hill, N., two nests were found within 150 yds. of one another ; one in a pile of stones with five eggs and the other in a hole in a wall (W.A.W.). Less numerous at Blagdon, N., than in 1949 ; but five ' flower-pot ' nesting boxes were occupied. The nests contained five, six, six, six, and eight young ; the last were successfully reared in quite a small flower-pot (M.W.R.).

202. Black Redstart.—On February 11th at Teesmouth, a cock was under observation for half an hour ; all its characteristic features were noted (K.L.). On April 19th on the Brownsman, Farne Islands, a hen was seen near the tower (A.D.F. & B.S.).

208. Robin.—On April 19th on the Brownsman, Farne Islands, one (A.D.F.). On October 1st one was seen to fly in off the sea and alight on South Shields Pier (J.C.C.). On November 12th on the North Wamsea, Farne Islands, one (V.D.).

A Robin ringed as young at South Shields on August 28th, 1949, by F.G.G. was recovered at Darlington on October 26th, 1949 ; 33 miles to the south (*B.B.*, Vol. XLIII, p. 317).

211. Hedge-Sparrow.—A bird ringed as an adult at South Shields on September 9th, 1949, was recovered in Jesmond Dene, Newcastle-on-Tyne, on April 24th, 1950 (J.C.C.).

213. Common Wren.—Several observers report a marked increase in numbers, which are now little short of pre-1947 figures.

In Upper Coquetdale the Wren winters singly in most out of the way places on the moors. It rises from amongst the long heather and one is often seen in the deep ditches overgrown with heather (E.M.). On October 1st one was seen at over 2,000 ft. on the banks of the burn in the Henhole, Cheviot (G.H.R.). On November 17th on the Inner Farne, one (H.T.).

218. Dipper.—About normal on the River Derwent (C.H.). None seen on the streams about Blagdon, N. (M.W.R.). On October 8th at Hallington East Reservoir, two seen, one of them singing—an unusual date (R.T.G. & E.M.L.).

220. Swallow.—On April 16th, Swallows were reported from all over the two Counties. There was only one earlier record—on April 9th in the West Hartlepool area (P.L.H.). On April 20th at Haltwhistle, with a sharp frost at 11-0 a.m., the first bird, a cock, arrived at its usual nesting place. It was seen again next day, but not subsequently until the 29th when several were at the nesting place. From the 23rd to 26th there was a hard frost with showers of snow. The main wave came in on May 1st, a sunny day with showers of rain (M.P.).

During September and early October large numbers were often seen crossing the Newcastle Town Moor in a S.W. direction (J.A.M.). In the Alnwick district birds stayed later and in larger numbers than usual. Plentiful until within a few

days of the last date—October 18th (J.E.R.). Last seen on November 12th, two at Seahouses, N. (H.T.).

222. House Martin.—First seen Sunderland, May 1st (J.W.). Alnwick, May 2nd (J.E.R.). Berwick, May 3rd (F.B.). At Haltwhistle on May 1st a dozen or so were seen, with fresh arrivals every day thereafter, till on the 22nd, with a sharp rise in temperature, hundreds were passing west up the Tyne Gap (M.P.).

Six pairs tried to nest on the cottage on the Brownsman, Farne Islands, but were driven away by the Terns, at least two being killed. Although for a century Swallows have bred sporadically, this is the first time that House Martins have settled on the Islands (*F.I.O.R.*, 1950).

On September 28th a large S.W. movement was noted crossing the Newcastle Town Moor with Swallows (J.A.M.). In the Berwick area, local birds left at the end of September, but thereafter small parties (largest 30 birds) were seen between October 1st and 17th flying in a westerly direction up the Tweed at Berwick (R.F.L.). Is there an autumn flight-line up the Tweed valley? In the Alnwick district birds stayed later and in larger numbers than usual. Plentiful to within a few days of the last date—October 18th (J.E.R.).

223. Sand-Martin.—First seen in Alnwick district April 10th (J.E.R.). Late at Haltwhistle this season; first arrivals April 22nd, but not seen again until May 1st; on the 22nd hundreds were passing west up the Tyne Gap with House Martins; see above (M.P.). On migration at Holy Island—on July 16th, 24 were seen flying south over the Snook (R.F.L.). In late July and early August at Teesmouth small numbers seen regularly flying south (D.S.).

225. Swift.—At Haltwhistle, N., on May 3rd, three and May 4th, two were seen, cold N. & N.E. winds. In the afternoon of the 5th, dozens arrived over the town, circling round and uttering their squealing notes. As night fell they swooped down and entered the nesting holes beneath the eves of the buildings with unerring accuracy, suggesting that they were the same birds as bred there last year (M.P.). In Berwick district first seen May 6th, three, thereafter common (F.B.). In Weardale first seen May 6th (C.G.).

On July 9th at Holy Island for half-an-hour about mid-day, 15 to 20 birds, usually singly, came in from the north, flew round Snook Point and made off towards the mainland in an S.W. direction against a southerly wind (F.B.). On July 10th at Teesmouth, a southerly migration was first noticed. It continued throughout the month and early in August. The birds followed the flight-line described by Nelson (*Birds of Yorkshire*, 1907) southerly across the Tees rather than along the coast (D.S.). On September 17th, near Boulmer, a single very late bird seen (M.G.R. & W.H.K.). On September 22nd, one seen over Norton, D., after main party had left in mid-August (D.S.).

233. Roller.—On October 14th near Arcot Hall, N., some 12 miles N. of Newcastle, a Roller was seen flying along a hedgerow. It was approached to within 10 yds. and its characteristic brilliant 'Oxford and Cambridge blue' plumage was clearly noticed, making identification easy. The observer is already quite familiar with this species in Africa (J.G.A.).

234. Kingfisher.—Many members report an increase in the number of birds seen on rivers and streams throughout both Counties. Some have occurred at unusual places—on January 7th, one at Hurworth Burn Reservoir (P.L.H.). On January 15th, one at Brasside Pond, D., 'the first I have seen there' (J.E.C.). On October 14th at Gosforth Park, one and on November 4th, two together (D.G.). In November a bird was seen more than once on the river Wear near Framwellgate Bridge, Durham City (R.M.P.).

235. Green Woodpecker.—Increasing notably in many districts: Alnwick district (J.E.R.). Derwent Valley (C.H.). River Till (F.B.). Correspondence in the local 'press' proved how widespread is its distribution.

237. Great Spotted Woodpecker.—In the early part of the year a hen regularly visited a tit-bell in a South Shields garden. After the middle of April it was joined by a cock (H.M.S.B.). On January 4th and on March 5th single birds were seen in Westoe Village, South Shields (J.C.C.). On February 12th one was seen in the new portion of Jesmond Dene, Newcastle (G.H.R.).

238. Lesser Spotted Woodpecker—The bird reported from Carrycoats Hall, Birtley, N., in 1949, was not seen or heard after the second week in May; but on March 27th, 1950, it was heard again and remained about throughout April (R.S.B.). On March 25th and on several subsequent occasions throughout the summer at

Whitworth Park, Spennymoor, D., a pair was watched under very favourable conditions, but no proof of breeding was established though what appeared to be fresh nesting holes were seen in the trees that they frequented (C.G.). In the summer of 1949 a pair bred in a wood on the Durham side of the Tees near Barnard Castle. The cock was seen going in and out of the nesting hole and could be compared in size and markings with the Great Spotted breeding in the neighbourhood. Old nesting holes of the species were found ; in one of which a pair of Nuthatches nested in 1950. In April, 1950, a single bird was seen but no nest located (F.C. & F.A.).

240. CUCKOO.—First seen at Fenham Flats, N., April 29th (F.B.). Sunderland, April 30th (J.W.). On June 4th, two adults were seen at the end of Tankerville Terrace, Newcastle ; one alighted and gave the bubbling call (G.H.R.). On May 10th, near Chevington, N., a hen was seen to perch in a hawthorn after making a bubbling call. A male approached, occupying various perches around her, but not nearer than about 10 yds. He was observed to drop to the ground on four occasions, at the last three at least, rising with dry grass in his bill ; but he made no advances to the hen with it, except to change to another perch. At that point a second male (?) appeared and they both flew to the female which passed out of sight. The two males then flew off together for about 400 yds. when one returned to find the female (M.F.).

249/254. OWLS.—During the month of April, at Stannington, N., four species of Owl were observed : A Little Owl seen in flight ; a Long-eared Owl seen in a fir tree, but no nest found ; a Tawny Owl seen to fly from a tree where it had previously nested ; a Barn-Owl in a tree in which three pairs of Jackdaws were already nesting—one addled egg of Owl present (G.J.).

249. LITTLE OWL.—Still spreading—on April 10th one was seen on the fells north of Rothbury (G.H.R.). At Tritlington, five miles north of Morpeth, a nest with four eggs in a hole in a tree (R.C.). A nearly-fledged bird was rescued from a cat near East Woodford Farm, Slaley, N., on July 7th, ' this is the first that I have seen in this district ' (A.J.C.). Two seen frequently at East Mill Hills Farm near Haydon Bridge during the breeding season (W.J.). Frequently heard near Gainford, D. (W.M.B.).

250. LONG-EARED OWL.—On August 13th at Cowey Sike, Northumbrian Loughs, one in scrubby bushes near the pond in broad daylight ; an unusual roosting place (R.V.H.B. & D.W.).

251. SHORT-EARED OWL.—Reported during the breeding season from a widening area of moorland in both Counties. Breeds sparingly on the Coquetdale moors ; nests found on Carshope and Quickening Cote (E.M.). More than usual reported from the coast in the autumn, generally single birds, but on November 18th, amongst dunes at Goswick, N., five together (F.B.).

254. BARN-OWL.—On February 20th at Alnmouth, one (H.T.). On June 16th an adult male was picked up dead in the Central Station, Newcastle. It bore a ring proving that it had been ringed as a nestling on July 31st, 1948, at Cawthorne, near Barnsley, Yorks. The fact that the bird when found had not been freshly killed suggests that it may have been struck by a train and carried from nearer to its place of origin. A bird ringed as an adult at South Shields on November 9th, 1949, was recovered dead at Cockburnspath, Berwickshire, 75 miles north, on April 25th, 1950 (J.C.C.).

259. PEREGRINE FALCON.—During the winter of 1949-50 a single bird haunted a moorland in Upper Weardale ; it roosted regularly on some high rocks in a deep ravine. It was noted that when it killed Wood-pigeons it ate the head and legs, but when it killed Grouse it left them both (R.M.). Very few records of breeding, though single birds were seen at and near the usual sites both during and after the nesting season (D.A.R., A.M.P., G.H.R., L.G.H., etc.).

At a Northumbrian eyrie a substantial ' hide ' had been erected on the nesting ledge for photographic purposes. The pair returned and after two eggs were laid the hide collapsed, frightening the hen so that she deserted the site. It is probable that the hide was destroyed by human agency as it had withstood a whole winter's gales without damage (A.R.H.). On November 17th on the Farne Islands, two ; one of them, a female, was first seen on the Staple (H.T.). On November 12th, 1949, a couple was seen at the same place when one of them was seen to strike down and kill a Woodcock. No doubt many in-coming migrants are destroyed in this way (*F.I.O.R.*, 1950). Other single birds reported from the coast in autumn.

261. Hobby.—On July 9th at the Snook, Holy Island, one flew over the dunes at a height of 50 ft. with the usual gliding flight. Suddenly it rose almost vertically for about 20 ft. executed a rapid twisting turn, swooped down almost vertically and flattened out over a hovering Sky-lark which it seized with both feet, the whole procedure carried out very smoothly and precisely. Then with short glides and partial hovering flight it appeared to eat its prey in the air, bending forward while it lifted the lark up in its feet. It then flew over the flats towards Goswick. Its size was about that of a Kestrel without the long tail. The bluish grey back, spotted creamy under-parts and black moustachial streak were clearly seen, but as no chestnut was visible on the legs and belly it was probably a female. The top of the head appeared black, so it was probably adult (F.B.).

262. Merlin.—More frequently reported from the moorlands of both Counties in the breeding season. On March 19th on the Weardale moors a pair was seen to attack a Short-eared Owl (C.G.). A pair nested on a crag on the Rothbury Hills, N., and laid four eggs, but the nest was deserted on account of disturbance due to campers near the site (R.C.). Several reported from the coast in October and November (F.B., J.M.C., H.M.S.B.). On October 7th one was seen to fly in from the sea at Seaton Sluice, N. (D.G.). On December 26th at Blagdon one was seen in a wood (M.W.R.).

263. Kestrel.—In town : a pair bred successfully on the old balloon barrage sheds at Longbenton, N. (W.H.K.). On October 25th one was observed perched on the Cathedral, Newcastle (G.H.R.).

266. Golden Eagle.—From February to May, 1950, a Golden Eagle spent some weeks in the Cheviot district. First seen at Netherton, near Thropton, on February 13th, by R. Cockburn and a gamekeeper when out rabbit catching. It came within 40 yds. so that all distinguishing characters could be noted. It was being mobbed by a dozen Carrion Crows. Later it moved to the Keilder and Falstone area of the North Tyne, where it was first seen on April 17th in the valley of the Yett Burn, by H. Earsman, gamekeeper of Whickhope Lodge, who is well acquainted with the species in Scotland. By May 20th it had earned such a reputation for killing lambs and grouse that its doings were chronicled in the Newcastle *Journal*. It was credited with having destroyed 50 lambs and a great many grouse. P. F. Garthwaite, the Forestry Commissioner's District Officer, investigated the matter closely, and obtained reports from many people who had seen the bird. While it is true that it was seen to swoop down over lambs and to be eating dead ones, it is probable that most of them had died of disease or been killed by foxes. Its principal roosting place was in Christianbury Crags, on the Northumberland-Cumberland border. It was last seen in that area on May 10th. On June 2nd it was reported to have been seen at Spylaw on the slopes of the Simonside Hills, but this was not confirmed. No further reports were received.

268. Rough-legged Buzzard.—One haunted a bit of fell land in the Haltwhistle district from January until the beginning of March—' I saw it nearly every day, skimming the hillside or perched on the top of one particular thorn bush ' (M.P.). On March 26th a Buzzard was seen circling over the moors near Middleton-in-Teesdale. It was identified by its white rump and pale under-parts (A.B.). In November and December one was reported from Quickening Cote, Coquetdale, where one was seen last year (E.M.). On November 4th a very fine female was shot in Lambton Park, D., and was sent to the Hancock Museum (J.W.). All species of Buzzard are protected all the year round in County Durham. It is therefore illegal for Gamekeepers to destroy them.

269. Common Buzzard.—On January 9th one was seen near Eggleston, in the Tees valley. It was seen under favourable circumstances and definitely identified (F.A. & F.C.). A single bird arrived on the Wolsingham moors in April, but only stayed for two weeks (R.M.). Occasionally a pair of non-breeding birds may haunt Falcon Clints, Upper Teesdale, in spring and summer, but none was reported this year until September, when a single bird was seen on the moors north of Middleton-in-Teesdale (H.W.).

272. Montagu's Harrier.—In May a pair returned to the moors in west Durham, where breeding has taken place in previous years. At one time (May 13th) no less than three cocks were seen together trying to pair with the hen ; much fighting took place in which the hen joined, showing great determination in driving off the two surplus cocks. Earlier in the same day an un-mated cock was seen on another part of the same moor engaged in nest-building, no hen being seen. On

June 17th this cock-nest was visited and found to consist of a substantial amount of material, no doubt entirely built by the un-mated cock (E.G.T.). The first nest was visited on June 10th when it contained four eggs (M.G.R.). Four young were hatched and on July 8th they were able to leave the nest but not to fly (J.A.M.). As late as August 13th five birds were seen together in the neighbourhood and one or two were about up to mid-September (W.R.).

273. HEN-HARRIER.—On November 17th, 18th and 19th, but not subsequently, on the Blagdon Estate a female or immature bird was seen (M.W.R. & J.W.). On November 26th, near Cabin Hill, on the moors three miles south of Wolsingham, in Weardale, D., a female or immature bird was observed, under very favourable conditions, quartering the moors (C.G. & D.B.).

277. SPARROW-HAWK.—In town : On January 20th one was seen in the S.E. corner of the Exhibition Park, Newcastle (G.H.R.).

281. HONEY-BUZZARD.—On July 1st at Embleton, N., one seen (J.M.C.).

284. OSPREY.—On May 28th an Osprey was seen fishing in the Tweed near Cornhill. It is satisfactory to note that there is no record of its having been shot (W. J. Straker-Smith in *The Field*, July 8th, 1950).

289. COMMON HERON.—Northumbrian Heronries : Longridge, near Berwick, on April 25th fifteen occupied nests were counted, with egg-shells lying under twelve of them. Last year only seven nests were seen, but this year an additional eight were found in another part of the wood not previously visited (H.C. per F.B.). Chillingham, on April 25th, fifteen occupied nests (Lady Tankerville). Boundary Wood, near Alnwick, not visited. Shipley Moor, no nests (H.T.). Catcleugh, Redesdale, not visited. Blagdon Estate, no nests (M.W.R.). Allen Banks, Bardon Mill, only one occupied nest, though six birds had been seen there earlier (S.N.R.), four young successfully reared (M.P.). ' I know of no other nests in West Northumberland ; though it is just possible that odd isolated pairs may be breeding in some of the tall timber in hill woods. Ten years ago I knew of several such instances, but the nests were, in the main, destroyed by gamekeepers ' (M.P.). Grey Court, Tyne Valley, no report of nests, but on March 17th ten birds had been seen in the neighbourhood (G.W.T.). Riding Mill, two occupied nests (C.J.G.). The Heronry near Gilsland, referred to last year, is on the Cumberland side of the River Irthing ; three pairs bred there this year (M.P.). Durham Heronries : Dyance Wood, near Gainford, on February 19th only eight nests were counted, though twenty birds were seen (K.L.). Later eleven nests were seen, but only five of them were actually in use this year (R.O.V.). Whitworth Park, Spennymoor, no nests this year (C.G.).

At Gosforth Park in September as many as four were seen together (G.J.G.), and on several occasions up to the end of the year three were seen (J.A.M.). On September 15th two were seen on the flooded Twelve Score Fields, by the Dunston Power-station (L.P.H.), and on the 21st five were on Jarrow Slake (W.H.K.). On November 12th on the North Wamses, Farne Islands, one (V.D.).

On November 26th, near Stamfordham, N., a Heron was flushed from a small stream, with distinctly reddish legs. As the bird was flying away from the observer, the bill colouring could not be seen (D. Gordon). This colour change has rarely been observed in the Common Heron, but see *B.B.*, Vol. XLII, pp. 42 and 46 for very interesting notes on this subject.

300. WHOOPER SWAN.—The unusually large numbers reported in the autumn of 1949 remained over the winter and birds were seen on waters not previously visited. Blagdon Park Lake (M.W.R.), Minsteracres pond (G.A.C.), Whittle Dene Reservoirs (G.W.T.). Some birds remained late—on April 16th there were still ten on Greenlee Lough (G.R.E.) ; on the 18th, two on Colt Crag Reservoir (A.D.F.), and on the 30th, one on Grindon (H.R.O.).

The earliest to be reported in the autumn were on October 8th, when 20 were counted near Holy Island (R.H.), and one was seen to fly in from the north and to alight on the reservoir at Hallington (R.T.G., E.M.L. & W.M.B.). Again flocks became scattered and in the long spell of frost birds were seen in unusual places. On December 21st, at Corbridge, a flock of *c.* 30 was seen to fly up the Tyne and to alight on the river, near the Cor Burn mouth (per T.F.H.).

301. BEWICK'S SWAN.—On December 21st, one at Alnmouth (H.T.). This is the only record for the winter and the first since April, 1949, when a single bird was reported from Greenlee Lough. As in other parts of the country, Bewick's Swan has ceased to be a regular winter resident and is now only a rare visitor (G.W.T.).

302. MUTE SWAN.—More numerous than ever on Budle Bay—largest number in November, on the 10th, 189 (V.D.).

303/307. 'GREY GEESE.'—In the late autumn many reports were received of skeins of Geese passing overhead. Most of these were flying west or south-west, many going up the Tyne valley. Some were judged by their calls to be Pink-footed but certain identification was not possible in most cases. Grey Geese are reported to have been more than usually plentiful on the Solway marshes—' very wild and constantly moving up and down the coast ' (M.P.).

303. GREY LAG-GOOSE.—From June 14th to July 8th a party of seven immature birds frequented Holy Island ; they were seen by several people and quite definitely identified (R.H.). On June 29th four Grey Lag-Geese were put up by a boat from the N.E. shore of the Inner Farne (E.A.R.E.). Compare *O.R.*, 1949 for a similar occurrence—where do these birds come from?

At Holborn Moss—October 5th, 15 ; November 12th, *c.* 200 ; December 10th, 138 (F.B.).

307. PINK-FOOTED GOOSE.—At Holy Island—September 10th, 26 ; October 8th, over 100 ; November 12th, over 200 ; December 10th, over 200 (R.H.).

(On October 15th, at Hule Moss, Greenlaw, Berwickshire, outside our area, *c.* 15,000. By November 26th only about 800 remained (F.B.)).

311. BARNACLE GOOSE.—On October 4th and 5th, at Holy Island, a flock of 26 birds was seen, both from the shore and from a punt (W.W.).

312/313. BRENT GOOSE.—Very few reported in the winter of 1949-50. On January 15th, at Holy Island, 12 ; March 19th, 32 (R.H.).

Again, in the winter of 1950, very few. On October 14th, on Fenham Flats, three, put up by a wildfowler (R.F.L.). On November 12th, at Holy Island, four (R.H.).

315. SHELD-DUCK.—On Holy Island 11 pairs bred (R.H.). On Staple Island, Farnes, five pairs bred (*F.I.O.R.*, 1950). No ducklings seen at Teesmouth this year, although adults were present throughout the year (A.B.).

A young bird, ringed on Budle Bay, N., on July 12th, 1949 (by J.S.A. & M.W.R.), was recovered at Southport, Lancs., on November 7th, 1949, 140 miles S.S.W. (*B.B.*, Vol. XLIII, p. 318).

For notes on moult-migration, see above.

318. GADWALL.—In the early summer a drake and seven ducks spent some time on Tunstall and Waskerley Reservoirs (R.M.). On September 24th, at Gosforth Park, one (J.A.M.).

319. TEAL.—On November 26th, at Gosforth Park, *c.* 300 present, reduced to 100 by December 9th (L.G.H.). On December 17th and 21st, on the Tyne, near Blaydon, as many as 30 were counted during a spell of frost (W.A.W.).

322. GARGANEY.—Several pairs reported in the breeding season, but no nests or young seen. On April 16th, at Potlands, Ashington, N., a pair, still there April 29th (R.C.). On May 7th and 14th, on Gosforth Park Lake, a pair (W.R.L.), a drake still present on June 4th (J.A.M.). Seen occasionally on the pond in N.E. Durham, where breeding took place in 1947 (F.G.G.), on April 30th, a pair present (J.C.C.). At Cowpen Marsh and on Greatham Marsh, Teesmouth, single birds were seen on June 18th, July 19th and 30th (A.B. & D.S.).

323. WIGEON.—On February 25th and March 5th, on Fenham Flats, *c.* 1,500 (F.B.). The gamekeeper at Swinhoe N., states that up to 15 or 20 years ago Wigeon were seldom seen on the lake. Mallard could be counted in thousands and in autumn there were usually up to 1,000 Teal. Now the position is reversed, Wigeon being the only abundant duck. They usually arrive there early, numbers reaching their peak between October 20th and 30th. This year they were late and only came in during the second week in November. On November 12th, the day of the Wildfowl Census, *c.* 1,000 were present. On the same day there were *c.* 1,500 at Holborn Moss, N. (F.B.).

325. PINTAIL.—Pairs and single birds reported from various waters throughout the year. On October 21st at Gosforth Park a duck was seen to dive persistently when feeding, its body being completely immersed on each occasion (J.A.M.). In the *Handbook* it is stated that—' diving does not seem to be recorded except when wounded or incapable of flight during moult or in captivity.'

326. SHOVELER.—On January 14th at Blagdon, one—an unusual date ' I do not think that any bred here this year, but they often do so ' (M.W.R.). At Gosforth, maximum counted 26, on November 4th ((D.G.).

[327. Red-Crested Pochard.—On February 11th a female was seen on Gosforth Park Lake. It was watched for some time at close quarters with binoculars and telescope, and all distinguishing characters were noted, though, being afloat, the colour of its legs was not seen. It was not present on the following day (R.G.G., K.N.G., W.R.L.). It is probable that this was an escaped bird (see *B.B.*, Vol. XLIV, p. 29, for a note on this)].

328. Common Pochard.—None reported from the pond in Co. Durham where they have previously bred (J.E.C.).

330. Tufted Duck.—On February 2nd on the Tyne at Blaydon, a flock of 20 (B.P.H.), on December 21st after the long frost, 74 (W.A.W.). Largest number reported from Gosforth Park, 85 birds on February 26th (J.A.M.). At Capheaton, N., five broods of newly hatched chicks were seen (W.H.K.).

331. Scaup-Duck.—Of recent years Scaup have been scarce on the coast. Very few reported in the winters of 1949-50 and 1950-51, usually single birds, maximum number four. Inland—on February 5th on Whittle Dene Reservoirs, one, immature (H.R.O.).

334. Long-tailed Duck.—Very few reported in the winter of 1949-50. During January and February, a small number off their usual haunt—the Stag Rocks, Bamburgh. Last seen on April 14th at Holy Island, two drakes and a duck (D.G. & R.F.L.). First seen in winter of 1950-51 on October 8th, one off Bamburgh (H.T. & J.E.R.). On November 5th there were seven drakes off the Stag Rocks (N.H.S. Field Meeting). Six were still present up to November 27th (V.D.).

337. Eider.—It is estimated that at least 450 pairs bred on the Farne Islands, but an accurate count was not obtainable (*F.I.O.R.*, 1950). Winter flocks have been noted as far down the coast as St. Mary's Island; on February 22nd ten were seen (C.G.) and during October and November a flock remained for several weeks, maximum number counted was on November 25th when 43 birds were present (D.G.).

Eiders are not often recorded from the Teesmouth area, but single birds were seen on March 31st and November 19th (D.S.), and on November 22nd, on a pond behind the slag breakwater near Port Clarence, three ducks flew down to a decoy-duck and two of them were shot (O.C.H.).

339. Common Scoter.—Scarce in the winter of 1949-50 (H.T.). Off Cheswick only *c.* 100 remained through the winter, chiefly immature birds; but on April 25th there were 700 to 800 adults (F.B.). On May 7th at Holy Island, *c.* 400 (R.F.L.). On July 4th, *c.* 250 arrived from the north and alighted in Alnmouth Bay. Compare July 1st, 1946 when a flock of 150-200 flew south (H.T.).

340. Velvet Scoter.—Very few reported, chiefly in October; on the 21st, at Holy Island, two (R.F.L.); on the 26th, at Marsden, five, flying north (F.G.G.); on the 27th, off Seaton Sluice, thirteen flying north (D.G.). On December 16th, at Holy Island, five; on the 24th, at Alnmouth, six drakes flying north (H.T.); and on the 27th, off Seaton Sluice, 19 (D.G.).

342. Goosander.—Still increasing in numbers and becoming more and more widely distributed. Present on the Upper Coquet all winter (E.M.). On August 26th above Shillmoor, fifteen were seen together (E.M.). Frequently seen on the Loughs; on Greenlee, March 5th, a flock of 16 (J.A.M.). On June 18th, on the Coquet, near Holystone, a duck was seen with seven young (E.G.T.). On November 26th, on Gosforth Park Lake, one (B.B. & L.G.H.). On February 19th, on Whittle Dene Reservoir, a flock of 18, chiefly males (W.A.W.). On December 16th, one on the Tees above Barnard Castle (K.L.). "On December 26th I shot a duck on the river at Blagdon which disgorged three minnows, two gudgeon and a six-inch trout! I have never seen one here before" (M.W.R.).

344. Smew.—Only one reported—the female which wintered on the Whittle Dene Reservoirs from November, 1949, and remained until March, 1950. No records for the winter of 1950-51.

346. Cormorant.—For the first time for over 20 years Cormorants attempted to nest on the East Wideopens, Farnes. About 50 pairs settled there in April, but the nests were washed off by a storm early in May. All the birds then congregated on the Megstone, where the colony was quite as large as in 1949 (*F.I.O.R.*, 1950).

A bird ringed as young on the Megstone on July 23rd, 1948, was found dead in a fishing net at Newton-by-the-Sea in July, 1950 (*F.I.O.R.*, 1950).

On September 8th at Haydon Bridge, Tyne Valley, three flying west (W.J.).

On April 14th, three birds were seen flying off shore at Snipe Point, Holy Island, which had their napes and the sides of the upper parts of their necks white, which distinguished them from other birds also present (R.F.L.). The amount of white on the heads and necks of Common Cormorants is very variable and it is impossible to be sure that these three birds were of the southern race.

348. Shag.—On April 19th on the Farne Islands a nest was seen with eggs, an early date (A.D.F.).

A bird ringed as young on the Farnes on June 30th, 1949, by the N.H.S. was found dead at Aberdeen on February 19th, 1950, 110 miles north (*B.B.*, Vol. XLIII, p. 321).

349. Gannet.—On August 15th a bird of the year was picked up alive on the rocks near Cullercoats. It was taken to the Dove Marine Laboratory for examination, but as it was found to be neither injured nor oiled, it was taken out to sea in a boat and released (U.M.G.).

On September 10th an immature bird came down in a turnip field near Darlington. It lived for some time in the aviary at Darlington South Park (A.B. & K.L.).

355. Manx Shearwater.—Fewer recorded than in the previous year. On July 2nd, off Seahouses, two, off Cullernose, twelve, flying north (H.T.). On September 7th, off Alnmouth, two, flying south (H.T.); on the 8th, off Teesmouth, one flying north (M.G.R.); on the 14th, off Seaton Sluice, one, flying north (M.G.R.).

[363. Sooty Shearwater.—On November 19th, off the coast S. of Craster, N., a large, uniformly dark Shearwater was seen flying low over the sea. When it turned the under-parts appeared as dark as the upper (W.S.C.). From the description given, this was probably a Sooty Shearwater (see *O.R.*, 1948 for the only previous record of this species since the compilation of these Reports began in 1933).]

368. Fulmar.—Ten pairs laid eggs on the Inner Farne and at least five young were reared. Three pairs haunted the cliffs of Staple Island, but did not breed (*F.I.O.R.*, 1950). The Cullernose colony returned very early for the 1950 breeding season; the first was seen inland from Cullernose on December 1st, 1949, and by December 27th they were present in strength (W.S.C.). At Marsden, 45 young were counted (F.G.G.).

370. Great Crested Grebe.—No proof of breeding in either County. On March 19th and again on April 16th, a pair were on Catcleugh Reservoir, one being still present on July 16th, but no young were seen (E.G.T. & A.R.H.). On August 13th, three birds present and on September 10th, one (A.R.H.). On July 16th, two on Hallington, but no young (R.T.G. & E.M.L.). From early August until mid-October, a single bird was on Gosforth Park Lake (G.J.G. & others).

371. Red-necked Grebe.—On April 12th, off Hud's Head, S. of Berwick, one close in shore (D.G. & R.F.L.). On May 18th, off Berwick, one, moulting to summer plumage (F.B.). From July 8th to 18th, off Holy Island, an adult in full breeding plumage (N.M.K.). It is most unusual for a bird in breeding plumage to be here so late in the summer. The late Abel Chapman recorded one on Hallington Reservoir on May 20th, 1926 (*Retrospect*, p. 12) and H.T. reported two on Grindon Lough on July 30th, 1938 (*O.R.*, 1938).

373. Slavonian Grebe.—On February 4th, at Whittle Dene Reservoirs, one (F.G.G.), and on March 24th, at the same place, one (H.M.S.B.). On the 15th at Tyne Dock, D., one; it was actually in the loading dock, sheltering and diving in the lee of concrete barges (G.R.E.). On the 20th and 21st, at Killingworth Ponds, one and another at the same place on October 10th (D.G.). Others reported from the coast in spring and autumn.

374. Black-necked Grebe.—On February 4th at Gosforth Park Lake, one (R.G.G.). On the 9th and 12th, at Alnmouth one and on the 19th, off Bamburgh, two (H.T.). On the 22nd off Whitburn, D., one (A.H.B.).

On the usual pond in N.E. Durham, a single bird was seen on April 16th (J.E.C.). This was the only bird seen during the summer.

375. Little Grebe.—On July 16th, at Gosforth Park Lake a family party with six young was seen, it was still present up to the end of October (J.A.M.). Owing to the presence of pike, young birds seldom survive on the lake.

376. Great Northern Diver.—On April 30th at Sandham Bay, Holy Island, two were seen on the beach *c.* 20 yds. from the tide edge (F.G.G.). On May 7th

at Beal Low, N., one allowed an approach to within 15 yds. ; it occasionally stretched its neck and tilted its bill upwards uttering a loud high-pitched ' oo-OO-oo-oo-oo ' (F.B.).

380. Wood Pigeon.—' Very numerous in the winter at Blagdon, feeding on beechmast ; I have never seen so many here before ' (M.W.R.). On November 12th, a large flock, *c.* 500 in woods near Capheaton Lake, N. (W.H.K.). Very large flocks this winter in the Haltwhistle district ; on December 11th, a flock of at least 2,000 was seen. They are feeding largely on the Swede tops in the fields. ' It is 30 years since I saw so many' (M.P.). In April, at Blagdon, one was seen swimming in deep water (M.W.R.).

391. Stock-Dove.—In an old building near Waskerley, D., a pair nested four times ; probably the same pair as raised five broods in the same building last year (R.M.).

Unusually numerous in December with the immigrant Wood Pigeon flocks (M.W.R.).

383. Turtle Dove.—Durham : Heard on several occasions during the summer, near Gainford, and on July 2nd, two seen (W.M.B.). On August 5th one seen near Darlington (A.B.). Heard again at Hamsterley, but no proof of breeding obtained so far (C.G.).

Northumberland : On May 28th, at Alnmouth, one (H.T.). On May 28th a pair was seen in a paddock at Apperley Dene, Stocksfield, but not subsequently. All through the summer of 1949 a pair was seen regularly, always at the same place, on the road between Newlands and Whittonstall (G.A.C.). On June 7th, 8th and 17th, a single bird was seen feeding on a newly sown field at Todburn Steel Farm, Slaley, N. During June and early July one was frequently heard cooing in Dipton Wood, perhaps the same bird (A.J.C.). On June 13th one seen at Craster (J.M.C.). Definite records of this species breeding in Co. Durham and South Northumberland are still needed. Each year birds are reported from two or three places, but no nests have yet been found.

386. Bar-tailed Godwit.—An adult, ringed as a migrant at Jæren, S. Norway, on September 10th, 1948, was recovered nine days later September 19th, 1948, at Alnmouth, N. (*B.B.*, Vol. XLIII, p. 290).

387. Black-tailed Godwit.—More records than usual. On April 2nd on a field near Druridge Bay links, two (M.F.) ; on the 16th, at Fenham Flats, one (F.B. & R.F.L.) ; on the 30th at the lough, Holy Island, two (F.G.G.). On June 22nd, at Cowpen Marsh, Teesmouth, one in breeding plumage, repeatedly calling both on the ground and in flight (A.B.) ; on July 19th, one at the same place (D.S.). On July 16th, at Colt Crag Reservoir, a single adult in rather dull summer plumage, flew in from the west and alighted on the east shore of the reservoir. It rested for 10 minutes with its bill tucked in to its flanks, then fed vigourously. It was under close observation for over an hour and was approached to within 50 yards (R.T.G. & E.M.L.). On August 26th, at Boulmer, one flying north (H.T.). On September 7th at Jarrow Slake, four were seen to fly in to feed as the tide went down and on September 21st, at the same place, two were seen, while from October 2nd to December 12th one was frequently seen (H.W.K., G.J. & B.B.). On September 8th, on a flooded portion of Boldon Flats, D., three in summer plumage and on the 9th two still present and on October 18th, one, seen and heard within 10 yards (A.H.B.).

395. Common Snipe.—' On November 5th, *c.* 100/200 were feeding on the shores of Hurworth Burn Reservoir, D. A flock of some 50 which I had flushed appeared to get caught up in a flock of Mallard and Teal, also in the air. The Snipe remained with the duck while they circled the reservoir two or three times, following every evolution of their flight ' (P.J.S.). (For an account of similar flightings see *B.B.*, Vol. XLIII, p. 332).

398. Jack Snipe.—Several reported. On January 21st at Gosforth Park, two in marshy ground (G.H.R.). On November 25th a considerable number of tired birds were seen about Blagdon, N. (M.W.R.).

400. Grey Phalarope.—On August 13th, at Teesmouth, one seen at close quarters, both feeding and in flight, in grey plumage (P.L.H. & D.S.). On September 18th, on the Aln estuary, N., one in grey plumage ; only present for one day (H.T. & A.E.G.).

402. Turnstone.—On May 21st, near Rothbury, N., one (N.H.S. Field Meeting). This is only the second inland record since these Reports were begun in

1933 ; the first being that of a single bird seen on May 27th, 1938, at Whittle Dene Reservoirs, by H.T. A third record has since come in—on August 13th, one was seen at Hurworth Burn Reservoir (A.B.).

Plentiful during the spring and autumn at Seaton Sluice. Largest counts, March 8th, *c.* 30 (C.G.), October 15th, 19 (D.G.).

403. KNOT.—A flock wintered on Jarrow Slake, largest number seen on January 29th, 368 (F.G.G.) ; February 18th down to 28 (J.C.C.). On February 3rd at Alnmouth, *c.* 135—a record number for Alnmouth (H.T.). On the 19th at Budle Bay a large number—certainly 1,000 (H.T.). On the 25th and on March 11th, on Fenham Flats, *c.* 4,000 (F.B.). On the night of January 24th/25th, large numbers were recorded off the Longstone, Farnes, and several were killed against the lighthouse lantern (*F.I.O.R.*, 1950). From January to March, a flock haunted the shore near Seaton Sluice ; in January it numbered 65/70 birds, increasing to 160 on February 4th ; on March 19th, 140. The first large flock here in the autumn was seen on November 11th, when *c.* 90 were counted, increasing to 100 by the 25th, but down to 55 on December 29th (D.G. and others). On January 8th, on the Seal Sands, Teesmouth, *c.* 50, on March 29th, *c.* 1,000, and on April 8th to 15th, *c.* 500 (D.S.). On July 16th, on Beal Shore, 190 adults in summer plumage, and on the 22nd, 50 (F.B.). On July 16th, at Budle Bay, 28 ' red birds,' and on the 21st, at Alnmouth, 11 (H.T.). First seen at Teesmouth July 17th, *c.* 100, mostly in breeding plumage, remained during August ; small flocks of fresh birds were seen arriving at Teesmouth throughout the month (D.S.). On October 8th, on Fenham Flats, *c.* 400 (F.B.).

404/5. DUNLIN.—More inland records than usual—at Grindon Lough on April 23rd, July 28th and August 18th, a single bird on each occasion (E.M.L.). On May 13th three or four pairs were seen on the summit of Cheviot, but no nests were found (R.F.L.). A pair nested in Coquetdale between Carshope and Windyhaugh, and reared two young (E.M.). An adult and three young were seen up the Ridlees Burn above Linshiels (H.H. per E.M.). On May 7th a pair S. of Tosson Hill, and on the 21st two pairs (E.G.T.). On May 21st, on the Coquet, near Rothbury, five (U.M.G. on N.H.S. Field Meeting). On July 16th, at Hallington Reservoir, seven, and on August 13th, two (R.T.G. & E.M.L.). On May 28th, on Harehope Hill, Edmundbyers, D., a pair (L.G.H.). On August 13th, at Hurworth Burn Reservoir, *c.* 30, and on 20th, *c.* 20 (P.L.H. & D.S.).

On July 16th on Fenham Flats, 250 of Southern race in summer plumage and on August 1st on Holy Island sands, *c.* 900, about one in forty were juveniles ; majority being Southern race in summer plumage, a few showing signs of moult on black bellies ; five or six were adult Northern race in summer plumage (F.B.). The largest number recorded at Seaton Sluice was 200/300 on March 8th (C.G.). On October 8th at the Teesmouth estuary a flock of 3,000 to 4,000 (P.J.S.).

On January 15th, at Seaton Carew, D., one, amongst a flock, was seen to be running and flying with difficulty. It was captured and a large cockle was found to be gripping its left foot (K.L.).

406. CURLEW-SANDPIPER.—Few records. On May 18th, at Alnmouth, one (H.T.). On August 26th, at Boulmer, one (H.T.). On September 3rd, at Alnmouth, one (W.H.K.). On September 17th, at Boulmer, one (N.H.S. Field Meeting), and on the 18th, at Alnmouth, eight (H.T.). On October 11th, at Berwick, two (R.F.L.). At Jarrow Slake birds were seen on September 19th, five ; 23rd, two ; 24th, four ; and October 3rd, one (W.H.K. & G.T.).

407. LITTLE STINT.—Very few reported. On February 19th, at Teesmouth, three (P.L.H.). On the 22nd, near St. Mary's Island, N., one with Dunlin (C.G.). On June 5th, at Alnmouth, one (H.T.). On September 21st, at Teesmouth, one (A.B.). On October 8th, on Salthouse Pool, Teesmouth, two, and later in the day, with a flock of Dunlin near the estuary, one (P.J.S.).

415. PURPLE SANDPIPER.—At Seaton Sluice, the winter flock remained at *c.* 40 during January and February, maximum number 52 on January 5th (F.G.G.). On October 27th the flock had returned and numbered 20, rising to 80 by November 25th, but falling to *c.* 30 by the end of December (D.G.).,

416. SANDERLING.—At Seaton Sluice during January and March numbers rose to *c.* 40 and in the autumn there were again *c.* 40 (D.G.). Many reported from other parts of the coast. On November 10th at Berwick, 90 in winter plumage ; an unusually large number for this place and time of year (F.B.). In early September some were identified on the Longstone, Farne Islands (*F.I.O.R.*, 1950).

417. Ruff.—On July 6th, at Cowpen marsh, Teesmouth, one adult in the moult ; on August 27th, three ; September 21st, one (A.B.). On August 12th one at Primrose pond, Jarrow (F.G.G.). On August 13th, at Hurworth Burn Reservoir, D., one, immature (P.L.H., D.S. & A.B.). On August 13th, at Monk's House pool, near Bamburgh, five ; August 18th, eight ; and September 15th, one (H.T.). On August 19th and 26th, at Alnmouth, one (H.T.). On August 27th, at Boldon Flats, D., seven (W.H.K.), and on September 1st, one (A.B.). On November 4th on a little pond near Cleadon, D., one ; it was still there on the 14th—a late date (W.H.K.).

421. Common Sandpiper.—A winter record : ' On January 12th, on the banks of the river Wear, near Chester-le-Street, I was surprised to see a Common Sandpiper feeding on the bank close to the water's edge. It was on the opposite bank, 25 to 30 yards away ' (C.E.T.). First seen Whitworth Park, D., April 21st (C.G.). On April 22nd, at Haltwhistle birds returned to the river and streams, but thereafter for several days during a spell of wintry weather with frost and snow, none was to be found (M.P.). On May 13th one was identified on the Inner Farne, and others visited the Longstone during early September (*F.I.O.R.*, 1950). Several reports of birds seen on the coast, evidently on passage.

423. Wood-Sandpiper.—Recorded from Darlington Sewage Farm, on August 25th, two ; 26th, one. They were seen in company with Green Sandpipers and Common Sandpipers with which they were compared and the distinguishing characters were clearly noted (A.B.). Single birds, thought to have been of this species were seen at Teesmouth on July 14th, 15th, and 17th (D.S.).

424. Green Sandpiper.—Again few reported on spring passage. On April 2nd, 6th and 13th, single birds at Primrose, Jarrow, D (F.G.G.). On April 14th one at Whitworth Park, Spennymoor, D. (G.C.).

Many reported in autumn. First arrivals noted July 14th, at Teesmouth, two (D.S.), and July 16th, on Budle Bay, N., one (F.B.). From July 20th to September 5th odd birds noted in the South Shields district—largest number together, three, at Primrose on August 12th (F.G.G.). From August 19th to September 13th, numerous at Darlington Sewage Farm—largest number, ten, on August 26th (A.B. & P.J.S.).

431. Spotted Redshank.—On August 13th in the marshes at Teesmouth, one (A.B.). On August 19th and 26th, at Alnmouth, one (H.T.). On September 25th on the shore at Goswick, N., one, with eight Common Redshanks for comparison (R.F.L.). [On November 25th, on the rocks north of Bamburgh, a wader was flushed from a flock of Common Redshanks and Turnstones, which, from the detailed description given, was almost certainly a Spotted Redshank in winter plumage. This is a late date for this species (V.D.). Previously latest date recorded was October 7th.]

432. Greenshank.—On January 22nd, one on the shore at Beadnell, N. (J.A.M.). Greenshanks in winter have become quite usual on the coast of recent years. In 1907 Abel Chapman wrote—'Arrives by mid-August and all have passed on southwards by mid-September. We have never met with one later than the 18th ' (*Bird Life of the Borders*, p. 402).

Many records between May and November ; sometimes of several birds seen together as on July 22nd on Beal Shore, six, and September 14th, eight (F.B.). July 15th and August 17th, at Teesmouth, five (D.S. & A.B.). A few inland records as at Hurworth Burn Reservoir, Darlington Sewage Farm and on the river Tees at Gainford.

435. Ringed Plover.—On the Farne Islands, ten pairs are known to have nested (*F.I.O.R.*, 1950). On April 28th three newly hatched young were seen on the gravels of the Coquet, above Rothbury (R.C.). One pair bred successfully between South Shields and Sunderland (L.K.). At least two pairs bred successfully at Teesmouth (D.S.). Inland, on migration, on August 13th, at Hallington Reservoir, on a sandy shore, seven (R.T.G. & E.M.L.), and on the 13th and 20th, at Hurworth Burn Reservoir, D., six (P.L.H. & D.S.).

A bird ringed as young on the Farnes on July 21st, 1949, by J.S.A. & M.W.R. was recovered at Warkworth, N., on August 19th, 1949, 20 miles south (*B.B.*, Vol. XLIII, p. 323).

440/441. Golden Plover.—Very numerous in the autumn. On September 6th, at Beal, N., *c.* 3,000 in fields and on September 24th, at Fenham Flats, *c.* 3,000 (F.B.). In October on Jarrow Slake, D., from 1,500 to 2,000 (B.B., G.J. &

H.W.K.). During September, October and November, up to 200 on the Town Moor, Newcastle—the severe weather in December drove them away (J.A.M.).

440. Southern Golden Plover.—On the Weardale moors there appeared to be more birds breeding than for several years past (R.M.).

441. Northern Golden Plover.—On April 6th, on Jarrow Slake, the wintering birds having gone, many Northern birds were distinguished in a passage flock of 171 birds and on April 13th at the same place many more were identified in a flock of 88 (F.G.G.). On April 30th in a field on Holy Island, four (F.G.G.).

444. Grey Plover.—Many reported both in spring and autumn, often in considerable flocks. On April 14th, on Holy Island, 17, and on 16th, at Fenham, 55 (R.F.L. & D.G.). On April 21st at Holy Island Crossing, 120, mostly in moult, and some still in winter plumage ; just over 60 seen on other visits during the month (F.B.). On September 24th, on Fenham Flats, 200 adults and juveniles —most adults moulting to winter plumage (F.B.). From September 24th onwards on Jarrow Slake, six (G.J. & W.H.K.). Numerous at the Tees mouth in autumn (O.C.H.), on October 8th a flock of *c.* 40 (P.J.S.).

449. Lapwing.—On February 17th and 18th a notable movement was observed at Sunderland. On the 17th flocks of 7 to 50 passed over almost continuously in a westerly direction, up to 3-0 p.m. On the following day the movement continued ; some flying down the coast against a heavy head wind and turning inland on reaching the River Wear (J.W.). On February 19th, at Boulmer, N., a flock of *c.* 50 flying high, steadily south (H.R.O.). No doubt this movement was associated with the change to milder weather after a spell of frost. On February 26th, near Ashington, a pair was seen and heard in nuptual display over a field white with snow. Later 14 nests were seen in that area ; an increase on previous years (R.C.). Increasing numbers are breeding in Upper Coquetdale (R.C.). In March, in the area round Craster, N., more paired birds were seen than for many years past (J.M.C.), but in May, between Craster and Howick, there were noticeably fewer breeding pairs this year (W.S.C.). In the Blagdon area, breeding pairs were again low in number. On January 21st a pale buff bird was seen (M.W.R.). A partially albino Lapwing with white wings has bred for five consecutive years in the same place near Prendwick, Whittingham (W. Curry per C.J.G.).

452. Oystercatcher.—Becoming more plentiful in Upper Coquetdale, breeding on ploughed fields as well as on the river gravels (R.C.). Established on the Coquet and Alwin gravels by the end of March (E.M.). More common than ever on the gravels of the South Tyne and on the hill streams. First nest on April 22nd, with two eggs (M.P.). On the Farnes, 28 or 29 pairs bred (F.I.O.R., 1950).

462. Black Tern.—More reported than usual at the Tees estuary. On August 18th, 21st and 25th, a single bird was seen (D.S.), and on September 2nd two (C.G.). On August 27th, a party of 12/15 were seen hawking insects over pools behind the sea-wall. Several times they were seen to dive into the pools or into the sea, instead of merely dipping to the surface. All that came close enough were seen to be immature birds with buff edgings to the mantle feathers. They were very noisy, calling continuously (A.B.). As late as September 8th one was seen flying south over the Tees (M.G.R.). On September 3rd two were seen at the Hurworth Burn Reservoir and on the 10th, one (P.L.H. & D.S.).

467. Sandwich Tern.—More birds present on the Farnes than in any season since 1939. It is estimated that nearly 1,000 pairs bred, compared with *c.* 370 last year (*F.I.O.R.*, 1950).

Three birds ringed as young on the Farnes have been recovered during the year. One, ringed on July 3rd, 1947, was found dead at Awunaga, Gold Coast, on March 7th, 1950, and of two others ringed on July 11th, 1949, one was found dead at Makkum, Friesland, Holland, in August, 1949, and the other was captured and released at Rufisque, Senegal, on May 27th, 1950 (*F.I.O.R.*, 1950).

468. Roseate Tern.—It is estimated that more pairs bred on the Farnes than last year (*F.I.O.R.*, 1950). On July 23rd, at Almouth, three (H.T.). On September 8th, a mature bird was seen off the mouth of the Tees (M.G.R.).

469/470. Common or Arctic Tern.—Inland : on May 12th, on the River Tyne, just below Hexham, one hawking flies with 10 Black-headed Gulls, and on September 14th, one, near the same place, flying down the river (E.M.L. & R.T.G.). On September 17th, at Gosforth Park, two terns came in from the north and circled

over the lake for 10 or 15 minutes ; they did not catch any food and left flying north (L.G.H.).

469. Common Tern.—For some years there has been a small colony on the mainland coast of N. Northumberland, not always in the same locality. It was visited on July 6th when approximately 25/30 pairs were seen. The majority of the nests contained eggs, which, at this late date, would indicate that the first clutches had been destroyed or collected (G.W. & R.G.G.). A few pairs bred on the Longstone, in the large Arctic Tern colony, but it was not possible to count them (*F.I.O.R.*, 1950).

At Teesmouth, *c.* seven pairs attempted to breed on two different sites ; eggs and/or young birds were seen at both (A.B. & J.A.C.). In July, adults from one of these colonies were frequently seen to use the power-cables crossing Seal Sands as look-out perches from which they mobbed Herring Gulls and a Kestrel (D.S.). On August 2nd, 100 150 Terns were fishing over the Tees estuary ; many of them alighted on the wires crossing Greatham Creek, about a mile from the wires mentioned above, as many as 25 being seen together, resembling Swallows perching on telegraph wires previous to migration (D.S.).

470. Arctic Tern.—Several pairs were present in the usual mainland colony in N. Northumberland ; but no reports have been received as to the number of broods reared (F.B., G.W. & R.G.G.). Large colonies bred on the Brownsman and Inner Farne and smaller colonies on other islands. (*F.I.O.R.*, 1950)

A bird ringed as a nestling on the Farnes on July 2nd, 1934, was found dead there sixteen years later, on July 12th, 1950. This is the longest life-span yet recorded for an Arctic Tern. Two nestlings ringed on June 29th, 1950, were found dead—one at Dunbar, on August 5th, and one at Mablethorpe, Lincs., on August 8th ; while two others ringed on July 10th this year were recovered, the first at Aldbrough, E. Yorks., on August 3rd, and the other at Dunbar, on August 4th (*F.I.O.R.*, 1950).

471. Little Tern.—On July 5th, the colony on the N. Northumberland coast consisted of *c.* 10 pairs, four nests with eggs being found (F.B.). On July 6th about a quarter of a mile from this site another colony was found of about four pairs, at least three chicks were seen (G.W. & R.G.G.).

At Teesmouth, *c.* 15 pairs bred on two sites. On July 6th nine pairs had eggs and two or three had chicks on one site ; on the other site only one nest was found (A.B.). It is remarkable how these birds cling to their old haunts.

A Little Tern, ringed as young at Tentsmuir, Fife, on July 16th, 1949, was recovered at Teesmouth, D., on August 20th, 1949, 135 miles to the south (*B.B.*, Vol. XLIII, p. 324).

477. Little Gull.—Only two occurrences reported. On February 18th, at Whitburn, D., a single bird was seen on the beach in company with Black-headed Gulls with which it could be compared. It was watched for a full hour, during which time it allowed of an approach to within 10 yards, so that all its distinguishing features could be noted and described in detail (L.K.).

On November 25th in the bay near St. Mary's Island, N., two small gulls were seen swimming with Black-headed Gulls, with which they could be compared as to size and markings (J.A. & T.H.A.). From the detailed description given, these can only have been Little Gulls in first winter plumage (G.W.T.).

478/486. Gulls.—On February 4th, at Scremerston, a vast concourse of gulls was feeding on herrings washed out of the Norwegian boat *Rask* wrecked on January 31st. The total of many tens of thousands was made up approximately as follows—Herring Gulls 50%, Great Black-backs 30%, Black-headed 15%, Common 5%. No Glaucous Gulls were seen. It is interesting to note that the large flocks of Common Gulls that were roosting nightly on the Goswick sandbanks, flighted inland at dawn as usual, in spite of the fact that an abundant supply of food was available along the shore close at hand (F.B.).

On November 19th, at Colt Crag Reservoir, at dusk, from 2000, to 3000 gulls had collected, chiefly Herring, Common, and Black-headed with 30-40 Great Black-backs (R.T.G. & E.M.L.).

478. Black-headed Gull.—On March 19th, at Hallington Reservoir, N., on the island, *c.* 800 to 1,000 birds very noisy (R.T.G. & E.M.L.).

On July 8th at the Edmundbyers colony over 100 adults and *c.* 30 young present (J.A.M.).

481. Common Gull.—A very noticeable migration of gulls of this species takes place from E. to W. across the Tyne Gap. This occurs during July and in mid-winter and early spring. No W. to E. movement is ever noted. On one day alone, during the hours of daylight, 2,500 birds were counted, all in small flocks of 30 or so and all flying steadily westwards (M.P.).

482. Herring Gull.—The breeding colony at Marsden, D., still doing well —at least four broods reared on the Rock itself (F.G.G. & J.C.C.).

485. Lesser Blacked-backed Gull.—Did not repeat last year's nesting at Marsden (F.G.G.).

486. Great Black-backed Gull.—This species is most abundant on the coast in autumn, large flocks roosting each night, with the Common Gulls, on Goswick Sands, south of the mouth of the Tweed. Numbers tend to fall off during November till a fairly stable winter population is left. Flocks normally disperse from the roost about dawn and flight in again for an hour or so before or at sunset (F.B.).

Occasionally reported far inland : on October 8th, on moors near Carrycoats, N., two, feeding on sheep's carcase (R.T.G. & E.M.L.).

487. Glaucous Gull.—Winter of 1949/50. As usual a few immature birds were reported on the coast. On January 5th, at Seahouses, three were present (M.G.R.). As the summer approached it was noticed that birds were remaining much later than usual. H.T. reported seeing, on May 6th, at Alnmouth, a second winter bird and on May 13th, at Budle Bay, an immature bird, which may have been an Iceland Gull, but positive identification was impossible. Later on June 17th, at Seahouses, he saw another white, and presumed second-year bird. Finally, on July 2nd, at Seahouses, while in company with the Scottish Ornithologists' Club, he saw another late bird, this one being judged to have been a third-year bird (H.T.).

On March 18th, and again on April 3rd, a gull about the size of a Herring Gull was seen on the beach at Scremerston. It was described as ' all white except for for light grey on back and wings and brownish tinge on neck and breast ; legs pink ; beak pink with a dark spot at the tip of the lower mandible ; wings projecting about a beak's length beyond the tail, hiding tail when bird at rest ; length of wings gave body a long tapering appearance.' This bird was judged to be an Iceland Gull, which species most of the description seems to fit ; but the fact that it had a pink bill rules this out. At no stage in its development has the Iceland Gull a pink bill. The bird was undoubtedly an immature Glaucous, probably in its fourth year. For differences between Iceland and Glaucous Gulls see *B.B.*, Vol. XL, p. 369, and Vol. XLIII, p. 410, etc. Will other observers please note this point and give particular attention to bill colouration. Those who have recorded Iceland Gulls in the past should refer again to their field notes to see what they recorded about bill colouration.

Winter of 1950/51. In *O.R.*, 1948, it was reported that a single Glaucous Gull in first year plumage had spent the winter at Seahouses. In 1949/50 a second-year bird wintered there. In the autumn of 1950 an immature bird again haunted the same place. It was first seen on September 13th (U.M.G.). On November 5th it was seen by members of the Ornithological Section when on a coast field-meeting. It is possible that this may have been the same bird on each occasion.

[488. Iceland Gull.—' On January 5th, on the foreshore inside the pier at South Shields, I got within ten yards of a gull which had bluish-grey wings without black tips. It had a yellow bill and flesh-coloured legs. From the size I identified it as an Iceland Gull in adult plumage ' (C.J.G.).]

489. Kittiwake.—On July 16th, at Dunstanbrough, at least 70 nests (J.M.C.). At the North Shields colony, on window ledges overlooking the Ferry, nearly two miles from the sea, 11 nests were built ; two containing eggs were destroyed, 18 other eggs were laid, 13 hatched and 12 young were successfully reared (J.C.C.). Steps are being taken by the owners of the property to insure that this colony is protected. One of the young from this colony, which had been ringed, was recovered oiled at Tynemouth, shortly after leaving the ledge (J.C.C.). On February 12th, at Marsden, D., already eight birds sitting on nesting ledges (J.C.C.).

At South Shields up to 300 Kittiwakes rested during the day-time on the south side of the pier where there are ledges between the convex blocks of masonry. This continued from August until the beginning of October, although by that

time the nesting sites at Marsden were deserted. The birds were almost entirely adults, very few juveniles being present at any time (J.C.C.).

491. Great Skua.—On August 26th, at Alnmouth, one attacking a Great Black-backed Gull (H.T.). On September 7th, at Cheswick, one ; it was watched chasing a Black-backed Gull, apparently without success (R.F.L.). On August 29th, one, off Teesmouth (J.A.C.).

493. Arctic Skua.—Unusually scarce on the Northumberland coast this autumn. ' The only bird I have seen this autumn was one flying north on August 26th ' (H.T.). On August 7th, at North Gare, Teesmouth, one, of the light form (A.B.). On August 18th, one ; 30th, three ; in Hartlepool Bay (D.S.). On August 30th, off Seaton Sluice, N., one, flying south, dark phase ; the only one seen this autumn (D.G.). On September 8th, in the late afternoon, 11 were seen, from the Yorkshire side of the Tees, to fly north into the Tees estuary (M.G.R.).

501. Black Guillemot.—On September 19th, off Holy Island, one (H.R.O.).

502. Little Auk.—On February 3rd one was seen swimming near the Longstone. It was oiled and died six days later (*F.I.O.R.*, 1950). On February 18th, off the Stag Rocks, Bamburgh, N., two (T.F.H. & G.W.T.). On December 10th, at Holy Island, six (R.H.).

504. Corncrake.—A pair nested in a meadow at Cockmount Hill, just north of Haltwhistle, but in mid-July a reaper destroyed the eight well-incubated eggs. Ten days later the same reaper destroyed a nest with three eggs in an adjoining field—probably a second attempt at breeding by the same pair—' A clear case of how modern grass-cutting can be responsible for the slow extinction of the Corncrake ' (M.P.). On June 27th, at Portobello, near Haltwhistle, one heard in a field of meadow-grass ; one was heard in the same field in the previous year (E.G.T.). On June 22nd one heard at East Mill Hills Farm, near Haydon Bridge (W.J.). On June 4th and during the following week one heard in a field near Hexham Hydro, and in the same week one heard near Fourstones (M.M.). One heard throughout the summer at Troughend, near Otterburn ; had missed last year, but regular before that (B.C.E.R.). On June 20th, at Trewitt, Coquetdale, one heard (B.P.H.). In the Tunstall district near Wolsingham, Weardale, a pair heard daily but no nest found (R.M.). Only one pair heard in Upper Teesdale, at Middleside, near Middleton ; breeding not proved (H.W.).

509. Water-Rail.—On May 28th at Gosforth Park, an adult was seen with two young in down (G.H.R.). The Water-rail doubtless breeds annually in the Sanctuary, but only occasionally is proof forthcoming. On October 25th, after a change of wind to the N.E., a Water-rail was found in a public convenience at South Shields. It was unharmed and, after being ringed, it was given its freedom (H.M.S.B. & F.G.G.). On October 14th, on Holy Island, one was seen to fly in from the east as though arriving on migration. When flushed it flew down to the lough (R.F.L.). On October 15th, on Cowpen Marsh, Teesmouth, an injured adult male was picked up ; it had evidently struck an overhead wire when on migration (P.L.H.).

510. Moorhen.—A Moorhen, ringed as full-grown at Burnley, Lancs., on September 10th, 1949, was recovered at Longframlington, N., on January, 10th, 1950 ; 105 miles north (*B.B.*, Vol. XLIII, p. 328).

511. Coot.—The following figures show how the number of Coots falls off as winter approaches at Gosforth Park : July 16th, 65 adults and 20 young ; September 3rd over 100 birds ; September 24th over 150 ; October 8th, over 60 ; 21st, *c.* 20 ; November 26th, *c.* 15 (J.A.M.).

513. Black Grouse.—Quite a nice lot this year in their usual haunts in Weardale (R.M.). On April 30th, near Sharnberry Fell, Weardale, six cocks together (C.G.).

514. Red Grouse.—In spite of an unfavourable summer, Grouse did remarkably well. Owing to a cold wet spell at hatching time, many early chicks were lost ; but birds nested again, sometimes even a third time, and good broods were reared (R.M.). Though there are not many Grouse in the Upper Coquetdale district, the Mackendon shepherd reported a pack of 95 near his house during the severe snowstorms at the end of the year and the Ridlees shepherd had also seen a large number (E.M.).

517. Pheasant. On January 21st, at Blagdon, a cock bird with the wings of a hen was shot and on the 24th, at the Blubbery Wood, near Hebron, N., another

of exactly similar type was shot. On examination both birds were found to be decided hermaphrodites (H.S.T.).

518. COMMON PARTRIDGE.—March : In the Craster area, N., more were about than have been seen since before the War (J.M.C.).

[519. RED-LEGGED PARTRIDGE.—The last of the covey reared from introduced eggs at Blagdon, in 1947, was shot in October, 1950 (M.W.R.) (see *O.R.*, 1947).]

520. QUAIL.—In late September on West Learmouth Farm, near Cornhill, N., a single bird was seen on two occasions (D.G. Brown per A.M.P.). In the first week in October, on the neighbouring farm of East Learmouth, two birds were flushed during a ' shoot ' (W. J. Davidson per A.M.P.). No birds were seen or heard on either of these farms during the summer. (For a previous record of breeding at Learmouth, see *O.R.*, 1947). No other birds reported.

KEY TO THE INITIALS OCCURRING IN THE ABOVE REPORT :

J. Alder, T. H. Alder, J. G. Arnott, J. H. Ash, F. Ashman, A. Baldridge, A. H. Banks, D. Bell (Miss), R. V. H. Benson, H. M. S. Blair (Dr.), F. Brady, W. M. Brady (Miss), B. Brown, D. G. Brown, R. S. Burn, J. E. Caffyn, R. C. Chislett, H. Church, F. Clark, A. J. Clissold, R. Clissold, R. Cockburn, R. Cook, S. E. Cook, J. A. Cooper, G. A. Cowen, J. C. Coulson, J. M. Craster, W. S. Craster, D. M. R. Crombie, W. Curry, W. J. Davidson, V. Dobson (Miss), H. Earsman, G. R. Elliott, E. A. R. Ennion (Dr.), G. Ewbank, M. Flanighan, A. D. Forster, P. F. Garthwaite, C. J. Gent, D. Gordon, G. J. Gowland, D. Graham, K. N. Green, C. Greenwell (Miss), A. E. Gregory, F. Gregory, F. G. Grey, R. G. Grey, R. T. Grey (Miss), U. M. Grigg (Miss), G. Hedley, H. Hedley, R. Henderson, B. P. Hill, O. C. Hill, L. P. Hird, T. F. Hird (Dr.), P. L. Hogg, L. G. Holloway, A. R. Huntley, C. Hutchinson, J. Hyatt, W. Johnson, G. Johnstone, N. M. Kennaby (Rev.), H. W. Kerridge, L. Kinlen, E. Laidler, M. Larkin, E. M. Lobley (Miss), W. R. Lofthouse, C. H. Longstaff, K. Longstaff, R. F. Lyndon, A. MacRae, J. A. Mc Geoch, R. Martinson, E. Miller, M. Munro (Miss), F. J. Nattrass (Prof.), H. R. Oliver, W. E. Oliver, (Mrs.) R. M. Palmer, M. Philipson, W. R. Philipson, A. M. Porteous, D. A. Ratcliffe, G. H. Redfern, B. C. E. Richardson (Dr.), M. W. Ridley, W. Ritson, M. G. Robinson, S. N. Robinson, N. Rollin, J. E. Ruxton, B. Sadler F. Scott, D. Seaward, D. R. Shannon, P. J. Stead, W. J. Straker-Smith, Lady Tankerville, H. S. Tegner, G. W. Temperley, H. Tully, C. E. Turner, E. G. Tyer, R. O. Varley, J. Walby, J. Walton, H. Watson, G. Watt (Miss), W. Watts, J. Whillis (Miss), J. H. Wood, D. Wright, W. A. Wright.

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**Ferruginous Duck and Green-Winged Teal in Yorkshire.** On March 18th 1951, at Wintersett Reservoir, near Wakefield, I.G.B. found a drake Ferruginous Duck (*Aythya nyroca*) consorting with Common Pochards (*Aythya ferina*). He had excellent views at about 20 yards, and noted the chestnut head, neck, breast, and flanks, the darker back, the white iris and under tail-coverts. Later the bird flew and the conspicuous white wing-bar was seen. On the 19th, P.E.D. found the bird at the edge of a flock of some 420 Pochards. It was repeatedly driven out of the flock by an aggressive drake. On the 20th, J.C. saw the Ferruginous Duck, in excellent light, and discovered that an American Green-Winged Teal (*Anas crecca carolinensis*) was also present. This bird alighted on the water only a few yards from the observer, with a pair of Common Teal (*Anas c. crecca*). The white crescentic line at the side of the breast, and the absence of the white side streak were immediately obvious, and there was an almost complete absence of buff lines on the head (though these were not clear in the drake Common Teal present). The Green-Winged Teal was seen again on the 21st by J.C., I.G.B., P.E.D., G. R. Edwards and A. Mitchell, and could easily be picked out at up to 100 yards in rather poor light. The Teal was not seen subsequently, but the Ferruginous Duck was still there on the 22nd. This would seem to be the third occurence of the Green-Winged Teal in Yorkshire, and the ninth occurence of the Ferruginous Duck. With three Bewick's Swans present on the 19th and 20th, this was a remarkable gathering of birds whose breeding areas are very widely separated.—Dr. I. G. BROWN, J. CUDWORTH, and P. E. DAVIS.

# THE ENTOMOLOGY OF SPURN PENINSULA

(*Continued from page 86*)

## 2. KILNSEA WARREN

The Warren, on which the cottage stands, is the central portion of the north end of the peninsula, below the Marsh Meadow. It consists of old marram dunes and sandy areas with a large number of different plants, the original flora having suffered some modification because of the ' gardens ' of the military huts. These huts were still standing during our first visit in 1947 but in subsequent years were slowly being removed.

In 1947, because of the huts and debris on the Warren little organised collecting was done there except when returning to the cottage and in the evenings. On subsequent visits, later in the year, when the mixed vegetation of the Warren was in flower it proved to be one of the most productive areas, especially in July and August when flower-loving insects came in great numbers to the wild carrot and celery flowers, to the privet blossom in the old cottage garden at night, and to the flowers of ragwort, chamomile, etc. In 1947 some unproductive evening collecting with car-headlights was attempted and some posts, buildings and the few trees of the garden were ' sugared ' for Lepidoptera. The lights of the cottage were sometimes very attractive to night-flying moths. In 1950, most of the huts having been removed from the Warren, the bricks and flags remaining were found to have a considerable number of species of ground-beetles (Carabidae) beneath them. The old garden of the cottage, near the Heligoland trap, produced many Diptera and Hymenoptera in June, 1950, and had been worked to a less extent previously.

Towards the sea-side of the Warren, beyond the railway lines, there is a meadow which contains a large bed of *Phragmites communis*. The reed grows thickest in a pond-like depression which is full of water in winter and dries out as the year advances. The water is fouled by the accumulation of decaying reed stems and was not worked but the drying mud, covered by reed debris proved to have a very interesting fauna which was carefully examined from 1948 onwards, together with the adjacent reed-beds. This is regarded as a subdivision of the Warren and is called the ' Phragmites Area.' Its insect population is very different from that of the Warren proper. Northwards the reeds gradually die out leaving what is virtually marsh meadow but the transition is not clearly marked as there are small dykes or runnels and two or three very small puddles which are full of water in spring but which gradually dry out as the season advances. For convenience ' Phragmites Area ' is the name given to the whole of this meadow. Beyond the reed-bed proper is a circular bomb-crater which has become filled with water. This is known as the ' Pond in Phragmites Area ' and was found to contain many water-beetles and bugs, etc.

The southern end of the Warren was found to be relatively unproductive. On 15th June, 1947, a fox's lair was discovered here and there was evidence of another in June, 1950. The former was very dirty and trampled, with scattered carcases of hens and rabbits, fish-heads, etc. It appeared that there was a family of cubs. The carcases had numerous carrion beetles (*Thanatophilus rugosus*, *Philonthus succicola*, etc.) but these were not collected. On learning of our discovery, the villagers, who had been losing many hens, organised a fox-hunt. Several of our members joined the party and were secretly relieved to learn that the vixen had become suspicious and had made off with her cubs.

There is a well near the railway lines in the Warren which was frequently examined as several interesting insects were found on the surface. In 1947 a static water tank near the cottage yielded some aquatic insects but this was removed before our 1948 visit.

Besides the very productive wild carrot and celery flowers other plants were found to be attractive to insects or had species associated with them. The thistles yielded several Trypetids, larvae of *Chilomyia vernalis* (Fall.) and the beautiful ' micro ' moth *Myelois cribrumella* Hb. etc. Burdock, chamomile and ragwort had many insect visitors to their flowers but the more strictly ' native ' plants usually had few associated insects.

## 3. MARSH MEADOW

The Marsh Meadow is very floriferous in summer and looks as though it should be very interesting to the entomologist. Actual experience was rather disappointing

however, for except on a few occasions it was rarely productive. It is rather open and windswept, a condition never very satisfactory for the entomologist. It is bounded to the north by a dyke, known as ' Boundary Dyke ' which contains very little insect life.

In the winter water collects in the hollows of the meadow and these become damp places in spring, drying out in summer. In several of the hollows asters grow and the vegetation is somewhat different from the rest of the meadow. Near the Humber shore the meadow is fringed with aster, mugwort, rest-harrow, etc.

Near the road there is a pond sheltered by a steep bank which is referred to as ' Pond in Marsh Meadow.' This is perhaps the least saline of any of the waters on the peninsula and contains many water-beetles and aquatic bugs. Near this pond and extending along the Humber side is a high bank shown on the six-in. Ordnance Survey map as ' Walker Butts Bank,' on the landward side of which runs a dyke. This dyke is one of the most interesting and productive spots on the peninsula, having a salt-marsh fauna which must be similar to that which occurred in the Salt Marsh, lower down the peninsular, before that dried out. In winter and early spring the dyke is full of water, gradually drying up until in August it consists of a number of shallow isolated pools and stretches of mud with beds of *Scirpus maritimus*. In June the mud-banks have a considerable population of Carabids, especially *Bembidion* spp., and Staphylinids, etc. Many interesting insects were also taken on the drier banks of the dyke among grass-roots, etc.

The salinity of the waters of the dyke must vary quite considerably. It is possible that water from the Humber may enter at one end at high tides, drainage and rains also help to fill it in winter. In summer drying out must increase the concentration of salt and the high winds often cause minor sand storms, bringing additional small quantities of salt. These fluctuations in salt-content probably have a considerable effect on the aquatic insect fauna. Other seasonal changes in the fauna are evident. The large number of spring insects (both species and individuals) appears to decrease in summer and to reach a minimum in August and September. The terrestrial Carabidae are little effected but the Diptera and other aerial forms are completely annihiliated in late summer by the large numbers of a few species of spiders (mostly *Aranea* spp.) which spin their snares on the *Scirpus* and other plants and the numerous *Sympetrum striolatum* (Charp.) and other dragonflies. The pools of water become very foul as the year advances and in the sun their temperature increases sharply. The carnivorous water-beetles (*Dytiscidae*) are more plentiful in species and individuals early in the year when the conditions are more sutiable for them. Later on as the water becomes foul and the oxygen content reduced the herbivorous water-beetles (*Hydrophilidae*) predominate. The waters of the dyke contain a very interesting population which would repay more careful investigation. Among the interesting aquatic insects may be mentioned the handsome fly *Stratiomys furcata* (F.) the leech-like larvae of which are plentiful in the dyke. The life-history of these insects is well known and their adaptation to such environmental conditions as exist in the dyke is perfect. Larvae and pupae were common in June and July, fewer in August. The adults, which are most inconspicuous for such a striking fly, due to their retiring habits, were difficult to find. They were scarce in June, plentiful in July, some even on flowers of celery in the Warren, and scarce in August.

Another very interesting but much less well-known member of the dyke fauna is an abundant shore-fly, *Ephedra micans* Hal. which will be dealt with in detail in the Diptera report.

The first portion of the dyke, some two or three hundred yards or so, is separated from its westerly portion. The latter is very foul and differs widely from the first portion ; it does not dry out and is relatively unproductive entomologically. The foregoing notes apply only to the first section of the dyke.

Near the Humber shore, just behind the bank near the beginning of this second part of the dyke is a small muddy pond known as ' Pond near Humber shore.' It has a small fauna of aquatic insects.

Between Walker Butts Bank Dyke and the Boundary Dyke there is a row of concrete road blocks extending in an east-west direction across the marsh meadow. In the middle of these blocks there is the crater formed by a land-mine which is full of water and which was explored in 1949 and 1950. It contains a number of aquatic beetles and bugs, including the rare water-beetle known as the ' Squeaker ' (*Hygrobia hermanni* F.) because of its stridulatory powers.

4. SALT MARSH

This area was visited once or twice during each visit but was never found to be very productive. The salt marsh plants are in poor condition and it is evident that the marsh has dried out considerably in recent years. A few interesting species however were found exclusively here such as the Byrrhid *Syncalypta setigera* (Ill.), the weevil *Gronops lunatus* (F.), and the Staphylinid *Bledius opacus* (Block), etc.

The sides of the railway lines in the vicinity of the Salt Marsh were examined in June, 1947, and later, and yielded specimens of *Athalia rosae* (L.), the Turnip Sawfly, long considered extinct in Britain but which reappeared in several coastal localities in 1947 (see *Ent. Mon. Mag.* **84**, 1948 : 177). During subsequent visits this insect was found in some numbers in the Warren, etc. Psammophilous aculeates were fairly plentiful in the salt marsh area in June and July. A specimen of *Oxybelus uniglumis* (L.), a common wasp on the peninsula, was taken with the fly, *Fannia armata* (Mg.) as its prey. The arenicolous Tenebrionids *Crypticus quisquilius* (L.) and *Phylan gibbus* (F.) were abundant in June and July and the Oedemerid *Nacerdes melanura* (L.) which passes its larval life in the timber of the groynes and railway sleepers, was flying in considerable numbers here in June, 1947. The grassy slopes near the salt marsh were favoured by grasshoppers and colonies were numerous. In the marsh itself debris, etc., housed numbers of the Common Earwig, *Forficula auricularia* (L.), large populations of *Dicheirotrichus gustavii* Crotch, *Broscus cephalotes* (L.) and smaller numbers of *Pogonus chalceus* (Marsh.) A single example of the Lesser Earwig, *Labia minor* (L.) was also taken. Nearer to the Warren plants of *Cakile maritima* sheltered many individuals of the flea-beetle *Psylliodes marcida* (Ill.) in June, and in July the leaves were found to be mined by the larvae of the beetle.

5. MAIN RIDGE

This area is perhaps the most unproductive of any on the peninsula. In many places there are dense thickets of sea-buckthorn which does not appear to be favoured by many insects except for a few Lepidoptera. Nor do the other plants associated with it yield much of entomological interest. Ragwort and the few umbelliferous plants however usually attracted some Diptera and Sawflies of the genus *Athalia* on sunny days and the grassy slopes, free from sea-buckthorn, had colonies of grasshoppers, usually *Chorthippus albomarginatus* (Deg.).

During early visits several attempts were made to collect from the impenetrable thickets of buckthorn without success and this area was rather neglected subsequently.

6. HUMBER FORESHORE

The strip of beach on the Humber side of the peninsula is a very interesting area, one where the unexpected may happen more frequently than elsewhere at Spurn ! The rejectamenta of the estuary varies almost weekly and ranges from dead dogs and sheep to tree trunks and packing cases. Carrion was always a prolific source of insects, especially beetles, Histerids and Staphylinids, etc., were very numerous in individuals on dead porpoises, fish, dogs, sheep, etc. In June, 1950 a large elm log washed up by the tide produced a number of brilliant Cardinal-beetles (*Pyrochroa serraticornis* Scop.) and another surprise on the same occasion was provided by numbers of the Flour-beetle, *Tribolium castaneum* (Herbst). The latter were found under pieces of damp wood and clearly represented the survivors of a sack of infested flour which had been dumped overboard. These and the cardinals will doubtless prove to be but ephemeral members of the Spurn fauna.

The old decayed groynes of the foreshore contain a large population of the Cossonid weevil *Phloeophagia spadix* (Herbst), a species which has been well-known at Spurn for many years. A few individuals could also be found under drift and some occur also in the groynes on the sea-side of the peninsula. The amount of seaweed washed up depends on the tides and when plentiful it yields several species of Kelp-flies, Staphylinids, Hydrophilids, etc.

Stones and debris in the dryer parts of the foreshore usually hide small colonies of *Broscus cephalotes*, a few other Carabids, and many earwigs, etc. Further from the water sea-purslane, sea lyme grass and other plants fringe the marram but

appear to cause relatively little change in the insect fauna. In June, 1947, in this zone, plants of a species of *Sonchus* were abundantly covered with the curious galls of the midge *Cystiphora sonchi* (F. Löw). In some pebbly parts of the foreshore, below high-water mark, the small Staphylinid *Diglossa mersa* (Hal.) was found under small stones.

The Humber shore was collected over very often, sometimes when going to or returning from some other area. It was never perhaps as prolific a spot as we had been led to expect and yet some interesting Spurn insects are restricted to it, or at least more plentiful there than elsewhere on the peninsula.

## IV. ' ORTHOPTEROID ' AND ' NEUROPTEROID ' ORDERS

W. D. HINCKS

The so-called ' Orthopteroid ' and ' Neuropteroid ' orders are relatively poorly represented in the area under consideration and may be conveniently dealt with together, in the present section.

### ORTHOPTERA

Three species of Orthoptera occur within the area. *Chorthippus albomarginatus* (Degeer) is the first to become adult and imagines may be found usually quite early in June although none were seen between June 2nd and 12th, 1950. *C. bicolor* (Charp.) and *Myrmeleotettix maculatus* (Thunb.) mature later. The first two species were found to be widely distributed in suitable grassy spots throughout the peninsula. The third species was only noted in small numbers in the Dyke where a colony with adults was found on July 18th, 1948, on a dry grassy bank. This species may be more widely distributed than was noted as many suitable habitats on the peninsula were not examined.

Outside the area two interesting species of Bush-crickets were observed (see *Naturalist*, 1949 : 31 ; *Journ. Soc. Brit. Ent.* 3, 1950 : 157-8). These are *Conocephalus dorsalis* (Latr.) from Long Bank Dyke, Kilnsea, about a mile from the area under investigation, where it was abundant in one small spot on *Scirpus maritimus*. *Roeseliana roeselii* (Hag.) was found sparingly in the same place and at Skefling, a few miles further along the estuary. It is interesting to note that these records represent the most northerly limit of distribution in the British Isles of both species as far as is known at present.

### DERMAPTERA

The Common Earwig (*Forficula auricularia* (L.)) was common in every area during each of our visits. In June most of the specimens were immature but by August few nymphs were observed. In that month adults were noted at night feeding on the flowers of ragwort and other plants and also at ' sugar.' Large numbers of immature earwigs were found in July under debris on the Humber foreshore and on all occasions a large population of the insect could be found in this area.

The Lesser Earwig (*Labia minor* (L.) was first noted under seaweed at the Salt Marsh in August, but in June, 1950, it was discovered in large numbers in a manure heap near the Phragmites Area and odd specimens were found under stones on the Warren.

### PLECOPTERA

None observed.

### PSOCOPTERA

Only a single species was collected although several others also occur on the peninsula. *Mesopsocus unipunctatus* (Mueller) was taken by Dr. Butler on June 10th, 1950, in marram, and nymphs about the same date from sea-buckthorn on the Main Ridge.

### EPHEMEROPTERA

No mayflies were noticed until our visit in June, 1950 when nymphs of *Cloëon* were seen in the crater-pond in the Marsh Meadow and a small swarm of males of *C. dipterum* (L.) was discovered on June 9th in the garden of the cottage.

ODONATA

Five species of Dragonflies were noted during our visits. Four species, namely *Ischnura elegans* (Van der Linden), *Lestes dryas* Kirby, *L. sponsa* (Hansemann) and *Sympetrum striolatum* (Charpentier) were plentiful in the Dyke, especially the last which was very abundant in August, pairing readily and combining with the numerous spiders to reduce very considerably the aerial fauna of the dyke. *Ischnura elegans* was seen near all the ponds and dykes of the area. Larvae of this and of *Sympetrum* were plentiful in the Dyke in July and in the Pond in the Phragmites Area in August. The two *Lestes* were scarcer than the other species and appeared to be confined to the Dyke. It is interesting to find these two member of the same genus flying together in the same restricted habitat.

The fifth species, *Pyrrhosoma nymphula* (Sulz.) was only met with in June, 1950, when a specimen was taken at the Pond in the Marsh Meadow.

MEGALOPTERA

None observed.

NEUROPTERA

The area is entirely unsuitable for Neuroptera. Only a single Lacewing, *Chrysopa carnea* Steph. was taken at light in August and one Dusky Lacewing, *Hemerobius stigma* Steph. The latter was also attracted to light and is said to be confined to conifers. There is a living and a dead Scots Pine in the cottage garden.

MECOPTERA

None observed.

TRICHOPTERA

Caddis-flies are very poorly represented in the Spurn fauna, the brackish dykes and small ponds apparently being unsuitable for them. Only six species were collected as follows :

*Limnephilus marmoratus* Curtis W., 16, 17/8/49.
*L. centralis* Curtis W., 5/6/50.
*L. affinis* Curtis D., 17/8/49 ! 4/6/50; W., 5/6/50, 7/6/50; M.M., 3/6/50 (L.B.D., 16/8/49).,
*Grammataulius strigosus* (Curtis) W., 16, 19/6/47, flying at night, 5/6/50.
*Colpotaulius incisus* Curtis PH., 21/7/48 (det. H. Whitehead), 6/6/50.
*Leptocerus aterrimus* Stephens P.M.M., 14/6/47.

The above are very common and widely distributed species found associated with all types of waters, except *Grammataulius strigosus* which is more a fenland species and *Colpotaulius incisus* which is a ditch species often overlooked on account of its retiring habits and rather small size.

## V. HEMIPTERA

W. D. HINCKS

Little attention was paid to this order during our visits, with the result that the following list of 57 species cannot be regarded as giving a true picture of the hemipterous fauna of the area. Such specimens as we found were generally obtained incidently whilst collecting other insects.

The general impression formed however, is that Spurn has a poor hemipterous fauna both in species and individuals. This is rather surprising when we remember how rich is the flora of the Warren and other parts of the peninsula. It was noticeable that most of the plants were free from aphid attack and this was clearly correlated with the scarcity of hymenopterous greenfly-parasites and predaceous ladybirds as may be seen from other sections of this report. The insignificance of the aphid fauna together with the specialised methods required for collecting specimens for determination have resulted in the family being entirely omitted from the present report. A single Coccid was found in significant numbers and therefore it is included below.

Several plant-bugs were fairly abundant in the marram areas, perhaps the most characteristic being *Gampsocoris punctipes*, a long-legged, slender species apparently specially associated at Spurn with arenicolous conditions. A few species were found commonly on the Warren on the flowers of *Senecio*, *Matricaria*, etc., and two Tingids were abundant on the thistles throughout the peninsula.

Some collecting of aquatic Hemiptera was done whilst searching for water-beetles but no attempt was made to survey the fauna completely nor to sample in such a way as to enable the population to be studied statistically. It is thought however, that a fairly complete list of the species occurring in the waters of the area as a whole has been compiled though it must be incomplete for individual stations. Species of *Pleidae*, *Notonectidae* and *Corixidae* were collected, the last occurring in every kind of water examined, from a static water tank to the saline waters of the Dyke. The results are tabulated below for the 15 species taken, Long Bank Dyke, outside the area, being included for comparison.

| Species | Dyke | Boundry Dyke | P.M.M. | P. in P.A. | crater M.M. | Static * Water Tank | L.B.D. | |
|---|---|---|---|---|---|---|---|---|
| *Plea leachi* | × | | | × | | | | 2 |
| *Notonecta glauca* | | × | × | | × | | × | 4 |
| *Corixa lateralis* | | | × | × | | | | 2 |
| *C. nigrolineata* | | × | | × | × | × | | 4 |
| *C. concinna* | | | × | | | | | 1 |
| *C. semistriata* | | | | | | | × | 1 |
| *C. scotti?* | | | × | | | | | 1 |
| *C. falleni* | | | | | | | × | 1 |
| *C. stagnalis* | × | × | | × | × | | × | 5 |
| *C. selecta* | × | | | | | | | 1 |
| *C. moesta* | | | × | × | | | | 2 |
| *C. linnei* | | | | × | | | | 1 |
| *C. affinis* | | | | | × | × | × | 3 |
| *C. panzeri* | | | | × | | | × | 2 |
| *C. striata* | | | × | | | × | × | 3 |
| | 3 | 3 | 6 | 7 | 4 | 3 | 7 | |

* 1947 only.

*C. stagnalis* appears to be the most generally distributed species, followed by *C. nigrolineata* and *Notonecta glauca*. Long Bank Dyke and the Pond in the Phragmites Area produced the largest number of species (seven). In general there appear to be fewer species in the waters of higher salinity such as the Dyke and most in waters where the salt content is lowest as is the case in the Pond in the Phragmites Area and the Crater pond in the Marsh Meadow. The latter pond has not yet been carefully examined for Corixids and probably will prove to contain several additional species. Long Bank Dyke was only collected in an area near the Kilnsea-Easington road, where the water is perhaps the lowest in salinity due to the distance from the Humber and the sea and because land-drains empty into it near this point.

Much collecting remains to be done on the Hemiptera at Spurn.

The late Mr. J. M. Brown kindly determined some of the species included in the following list and I am indebted to Mr. S. Shaw for naming the Corixids.

## HETEROPTERA

COREIDAE

*Myrmus miriformis* (Fall.). D., 14, 17/8/49.

NEIDIDAE

*Berytinus signoreti* (Fieb.). W., 15/8/49

*Gampsocoris punctipes* (Germ.). common in most areas, M.M., 17/6/47 ; W., 17/7/48, 15/8/49 ; D., 17/8/49, 14/8/49.

LYGAEIDAE

*Macroparius thymi* (Wolff) W., 14, 15/8/49.

*Heterogaster urticae* (F.) 1 spn. found dead M., railway lines, 13/8/49 (see page 86).

*Megalonotus praetextatus* (H.-S.) W., 25/7/48.

*Stygnocoris fuligineus* (Geoff.) common in marram and elsewhere, M.H., 15/6/47, W., 17/7/48, 12/8/49, M.R., 3/6/50.

*Drymus sylvaticus* (F.) M.M., 3/6/50, W., 5/6/50.

*Scoloposthethus affinis* (Sch.) M.H., 15/6/47, K. 3/6/50.

*Taphropeltus contractus* (H.-S.) W., 12/8/49, 7/6/50.

TINGIDAE

*Tingis ampliata* (H.-S.) M.H., 15/6/47 ; M.M., 17/6/47, 3/6/50 ; W., 17/8/49, 7/6/50 ; S.M., 19/7/48.

*T. cardui* (L.) M.M., 3/6/50 ; PH., 15/8/49. Both species were common on thistles throughout the area but few records were kept.

NABIDAE

*Nabis flavomarginatus* Scholtz, W., 13/8/49.

*N. major* Costa, M.H., 16/8/49 ; M., near railway lines, 13/8/49.

ANTHOCORIDAE

*Anthocoris nemoralis* (F.) M.R., on *Senecio* flrs., 13/8/49 ; PH., 15/8/49.

*Orius majusculus* (Reut.) W., on *Senecio* flrs., 12/8/49.

*O. laevigatus* (Fieb.) W., on *Matricaria* flrs., 12/8/49.

LORICULIDAE

*Loricula pselaphiformis* Curt.? One immature female M.R., on *Senecio* flrs., 13/8/49.

MIRIDAE

*Pithanus märkeli* (H.-S.). One nymph D., 21/7/48.

*Adelphocoris lineolatus* (Gze.) D., 14/8/49.

*Calocoris norvegicus* (Gmel.) W., 12, 13/8/49 ! on *Senecio* flrs.

*Liocoris tripustulatus* (F.) W., 15/8/49.

*Rhopalotomus ater* (L.) M.H., 13/6/47.

*Stenodema calcaratum* (Fall.) D., 17/8/49 ; M.M., 3/6/50 ; W., 5/6/50 !

*S. laevigatum* (L.) W., 15/8/49, 4/6/50.

*Leptopterna ferrugata* (Fall.) D., 21/7/48.

*Cyrtorhinus flaveolus* (Reut.). One brachypterous spn. PH., 20/8/49.

*Megalocoleus pilosus* (Schr.) M.R., 13/8/49, on *Senecio* flrs.

*Macrotylus paykulli* (Fall.) W., 17/7/48.

GERRIDAE

*Gerris thoracicus* Schumm. D., 18/7/48 ; Boundary Dyke, 8/49.

(*G. lacustris* (L.) L.B.D., 1947).

SALDIDAE

(*Salda littoralis* (L.), Welwick, 18/8/49).

*Saldula pallipes* (F.) D., 21/7/48, 14/8/49 ! !

PLEIDAE

*Plea leachi* MacG. & Kirk. One spn. D., 21/8/49 ; one spn. P.P.A., 20/8/49.

NOTONECTIDAE

*Notonecta glauca* L. Boundary Dyke ; P.M.M., 14/7/47 ; Crater M.M., 8/6/50 (L.B.D., 2/5/50).

CORIXIDAE

*Corixa lateralis* Leach, P.P.A., 2/5/50, 5/6/50 ; P.M.M., 21/8/49.
*C. nigrolineata* Fieb. Static water-tank nr. cottage, 14/6/47 ; Boundary Dyke, 8/49 ; P.P.A., 5/6/50 ; Crater M.M., 8/6/50.
*C. concinna* (Fieb.) P.M.M., 21/8/49.
(*C. semistriata* (Fieb.) L.B.D., 31/6/47).
*C. scotti* (Fieb.)? Three females P.M.M., 6/50, 21/8/49.
(*C. falleni* (Fieb.) L.B.D., 21/6/47).
*C. stagnalis* Leach (L.B.D., 8/49 ! !, 2/5/50 ! !) ; Boundary Dyke, 18/8/49 ! ; D., 21/7/48, 10/6/50 ; P.P.A., 2/5/50 ; Crater M.M., 8/6/50.
*C. selecta* (Fieb.) D., 21/7/48.
*C. moesta* (Fieb.) P.M.M., 21/8/49, 6/50 ; P.P.A., 2/5/50.
*C. linnei* (Fieb.) P.P.A., 2/5/50.
*C. affinis* Leach (L.B.D., 21/6/47, 8/49, 2/5/50) ; Static water-tank near cottage, 14/6/47 ; Crater M.M., 8/6/50.
*C. panzeri* (Fieb.) (L.B.D., 8/49 !, 2/5/50) ; P.P.A., 2/5/50.
*C. striata* (L.) (L.B.D., 2/5/50 !) ; Static water-tank near cottage, 14/6/47 ; P.M.M. 14/6/47, 21/8/49.

## HOMOPTERA

CERCOPIDAE

*Philaenus leucophthalmus* (L.) D., 14/8/49 ; M.H., 16/8/49.

MEGOPHTHALMIDAE

*Megophthalmus scanicus* (Fall.) W., 12/8/49.

TETTIGONIELLIDAE

*Euacanthus interruptus* (L.) M.R., on *Senecio* flrs., 13/8/49 !

JASSIDAE

*Euscelis grisescens* (Zett.) M.M., 3/6/50.
*E. obsoleta* (Kirschb.) D., 21/7/48.

TYPHLOCYBIDAE

*Cidadella atropunctata* (Gze.) M.M., 17/6/47.
*Dikraneura variata* Hardy, M.M., 3/6/50.

DELPHACIDAE

*Stenocranus minutus* (F.) M.M., 3/6/50.
*Delphax pellucida* (F.) W., 15/8/49.
*Criomorphus nigrolineatus* (Scott) M., 6/50 (P. M. Butler).

PSYLLIDAE (Chermidae)

*Psylla hippophaës* Foerst. W., 15/8/49 ; M.R., 13/8/49, on sea-buckthorn.

COCCIDAE

*Lecanopsis formicarum* Newst. M.R., near edge of sea cliff, at grass roots, 7/6/50 ! !

(*To be continued*)

# In Memoriam

## JAMES MEIKLE BROWN

(1875—1951)

James Meikle Brown was born in London and died at his home in Robin Hood's Bay on Easter Saturday, March 24th, a few days after his 76th birthday, after some years of failing health. Much of his life was spent at Sheffield, where he graduated from Firth College, subsequently taking a London B.Sc. and becoming a much respected member of the teaching staff of the High Storrs Grammar School.

After his marriage he retired to Robin Hood's Bay, where he spent many happy

*Photo by*] [*Wm. Fox & Sons (Sheffield) Ltd.*

years before failing health deprived him of the moorland walks and natural history rambles which were so much to him.

Brown was a true naturalist of very wide interests and all the different aspects of nature which attracted him at different periods of his life were approached with a scientific competency which excited the admiration of all who knew him. As early as 1910 we find him writing on the Rhizopoda. An excellent field botanist his attention was occupied a little later by plant galls. He was always interested in freshwater biology, particularly in the insects and many papers on Mayflies, Stoneflies, Caddisflies, etc., remain to us as reminders of his keen interest and exceptional ability. At an early date he took up the Hemiptera and became our Yorkshire authority and recorder for this order as well as for the ' Neuropteroid ' and ' Orthopteroid ' orders. Brown was a good collector and although not specially interested in beetles he managed to add to the county list several interesting species which had escaped record by acknowledged coleopterists. In later years he took up the Sawflies and, as usual, accomplished some very valuable work though of a local character.

It is to his studies of the Collembola, however, that Brown owed his international reputation as an entomologist. These much neglected primitive insects were of special interest to him for many years and important collections were entrusted to him for specialist study. He wrote up the results of his work in a

series of papers dealing with the Collembola of Mesopotamia, West Africa, Lapland, Hudson Strait, Iceland and Greenland, etc.

All Brown's scientific work was of the highest quality and its wide range made him the most able Yorkshire naturalist of his generation.

For many years Brown was a constant attender at Y.N.U. meetings and excursions. Being slightly deaf perhaps engendered a suggestion of reserve with strangers, but it was always a great pleasure to have him amongst us during any Union function, not only for his inherent ability as a naturalist, but because of his quiet humour and the friendly way in which he entered into the spirit of things. He was a past President of the Sorby Natural History Society and for some years he was Chairman of the Entomological Section of the Y.N.U. In 1933 he was the President of the Union. At one time he was a Fellow of the Linnean, Royal Entomological, and Chemical Societies.

It is hoped that Brown's collections of Yorkshire insects will find a home in one of our county museums where they may be preserved for the use of future students. J. M. Brown's death leaves a wide gap in the ranks of the Entomological Section and the Union itself has lost a great naturalist and a fine man.

We offer to his widow our deep and sincere sympathy in her great loss.

W.D.H.

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**The Fire on Austwick Moss.**—Austwick Moss holds pleasant memories for Yorkshire naturalists and the fire on May 12th, which was reported in the daily press, has caused many enquiries as to the effect on the plants, insects and general natural history.

The cause has not been ascertained but it is evident that the fire originated at the corner where Long Train Plantation is marked on the 6-inch maps. The wind kept the fire on the Moss side of the Moss beck (see *The Naturalist*, 1945, p. 118, for a plan of the Moss), the north side being unharmed and the south bank all burnt. The fire crossed the Moss to the hedge boundary of Middlesber Farm, the dry tufts of *Molinia* (Purple moorgrass) providing the source of the flames. Where masses of *Molinia* were near to bushes, especially the Sweetgale (*Myrica*) these were damaged. The fire did not damage trees and shrubs where the undergrowth was damp, though the flames from the *Molinia* areas scorched the other plants and masses of *Sphagnum* suffered. The wet areas where Bog Andromeda grows took little harm and the plant was flowering well on May 29th when the Green Hairstreak butterfly and the water-loving tipulid *Prionocera* were flying around, having been unhurt. On Austwick Moss *Molinia* is not eaten by animals ; it grows up in tall tufts, the old dry leaves hanging down and providing food for fire. Given a large area of this plant the fierce flames damage anything on the lee side, but at the date of the fire other parts of the Moss were too damp to take fire and escaped serious injury.

The only other plant that took a small share in the fire was the single-headed Cottongrass which forms similar tufts of dry leaves. Both plants are now (June) making their normal new growth.—C. A. CHEETHAM.

**Purple Moorgrass (*Molinia*) around Ingleborough.**—During the last forty years I have shown to visitors to Austwick Moss a large area of this plant some 200 by 50 yards that is never grazed by cattle and on enquiry have found that the plant is avoided in many other places in the vicinity of Ingleborough. This is very evident between Horton and Selside and between Ribblehead and Chapel-le-Dale.

On reading in Professor Pearsall's book *Mountains and Moorlands* that ' *Molinia* is in many moorland areas a most valuable form of pasture ' one is led to ask the reason for this difference and I have come to the conclusion that the system of farming where several neighbouring farmers have stinted rights of grazing on the same area is probably the answer. If *Molinia* is heavily and regularly grazed the growth is controlled, the young leaves are eaten and other types of grass encouraged. Pearsall says ' it is sensitive to grazing and quickly disappears when regularly and heavily grazed but curiously enough it is not so greatly affected by burning.' The old growth at the later part of the year is unpalatable. It is evident that the individual farmer's rights do not allow the necessary over grazing in the early part of the year when the plant is appreciated by stock and would be controlled.—C. A. CHEETHAM.

## BOOK REVIEWS

**Zoogeography of the Land and Inland Waters,** by **L. F. de Beaufort.** Pp. 208. Sidgwick and Jackson Limited—Text-Books of Animal Biology, 30/-.

**Animal Evolution,** by **G. S. Carter.** Pp. 368, with 63 text-figures. Sidgwick and Jackson—Text-Books of Animal Biology, 30/-.

The unravelling of the problems of zoogeography is rather like attempting the solution of a jigsaw puzzle in the cube. The topmost picture is reasonably complete and the student attempts to discover how it was attained from the fragmentary evidences that geology affords. In order to speak with authority he must have more than an average knowledge of all the groups of land and freshwater animals, their relationships, their ecology and their means of dispersal. He must have a good knowledge of the fossil record, of the evidences of the past changes of land and water and of the information that rocks afford of the local changes of climate through the ages. He will probably build up his main theory from the mammals, the evidence from which is most complete, but he must ensure that his theory does not conflict with the distribution of the other groups of vertebrates and of the molluscs, crayfishes and earthworms. He will even use at times the evidences given by the parasites that infect the higher forms. Above all he must keep an open mind for as we read in this book, ' In the past zoogeographers have built land bridges whenever they faced the difficulties of distribution ; but we must take care not to run to the other extreme and to try to explain everything by flotsam-jetsam methods.'

Few authors have attempted the whole of this exacting task but many have dealt with authority on special regions or with the detailed movements and distribution of restricted groups. Zoologists will therefore be grateful to Professor de Beaufort that, having the required attributes, he has surveyed and assessed this vast field of literature and condensed it into a well-documented volume.

The work is divided into nine chapters of which six are given up to the larger realms and regions while the remaining three deal with smaller areas of special interest. The British Isles are treated with reference to the successive waves of animal invasion during the periods of low sea-level in the Ice Age. Madagascar shows us an island populated from Ethiopia but isolated since the Eocene. Celebes and the adjacent islands afford evidence of vertical movements and also horizontal ones in the sense of Wegener. The important work of Worthington and others on the fishes of the African Lakes is dealt with in an interesting manner and throughout the book the relationship of spatial isolation and time with species formation is discussed, for in this the most valuable teachings of zoogeography are to be found.

Works of reference, such as de Beaufort's book will certainly become, should be fully indexed but the indexing is rather overdone. There are, for instance, forty-three unqualified page references to North America, eleven of them being consecutive pages with one page missed. This is about one-fifth of the whole book. Italics are used for references and the use of roman type for chief references would have been of advantage.

*Animal Evolution* is no book for the dilettante reader, but a work of very high value to the serious student, particularly the University student. It brings together the significant results of palaeontology, genetics, systematics, and the new natural history and shows how they fit into a comprehensive picture of evolutionary processes. The book is divided into two parts, the first on the basis of biological fact and the second on the theory of evolution. The palaeontological aspect is dealt with from the modern standpoint. The relation of fossil vertebrates, brachiopods, *Gryphaea* and *Micraster* to micro-, macro-, and mega-evolution and to such principles as adaptive radiation, allometry and aristogenesis are discussed. The two chapters on the relations of systematics to the new natural history are full of interest. The species is regarded as a true natural category, the explanation of whose origin from the deme and the sub-species is the main purpose of an evolutionary theory. In this connection the examples given include consideration of the Galapagos finches and the herring gull and black-backed gull. Darwin's main arguments, concerned with competition, isolation, and natural selection, are reconsidered in relation to recent genetical and mathematical analysis.

In spite of so much modern learning, most naturalists will find the greater part of this book readable and fascinating. The genetics will probably be beyond the majority of amateurs, but effort would be well repaid. Certainly no serious naturalist can ignore the subjects with which it is concerned.

**Wild Orchids of Britain,** by **V. S. Summerhayes.** *New Naturalist,* Vol. 19. Pp. xviii+366, with 100 photographic illustrations, 61 in colour, 19 text figures and 43 distribution maps. Collins, 21/-.

Different volumes of the *New Naturalist* books differ rather widely in scope. Some have aimed at describing the natural history of large areas, others at surveying the geology and botany of Great Britain as a whole. The latter raise special problems due to the size of the subject and the limited space available in which to do justice to the theme. The former are clearly amongst the most difficult books to write successfully an account of the inability of any one author to deal equally competently with each branch of natural history. The zoological author is unlikely to win the unqualified approval of botanical critics, while the botanical author is apt to fall short of satisfying his ornithological or entomological readers. No such difficulties have confronted Mr. Summerhayes whose subject matter is limited to a single family of flowering plants numbering only fifty species. These are described in such a thoroughly competent manner that both the accuracy and high quality of the text together with the fine series of photographs together form a book of outstanding merit.

The orchids are a group of plants which make a strong appeal both to non-specialist and expert field botanists. Their striking and often beautiful flowers sufficiently account for their popular appeal, an appeal which is no doubt further enhanced by the attractions bestowed in many instances by rarity, while the taxonomic complexity of certain groups is a challenge to the critical field botanist. Less than twenty years ago Colonel Godfrey's comprehensive and costly *Monograph and Iconograph of native British Orchidaceae* was hailed by many students of these plants as likely to remain an authoritative work for many years to come. Yet so much work has since been done on the dactylorchids and helleborines that that work is already out of date on these groups. Mr. Summerhayes' book has the double distinction of being both a work which the general reader with an interest in our native orchids can read with pleasure as well as profit, and one to which the more advanced systematist will turn because of the up-to-date treatment of the more difficult sections of the family. The inclusion of a key to all British species is a feature which will particularly appeal to critical students of the group.

The introductory chapters deal with the life history of the orchid plant, the morphology of the flower and methods of pollination and fertilisation, and the distribution and ecology of the species. The major part of the book is devoted to systematic accounts of all the British species. These include ecological, distributional and biological information. Distribution maps (based on vice counties) are given for all save the dactylorchids in which the exact limits of distribution are still insufficiently known. Five distinct species of marsh orchids are recognised, viz., *O. latifolia, praetermissa, purpurella, occidentalis* and the recently discovered *O. cruenta.* Other populations of more doubtful status not accepted on present evidence as distinct species are *O. pardalina, kerryensis* and *traunsteinerioides,* though these are included in the key. The Yorkshire plant named *O. eborensis* by Colonel Godfrey is included under *O. traunsteinerioides* but not referred to by name. Mr. Summerhayes reverts to the earlier treatment of the northern and southern forms of the Irish Ladies' Tresses as variants of a single variable species under the old name *Spiranthes Romanzoffiana,* but specific rank is accorded to four rather closely similar, self-pollinated, dune and woodland helleborines though their status as species is widely different from that obtaining in the cross-pollinated species. The colour and monochrome photographs illustrating every species save *Orchis cruenta* are a valuable feature of the book and in nearly every instance are beautiful and characteristic representations of the species portrayed. Unstinted praise is due to author, photographers and all who have had a hand in the production of this fine book. W.A.S.

**Flora of County Wicklow,** by **J. P. Brunker.** Pp. 310 with folding map. Dundalgan Press, Dundalk, 1950, 25/-.

To field botanists interested in the distribution of plants within the British Isles, the publication of a new county flora is always a matter of interest. Despite Dr. Praeger's numerous botanical works, which have made the regional botany of Ireland almost as well known as that of England, Ireland is less well served with county floras. Mr. Brunker's *Flora of Wicklow* will therefore be welcomed by botanists in both countries.

Wicklow includes within its boundaries the highest mountain in eastern Ireland though the granitic rocks of all its hills reduce the number of species which might otherwise be expected to occur. Limestone rocks are absent throughout the county but this deficiency is to a considerable extent offset by the calcareous drifts. The topographical variety afforded by the county is reflected in a flora of considerable interest, and though eastern Ireland lacks the special botanical interest of the west, Wicklow includes a good number of rare and interesting species.

In its arrangement Mr. Brunker's book follows conventional lines. The introduction deals with the history of botanical investigations in the county, physical, climatic and soil features, the influence of man on the flora, and an account of the botanical sub-divisions of the county and their more interesting localities and species. The floristic section is marred by the author's misguided adherence to the archaic nomenclature of the *London Catalogue*. However we may sympathise with his views about vexatious name changes his conservatism in this matter is a disservice to his readers, and especially younger workers, for it is quite certain that many of the names used in the book, together with the citations of their authors, are both obsolete and incorrect. Even where recent papers on particular groups are available the treatment sometimes fails to bring nomenclature into line with current usage. *Carex Oederi* Retz. and *C. tumidicarpa* Anders. are not synonyms but different species. *Agrostis alba* is preferred to *A. stolonifera* as is *Potamogeton heterophyllus* to *P. gramineus*. These at least leave us in no doubt as to the species intended, but in the case of *Potamogeton pusillus* one wonders if the name is used in the sense of the *London Catalogue* or as up-to-date botanists interpret the name. As there is no mention of *P. Berchtoldii* or *P. panormitanus* our query is unresolved and the species intended is uncertain. The book also suffers from careless proof reading. *Tragopegon*, *Pinguicola* and *Amtsinckia* occur both in text and index and the late Mr. H. W. Pugsley is referred to in the preface and elsewhere as F. W. Pugsley. In spite of these blemishes, however, the book is a useful addition to the stock of county floras. W.A.S.

**The Study of the Distribution of British Plants.** Edited by **J. E. Lousley** for the Botanical Society of the British Isles and obtainable from the Society, c/o Department of Botany, The University, Oxford. Pp. 128 with one plate and 28 maps and figures. 10/-.

The second conference arranged by the Botanical Society of the British Isles in the spring of 1950 dealt with methods of ascertaining and recording plant distributions and problems of interpretation of distributional data. The inadequacy of maps purporting to show the distribution of British species by shading or blacking out the vice-counties in which they occur has long been realised, and the defective and often misleading picture which they present has been emphasised by recent Continental publications—especially Hultén's splendid atlas showing the distribution of Scandinavian species—which combine detailed information with a high degree of accuracy and precision. The papers contributed to the Conference dealt with the historical background to the subject and methods of portraying distribution. Techniques of cartographical treatment vary considerably and their potentialities for helping to elucidate problems of distribution as well as giving accurate visual information, and hence the importance which attaches to the choice of the mapping method which should be adopted are clearly brought out in the various papers. The maps and exhibits arranged in connection with the Conference illustrated geographical distribution of selected species and methods of portrayal and an account of the exhibits is included in the report as well as the papers read at the meeting. The concluding paper by Professor A. R. Clapham reviewed the work of the Conference and put forward concrete proposals and a committee was appointed to consider the preparation and publication of a series of distribution maps of the British flora. The importance of the subject and of the views expressed upon it are such that no one interested in the serious study of the British flora can afford to ignore this report. W.A.S.

**Lectures on the Development of Taxonomy.** Pp. 84, 1950. 4/-.

**Lectures on the Practice of Botanical and Zoological Classification.** Pp. 64 with 13 maps and figures, 1951. 4/-. Both obtainable from the Linnean Society, Burlington House, Piccadilly, W.1.

In recent years there has been a marked revival of interest in systematics on the part of academic botanists. A new approach to taxonomic studies has been made

through the synthesis of herbarium and field studies with ecological, genetical, cytological and other experimental avenues of approach to the subject. But the place of taxonomy in University curricula has still not regained its former importance, and it was with a view to encouraging interest and instruction in taxonomy amongst students that the Linnean Society in conjunction with the Systematics Association arranged courses of lectures which were delivered in the rooms of the Linnean Society during the sessions 1947-1948, 1948-1949 and 1949-1950. These booklets contain the collected lectures given during the second and third courses.

The course devoted to the historical development of classification contains papers on ' The Evolution of Botanical Taxonomy from Theophrastus to Linnaeus ' by T. A. Sprague, ' Animal Classification from the Greeks to Linnaeus ' by A. T. Hopwood, ' Systematic Botany from Linnaeus to Darwin ' by A. J. Wilmott, 'Animal Classification from Linnaeus to Darwin ' by A. T. Hopwood, and ' Post-Darwinian Development of Taxonomy in Botany ' by H. K. Airy Shaw, and in Zoology by John Smart.

In the series on present-day aspects of taxonomy the technique of classification of plants and animals is dealt with by B. L. Burtt and A. Graham under the title of ' Dealing with the Raw Materials.' Geographical distribution in relation to the classification of plants and animals is discussed by the late A. J. Wilmott and Professor G. D. Hale Carpenter respectively, whilst the lectures on ' Fossils and Classification ' by A. T. Hopwood, and ' Cytology as a factor in Classification ' by F. C. Stern are expressions of some of the newer aspects of taxonomy.

It would be invidious to select particular articles for comment or praise. All are both informative and readable. It may be noted, however, that about twice as many pages are occupied by the botanical as by the zoological articles. That some appear more interesting than others is no doubt largely a reflection of one's own special interests. This collection of lectures is certainly a most useful source of information on the practice and history of taxonomy and will be of real value to students. The bodies responsible for arranging the courses and for making the lectures available to all those who were unable to hear them given, deserve thanks for this very practical contribution to the promotion of taxonomic learning. W.A.S.

**British Plants and their uses,** by **H. L. Edlin.** Pp. 152 with 33 plates and numerous illustrations in the text. B. T. Batsford, Ltd. 15/-.

During the past fifty years progress and invention have affected the way of life of all of us to an extent unequalled in any equivalent period. Before the rapid changes of recent years generations of country people had learnt to adapt many wild as well as cultivated plants to their varying needs. In this book Mr. Edlin sets out to describe the varied uses, both present and past, made of all the wild and cultivated plants of Britain, excluding timber trees, fungi and purely horticultural plants. About 450 species are included in this survey and the account is rendered all the more interesting by the allocation of as much space to obsolete and moribund usages and the special employment of local plants, as to the more familiar grain and root crops, culinary plants and wild and cultivated fruits. These include oilseeds and forage plants, thatching plants, pot herbs, perfumes, condiments, drugs and poisons, fibre-yielding plants, dyestuffs, peat deposits, kelps and seaweeds, and the uses made of lowland and mountain pasture plants and heather moor species. There is thus plenty of information here likely to appeal to a wide variety of interests, to students of folklore and country life as much as to those whose interest lies in the plants themselves. The distribution and status assigned to a few species is incorrect but having regard to the amount of information assembled it would be unfair to find fault on these grounds. The book is illustrated with first-rate photographs and reproductions and the numerous woodcuts from Gerard's *Herball* are in keeping with much of the subject matter of the book. W.A.S.

**British Birds in Colour.** Advisory Editor **R. S. R. Fitter.** Pp. 192, with 108 plates from John Gould's *Birds of Great Britain* and 183 monochrome photographs by leading bird-photographers. Odham's Press Ltd., 21/-.

Although a picture book, this volume is well designed as ' a comprehensive introduction to the study of British birds.' R. M. Lockley opens with an entertaining chapter headed ' The Pleasures of Bird-Watching.' Chapters entitled ' The Technique of Bird-Watching,' ' British Birds Described,' and ' Eggs, their

Colour and Markings ' are written by Richard Perry. ' Habitats ' are ably dealt with by Bruce Campbell. E. R. Parrinder writes competently of ' Migration and Movement,' and Phillip E. Brown deals in a broad-minded manner with ' Bird Protection in the British Isles.' To point out a few omissions would not be difficult, but hardly fair in view of the restricted space each writer had at his disposal. Generalisations, obviously unavoidable, reach their limit with a reference to Spotted Flycatchers ' arriving from *all* parts of Africa in May.' That some leaf-warblers with dark legs can possibly be Willow-Warblers does not seem to be known to Mr. Perry. The Nightingale does *not* reach its northern breeding limit in Europe south of the Humber ; nor even on occasion in England. Ornithologists who travel direct from parts of the southern half of England to Scotland for their knowledge of birds in hill-country not unusually show a lack of appreciation of Pennine habitats and distribution Nevertheless, each chapter deals with its subject comprehensively, and added together achieve the book's design and objective.

The Gould illustrations alone are a valuable feature of the book. Many of us have sighed to see the prices Gould's works command at sales. Here is an opportunity, at a comparatively small price, to possess some of the extraordinary work of this nineteenth-century artist admirably reproduced—not that the colours are true in every detail on every plate. The photographs form a fine collection. The book is excellent value for its price. R.C.

**The Wood Pigeon in Britain.** Abridged from a Report by **M. R. Colquhoun** on the 1942-43 Wood Pigeon Investigation of the British Trust for Ornithology. Pp. 69. H.M. Stationery Office, 1951, 3/- net.

Breeding habitats, habits and behaviour, development from egg to adult, food and feeding habits, damage caused, status and density, movements and migration, are dealt with in detail, with much interesting writing, and information tabulated and otherwise. It is interesting to note that the smaller darker birds so often shot in late autumn were concluded by Mr. W. B. Alexander, after the sifting of much evidence, to be juveniles and not ' foreign birds ' as has been popularly supposed. An introduction modestly states ' the volume is in no way a life history of the wood pigeon (*Columba palumbus*), nor is it a review of the extensive literature which already exists on the species.' Nevertheless the book is a useful and welcome addition, at a very moderate price, to the other monographs on individual species, to be placed after reading alongside such on our shelves for reference. R.C.

**Geology of the District North and East of Leeds.** *Mem. Geol. Surv. Great Britain.* By **W. Edwards, G. H. Mitchell** and **T. H. Whitehead.** Pp. 93. H.M. Stationery Office, 7/6.

This long-awaited memoir is a disappointment. The economy axe has been wielded to such effect that the bulk of the memoir is little more than a *coup d'oeil* on local geology. The condensation has not been uniform for while the Millstone Grit Series which occupies the largest area is dismissed in fourteen pages, the glacial deposits are given a more extended treatment in nineteen pages. This latter chapter—on Pleistocene and Recent Deposits—is the best in the memoir and gives a reasoned account of a subject on which there is still divergences of opinion while Plate III gives an excellent picture of the regional distribution of the many types of glacial deposits.

The description of the Millstone Grit Series is divided into Stratigraphy, Palaeontology and Local Details and involves much repetition which is more obvious in that each paragraph is so short. The palaeontology is dismissed in just over two pages and it is unfortunate that a publication like this cannot be more inclusive and not have to refer the reader to papers published elsewhere. The small amount of workable Coal Measures in the area is adequately treated but the value of fig. 6 showing the Elland Flags at six borings, not specifically located, and in two directions at right angles, is not obvious.

In the chapter on Permian rocks, reef-limestones are described for the first time in this area and fossil localities in both Lower and Upper Limestones are given although a visiting geologist will not be able to make use of outcrops in ploughed fields.

It would appear that the memoir was written some years before its publication for quarries mentioned as giving visible sections are now completely filled in. Again, on page 44, a well at Bilbrough is reported as having penetrated 211 feet of Bunter, but another well here, bored in 1943, passed through 296 feet of this rock before reaching the Permian Marls.

There are only two photographs illustrating the memoir and one of these is of an outcrop-coal excavation no longer visible. Surely there are other features in the area worthy of photography other than Great Alms Cliff. H.C.V.

**Gall Midges of Economic Importance. Vol. V, Trees,** by **H. F. Barnes.** Pp. 270, with 8 plates. Crosby Lockwood & Son, Ltd. 15/-.

Volume VI of this series (' Miscellaneous Crops ') was reviewed as long ago as 1949 (*The Naturalist,* 1949, p. 173). Volume V, dealing with the gall midges of trees, is especially welcome to field naturalists as it includes those species associated with hosts most frequently examined by amateur cecidologists and which are the least adequately treated in British works on cecidology.

A foreword is contributed by Dr. R. Neil Chrystal, of the Oxford University Department of Forestry. The general plan of the book is similar to that adopted in previous volumes. The species associated with conifers are dealt with in the first section followed by those attacking broad-leaved trees. The book is primarily intended for foresters whose work will be greatly facilitated by this admirable digest of the available information.

The preface of Vol. V is dated December 1948, and includes a brief review of the incidence of gall midges in the vegetable kingdom. The author makes the following statement which should particularly stimulate the field naturalist: ' The lack of knowledge concerning the gall midges of forest and woodland trees is striking when one considers their comparative abundance with those on other useful and ornamental plants.' W.D.H.

**British Spiders, Vol. I,** by **G. H. Locket** and **A. F. Millidge.** Pp. 310 with frontispiece and 142 figures. The Ray Society, British Museum (Natural History), Cromwell Road, London, S.W.7. 27/6.

This is a book for which all students of araneology have been waiting, and one which they will unquestionably find of the greatest value in the identification of British spiders. It is the first complete work of its kind since the publication, seventy years ago, of the Rev. O. Pickard Cambridge's *The Spiders of Dorset,* and its welcome appearance should provide renewed encouragement to all students of this branch of natural history.

This volume embraces 17 of the 24 families and 205 species, the remaining seven families and 362 species being reserved for the second volume. There is an introduction by W. S. Bristowe giving a brief history of araneology followed by a chapter on the collection, preservation and examination of spiders and one on their external anatomy. These are succeeded by a key to the families and both here and in the keys to the genera and species, the authors have been at great pains to improve on the utility and workability of these as compared with pre-existing keys. The main part of the book is devoted to detailed descriptions of the morphological characteristics of the families, genera and species and briefer accounts of their distributions and habitats, the value of the descriptions being enhanced by the admirably clear and helpful illustrations. The classification and nomenclature follows closely on that of Bristowe's *Comity of Spiders.*

I have nothing but praise for this book. It will be a boon and constant source of service and encouragement to all British araneologists who will look forward eagerly to the appearance of the second volume. A.C.B.

**A Field Guide to the Butterflies** of North America east of the Great Plains, by **Alexander B. Klots.** Pp. 349 with coloured plates of 247 species and 232 photographs. Houghton Mifflin Co., 2 Park Street, Boston, Mass., 1951. $3.75.

This book, which fits the normal pocket without undue strain, is remarkable for the large amount of information which it packs into so small a space. Though the collection and classification of butterflies is Mr. Klots' main concern he has an ecological approach to his subject which makes this volume more than ' just another book about butterflies.'

The book is divided into three parts. Part one is an introduction to the study of butterflies, part two comprises descriptions of all the resident species as well as—in lesser detail—the casuals, whilst the third part consists of explanations of the principles of classification, details of literature and collections, a check list, and indices of species and larval food plants. The standard of the photographs is very good, whilst that of the coloured plates is generally high, although there sometimes (amongst the Skippers for example) appears to be some indistinctness of detail. One would have expected also more than two plates to be devoted to

stages other than the imago, in a book with an avowed ecological bias. But it should be easy enough, even for a tyro, to determine a species with all the information presented in this competent volume. E.D.

**British Fossils,** by **Duncan Forbes.** Pp. 96, with 23 plates and 13 text figures. **Pond Life,** by **R. L. E. Ford.** Pp. 96, with 22 plates, 6 in colour. **The Naturalist on the Seashore,** by **E. M. Stephenson.** Pp. 96, with 32 plates, 8 in colour, and 10 text figures. **British Trees,** by **C. A. Hall** and **B. A. Jay.** Pp. 96, with 22 plates, 6 in colour. A. & C. Black, Ltd. 6/6 each.

These four additions to Messrs. Black's ' Young Naturalists' Series ' are all well written in non-technical language, are excellently illustrated and attractively produced, and can all be warmly recommended to amateur naturalists and beginners in the subjects concerned.

Mr. Forbes' brief descriptions of the anatomy of each phylum of fossils together with the excellent plates should enable the more important genera in each group to be readily identified. The second half of the book outlines the distribution of life as shown in the succession of stratified rocks in Britain with details of the chief areas where fossils may be collected. Mr. Ford includes a chapter on microscopic life in addition to his account of the animals and plants most likely to be found in and around ponds. The photographs are again very good, but it would be well in any future edition to correct the legend to plate 16. Figure 1 is certainly not *Phryagnea* (*sic*) *minor*. Miss Stephenson's account of the habits and life histories of some of the commoner animals and seaweeds of the seashore is both interestingly written and accurate. The book on English trees which includes non-indigenous but commonly planted trees as well as native species was first published twenty years ago but has been entirely revised and re-illustrated to bring it into line with others of the series.

**Carnations in Colour and Cultivation,** by **T. C. Mansfield.** Pp. 243, with 64 plates in colour and 47 other illustrations. Collins. 21/-.

Carnations are amongst the most decorative of all garden flowers. Their freedom of flowering and relative ease of cultivation coupled with their great variety and beauty combine to give them a well-deserved popularity which few other flowers surpass, This generously and finely-illustrated volume follows closely on the lines of Mr. Mansfield's other volumes in the same series. It describes the historical, cultural and taxonomic aspects of carnation growing followed by a comprehensive glossary in which the characteristics and cultural treatment of over 800 species and varieties are given. Amateur gardeners and experienced growers will both find much useful information in this work.

**Life and Growth,** by **F. R. Elwell.** Pp. 70, with about 120 illustrations. Methuen & Co., Ltd. Cloth boards, 4/6. Strong card, 3/6.

The ' Life and Science ' series of booklets, designed especially for modern school pupils of eleven and over, deserve the highest praise for their effective manner of presentation. There is a refreshing absence of the dullness so often associated with school books. They contrive both to instruct in a simple, direct and lively manner, and at the same time to stimulate the curiosity of the pupil who is constantly encouraged to follow up the subject matter by making independent observations out of school, on lines suggested at the end of each chapter. This book deals with the cellular construction of organisms, fossils and the outline of evolutionary advance in animal life, reproduction, growth and environment. Both text and marginal illustrations are excellent.

## THE PROTECTION OF BRITISH INSECTS

The Protection Committee of the Royal Entomological Society of London was instituted in 1925, as a result of many complaints in the entomological journals of that time, concerning the wanton damage that was being caused by a certain number of unscrupulous collectors, which was actually threatening the very existence of particular species. Since its institution the Committee has met with considerable success, and those insects most threatened in 1925 are now considered to be firmly established in their particular habitats.

At the end of the war the Committee was able to resume its full activities, which had been curtailed during hostilities, and in 1947 it was decided to emphasise the importance and representative character of the Committee by inviting the principal entomological societies to nominate one of their members to serve thereon.

Modern agricultural practices, the heavy programme of forestry now in being, and sometimes the generally well intended activities of local authorities often involve threats to rare or local species through the alteration and sometimes the destruction of existing conditions.

The Committee has taken an active part in endeavouring to minimise the risks that have arisen from such causes, and has been careful to co-ordinate its activities with other organisations interested in the preservation of the fauna and flora of the country. With the advent of the Nature Conservancy, with which the Committee has established close relations, and of the International Union for the Protection of Nature, to which the Committee is linked, it may prove possible to do even more in the future to preserve those natural conditions essential to the existence of particular insects.

The success of these endeavours should be sufficient to safeguard rare or local insects of the lesser known Orders, but in the case of the Lepidoptera it is also necessary to guard them from extinction at the hands of avaricious collectors.

It is with great regret that the Committee must record that from time to time reports are still received of most reprehensible activities by collectors, which may well cause the extermination of rare and local species.

The following is a list of the species in which the Committee is at the moment particularly interested :

| | |
|---|---|
| Swallow Tail | *Papilio machaon* Linné. |
| Glanville Fritillary | *Melitaea cinxia* Linné. |
| Heath Fritillary | *Melitaea athalia* Rottenburg. |
| Large Blue | *Maculinea arion* Linné. |
| Blair's Wainscot | *Sedina buettneri* Hering. |
| Clifden Nonpareil | *Catocala fraxini* Linné. |
| Lunar double-stripe | *Minucia lunaris* Schiffermueller. |
| Lesser Belle | *Colobochyla salicalis* Schiffermueller. |
| Rest Harrow | *Aplasta ononaria* Fuessly. |
| Sussex Emerald | *Thalera fimbrialis* Scopoli. |
| Lewes Wave | *Scopula immorata* Linné. |
| Netted Carpet | *Eustroma reticulata* Schiffermueller. |
| Dark Bordered-Beauty | *Epione vespertaria* Thunberg. |
| Rose Plume | *Euenaemidophorus rhododactylus* Schiffermueller. |
| Fiery Clearwing | *Aegeria chrysidiformis* Esper. |

All collectors are most earnestly requested, therefore, to use the utmost restraint at all times in taking any of the above species, in any of their stages, and particularly when adverse factors have reduced their numbers. The indiscriminate capture of large numbers of these species not only may endanger their existence in this country, but also renders more difficult any negotiations being carried out by the Committee in the endeavour to preserve them and their natural habitats.

After mature consideration and full realisation of what it entails, the Committee would beg entomologists to report direct and at once to its Honorary Secretary any thoughtless collecting of this kind, which may come to their personal notice, giving the fullest particulars.

The Committee is glad to report that one well known dealer has already given an undertaking to have no dealings whatever in a number of the insects on the Committee's list in any living stage. It is hoped that similar co-operative undertakings may be secured from other dealers, who are hereby invited to communicate with the Honorary Secretary.

The Committee would be glad at all times to receive practical suggestions from entomologists. In particular it would urge entomologists to notify the Committee at the earliest possible moment of any observed threat to a rare or local species or to its habitat, giving all the information obtainable, so that its support and experience may be made available in framing measures necessary for their protection.

N. D. RILEY,
*Hon. Secretary,*
*Committee for the Protection of British Insects.*
Royal Entomological Society of London,
41 Queen's Gate, London, S.W.7.
*30th March*, 1951.

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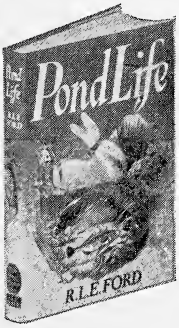


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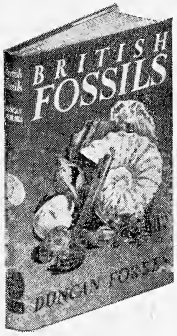


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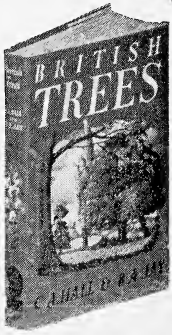


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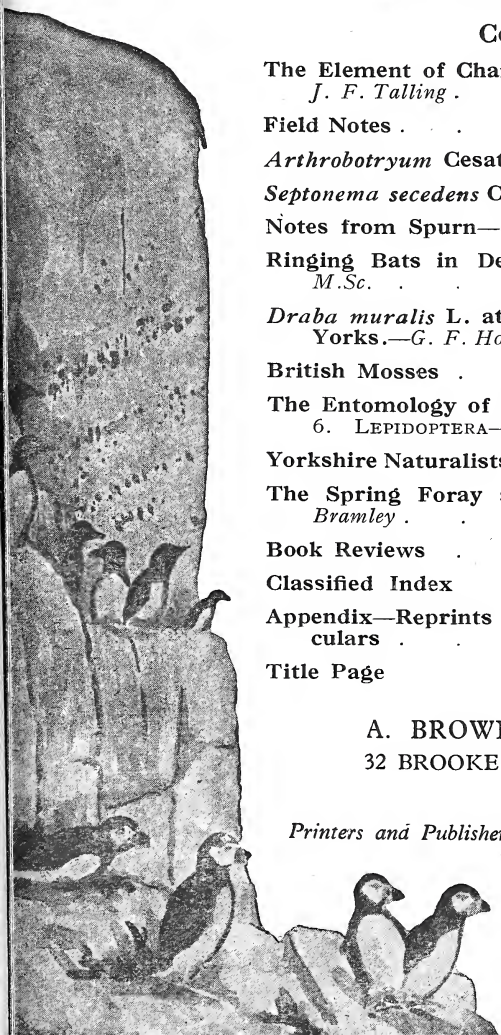

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# THE ELEMENT OF CHANCE IN POND POPULATIONS

J. F. TALLING

' . . . there is not a reason found out, I think, by any, why they should breed in some ponds, and not in others, of the same nature for soil and all other circumstances.'—*Izaak Walton.*

## Introduction

It is a familiar fact that difficulties of dispersal prevent living organisms from occupying all the habitats in which they are physically capable of surviving. The restrictions imposed by dispersal upon the exploitation of suitable habitats are manifested in two ways. Their clearest expression is found in the limitations of geographical distribution, and from the geographical aspect is derived most of the interest shown in the problems of dispersal. But even within the limits of its geographical range, difficulties of dispersal will prevent a species from occupying all the habitats potentially available. In this ecological setting the limitation of distribution by imperfect dispersal is more difficult to assess, since neither the demands of the species nor the suitability of the habitat can be completely defined or measured. Such limitation is of considerable importance in relation to the question of the determinacy or indeterminacy of natural communities, a subject of fundamental interest to the theoretically minded ecologist. If an ideally determinate relationship existed between the physical conditions prevailing in a habitat and the species occurring therein, it could be supposed that this species group would occur wherever the given combination of environmental factors was realised. Imperfect dispersal would prevent the attaining of this ideal of biosociology, either by preventing a suitable species from arriving in the habitat, or by delaying its advent until a late stage in the colonisation when competitive difficulties of establishment present an insuperable barrier.

Owing to the difficulties of estimation, widely divergent views have been expressed concerning the significance of the element of indeterminacy or chance in natural communities. Its importance in terrestrial plant communities has been especially emphasised by Palmgren (1929) and Gleason (1939). The following discussion is concerned with its significance for the populations of freshwater ponds. A considerable amount of relevant data exists for these habitats, and does not appear to have been previously summarised. Much of it consists of incidental observations, and only two papers dealing specifically with the main problems here discussed (Reid 1892 ; Godwin 1923) are known to me.

The small size and isolation of freshwater ponds provide *a priori* grounds for assuming the chance element to be strongly pronounced in these habitats. This is well expressed by Fritsch (1931, pp. 253-4) in a discussion of algal communities. ' Ponds are at least largely of the nature of isolated islands . . . their algal population must reach them from without, so that a considerable element of chance becomes a factor in determining their flora . . . It seems probable therefore, that except in a long established pond, many forms will be lacking that could exist there.' Notwithstanding the analogy with the isolation of islands or oases, suggested (*inter alia*) by Fritsch, Boycott, and Reid, there is evidence that the physical isolation of ponds may be mitigated by other factors. The factors governing the chance element in ponds can be classified as below.

A. Factors governing the dispersal of reproductive bodies (diaspores, propagules).

1. Intrinsic properties of the organisms
   - (a) Formation of resistant reproductive bodies
   - (b) Capacity for active overland dispersal
   - (c) Frequency of occurrence in nature
2. External agencies of dispersal
   - (a) Wind
   - (b) Animals, especially birds and insects
   - (c) Inflowing stream and water drainage
3. Local factors
   - (a) Age of pond
   - (b) Area of pond
   - (c) Distance of separation from other water-bodies.

B. Factors governing establishment of the reproductive bodies
   1. Intrinsic powers of multiplication and resistance to competition
   2. ' Openness ' of the habitat
   3. Destruction by other organisms.

Before considering the ecological consequences of limitations of dispersal, the actual materials and agencies of dispersal may first be summarised.

### Resting Stages

The majority of freshwater organisms are well provided with resistant reproductive bodies which facilitate passive dispersal. In addition to the normal seeds and spores of higher plants and eggs of animals, there can be mentioned the numerous spores, sexual and asexual, of algae, the gemmules of freshwater sponges, statoblasts of freshwater Polyzoa, and ' resting eggs ' of Rotifers, Phyllopods, Cladocera, some Copepods and such Turbellaria as *Mesostoma*. In this respect the fauna and flora of freshwater is in marked contrast with that of the sea. The prevailingly small size of freshwater organisms also renders possible the passive dispersal of adult organisms, provided that these can withstand temporary desiccation. In this connexion the encysted adults of various Protozoa, such Oligochaetes as *Aelosoma* and Rotifers as *Philodina roseola*, a few Copepods and the Tardigrade *Macrobiotus*, are of interest. Regarding algae, it has been considered that ' it is very probable that the dissemination of vegetative cells is of far greater importance than that of resting cells ' (Smith 1933, p. 12). The vegetative cells of some algae are resistant to desiccation, but according to some authors (e.g. West & West 1909 ; Strøm 1924) this does not apply to Desmids, although Iyengar (1938) makes an exception for some tropical Desmids.

Numerous observations and experiments have been made upon the powers of resting stages to withstand desiccation and adverse temperatures. Some species, especially of algae, Entomostraca, and Oligochaetes, are only known from artificial cultures of dried mud, and various Phyllopoda, Copepoda, Cladocera, and Ostracoda have been raised from mud dried for periods of ten years or longer. The capacity of the cocoons of freshwater Oligochaetes to withstand a period of desiccation was shown by Bretscher (1903), and the adults of some Tardigrades and Rotifers with cosmopolitan distributions have been demonstrated to be resistant to heat and drought for long periods (cf. Carpenter 1928, p. 220). The ability of adult Rotifers to resist desiccation was strongly championed by the early microscopists (e.g. Mantell 1846, p. 77), but may be less widespread than was believed (Whitney 1908). Recently a proof was given that the famous *Amoeba proteus* in the young encysted stage ' can survive desiccation and is thus capable of dispersal by wind or other agencies' (Galbraith & Taylor 1950).

Teleologically, the frequent formation of resting stages by freshwater organisms is usually explained as an adaptation to withstand summer drought or winter cold. An alternative function, mentioned by Darwin (1859, chap. 12), is the direct facilitation of dispersal between small isolated water-bodies. In this connexion the hooked prominences on the eggs of *Hydra*, the statoblasts of *Cristatella*, and the ephippia of the water-flea *Leydigia acanthocercoides* (Scourfield 1899) have been compared with similar structures on the fruits of flowering plants dispersed by animals, although direct evidence of their utility is difficult to obtain. Indeed many of the functions ascribed to resting stages are, as Strøm (1924, p. 24) pointed out, merely ' teleological deductions from the writing desk.' There can be no doubt that the existence of resting bodies will help dispersal, but whether this is a primary function is another matter.

### Active Dispersal

Active dispersal is obviously of great importance for the majority of aquatic insects, but with this exception is generally agreed to play a subordinate rôle in the colonisation of ponds. Its precise significance, however, is still uncertain. Eels and possibly some pond snails are capable of prolonged overland movement, and unsuspected examples may exist among other groups. The water film which covers the ground after rain might well afford a medium for the active dispersal of small aquatic animals such as Oligochaetes. Stelfox (1912) suggested that active dispersal may be of considerable significance for freshwater mollusca, although passive dispersal by birds is usually considered to be more important (Boycott 1936). Active overland dispersal has been recorded for the freshwater shrimp

*Gammarus duebeni* (Segerståle 1950, p. 26), but not for its common relative *G. pulex*. The part played by active dispersal in the colonisation of small isolated mountain lakes has received attention from several continental workers, including Zschokke, Monti, Steiner, Keilhack and Kreis. The scanty evidence, reviewed by Pesta (1929, pp. 124-132), suggests that it is of significance for only a small number of species, and (as Zschokke pointed out) is completely inapplicable to the majority of planktonic forms. In this connexion certain alpine lakes described by Hustedt (1943) are of interest. Their diatom flora consisted entirely of motile species, and Hustedt considered that the diatoms had reached the lakes by actively ascending wet slopes and not by passive transport.

Many small pond organisms have been recorded from the inhabitants of the soil, but the recruitment of pond populations from individuals present in the surrounding soil remains a factor of unknown importance. Fritsch (1931, p. 254) discusses the subject in relation to pond algae.

## Agencies Effecting Passive Dispersal

The two general agencies available for the dispersal of pond organisms are wind and such widely ranging animals as birds and insects. Their mode of operation is readily visualised, and was described by Hudson (1889) with characteristic eloquence. Darwin (1859) was one of the first to record systematic observations on the subject, and noted the adherence of small aquatic animals, plants, and seeds to ducks and the water beetle '*Dyticus*.' He performed the simple experiment of dipping a severed duck's foot in an aquarium to test the viabilities of aquatic organisms left stranded on the foot; a repetition of this experiment in nature would be of interest. Pockets of moist mud are probably often present between digits of the feet of flying waterfowl, especially when the digits are recurved in flight, and it would appear that larger and more drought-susceptible organisms and resting stages could be carried in this way than by any other means. A rich content of seeds in pond mud was demonstrated by Darwin, although his example probably represents an exceptional case (cf. Wulff 1943, p. 124). A similar abundance of other resting stages was often revealed by the germination experiments of later naturalists.

Darwin also showed that birds can transport seeds unharmed in their crops, and Guppy (1892) considered that 'the seeds and fruits of many of our water-plants are more frequently transported in the digestive canal of a bird than in mud sticking to its feet or plumage.' However, according to Wesenberg-Lund (1910) and Bennett (1914), Danish ornithologists have shown that birds in migration normally travel with empty crops. Further evidence for the dispersal of fresh-water organisms by birds was provided by the observations of Humbert, de Guerne —who studied the organisms found on fresh ducks from the Parisian game-shops— and Zacharius (cf. review by Zacharius 1888a). An examination of aquatic insects—*Gyrinus, Hydrophilus, Dytiscus*—by Migula (1888) demonstrated many species of small adhering pond organisms, especially algae, and Migula suggested that aquatic insects may be more important agents than waterfowl for dispersal over short distances. In spite of such observations, the 'historical duck's foot' remained the most popular means of dispersal. Specimens of the feet of birds, newts, and insects found with attached molluscs were embalmed in various museums and some are figured in the excellent monograph by Kew (1893); cf. also Darwin (1878).

In later years interest in the direct evidence of dispersal by animals waned. To the credulous all the major problems appeared to be solved, whereas the critical viewed 'this uncertain realm' with disfavour. In consequence only scattered observations are recorded. Bretscher (1903) gave evidence of the dispersal of certain aquatic Oligochaetes by alpine jackdaws. By means of cultures Spandl (see Storch 1925) demonstrated the presence of the resting stages of 11 species of Cladocera in the debris adhering to the body and feet of wild ducks. Water-mites and Ostracods have been found on the legs of flying water beetles (Sharpe 1918), and a *Plumatella* statoblast was once found on a heron's beak (cf. Elton 1927; Harmer 1916). Some other examples are given by Thienemann (1950). It is unfortunate that the interest shown by ornithologists in migrant birds has not extended to the small organisms which they may carry. Woodruffe-Peacock, however, observed flying ducks to carry fragments of *Potamogeton perfoliatus, P. crispus*, and *Elodea* (see Ridley 1930). Some accounts of the colonisation of

ponds have ascribed the introduction of new species to the particular birds observed to frequent the ponds, but obviously such evidence is too indirect to be rigorous. However the conclusion reached in a recent paper (Manguin and Leboime 1948), that the occurrence of some 35 species of marine diatoms in artificial ponds at Paris was due to carriage from the coast by seagulls seen to visit the ponds, appears well founded. The problems of dispersal raised by such inland occurrences of species normally found along the sea coasts have attracted the attention of several naturalists. Transportation from the coast by birds has usually been invoked (e.g. Spandl 1929 for *Eurytemora velox*, Gurney 1920 for *Tachidius brevicornis*, Bondesen and Kaiser 1949 for various molluscs, Kolbe 1932 for some diatoms, Børge 1897 for a *Prasiola*) but direct evidence is usually lacking.

Two special animal agencies of dispersal are worthy of mention. Some small pond animals attach themselves to other animals from which they obtain both sustenance and transport; the parasitising of waterfowl by the leech *Protoclepsis tesselata*, and of various insects by water-mites, are examples. The dependence of water-mites upon insects for their dispersal has been emphasised by Barrois (1889) and Halbert (1912, p. 4). Secondly, man himself has been an agent in the dispersal of freshwater organisms. In addition to accidental transportations, the vexed question of artificial transplantations belongs here. The morals of this matter have been discussed by Gyngell (1926) and Boycott (1926). Also, 'even the energetic field naturalist may be unconsciously responsible for extending the range of a species, as he empties the residue of his collections of the day into some convenient pond or stream' (Carpenter 1928, p. 107). Such an act was probably performed by myself in 1948, when two species of Desmids—*Pleurotaenium ehrenbergii* and *Cosmarium botrytis*—appeared in a pond on Flatts Lane, Normanby, N. Yorks. In some hundreds of samples taken from the pond over a period of four years I had never encountered specimens of these conspicuous Desmids. In the summer and autumn of 1948 the two species appeared simultaneously in the pond, coinciding with my study—using the same collecting jars—of some other ponds in which both species were abundant.

A similar disposal of unwanted residues by 'shell collectors resident in Leeds' was suspected by Kew (1893, pp. 14-15) to underlie the entry of seven species of mollusca into a pond near Black Hills, Leeds, between the years 1863 and 1883. Likewise, although the original entry (or entries) of *Elodea canadensis* into Britain is veiled in obscurity—the report that led to its unofficial renaming as *Babingtonia horridus* was never verified—its entry into Loch Leven is linked with some aquarium residues left by 'an itinerant hawker of goldfish' (West 1910, p. 172). A similar suspicion attaches to the recent establishment of a related species in a southern English river.

For many years very little was known concerning the rôle of wind in the dispersal of freshwater organisms. Spectacular rains of fish and other large aquatic organisms have long been recorded (cf. Kew 1893, Gislén 1948, Thienemann 1950) but such occurrences are probably too infrequent to play an appreciable part in dispersal. Although wind is clearly all-important for the dispersal of the plumed seeds of such water-plants as *Typha*, the majority of species common in isolated ponds have seeds ill-suited for wind dispersal, as Reid (1892) pointed out. The dispersal of small viable resting stages in wind-born dust is frequently postulated but difficult to detect (cf. Gislén 1948). The exposed and drying mud on the margins of ponds would readily contribute to such aerial dust, as several authors have pointed out (cf. Pettersson 1940). An empirical approach to the problem is possible from observations of the entry of small aquatic organisms into sterilised cultures or infusions left exposed to the air. Its frequent rapidity led several algological workers (e.g. Eddy 1925, Pettersson 1940, Messikommer 1943) to emphasise the importance of wind dispersal for freshwater algae. However the total number of species obtained was small, as in the earlier experiments of Puschkarew (1913) on Protozoa, and many were exceptionally robust forms often present in terrestrial habitats such as soil. It is probably more appropriate to conclude, as Puschkarew did, that such culture experiments have not established the importance of wind in the dispersal of the aquatic micro-fauna and flora. The important question of the dispersal of plankton forms is particularly obscure, notwithstanding an impressive list of possible agencies compiled by Huber-Pestalozzi (1937, p. 62). Pettersson and Messikommer both claimed to have demonstrated the wind dispersal of planktonic algae by exposed cultures, but the species recorded (*Tetraëdon punctu-*

*latum*, *Roya* sp., *Pandorina morum*) are quite inadequate evidence for the general dispersal of planktonic algae by wind. Some less direct evidence of the wind dispersal of algae is reviewed by Smith (1933, p. 12). In general, although many individual examples of the dispersal of small aquatic organisms by wind have been established, the overall significance of such dispersal is still not clear.

## Rapid Colonisation of New Ponds

Some estimate of the effectiveness of dispersal can be made from the rapidity of the colonisation of newly-formed ponds. Ecological conditions in such ponds are however usually exceptional, both as regards physical characters and the reduction of competition from the pre-established population. The latter effect was envisaged by Darwin (1859, chap. 12) in the following sentence. 'When a pond or stream is first formed, for instance, on a rising islet, it will be unoccupied; and a single seed or egg will have a good chance of succeeding.' Many years later Leege (1911, quoted by Storch 1925, Elton 1927) studied the colonisation by Cladocera of such a newly-formed pond on an island that had just emerged from the Baltic Sea. The pond first formed in 1908; in the following year it contained four of the commonest species of Cladocera in large numbers, suggesting rapid and effective dispersal. The island was frequented by many birds, and Leege supposed that winter eggs of the water-fleas had become entangled in their feathers and thus transported from the mainland. A British example of colonisation by Entomostraca was described by Elton (1929) for an artificial tarn on Borwick Fell, Lancs. Eight years after its formation the tarn was inhabited by five species of Cladocera, five species of Copepoda, and two species of Ostracoda.

Remarkably few studies appear to have been made on the initial colonisation of ponds by macrophytic vegetation. A flora of Lancashire (Wheldon and Wilson 1907) reports the early history of a pond at Garstang, which was dug and railed off from cattle in 1903. Soon afterwards *Nitella opaca* appeared in the water, and only 20 months later *Alisma plantago*, *Callitriche*, *Glyceria fluitans* and *Juncus communis* were also established. An American example was described by Gates (1927), who gave an account of the rapid colonisation of a pond in an abandoned sand pit by *Typha latifolia*, *Sagittaria latifolia* and *Salix interior*. Initial fluctuations in the numbers of *Typha* and *Sagittaria* seedlings appeared to be at random, and Gates concluded that 'the development of vegetation emphasised the chance appearance of plants as individuals.' A survey of recent water-bodies in N.W. Germany by Steusloff (1945, p. 233) suggested that chance also played a part in the appearance of plants as species. Further evidence of the rapid colonisation of artificial water-bodies by vegetation is given by Hotchkiss (1941).

Accounts of the initial development of planktonic life in isolated water-bodies do not show any general agreement concerning the rapidity of the process. Smith (1933, p. 20) held such colonisation to be slow in certain artificial lakes, but James Murray (1910, p. 309) had noted a rapid occupation by plankton of a similarly artificial and well isolated lake in the Scottish lowlands. Messikommer (1943, p. 310) stated that high alpine lakes had been known to develop a typical plankton within a few months from their origin, although Hustedt (1943, p. 273) considered barriers to dispersal as responsible for a scanty development of planktonic diatoms in such lakes. Several newly created reservoirs fed by streams have been shown to develop a varied plankton within a few years (e.g. Eddy 1934; Huber-Pestalozzi 1938, p. 64; Laupper 1940; Thompson 1946; Oliver 1948), but in some cases certain common species were noted as conspicuously absent. The non-appearance of the diatom *Asterionella* in Lake Decatur (Eddy 1934) and in Ladybower reservoir (Thompson 1946) illustrates this point. Frequently the colonising species could not be detected in the stream water supplying the reservoir and were consequently assumed to have entered by aerial dispersal from distant water-bodies (cf. Smith 1933, p. 20; Flint 1950). The species may, however, have existed in the inflow water in numbers too small to be detected by sampling.

The colonisation of bomb-crater ponds has attracted the attention of several observers. Certain examples recently described by Warwick (1949) appeared generally unsuitable for mollusca, and yet the lower ones were well colonised by these animals owing to flooding from a nearby stream and the Thames. Very few molluscs, if any, seemed to have entered by passive dispersal overland. The fewer species in higher isolated ponds not affected by flooding—a fact which Kew (1893, p. 31) asserted 'every shell collector knows'—is probably indicative of an

element of chance in these molluscan populations. Alternatively, an amelioration of the habitat conditions by currents may be at least partly responsible ; the greater numbers of mollusca in ' open ' than in ' closed ' ponds at Aldenham was ascribed by Boycott (1919, p. 12) to this cause. Colonisation by mollusca of some isolated mine-crater ponds in Holland was recently described by den Hartog (1950), and the entry of various organisms into some Austrian bomb-crater ponds has been recorded by Wettstein (1950). The latter believed that two species of plants (*Sparganium ramosum* and *Potamogeton pusillus*) had been introduced from a nearby pond through the adhesion of their seeds to certain aquatic insects. In Britain the rapid occupation of such ponds by dragonflies has been witnessed by Corbet (1950) and Michael (1950).

Among other actively dispersed insects, Corixids have been shown to colonise rapidly small recently-formed water-bodies (Macan 1939). Even in such well dispersed species, however, an element of chance may influence distribution in isolated ponds. The rapid changes which may occur in the Corixid populations of dew-ponds led Macan and Macfadyen (1941, p. 179) to admit that ' chance is, therefore, a factor which may be important in the ecology of water bugs in dew-ponds.' It has been claimed that Corixids may be absent from inconspicuous ponds which are not readily detected by the flying imagos (Popham 1943 ; cf. Ellison 1945). It seems likely that several insects with aquatic larvae or nymphs exercise a deliberate selection of their breeding places (cf. Macan and Worthington 1951, p. 122). Evidence also exists for a similar selection of certain types of ponds by frogs (Savage 1939).

### Reduced Colonisation of Older Ponds

The continued colonisation of any habitat can be expected to show a decreasing rate of influx of new species, which may be brought about in two ways. First, the increasing number of organisms present in the habitat is likely to increase the competition therein, and hence the competitive difficulties opposing the entry of new arrivals. Second, the continued accretion of species in the habitat will reduce the number of species which are available and have not yet entered. It is evident that a more rapid influx of new species is to be expected in a habitat which contains only one half of the total species available than in one which contains nine-tenths of the available species.

The relative importance of these two alternatives in the colonisation of ponds will directly influence the element of chance in pond populations. If competitive exclusion is the more important factor, the vagaries of the initial colonisation are likely to be perpetuated in the mature populations (cf. Steusloff 1945, p. 223). Alternatively, if the exhaustion of available species plays a greater part in the decreasing colonisation, any indeterminacy in the mature populations will depend upon limitations of dispersal operating over the entire period of the colonisation.

Very few studies illustrating the decline in rate of colonisation of ponds by new species are available. Such a decline was shown graphically by Godwin (1923) from a comparison of the numbers of species of higher plants present in different ponds of known ages near Trent Junction. The history of the vegetation of the Bramhope ponds near Leeds affords more direct evidence on this question. These ponds originated from artificial excavation in 1839, and by 1905 had acquired a varied vegetation which was described in a classic paper by Norman Walker (1905), and has changed little in essentials between then and the present day.

The slow rate of colonisation of relatively mature ponds has been used as evidence of the barriers of dispersal and establishment confronting pond organisms (cf. Godwin 1923 ; Fritsch 1931, p. 254). In most cases, however, it is difficult to exclude the possibility that most of the ecological niches available have already been occupied. Moreover, a new ' arrival ' may merely reflect a change in physical conditions, and may be derived from pre-existing individuals whose numbers were too small to be detected. The classical ' invasion ' of Lake Zurich by a succession of planktonic algae (cf. Huber-Pestalozzi 1937 ; Hasler 1947) illustrates this point, and the same explanation may apply to other descriptions of a sudden entry of small species (e.g. Wyllie Fenton 1949), especially in ponds whose physical features often change markedly with increasing age. In this connexion some evidence for the long persistance of viable seeds of aquatic plants in pond muds is of interest (cf. anonymous review, 1915).

### Chance and Succession

Numerous instances exist of species exhibiting a preference for recently-formed ponds, whereas others are confined to older ponds. In many cases such peculiarities are probably determined by physical differences between the two types of pond, but in others it has been claimed that differences in efficiency of dispersal are responsible. Thus Elton (1927, 1929) considered that the Copepod *Diaptomus gracilis* was confined to older ponds in Britain owing to imperfect means of dispersal (cf. however Lowndes 1929), and Ward (1940, p. 666) adopted a similar explanation to account for the limited distribution of two species of *Cyclops* in some American ponds. Conversely, the frequency of some species in recent ponds has been suggested to depend upon their effective means of dispersal. It has been pointed out, for example, that some small German water-bodies were often first colonised by plants (' Wasserunkrautern ') which produce detachable winter buds which are probably readily dispersed (Steusloff 1945, p. 223). Although such morphological criteria of dispersal efficiency are of doubtful value (see later discussion), the element of chance can be expected to influence the succession of species in a pond to a greater extent than the composition of the maturer populations.

### Competitive Exclusion

The effect of competition in contributing to the element of chance in pond populations has already been outlined. The restriction of some species to recent or temporary ponds has been related to their supposed incapacity to withstand the more intense competition prevailing in older ponds. The preference of various Phyllopoda for ' the comparatively tranquil life of a temporary pond ' (as Oldham described it) has been repeatedly discussed in this connexion. Similarly, the restriction of some pond molluscs to apparently unfavourable ' oecological slums ' is possibly enforced by their inability to withstand strong competition (Boycott 1919, p. 181 ; 1936, p. 128).

Several instances of ' mutual exclusion ' between species of similar ecological requirements have been reported from the freshwater Entomostraca. Among British Entomostraca it has been described for *Eurytemora lacinulata* (*velox*) and *E. affinis* (Gurney 1904, p. 649), and Elton (1927, 1929) postulated a unilateral exclusion of *E. lacinulata* by *Diaptomus gracilis*, a view which was criticised by Lowndes (1929). The importance of competitive exclusion in the ecology of Entomostraca has been emphasised by Carl (1940), who noted that it ' introduces an element of chance to the final distribution of any of these mutually intolerant species ' since ' the particular species present will be partly the result of chance, being [partly] determined by the first to arrive and become established . . . ' In illustration, he instances ' the irregular distribution of some Copepods within large districts containing lakes apparently all equally favourable to their existence.' Thienemann (1913 ; 1950, pp. 63-7) has discussed the same problem. He ascribed the differences in colonisation observed between certain reservoirs to competitive exclusion.

Competitive displacement between species of aquatic micro-organisms has been followed in cultures, but is difficult to demonstrate in natural populations. Although its possible importance in algal planktonic communities has been stressed by Hutchinson (1941), and has been invoked in several studies of the seasonal periodicity of pond algae, it is noteworthy that several hundreds of species of pond algae may co-exist in a small volume of water. Displacement of species was rarely observed during the development of plankton in several American water-bodies (Eddy 1934). It has been suggested that destruction by animals may render the entry of new species of algae into a pond difficult (cf. Fritsch 1931, pp. 253-4), although the point is hard to demonstrate. A general ' massacre ' of algae by Entomostraca was described by Pennington (1941), but the influence of such animals upon the natural phytoplankton populations of lakes is probably negligible (cf. Pearsall 1949).

In general, the evidence regarding competition between pond organisms does not justify any assumption that competitive exclusion will make the element of chance unusually prominent in these populations. Evidence supporting the opposite view will now be considered.

### Evidence from Geographical Distribution

In many instances it is probable that the extension of an organism's geographical range is more limited by difficulties of establishment than by mechanical difficulties

of transport. In the flowering plants, for example, rapid extensions of geographical distribution have been most conspicuous among species of relatively 'open' habitats such as railway embankments (*Senecio squalidus*), river banks (*Mimulus guttatus*), and waste ground (*Epilobium angustifolium*). A comparable behaviour is most conspicuously found in some aquatic plants, including the classic *Elodea canadensis* and the water-ferns *Azolla filiculoides* and *A. caroliniana* (cf. Marsh 1914). It has consequently been suggested (e.g. by Good 1947) that water-bodies may rank among the more 'open' of natural habitats. The rapid spread of the aquatic snail *Paludestrina* (*Hydrobia*, *Potamopyrgus*) *jenkinsi* is equally notable in this connexion (cf. Bondesen & Kaiser 1949).

Other facts of geographical distribution are suggestive in relation to problems of dispersal. It has long been recognised that, in general, species of the freshwater fauna and flora show a definite tendency towards cosmopolitanism. Darwin (1859, 1878, 1882) was strongly impressed by this fact, and in the *Origin of Species* (chap. 12) gave an excellent discussion of its implications upon means of dispersal. More recent summaries are given by Carpenter (1928), Welch (1935), and Hesse *et al.* (1937).

Several explanations have been advanced to account for the tendency towards cosmopolitanism. Wesenberg-Lund (1910) held that many freshwater organisms were ancient forms that had acquired a wide geographical distribution by virtue of their age. This possibility was mentioned by Darwin but he did not attribute great significance to it. It implies that rates of speciation are generally low in freshwater organisms, and for this there is no adequate evidence. A more acceptable explanation, favoured by Darwin, relates the wide distributions of most freshwater organisms with the effectiveness of their dispersal. The frequent formation of resting stages has often been emphasised, and in the Desmids a correlation between widespread distribution and formation of resting stages can be recognised (Fritsch 1931, p. 254). On the other hand the planktonic diatoms, which resemble the planktonic desmids in generally lacking resting stages, nevertheless differ from the latter in their typically wide distributions. Further instances of non-correlation between geographical distribution and the visible means of dispersal are given by Lowndes (1929, 1930) for Entomostraca, and many examples could be quoted from the flowering plants. Moreover, even among related species with similar means of reproduction the aquatic forms frequently possess wider geographical distributions than the terrestrial forms. Aquatic species living in shallow water are probably more readily exposed to agencies of dispersal such as birds than are species in most other habitats, as has been pointed out for pond life in general (Darwin 1859, chap. 12 ; Reid 1892, p. 286) and for Oligochaetes in particular (Beddard 1896 ; Stephenson 1930). Waterfowl can also be expected to seek out situations favourable for the aquatic organisms that they may carry, thus endowing the latter with a selective dispersal. A relative 'openness' of aquatic habitats, as compared with most terrestrial ones, would also account for the wider distributions of freshwater organisms without involving special features in reproductive bodies. In general, the evidence from geographical distribution suggests that the dispersal of freshwater organisms is often unusually effective, although the reasons for this are difficult to define.

## Presence and Absence

The older naturalists frequently used the presence of aquatic organisms in isolated water-bodies as a measure of the effectiveness of their dispersal. Early views on the relation of such occurrences to spontaneous generation (Walton 1653 ; Ingolls, quoted by Kew 1893, p. 17) have now disappeared, although the effect of isolation upon evolution in lakes has attracted some attention (e.g. Worthington 1940, Tonolli 1949, Brooks 1950 ; cf. also Meek 1925 for ponds). The discussion by Zaccharius (1888b) of the populations of some crater lakes, and especially the classic study by Clement Reid (1892) on the inhabitants of dew-ponds, illustrate this approach to the problems of dispersal. From his observations Reid concluded that the efficiency of the dispersal of the larger pond organisms had been seriously underestimated.

A better indication of the limitations imposed by dispersal would be given by the inexplicable absence of organisms from ecologically suitable habitats, but the assessment of 'suitability' is obviously difficult. The barren character of some ponds has been assigned to difficulties of dispersal (e.g. Ridley 1930) although

the importance of other physical factors has often been neglected. From his study of the Aldenham ponds, Boycott (1930) concluded that ' it can hardly be doubted that most of the better ponds could maintain more sorts of snails than they do . . . the absence of various common snails from apparently suitable ponds is therefore to be attributed to their not having reached them by the chances of transportation.' The rare occurrence in ponds of some operculate snails and lake bivalves was related by Boycott (1919, 1936) to ineffective dispersal, and the absence of the Copepod *Eurytemora raboti* from inland pools on Spitzbergen was explained by Elton (1927) in the same way. More convincing evidence can be obtained by means of transplantation experiments ; in this way Boycott (1936) showed that the habitual absence of *Planorbis corneus* from isolated (' closed ') ponds was due only to some obscure difficulty of dispersal. In spite of such cases, Boycott believed that the majority of his pond mollusca were effectively dispersed. Similarly a study of pond Entomostraca led Gurney (1915, p. 33) to assert that ' the means of dispersal of aquatic invertebrates seem to be so mysteriously adequate that the absence of a species may generally be taken as a proof of the unsuitability of the surroundings.' A similar view is expressed by Macan & Worthington (1951, pp. 130, 158). Dispersal limitations have not infrequently been postulated in studies of local distribution, but the evidence is often tenuous. Thus the correlation between frequency of rare species of Rotifers and visitation by migrant birds, reported for some Scottish lochs by Hood (see Hudson 1889) may or may not illustrate the limitations of dispersal. Such limitations may have influenced the distribution of the snail *Limnaea pereger* in the Aldenham ponds (Boycott 1919, 1936) and in some recent crater ponds (Warwick 1949), but are probably unimportant for this species in the Aberystwyth district (Carpenter 1923) and in Lake District tarns (Macan 1950).

In contrast to the anomalies of absence arising from ineffective dispersal, some sporadic visitations by pond organisms have been related to overeffective dispersal, the organisms being supposed to enter unfavourable habitats where they are unable to survive for more than a short time. Several possible instances have been noted for pond Entomostraca (Gurney 1904, p. 641 ; cf. Scourfield 1920) and Mollusca (Macan 1950, p. 138). The sporadic records of *Apus* in Britain have been ascribed to short lived introductions by birds, but recently doubt has been cast upon this interpretation (Balfour-Browne 1948 ; Fox 1948, 1949). A better example is provided by the dragonfly *Sympetrum fonscolombii*, whose rare appearences in ponds in southern England are maintained entirely by active dispersal from the Continent (cf. Longfield 1949). Some inland occurrences of typically coastal species, mentioned earlier, are also of interest in this connexion. On general grounds such abortive colonisation of ponds is likely to occur, and will make its contribution to the element of chance in their populations.

## The Comparison of Neighbouring Ponds

Neighbouring ponds are likely to be often very similar in physico-chemical features, and pronounced differences in their populations then provide some of the best evidence for an element of chance in these populations. The most detailed British investigation of this subject was reported by Godwin (1923), who found that a series of ponds near Trent Junction exhibited remarkable differences in their species of higher plants. The ponds were said to be physically similar (although no exact data were given), and it was concluded that the floristic differences reflected difficulties of dispersal to isolated ponds. Similar apparently random differences between the species of nearby ponds have been noted for algae (Rich 1906 ; Griffiths 1922 ; Fritsch 1931, p. 253 ; Kurz, quoted by Thienemann 1950), various infusoria (Gray 1943), Oligochaetes (Bretscher 1903), Entomostraca (Neubauer, quoted by Thienemann 1950, p. 66), and water-beetles (Balfour-Browne 1948). Detailed data on physico-chemical conditions, however, are usually lacking. More satisfactory in this respect is a detailed study of some German ponds made by Kreuzer (1940). Physically similar ponds were said to frequently contain very different groups of species, even as regards such widespread and apparently well dispersed forms as the midge *Chironomus anthracinus*.

Conspicuous differences between the populations of similar adjacent ponds are however by no means always observed, and the distribution of aquatic plants described by Godwin would in particular seem to represent an exceptional case. Much smaller differences were recorded, for example, for the plants of a pond group

in Germany (Brockmeier 1896) and for another at Aldenham (Boycott 1919). My interest in the question was aroused in 1948 during a survey of some 150 ponds near Wilton, N. Yorks., where a marked uniformity was encountered in the dominant species of macrophytes and algae. Even more striking was the tendency of species that are normally uncommon to recur repeatedly; examples included the liverwort *Ricciocarpus natans* and the algae *Radiofilum flavescens, Geminella interrupta, Cylindrocapsa geminella, Ankistrodesmus falcatus* var. *spirale,* and *Coelosphaerium naegelianum.* Examples of such recurrence elsewhere include the plant *Oenanthe fistulosa* in the Bramhope ponds, the worm *Gordius aquaticus* in old pits at Moss Side, Manchester (Standen 1910), and the Copepod *Cyclops gracilis* in some Norfolk ponds (Gurney 1929, p. 571). A similar behaviour among rare species of Rotifers was discussed by Hudson (1889).

In many cases such local repetition of rare species seems unlikely to be due to a local prevalence of special physical conditions, and (as Hudson remarked) is more plausibly related to restrictions of dispersal. It is probable that the chances of dispersal fall rapidly with increasing distance (cf. Wolfenbarger 1946), so that although established species may spread readily between ponds of a group (cf. Wettstein 1950), other eligible species outside the group may be excluded by the limitations of long distance dispersal. Similarity between nearby pond populations is not, therefore, a direct indication of the effectiveness of dispersal. Dissimilarity, on the other hand, would imply the existence of an element of chance if uniformity in physical features is established. Since adequate evidence on the latter point is usually lacking and since the extent of dissimilarity between adjacent pond populations in nature is not clear, it can be concluded that the present evidence from this source is to be treated with caution.

## Conclusion

In this review I have attempted to show the rudimentary nature of our knowledge concerning the dispersal of pond organisms. Possible means of dispersal are numerous, but which of them are of real importance in nature generally remains obscure. The influence of the limitations imposed by dispersal upon the determinacy of isolated populations is rarely considered by the ecologist, yet the problem raised is of fundamental ecological interest. Although the few detailed discussions of the subject have concluded that a considerable element of chance probably often exists in pond populations, the supporting evidence is often ambiguous. Several lines of evidence indicate that the obvious physical barriers between these populations are usually overcome by the efficacy of dispersal, and so do not greatly modify Nature's habitual abhorrence of the ecological vacuum.

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## FIELD NOTES

**Unusual Numbers of Craneflies.**—The contrasting types of weather we have experienced this year have been made evident to naturalists by the varied growth of plants and appearances of insects. At present (August 8th) we have what may be said to be a plague of the craneflies, commonly called daddy-long-legs. One hears strange tales of the happenings in various farms and countrysides. My first intimation came when asked by a person about a narrow, little-used lane where you could ' hear ' these insects ; evidently the large number of them were associated by the individual with the hum of insects on lime trees close at hand. A more general note came from houses with open windows and lighted rooms to which the insects came in quantity. As far as I have seen they all belong to *Tipula paludosa* Mg., the species with long-bodied females normally plentiful at this time of the year. Insects were almost absent prior to July, the cold, dry weather being the main reason. Although many districts had too much rain the Settle area got far less than its normal amount and though it was persistently damp and unpleasant the soil was too dry to encourage any growth of grass until the end of June. This dry ground evidently kept back these insects and they have now developed simultaneously and produced the present plague.—Chris. A. Cheetham.

*Monotropa hypopitys* **L.**—On Sept., 24th, I saw eleven plants of this under beech trees at Fountains Abbey. So far as I know there has been no recent verification of the old record in Lees' *Flora* which was confirmed ' about 1860.'—W.A.S.

**The Northampton Sand Ironstone: Stratigraphy, Structure and Reserves,** by **S. E. Hollingworth** and **J. H. Taylor.** *Mem. Geol. Surv.* H.M. Stationery Office, 1951. 17/6.

The importance of the Northampton Sand Ironstone in the mineral economy of Britain warrants the extensive and detailed treatment which it receives in this memoir. The information results from a resurvey of the orefield carried out during the war by the authors with five other members of the Geological Survey. The relation of the ironstone to the beds below and above, the regional tectonic structures and the interesting superficial disturbances by which they are affected are fully described. The mineralogy and petrography of the ironstone, which has been the subject of a previous memoir, are here recapitulated. The resurvey has permitted a reasoned estimate of available reserves which are grouped as proved, probable, possible and conjectural. It is believed that about 900,000,000 tons remain in the first two groups while possible reserves, not yet adequately tested by boring may add another 300,000,000 tons. The final portion of the memoir gives a detailed description of the productive area from Lincoln in the north to Northampton in the south. H.C.V.

# *ARTHROBOTRYUM* CESATI

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In 1854 (*Hedwigia*, i, Tab. iv, fig. 1) Cesati (presumably) published figures which were assigned to '*Arthrobotryum stilboideum* Ces.' in the 'Erklarung der T.iv und V ' which is on an unnumbered page. There was no diagnosis of any sort but the figure is a good one and there does not seem to have been any doubt as to the fungus from which it was drawn. According to modern rules of nomenclature this figure can be regarded as sufficient to validate the name *A. stilboideum* ; the species is the type of *Arthrobotryum* Cesati.

According to Ferraris (Flora italica cryptogama, Hyphales, p. 191, 1910) Klotzsch, *Herb. viv. mycol.* n.1821 (distributed in 1854 fide Lindau & Sydow, *Thesaurus*) was published sub *Arthrographium stilboideum* Ces. but I have not seen a copy and do not know whether it bears a diagnosis ; this exsiccatum is assigned to *Arthrobotryum stilboideum* by Ferraris.

The Herb. R.B.G. Kew copy of Rabenhorst's, *Klotzsch. Herb. myc. viv.* ed nova, 139 (distributed in 1855 fide Lindau & Sydow, *Thesaurus*) has been examined through the kindness of Miss E. M. Wakefield [45142]. This exsiccatum was published sub '*Arthrographium* (gen. nov.) 139. *A. stilboideum* Ces. Mspt. . . . *Hedwigia* [1854], T.iv, F.3 [Fig. 1] ' and bears enough of a diagnosis to validate the name. The Kew copy of this exsiccatum, however, bears no synnemata, only an abundance of *Sporoschisma saccardoi* Mason & Hughes.

As far as I am aware the name *Arthrographium* has not been used since 1855 and in European floras it has been treated as a synonym of *Arthrobotryum*. At present there seems to be no reason why we should not use the name *Arthrobotryum stilboideum* Ces.

Some other species assigned erroneously to the genus *Arthrobotryum* have been described and re-classified in a previous publication (Mason & Hughes, *The Naturalist*, pp. 97-105, 1951).

*A. stilboideum* Ces. is represented in Herb. I.M.I. by two more or less recent collections made in Yorkshire by Professor C. G. C. Chesters who kindly deposited parts of them in Herb. I.M.I. ; they are Herb. I.M.I. 6786, on worked wood of British Oak, Arncliffe Woods, 17/9/1946 and Herb. I.M.I. 6792, on wood of British Oak, Mulgrave Woods, 18/9/1946. The description that follows was drawn up from both and one of them is illustrated in Fig. 1.

## DESCRIPTION OF ARTHROBOTRYUM STILBOIDEUM

From British literature and from conversations with other collectors it appears that this fungus is extremely uncommon in British woodlands. It can, however, form extensive colonies on wood of British Oak and the synnematous fructifications are quite conspicuous by virtue of their being up to 2·5 mm. high. There seems to be no discolouration of the substratum.

The **mycelium** is mostly immersed and is composed of hyaline to brown, septate, branched, smooth-walled hyphae 1·5 to 3$\mu$ wide.

The **synnemata** usually arise singly but occasionally in groups of two to four ; they are scattered, less often crowded, erect, usually straight, sometimes curved, black, up to 2·5 mm. high, subulate or nearly cylindrical and capped by a globose or pyriform slimy head. The stalk is 30 to 40$\mu$ wide at the base, usually tapering above and 15 to 35$\mu$ wide below the head ; it is composed of more or less parallel, dark brown, septate, rarely branched hyphae 2 to 3·5$\mu$ wide, which adhere firmly together although towards the base, loose upwardly directed hyphae are frequently observed. The head of the synnema is up to 140$\mu$ wide due partly to the slimy mass of conidia and also to the branches borne towards the apices of the hyphae comprising the synnema. Below the upper one to three septa of the synnematous hyphae which become paler towards the apex, are borne paired lateral branches which develop parallel with or slightly divergent from the axis. Such branches, except when borne below the upper septum, become septate and also bear similar lateral branches with the result that a more or less dichasial arrangement is produced. The terminal cells of the main hyphae and lateral branches are the sporogenous cells and form a more or less regular layer.

The **sporogenous cells** are hyaline to subhyaline, 15 to 30$\mu$ long, 2 to 3$\mu$ wide and more or less cylindrical along their length although towards the immediate apex some can be seen to taper somewhat or expand a little first and then taper.

Also towards the flattened apex are inconspicuous lateral irregularities which I consider to be the visible margins of circular ridges running around the tips of the cells ; however, I could not see the transverse lines across the hyaline cell wall in support of this conjecture.

The **conidia** are blown out ends of the apex of the sporogenous cells and are produced in basipetal succession in slime ; they are oval or cylindric-oval, rounded at the apex, flattened somewhat at the darker basal scar, 3 (rarely 2)-septate, subhyaline to very pale brown, black in mass, and they measure 10 to 16 by 3·8 to 4$\mu$, mostly 12 by 4$\mu$.

**Development of conidia** should be described by more than a mere reference to basipetal development from the apex of the sporogenous cells. I am convinced

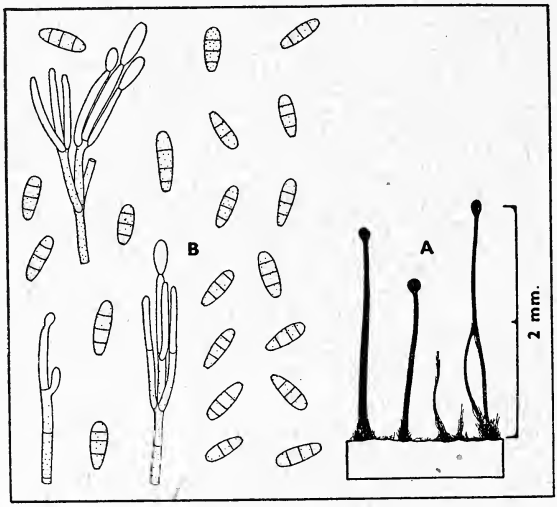


**Fig. 1.**

*Arthrobotryum stilboideum:* **A,** three mature synnemata from Herb. I.M.I. 6786 ; **B,** distal ends of synnematous hyphae showing sporogenous cells, conidial initials and also mature conidia ; × 500 except **A** which has a scale provided.

that the conidia are not phialospores ; the presence of irregularities towards the flattened apices of the sporogenous cells suggests to me that after one conidium has developed, the apex of the sporogenous cell grows through the old scar to form another conidium ; by a repetition of this process the successive scars would leave the lateral ridges although transverse circular lines should be visible if this is so. However I could not make them out, possibly because the cell wall is hyaline, so that this mode of development can only be put forward as a possibility. Such a type of conidial development is conspicuously seen in the coloured conidiophore of *Venturia inaequalis* and much less conspicuously in *Mastigosporium rubricosum* in which the conidiophores are hyaline.

British References *sub Arthrobotryum stilboideum*

Berkeley & Broome (Notices of British Fungi, No. 943, in *Ann. & Mag. Nat. Hist.*, ser. 3, vii, [p. 9 in reprint], 1861) recorded this on a pollard willow, Langridge, Som., April, 1859. I have not seen this collection.

Cooke (*Handbook of British Fungi*, Vol. II, p. 563, 1871) compiled Berkeley & Broome's record.

Massee (*British Fungus Flora*, Vol. III, p. 460, 1893) cited no particular collection. He stated ' whole plant not 1 mm. in height.'

Massee & Crossland (*The Fungus Flora of Yorkshire*, p. 347, 1905) recorded this species ' Nr. Keighley, on fungus mycelium (Lees' Fl.). Yorkshire, loc.? ' I have not seen this collection.

Rabenhorst, *Fungi europaei* 978 sub *Arthrobotryum stilboideum* was collected on

rotten wood, near Batheaston, by C. E. Broome. The Herb. R.B.G. Kew copy of this exsiccatum has been examined [5615] and it bears *A. stilboideum*.

GRAINGER *et al.* (*The Naturalist*, 1947, p. 89) recorded Professor Chesters's collection made on wood of *Quercus* at Mulgrave Woods.

## *SEPTONEMA SECEDENS* CORDA

S. J. HUGHES
*Commonwealth Mycological Institute, Kew, Surrey.*

CORDA published his generic name *Septonema* in 1837 (*Icones fungorum*, 1, p. 9) for his single species *S. secedens* which is thus the type species of the genus. As far as I am aware the fungus has not been redescribed or illustrated since 1837. Corda's original illustrations are reproduced as Fig. 1; the fungus is illustrated from a few of the 17 more or less recent collections preserved in Herb. I.M.I., upon which a redescription is based. Corda's original diagnoses are as follows: 'Flocci erecti ramosi, infra filiformes septati; supra e sporis polyseptatis tri- vel tetradymis, concatenatis, compositi; stromate nullo suffulti. *S. secedens*: acervulis pulvinatis, olivaceis; floccis ramosis, fuscis; sporis oblongis concoloribus, pellucidis, tri- vel tetradymis. Long. spor. 0·00074-0·00081 [20·6-22·5$\mu$]. Hab. in cortice putrida *Betulae albae* prope Reichenberg.'

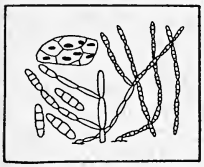

Fig. 1. *Septonema secedens* Corda after Corda (1837).

Through the kindness of Professor A. Pilát I was allowed to examine Herb. crypt. Mus. Nat. Praha, Czechoslovakia No. 515144 [Herb. I.M.I. (slide) 44296] which consists of a piece of birch bark labelled '*Septonema secedens* Ca' by Corda; this is authenticated for the name *S. secedens* if not indeed the type collection. It has not preserved well, however, and most of the Hyphomycete has disappeared. Two types of three-septate spores were observed and are illustrated in Fig. 2**A** and **B**; Fig. 2**B** represents the ascospores of *Hysterium angustatum* (Alb. & Schw. ex Fr.) Chev. which measure 16 to 23 by 6 to 7·5$\mu$, mostly 19 to 22 by 6$\mu$, and which have presumably originated from the numerous hysterothecia of this fungus present on the bark. Fig. 2**A** represents conidia which match up perfectly with recent collections whose structure agrees with Corda's diagnosis. It will be noticed that whereas most of the conidia that

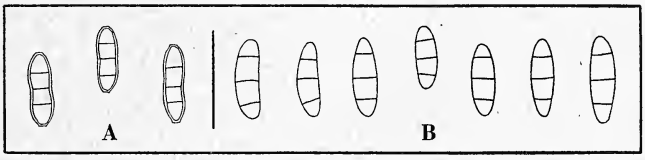


Fig. 2. **A**, *Septonema secedens* Corda; conidia from a collection in Corda's Herbarium; **B**, *Hysterium angustatum*; ascospores from the same collection; all ×500.

Corda figured are fusoid and even constricted at the septa, the diagnosis indicated that they should be oblong as are the three conidia drawn in Fig. 2**A**.

The redescription of *Septonema secedens* that follows is based on 16 more or less recent collections on the type host, birch bark and periderm, and one collection on conifer bark from a stump amongst birch in Yorkshire; the fungus is illustrated in Fig. 3.

DESCRIPTION OF *Septonema secedens*

The *caespituli* are found on the outer or inner, generally the outer surface of the periderm or bark of fallen birch logs and develop best where the periderm is kept damp such as on the surface next to the ground or even on the upper surface of a log covered by vegetation or decaying leaves; they are generally scattered, sometimes crowded and may occupy extensive areas of the periderm. The fungus either occurs solitarily or more often in association with the still more common birch periderm fungi, *Melanomma subdispersum* (Karst.) Berl. & Vogl. (usually as its conidia, *Helminthosporium longipilum* Corda) and *Coniosporium paradoxum*

(Corda) Mason & Hughes. The caespituli are composed of crowded conidiophores, are irregular in outline, up to 7 mm. wide but larger by confluence, pale olivaceous when young, fuscous when old.

The *mycelium* is composed of mostly superficial, subhyaline to brown, smooth-walled, septate, branched, reticulate hyphae 1·5 to 3$\mu$ wide.

The *conidiophores* arise singly or less frequently in groups of four to five and are crowded to form caespituli ; occasionally small tufts of conidiophores within a caespitulus may be almost fasciculate. They arise from an upturned hypha or more usually as an upright lateral branch of a repent hypha, are erect, more or less straight, simple or rarely forked at the base, septate (cells 18 to 25$\mu$ long), subhyaline to pale brown, more or less cylindrical, 4 to 5$\mu$ wide and up to 200$\mu$ long with a brown to dark brown basal cell.

The *conidia* are borne in a long acropetal chain at the apex, and in shorter branched chains developed laterally on the conidiophores ; at maturity they break apart readily and the resulting conidia are oblong-oval or oblong, generally a little wider at the upper end, and very slightly waisted in the middle, with a slightly raised flat scar at each otherwise more or less rounded end, thick-walled, with three thinner transverse walls, smooth, not constricted at the septa, pale brown to olivaceous-brown, 18 to 23 by 6 to 6·5$\mu$ mostly 19 to 21 by 6$\mu$.

*Development of conidia* : the conidiophores are cylindrical for most of their length, with septa 18 to 25$\mu$ apart, but towards the apex, the septa develop at slight constrictions which are successively deeper as growth proceeds and conidial initials delimited ; the result is that from the point of view of their shape, the upper cells of the conidiophore merge imperceptibly into the chain of conidia. Thus, each conidium develops from the apex of the preceeding one by the blowing out of the cell wall into a spherical bulb which by expansion acquires the shape and colour of a mature conidium, but not until another initial is well developed at its apex ; the initial is soon cut off by a septum from the initial below it. Maturation of the conidia is sometimes very protracted and the entire chains may consist of subhyaline to pale brown, continuous initials (Fig. 3**B** and **C**). Generally, however, septation and the development of brown or olivaceous-brown colour of the conidia follows at a distance of only two to four conidia behind the growing apex of the chain. At first a median septum is laid down, followed by one in each of the two cells thus formed. Septation and colouration eventually reaches the apical cell of the chain and further growth is checked. It will be noticed that the end conidium of a chain has only a basal scar (after separation) whilst the apex is smoothly rounded.

In addition to the apical chain of conidia, up to four lateral, very often unilateral, upwardly directed chains of conidia have been developing, in the meantime, below the upper septa of the conidiophore, one below each septum. These chains develop like the apical one but may be once or twice branched, and are successively shorter towards the apex of the conidiophore. The lower or first formed conidium of a lateral chain may be the only 1-septate and often a little narrower than those formed later.

At maturity the fuscous caespituli are quite brittle and the chains secede readily into a dry pulverulent heap of the 3-septate constituent conidia ; the name *Septonema secedens* [a septate hypha which secedes] is truly fitting for this fungus.

Collections assigned to *Septonema secedens* in Herb. I.M.I.

(*a*) on *Betula* periderm or bark : Ashtead Common, Surrey, 12/1/1947, Herb. I.M.I. 9939 ; 2/3/1947, 12257(d) ; 29/2/1948, 25211, 25234(c) : Banstead Woods, Surrey, 4/1/1948, 21080(b) : Brierley Wood, near Chesterfield, Derby, 4/2/1950, 41074 : Hackfall, near Masham, Yorks., 14/4/1950, 40540(a) : Limb Valley, Derby, 10/4/1948, 27617(b) : Oxshott, Surrey, 7/3/1948, 25535(d), 25536(a), 25538(a) ; 21/11/1948, 32258(d) : Ranmore, Surrey, 6/1/1947, 9883(c) : Richmond Park, Surrey, 1/2/1948, 22573(c), 22639(b) ; 13/3/1948, 25866, 25867(a).

(*b*) on conifer bark : Hackfall, near Masham, Yorks., 25/9/1948, 32020.

Herb. I.M.I. 41074 from Brierley Wood, near Chesterfield, was collected by Mr. J. Webster.

*Septonema secedens*, *Melanomma subdispersum* and *Coniosporium paradoxum* are three characteristic fungi of *Betula* periderm although until a few years ago they did not appear to have been collected in Britain ; the two latter fungi have been redescribed by Hughes (*Mycol. Pap.*, *C.M.I.*, 37, pp. 1-17, 1951).

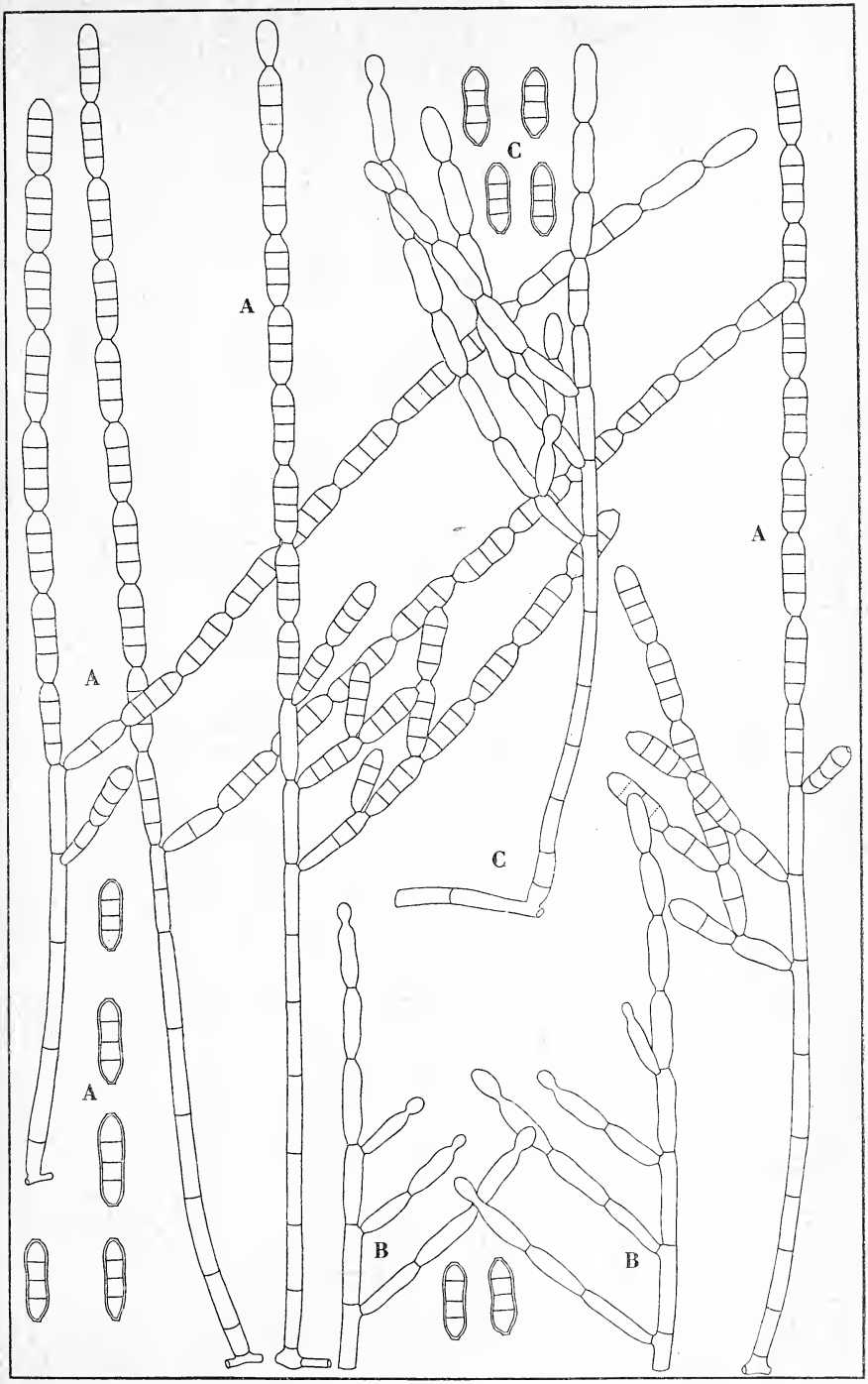


Fig. 3. *Septonema secedens* Corda; conidiophores and conidia; **A,** from Herb. I.M.I. 32258(d); **B,** from Herb. I.M.I. 9883(c); **C,** from Herb. I.M.I. 25211; all ×500.

*Septonema secedens* IN PURE CULTURE

The fungus has been obtained in pure culture twice ; both cultures were started from conidia, of Herb. I.M.I. 21080(b) and 22639(b) respectively. The colonies grow very slowly but on a medium prepared by sterilising fragments of *Betula* periderm in tap water agar, conidiophores and conidia had developed after a month on a growth which was up to 1 cm. wide. Abundant conidiophores and conidia had been produced on fragments of sterilised *Betula* periderm sticking out of the agar in a culture set aside for nearly two years. The conidiophores and conidia are similar to those produced in nature.

Some other species which are considered to be congeneric with *Septonema secedens* will be described in a later publication.

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## NOTES FROM SPURN, July, 1951

G. H. A. AND R. C.

CONTINUOUS observation during the period when young birds, and adults that have bred successfully, are beginning to wander has proved to be eminently worthwhile. From June 29th, when the new Chalk Bank trap was opened, to July 31st, more than 500 birds were ringed, including some 200 Linnets, and covering 18 other species. A good number of Meadow-Pipits, several Cuckoos, and some young Ringed Plovers, Little Terns and Swallows were included. A Skylark, first ringed on February 21st, 1950, which has visited all the traps near to the Cottage more than 100 times, was awarded a special additional blue ring. By July 31st the total of birds ringed for the year exceeded 1,100.

SPOONBILL.—A flight of 10 Spoonbills had been recorded as passing south over the Cottage on May 24th. On July 15th, at 11.30 a.m., R. M. Garnett spotted a Spoonbill in flight above the estuarial mud, which alighted near to the mussel-beds. By the time I reached the adjacent shore the bird was standing in the edge of the incoming tide surrounded by Great Black-backed Gulls, above which it stood tall and white. As the tide advanced the gulls had to swim but the Spoonbill still waded. Gradually the bird came nearer to us (R.M.G., G.H.A., H. G. Brownlow, Mr. Atherstone (a South African visitor), and my wife and I). The spatulate end of the bill was of a yellowish-orange hue. The primaries had dark tips indicating immaturity. The bill was moved sideways in the water at times, but we could not see if food was taken. The long line of outstretched bill, head and neck, and the legs held under the tail and projecting beyond, made the bird easily recognisable in flight. It was seen again on the 20th and 25th.

MIGRATION. THE SHELD-DUCK.—Mr. R. A. H. Coombes has written recently (*Ibis*, Vol. 92, p. 405, etc.) concerning the moult-migration of this species from Morcambe Bay via the Aire Gap to the eastern side of the North Sea. It was very interesting visually to intercept a number of parties of Sheld-Ducks as they flew down Humber from the west and passed eastward out to sea. On July 15th, 1951, some 250 birds passed, including two parties of *ca.* 100 birds each. Sheld-Ducks passing out to sea were also noted on July 16th, 24th, 25th and 31st in smaller numbers. It is highly probable that others passed unnoticed.

Swifts passed south down the coast on a number of days, on several of which *ca.* 2,000 birds was considered a low estimate of their numbers. Sand-Martins, too, passed on some days. Wheatears began to appear quite early in the month in small numbers. Warblers noted were entirely of locally breeding species, Sedge-Warbler and Whitethroat. No Willow-Warblers appeared until early in August.

The tide of wader migration was beginning to trickle. A few Knots, mostly in breeding dress, were seen from July 14th ; Sanderlings from the 15th ; four Whimbrels on the 17th after which a few were present on most days. A Greenshank appeared on the 21st. On the 22nd, H. O. Bunce noted a Black Tern. Dunlins were always present and had increased to *ca.* 350 by the 22nd.

Terns (Common, Arctic and Sandwich) were seen on most days, the adult Sandwich Tern usually accompanied by a juvenile. The Little Terns were at all stages ; some young were on the wing, others only recently hatched, and in the earlier part of the month a few adults still incubated eggs, no doubt second or third attempts. By the end of the month the Great Black-backed Gull was the most numerous of its kind, though flocks will no doubt be larger before September.

# RINGING BATS IN DENBIGHSHIRE

G. E. HESKETH, M.Sc.

THE author commenced ringing bats in February, 1950, and the following is a brief account of the results obtained to the end of July, 1951. All the bats save one (a Pipistrelle) have been found in caves, old mine tunnels or other subterranean haunts, and all have been found in the Vale of Clwyd or in the vicinity of the Vale. The species involved are the Lesser Horseshoe bat (*Rhinolophus hipposideros*), Natterer's bat (*Myotis nattereri*), the Long-eared bat (*Plecotus auritus*) and the above-mentioned Pipistrelle (*Pipistrellus pipistrellus*). In addition three specimens of Daubenton's bat (*M. daubentonii*) have been found but these were not ringed. Discoveries of the Lesser Horseshoe bat far outnumber those of other species; hence the greater part of these observations is concerned with this bat.

TABLE I

*Number of bats ringed, February 1950—July 1951*

| | |
|---|---|
| *R. hipposideros* | 207 |
| *M. nattereri* | 9 |
| *P. auritus* | 7 |
| *P. pipistrellus* | 1 |
| TOTAL | 224 |

The 'rings' or bands employed are of the same type as those used by the Devonshire Speleological Society. Hooper, Hooper and Shaw—to whom the present author is much indebted for encouragement and advice—have published recently in the pages of this journal an account of this Society's work on bats. The work herein described is on a smaller scale than that carried out in Devon, partly because it has been done largely by one individual, and partly because the Greater Horseshoe bat, which occurs in large numbers in Devon, is absent from the area.

RECOVERIES OF *R. hipposideros*

Recoveries are plentiful for this species as is shown in Table II. In the immediate area of Ruthin, Denbighshire, discoveries of new bats are outnumbered by recoveries and it seems that a large proportion of the population has been labelled, but in areas more remote from the author's home, where visits to the caves are less frequent, this is not the case.

TABLE II

*Recoveries of Lesser Horseshoe Bats*

| | *Males* | *Females* | *Sex unknown* |
|---|---|---|---|
| Number of individuals not seen again... ... ... | 51 | 47 | 14 |
| Number seen once after ringing ... ... ... | 11 | 20 | 0 |
| ,, ,, twice after ringing ... ... ... | 11 | 13 | 0 |
| ,, ,, 3 times after ringing ... ... ... | 3 | 5 | 0 |
| ,, ,, 4 ,, ,, ,, ... ... ... | 3 | 3 | 0 |
| ,, ,, 5 ,, ,, ,, ... ... ... | 2 | 2 | 0 |
| ,, ,, 6 ,, ,, ,, ... ... ... | 3 | 1 | 0 |
| ,, ,, 7 ,, ,, ,, ... ... ... | 0 | 1 | 0 |
| ,, ,, 8 ,, ,, ,, ... ... ... | 1 | 2 | 0 |
| ,, ,, 9 ,, ,, ,, ... ... ... | 1 | 2 | 0 |
| ,, ,, 10 ,, ,, ,, ... ... ... | 2 | 1 | 0 |
| ,, ,, 11 ,, ,, ,, ... ... ... | 3 | 0 | 0 |
| ,, ,, 12 ,, ,, ,, ... ... ... | 0 | 0 | 0 |
| ,, ,, 14 ,, ,, ,, ... ... ... | 1 | 0 | 0 |
| ,, ,, 16 ,, ,, ,, ... ... ... | 0 | 1 | 0 |
| ,, ,, 17 ,, ,, ,, ... ... ... | 1 | 0 | 0 |
| ,, ,, 19 ,, ,, ,, ... ... ... | 0 | 1 | 0 |
| ,, ,, 21 ,, ,, ,, ... ... ... | 1 | 0 | 0 |
| TOTAL ... ... | 94 | 99 | 14 |

The majority of recoveries have been made at the original place of ringing, although a considerable amount of movement has been recorded. It can be seen from Table II that 95 bats have been seen again out of a total of 207. This represents a recovery rate of nearly 46 per cent. which is considerably higher than the figure

of 28 per cent. reported from Devon. The time intervals between refinds vary ; some bats have been seen many times within a few months, whilst others have not been seen again until about twelve months after ringing. Table III shows the maximum periods between the dates of ringing and recovery.

TABLE III

*Maximum periods between ringing and being retaken* (*R. hipposideros only*)

| | |
|---|---|
| Not yet seen again... ... | 112 |
| Less than 1 month... ... | 8 |
| Between 1 and 2 months | 5 |
| ,, 2 ,, 3 ,, | 18 |
| ,, 3 ,, 4 ,, | 12 |
| ,, 4 ,, 5 ,, | 10 |
| ,, 5 ,, 6 ,, | 10 |
| ,, 6 ,, 7 ,, | 9 |
| ,, 7 ,, 8 ,, | 3 |
| ,, 8 ,, 9 ,, | 1 |
| ,, 9 ,, 10 ,, | 2 |
| ,, 10 ,, 11 ,, | 1 |
| ,, 11 ,, 12 ,, | 4 |
| ,, 12 ,, 13 ,, | 8 |
| ,, 13 ,, 14 ,, | 2 |
| ,, 14 ,, 15 ,, | 1 |
| ,, 15 ,, 16 ,, | 0 |
| ,, 16 ,, 17 ,, | 1 |

Months in this table are calendar months.

The following example is given in order to make the meaning of this table clear : bat number 45 was ringed on 14th June, 1950, and was seen again on the 8th September, 1950, and on the 21st May, 1951. Thus the maximum period between ringing and being retaken is just over 11 months and this bat is one of the four bats classified in the period 11 to 12 months.

RECOVERIES OF OTHER SPECIES.

A Natterer's bat ringed in an old mine level on 18/2/51 was found about half a mile away in the dungeons of Ruthin Castle on 11/3/51. Also one Long-eared bat first found in Ruthin Castle on 8/1/51 was seen again almost in the same place on 28/1/51.

SEX RATIO FOR THE LESSER HORSESHOE BAT (*R. hipposideros*).

The correct sexing of these bats gave considerable difficulty at first, hence a number of bats which were ringed before a satisfactory technique was developed, and which have not yet been found again, are classified as ' sex not known.' According to Vesey-Fitzgerald there is a difference in colouration between the sexes of this species. The majority of my bats have been examined in artificial light and no difference has been noticed ; even those examined in full daylight have shown no constant difference. The only reliable method of sexing is by a careful examination of the external genitalia. Colour variation exists to some extent between individuals ; two extreme examples are a white female with grey wing membranes and another distinctly rufous female.

Throughout these investigations it has been the general policy not to kill any of the animals. This policy was rigorously carried out until a request for specimens was received from the British Museum, when three specimens were taken. These three bats are included in the figures given in Table IV, the total number of bats considered being the 207 ringed specimens plus three.

TABLE IV

*Sex ratio for R. hipposideros*

| | |
|---|---|
| Males ... | 96 |
| Females ... | 100 |
| Sex unknown | 14 |
| Total | 210 |

There is no indication here of an excess of males over females, a condition frequently reported for bats of various species.

Table V shows the distribution between the sexes of finds of the lesser Horseshoe bat for each calendar month.

TABLE V

*R. hipposideros only*

| | *New Finds* | | | | *Total Finds* | | | |
|---|---|---|---|---|---|---|---|---|
| 1950 | *Male* | *Female* | *Not Known* | *Total* | *Male* | *Female* | *Not Known* | *Total* |
| February ... | 1 | 0 | 5 | 6 | 1 | 0 | 5 | 6 |
| March... ... | 4 | 1 | 2 | 7 | 4 | 1 | 2 | 7 |
| April ... ... | 0 | 4 | 3 | 7 | 0 | 4 | 3 | 7 |
| May ... ... | 4 | 8 | 2 | 14 | 5 | 8 | 2 | 15 |
| June ... ... | 2 | 5 | 0 | 7 | 5 | 6 | 0 | 11 |
| July ... ... | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 2 |
| August ... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| September ... | 5 | 13 | 2 | 20 | 8 | 19 | 2 | 29 |
| October ... | 3 | 11 | 0 | 14 | 10 | 14 | 0 | 24 |
| November ... | 18 | 9 | 0 | 27 | 21 | 13 | 0 | 34 |
| December ... | 6 | 7 | 0 | 13 | 17 | 15 | 0 | 32 |
| 1951 | | | | | | | | |
| January ... | 24 | 7 | 0 | 31 | 45 | 18 | 0 | 63 |
| February ... | 0 | 1 | 0 | 1 | 12 | 8 | 0 | 20 |
| March... ... | 0 | 3 | 0 | 3 | 12 | 11 | 0 | 23 |
| April ... ... | 11 | 11 | 0 | 22 | 36 | 31 | 0 | 67 |
| May ... ... | 4 | 7 | 0 | 11 | 10 | 17 | 0 | 27 |
| June ... ... | 3 | 5 | 0 | 8 | 12 | 13 | 0 | 25 |
| July ... ... | 9 | 8 | 0 | 17 | 11 | 21 | 0 | 32 |
| | 94 | 99 | 14 | 207 | 211 | 199 | 14 | 424 |

The figures under ' total finds ' include both new ringings and refinds. Any bat found more than once in a particular month is only counted once. From the total finds we can see that there have been 211 finds of males and 199 finds of females. This small excess is not considered significant.

HIBERNATION OF *R. hipposideros*

Although the winter sleep of these bats is deep in the sense that their body temperature is much reduced and they are very comatose, it is in general not continuous. Hooper, Hooper and Shaw are of the same opinion concerning the Greater Horseshoe and have quoted figures for movements of *R. ferrum-equinum* during the period November to March inclusive. The following figures for *R. hipposideros* are comparable : of 43 movements between Ruthin Castle and a mine level in the Coed Marchan escarpment, about half a mile away, 17 are known to have taken place during the period November-March. Some of these movements may have been due to disturbance of the animals by the author, but like Hooper and his collaborators he is of the opinion that disturbance of this nature is not entirely responsible. Many winter movements are of an indeterminate nature in that bats depart from quarters under investigation to unknown haunts, and what is more significant from the disturbance point of view, often appear from unknown sources where ringing operations by the author cannot have caused their movement. However, it should be realised that although the bats may shift their quarters it seems that most of the winter is spent in sleep.

Many authors have stated that the Lesser Horseshoe bat is gregarious and that the sexes are segregated during hibernation. The bat may be said to be gregarious, but it is rarely found in closely packed clusters. It is usual to find the bats suspended individually. Distances of a few inches, a few feet, or yards may exist between bats, and solitary specimens are quite common. In the Vale of Clwyd segregation of the sexes in winter is not found. It is interesting to note that the Devonshire Speleological Society find no evidence of segregation in clusters of the Greater Horseshoe.

From observations on bat haunts in Denbighshire, it appears that the Lesser Horseshoe bat prefers caves and tunnels which have an upward gradient from the entrance and which are closed at the upper end. In such places and in branches of caves where the branch fulfils the same conditions, there are few air currents

in winter, the colder, denser external air being virtually excluded. The bats are thus safe from temperatures about freezing point and yet the temperature in such sheltered portions of the cave, approximating to the mean annual temperature of the locality, is not too high for hibernation to take place. Bats found in tunnels through which a strong wind is blowing are uncommon and always in sheltered crevices.

Although these bats do not seem to hang in parts of cave roofs which are streaming with water, but seem to prefer relatively dry areas, they may be found hanging where there is much moisture. Probably a high degree of humidity is advantageous in that it will minimise loss of water from the body by evaporation, for the large area of wing membrane would cause a high evaporation loss in a dry atmosphere. The conservation of water is perhaps another reason for the avoidance of passages in which there are strong air currents and in which a high degree of humidity is less likely to be attained. It must be stated, however, that the bats may be found in dry passages.

It is possible that the non-continuity of hibernation referred to above is due to a necessity for water and to drink rather than for food.

When the bats are disturbed they hoist themselves up slightly by the hind legs —they are nearly always found freely suspended—long before they are thoroughly awake, and at a later stage of awakening can be seen to vibrate rapidly. Perhaps this vibration is a means of raising the body temperature to that which is normal in the fully awakened state. (Shivering is one of the temperature regulating mechanisms of the human body.)

### Movements of the Lesser Horseshoe Bat

Most specimens of *R. hipposideros* have been recovered at the original place of ringing, but distances of a few miles have been travelled by a number of individuals, return journeys being not uncommon. Thus 23 individuals were involved in 43 recorded movements between Ruthin Castle and a mine level near Coed Marchan, half a mile away.

Other recorded movements are as follows :

Between Eyarth Bridge and Ruthin Castle, 2 cases, 1 individual, 1·7 miles.
,, Eyarth Bridge and Pwll Glas, 2 cases, 2 individuals, 0·3 miles.
,, Nant-Graig and Cefn, 1 case, 1 individual, 1·1 miles.
,, Ruthin Castle and Pwll Glas, 2 cases, 1 individual, 1·9 miles.
,, Bont Newydd and Cefn, 1 case, 1 individual, ½ mile.
,, Nant Graig and Bont Newydd, 3 cases, 3 individuals, 0·6 miles.
,, Cefn and Rhyl, 1 case, 1 individual, 6½ miles. (This journey was made in February 1950.)
,, Ruthin Castle and Loggerheads, 1 case, 1 individual, 5½ miles over the Clwydian Hills. This bat was ringed on 23/1/50 and was still in the same place on the following two days. It was next seen in Ruthin Castle, ½ mile to the east on 9/6/50. It was seen flying about a school drive near Loggerheads by schoolboys in the following November.
,, Eyarth Bridge and Bron Eyarth, and thence to Ruthin Castle, 1 case, 1 individual, 0·3 plus 1·5 miles.
,, Ruthin Castle and a second mine level in Coed Marchan, 2 cases, 1 individual, 0·7 miles.

Movements between haunts which are only a few tens of yards apart are not given in this paper.

### External Parasites

*R. hipposideros* appears to be very clean. Only one specimen of *Ixodes vespertilionis* has been found though about 200 bats of this species have been examined.

Other species of bats have provided specimens of *Ncyteribia pedicularia* and *Macronyssus* sp.

### Places from which the Bats have been recorded :

Cave at Cefn, near St. Asaph. (*R. hipposideros, M. nattereri, P. auritus.*)
Cave at Bont Newydd, near St. Asaph. (*R. hipposideros, P. auritus.*)
Caves at Nant Graig, near Llanefydd. (*R. hipposideros.*)
Caves at Tremeirchion, near Bodfari. (*R. hipposideros.*)
Cave at Plas Heaton, near Trefnant. (*R. hipposideros.*)
Dungeons and subterranean passages in Ruthin Castle. (*R. hipposideros, M. nattereri, Plecotus auritus.*)

Urban Ruthin. (*Pipistrellus pipistrellus.*)
Mine level in Coed Marchan, Ruthin. (*R. hipposideros.*)
Mine level near Coed Marchan, Ruthin. (*R. hipposideros, M. nattereri, P. auritus.*)
Mine level, Bron Eyarth, near Ruthin. (*R. hipposideros.*)
Cavern (?) at Eyarth Bridge, near Ruthin. (*R. hipposideros, P. auritus.*)
Mine level near Pwll Glas. (*R. hipposideros, M. daubentonii.*)
Cave near Llanferres. (*R. hipposideros, M. nattereri, M. daubentonii.*)

Bats have also been recovered from a private garage in Rhyl and from Loggerheads, near Mold. (Both *R. hipposideros.*)

The bats are not plentiful in their underground haunts during the summer months, and the caves are then largely deserted.

Acknowledgements

The author is indebted to Mr. and Mrs. Hooper, of the D.S.S., for their encouragement, and to Mr. R. A. Wyke for company and valuable assistance on ringing expeditions. Thanks are also due to various landowners for their co-operation, especially the Ruthin Castle Sanatorium Authorities, and also to the Cave Research Group and Mr. H. Oldroyd for the identification of parasites.

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Hooper, W. M., Hooper, J. H. D., and Shaw, T. R. (1950), *Naturalist*, 149-159.
Vesey-Fitzgerald, B. (1949), *British Bats*, Methuen, London.

The author would be grateful for any information concerning finds of ringed bats. The rings carry a serial number and the letters GEH, EH, GH, or EGH. Any information should be addressed to the writer at Ruthin School.

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## *DRABA MURALIS* L. AT HARTFORTH NEAR RICHMOND, YORKS.

G. F. HORSLEY

In the spring of 1948 my friend, Mr. J. B. Nicholson, M.A., the discoverer of this plant at Hartforth, gave me a copy of a note which he had prepared for publication. This note was never published, and the only reference to his discovery occurs in this Journal for October-December, 1947, No. 823, p. 163 : this was based on information given by Mr. Nicholson during the Y.N.U. excursion to Scotch Corner in May, 1947. Since my friend's decease nearly a year ago it has occurred to me that his note should be published in this Journal. It reads as follows :—

' *Draba muralis* L. In Watson's *Topographical Botany*, this species is recorded for V.C. 64 on the authority of " Tatham sp." and for V.C. 65 on the authority of " Ward sp." As James Ward is stated to have collected " within three miles of Richmond," it seemed possible that his specimen might have come from Hartforth ; so Kew were asked for a note of the locality given on Ward's specimen in the Watson Herbarium. We received the surprising reply that Ward's specimen was collected in 1835 at Kilnsay Crag, *i.e.*, in V.C. 64. It occurred to us that there might have been some confusion between Ward's and Tatham's specimens ; so we inquired of Kew as to the locality of the latter. The reply was that Tatham's plant was localised Malham Cove ; that on the same sheet is one collected by John Windsor at Mulham, Yorks. (presumably Malham), with the additional information " formerly abundant on walls, etc., now scarcely seen there " ; and that other Yorkshire records in the general herbarium are Gordale Beck and Arncliffe.

' Watson's V.C. 65 record thus appears to be an error ; the only previous record for the vice-county appears to be Soutter's at Sleightholme Beck, 1876, given in Baker's " North Yorkshire."

' 18th April, 1948. Mr. G. F. Horsley visited the Hartforth locality and found only about ten plants, some very small, on the west wall of the lane, and none on the east wall, though in 1947 it was in good quantity on both sides. No reason for the falling off in numbers was apparent ; the mosses on both walls seemed to have been undisturbed.

' During the years since I first noted the species at Hartforth in April 1932, I several times passed the spot (on at least two occasions in the spring) without observing any plants and had almost come to the conclusion it had died out, until we found it again in 1947. It was then much more numerous than in 1932 and

some of the plants much larger than any on the former occasion : a wide range of size and degree of branching appears to be characteristic of the species. From John Windsor's remark and our more recent observations, a tendency to extreme fluctuation in numbers from year to year would also seem to be characteristic.
J.B.N. 30/4/48.'

Since 1948, the plants at Hartforth have been examined on several occasions. In May 1949 the increasing growth of ivy on the wall appeared to be restricting the spread of the plants, and none were seen on the east wall, which was almost completely covered with ivy. Only 12 plants were seen on the west wall, all between 30 and 50 yards from the crossroads corner. Under trees to the west of the wall about 24 plants were growing on the ground. Several plants were seeding well ; but others had failed to set even a single seed. In July 1950 all the year's plants had shed their seeds, and the stems and rootlets had withered. Around each plant were dozens of seedlings, each with two small cotyledons only. The number of seedlings amounted to some hundreds ; but only a few of these survived until the spring. It was very evident that the young plants failed to develop either under ivy leaves or on the bare wall ; a little earth is necessary, and not too much shade. In August 1951 the situation had not changed much since the previous year, although the ivy had been pruned slightly during the summer : no plants were seen except upon the west wall. Those seen upon the ground in 1949 have not been seen again, and the site is overgrown now with a mixed herbage.

It is hoped to continue the periodical survey of this colony in future years, and any comments, queries or advice will be welcomed.

## BRITISH MOSSES

The late Mr. H. N. Dixon's international standing as a bryologist and the excellence of his systematic treatise on the British Mosses have resulted in an implicit acceptance of his names and classification by British bryologists. For over fifty years they have relied almost exclusively upon successive editions of *The Student's Handbook of British Mosses*, and the combination of its merit and its authority have been responsible for the high degree of stability in taxonomy and nomenclature which this group has enjoyed. But taxonomic progress is unfortunately inseparable from name changing and Dixon himself in 1938 gave a list (*B.B.S. Report*, 117-120) of over 50 British mosses the names of which required alteration from those given in his *Handbook*. The decision of the International Botanical Congress to adopt Hedwig's *Species Muscorum* (1801) as the starting point for the nomenclature of true mosses, together with the inevitable new combinations required by the newer concepts of generic boundaries, have necessitated more drastic alterations. Professor P. W. Richards and Mr. E. C. Wallace have recently issued 'An Annotated List of British Mosses ' (*Trans. Brit. Bry. Soc.*, **1**, 4, 1950 ; separates obtainable from the Secretary, B.B.S., 2 Strathearn Road, Sutton, Surrey ; price to members 1/6, non-members 2/6) with the object of bringing nomenclature and classification up to date. The sequence of families and genera is, broadly speaking, that of Fleischer's system (1915-1922).

The need for bringing nomenclature into line with that employed on the Continent and in America has made a wholesale substitution of new for old-established names inescapable. Bryologists must bow regretfully to the inevitable. But those who have been nurtured on Dixon's *Handbook* and whose bryological horizons are bounded by our own shores will feel no enthusiasm for the changes. Indeed, the feelings engendered are akin to those experienced when having a large number of teeth extracted and replaced by new and unfamiliar substitutes. The necessity for the operation is admitted, the competence of the technicians is unquestioned, but the process is distressing and despite its skilful execution the strange and unfamiliar results are slow to win approval or give satisfaction. Reconciliation, however, is largely a matter of time. In this case the time is likely to be prolonged. For many years to come these will be ' paper names ' only, dutifully employed in publications but not in the spoken word except perhaps by a select and small minority of bryologists. So long as Dixon's *Handbook* retains its present undisputed position the old names will continue to be employed by the great majority of those interested in the collection and identification of British mosses.—W.A.S.

# THE ENTOMOLOGY OF SPURN PENINSULA

(*Continued from page* 146)

## VI. LEPIDOPTERA

H. N. MICHAELIS

The list of Lepidoptera given below is the result of collecting for short periods during 1947, 1948 and 1949 on Spurn Peninsula and is compiled from lists supplied by W. D. Hincks, S. M. Jackson, H. N. Michaelis and the late Robert Proctor.

The late Robert Proctor, a member of the 1947 party, collected for ten days in June of that year. He produced a good list of the larger Lepidoptera and found time to take some of the smaller moths. He worked on Kilnsea Warren and the Marsh Meadow during the day and used ' sugar ' extensively on the Warren at night. In July, 1948, there was no lepidopterist in the party but W. D. Hincks brought back a fine collection of moths taken, mainly, at the lighted window of the cottage ; these have been identified by Michaelis. For a week in mid-August, 1949, H. N. Michaelis searched and beat the herbage by day and collected at flowers and with light after dark. S. M. Jackson collected for two days in the same period.

Considering the short period of collecting the result has been fairly satisfactory, but it is certain many species have not been recorded. Many additions, especially among the smaller species, could be made by collectors, who are prepared to work hard and methodically. It is a matter of regret that so many lepidopterists should ignore any moth smaller than a *Eupithecia*. If more attention was given to structure and descriptions for the purpose of identification and less reliance placed on coloured plates, many of the alleged difficulties would be removed and the identification of the frequently neglected smaller species would be simplified. Further, much remains to be discovered regarding the habits and distribution of the so-called Micro-lepidoptera.

To return to the subject of these notes, the Spurn area has plants indigenous to sandhills, saltmarsh, meadow and marshland ; there are few trees. Breeding from mined leaves, spun shoots, flowers, seeds and plant stems, etc., which have been attacked by larvae, would produce many species not in the list. It is suggested the use of the beating tray and the larvae ' bags ' would give better results during the morning and afternoon than the use of the net. Beating Marram Grass and over-hanging edges of sandhills will disturb many species of moths which might otherwise pass unnoticed ; this method is most profitable in the late afternoon. A little later many of the smaller moths become active and fly until it is too dark to see them. After dark, attention should be given to flowers and flowering grasses. In August the flowers of ragwort and marram grass were visited by moths for hours after the sugar patches had ceased to attract. The lighted window of the cottage was always an attraction and a 300 c.p petrol vapour lamp gave good results in other parts of Kilnsea Warren.

A number of records for Spurn are found in the *List of Yorkshire Lepidoptera* by G. T. Porritt, 2nd edition, 1904. The majority of these records are of species peculiar to cosatal areas only and do not give a fair picture of the species to be found at Spurn. A few of the more notable records taken in the years 1947-49 are : *Euxoa obeliscata*, Schiff., *Spaelotis ravida* Schiff., *Triphaena interjecta* Hubn., *Cucullia asteris* Schiff., *Heliophobus sordidus* Borkh., *Sterrha fuscovenosa* Goeze, *Myelois cribrella* Hubn., *Platytes alpinellus* Hubn., *Loxostege palealis* Schiff., *Polychorosis fuligana*, *Gelechia hippophaella* Schrank, *Elachista triatomea* Haw., *Opostega salaciella* Treits., *Bucculatrix maritima* Stainton and *Ochsenheimeria birdella* Curtis.

In 1949 my object was to record as many species as possible and there was little time to assess the quantities of individual species. In consequence those dangerous words ' scarce,' ' rare ' and ' uncommon ' are not used in the list for insects recorded by me, indeed, such descriptions should be used with care in local lists and only if the compiler has worked long and hard in his area. ' Scarce ' so often covers the fact that observation has not been made at the hour, day or night, when the insect is active or that there has been no search for the early stages.

* The cost of publishing this part has been defrayed by subscriptions from members of the Section and by a generous donation from the *Entomologist's Monthly Magazine*.

The expressions ' common ' or ' plentiful ' are used sparingly, and where such terms are deemed unsuitable, the numbers seen or taken are given as far as is possible. In the list of the Tortricoidea and the Tinaeoidea, the accepted food plants have been added as a help to collectors ; in the short time at my disposal at Spurn I was unable to search for larvae to any extent.

## CARADRINOIDEA

### ARCTIIDAE

*Eilema lurideola* Zinck. K.W. Several at light, August 1949. Larvae plentiful in June 1950.
*Nudaria mundana* Linn. K.W. One at light, August 1949.
*Hypocrita jacobaeae* Linn. Plentiful among ragwort.
*Phragmatobia fuliginosa* Linn. K.W. Three at light, August 1949.
*Spilosoma lubricipeda* Linn. K.W. Larvae cn., August 1949.
*S. lutea* Hufn. K.W. One approaching var *radiata*, June 1947 (R.P.). Larvae cn., August 1949.
*Diacrisia sannio* Linn. K.W. One male, June 1947 (R.P.).
*Arctia caja* Linn. K.W. Larvae, Ridge : one at light.

### CARADRINIDAE

*Apatele psi* Linn. K.W. One, June 1947 (R.P.). Ridge Larvae, August 1949.
*Amphipyra tragopoginis* Linn. Plentiful at sugar and ragwort, August 1949.
*Gortyna flavago* Schiff. K.W. One at Marram flowers, August 1949. W.B.B.D. Pupae in thistle stems.
*Luperina testacea* Schiff. Plentiful at light and grass flowers, August 1949.
*Caradrina clavipalpis* Scop. (*cubicularis* Schiff.). K.W. and W.B.B.D. Five sp., August 1949.
*C. morpheus* Hufn. K.W. ' Scarce at sugar,' June 1947 (R.P.).
*Pyrrhia umbra* Hufn. K.W. One at sugar, June 1947 (R.P.). The foodplant *Ononis* grows on sandhills.
*Arenostola phragmitidis* Hb. K.W. August 1949, cn. at ragwort especially near the Phragmites area.
*A. elymi* Treits. K.W. One sp. June 1950.,
*Meristis trigrammica* Hufn. K.W. One sp., June 1950.
*Thalpophila matura* Hufn. K.W. One sp., August 1949.
*Phlogophora meticulosa* Linn. K.W. Cn.
*Xylophasia obscura* Haw. (*remissa* Hb.). K.W. Cn.
*X. lithoxylea* Schiff. K.W. One sp.
*X. monoglypha* Hufn. Plentiful.
*Apamea sordens* Hufn. K.W. Plentiful, June 1947.
*Celaena leucostigma* Hb. K.W. and W.B.B.D. Five sp., August 1949. Not attracted to light but found on flowers of grass and marram.
*Celaena secalis* Linn. Plentiful.
*Hydraecia micacea* Esp. K.W., W.B.B.D. Fairly cn., August 1949.
*H. oculea* Linn. (*nictitans* Bork.). K.W. Two sp., August 1949.
*Miana literosa* Haw. Plentiful at ragwort, August 1949.
*Procus furunculus* Schiff. Plentiful.
*P. strigilis* Clerck K.W. Cn. at sugar, mostly dark forms, June 1947.
*P. fasciunculus* Haw. K.W. Not uncommon, June 1947.
*Euxoa obelisca* Schiff. K.W. One sp. at ragwort, August 1949 (H.N.M.).
*E. nigricans* Linn. K.W. Three sp., August 1949.
*E. tritici* Linn. K.W. Plentiful at ragwort, August 1949.
*Agrotis segetum* Schiff. K.W. Three at ragwort, August 1949.
*A. vestigialis* Hufn. Plentiful.
*A. puta* Hubn. K.W. Four sp., August 1949.
*A. exclamationis* Linn. K.W. Plentiful, June 1947.
*A. ypsilon* von Rott. K.W. Fairly cn., August 1949.
*A. ripae* Hubn. K.W. ' Not uncommon, June 1947. Essentially a coast species, the larva feeding on saltwort and sea-rocket on the sandhills. Spurn Head is a well-known locality.' (R.P.).
*Ochropleura plecta* Linn. K.W. One sp., June 1947. One sp., August 1949.
*Graphiphora augur* Fabr. K.W. A few at sugar, June 1947.

*Amathes xanthographa* Schiff. Plentiful.
*A. umbrosa* Hubn. K.W. Cn. August 1949.
*A. baja* Schiff. K.W. August 1949.
*Spaelotis ravida* Schiff. K.W. Fairly cn., August 1949.
*Diarsia rubi* Vieweg K.W. Twelve sp., August 1949.
*Triphaena pronuba* Linn. Plentiful.
*T. comes* Hufn. Plentiful.
*T. janthina* Schiff. K.W. Three sp., August 1949.
*T. interjecta* Hb. K.W. Several, August 1949. At privet flowers and ragwort. Occasionally found in daytime.
*Phalaena typica* Linn. K.W. One sp., August 1949.
*Anchoscelis lunosa* Haw. K.W. One sp. at flowers of Marram, August 1949.
*Citria lutea* Stroem K.W. August 1950.
*Cucullia umbratica* Linn. K.W. Two sp., June 1947.
*C. asteris* Schiff. K.W. and M.M. Ten larvae on *Aster tripolium.*, August 1949. Bred July 1950.
*C. chamomillae* Schiff. K.W. Three sp., June 1950.
*Bombycia viminalis* Fabr. W.B.B.D. One dark sp., August 1949.
*Eumichtis lichenea* Hb. K.W. One sp. at light, August 1949 (H.N.M.).
*Leucania impura* Hb. K.W. and W.B.B.D. A few worn sps., August 1949.
*L. pallens* Linn. K.W. and W.B.B.D. A few worn sps., August 1949.
*L. lithargyria* Esp. K.W. One sp. (W.D.H.). One sp. August 1949.
*Orthosia gothica* Linn. K.W. One sp.
*Charaeas graminis* Linn. K.W. and M.M. A few.
*Tholera popularis* Fabr. Ridge. Two sp. at light, August 1949.
*T. cespitis* Schiff. K.W. One sp. at light, August 1949.
*Hadena chenopodii* Schiff. (*trifolii* von Rott.). K.W. Five sp. at ragwort, August 1949.
*H. lepida* Esp. K.W. One sp., June 1950.
*H. cucubali* Schiff. K.W. Bred July 1950.
*H. suasa* Schiff. K.W. One sp. at sugar, June 1947.
*Heliophobus albicolon* Hb. K.W. Plentiful, June 1947.
*H. sordidus* Bork. (*anceps* Hb.). K.W. One sp. June 1947 (R.P.)
*Diataraxia oleracea* Linn. K.W. Plentiful, June 1947.
*Ceramica pisi* Linn. K.W. and M.M. A few larvae, August 1949.
*Mamestra brassicae* Linn. K.W. Scarce, June 1947. A few larvae observed, August 1949.

PLUSIIDAE

*Zanclognatha nemoralis* Fabr. Ridge. One sp., August 1949.
*Euclidimera mi* Clerck K.W. One sp., June 1947. Marsh Meadow, six larvae, August 1949.
*Plusia festucae* Linn. W.B.B.D. One cocoon on reeds, since bred, August 1949.
*P. gamma* Linn. Plentiful.

LYMANTRIIDAE

*Orgyia antiqua* Linn. Salt Marsh. Larvae cn. on *Hippophaë rhamnoides*. Also on Ridge.
*Euproctis chrysorrhoea* Linn. (*similis* Fuessl.). Salt Marsh. Larvae on *H. rhamnoides*. K.W. A few at light, August 1949.

## NOTODONTOIDEA

STERRHIDAE

*Sterrha virgularia* Hb. K.W. One at light, August 1949.
*S. fuscovenosa* Goeze. (*interjecteria* Boisd.). K.W. Two sp. at light, July 1948 (W.D.H.). One sp., August 1949 (H.N.M.).
*S. aversata* Linn. K.W. Several at light.
*S. bisetata* Hufn. K.W. Cn. July 1948.
*S. dimidiata* Hufn. K.W. Twenty at light and ragwort, August 1949.
*Scopula imitaria* Hb. K.W. One sp. at light, July 1948.
*S. emutaria* Hb. K.W. Cn., July 1948. Bred from larvae on Centaurea, June, 1950.
*Calothysanis amata* Linn. K.W. Three sp., August 1949.

HYDRIOMENIDAE

*Eupithecia venosata* Fabr. K.W. One sp., July 1948.
*E. absinthiata* Clerck K.W. At light, July 1948. Larvae cn. 1949.
*E. albipunctata* Haw. K.W. One sp., June 1947.
*E. centaureata* Schiff. K.W. Plentiful at ragwort, August 1949.
*E. subfulvata* Haw. K.W. Several larvae, since bred, August 1949.
*E. vulgata* Haw. K.W. Several.
*E. virgaureata* Doubl. K.W. Bred July 1950.
*Eucymatoge subnotata* Hb. K.W. One at light, July 1948.
*Epirrhoe galiata* Schiff. K.W. One at light, August 1949.
*E. alternata* Muller (*sociata* Bork.). Salt Marsh. A few, June 1947.
*Lyncometra ocellata* Linn. K.W. Cn. at light, July 1948, August 1949.
*Dysstroma truncata* Hufn. K.W. and Ridge. Eight sp., August 1949.
*Euphyia bilineata* Linn. Plentiful.
*Perizoma bifaciata* Haw. K.W. One at light near phragmites patch, August 1949. Larvae feed on flowers and seeds of red Bartsia, a plant I did not observe in the area. (H.N.M.).
*P. albulata* Schiff. Marsh Meadow. One sp. June 1947. K.W. One sp. at light, July 1948.
*Pelurga comitata* Linn. K.W. At light, August 1949.
*Xanthorhoë ferrugata* Clerck (*unidentaria* Haw.). K.W. Cn., August 1949.
*X. spadicearia* Schiff. K.W. Two sp., August 1949.
*X. montanata* Schiff. K.W. and Marsh Meadow. Cn. (R.P.).
*X. fluctuata* Linn. K.W. Common.
*Ortholitha limitata* Scop. Plentiful.
*Hydriomena furcata* Thunb. M.M. Bred salix.
*Operophtera brumata* Linn. Larvae abundant.

BREPHIDAE

*Odezia atrata* Linn. K.W. Fairly cn., June 1947.

SELIDOSEMIDAE.

*Opisthograptis luteolata* Linn. K.W. Larvae, August 1949.
*Semiothisa alternata* Schiff. K.W. One sp.
*Chiasmia clathrata* Linn. Three sp., June 1950.
*Cleora rhomboidaria* Schiff. (*gemmaria* Brahm). K.W. Several worn specimens near the cottage, August 1949.
*Erannis progemmaria* Hübn. K.W. Larvae, June 1950.
*Biston betularia* Linn. K.W. Pair found in cop. Male—black form, female—typical, June 1947.
*Abraxas grossulariata* Linn. K.W. Two sp. August 1949.
*Crocota ochrearia* Rossi K.W. One 16/6/51 (S.M.J.).
*Crocallis elinguaria* Linn. K.W. One sp., August 1949.

SPHINGIDAE

*Macroglossa stellatarum* Linn. K.W. Several seen, June 1947. One sp., August 1949.
*Smerinthus ocellatus* Linn. K.W. A few larvae taken from *Salix*., August 1949.
*Acherontia atropas* Linn. K.W. One, 1/7/51 (S.M.J.).

## PAPILIONOIDEA

SATYRIDAE

*Dira megera* Linn. Plentiful.
*Maniola tithonus* Linn. Two seen at Kilnsea outside the area, August 1949.
*M. jurtina* Linn. Plentiful.
*Coenonympha pamphilus* Linn. Common, August 1949.

NYMPHALIDAE

*Vannesa atalanta* Linn. K.W. A dozen seen, August 1949.
*V. cardui* Linn. K.W. Common, August 1949.
*Aglais urticae* Linn. K.W. Common, August 1949.
*Nymphalis io* Linn. K.W. Common, August 1949.

LYCAENIDAE

*Polyommatus icarus* von Rott. K.W. and Marsh Meadow, Common.
*Lycaena phlaeas* Linn. Common.

PIERIDAE

*Pieris brassicae* Linn. Plentiful. A migration heading north-east was seen throughout the week 13th-20th August 1949, (H.N.M.).
*P. rapae* Linn. Common.
*P. napi* Linn. Plentiful in Marsh Meadow and W.B.B.D.
*Colias croceus* Geoff. in Fourc. A few seen, June 1947. Perhaps a score seen throughout the area, August 1949.

## DREPANOIDEA

DREPANIDAE

*Cilix glaucata* Scop. K.W. Two sp., August 1949.

## PYRALOIDEA

PHYCITIDAE

*Anerastia lotella* Hb. K.W. Five sp. at light, July 1948.
*Salebria fusca* Haw. K.W. One sp., August 1949.
*Homoeosoma nimbella* Dup. K.W. Three sp. at light and ragwort, August 1949.
*Myelois cribrumella* Hb. K.W. Found in plenty among thistles by R.P. and W.D.H. in June 1947 and July 1948. There is no record of this insect in G. T. Porritt's *List of Yorkshire Lepidoptera*, 1904. It is unlikely that this insect was overlooked by the collectors of Porritt's time and indicates colonisation within the past fifty years (R.P.).

CRAMBIDAE

*Crambus pratellus* Linn. K.W. Plentiful.
*C. culmellus* Linn. Plentiful.
*C. hortuellus* Hb. Plentiful.
*C. perlellus* Scop. W.B.B.D. and K.W. July 1948.
*C. geniculeus* Haw. Sandhills at edge of salt marsh, plentiful. K.W. Ten sps., August 1949.
*C. tristellus* Schiff. Plentiful.
*Platytes alpinellus* Hb. K.W. One sp. at edge of sandhills, August 1949 (H.N.M.). Not in Porritt's List.
*Chilo phragmitellus* Hb. K.W. Two sp., July 1948.

PYRAUSTIDAE

*Cataclysta lemnata* Linn. W.B.B.D. One sp., August 1949.
*Nymphula* (*Hydrocampa*) *nymphaeata* Linn. W.B.B.D. One sp., August 1949.
*Eurrhypara hortulata* Linn. K.W. August 1949.
*Phlyctaenia lutealis* Hb. K.W. Plentiful.
*P. fuscalis* Schiff. K.W. Two sp., June 1950.
*P. prunalis* Schiff. K.W. Five sp., July 1948.
*P. sambucalis* Schiff. K.W. One sp., July 1948.
*Nomophila noctuella* Schiff. K.W. and Marsh Meadow. Cn., August 1949.
*Loxostege palealis* Schiff. K.W. Two sp., August 1949. Food : *Daucus carota*.
*Scoparia angustea* Steph. K.W. Three sp., August 1949.
*S. cembrae* Haw. K.W. Two sp., August 1949.
*Mesographe forficalis* Linn. K.W. July 1948.

PYRALIDIDAE

*Hypsopygia costalis* Fabr. One sp. in cottage, August 1949.
*Pyralis farinalis* Linn. K.W. One sp. in cottage, August 1949.

ALUCITIDAE

*Platyptilia gonodactyla* Schiff. K.W. Ten sp., 1949.
*P. pallidactyla* Haw. K.W. Three sp., August 1949.
*Oidaematophorus monodactylus* Linn. K.W. One sp., August 1949.
*Alucita pentadactyla* Linn. K.W. Common.

## LASIOCAMPOIDEA

LASIOCAMPIDAE

*Lasiocampa quercus* Linn. K.W. One larva, August 1949.
*Philudoria potatoria* Linn. K.W. Larvae cn., June 1947.

## PSYCHOIDEA

ZYGAENIDAE

*Zygaena filipendulae* Linn. K.W. and Marsh Meadow, plentiful.
*Z. lonicerae* von Scheven K.W. and Marsh Meadow, plentiful.

## TORTRICOIDEA

PHALONIDAE

*Phalonia manniana* F.v.R. M.M. Two sp., June 1950. Food : Mentha.
*P. smeathmanniana* Fabr. W.B.B.D. One sp., August 1949. Food : Flowers of Achillea, *Centaurea*.
*P. vectisana* Westw. (*griseana* Steph.). W.B.B.D. Cn., August 1949. Food : *Triglochin maritimum* and *palustre*.
*P. roseana* Haw. K.W. One sp. 1949. Larvae in heads of *Dipsacus*. See note following *Eucosma gentianaeana* in Addenda.
*P. atricapitana* Steph. K.W. Cn. at light, August 1949. Food : flowers and stems of *Senecio jacobaea*.
*P. dubitana* Hb. K.W. Two sp., August 1949. Food : seeds of *Senecio*, *Crepis*, etc.
*Euxanthis straminea* Haw. K.W. Cn., August 1949. Food : *Centaurea nigra*.
*E. zoëgana* Linn. K.W. Cn. at light, August 1949. Food : roots of *Centaurea* and *Scabiosa*.
*E. hamana* Linn. K.W. Cn. at light, August 1949. Food : roots of *Carduus*.

TORTRICIDAE

*Cacoecia podana* Scop. (*oporana* Linn.). K.W. August 1949.
*C. rosana* Linn. K.W. July 1948.
*C. xylosteana* Linn. K.W. July 1948.
*Pandemis corylana* Fabr. K.W. August 1949.
*P. heparana* Schiff. K.W. July 1948.
*Tortrix paleana* Hb. Common.
*T. costana* Schiff. Common.
*Cnephasia osseana* Scop. K.W. One sp., August 1949 (H.N.M.).
*C. longana* Haw. K.W. One sp. at light, August 1949 (H.N.M.).
*C. incertana* Treits. K.W. July 1948.
*Argyrotoxa bergmanniana* Linn. K.W. July 1948. Food : Rose.
*Peronea aspersana* Hb. W.B.B.D. July 1948. Food : *Spirea, potentilla*.
*Peronea variegana* Schiff. K.W. August 1949.
*P. comariana* Zell. W.B.B.D. July 1948.

EUCOSMIDAE

*Spilonota ocellana* Schiff. K.W. One sp., August 1949 (H.N.M.).
*Ancylis lundana* Fabr. K.W. Two sp., August 1949.
*Notocelia uddmanniana* Linn. K.W. July 1948. Food : *Rubus*.
*Eucosma nigromaculana* Haw. K.W. Cn., August 1949. Food : seeds of *Senecio jacobea*.
*E. aemulana* Schlag. K.W. Two sp., August 1949 (H.N.M.). Food : flowers of *Aster tripolium*.
*E. scopoliana* Haw. K.W. Cn., July 1948. Food : seeds of *Centaurea nigra*.
*E. expallidana* Haw. K.W. Two sp. at light, August 1949 (H.N.M.). Food : seeds of *Sonchus arvensis*.
*E. pflugiana* Haw. K.W. June 1947. Food : in stems of *Carduus*.
*E. trigeminana* Steph. (*costipunctana* Haw.). K.W. July 1948. Food : roots of *Senecio*.
*Bactra lanceolana* Hubn. K.W. and M.M. (W.D.H., H.N.M.).
*Polychrosis fuligana* Haw. K.W. Common at light near Phragmites area. Not seen during day. Appeared at light immediately after dark for a short time only, August 1949 (H.N.M.). Not in Porritt's List. Food : in shoots of *Carduus arvensis*. Also taken in June 1950.

*Argyroploce lacunana* Dup. K.W. June 1947.
*A. urticana* Hubn. K.W. Common.
*Hemimene petiverella* Linn. K.W. July 1948, August 1949. Food : roots of Achillea.
*Ernarmonia rufillana* Wilk. K.W. At light, July 1948 (W.D.H.). Food : on seeds of *Daucus*, *Angelica* and *Heracleum*.

## TINAEOIDEA

GELECHIIDAE

*Metzneria lappella* Linn. K.W. K.W. Three sp., July 1948. Food : seeds of *Arctium lappa*.
*M. metzneriella* Staint. K.W. June 1947. Food : seeds of *Centaurea nigra*. R.P. also reported *M. carlinella*, Stainton, but was not certain of his determination. I have the specimens taken by W.D.H., which are the two species listed above.
*Aristotelia stipella* Hubn. M.M. White blotches in leaves of *Chenopodium*, indicate presence of the larva, August 1949. Since bred, April 1950.
*Bryotropha desertella* Dougl. K.W. July 1948, August 1949.
*Gelechia hippophaella* Schrank K.W. and Dense Bush area. Nine sp. taken during day, also comes to light. Not in Porritt's List. Food : spun shoots of *Hippophae rhamnoides* (H.N.M.).
*Phthorimaea marmorea* Haw. K.W. Plentiful, August 1949 (H.N.M.). Food : *Cerastium trivale*.
*Anacampsis populella* Clerck K.W. Two sp., August 1949. Food : *Salix*.
*Brachmia rufescens* Haw. W.B.B.D. July 1949. Food : in rolled stems of grass.

COSMOPTERIGIDAE

*Mompha fulvescens* Haw. M.M. Two sp., August 1949. Food : *Epilobium hirsutum*. Mined leaves of *Epilobium angustifolium* suggest *Mompha raschkiella* Zell., but I was unable to breed the moth.

OECOPHORIDAE

*Borkhausenia fuscescens* Haw. K.W. Three sp. near the bird trap, August 1949.
*B. pseudospretella* Staint. Plentiful in cottage.
*Carcina quercana* Fabr. K.W. One at light, August 1949.
*Depressaria heracliana* Linn. K.W. Cn. (R.P., H.N.M.). Food : *Heracleum*.
*D. costosa* Haw. K.W. One sp., August 1949. Food : *Ulex* and *Genista*.
*D. liturella* Schiff. K.W. Cn., August 1949. Food : *Centaurea nigra*.
*D. subpropinquella* Staint. K.W. Cn., August 1949. The form with the black thorax occurs sparingly. Food : *Centaurea* and *Carduus* (H.N.M.).
*D. arenella* Schiff. K.W. Common, August 1949. Food : *Centaurea* and *Carduus*.
*D. angelicella* Hubn. K.W. One sp., August 1949. Food : *Angelica*.
*D. applana* Fabr. K.W. Plentiful.
*D. alstroemeriana* Clerck K.W. Cn., August 1949. Food : *Conium maculatum*.
*D. yeatiana* Fabr. K.W. Common, August 1949.

The genus *Depressaria* may be taken at the flowers of ragwort and at light after dark ; in the late afternoon and early evening they may be disturbed, together with *Gelechiidae*, from the over-hanging edges of sandhills (H.N.M.).

GLYPHIPTERIGIDAE

*Simaethis fabriciana* Linn. K.W. Common among nettles.

ELACHISTIDAE

*Elachista albifrontella* Hubn. K.W. June 1947 (W.D.H.).
*E. triatomea* Haw. K.W. July 1948 (W.D.H.).
*E. rufocinerea* Haw. K.W. and M.M. Common, June 1947.
*E. cygnipennella* Hubn. K.W. Common, June 1947.

HYPONOMEUTIDAE

*Argyresthia nitidella* Fabr. K.W. August 1949. Food : Hawthorn.
*Hyponomeuta padella* Linn. K.W. One sp., August 1949. Food : Apple, Hawthorn.

COLEOPHORIDAE

*Coleophora tripoliella* Hodg. K.W., W.B.B.D., M.M. Cn., August 1949 (H.N.M.) Food : *Aster tripolium.*

GRACILLARIIDAE

*Gracillaria syringella* Fabr. K.W. Among privet near cottage.
*G. tringipennella* Zell. K.W. Six sp., August 1949. Food : *Plantago.*

PLUTELLIDAE

*Plutella porrectella* Linn. Humber Shore. Two sp. bred from sea rocket.
*P. maculipennis* Curt. Plentiful.

LYONETIIDAE

*Opostega salaciella* Treits. M.M. Two sp., August 1949 (H.N.M.). Food : in stems of *Rumex.*
*Bucculatrix maritima* Staint. K.W. and M.M. Larvae common on *Aster tripolium,* August 1949 (H.N.M.).

TINAEIDAE

*Monopis rusticella* Hubn. K.W. Three sp., near cottage, August 1949.
*Tineola bisselliella* Hum. Common in cottage, August 1949.
*Tinaea cloacella* Haw. K.W. July 1948.
*T. pellionella* Linn. K.W. Common in cottage.
*T. pallescentella* Staint. K.W. One sp. in bird trap, August 1949.
*Ochsenheimeria birdella* Curt. K.W. Two sp., August 1949. Food : in stems of grass.

MICROPTERIGIDAE

*Micropteryx calthella* Linn. K.W. June 1947.

## ADDENDA

The following species, additional to the previous list, were seen or taken between 3rd—6th June, 1950, by H. N. Michaelis and from 3rd—15th June, 1950, by W. D. Hincks. Also included are species bred from larvae taken during this period and in August, 1949. The spring and early summer broods of many species, taken in August 1949, were observed in early June, 1950.

Where no date is given the record is for June, 1950.

## TORTRICOIDEA

EUCOSMIDAE

*Endothenia gentianaeana* Hübn. K.W. and M.M.

This species and also *Phalonia roseana* Haw., were bred from the seed heads of *Dipsacus* gathered in August, 1949 and June, 1950. The best results were obtained from the seed heads of the previous year gathered in June. Almost every head examined contained a larva of one or other species and occasionally both species were found in the same head.

The larva of *E. gentianaeana* Hubn., lives in the large cavity of the seed head and appears to feed on the pith and occasionally enters the stem. The cocoon is made of white silk mixed with fragments of pith and frass and often fills the whole cavity. Prior to pupation a hole is bored through the wall of the seed head, usually near the top, and covered lightly with silk. After emergence the pupa is found half extruded from this hole. The moths emerged from July 7th to August 5th, 1950.

The larva of *Phalonia roseana* Haw., feeds when young in a tunnel made through the seeds close to the outside of the cavity of the seed head and later feeds inside the cavity and on the pith of the stem immediately below. The cocoon is similar to that of the *Eucosma* but much smaller. The moths emerged from 3rd-15th August, 1950.

Twenty-six infested seed heads produced twenty *E. gentianaeana* and nine *P. roseana.* No parasites were observed. It is essential to keep the heads in an airy cage out of doors, for six other seed heads kept indoors contained four dead larvae and two dead pupae.

(*To be continued*)

# YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1951

## HOWDEN, May 12th-14th

The date on which Whitsuntide fell this year was early even in a normal spring and for weeks we had had damp, cold, unseasonable weather with cold east winds and this held back all growth and made it a very late season. Fortunately the rains ceased and we were able to enjoy outdoor activities much better than appeared likely during the previous week. Flowering plants had to be sought and insects were scarce. The marshy ings at Wressle and the ponds and ditches gave evidence of the wealth of plants that would be there later in the year. The same may be said of the banks of the Ouse and the old woodlands on the Saltmarshe Estate. To a West Riding moss lover the absence of such a moss as *Tetraphis*, so frequent on old tree stumps in the west, seemed most likely to be due to the yearly lack of moisture and this might account for the absence of lichens. A form of *Xanthoria parietina* on trees on the Ouse bank was the only lichen noted. To any one who, thirty years ago, saw the beginning of the spread of the then newly-developed variety of *Orthodontium*, finding this at Saltmarshe was very interesting. Newcomers to bryology should turn up Burrell's paper on this variety in *The Naturalist*, 1940, p. 295 and also the note on it at Bolton Woods in *The Naturalist*, 1948, p. 131.

**Ornithology** (Ralph Chislett). With May 11th and 12th practically the first spring-like days of the year, migrants were late. The 13th and 14th were cold again. Varieties of habitat were not numerous; but Mr. Kitchen's efforts to enable us to explore a new area were much appreciated.

Tawny and Little Owl occurred near Howden; and a Barn Owl and numerous Jackdaws were disturbed at Wressle Castle. The open grasslands with hedges and dykes, whither we were escorted by Mr. E. A. Croft, had Skylarks, a few Corn-Buntings and Yellow-Buntings, Moorhens, the Yellow Wagtail, and both Common and Red-legged Partridges. About the wetter portions Lapwings had young, Redshanks and Curlews called and Snipe drummed; and Reed-Buntings and Sedge-Warblers sang. A bushy field yielded Linnets, Greenfinches (generally common) and a pair of Whinchats.

In the woodland belts at Saltmarshe occurred Missel-Thrushes (fairly numerous), Green and Great-spotted Woodpeckers, a Coal-tit, a pair of Long-tailed Tits, Turtle Doves (fairly numerous), Jays, Whitethroats and Blackcaps (both newly arrived), and a Willow-Warbler which Capt. Saltmarshe informed us is usually scarce in the park, but which was fairly numerous nearer to Howden. Swifts were very scarce (three seen), perhaps most had not yet arrived. The Swallow was the most numerous of its kind.

Skipwith Common added the Teal, Garden Warbler and Tree-Pipit to our lost of 65 species; and a visit to the Thorne area added Goldfinch, Willow-Tit and a Lesser Whitethroat, which obliged by singing its distinctive song repeatedly. The Spotted Flycatcher, which breeds in the vicarage garden, had not yet arrived. Coots occurred on a reedy pond near Saltmarshe. All the common resident species were present in normal numbers.

**Freshwater Biology** (H. Whitehead): As a consequence of the late season and dull cold weather few insects were seen on the wing. We were favoured by a sunny, warm day on Monday, May 14th, when a visit was paid to Wressle. The only imagoes taken were the alderfly (*Sialis lutaria* (L.)), a few stoneflies, *Nemoura cinerea* Retz., and a couple of caddises, *Limnephilus griseus* (L.). A large pond near Loftsome Bridge, where the reed-mace was abundant, yielded numerous nymphs of demoiselles, larvae of a species of *Athripsodes* (*Leptocerus*) and *Asellus aquaticus* L.

On Sunday a trip was made to Skipwith Common but the dull day and very cold wind prevented successful collecting.

Monday morning was cold and dull but the weather improved later. An excursion was made to Saltmarshe and in a pond to be mentioned later nymphs of *Cloeon dipterum* (L.) were found in numbers.

G. Fryer, who was more industrious, writes 'on the Monday collections of small crustacea were made in five ponds and ditches in the neighbourhood of Howden village and along the road to Saltmarshe. While the organisms were

numerically abundant, the number of species found was small as the following list shows :

COPEPODA
*Cyclops agilis* s. str. (Koch)
*C. strenuus* s. str. (Fischer)
*C. viridis* (Jurine)
*C. vernalis americanus* (Marsh)
*Canthocamptus staphylinus* (Jurine)

CLADOCERA
*Daphnia pulex* (De Geer) ♂♂ and ephippial ♀♀
*D. obtusa* Kurz. ♂♂ and ephippial ♀♀
*D. longispina* O.F.M.
*Simocephalus vetulus* (O.F.M.)
*Chydorus sphaericus* s. str. (O.F.M.)

The only species calling for comment is *C. vernalis americanus* which is a rather uncommon species occurring chiefly in southern England. I have found this species in the Huddersfield district, but apart from these records it does not appear to have been taken north of Warwickshire. Only a single specimen was taken, this being from a small but deep and clear pool overgrown with *Ranunculus aquatilis* L. between Kilpin and Saltmarshe. All the other species taken are common and were to be expected in such habitats.'

**Conchology** (Mrs. E. M. Morehouse) : On the Wressle Castle Farm and surrounding land the following were observed :

*Limnaea pereger* Müll.
*Helix nemoralis* L.
*Theba cantiana* Montagu
*Pyramidula rotundata* Müll.
*Limax maximus* L.
*Agriolimax agrestis* L.
*Planorbis spirorbis* L.

Mainly in the woods on the Saltmarshe Estate were taken :

*Vitrea pura* Alder
*V. alliaria* Miller
*V. cellaria* Müll.
*V. nitidula* Drap.
*Pyramidula rotundata* Müll.
*Cochlicopa lubrica* Müll.

In a pond at Howden the following were taken :

*Physa fontinalis* L.
*Aplecta hypnorum* L.
*Planorbis spirorbis* L.
*Limnaea auricularia* L.

**Mycology** (W. G. Bramley) : Only two of the localities on the circular were investigated, viz. a small area in the immediate vicinity of Loftsome Bridge and Saltmarshe. Most attention was paid to the dead vegetation and at the Bridge the stems of last year's teasels yielded a new British pyrenomycete. Specimens collected in 1947 near Tadcaster had not been named. *Typha* had a *Pleospora* as well as a *Lophodermium* not on the Yorkshire list. It is probably not uncommon. *Phragmites* proved rather poor in fungi at both localities, several gatherings were sterile and effete, and except for a *Tapesia* nothing else was found on it. A fine group of *Polyporus squamosus* was the only polypore noted. Jew's Ear was frequent on its usual host and was also seen on horse chestnut. The much rarer *A. mesenterica* was noted on elm. The bird's nest fungus was found growing on dead young branches of *Sambucus*, while the common ash pyrenomycete, *Daldinia*, was also noted on horse chestnut. *Solenia fasciculare* looking like an elongated white discomycete is not as frequent as its brown, hairy relative, *S. anomala*. Both were found and are a trap for the inexperienced fungus hunter.

The following is a list of the more interesting and uncommon species :

† Not in Mason & Grainger's *Catalogue* for Yorkshire.
* Not in Mason & Grainger's *Catalogue* for V.C. 61.
L.=Loftsome Bridge. S.=Saltmarshe.

DISCOMYCETES

*Dasyscypha acutipila* (Karst.) Sacc., on *Phalaris*, L.
*D. nivea* (Hedw. fil.) Sacc., on *Quercus*, S.
†*D. nudipes* var. *minor* Dennis, on *Epilobium*, L.
†*Tapesia evilescens* Karst., on *Phragmites*, S.

PYRENOMYCETES

†*Phyllachora dactylidis* on *Dactylis*, L.
†*Ophiobolus herpotrichus* (B. & Br.) Sacc., on *Agropyron*, L.
**O. rubellus* (Pers.) Sacc. (=*porphyrogenus* (Tode)), on umbellifer stems, L. ; on potato stems, S.
†*Pleospora typhicola* (Cooke) Sacc., on *Typha*, L.
†*Lophodermium typhinum* Lamb., on *Typha*, S.

Basidiomycetes

†*Puccinia mirabillissima* Peck, II. III. on *Mahonia*, S.
*Uromyces geranii* Otth. & Wart., OI. on *G. pratense*, L.
**Auricularia mesenterica* (Dicks.) Fr., on *Ulmus*, S.
**Solenia fasciculata* Pers., on *Ulmus*, S.

Fungi Imperfecti

**Dinemasporium hispidulum* (Schrad.) Sacc., on *Urtica* & umbellifer, L.; on *Sambucus*, S.
*Helminthosporium turbinatum* B. & Br., on *Sambucus*, S.

**Bryology** (R. Lewis): The bryophyte flora of the area explored during the week-end, apart from that of Skipwith Common, is not prolific or particularly interesting. One or two species were, however, recorded for the first time from the Wressle Castle and Saltmarshe areas. *Cinclidotus fontinaloides* was collected from the River Derwent near Wressle Castle, and *Pottia heimii* was found growing with *Barbula tophacea* and *Bryum caespiticium* on the mud of the Ouse embankment at Saltmarshe. I am pleased to be able to confirm that *Dicranum rugosum* (*D. undulatum*) and *D. spurium* are still growing plentifully in a small wood near the road between Skipwith and Thorganby villages.

The following is a complete list of all the mosses and liverworts noted during the three days with the localities of the more local plants, and the recorder's name where a specimen has not been seen by me:

Sphagna

The peat mosses were totally absent from the Wressle and Saltmarshe areas, but were quite abundant on Skipwith Common. No effort, however, was made to collect or list these in view of the full and adequate lists already published by Mr. A. Thompson in his *Yorkshire Sphagna* in *Trans. Y.N.U.*, Part 37, 1946.

True Mosses

*Polytrichum piliferum* Hedw. Skipwith Common.
*P. formosum* Hedw. Det. A. Thompson. Skipwith Common.
*Fissidens bryoides* Hedw.
*F. taxifolius* Hedw.
*Ceratodon purpureus* (Hedw.) Brid.
*Pseudephemerum nitidum* (Hedw.) C. Jens. (*Pleuridium axillare* (Dicks.) Lindb.) Wressle. Mrs. J. Appleyard.
*Dicranella heteromalla* (Hedw.) Schp. Skipwith Common.
*Dicranoweisia cirrata* (Hedw.) Lindb.
*Dicranum bonjeani* De Not. Skipwith Common.
*D. scoparium* Hedw. Skipwith Common.
*D. rugosum* Brid. (*D. undulatum* Ehrh. non Turn.) Between Skipwith and Thorganby.
*D. spurium* Hedw. Between Skipwith and Thorganby.
*Campylopus piriformis* (Schultz) Brid. Skipwith Common.
*Leucobryum glaucum* (Hedw.) Schp. Skipwith Common.
*Tortula latifolia* (Bruch) Hartm. (*T. mutica* (Schultz) Lindb.) Near Loftsome Bridge, Wressle.
*T. muralis* Hedw.
*Pottia heimii* (Hedw.) Fünr. Ouse Embankment, Saltmarshe.
*P. truncata* (Hedw.) Fünr. (*P. truncatula* Lindb.) Wressle. Mrs. J. Appleyard.
*Cinclidotus fontinaloides* (Hedw.) P. Beauv. River Derwent, near Wressle Castle.
*Barbula convoluta* Hedw. Wressle.
*B. tophacea* (Brid.) Mitt. On Ouse Embankment, Saltmarshe.
*Funaria hygrometrica* Hedw.
*Physcomitrium pyriforme* (Hedw.) Brid. Wressle.
*Orthodontium lineare* Schwaegr. (*O. gracile* (Wils.) Schwaegr. var. *heterocarpum* W. Watson)
*Pohlia nutans* (Hedw.) Lindb. (*Webera nutans* Hedw.) Skipwith Common.
*P. delicatula* (Hedw.) Grout (*Webera carnea* Schp.) Wressle.
*Bryum caespiticium* Hedw. On Ouse Embankment, Saltmarshe.
*B. argenteum* Hedw.
*B. capillare* Hedw.
*Mnium hornum* Hedw.

*Aulacomnium palustre* (Hedw.) Schwaegr. Skipwith Common.
*A. androgynum* (Hedw.) Schwaegr. Saltmarshe.
*Orthotrichum affine* Brid.
*Leptodictyum riparium* (Hedw.) Warnst. (*Hypnum riparium* Hedw.) Saltmarshe. Mrs. J. Appleyard.
*Amblystegium serpens* (Hedw.) B. & S.
*Drepanocladus aduncus* (Hedw.) Warnst. (*Hypnum aduncum* Hedw.) Wressle. Mrs. J. Appleyard.
*Drepanocladus fluitans* (Hedw.) Warnst. (*Hypnum fluitans* Hedw.) Skipwith Common.
*Acrocladium stramineum* (Brid.) Richards & Wallace. (*Hypnum stramineum* Brid.) Skipwith Common. Mrs. Appleyard.
*A. cuspidatum* (Hedw.) Lindb. (*Hypnum cuspidatum* Hedw.)
*Camptothecium sericeum* (Hedw.) Lindb.
*Brachythecium rutabulum* (Hedw.) B. & S.
*B. velutinum* (Hedw.) B. & S. Saltmarshe. Mrs. J. Appleyard.
*Eurhynchium praelongum* (Hedw.) Hobk.
*E. riparioides* (Hedw.) Jennings (*E. rusciforme* (Neck.) Milde)
*E. confertum* (Dicks.) Milde. Saltmarshe. Mrs. J. Appleyard.
*Pleurozium schreberi* (Brid.) Mitt. (*Hypnum schreberi* Brid.) Skipwith Common.
*Plagiothecium denticulatum* (Hedw.) B. & S. Skipwith Common.
*Hypnum cupressiforme* Hedw.
*H. cupressiforme* Hedw. var. *ericetorum* B. & S. Skipwith Common.

HEPATICS

The following liverworts were all noted on Skipwith Common except *Pellia epiphylla* which was the only hepatic seen in the Wressle area :

*Pellia epiphylla* (L.) Corda
*P. Fabbroniana* Raddi
*Alicularia scalaris* (Schrad.) Corda
*Lophozia ventricosa* (Dicks.) Dum.
*Lophocolea bidentata* (L.) Dum.
*L. cuspidata* Limpr.
*Odontochisma sphagni* (Dicks.) Dum.
*Calypogeia Trichomanis* (L.) Corda
*Ptilidium ciliare* (L.) Hampe.

For the classification and nomenclature of the Mosses I have followed Richards, P. W. and Wallace, E. C., *Trans. B.B.S.* **1**. pt. 4, i-xxxi, 1950. In order, however, to avoid any confusion I have also added the more familiar names of Dixon's *Students' Handbook of British Mosses*.

In conclusion I should like to express my thanks to Mrs. J. Appleyard for much assistance in compiling this list, and for her help with the identification of doubtful plants ; also to Mr. A. Thompson for his determination of *Polytrichum formosum*, and to Miss E. Crackles and her students for drawing my attention to plants in the field.

## WEST BURTON and WALDENDALE, June 2nd

A week previous to the date of this meeting gave no promise of the fine weather that was experienced by the few members who attended. The cold season kept back all plant growth and no insects appeared until the end of May.

Waldendale is a bleak area at any time, a deep, narrow valley facing into the north-east from where the cold winds had come for most of the early part of the year. It is cut off from the south by a large area of high mountainous moorland with Buckden Pike, 2,302 ft., at the head of the dale. We were fortunate to have a warm, sunny day for our visit and this made amends for the lack of flowers and insects due to the backward season. The falls at West Burton are well known and have been visited frequently by naturalists, but on this occasion our meeting was arranged to investigate the higher portion of the dale which appeared to offer little, being neglected by visitors and unknown to the Union. Botanists were rewarded for their effort by finding *Hutchinsia* which has been known for at least sixty years as growing in plenty on the riverside wall below West Burton village and the falls. Recently a flood from what was described as a cloudburst washed away the greater part of this wall and very little of the plant remained. Members were pleased, therefore, to find that in the neglected area of Waldendale it was in one place in much greater profusion than it used to be in the old habitat. One plant to delight the eye with bloom was sweet ciceley, but it was only in the lower part of the dale that the bird cherry was in full flower.

Insects were scarce, a few black empid species of diptera were in the air around the trees and our Treasurer with the eye of an angler saw a few early mayflies on the stream. The only species of stoneflies noted were the Perlas. No caddisflies were noted and the only cranefliès caught were the streaky-winged and somewhat uncommon *vittata* and common *lateralis* by the streamside. Butterflies were scarce, only odd Whites and a Small Tortoiseshell being seen, but high up on the hillside on the south of the valley some large moths were reported and the smaller Common Heath Moth was just appearing. It was strange to see a large number of House Martins evidently catching insects just above the ling which covered a portion of the hillside some 1,250 ft. up and a long way from the houses of the village. A rookery up here had a dozen nests in a small plantation high above the more normal habitat of the species.

**Ornithology** (J. P. Utley) : Conditions for observation were excellent and it is regretted that it was impossible to cover the whole of the dale and particularly the head where, it is admitted that the number of species seen would be small, but they could have been most interesting. The lower part of the dale was examined and an excursion made via Morpeth Scar to the Height of Hazeley and down Thapton Gill. Interesting items were the recording of Nuthatches in the old timber leading to Morpeth Scar ; a pair of Ring Ousels seemed to be in occupation of each scar visited after the plantation line had been passed ; the finding of a rookery of several nests by Mr. Hartley at an altitude of 1,200 ft., nests at this height are most unusual : in my census of rookeries taken in 1942 there is no record of a rookery higher than 1,000 ft. (*Naturalist*, 1942, p. 165). Miss Robb found a female Mallard with a family and a Dipper was seen feeding young at a nest at West Burton Falls to which access appeared possible only by flying through the falling water. Owing to indisposition it was not possible for Mr. Chislett to arrive till late in the afternoon but he managed to add Lesser Redpoll to the list. With Mrs. Chislett, his appearance at the meeting was most welcome. The very creditable total of 57 species was recorded as follows : Carrion Crow, Rook, Jackdaw, Starling, Greenfinch, Lesser Redpoll, Linnet, Chaffinch, Yellow Bunting, Reed Bunting, House Sparrow, Skylark, Tree Pipit, Meadow Pipit, Yellow Wagtail, Grey Wagtail, Pied Wagtail, Tree Creeper, Nuthatch, Coal Tit, Blue Tit, Marsh Tit, Long-tailed Tit, Spotted Flycatcher, Willow Warbler, Garden Warbler, Blackcap, Whitethroat, Mistle Thrush, Song Thrush, Ring Ousel, Blackbird, Wheatear, Redstart, Robin, Hedge Sparrow, Wren, Dipper, Swallow, House Martin, Swift, Cuckoo, Tawny Owl, Mallard, Wood Pigeon, Stock Dove, Curlew, Snipe, Sandpiper, Golden Plover, Lapwing, Black-headed Gull, Moorhen, Black Grouse, Red Grouse, Pheasant and Partridge. The Cuckoo was not heard very much ; in the area visited there were not many Lapwings, and but one Black Grouse (Black-cock) was seen near the head of Thapton Gill.

Had more ornithologists been present at the meeting the list would probably have been longer.

**Flowering Plants** (C. M. Rob) : The effects of the abnormally late season were very marked, especially in the upper part of the dale around Waldenhead, where *Anemone nemorosa* L. and *Ranunculus ficaria* L. were still in full bloom. Lower down the dale about Cote Farm, *Adoxa moschatellina* L. and *Primula vulgaris* Huds. were noted still in flower, while *Equisetum telmateia* Ehrh. still had fertile fronds at about 700 ft. The vegetation on the whole seemed to be about a month behind normal. *Hutchinsia petraea* (L.) R. Br. which has almost gone from its well-known station by the beck, owing to the wall being damaged in a 'cloudburst,' is plentiful on walls at the Walden end of West Burton village growing with *Saxifraga tridactylites* L. and *Linaria cymbalaria* (L.) Mill. *Primula farinosa* L. was plentiful over a limited area about halfway up the dale and here also were noted *Pinguicula vulgaris* L., *Selaginella selaginoides* (L.) Link., *Asplenium viride* Huds. and *Polystichum setiferum* (Forsk.) Woynar. were seen on rocks near the beck. *Ophioglossum vulgatum* L. was plentiful, especially in the upper part of the dale, while *Botrychium lunaria* (L.) Sw., occurred sparingly near Waldenhead Bridge. Other plants noted included *Cardamine amara* L., *Arabidopsis thaliana* (L.) Heynh., *Salix phylicifolia* L., *Orchis mascula* L., *Paris quadrifolia* L., *Luzula pilosa* (L.) Willd., and *Carex caryophyllea* Latour, the last named being almost dominant in some of the marginal grassland.

**Bryology** (Mrs. Appleyard) : The main valley of the Walden Beck was

followed and it may be that a richer bryophyte flora would have been found in the side gills.

On leaving the road near Cote *Tortula laevipila* Schwaeg. was found on a tree and on the wall below. In addition to *Dichodontium pellucidum* Schp., which was plentiful on wet rocks, there was a little *D. flavescens* Lindb. growing in the gritty sand on the margin of the stream. *Barbula cylindrica* Schp., *B. sinuosa* Braith. and *Ditrichum homomallum* Hampe occurred sparingly. The most interesting place was an area of dripping tufa rock. Here grew *Orthothecium intricatum* B. & S., *Weisia rupestris* C.M. and *W. verticillata* Brid. The last named was fruiting freely. Other mosses which are not common in fruit were seen with capsules, namely *Amblystegium filicinum* De Not. and *Hypnum cuspidatum* L. There was a fine show of *Conocephalum conicum* (L.) Dum. on the tufa, some *Aplozia riparia* Tayl., a little *Lophozia Floerkii* Web. & Mohr and some *L. turbinata* Raddi.

**YEARSLEY DAM, June 16th**

The piece of country chosen for this meeting had not previously been visited by the Union. On its two earlier visits to Coxwold the hillier country to the north and east had been explored. The area proved to be pleasant and the day fine and sunny and most members probably enjoyed the excursion even if they went home with little material new to them. An exception to the latter, however, was provided by Mr. Bramley who reports that on *Scirpus* he found seven species of microfungi, two being new to Britain, three others new to Yorkshire and two more with very few records. The ornithologists were present in force as usual, and Mr. Utley was able to give a goodly list of species seen during the day. As the entomologists present numbered only three it is not possible to draw general conclusions regarding the insects though the small number of lepidoptera and diptera seen was in accord with statements from all over Britain this summer. Mr. Whitehead was able to add to the vice-county list, however. Wading up the artificial channel through which the water flows fast on leaving the reservoir was interesting as a number of species with aquatic larvae were to be found on the concrete walls. The President was in the chair at the meeting which followed tea and eleven Societies answered the roll-call. About twenty-eight members had been present during the day, including our old-time member, Prof. E. Percival, who is on holiday from New Zealand.

**Mammalia** (J. P. Utley) : No definite records were taken but a few notes might prove of interest. The grey squirrel was seen alive, but 26 were dead counted as they hung on a keeper's gibbet ; with them were about the same number of stoats and weasels. One member of the party had the uncommon experience of watching for some time a family of two parents and five young weasels at play. The keeper for that area told me that all the vermin seen on the gibbet had been shot within the last six weeks : he also said that rabbits were one of the most serious pests because of the damage done to young corn—this was evident in the fields alongside the plantations. Considerable areas were being enclosed by rabbit netting which should result in a reduction of damage and confine the pest to limited areas. It would appear that foxes are something of a menace even though the area may be covered by three hunts—York and Ainsty, Bramham Moor and Sinnington. One particular dog fox which has the distinction of having no tail, has for some time evaded capture by hunts, organised shoots or casual gun. He is said to be very fast—maybe because he has no brush to carry ! A few nights before the meeting he was at Pond Head Farm. A Forestry Commission Warden told me that badgers, which were fairly common, were their worst enemy, being strong enough to get under the wire-netting guarding plantations and so let in rabbits, etc.

**Ornithology** (J. P. Utley) : An examination of recorded species shows the area covered to be most favourable to the smaller passerines. The country examined would cover about one and a half square miles and the greater portion of this was either plantation, felled plantation, or scrub. The so-called ' moor ' (550 ft.), although carrying *calluna* and *erica*, was also fairly densely spotted with birch scrub. There were a few rills but no real streams, so associated bird life was absent. The dams had no shingly beaches or mud flats but there was considerable cover in reed beds at the sides. The upper sheet of water seemed ideal for Great Crested Grebe but not even the Little Grebe was recorded ; the pair of Mute Swans, who had a family, may be responsible for the lack of *Podiceps*. On the Keeper's Gibbet mentioned under MAMMALIA, were a few Carrion Crows, Rooks, Jackdaws, one Jay and one Little Owl. The keeper told me that both Tawny Owl and Barn

Owl were present in the area, though neither species was seen by any member ; he assured me that he never shot them. I asked about Magpies and he said that there were none, yet adults and a young brood were seen by some members ! There were very few Cuckoos and not many pairs of Lapwings. The one Grasshopper Warbler heard was in the locality which has been favoured by the species for a number of years. A rather surprising feature was the small number of Titmice seen or heard, for the mixed hardwood and conifer plantations and the large areas covered by birch, indicated a goodly number of *Parus*. One species which failed to appear was Goldcrest.

A useful total of 56 species was recorded as follows : Carrion Crow, Rook, Jackdaw, Magpie, Jay, Starling, Greenfinch, Goldfinch, Linnet, Chaffinch, Yellow Bunting, Reed Bunting, House Sparrow, Skylark, Tree Pipit, Pied Wagtail, Tree Creeper, Great Tit, Blue Tit, Coal Tit, Long-tailed Tit, Spotted Flycatcher, Willow Warbler, Wood Warbler, Grasshopper Warbler, Sedge Warbler, Garden Warbler, Blackcap, Whitethroat, Mistle Thrush, Song Thrush, Blackbird, Redstart, Robin, Hedge-Sparrow, Wren, Swallow, House Martin, Sand Martin, Swift, Green Woodpecker, Great Spotted Woodpecker, Cuckoo, Little Owl, Kestrel, Heron, Mute Swan, Mallard, Wood Pigeon, Turtle Dove, Woodwock, Lapwing, Moorhen, Coot, Pheasant and Partridge.

**Freshwater Biology** (H. Whitehead) : Collecting commenced on arrival, Professor Percival examining submerged logs and stones on the margin of the dam and also the concrete lined overflow. Winged insects were taken in sweeping nets by Mr. K. G. Payne and the writer. Nymphs of Aeschnids, Libellulids and demoiselle dragonflies were found on logs. A good selection of caddisflies, pupae and larvae, included *Phryganea striata* L., ♂♀ ; *Limnephilus auricula* Curt., ♂ ; *Lype phaeopa* Steph., ♂♂. A few pupae hatched out a few days later and were identified as *Mystacides longicornis* L.—the grouse wing of fisherman. Larvae of unidentified species of *Hydropsyche* and *Athripsodes* occurred on logs and under stones.

*Ephemera danica* Müll, ♂♂ (Black Drake) were numerous near the sandy shores and nymphs of *Baetis* and *Caenis* completed the list of mayflies. Other insects of interest were the alderfly, *Sialis lutaria* (L.) which was quite common and also *Simulium* larvae and eggs in the overflow channel.

A good-sized specimen of crayfish and one small one were caught. Two other crustaceans, *Gammarus pulex* L. and *Asellus aquaticus* L. were numerous.

Three species of leeches were noted : *Glossiphonia complanata* (L.), *G. heteroclita* (L.) and two specimens of the very interesting *Protoclepsis tesselata* (O.F.M.) The last-named is said to invade the nostrils and throat of ducks and other water fowl. So far I have been unable to obtain confirmation of this from members of our Ornithological Section, but there is a record of a small specimen having been found in the nasal cavity of a curlew at Loch Rhynd, Perthshire.

Three species of planarians were seen : *Dendrocoelum lacteum* Müll. and unidentified species of *Planaria* (? *polychroa*) and *Polycelis*.

**Conchology** (Mrs. E. M. Morehouse) : With the help of our President and Professor Percival, the following species were taken. The lakes and woodland were well worth further investigations.

*Limnaea stagnalis* L.
*L. pereger* Müll.
*Planorbis umbilicatus* Müll.
*P. spirorbis* L.
*P. albus* L.
*Paludestrina jenkinsi* Smith
*Bithynia tentaculata* L.
*Sphaerium corneum* L.
*Anadonta cygnaea* L.
*Pyramidula rotundata* Müll.
*Vitrea alliaria* Miller
*Vitrea cellaria* Müll.
*V. pura* Alder.
*V. chrystallina* Müll.
*Carychium minimum* Müll.
*Euconulus fulvus* Müll.
*Agriolimax agrestis* L.
*Limax maximus* L.
*Arion ater* L.
*A. ater* var. *brunnea* Roebuck
*A. ater* var. *plumbea* Roebuck

**Flowering Plants** (C. M. Rob) : Absence of published records, especially in a district so near the favoured haunts of past botanists is never a hopeful sign, and the flora of the area visited was not of outstanding interest, though there was a good variety of plants noted, and the abundance of certain species was quite exceptional.

The ponds had little marginal vegetation. Large areas of *Scirpus lacustris* L. occurred at the top end, with smaller beds in favourable places all along the shores. *Carex rostrata* Stokes also occurred at the top end and *C. vesicaria* L. was abundant around both the ponds and in the swampy woodland nearby. The best plant of the ponds was *Potamogeton gramineus* L. This was plentiful and it was particularly pleasing to see it here as it has gone from both Gormire and Pilmoor. *Hippuris vulgaris* L. was noted in one or two spots, and *Scirpus sylvaticus* L., *Littorella uniflora* (L.) Aschers. and *Chara hispida* L. also occurred.

The exceptional size and abundance of *Lysimachia nemorum* L. was a feature of the felled woodland, the disused rides being carpeted with the plant. There was a good show of sedges and in addition to the two mentioned *C. remota* L., *C. tumidicarpa* Anderss., *C. pallescens* L., *C. Otrubae* Podp., *C. hirta* L., *C. nigra* (L.) Reichard, *C. pilulifera* L. and *C. sylvatica* Huds. were noted.

*Cerastium arvense* L., *Sherardia arvensis* L. and *Carlina vulgaris* L. were in the old quarries overlooking the ponds. *Crepis paludosa* (L.) Moench. and *Valeriana dioica* L. occurred in the wet woodland at the head of the ponds. *Ophioglossum vulgatum* L. was plentiful in the surrounding grassland. *Spergularia rubra* (L.) J. & C. Presl and *Ornithopus perpusillus* L. were seen on the sandy moorland higher up.

An interesting alien, *Amsinckia lycopsoides* Lehm., a native of California, was found by Mr. Utley in an arable field near Ampleforth, where it was plentiful.

**Mycology** (W. G. Bramley) : Most of the time was spent in the examination of the vegetation of the upper lake and a small area of the swampy woodland. Uredines were not much in evidence, the only outstanding example was the finding of aecidia of *Ochropsora sorbi* on the leaves of *Anemone*. A visit a month later failed to reveal any occurrence of the other stages on the Mountain Ash. Dead stalks of *Scirpus* provided no less than seven different species, two of which are new to Britain and three new to Yorkshire.

The numerous plants of *Caltha* were healthy, but one small patch yielded *Ramularia calthae*. The larger fungi were, as expected, not much in evidence, but a small *Mycena* was quite frequent on the *Scirpus*, often in groups of twenty or more and has been named *M. quisquiliaris* by Dr. Dennis of R.B.G., Kew, to whom I am indebted for identifying and checking other materials.

The following list gives only the more interesting species :

‡ New to Britain.
†Not in Mason & Grainger's *Catalogue of Yorkshire Fungi*.
*Not in Mason & Grainger's *Catalogue* for V.C. 62.
Y=in Herb. Yorkshire Museum, York.
K=in Herb. R.B.G., Kew.

Discomycetes

*Calycella uliginosum* (Fr.) Boud., Y.
‡*Dasyscypha albidorosea* (Rehm.) Dennis, on *Scirpus*, Y.K.
†*D. controversa* (Cooke) Rehm., on *Digraphis*.
†*D. inquillina* (Karst.) Winter, on *Equisetum*, Y.K.
†*D. nudipes* var. *minor* Dennis, on *Epilobium*.
†*D. pudibunda* (Quel.) Sacc., on *Salix*, Y.K.
**Mollisia phalaridis* Rehm, on *Digraphis* (= ?*arundinacea* (DC.) Phill.)
‡*Sclerotinia scirpicola* Rehm, on *Scirpus*, K.

Pyrenomycetes

†*Cryptodiaporthe salicina* (Curr.) Wehm., on *Populus*, Y.
†*Leptosphaeria libanotis* (Fuckel) Messl., on *Angelica*, Y.
†*L. sowerbyi* (Fuckel) Sacc., on *Scirpus*, Y.K.
**Pleospora scirpicola* Karst., on *Scirpus*, Y.
†*P. typhicola* (Cooke) Sacc., on *Typha*, Y.

Uredinales

*Ochropsora sorbi* Diet., OI on *Anemone*.

Agaricales

†*Mycena quisquiliaris* Joss., on *Scirpus*, K.

Fungi Imperfecti

*Cladosporium herbarum* (Pers.) Link, on *Scirpus*, Y.
†*Phoma lacustris* Karst., on *Scirpus*, Y.K.

**Bryology** (Mrs. Appleyard) : There are no bryological records for Yearsley Dam, neither did the excursion bring to light any noteworthy species.

A curious form of *Fontinalis antipyretica* L. was observed at the end of one of the lakes. It was very large in the leaf and growing erect in large tufts. Later a few stems were found growing in a damp but not very wet patch of ground, among grass and other mosses, and looking very like a *Fissidens*.

A fine patch of fruiting *Marchantia polymorpha* L. covered a considerable area and in a boggy place there was a healthy growth of *Mnium Seligeri* Jur. ex Lindb.

Besides some of the commoner species, other mosses noted were : *Dicranella varia* Schp., *D. squarrosa* Schp., *Tetraphis pellucida* Hedw., *Orthotrichum anomalum* var. *saxatile* Milde, *O. affine* Schrad., *O. diaphanum* Schrad., *Bryum pallens* Sw. (a slender form), *Hookeria lucens* Hedw., *Eurhynchium murale* Milde, *Fossombronia pusilla* L., *Calypogeia arguta* Nees & Mont.

## DEANHEAD VALLEY, June 30th

This excursion was favoured by warm, sunny weather and was attended by about thirty Members and Associates, representing seven Societies.

**Ornithology.** Mr. T. D. Bisiker reports that the following birds were identified : Carrion Crow, Rook, Magpie, Yellow Bunting, Lark, Meadow-pipit, Pied Wagtail, Blackbird, Wheatear (4 pairs), Wren, Dipper, Swallow, Swift, Woodpigeon, Curlew and Sandpiper. One Meadow-pipit's nest contained a young Cuckoo aged about a week.

**Freshwater Biology** (H. Whitehead and G. Fryer) : Work commenced with the examination of a dam in a small stream just above a mill. A fine nymph of *Siphlonurus sp.* was taken along with the small crustaceans, *Alona quadangularis* (O.F.M.), *Chydorus sphaericus s. str.* (O.F.M.), *Cyclops fuscus* (Jurine), *C. albidus* (Jurine) and *C. agilis s. str.* (Koch).

The main stream (Black Burne) was then followed up to Scammonden. The stream bed consisted chiefly of angular stones projecting above the water surface with slight growths of moss. In one or two places the bed consisted of solid rock on which there was a moderately thick growth of algae. There was very little animal life in the stream, nymphs of *Baetis* and *Rhithrogena* and a few caddis larvae including *Rhyacophila* and *Hydropsyche*. Small trout were abundant and probably a good deal of their food consisted of non-aquatic insects from the banks. Few winged insects were seen. The alderfly, *Sialis lutaria* (L.) was fairly common and the stoneflies *Isoperla grammatica* (Poda), *Chloroperla torrentium* (Pict.), *Leuctra inermis* Kemp. and *Amphinemura sulcicollis* (Steph.).

After tea and the meeting, G.F. continued upstream to the reservior where he took a fine specimen of *Phryganea striata* L., ♀. He found that the plankton in the reservoir was dominated by the rotifer, *Brachionus sp.* There were also a few *Cyclops vernalis s. str.* (Fischer) and, amongst algae on the margin, *Chydorus sphaericus* (O.F.M.).

**Botany** (Mrs. J. Appleyard) : The Deanhead Valley, being a millstone grit area, was not expected to yield a rich flora and this proved to be the case.

Striking features of the vegetation were the beautiful masses of *Polygonum bistorta* L. to be seen in many places and the predominance of the delicate Wood Horse-tail, *Equisetum sylvaticum* L. *Claytonia alsinoides* Sims was well established along the Black Burne and the Small Flowered Monkey Musk, *Mimulus moschatus* Lindb. grew in many places along the stream. *Ranunculus flammula* L. and *Viola palustris* L. occurred in boggy places and there was some *Myrrhis odorata* (L.) Scop. at the lower end of the valley.

Other plants noted were : *Lactuca muralis* (L.) Fresen., *Angelica sylvestris* L., *Montia fontana* L., and *Ranunculus Lenormandi* F. Schultz. Some members observed *Ilex aquifolium* L. *var. ferox* growing near the old vicarage, doubtless a relic of cultivation.

Sedges were poorly represented. *Carex ovalis* Good., and *C. nigra* (L.) Reichard being the only species noted.

**Bryology** (Mrs. J. Appleyard and H. Walsh) : The valley was entered below the Manor House at Red Lane Dyke and the brook followed to near the reservoir. Rough pasture and a few marsh areas adjoin the brook and along its course are a few shale outcrops and clay banks, with little woodland. The route did not include

any moorland. Little was found beyond what would be expected in such an area, the following being the plants met with. In the brook *Hypnum ochraceum* Turn. was dominant, with *Fontinalis antipyretica* L. and *Scapania undulata* (L.) Dum. *Alicularia compressa* (Hook.) Nees was more local, with a little *Aplozia sphaerocarpa* (Hook.) Dum. on projecting boulders. *Catharinea crispa* James is present by the brook side but in more quantity on the exposed sides of the reservoir. The clay banks provided *Polytrichum aloides* Hedw. with the hairy calyptras well above the leaves, much of what appeared to be *Dicranella rufescens* Schp. but not seen fruiting, and a little *Webera carnea* Schp. On stones by the brook and in marsh and pasture were found *Mnium hornum* L., *Brachythecium rivulare* B. & S., *Eurhynchium rusciforme* Milde, *Hyocomium flagellare* B. & S., *Dichodontium pellucidum* Schp., *Fissidens taxifolius* Hedw., *F. bryoides* Hedw., *Webera albicans* Schp., *Mnium punctatum* L., *Bryum pseudo-triquetrum* Schwaeg., *Plagiothecium elegans* Sull., *Dicranella cerviculata* Schp., *D. Schreberi* Schp., *D. squarrosa* Schp., *Webera annotina* Schwarg., *Chiloscyphus polyanthus* (L.) Corda, *Calypogeia Trichomanis* (L.) Corda, *Cephalozia bicuspidata* (L.) Dum., *Alicularia scalaris* (Schrad.) Corda, *Gymnocolea inflata* (Huds.) Dum. Much rarer were *Calypogeia arguta* Nees & Mont., *Alicularia geoscyphus* De Not., and *Fossombronia pusilla* (L.) Dum., with *Pellia epiphylla* (L.) Corda generally distributed. *Orthodontium lineare* Schwaegr. (*heterocarpum* Wats.) was met with in a few places but not plentifully and only appeared in poor condition. On the main road above Outlane, *Webera proligera* Bryhn was seen in some quantity on a roadside bank and on the shale outcrops in the valley.

## THORP ARCH, July 14th

The early morning was wet and this may have reduced the attendance. The fine afternoon gave what seems to be the normal attendance, about thirty from eight Societies. Again we were glad to see Professor Percival and the freshwater biologists were the main workers. Some doubt had been expressed about two plants listed in the Circular, but *Lactuca virosa* proved correct and the *Pyrus torminalis* is apparently bird sown. It grows on a perpendicular cliff and produces a few flowers and sets fruit.

**Freshwater Biology** (H. Whitehead): The examination of the river bank by Professor E. Percival, Messrs. K. G. Payne, E. Thompson and the writer below and above the bridge produced a pleasing number of species and individuals of aquatic insects. This was in spite of threatening weather following heavy rains. Large numbers of sub-imagoes of mayflies were about and many of these reached their final instar after capture. Several ♂♂ of *Paraleptophlebia cincta* (Retz.) were taken and also *Habrophlebia fusca* (Curt.), ♂, *Ephemerella ignita* (Poda) as nymphs, sub-imagoes and imagoes. *Heptagenia sulphurea* (Müll.), sub-imagoes and ♂♀ imagoes. There were also nymphs and a sub-imago of *Ecdyonurus*—probably *E. dispar* (Curt.). A number of ♂♂ of *Caenis macrura* Steph. were found dead, floating in a pool of water under trees.

The small caddis, *Pschomyia pusilla* Fab. occurred in great numbers. Several individuals of *Mystacides nigra* L. ♂♂♀♀ were taken on the river bank above the weir. Other caddis were *Athripsodes dissimilis* (Steph.) ♂♀ (third record for the county), *Polycentropus flavomaculatus* Pict. ♂ *Lype phaeopa* Steph. ♂ and a ' micro ' caddis, *Hydroptila forcipata* Eaton, ♂.

The only stoneflies captured were a few *Leuctra fusciventris* Step. ♂♀ and exuviae of *Perlodes mortoni* (Klap.).

**Fungi** (W. G. Bramley): Although some forty species of fungi were noted, nothing of outstanding interest was amongst them. More intensive search, especially amongst the luxuriant herbage of the riverside, would no doubt have yielded many of the smaller species. A number of agarics were seen including quite a number of the horse mushroom (*Psalliota arvensis*). Although the meadow cranesbill was attacked by *Plasmopa pusilla* no *Uromyces* was found on the many plants examined.

The following are not recorded in Mason & Grainger's *Catalogue* for V.C. 64.

*Mollisia discolor* (Mont. ex Fr.) Phill., on *Crataegus*.

*Hyalinia dilutella* (Fr.) Boud., on *Heracleum* and *Epilobium hirsutum*.

*Ophiobolus acuminatus* (Sow.) Duby, on thistle stems.

*Puccinia crepidis* Schroet., II. on *Crepis virens*.

# THE SPRING FORAY AT HEBDEN BRIDGE
## April 19th-23rd, 1951

W. G. BRAMLEY

FINE though cold weather favoured the rather small company which gathered for the 1951 spring foray. The writer was only able to be present for one day and only some half dozen members were staying at headquarters, together with about the same number of visitors. Amongst the latter we were pleased to welcome and make the acquaintance of Messrs. W. D. Graddon and J. T. Palmer of the North Western Naturalists' Union. Members of local societies also turned up.

Hebden Bridge does not seem to have been visited by the mycological committee before though the district had been well worked at the beginning of the century especially by James Needham, and many interesting records are to be found in the pages of *The Naturalist* and the *Fungus Flora of Yorkshire*.

From the evidence of this meeting it is apparent that industrialisation during the past 40 or 50 years has had a great effect on the cryptogamic plant life of the area and this is apparent in the lichen notes attached, these plants being particularly susceptible to atmospheric pollution. Most of the collecting was done in the Hardcastle Crags area where fungi were scrace. Three days' collecting by Mr. Graddon produced only 15 Discomycetes. More fungi would probably have been found but some of our most assiduous collectors were unfortunately absent and some records have not yet been received by the recorder.

I am much obliged to Mr. Graddon for the list of Discomycetes and to Mr. Rimington for the account of the Lichens.

†Not in Mason & Grainger's *Catalogue of Yorkshire Fungi*.
*Not in Mason & Grainger's *Catalogue* for V.C.63.

PYRENOMYCETES

**Didymella tosta* B. & Br., on *Epilobium angustifolium*.
*Nectria mammoidea* Phill. & Plowr.
†*Melanomma subdispersum* (Karst.) Berl. & Vogl. (stat. con. on *Betula*).

DISCOMYCETES

*Ombrophila clavus* (A. & S.) Cooke, on rotten wood.
*Sclerotinia curreyana* (Berk.) Karst., on *Juncus*.
*Dasyscypha nivea* (Hedw.) Sacc., on oak stumps.
*D. fugiens* (Bucknall) Mass., on *Juncus*.
*D. inquilina* (Karst.) Wint., on *Equisetum*.
**Hyaloscypha leuconica* (Cooke) Nannf., on birch.
†*H. stevensonii* (B. & B.) Nannf., on pine.
*H. quercus* Nannf., on oak =*H. hyalina* (Pers. ex Fr.) Boud.
*Mollisia cinerea* (Batsch) Karst., on birch.
*M. ligni* (Desm.) Karst., on unidentified hard-wood.
*Pyrenopeziza mercurialis* (Fuckel) Boud., on *Mercurialis perennis*.
*Tapesia fusca* (Pers.) Fuckel, on birch and conifer.

Two quite distinctive species of *Hyaloscypha* and a minute *Cistella* do not seem to fit anywhere and Dr. Dennis and I have so far been unable to give them reliable names.

**Lichens** (F. C. Rimington).: The lichens were most disappointing, owing to the almost permanent contamination of the air from the nearby industrial towns. The only corticolous species was the ubiquitous *Lecanora conizaeoides* A.L.Sm., and the smoke-begrimed stone walls were completely bare. On grit boulders *Parmelia saxatilis* Ach. and *Platysma glaucum* Ach. were quite common and *Parmelia caperata* Ach. occasional.

On the stones in the River Hebden, particularly in the higher reaches, *Lecidea macrocarpa* (*contigua* Fr.) flourished, but little else. *Cladonia* thallus was common in the woods, but disinclined to fruit. Near Hardcastle Crags some small plants of *Racodium rupestre* Pers. were found. On the high moors only depauperate *Cladonias* were seen and even at the 1,400 ft. contour, smoke contamination was plain.

It is interesting to compare this report with the much larger list made by Thos. Hebden in a neighbouring valley in 1916 (*Naturalist*, 1916, p. 132). The continuing deterioration of the lichen flora in this district is only too obvious.

## BOOK REVIEWS

**Life in Lakes and Rivers**, by **T. T. Macan** and **E. B. Worthington**. New Naturalist, Vol. 15. Pp. xvi+272, with 113 photographic illustrations, 45 in colour, and 20 maps and diagrams. Collins, 21/-.

The study of life in lakes and rivers or, to give it another name, freshwater biology, has been a much neglected subject in this country. The fact that Britain has such a long coast-line has drawn students to the study of marine life, and the comparatively small funds devoted to biological studies in the past have been absorbed in research connected with our sea fisheries. Twenty years ago the Freshwater Biological Station on Windermere was founded and since then freshwater biology has made marked progress in Britain.

So much for professional work in this field but what about the amateur naturalist? His troubles have been of quite a different character. Twenty years ago there were scarcely any books in English which would help him to identify his specimens, works on mollusca being an exception. There were a few good books dealing with freshwater organisms in German and French and if the language difficulty could be overcome the naturalist could identify many of the organisms. Fortunately, affairs are much better now ; good inexpensive pamphlets in English are available to the naturalist and it is possible for him to identify a large proportion of the fauna of our lakes and rivers.

The appearance of the volume by Drs. Macan and Worthington is another step forward. It would be difficult to find more competent men to write such a book. Both have been intimately connected with the work and development of the Freshwater Biological Association at Windermere. The book brings together in readable form many aspects of interest to the naturalist, to the angler and to all who are interested in unpolluted water.

Three chapters deal with lakes. A typical lake is described and the more salient features due to physical and chemical conditions are dealt with in understandable terms. The scientific study of lakes needs a good deal of special apparatus for dealing with plankton and bottom deposits. A new branch of study is echo sounding and a reproduction is given of a portion of an echo-sounding record of Esthwaite Lake. A chapter devoted to different kinds of lakes and their classification concludes with a fascinating account of the history of Windermere for the last 10,000 years. This has been made possible by the use of a specially-designed instrument for picking up cores of mud from the bottom of the lake. A brief but clear account is given of the method of interpreting these mud cores.

Rivers have not received so much attention from biologists as lakes have done and only one chapter is given solely to them. Problems peculiar to flowing water are enumerated and some schemes of river classification are given.

The field naturalist will find chapters 6 to 11 of special interest. They deal with animals and plants found in lakes and rivers, and their relations to their environment. In this survey food supplies and food chains are discussed. An account is given of life on the banks of rivers and lakes and its relationship to the submerged fauna and flora. Animal travel is discussed under the headings of migration, emigration and dispersal and illustrative examples are given.

Two chapters are devoted to subjects of interest to the angler ; not how to catch fish, but how to grow big, healthy fish. The principles governing fishpond maintenance and manuring receive careful consideration. The chapter headed ' Impure Water ' has an account of pollution caused by sewage and also by industrial wastes and a brief review is given of various enquiries and commissions and the resulting legislation. The chapter on ' Pure Water ' gives the layman a good idea of our water supplies and some of the biological problems involved. There is an excellent bibliography for those who wish to go deeper into the subject. The book is admirably written and technical terms avoided if possible but if necessary they are carefully explained.

The illustrations in black and white are very good but some of the plates in colour are disappointing, especially where expanse of water is shown. The water (in many cases) is much too blue. These are minor details and the book is worth reading more than once and being kept on the shelf for reference. On reading the book one marvels that so much useful, accurate and readable information has been condensed into so comparatively small a volume.

H.W.

**British Mysidacea,** by **W. M.** and **O. S. Tattersall.** Pp. viii+460 with 118 figures. Ray Society Monograph. Bernard Quaritch, Ltd., 11 Grafton Street, London, W.1. 42/-.

Mysids are small, shrimp-like, marine crustaceans. Some are restricted to deep waters where they may be either bottom-living or pelagic species; others inhabit the littoral zones and shallow, inshore waters. The study of mysids had engaged the attention of Professor W. M. Tattersall for forty years and at the time of his death eight years ago he was working at a monograph of the British species. In this he was helped by his wife who has now completed the account. Their joint work, which has been produced in the handsome manner associated with all Ray Society publications, will be invaluable to marine zoologists. Though primarily a systematic work, the introductory sections give full accounts of the historical, morphological and bionomical aspects of the subject. The section on bionomics gives a particularly valuable account of behaviour, breeding, migration, responses to stimuli and the economic importance of the group. Of the 400 known mysids, 75 species belonging to 40 genera are recorded from British waters and these are all fully described and beautifully illustrated. Keys are provided for the identification of the species, and under each species details of distribution are given—both within and beyond British waters—together with discussions of relevant taxonomic, biological and geographical information.

**Spotting British Birds,** by **S. Vere Benson.** Pp. 230 with coloured frontispiece, 32 half-tone plates and 127 line drawings. Frederick Warne & Co., Ltd. 17/6.

If you are one of the new amateur bird-watchers of whom Miss Vere Benson tells us, and appear to have acquired more knowledge of birds in two or three years than she has learned in twenty-five years of watching, then don't buy this book. You will not find in it the distinguishing features of, say, *Emberiza melanocephala* and *E. bruniceps,* nor the field-characters and general habits of the Yellow-browed and Eversmann's Warbler! Of the 200 species of our rare visitors or vagrants, under 40 are mentioned.

The book has been planned 'to assist the new bird-watcher to identify our own familiar birds of the garden and countryside' and 'to provide the rather more advanced watcher with . . . some hints to assist him in the wilder haunts of birds.' Miss Vere Benson, who is the founder and Hon. Secretary of the Bird-Lovers League, also states in her introduction that the main object is to encourage bird-watchers to become bird protectionists. She writes, for example, with obvious experience of the horrible 'oil menace' but unfortunately gives no hints on the treatment of birds found clotted with the tar-like filth.

In her latest volume, the author of *The Observers Book of British Birds* writes with charm and experience on birds of the graden, of the woods, trees and coppices; birds of the rocky streams, mountains, moors and seashore. There are also interesting chapters on summer and winter visitors, birds of the Orkneys, the Highlands, the Bass Rock and other islands. A schedule of bird-song and notes forms a rough guide to bird identification by their voices. As the species are described according to their habitat and are not in classified order, the book concludes with a chapter on uncommon migrants and gives a list of orders, families and species.

The book is well illustrated with half-tone plates by John Barlee, Eric Hosking, A. R. Thompson and J. Wharham. The 126 splendid line drawings by the author and the one by R. G. Adams emphasise the field characteristics of the birds. These, together with the description of the colour, the details of the size of the male and female and the notes on call or song, simplify identification.

This book would be most helpful to anyone wishing to take up bird-watching.

G. H. Ainsworth.

**Collecting and Breeding Butterflies and Moths,** by **Brian Worthington-Stuart.** Pp. 180 with frontispiece in colour and 17 text figures. Frederick Warne & Co., Ltd., 10/6.

This latest addition to the *Wayside and Woodland* series should find its way into the hands of all lepidopterists. The author first deals systematically with the various aspects of collecting, setting and arranging specimens, and then with the more fascinating (though more arduous) problem of breeding. The hints

and suggestions are obviously the result of experience and are worth careful consideration, but as the author points out collectors who have achieved success using other methods will doubtless remain faithful to them. That does not detract in any way from the value of the advice given ; there must be some fundamentals on which the newcomer can build experience.

As regards the various methods described, the reviewer has only one criticism and that is the absence of any reference to chloroform vapour as a killing agent. It is his opinion that it is one of the most reliable, safe to handle and cheap substances available and does not cause brittleness in the specimens. The novice should not be dismayed by the rather formidable list of apparatus suggested at various stages. It is possible to start in quite a modest way and the various accessories will gradually accumulate.

The book is readable and the diagrams well chosen but occasionally one gets a rather uncomfortable impression from the author's style that he is inclined to credit his readers with a shortage of commonsense—and that is irritating ! These are minor points, however, and the book should be a great help to those interested in the subject and in particular to those who have just begun to explore the possibilities of the lepidoptera.

J.H.E.

**Curious Creatures,** by **Erna Pinner.** Pp. 256 with many illustrations. Jonathan Cape, 12/6.

It is not easy to divine the inspiration of this book. The author's earlier exploits have been in the field of illustration and the text of this work is so generously interspersed with drawings as to make one suspect that the illustrations inspired the commentary.

The fourteen chapters are devoted to various aspects of extreme specialisation by animals in furtherance of their feeding, survival and reproduction, each chapter concerning itself with the peculiar forms and aptitudes of a number of dissociated creatures. The author has sought to contrive a continuity by connecting each animal with the one earlier discussed by a variety of turns of phrase which must have been as great a tax upon her ingenuity as it will be upon the patience of the adult reader.

Miss Pinner is stated to have travelled widely and to have observed many of her subjects at first hand. One could have wished for a more personal narrative in place of the studious compilation, always scrupulously acknowledged, which comprises the text. But the facts presented are, to say the least, sketchy in the extreme and are not without error. Thus the fangs of the King Cobra are said to be hollow whereas they are grooved and it was surely Steller, not Behring, who discovered the sea-cow which bears his name ; there are other errors including mistakes of spelling which a more sedulous proof-reading might have eliminated.

On the whole the illustrations are extremely graphic portraits though Miss Pinner's somewhat individual technique does not lend itself very happily to the depiction of feather and the drawing of rhinoceros birds on a kudu cow contrives to be ludicrous.

All in all, the book may be safely recommended to those in search of a ' suitable ' present for a nephew or niece whose interest in natural history is alive without being profound. Considering the freedom of illustration, the price is not unduly high but the much too prevalent carelessness in binding has resulted in the reviewer's copy having duplicate pages which may well be missing in another.

E.H.

**The Amateur Entomologist, Vol. 10.** Edited by **Trevor Trought** and **W. J. B. Crotch.** Pp. 40 with 12 plates and 10 text figures. Published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 6/-.

This annual publication of the Amateur Entomologists' Society contains 12 articles on matters of interest to its members. Two of the articles deal with methods of collecting lacewings and caddisflies respectively. There is useful information on the photography of lepidoptera with some excellent examples. There are also some useful suggestions for the study of the ecology of lepidoptera. A paper of theoretical interest discusses death-feigning in insects and catalepsy in human beings.

# CONTRIBUTORS

# CLASSIFIED INDEX

COMPILED BY W. E. L. WATTAM.

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Circular No. 511

# Yorkshire Naturalists' Union.



## Spring Mycological Foray

# HEBDEN BRIDGE

## APRIL, 19th to 23rd, 1951

For the investigation of Woodlands at Hardcastle Crags and Pecket Wood.

*Chairman* : Dr. J. Grainger, Auchineniure.
*Recorders* : Dr. J. Grainger and Mr. W. G. Bramley, Pallathorpe, Bolton Percy.
*Secretary* : Miss J. Grainger, Wilshaw, Meltham, Huddersfield.

**HEADQUARTERS.**—Bent Head Farm, Pecket Well, Hebden Bridge. Terms 12/6 a day, sharing rooms, single accommodation is very limited and at least 1/- a day extra. Members should write to Mrs. Crabtree at Bent Head stating requirements.

The Area was included in the earliest classical survey of fungi by Bolton in the late 18th century. It was also worked very thoroughly by Crossland with results published in Masse and Crossland's Yorkshire Fungus Flora.

**BOOKS AND MICROSCOPES.**—Will members please bring their own, if members relying on public transport will write to the Secretary she will probably be able to arrange for the books they require to be available.

**MEETING.**—A short business meeting will be held on Saturday, April 21st.

**Excursions** will be arranged on the 20th, 21st and 22nd, under the leadership of Mr. A. C. Collinge and other members of the Halifax Naturalist Society.

CIRCULAR No. 512

# Yorkshire Naturalists' Union.

**President:**
HENRY WHITEHEAD, B.Sc., Leeds.

**General Secretary:**
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

**Hon. Treasurer:**
J. D. HARTLEY, Linton Avenue, Boston Spa.

**Deputy Divisional Secretary:**
REV. T. BASIL KITCHEN, F.R.E.S., Howden.

## The 512th Meeting

WILL BE HELD AT

# HOWDEN

V.C. 61.

## Sat. to Mon., MAY, 12th to 14th, 1951

**HEADQUARTERS.**—The Wellington Hotel, Howden, proprietor Mrs. Westlake, the charge is 15/- per day. It is essential that early booking is made to ensure the available rooms, at least a fortnight's notice is necessary.

**TRAIN AND BUS SERVICE TO HOWDEN.**
**No convenient trains stop at Wressle.**

| *Hull* | *North Howden* | *North Howden* | *Hull* |
|---|---|---|---|
| 7-15 a.m. | 8-40 a.m. | 4-31 p.m. | 5-18 p.m. |
| 12-25 p.m. | 1-16 p.m. | 9-49 p.m. | 10-40 p.m. |

| *Leeds* | *Selby* | *North Howden* | *North Howden* | *Leeds* |
|---|---|---|---|---|
| 8-22 a.m. | 8-45 a.m. | 9-2 a.m. | 5-30 p.m. | 6-24 p.m. |
| 9-25 a.m. | 10-6 a.m. | 10 26 a.m. | 6-3 p.m. | 7-11 p.m. |
| 12-30 p.m. | 1-8 p.m. | — | 7-44 p.m. | 8-34 p.m. |
| 1-3 p.m. | 1-51 p.m. | — | — | — |

The East Yorkshire Bus Co. buses leave Selby for Howden at half past the *even* hour, arriving at Howden in just over forty minutes.

These buses pass within a mile of Wressle where the Saturday meeting commences.

Buses of the same Co. leave Hull at five minutes to each hour from the Hull Bus Station, and arrive in Howden one hour and a half later. There is an hourly bus service from Howden to Hull leaving Howden at ten minutes past the hour.

The buses which reach Howden at twenty-five minutes past the even hour proceed to Selby and pass within a mile of Wressle. Alight at Loftsome Bridge.

Buses from Goole to Howden, East Yorkshire Bus Co. Five minutes to each *even* hour. (Hull Bus).

Lincolnshire Bus Co. (Green Bus) leave Goole for Howden at a quarter past each hour. Extra buses on Saturdays.

**THE DISTRICT.**—The area to be visited is the Derwent banks from Wressle to Barmby-on-the-Marsh, and the bank of the Ouse from Saltmarshe to Sandhall. It may be considered as the northern portion of the old ' Marshland ' a name which indicates the type of country the area was originally, now it is valuable agricultural land, not the ' Merschlie londe ' of Chaucer's time. The ground to be examined lies on the untouched banks of the tidal rivers and the more or less artificial watery places due to the dykes and open drains. These places should still retain many of the original plants on the marshes with birds and insects associated with these localities. Geologists will find little of interest but the remains of the fine old Church will raise questions of the reason for such a building in a marshy area as this was when the Church was built.

**PERMISSION.**—Permission to visit his estate at Sandhall has been given by Capt. E. Scholfield, M.A., J.P. For the Saltmarshe estate by the agent Capt. Storey, and for Wressle Castle.

**SUGGESTED ARRANGEMENTS.**—Saturday, meet at Wressle station at 11 a.m., proceed to Wressle Castle and follow the Derwent to Barmby-on-the-Marsh.

Sunday, the alternatives are (1) work the banks of the Market Weighton Canal starting from Land of Nod Inn (2) visit Skipton Common, and (3) Swinefleet and Ousefleet for ornithology.

Monday, visit Saltmarshe estate and the Ouse banks to Sandhall estate.

**ORNITHOLOGY.**—Ralph Chislett writes : The levels about Howden, and westward to the meeting of Derwent and Ouse, and south-east towards Saltmarshe and Blacktoft, contain country that I have not explored ; and which is better-known ornithologically in winter than in the breeding season. In mid-May, passage migration is still taking place, and parts of the area may have interest from this aspect. It will be interesting to compare avian distribution and frequencies with those of the areas to the south and west of the Ouse. Will the black-capped tits include both Willow-tit and Marsh-tit, as they do farther east, whilst westward only the former occurs over a fairly wide area ? This is just one problem that will arise ; and in any case stumps and rotten branches in woodlands and hedgerows will be interesting in mid-May, as also will Marshes and beds of *phragmites*. Song will be at its height. Should anyone wish to compare the confluences of Derwent-Ouse and Trent-Ouse, a car will make it easy.

**BOTANY.**—(C.A.C.). The following has been extracted from J. Fraser Robinson's *Flora of the East Riding*. Commencing with the plants on the verge of the high-water mark where we find the Seaside Sedge, *Scirpus maritimus*, Seaflote grass, *Glyceria distans*, Sea Aster, Sea Meadow grass, *Glyceria maritima* and Gerard's Rush.

A little higher on the Salt meadow are the Creeping Fescue grass, *F. rubra*, Sea Hardgrass, *Lepturus filiformis*, Thrift, Black Saltwort, Arrowgrass, Buckshorn and Seaside Plantains and the Wild Celery, *Apium graveolens*.

In the dykes and ponds several Water Starworts, *Callitriche verna, stagnalis, hamulata*, possibly the Water Crowfoot species are most plentiful where the water is brackish *Ranunculus Baudotii* is commonest but forms of *R. Drouetii* are most frequent elsewhere. The Celery-leaved Crowfoot and the Mares Tail are nearer the water's edge, with the Water plantain, the smaller species *Alisma ranunculoides* is mentioned as near Howden.

Several Cresses, Water Cress, Creeping and Marsh Yellow Cress and the Amphibius are all to be found with the Water Parsnips, *Sium erectum* and *latifolium*, the Water Dropworts, *Œnanthe fistulosa, crocata, Phellandrium* and *Lachenalii*. Amongst the more showy type of flowers are the White and Yellow Water Lilies, the Flowering Rush, Purple Loosestrife, Great Hairy Willowherb, Meadow Rue and Yellow Iris.

Less noticeable are the Garlics, *Allium scorodoprasum, vineale, oleraceum.* Bladderwort and Frogbit, Hornwort *Ceratophyllum,* Horned Pondweed *Zanichellia* and Pondweed, possibly *natans, poligonifolius* and *crispus.* Many interesting Sedges will be found.

Amongst the Mosses the main interest will be the small species growing on the soil, *Phascum, Pottia, Physcomitrium* and *Fissidens,* but on bushes and old stumps careful search may find the Tortulas *mutica* and *laevipila* and *Leskea polycarpa,* it is also just possible *Helicodontium pulvinatum* or *Pylaisia polyantha.*

**ENTOMOLOGY.**—W. D. Hincks writes: The country surrounding the confluence of the Derwent with the Ouse has not received the attention from entomologists which it deserves. It is true that the larger Lepidoptera of the Selby district were carefully studied by the older Lepidopterists; also the late Dr. W. J. Fordham, who lived at Bubwith for some years, prepared a very interesting list of the insects of Derwentland. Unfortunately, however, this was never published and is now preserved with the Fordham Records in the Union's Soppitt Memorial Library at the Yorkshire Museum, York. As a consequence there is little published on the insects of the area.

Despite the scenically rather uninteresting appearance of the banks of the two rivers and the adjacent country it is extremely rich ground for the Naturalist. Of recent years I have paid a number of visits to the district and can strongly commend it to entomologists. In my own experience the rich and varied vegetation of the Ouse banks provide habitats for some very interesting Coleoptera, Hymenoptera and Diptera. To mention only a single species, of the first order, the capture in some numbers of *Dorytomus filirostris* Gyll. by the Rev. T. B. Kitchen, is of great interest. This species was only introduced to the British list quite recently on one or two specimens from Wicken Fen.

The lanes intersecting these lowlands, with their sluggish dykes, also support a rich flora and therefore insect population, and should not be neglected. The generally similar conditions of the waters of the district, high in organic matter and low in oxygen, result in a uniformity of aquatic life which is rather disappointing but the marginal fauna of the mud banks and marshy places abound in interesting species. Throughout the district there are some small pieces of rather recent woodland and areas of wooded common which would also repay investigation if it is possible.

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**MEETING AND TEA.**—A meeting to receive sectional reports and for the election of new members will be held in the Church room at 6-0 p.m., this will be after the tea at headquarters at 5-0 p.m., the price is 3/6.

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## Y.N.U. ENTOMOLOGICAL SECTION
## FIFTH EXPEDITION TO SPURN
### Friday, June 15th—Monday, June 25th, 1951

**HEADQUARTERS.**—Warren Cottage, Kilnsea.

The general arrangements will be as previous. Will members wishing to join the party please write to me as early as possible, accommodation at the cottage is very limited. As soon as they hear from me that the desired accommodation can be arranged they should book the meals required with Miss C. Leonard, The Cafe, Kilnsea, Patrington, E. Yorks. Accommodation is 3/- per night. Meals are 9/6 per day or Breakfast 2/6, Packed lunch 2/-, Dinner 5/-.

Blankets, etc., are available at the Cottage. You should bring a pillow case, sleeping bag, some tea and sugar, all collecting and mounting equipment, microscopes, books, etc.

Parcels may be sent by post to Miss Leonard who will look after them until you arrive.

The Ecological areas have now been fairly well worked and it has been decided to follow a different plan this year. Problems unsolved during previous visits, and groups hitherto badly neglected will be specially investigated. Several adjacent localities may be visited for comparison with Spurn.

Hon. Secretary, W. D. Hincks, Manchester Museum, Manchester 13.

## COUNCIL FOR THE PROMOTION OF FIELD STUDIES

A member of a certain Natural History Society recently wrote to us : ' I am quite convinced that the ordinary nature lover does not know of the facilities offered by the Council for the Promotion of Field Studies and of the wonderfully interesting time that can be had at the Field Centres, gaining knowledge on how to go about one's chosen hobby . . . I have heard the remark that the usual leaflets sound too learned ; ordinary nature lovers would think the Centres far above their heads. Those of us who have stayed at the Centres know that there is no such feeling once one gets to a Centre. The Wardens are keen to help the humblest learner and ready to answer the simplest question. They never laugh at the colossal ignorance some of us display, nor make us feel small.' This letter has prompted us to send you this leaflet, in the hope that you will use the Field Centres yourselves and pass on information about them to your friends.

The Centres are intended just as much for the individual ' amateur nature lover ' as for parties from universities, training colleges and schools ; in fact, it is one of the aims of the Council to encourage and help the ordinary person with an interest in some branch of natural history who wishes to learn more of this or allied subjects. (The word ' amateur ' is used here simply to denote someone not connected with teaching establishments). Such people are of course at liberty to arrange their own programme at the Centres, and they would seem to have four alternatives to choose from :

(1) To attend the special courses in bird study, freshwater and marine life, insects, plants, geology, geography, meteorology, archaeology and art. Very little specialised knowledge is required ; no one who is genuinely interested need hesitate to take part.

(2) To join the organised field work which is carried on at the Centres during any week.

(3) To work on their own with help and advice from the Warden when required.

(4) To attend special weeks which can be reserved for ' amateurs ' if there is a sufficient demand.

Groups from Natural History Societies have come long distances to our Centres in order to work in an area entirely different from their own.

It is precisely because they are not directly concerned with education that ' amateurs ' contribute to a mixed party the spirit of genuine interest and enthusiasm which has nothing to do with examination results. Their contribution to any course is correspondingly valued. They are so often people of wide experience that they have a special contribution to make to discussion and argument on any course, and the work of the Centres suffers accordingly when there are none in residence.

Life at a Field Centre is bound to be somewhat communal, but similarity of interests and hobbies does much to overcome any objections on this score and we try to make visitors as comfortable as possible. Single room accommodation cannot often be guaranteed at present, but older people will not be put in rooms for more than two or three and we hope to have more single rooms soon.

The present four Field Centres are situated in totally contrasting types of country :

**Flatford Mill,** East Bergholt, near Colchester, Essex, made famous by Constable is in agricultural country on the Stour estuary.

**Juniper Hall,** near Dorking, Surrey, close to Box Hill, is in a beautiful wooded valley of the North Downs.

**Dale Fort,** near Haverfordwest, Pembrokeshire, lies at the entrance to Milford Haven amidst striking coastal scenery. The bird observatory of Skokholm Island is run from here.

**Malham Tarn**, near Settle, Yorkshire, situated at 1,200 feet above sea-level, overlooks a Tarn of 153 acres and is surrounded by a great expanse of wild moorland and bog.

The normal period of residence is one week or more, and the charge is £5 15*s*. 6*d*. per week. Enquiries about accommodation or other information relating specifically to one of the Centres should be addressed to the Warden. Otherwise, and for general information, correspondence should be addressed to the Director, Council for the Promotion of Field Studies, 10 Exhibition Road, South Kensington, London, S.W.7. (KENsington 8806).

CIRCULAR No. 513

# Yorkshire Naturalists' Union.

**President:**
H. WHITEHEAD, Esq., B.Sc., Leeds.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Divisional Secretary:**
C. M. ROB, F.L.S., Catton Hall, Thirsk.

## The 513th Meeting

WILL BE HELD AT

# WEST BURTON

## For WALDENDALE, V.C. 65

## On SATURDAY, JUNE 2nd, 1951

**HEADQUARTERS.**—The Fox and Hounds Hotel, West Burton, where the proprietor, Mrs. Bellas will provide tea. Plain Tea 2/6 ; High Tea 4/6.

**TRANSPORT—**

United Bus service No. 26 (Darlington-Hawes).

| | | | |
|---|---|---|---|
| Dept. Darlington | 9.00 a.m. | Dept. West Burton | 6.18 |
| Leyburn | 10.27 a.m. | Leyburn | 6.45 p.m. |
| West Burton | 10.54 a.m. | Darlington | 8.10 p.m. |

Service No. 127 (Ripon Hawes).

| | | | |
|---|---|---|---|
| Dept. Ripon | 9.15 a.m. | Dept. Leyburn | 6.46 p.m. |
| Leyburn | 10.27 a.m. Change to Service 26. | Ripon | 7.58 p.m. |

At the time of going to press the summer time-table is not available and these times should be verified.

**MAP.**—Sheet No. 21 of the 1 inch to 1 mile Ordnance Survey covers all the area.

**ROUTE.**—Meet at Headquarters 11 a.m. Follow the Walden Beck from the Village as far as time will permit.

**PERMISSION.**—Mr. R. Close of Cote Farm, West Burton, has given permission for land in the lower part of the dale, much of the ground hereabouts is commonland.

The village of West Burton lies at the foot of the Waldendale, a short distance from its junction with Bishopdale. The latter valley has been well worked in the past, but from records available little seems to have been done in Waldendale. The dale is narrow and very soon after leaving the village there is little cultivated ground, near the head of the dale are some interesting looking scars, smaller ones occur from time to time all along the valley. The waterfall almost in West Burton village has been throughly investigated especially for Bryophytes, but the stream higher up should be interesting. There should be ample ground for all sections, but unless the season has altered considerably it will be early for most things except in the lower part of the area. The Union paid a short visit to Waldendale in 1922 when the meeting was held at Newbiggin for Bishopdale and a good account is given in *The Naturalist* for 1922.

**FLOWERING PLANTS.**—C. M. Rob: The late spring will affect the flowering plants and it seems unlikely any outstanding records will be made.

In the *Flora of North Yorkshire, Draba incana* L., *Potentilla Crantzii* (Crantz), Beck, and *Ophrys apifera* Huds. are given as occurring in this area. *Hutchinsia petraea* Br. grows on the wall by the beck below the village, though in much less quantity owing to the damage to the wall in the disastrous ' Cloudburst ' some years ago, this plant grows on the scars above Carperby on the other side of Wensleydale, and should be looked for on the same type of ground in Waldendale. Another plant to be looked for is *Andromeda polifolia* L., which is plentiful on the ridge between Coverdale and Nidderdale, members who get on the Walden-Coverdale Ridge should keep this plant in mind.

*Equisetum Telmateia* Ehrh. grows near the beck above Cote farm. Old Lead workings should yeild *Thlaspi alpestre* L. and *Arenaria verna* L.

**MOSSES.**—J. Appleyard : The West Burton area has been well worked by bryologists in the past, many interesting mosses and hepatics have been recorded, which is to be expected from a region so congenial to bryophytes, with its combination of limestone and running water.

Some of the noteworthy records, chiefly from Bishopdale and the main valley of the Ure, are *Seligeria tristicha* Brid., *S. recurvata* Hedw., *Fissidens crassipes* Wils., *Weisia crispa* Hedw., Waldendale, *Trichostomum mutabile* Bruch., and var. *cophocarpum* Schp., *Encalypta ciliata* Hedw., *Orthotrichum Schimperi, Philonotis calcarea* B. and S., *Plagiobryum Zierii* Hedw., *Mnium affine* Bland., *M. stellare* Hedw., *Neckera pumila* Hedw., *Myurella julacea* Schwaeg., *Thiudium delicatulum* Hedw., *T. Philiberti* Limpr., *Plagiothecium depressum* Bruch., *Hypnum falcatum* Brid. var. *virescens* Schp., and *Hylocomnium rugosum* Hedw. Interesting hepatic records include *Reboulia hemisphaerica* L., *Prissia quadrata* Scop., *Lophozia quinquidentata* Huds., *Plagiochila punctata* Tayl. this record from Wensleydale by Dr. F. A. Lees is the only one from Yorkshire, *Cephalosia media* Lindb., *Calypogeia arguta* Nees and Mont., *Lepidozia setacea* Web., *Scapania aspera* Bernet., *Madotheca Cordeana* Huebn., *Cololejeunea calcarea* Lib., and *C. Rossettiana* Massil.

**ENTOMOLOGY.**—W. D. Hincks : The entomological productivity of the West Burton district in early June will depend very largely on the weather from April onwards. As I write, at the end of March, very few insects have yet appeared. If we get some weeks of warm weather all will be well, if not entomologists will be well advised to keep to lower ground where stream-side collecting will be the most profitable.

An excellent brief description of the area will be found in W. E. Sharp's 'The Coleoptera of Bishopdale, Yorkshire' (*The Naturalist*, 1913 : 415-418) which includes some interesting records. Aquatic insects should be in evidence at the time of our visit and Stone-, May-, and Caddis-flies may be plentiful. Beating blossom will be profitable at this time of the year, especially isolated hawthorns and rowans etc., at the edges of woods. Netting insects on the wing will be one of the best methods of collecting Coleoptera, Diptera and Hymenoptera if the weather is warm and sunny.

**ORNITHOLOGY.**—J. P. Utley, B.Sc., M.B.O.U. : Walden might be termed a 'bare' dale so a long list of birds seen must not be expected. So far as I know no organised records have been kept.

Several of the smaller Passerines found in Yoredale may not be recorded here. Birds which have been noted for the dale include Raven, Goldfinch, Lesser Redpoll, Spotted Flycatcher, Ring Ousel, Redstart, Short Eared Owl, Peregrine, Merlin, Common Buzzard, Common Heron and Corncrake. No records are to hand for Bullfinch, Tree Sparrow, Nuthatch, Pied Flycatcher, Wood-Warbler, Sedge-Warbler Whinchat, Green Woodpecker, Lesser Spotted Woodpecker, Long Eared Owl, Turtle Dove or Woodcock. Observations of birds in either of the foregoing lists will be welcome.

A number of species are not mentioned because there are no suitable habitats for them.

The vicinity of West Burton and up to Thupton Gill will be the best areas for lowland birds. All the common moorland birds may be seen or heard.

Both Raven and Buzzard are known to 'beat' from The Stake, across Bishopdale Gavel, Buckden Pike and Walden Head to Great Whernside ; and on more than one occasion ' kills ' have been found which indicated that a Peregrine had passed over.

Short Eared Owls breed fairly regularly on the high ground between the head of the dale and Coverdale and the Merlin has bred occasionally.

**MAMMALIA.**—J. P. Utley, B.Sc. : Walden has the distinction of being one of the last Deer Forests in the country but its present animal life is much more lowly. There are Hill Foxes but I have not heard of a Badger having been seen. Hare and Rabbit are in average numbers and so are Stoat and Weasel. The dale is somewhat sparsely wooded, so squirrels, either Grey or Red, may not be seen. The Brown Rat, Long Tailed and Short Tailed Field Mouse, Shrew and House Mouse are in residence. The Pipistrella is the only record to hand of the Bat family.

Regarding reptiles, Adders may be found in a few places and an occasional Grass Snake might be seen. The Common Frog is at about normal strength but the Common Toad is not often seen. Lizards may lurk about some of the scars but their appearance will depend largely on the weather.

**GEOLOGY.**—J. P. Utley, B.Sc. : Walden is a small, steep-sided valley with a stream tributary to the river Yore. It lies in the Yoredale series of the Carboniferous Age though the Hardraw Limestone extends up the floor of the valley as far as Cowstone Gill with a good exposure at West Burton Falls. The Millstone Grit Cap, which ends abruptly at Penhill to the south-east, continues on the south by the Height of Hazely (1800) and Harland Hill (1758). The saddle between Walden and Flewis Gill is grit free with a few lead veins and a small coal seam at the old Fleersop Colliery. Then comes the long grit ridge of Brown Haw (1904) leading up to Tor Mere Top (2023). This is at the very head of the dale and the Millstone Grit becomes considerably thicker at Buckden Pike (2302) though falls away to the north-east and ends at Wasset Fell (1650), a spur of Naughtberry Hill (1852), where, just beneath the grit base, are further lead veins : another vein goes across the foot of the dale at West Burton. There are a number of ' shake holes ' on both sides of the valley at about the 1100 contour with some old shafts on Petticoat Lake and on Wasset Fell. Some fossils may be found in the exposed limestone at Morpeth Scar. Raven Scar is a fine exposure at the very head of the dale and nearby are further old coal workings.

During the Glacial Period the valley may have been a temporary lake, dammed at the foot by the Yoredale ice, and overflowing into the Coverdale lake by the Fleensop saddle or the head of Thupton Gill. There are several ' roches moutonnées ' on the ridge between Walden and Bishopdale foot.

**MEETING.**—Following tea at Headquarters 5-0 p.m., a meeting will be held to receive reports from the various sections and for the election of new Members.

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**Next Meeting.**—The next meeting will be at Yearsley Dam, V.C. 62.

CIRCULAR No. 514

# Yorkshire Naturalists' Union.

**President:**
HENRY WHITEHEAD, Esq., B.Sc., Leeds.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Linton Avenue, Boston Spa.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Divisional Secretary:**
K. G. PAYNE, Esq., A.R.C.S., B.Sc., Copmanthorpe, York.

## The 514th Meeting

WILL BE HELD AT

## COXWOLD FOR

# YEARSLEY DAM

## On SATURDAY, JUNE 16th, 1951

**HEADQUARTERS.**—Ivy House Cafe, Coxwold. Plain Tea about 2/-, High Tea about 4/-. Will those wanting High Tea please notify K. G. Payne, West Dene, Manor Heath, Copmanthorpe, York, by Wednesday, 13th June ('phone York 6358).

**TRANSPORT.**

**Train.**—Dept. York 10-30 a.m., arr. Coxwold, 11-22 a.m.
Dept. Coxwold 6-40 p.m., arr. York, 7-22 p.m.
York can be reached in adequate time from Leeds, Bradford or Hull, by train or bus.

**Bus.**—Coxwold can be reached by United Bus from Ripon, Thirsk and Scarborough.

| | |
|---|---|
| Ripon 8-40 a.m. | Coxwold 7-18 p.m. |
| Thirsk 9-25 a.m. | Thirsk 7-50 p.m. |
| Coxwold 9-57 a.m. | Ripon 8-30 p.m. |

Transport for the three miles from Coxwold to Yearsley Dam and back will be arranged for those coming by train. It would be a help if those doing so would notify the Divisional Secretary (address above).

**ASSEMBLY.**—Meet 11-22 a.m. at Coxwold railway station.

**PERMISSION.**—Permission to visit Oulston Reservoir (Yearsley Dam) and the adjoining woods has been given by Captain Wombwell. Members are specially

requested to note that there may be a considerable amount of inflammable material in the woods and great care should be taken with matches and cigarette ends. No dogs can be allowed.

**PREVIOUS MEETINGS.**—The Union was at Coxwold in 1902 (see account by Rev. T. Ainsworth Brode, *Naturalist* 1902, pp. 277-284) and 1919 (see *Naturalist*, 1919, pp. 206-210). In both cases attention was devoted mainly to the more spectacular country between Sutton Bank and Wass, and the Oulston-Yearsley area was not visited. The lack of previous records from the area of the 1951 meeting is reflected in the sectional notes below.

**THE DISTRICT.**—Oulston Reservoir, also known as Pond Head and Yearsley Dam, lies in a little valley running north-east into the Howardian Terrace 1½ miles east of Oulston. The reservoir was formed by damming the stream which becomes the Foss (before Baker's time, for he mentions the ' Foss Reservoirs '). The pair of lakes extend nearly half a mile in total length and up till the recent war were wooded all round the south and east sides. The felling of these woods has detracted considerably from the beauty of the place. There are however, still considerable woods north of the lakes and along the stream entering at the upper end. The old stone dam at the lower end is overgrown with grass and moss, and there is a good deal of *Alchemilla arvensis* on it. A disused mossy stone channel below the dam may provide some interesting habitats for freshwater life. The stream just below the dam flows fast in an artificial channel for 50 yards before becoming a natural stream down the valley. The slopes north of the lakes towards the farm are grazed, with *Ulex* and a good deal of *Carlina vulgaris*. On the south side of the lower lake the water is readily accessible in several places, being shallow and the bottom sandy there. There are patches of *Scirpus lacustris* on the edges of both lakes, and a heavy growth of *Fontinalis antipyretica* in the upper one. *Typha* is at the upper end, which is marshy where the stream enters. Above this the stream flows fairly fast with some deepish pools below alders. The hill tops above the lakes are heathy, with oak, birch and rowan, and run up to Yearsley Moor, 1½ miles north-east.

**BOTANY.**—Baker gives only one record for Pond Head, *Littorella uniflora* (L.), Aschers, which still is plentiful in Gormire. He also mentions it for Yearsley Moor. Several species of *Potamogeton* grow in the lakes. No records for mosses or hepatics seem to exist for the valley.

*Trientalis europaea* L. is almost certain to be present on the higher ground

*Plantago coronopus* L., *Spergularia rubra* (L.) J. and C. Presl., *Cerastium semidecandrum*, L., and, strangely, *Sedum telephium* L. are recorded for Yearsley Moor. Miss C. M. Rob mentions this moor as being a good locality for *Rubi*. *Helleborus viridis* L., *H. foetidus* L., *Daphne laureola* L., and *Geranium phaeum* L., are among other flowering plants still occurring in the neighbourhood.

*Mnium stellare* Reich., *Funaria calcarea* Wahl., and *Barbula sinuosa* Braithw., are among the rather few moss records even for the Coxwold area taken more broadly (see *Naturalist*, 1902 and 1919).

Some interesting lichens are recorded from Yearsley Moor.

**ORNITHOLOGY.**—Mr. Ralph Chislett says that he has only a few records from the area. The type of country provides a guide to the species to be expected.

**ENTOMOLOGY.**—There appear to be no records referring to Pond Head itself. In his account of the Yorkshire Ephemeroptera, J. R. Dibb gives no localities nearer than Helmsley and Pickering. A few insect records for the area near Coxwold visited by the Union in 1919 are given in the *Naturalist* for that year. The Diptera of Gormire, eight miles north-west were examined by Mr. Cheetham and the late Dr. Edwards (*Naturalist*, 1927, p. 60), and Mr. Whitehead gives an account of the aquatic insects seen at the 1948 Thirsk meeting (*Naturalist*, 1948, p. 163).

**TEA and MEETING.**—Tea at 5-0 p.m. at Headquarters will be followed by a meeting to receive sectional reports and elect new members.

CIRCULAR No. 515

# Yorkshire Naturalists' Union.

**President:**
H. WHITEHEAD, Esq., B.Sc., Leeds.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Divisional Secretary:**
Miss J. GRAINGER, Meltham.

## The 515th Meeting

WILL BE HELD AT

# DEANHEAD

## On SATURDAY, JUNE 30th, 1951

**HEADQUARTERS.**—Nont Sarah's Hotel, Scammonden, Nr. Huddersfield. (Tel. Stainland 223211). Tea at 4-30 p.m. Meat tea with salad, etc., 3/6. Ham and tongue tea with salad, trifle, cakes, 5/6. Members requiring tea please send a post-card to Mr. A. W. Home, Nont Sarah's Hotel, by June 16th.

**TRANSPORT.**—From Huddersfield—Trolley bus 73 to Outlane terminus every twelve minutes from Westgate. Petrol buses to Nont Sarah's—Huddersfield Bus Station, half-hourly from 1 p.m.

From Halifax, from Regal Fruit Stores, Halifax. First bus 11-45 a.m., catch Stainland bus from Halifax, same starting place (and near Woolworths) on the hour. Buses then available from Stainland to Outlane (the Elland to Outlane route runs through Stainland).

From Elland, 10 a.m., 11 a.m. and 12-10 p.m., then hourly, 1-10 p.m.

**MEETING PLACE.**—Outlane trolley bus terminus, at 11 a.m. Later parties leave road at Pole Moor and proceed in N.W. direction to the bottom of the valley.

**PERMISSION.**—The Huddersfield Corporation have kindly given permission, per Mr. J. P. Beveridge, to visit the area in the vicinity of Deanhead Reservoir.

**THE DISTRICT.**—Mr. W. E. L. Wattam writes: The Black Burne (locally oftimes called the Deanhead Valley) is reached from Huddersfield by the Huddersfield and new Hay Road to Outlane on reaching which turn to right down the hill to Dean House, entering the valley by the bridge which carries the road over Black Brook. Then proceeds upstream in a North-westerly direction through the hamlet of Deanhead, passing the reservoir at Head Green, finishing on Brickstones Moss Moor. The whole area is within the Huddersfield district. As far as I can trace this will be the first visit of the members of the Union to the defined area, and thus it affords scope to students in every section and gives a good opportunity to study a typical bit of the vegetation of the southern Pennines. Woodland is sparse. The Black Brook and its tributaries are cut through the Millstone Grit series. Beyond the areas brought into cultivation the pasturage is of a rough

moorland type. On approaching Buckstones Moss the typical moorland plants Bilberry, Black Crowberry, Ling, Fine and Cross-leaved Heaths and Purple Molinia grass occur. The flatter parts are Rush beds with small sphagnum bogs in which the cranberry finds home. The Cowberry is scarce. The expanse of Buckstone Moss gives an excellent picture of a Cotton Grass Moor with *Eriophorum vaginatum* as the chief peat former. In wet peaty hollows is a little of *E. angustifolium*.

**FLOWERING PLANTS.**—The following species will doubtless be noted, viz.: *Ranunculus flammula, Caltha palustris, Nasturtium officinale, Barbarea vulgaris, Cardamane amara, C. flexnosa, Viola palustris, Genista anglica, Hydrocotyle vulgaris, Myrrhis odorata, Cnicus heterophyllus, Solidago virgaurea, Scabiosa Succisa, Valeriana dioica, V. sambucifolia, Narcissus Pseudo-narcissus, Luzula sylvatica, Juncus bufonius, Scirpus caespitosus, Carex pulicaris, C. stellulata* and *C. ovalis*.

**GENERAL.**—Mr. G. Fryer writes: The hamlet of Deanhead, from which the upper reaches of the valley of the Black Burne Brook take the name of Deanhead Valley, lies some six miles to the west of Huddersfield. The stream itself rises on Buckstones Moss and flows approximately N.E. for some $7\frac{1}{2}$ miles before joining the Calder just below Greetland. A little over a mile from its source the waters of the stream are impounded by the Deanhead Reservoir which dominates the upper part of the valley.

The valley itself, which is very secluded and gives no obvious indications of the nearby industrial towns, can best be described as derelict. Formerly the home of a race of handloom weavers, and having the small mills associated with such a community, the sprawling township of Scammonden, of which Deanhead forms a part, boasted a population of 1,012 in 1861, yet to-day the population is less than 400 (394 at 1931 census). Ruined mills and homesteads bear mute testimony to the valley's former prosperity, and fields, formerly tended, have now reverted to moorland.

**FRESHWATER BIOLOGY.**—Mr. G. Fryer: The Black Burne Brook is a Trout stream, but beyond knowing of the existence of this fish little is known about its fauna. The insect fauna of the stream appears to be somewhat sparse but would doubtless repay close investigation.

The ruined mills are accompanied by small dams which, however, yearly decrease in area due to encroaching vegetation. These, together with two small dams lower down the valley, contain an interesting fauna, though the zoo plankton and small crustacean element is very sparse. A conspicuous feature of these dams during certain years is the large number of larvae of *Dytiscus marginalis* which are to be seen there. These can be seen attacking tadpoles and even newts on occasion, and provide in interesting spectacle. Microscopists may be interested to know that the ' Phantom larva ' (larva of the Dipteran *Chaoborus plumicornis*) occurs in these waters. As the water is acidic the Molluscan fauna is not very varied, but is worthy of investigation.

**ORNITHOLOGY.**—A mixture of moorland and hedgerow birds are likely to be seen, as well as a few streamside species.

A keen watch should be kept for Merlins which formerly bred in the area, but for which no reports have come to hand recently. Indeed the only bird of prey usually to be seen is the Kestrel. Dippers are sometimes to be seen along the stream, but are not common. Reports of Ring Ouzels would also be welcome as the species was once reputedly fairly common in the area, but has much diminished in numbers during recent years.

**GEOLOGY.**—Dr. H. C. Versey: The Black Burne valley at Deanhead is cut in the Millstone Grit Series, with the Upper Kinderscout Grit forming an inlier in the floor of the valley. The Scotland Flags appear in the valley sides while the higher ground along the main roads is occupied by the Midgley Grit. Above the Kinderscout Grit is a marine band, from which a fauna may be collected near Scammonden.

**MEETING.**—Nont Sarah's Hotel, Scammonden. Tea 4-30 p.m., this will be followed by a meeting to receive reports on the excursion and to elect new members to the Union.

Several interesting return routes are available to anyone not wishing to return directly to Huddersfield.

CIRCULAR No. 516

# Yorkshire Naturalists' Union.

**President:**
H. WHITEHEAD, Esq., B.Sc., Leeds.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Divisional Secretary:**
W. G. BRAMLEY, Bolton Percy, York.

## The 516th Meeting

WILL BE HELD AT

# THORP ARCH

V.C. 64

## On SATURDAY, JULY 14th, 1951

**HEADQUARTERS.**—Trustees Hall, Boston Spa, where tea and sandwiches will be available at 5 p.m., price 3/-. Members requiring a high tea can obtain this at the Royal Hotel (just across the road from Headquarters) at 6/6. Will members requiring tea please advise the Divisional Secretary by July 9th.

**TRANSPORT.**—There is a good service of buses from Leeds, York and Harrogate (West Yorkshire Bus Co.). See current tables.

**MEETING PLACE.**—Trustees Hall, near the bus stop, at 11 a.m.

**PERMISSION** to visit Thorp Arch Park has been given by the Agents to the Hatfield Estates Co., Messrs. Byron & Granger.

**MAPS.**—Sheet 26, Coloured Edition, one-inch Ordnance; Sheet 27, Popular Edition; Sheet 97, New Popular Edition (Grid).

**AREA.**—This does not seem to have been visited by the Union since 1897 (Circular 129, *Trans. Y.N.U.*, Pt. 26). No report seems to have been published.

**ROUTES.**—The morning party will cross Thorp Arch bridge and explore the Ings land down-stream as far as time permits. In the afternoon the route will be up-stream through the park as far as Flint Mill. Here the river can be crossed by the more venturesome and the right bank examined.

**GEOLOGY.**—The whole area is on the Magnesian Limestone which is exposed in the river gorge.

**BOTANY.**—Miss R. Kilby sends the following list of plants :

*Clematis Vitalba.*
*Thalictrum flavum.*
*T. minus.*
*Ranunculus pseudo-fluitans.*
*Actaea spicata.*
*Meconopsis cambrica.*
*Hesperis matronalis.*
*Reseda lutea.*
*R. Luteola.*
*Stellaria nemorum.*
*Geranium columbinum.*
*Euonymus europaeus.*
*Spiraea Filipendula.*
*Pyrus torminalis.*
*Pimpinella major.*
*Myrrhis odorata.*
*Lactuca virosa.*
*Campanula latifolia.*
*Lycopsis arvensis.*
*Atropa Belladonna.*
*Inula conyza.*
*Lamium Galeobdolon.*
*Daphne Laureola.*
*Listera ovata.*

**MOSSES.**—A liat by J. S. Wesley in *The Naturalist*, 1879, includes this area. *Pottia Heimii* was gathered here by Dr. R. Spruce ; it was also found in 1897.

**CONCHOLOGY.**—Mr. C. F. Sweetman gives the following list :

Mollusca (nomenclature follows the 1904 list). Our records relate mainly to the wooded banks of the River Wharfe at Boston Spa and the hedgerows of the neighbourhood. In the latter *Hygromia rufescens* Pennant (red, white and grey forms) and *Helicella cantiana* Montagu, are the most common species, though *Helix nemoralis, H. hortensis* and *H. aspersa* are all plentiful and very varied.

On the Wharfe banks the most characteristic local species are that descendant of a venturesome winkle, *Pomatias elegans* Müller and *Vitrea rogersi* B. B. Woodward.

Other local species (recorded by Mr. A. Smith) are *Azeca tridens* Pulteney, found with the abundant *Cochlicopa lubrica* Férussac, and *Helicigona lapicida* Linné.

Also recorded at Boston Spa are :

*Acanthinula aculeata* Müller.
*Vitrina pellucida* Müller.
*Vitrea alliaria* Miller.
*V. cellaria* Müller.
*V. crystallina* Müller.
*Zonitoides nitidus* Miller.
*Jaminea cylindracea* Da Costa.
*Carychium minimum* Müller.
*Clausilia bidentata* Ström.
*C. laminata* Montagu
*Pyramidula rotundata* Müller.
*Ena obscura* Müller.

It is good ground for mollusca and undoubtedly many other species could be found by intense search.

**FRESHWATER BIOLOGY.**—H. Whitehead : This should be a good spot for mayflies, caddisflies and stoneflies, though there appears to be no record of species. Prof. E. Percival visited here 26 years ago and the following is taken from his notes made at that time. Below weir, gravel with abundant nymphs of *Perla, Perlodes, Rhithrogena* and *Ecdyonurus*. Above weir, below Thorp Arch Hall, muddy edge to river, *Sphaerium, Anodonta*, oligochaetes, unidentified caddis larvae and *Ammocoetes* (larvae of Lamprey). Fauna abundant in the slow stream.

**BIRDS.**—J. D. Hartley : Habitat—Mixed woodland, agricultural land, riverside, cliffs and filter beds.

The area, if Boston Spa is included, is varied and provides suitable cover and feeding ground for many lowland species. Intensive effort against ' vermin ' leaves few predators. Birds which have bred in the vicinity in the past three years include Carrion Crow, Rook, Jackdaw, Magpie, Jay, Greenfinch, Linnet, Bullfinch, Yellow Bunting, Reed Bunting, Skylark, Tree Pipit, Yellow, Grey and Pied Wagtails, Tree Creeper, Long-tailed Tit, Spotted Flycatcher, Willow, Sedge and Garden Warblers, Black Cap, Whitethroat, Dipper, Kingfisher, Green Great Spotted and Lesser Spotted Woodpeckers, Tawny and Barn Owls, Mute Swan, Mallard and Turtle Dove. Curlews are frequently seen on the rough ground north of the Wharfe towards Wighill and are suspected to have bred there. Goldfinch, Whinchat, Common Sandpiper, Redshank, Dabchick, Kestrel, Little Owl, Redstart, Marsh Tit and Corn Bunting have been seen during the breeding season but nesting has not been proved.

**MEETING.**—A meeting to elect new members and to receive reports from the various sections will follow the tea at 5 p.m. in the Trustees Hall.

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**The next meeting** of the Union will be the Fungus Foray at Ripon, September 21st to 25th, 1951.

CIRCULAR No. 517

# Yorkshire Naturalists' Union.

**President:**
H. WHITEHEAD, Esq., B.Sc., Leeds.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Divisional Secretary:**
W. G. BRAMLEY, Esq., Bolton Percy, York.

## The 517th Meeting

## The Autumn Fungus Foray

WILL BE HELD AT

# RIPON

## SEPTEMBER 21st to 25th, 1951

*Chairman*: Dr. J. GRAINGER, Auchincruive.
*Recorders*: Mr. W. G. BRAMLEY, Bolton Percy, York;
Dr. J. GRAINGER, West of Scotland College, Auchincruive.
*Secretary*: Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield.

**ACCOMMODATION.**—Mr. D. M. Hopkinson, M.A. (Oxon.), Warden of the West Riding Adult College at Grantley Hall, near Ripon, has offered accommodation for 15 people.

There are one or two double rooms for married people, but most of the accommodation is single cubicles.

The terms are 15/- per day.

Members are asked to assemble for supper at 7-15 p.m. on Friday, September 21st.

Bookings should be sent to Miss J. Grainger, Wilshaw, Meltham, by August 31st. The first 15 will be accepted for Grantley. Later bookings will be able to get accepted in Ripon.

**EXCURSIONS.**—The area to be worked will include woods in the neighbourhood and it is hoped to work Fountains Abbey Woods if sufficient transport is available and pending permission being granted.

**WORKROOM.**—The Warden promises a room for the display of specimens and for work.

**EXHIBITION.**—An exhibition of the most interesting species will be laid out for Monday evening. Students from other courses will be invited to attend.

**CHAIRMAN'S ADDRESS.**—Dr. J. Grainger will deliver his Address before the Annual Meeting on Saturday, September 22nd. The title is ' The Ecology of Parasitic Fungi.'

**ANNUAL MEETING.**—The Annual Meeting will be held at approximately 8 p.m. on Saturday, September 22nd.

**MICROSCOPES AND BOOKS.**—Will members please bring microscopes and books.

**Do not forget** all queries *re* accommodation to Miss J. Grainger, Wilshaw, Meltham, who will do her best to meet the wishes of members. She may be able to say what text-books will be available if members wish to avoid carriage of theirs.

CIRCULAR No. 518

# Yorkshire Naturalists' Union.

**President:**
H. WHITEHEAD, B.Sc., Leeds.

**General Secretary:**
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

**Hon. Treasurer:**
J. D. HARTLEY, Linton Avenue, Boston Spa.

# Sectional Meetings, 1951

**to consider the Annual Reports and nominate Officers for the Sections and their Committees.**

*All members and associates of the Union are elegible to attend.*

OCTOBER 6th.—Leeds Church Institute, Committee Room. The **Geological Section** meet at 2-30 p.m. The **Freshwater Biological Section** at 3-30 p.m. The **Conchological Section** meet at the Geological Department, Leeds University.

OCTOBER 13th.—**The Botanical Section** will meet in the Botanical Department, Leeds University. This will be preceded by a Meeting of the **Phenological Committee** at 2-30 p.m.

After tea there will be an exhibition of specimens to which members are invited to contribute.

OCTOBER 13th.—**Vertebrate Section.** Chairman: A. Hazelwood, Esq. Meetings will be held in the **Belgrave Rooms, New Briggate, Leeds 1,** on SATURDAY, 13th OCTOBER, 1951 (kindly note change of date).

2-00 p.m....Wild Birds and Eggs Protection Acts Sub-Committee (members only).
2-30 p.m. Spurn Observatory and Ringing Sub-Committee (members only).
2-45 p.m. Committee for Ornithology (Election of Officers).
3-00 p.m. Mammals, Reptiles, Amphibians and Fishes Committee (Election of Officers).
3-15 p.m. Vertebrate Section.

## AGENDA

1. Apologies for absence.
2. Minutes of previous meeting.
3. Report of the Mammals, Reptiles, Amphibians and Fishes Committee (Mrs. E. Hazelwood).
4. Short interim report of the Committee for Ornithology (Mr. R. Chislett).
5. Short interim report of the Spurn Observatory and Ringing Sub-Committee (Mr. G. H. Ainsworth).
6. Election of officers (Chairman, Secretary, Assistant Secretary, Representative on the Executive and Recorders).
7. A First Visit to the French Camargue, by Mr. E. Wilfred Taylor.
8. Birds of Norfolk—Coast and Marsh and other films, by Mr. A. Faulkner Taylor, A.I.B.P., F.R.P.S.
9. Any other business.

Members and associates are cordially invited to attend the above meetings. Will officials of affiliated societies kindly notify their members.

There will be a break for tea between items 7 and 8 of the Agenda from about 4-45 to about 5-45 p.m. at which time the evening session will commence. Arrangements will be made to provide tea for those members who care to bring sandwiches.

October 27th.—The **Entomological Section** will meet in the Committee Room of the Leeds Church Institute, Albion Place, at 2 p.m. This will be followed by an exhibition of specimens to which members are asked to contribute.

November 3rd.—An **Executive Meeting** will be held in the Committee Room on the first floor of the Parkinson Building. The entrance is *via* the main entry to the University in Woodhouse Lane, at 3 p.m.

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December 1st.—**The Annual Meeting** will be held in Leeds University.

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October 1st, 1951

THE

# NATURALIST:

A QUARTERLY JOURNAL OF

## *Natural History for the North of England*

EDITED BY

W. A. SLEDGE, Ph.D., B.Sc.,

THE UNIVERSITY, LEEDS,

*with the assistance as referees in special departments of*

CHRIS. A. CHEETHAM, F.R.E.S.
RALPH CHISLETT, F.R.P.S., M.B.O.U.
Mrs. A. HAZELWOOD.
W. D. HINCKS, M.Sc., F.R.E.S.
Mrs. ELSIE M. MOREHOUSE.
W. H. PEARSALL, D.Sc., F.R.S., F.L.S.
H. C. VERSEY, D.Sc., F.G.S.



1952.

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ANUARY-MARCH, 1952 No. 840



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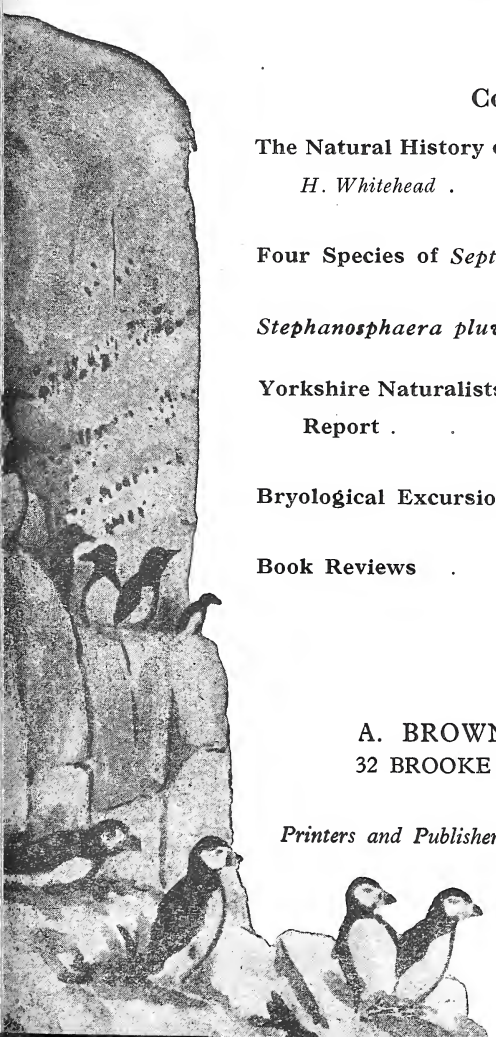
W. D. Hincks, F.R.E.S.
Mrs. Elsie M. Morehouse.
W. H. Pearsall, D.Sc., F.R.S., F.L.S.
H. C. Versey, D.Sc., F.G.S.



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Copies of Dr. J. H. Fidler's 'Coleoptera of Askham Bog' (price 1/-) may be obtained, post free, from The Editor of *The Naturalist.*

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NOTICE.

Exchange copies of the following periodicals may be had on loan from The Editor of *The Naturalist*, The University, Leeds 2, on receipt of stamped addressed envelope:

*The Entomologist.*
*The Entomologists' Monthly Magazine.*
*British Birds.*
*Bird Notes.*
*Science Progress.*
*Essex Naturalist.*
*The London Naturalist.*
*The Scottish Naturalist.*
*Irish Naturalists' Journal.*
*Transactions of the Lincolnshire Naturalists' Union.*
*Transactions of the British Mycological Society.*

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# THE NATURALIST

**FOR 1952**

## THE NATURAL HISTORY OF SOME YORKSHIRE RIVERS

H. WHITEHEAD

*Presidential Address to the Yorkshire Naturalists' Union, Leeds, December 1st, 1951.*

LAST time the Annual Meeting was held in Leeds was in 1942 when Prof. A. C. Hardy delivered an address on a topic of marine biology entitled ' Plankton Ecology in the Service of Man.' Nine years previously, in 1933 we met here in the University to hear an address from James Meikle Brown on ' Animal Biology of Upland Streams.' It was with deep regret that we heard of his death last Easter. Brown's Presidential Address was never published but recently Mrs. Brown forwarded to me the notes he used on that occasion. I am grateful to her for her kindness and take this opportunity of acknowledging one of the sources of information used in preparing this address.

The study of freshwater biology is of comparatively recent origin in this country and, as I shall endeavour to show, members of the Yorkshire Naturalists' Union and of the Leeds University have played an active part in its development.

We may commence with L. C. Miall, who occupied the Chair of Biology in what was then the Yorkshire College. His studies on aquatic insects were carried out mainly in the River Wharfe and its tributaries and in Meanwood Beck. He published several papers on the subject in the *Proc. Ent. Soc.*, but his best-known work is the book bearing the title, *The Natural History of Aquatic Insects*, first published in 1895.

In the early 'twenties, Edward Percival, Lecturer in Zoology in the University of Leeds and an active member of the Y.N.U. and of the Leeds Naturalists' Club, began to study the fauna of our streams and rivers and continued to do so until his appointment in 1928 to the Chair of Biology at Canterbury College, Christchurch, N.Z. I was fortunate in taking a share in this work and but for a happy association with him for seven years in this branch of biology it is certain that I should not be addressing you to-day.

At that time little was known about the fauna of the British rivers, although considerable work had been done on the Continent and in the United States. One great difficulty was the identification of larvae and nymphs of aquatic insects. Almost all the information on the subject was either in French or in German. This state of affairs has been remedied to a considerable extent.

In 1924, our Honorary Secretary, Mr. C. A. Cheetham, called a meeting of the Committee of Suggestions for Research which was presided over by Prof. J. H. Priestley. The outcome of that and successive meetings was that a biological survey of the River Wharfe was made in which at least five of our members took an active part. Five stations were selected and from them biological material was collected periodically and at the same time water samples for analysis from three of them were taken by members of the Staff of the West Riding Rivers Board. Grants for this work were made by the Rivers Board, the Royal Society and the University of Leeds. The results of this survey were published in the *Journal of Ecology* in 1930.

I will now give a brief account of our earlier river work. In studying the fauna of a river or stream it soon becomes apparent that there are marked differences in character even within a small space. Some recent writers have aptly described a river bed as a ' mosaic of habitats ' which often overlap. One reason for this is clear. Animals on a river bed are in danger of being washed away by the current. Some species are better able than others to maintain their position, either by holding on to fixed objects or by seeking shelter from the full strength of the current and so the organisms become sorted out according to the nature of the bed and to the strength of the current. It seemed desirable therefore to make some kind of classification of types of stream bed under consideration. Omitting details of sub-division and overlap it was found that our stream beds could be arranged as follows:

1. Stones, fixed or movable, without visible vegetation.
2. *Cladophora* and similar filamentous algae attached to stones.
3. Mosses on submerged stones.
4. Regions where phanerogams flourish with roots fixed in sand, silt or mud.
5. Regions covered with sand, silt or mud without submerged plants.

The terms common, scarce, rare when applied to the various species of invertebrates give only a vague idea of their incidence in any region and it seemed advisable to attempt to devise means for making quantitative estimations.

Ultimately methods were found and apparatus made which gave reasonably consistent results. Some of these methods, with modifications, are still in use. One drawback was that our apparatus limited sampling to regions of a stream in which wading was possible and where the stream bed could be reached by the hands.

Our samples showed that there is an immense variety of organisms living on the beds of streams and rivers. These belong to a number of phyla and classes of the animal kingdom. Protozoa, Sponges, Coelenterata, Platyhelminthes (Flatworms), Annelida (including relatives of Earthworms and Leeches) and members of the phylum Mollusca. The phylum Arthropoda includes representatives of the Crustacea,

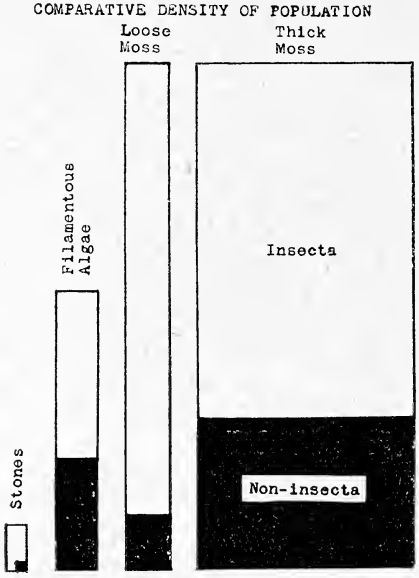


FIG. 1

Hydrocarina (Water Mites) and, most numerous of all, the Insecta. Excepting the insects, the remainder of the invertebrates spend the whole of their lives submerged. Aquatic insects, with the exception of some beetles use rivers, lakesponds and as a nursery where the larvae feed and grow. Pupation may take place either in water or on land but mating takes place on the banks.

Let us consider for a moment the relative densities of population on the first three types of river bed. The sizes of the rectangles shown in Figure 1 are proportional to the number of animals in unit area. Stones carry the least. The stony regions have no noticeable plant covering, but when we look at the stones bearing growths of filamentous algae, the number of animals rises quickly—the plants serving as food and shelter. Moss-covered stones afford the best shelter and numbers increase in proportion to the thickness of the moss. An account of the population of streams in which phanerogams are the dominant plants will be referred to later, but it may be assumed that the density of the population bears relation to the character and amount of plant growth. The diagram shows also that insects exceed in numbers the non-insect population and this is particularly noticeable in the stony region.

We may now look to see how the populations of these three regions are built up and try to find which type of animal life is dominant in each of them. Figure 2 is based on an examination of eighty samples and gives some idea of the percentage composition of the three regions. The orders Ephemeroptera (Mayflies) and Trichoptera (Caddisflies) are dominant in the stony regions. Amongst plant growth the Diptera far exceed in numbers that of other insects. Most of the Diptera are Chironomidae, better known to us as midges. This bears out the statements of two American biologists, Needham and Lloyd, who said, ' By far the most important of the aquatic Diptera, in the economy of nature are the midges.' ' Midge larvae are

among the greatest producers of animal food.' The Coleoptera (Beetles), though much fewer in numbers are well represented in the three regions. The distribution of molluscs is more irregular, *Ancylastrum* being most abundant in the stony regions where the current is swift and *Limnaea pereger* (Müll.) frequenting the calmer parts of the river bed. *Limnaea* is one of the few invertebrates breathing gaseous air which occur submerged in streams and rivers. The Oligochaeta, especially the tiny Naididae play an important part in river economy. From the diagram it is apparent that they are most abundant in the thick moss. It was estimated that in some instances their number exceeded 100,000 per square foot. The blackened spaces in

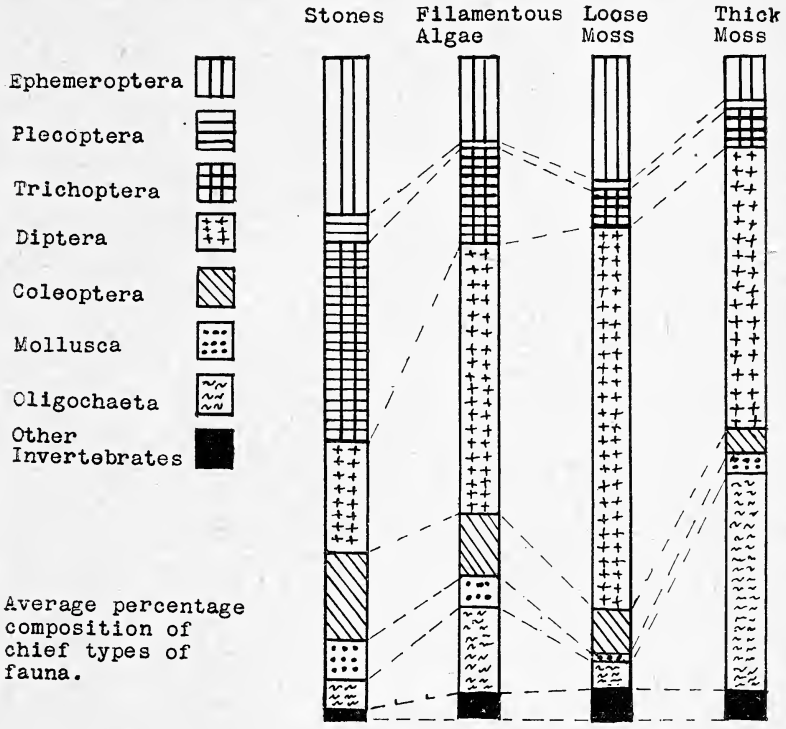


Fig. 2

the diagram labelled ' other invertebrates ' consist of Crustacea (chiefly *Gammarus*), Hydracarina (Water Mites) and Hirudinea (Leeches).

I have used the expression stony regions without visible plant growth. Submerged stones in most streams are covered with a thin brown, greenish deposit which on being examined under the microscope is seen to consist of various species of unicellular algae, chiefly diatoms and sometimes stunted growths of filamentous algae. Accounts of investigations of the algae of the River Wharfe were published by Butcher in 1924 and by Schroeder in 1930. I would remind you that both these naturalists were at that time members of the Y.N.U. Schroeder remarked that there were few true plankton species and that the samples of algae that he had examined suggested washings from stones on the river bed. During summer months when considerable quantities of oxygen are given off by the algae on stones, large fragments of the deposits float to the surface and are carried down stream. Butcher in 1940 described sessile algae which grew on glass plates that he had submerged for a time in the River Hull.

Pearsall in his introduction to the report on the biological survey of the River Wharfe says: ' It was hoped that the water analyses would throw some light on the phases of algal periodicity, but an examination of the data shows few or no obvious

correlations. The striking feature of the water analyses seems to be the lack of any marked depletion of substances like phosphates, nitrates and silica, which in the sea and in lakes seem to vary enormously in relation to the demands of the plankton algae.'

I have spent a little time on these algal deposits because they provide the chief supplies of food for animals living in the apparently barren stony regions. The deposits in addition to unicellular organisms contain numbers of Chironomid larvae and small Oligochaete worms which serve as food for larger animals. One of the commonest insect larvae in the stony regions apart from Chironomids is the caddis *Agapetus* which may form as much as 25 per cent. of the fauna. Several species of stream-lined *Baetis* nymphs are found here and perhaps the most characteristic insects are two genera of Ecdyonuridae—*Ecdyonurus* and *Rhithrogena*. Their flattened forms lie close to the rock surface and with well-developed claws and spines they are able to resist the current.

Stones with growths of filamentous algae have a strikingly different fauna. Chironomids and Oligochaetes constitute more than half the total. One reason for this is doubtless due to their narrow, cylindrical and flexible bodies which enable them to move easily amongst the algal filaments. Ecdyonurid nymphs are absent—their flattened bodies would prevent them from moving freely among the algal threads. The commonest caddis is the tiny *Hydroptila* which frequents stones with slight depressions on which the algae are growing.

Mosses on submerged stones provide excellent shelter for small animals and the moss regions usually have the richest fauna of any part of the river. Not only are animals more numerous but there is a greater variety. Oligochaetes and Chironomids form more than half the population. The latter usually belong to the Orthocladius group of the family and form gelatinous cases attached to the leaves and stems of the mosses. The stream-lined mayfly nymphs, *Baetis* and *Ephemerella* can move easily through loose moss but their numbers diminish where the moss is thicker. On the other hand the flattened Ecdyonurids are rarely found. It would be difficult for them to move in such an environment. Carnivorous forms are frequent owing to the presence of many small worms and midge larvae. The Plecoptera are represented by one or two species of *Perla*. Most of the caddis larvae belong to species which do not form a case and some, like *Rhyacophila* move freely to catch their prey. Others, like *Polycentropus* and *Hydropsyche* form nets in which the prey is caught.

The foregoing account is based upon material taken from Yorkshire rivers rising in the Pennines. It is interesting to compare conditions in rivers and streams in West Yorkshire with a river which rises in the Wolds, viz. Driffield Beck. The physical conditions in the two areas are markedly different. Many Pennine streams start in peaty uplands but in their course seawards soon encounter the Carboniferous Limestone where acids of vegetable origin are soon neutralised. A course over Millstone Grit follows and then the flow is continued over Magnesian Limestone. Water from the Wharfe is definitely alkaline from Grassington to Ulleskelf. Another feature of the Pennine rivers to which I should like to draw attention is the variable rate of flow due to flooding and to drought.

The water in the Driffield Trout Stream is derived from a number of springs known as ' kelds ' or ' kells ' where water oozes out of the chalk. Two main branches unite below Driffield to form the River Hull. The northern branch (Elmswell Beck), arising from springs near Elmswell, flows in a south-easterly direction and becomes Driffield Beck before joining the southern branch. The main part of the southern branch arises from springs near Kirkburn Church and is known as Eastburn Beck; but, lower in its course, it is marked on the Ordnance six-inch map as Driffield Trout Stream. The water is definitely alkaline, varying from *p*H 7·6 in winter to 8·4 in late summer. At Driffield there is very little change in the water level. During drought the accumulation of vegetation in the river bed holds up the water and during flood periods water is let off through sluices.

The water at Driffield is warmer than in the River Wharfe and there is not such a wide range of variation. Temperatures at Driffield vary from 7° C. to 15° C. Those at Grassington vary from 1·7° to 12·8° and at Ulleskelf from 3·9° to 16·1°.

Flint flakes and pieces of chalk form the bed in shallow regions and these may be moved along during the winter floods. In the main stream there are no filamentous algae or mosses but there is a prolific flora of phanerogams—chiefly *Sium erectum* Huds., *Ranunculus* spp. and in deeper water, the Mare's Tail, *Hippuris vulgaris* L. *Elodea* and *Callitriche* occur but not so abundantly.

A comparison of the fauna of the chalk stream with those of the Pennines shows several matters of interest and furnishes several problems for solution. In the stony regions at Driffield, *Agapetus* is common but an examination of 105 samples taken during a period of twelve months failed to find a single specimen of an Ecdyonurid nymph. The mayfly fauna consists entirely of species of *Baetis* and *Ephemerella* which live amongst submerged plants. In addition to *Agapetus* several species of caddis occur, chiefly Limnophilidae. Stoneflies are rarely seen. The Diptera are well represented by Chironomids and large numbers of *Simulium* larvae and pupae were found on submerged leaves.

Perhaps the most interesting invertebrate at Driffield is the freshwater shrimp (*Gammarus pulex* L.). It is the commonest invertebrate in the stream, occurring in all regions and at all times of the year. In the stony region at Kirkburn it was abundant—almost to the complete exclusion of other species. During winter floods numbers diminished in the stony regions but there was a corresponding increase amongst patches of *Sium*. *Gammarus*, though active, is a weak swimmer and is unable to maintain its position in a stream if the current is strong enough to move grains of sand. This would account for its seasonal change of habitat.

My remarks so far have dealt with the relationship of the fauna to the nature of the stream bed but conditions adjacent to the stream have an important bearing. The fauna and flora on the river bank may provide a large proportion of the food for the animals submerged in the water. Food is not all. Aquatic insects newly emerged from their watery cradle need shelter from sun and wind and enemies until their external covering has hardened. This shelter is provided by trees and herbaceous plants growing on the banks. One has but to beat the bushes or sweep the vegetation at the stream side to realise the important part played by terrestrial plants in this connection. The vegetation on the banks also shelters enemies of the aquatic fauna. Insect-eating birds hawk the innumerable midges already referred to.

I have chosen as the subject of this address ' The Natural History of some Yorkshire Rivers ' partly in the hope that it may appeal in some way to naturalists of diverse tastes. In the study of nature, however limited our outlook may be at first, we find ourselves looking to others working perhaps in another field for answers to our questions and for help in solving our problems. In the brief survey just given it has been necessary to consult other naturalists—the botanist to tell us more about the plants we find: the meteorologist to throw light on the causes of flood and drought: the geologist to tell us about the nature of the rocks forming the stream bed and about the vagaries of the currents. We ask the chemist for information on the substances in solution in river water and the part they play in building up living matter; the angler to tell us of the fish population and to the taxonomist for help in the identification of species. This co-operation can best be obtained in a union of naturalists such as ours where information is pooled. We learn much by personal intercourse with friends but we must not forget the work of others separated from us in time and space. The foundations of a great deal of our ecological knowledge were laid by the untiring energy, perseverance and labours of workers in this country, on the Continent and in the United States. Our task has been lighter and more exciting by their contributions. We may look with pride upon the results of the work carried out by members of this Union; results which have been recorded continuously in *The Naturalist* during the past eighty years.

May I, in conclusion, offer a saying which clearly expresses the attitude of mind of all true naturalists. ' Let us seek then as searchers who have to find, and let us find as finders who still have to seek.'

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**The British Amphibians and Reptiles,** by **Malcolm Smith.** Pp. xiii+318, with 17 colour plates, 19 black-and-white plates, and 88 text figures. *New Naturalist.* Vol. 20. Collins, 21/-.

Even including the introduced species, the number of reptiles and amphibians on the British fauna list is very small, yet it embraces creatures with such diversity of form and habit as to provide ample material for study, since of all the vertebrates they are the least known.

The separation of these islands came too soon after the amelioration of the European climate to allow many of these relatively slow-moving animals to reach our shores and we are thus bereft of many species whose distribution extends to the other side of the English Channel. Of those which do occur, some are so local as to be out of everyday reach of most of us. It is not surprising, therefore, that few books are available for their study. The earliest, Bell's *British Reptiles,* first published in 1851, was yet too soon to include all the native species for the smooth snake eluded the ken of this practised naturalist. Dr. Leighton published two volumes on *British Serpents* and *British Lizards* in 1901 and 1903 respectively, but their principal virtue lies in a well-compiled survey of the status of the various species at the time and the amphibians did not receive his attention. The need for a modern work on these two classes of animals is therefore obvious and Dr. Malcolm Smith in his *British Amphibians and Reptiles,* published in the centenary year of Bell's work, has made a gallant and successful bid to fill the gap.

Dr. Smith recapitulates all that was earlier known and contributes much that is new in this first really adequate survey of British herpetology. The first two chapters deal with the history of the study of reptiles and amphibians, with especial reference to Great Britain, and the zoogeography of the British species. All the species treated trinomially are considered to be of the typical race with the exception of the grass snake which is regarded as being of a more southerly race. Although the separation of the indigenous species has been complete since the isolation of the British Isles and although selective pressure might be thought high in creatures which reach, in most species, the most northerly limit of their range well before our most northerly latitudes, there has been no significant diversion as a result either of selection or drift.

Ensuing chapters deal, seriatim, with each order and sub-order, first as a whole and then species by species. The external appearance of each animal is scrupulously described, its general habits and breeding biology always adequately treated, its enemies are recounted and its distribution given as fully as is known. The author's interest in and knowledge of his subject is infinitely wider than that of the British or even the European field and the present work gains immeasurably thereby. Earlier works have been written mainly by men whose knowledge of the subject was limited to the species under their review and their treatment is consequently narrow and ill-defined. Dr. Smith's vast experience has enabled him to produce the fullest exposition of the known facts.

The illustrations are, as a rule, excellent, particularly the text figures, though the coloured plates may prove misleading. The book also includes two chapters on parasites by Dr. Baylis and Mr. Hawes whilst the final chapter on ' Some unsolved problems in herpetology ' provides much food for thought—and work. The bibliography is invaluable. An appendix treating of the classification of the British species surprisingly omits the turtles.

The book is an excellent production and should occupy a place on the bookshelves of every natural history society, school and university, as well as of everyone interested in the natural history of Britain.

The promotion of a work of this kind provides the needed stimulus for much field and laboratory work. Acceleration in the growth of knowledge is much advanced and the impetus continues long after the book must go to press. It is thus the unenviable lot of the author to be most aware of the incompleteness of the published work but it would be churlish to make more of this than to hope that he may be encouraged by the success of his excellent work quickly to produce an even more complete edition. E.H.

# FOUR SPECIES OF *SEPTONEMA*

S. J. HUGHES
*Commonwealth Mycological Institute, Kew, Surrey.*

THE type species of *Septonema* Corda was redescribed in *The Naturalist*, 1951, pp. 173-174. Four other species, three of which are known in Britain, are here included in *Septonema* ; the result seems to me to be a composite genus but nevertheless I consider that the species are better classified, for the time being at least, in *Septonema* than in any other genus. The primary character of *Septonema*, as delimited here, is the production of a simple or branched chain(s) of phragmoconidia developing acropetally as blown-out ends, on a conidiophore whose growth is terminated by the production of an apical chain ; the fungi included vary from subhyaline to very dark brown.

**1.** ***Septonema pallidum*** (Grove) Hughes comb. nov.

≡*Septocylindrium pallidum* Grove in *J. Bot. Lond.*, xxiv, p. 199, 1886.
=*Septonema diatrypellum* Bubàk (Saccardo's *Sylloge Fungorum*, xxv, p. 812 ; original reference not seen).

DESCRIPTION OF *Septonema pallidum*

The *colonies* are for the most part found on and around fructifications of diatrypaceous fungi ; of the 36 collections assigned to this name in Herb. I.M.I. (some of which are illustrated in Fig. 1), 27 were made on *Diatrype stigma*, two on *Eutypa flavovirens*, four on undetermined pyrenomycetes, one on *Anthostoma turgidum*, and two on rotten wood which was devoid of any perithecia. The mould is found on such sphaeriaceous fructifications on branches and fallen logs especially where kept moist as on those surfaces next to the ground or where covered by dead leaves or other vegetation. The perithecia of the pyrenomycetes on which the mould has been found are mostly effete but I have no evidence that this is due to the mould ; I prefer to regard the mould as a saprophyte which finds the presence of the particular pyrenomycete in some way suitable to its requirements. When in good condition the mould appears as glistening, pale olivaceous tufts of conidiophores each with a chain of conidia ; the tufts are mostly found around the ostioles of the host but may be more scattered on the substratum.

The *mycelium* is immersed or superficial and is composed of hyaline to brown, septate, branched, smooth-walled hyphae 1 to 2·5$\mu$ wide although occasional cells are expanded and much lobed within the cells of the wood.

The *conidiophores* are produced singly but are often crowded into tufts ; they are usually simple, rarely forked at the base, erect, usually straight, sometimes curved, pale brown but darker at the base, continuous or with up to five thin transverse walls and 24 to 65$\mu$ long ; they may be swollen up to 5$\mu$ wide at the base, above which they are 2 to 3$\mu$ wide and more or less cylindrical, although towards the apex, usually very slightly wider before tapering ultimately to a 1 to 1·5$\mu$ wide flat scar ; they arise either as a lateral branch of an immersed or superficial hypha, or a hypha may turn up away from the substratum and become modified into a conidiophore.

The *conidia* are produced in a single, simple, acropetal chain of at least seven conidia at the apex of each conidiophore ; the chains are usually straight and readily break up into conidia. The first formed conidium develops as the blown-out apex of the conidiophore and successive conidia develop from the apex of the preceeding conidium in the same way. The conidial initial is soon cut off by a septum from the conidiophore or conidium that bears it and develops septa from the base upwards as it elongates. At maturity the dry conidia are fusoid with tapering ends, the upper end tapering more than the lower, with a flat 1 to 1·5$\mu$ wide scar at each end, except the terminal conidium of a chain which bears a scar only at the base ; they are very pale brown, smooth, with a thick outer wall and up to six (mostly three) thin, transverse septa, and measure 14 to 48 by 4 to 6$\mu$. The conidia are usually successively shorter towards the apex of a developing chain ; the conidia of four chains gave the following lengths in $\mu$ when measured from the base towards the apex of a chain—35, 33, 31, 27, 23,—22, 20, 19, 16,—26, 24, 22, 19, 18, 14,—36, 32, 31, 28, 26, 25, 21.

This description is based on the more or less recent collections listed below, and the type collection which has been examined through the kindness of Professor W. Stiles, the University, Birmingham.

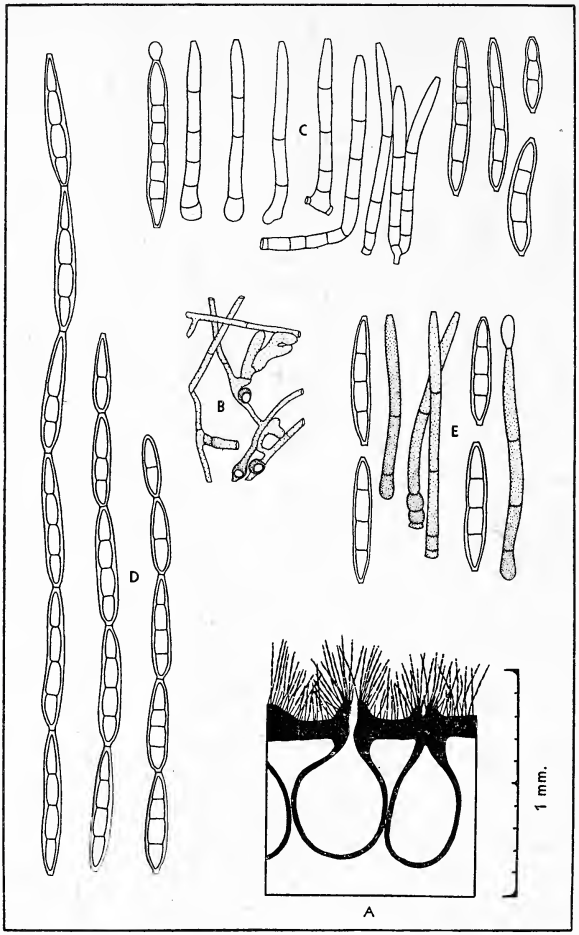


Fig. 1. *Septonema pallidum*: **A,** vertical section through Herb. I.M.I. 15485(a) showing perithecia of *Diatrype stigma* with conidiophores and chains of conidia of *S. pallidum*; **B**, mycelium with bases of conidiophores from Herb. I.M.I. 23531; **C,** conidiophores and conidia from Herb. I.M.I. 23531; **D,** chains of conidia from Herb. I.M.I. 14777(a); **E,** conidiophores and conidia from Herb. I.M.I. 15485(a); all ×500 except **A** which has a scale provided.

### British Records sub *Septocylindrium pallidum*

Grove's original record was in 1886 and the type collection has been examined [Herb. I.M.I. (slide) 18227]; it is labelled '*Septocylindrium pallidum* sp. n., round the ostioles of *Diatrype stigma*, Blackwell, 22/3/84' by W. B. Grove, but it is interesting to note that whilst the packet was originally labelled *Septonema*, this was altered to *Septocylindrium*.

Massee (*Brit. Fungus Flora*, iii, p. 349, 1893) cited no particular collection but added 'The olive colour of the hyphae and spores along with the well-developed hyphae suggest that the present species should be located with the Dematieae.'

All the subsequent records of this name that I have traced are based on collections now preserved in Herb. I.M.I. ; these are :

*The Naturalist*, 1947, p. 162—Herb. I.M.I. 13966(c), 13789, 14016(b).
*The Naturalist*, 1949, p. 82—Herb. I.M.I. 31415(b), 31412(b).
*Trans. Brit. Mycol. Soc.*, xxxiii, p. 174, 1950—Herb. I.M.I. 19023(c), 19040, 19051, 19078(a), 19088.

All these are now disposed as *Septonema pallidum*.

Collections Assigned to *Septonema pallidum* in Herb. I.M.I.

(*a*) On *Diatrype stigma*—
on *Acer pseudoplatanus* ; Aberystwyth, Cards., 26/3/1948, Herb. I.M.I. 27367(a), 27372 ; Exeter, Devon, 14/9/1947, 19023(c) ; Forge Valley, Yorks., 11/4/1947, 13966(c) ; Llanelly, Carms., 5/8/1946, 6158(c) ; Mickleham, Surrey, 26/5/1947, 15485(a) ; Richmond Park, Surrey, 6/7/1947, 16090 ; Swinton Park, near Masham, Yorks., 26/9/1948, 31415(b) ; Thornton-le-Dale, Yorks., 13/4/1947, 13789.
on *Corylus avellana* ; Buff Wood, Cambs., 19/10/1946, 8088 ; Ranmore, Surrey, 6/1/1947, 9878 ; 15/2/1948, 23531.
on *Fagus sylvatica* ; Boxhill, Surrey, 1/9/1946, 6584(a) (M. B. Ellis) ; 27/4/1947, 14777(a).
on *Fraxinus excelsior* ; Exeter, Devon, 14/9/1947, 19040(b) ; Quarry Ghyll, near Masham, Yorks., 16/4/1950, 40545, 40546 ; Ranmore, Surrey, 25/5/1947, 15419.
on ? *Fraxinus excelsior* ; Hackfall, near Masham, Yorks., 25/9/1948, 31412(b) ; Ranmore, Surrey, 30/6/1946, 5994.
on *Hedera helix* ; Exeter, Devon, 14/9/1947, 19088.
on *Ilex aquifolium* ; Exeter, Devon, 14/9/1947, 19051 ; Sellers Wood, Devon, 11/9/1947, 19078(a).
on *Populus* sp. ; Donhead St. Mary, Wilts., 12/1946, 2061(a) (T. W. Dunston).
on *Prunus spinosa* ; Boxhill, Surrey, 19/1/1947, 10327(a).
on *undertermined wood* ; Ranmore, Surrey, 13/6/1948, 29355 ; Swinton Park, near Masham, Yorks., 27/9/1948, 31483.

(*b*) On *Eutypa flavovirens*
on *Fagus sylvatica* ; Ranmore, Surrey, 18/8/1946, 6544.
on *undetermined wood* ; Ranmore, Surrey, 13/6/1948, 29340.

(*c*) On *Anthostoma turgidum*
on *Fagus sylvatica* ; Margam, Glam., 15/4/1945, 31284.

(*d*) On *undetermined Pyrenomycetes*
on *Fagus sylvatica* ; Park Cwm, Gower, Glam., 7/8/1946, 6649 ; Ranmore, Surrey, 13/6/1948, 29333 ; Wooton-under-Edge, Glos., 24/5/1950, 41573 (R. W. G. Dennis).
on *Sarothamnus scoparius* ; Petit Port, Guernsey, 16/9/1948, 31694 (M. B. & J. P. Ellis).

(*e*) On wood of *Fagus sylvatica*
Mickleham, Surrey, 4/5/1946, 5183.

(*f*) On wood of *Fraxinus excelsior*
Thornton-le-Dale, Yorks., 10/4/1947, 14016(b).

*S. pallidum* grows readily in pure culture.

**2.** ***Septonema chaetospira*** (Grove) Hughes comb. nov.

≡*Septocylindrium chaetospira* Grove in *J. Bot. Lond.*, xxiv, p. 199, 1886.

Two collections have been available for examination ; in the type collection [Herb. I.M.I. (slide) 18228], *S. chaetospira* (Fig. 2A) is growing in association with *Catenularia cuneiformis* (Richon) Mason ; the packet is labelled by W. B. Grove ' on decayed wood, with *Catenularia simplex*, Streetly, 24/10/1885.' The second collection [Herb. I.M.I. 29316(c)] is on rotten wood of *Fraxinus excelsior* and the mould (Fig. 2B) is growing in association with *Sporoschisma mirabile* Berk. & Br. It was collected at Wauldby Green, E. Yorks., 5/6/1948, by J. Webster who got the mould into pure culture. As far as I am aware these are the only records of Grove's fungus for Britain.

DESCRIPTION OF *Septonema chaetospira*

The *colonies* are thin and inconspicuous, being barely visible under a lens as a cottony growth over the black moulds *Catenularia cuneiformis* and *Sporoschisma mirabile*.

The *mycelium* is immersed, superficial, and aerial, being composed of hyaline to subhyaline, septate, branched, smooth-walled hyphae 1 to 2·5$\mu$ wide.

The *conidiophores* are produced singly and scattered from the immersed, superficial and aerial hyphae, and also from the hyphae which creep over the conidiophores of the black moulds ; they are usually simple, sometimes once branched or forked at the base, straight or slightly curved, very pale brown, up to 4-septate and 20 to 60$\mu$ long ; they may be swollen up to 5·5$\mu$ at the base, above which they

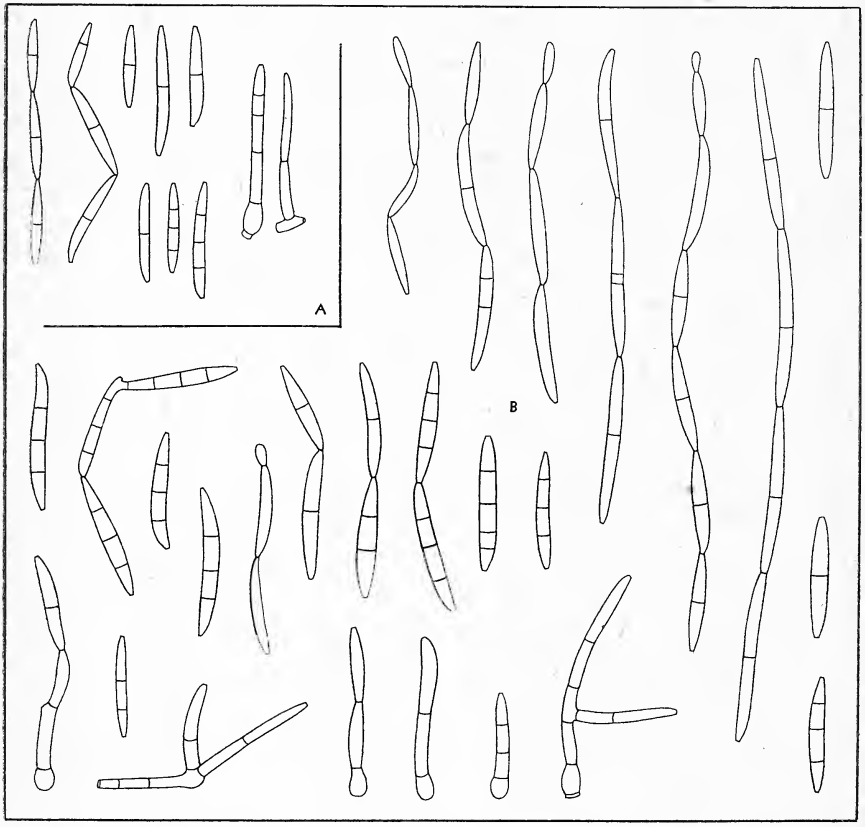


Fig. 2. *Septonema chaetospira* : **A,** conidiophores and conidia from the type collection [Herb. I.M.I. (slide) 18228] ; **B,** conidiophores and conidia from Herb. I.M.I. 29316(c) ; all ×500.

are 2·5 to 3·5$\mu$ wide and more or less cylindrical, tapering gradually towards the apex which bears a flat scar 1 to 1·5$\mu$ wide.

The *conidia* are produced in a single, simple acropetal chain of at least seven conidia at the apex of each conidiophore ; the chains are more or less spirally coiled and readily break up into conidia. The first formed conidium develops as the blown-out apex of the conidiophore and successive conidia develop from the apex of the preceeding conidium in the same way. The conidial initial is soon cut off by a septum from the conidiophore or conidium that bears it, elongates, develops at first a median septum and then two or more other transverse septa ; in the meantime another conidium will be developing at its apex. At maturity the dry

conidia are fusoid and straight to almost falcate and curved, with a flat apical scar at each end, except where the conidium terminates the chain ; the scar is often eccentric, following the spiral arrangement of the conidia ; they are hyaline to very pale brown, smooth, thin-walled, with up to four, generally three, thin, transverse septa and measure 20 to 45 by 2·5 to 5$\mu$, generally 25 to 35 by 3 to 4·5$\mu$ ; for a long time the conidia may remain 1-septate.

One conidium has been seen to have produced two chains of conidia at its apex but this seems to be exceptional.

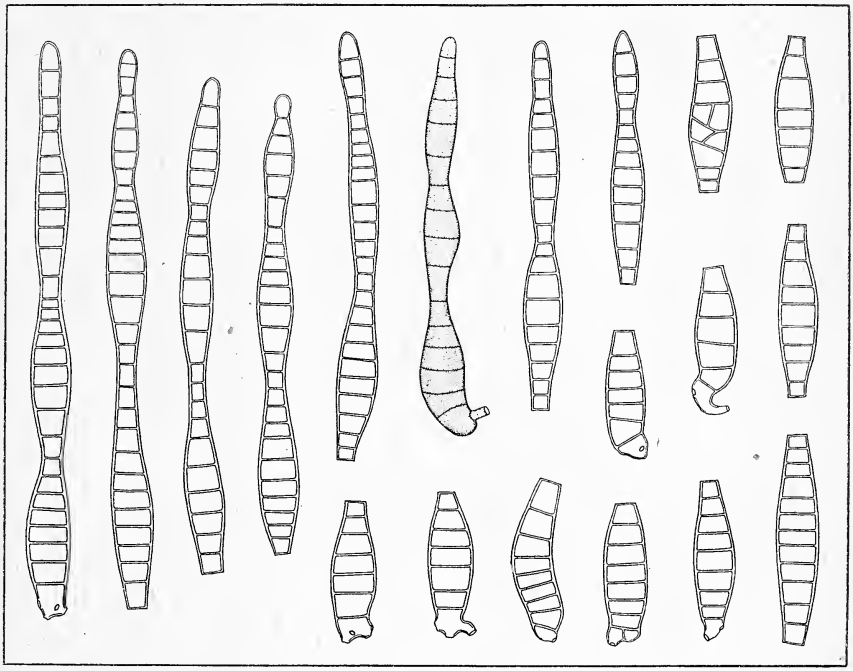

Fig. 3. *Septonema hormiscium* : conidiophores, chains of conidia and loose conidia from Herb. I.M.I. 31196 ; ×500.

**3. *Septonema hormiscium*** Saccardo in *Michelia*, ii, p. 559, 1882.

The single collection in Herb. I.M.I. assigned to this name, I made on a rotting conifer plank at the Botany Field Station, Cambridge, 16/7/1948 ; it is Herb. I.M.I. 31196, agrees fairly well with Saccardo's diagnosis, and is illustrated in Fig. 3.

Description of *Septonema hormiscium*

The *colonies* are extensive and the conidiophores and chains of conidia (frequently broken in this material) are scattered or crowded and show up as black shining patches.

The *mycelium* is immersed and composed of pale brown hyphae but further details could not be made out.

The *conidiophores* are more or less erect, straight or slightly curved, broadly fusoid, truncate above, irregularly shaped below, dark brown, thick-walled, smooth, with five to eight transverse septa, not constricted at the septa, with the basal cell showing the scars left by one or more mycelial hyphae from which the conidiophore has broken away ; they measure 32 to 46 by 10 to 14$\mu$ and are very similar to the conidia ; the flat apical scar is 4·5 to 6$\mu$ wide.

The *conidia* are borne in a single, simple, acropetal chain of at least four conidia at the apex of each conidiophore. The chains are straight and at maturity they fragment into the conidia. The first conidium develops as the blown-out apex of the conidiophore and the successive conidia develop from the apex of the preceding one in the same way ; the conidial initial is soon cut off by a septum from the conidiophore or conidium on which it is borne ; it becomes brown and septate, continues to elongate throughout its length and further septa are laid down in the enlargening cells. In the meantime a further initial has developed at the apex and the maturation of this one, together with the development of another proceeds simultaneously. At maturity the dry conidia are fusoid, with truncate or almost parallel-sided ends, often more tapered above than below, with a flat scar 4·5 to 6$\mu$ wide at each end, except the terminal conidium of a chain which bears a scar only at the base ; they are very dark brown with a thick outer wall and six to eleven thick-walled transverse septa and they measure 38 to 60 by 9 to 12$\mu$. Occasional conidia develop one or two longitudinal walls.

**4.** ***Septonema loranthi*** (Hansf.) Hughes comb. nov.

≡*Dendryphion loranthi* Hansf. in *Proc. Linn. Soc. Lond.*, clv, p. 46, 1943.

*S. loranthi* is a hyperparasite, usually of asterinaceous fungi ; it is known in Herb. I.M.I. from Uganda, Gold Coast and Sierra Leone. The conidia are produced in a single simple, acropetal chain at the apex of each conidiophore as in *S. pallidum*.

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## *STEPHANOSPHAERA PLUVIALIS* COHN

M. R. DROOP
*Botany School, Cambridge*

Lund (1950) has put forward some evidence supporting the idea that *Stephanosphaera pluvialis* Cohn favours calcareous rocks. In July of this year I had occasion to examine some 200 pools on islands off the coast of Sweden and Finland, and have found *Stephanosphaera* to be one of the commonest algae in these pools. For instance, out of 40 ' ephemeral rain pools ' in the Tvärminne archipelago, 20 contained *Haematococcus pluvialis*, 10 *Stephanosphaera pluvialis*, 7 *Brachiomonas* spp. and 7 *Hemidinium ochraceum*. The islands of the archipelago consist almost entirely of glaciated crystalline rocks of an acid nature. Rare outcrops of a type of marble occur, however. I collected from two such islands (41 samples in all) and in none did I find *Stephanosphaera*, though *Haematococcus* was there in abundance. I had, in fact, formed a very strong impression that *Stephanosphaera pluvialis* was a common alga typical of the glaciated granite rock pools of the Baltic.

The evidence from Britain now suggests to me that the important factor is not so much the acid or basic nature of the rock but rather, for want of a better phrase, the physical nature of the pool. Only where conditions have resulted in the formation of hollows free from drainage in a naked rock surface, is *Stephanosphaera* abundant. In the Baltic these conditions are realised on granite, owing to glaciation, while they are realised in England on the limestone flats of the Pennines.

In Finland I correlated the presence of *Stephanosphaera* with the absence of any vegetation in the drainage area of the pool : thus, it was present in 19 out of 73 cases (25 per cent.) of pools without vegetation in the area of drainage, and in only 3 out of 32 cases (10 per cent.) of pools with vegetation. On those islands the difference between the two types of pools is very evident (Levander, 1900), the water of the one being colourless and that of the other a straw colour. Even the presence or absence of a small clump of grass in a crevice in the drainage area is often sufficiently indicative of the nature of the pool.

I do not wish to suggest that these considerations by any means entirely account for the distribution of this interesting alga ; rather I present them as being possibly one particular limiting factor.

### References

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Lund, J. W. G. (1950). Algological Notes VI. *The Naturalist*, p. 147.

## THE YORKSHIRE NATURALISTS' UNION NINETIETH ANNUAL REPORT

**The Eighty-ninth Annual Meeting** was held in the Cartwright Memorial Hall, Manningham Park, Bradford, on Saturday, December 2nd, 1950, on the invitation of the Bradford Naturalists' Society. The Annual Report for 1950 was presented there and is printed in *The Naturalist*, 1951, pp. 18-34.

**The Presidential Address** was given by A. Raistrick, Ph.D., M.Sc., F.G.S., on Late Glacial and Post-Glacial Time in Yorkshire. This is printed in *The Naturalist*, 1951, pp. 1-5.

**The Excursions** for 1952 will be held at :

V.C. 61. Leven Canal, July 26th.
V.C. 62. Loftus, May 31st to June 2nd.
V.C. 63. Hatfield, July 12th.
V.C. 64. Litton, June 14th.
V.C. 65. Leckby Carr, June 28th.

**New Members**—Baker, Mrs. Jean, The Pentre, Slingsby Walk, Harrogate. Blower, J. G., M.Sc., Zoology Department, Manchester University. Brocklesby, R., The Elms, North Eastern Road, Thorne, Doncaster. Brown, Miss E. M., B.Sc., West View House, Ilkley. Conder, E. M., High Dalby House, Thornton-le-dale, Pickering. Duncan, A. C. M., Bransty, Rupert Road, Ilkley. Gilmour, E. F., 12 Prince of Wales Terrace, Scarborough. Grace, J., 72 The Crescent, Ravensthorpe, Dewsbury. Greenwood, A. D., B.Sc., Botany Department, Leeds University. Hutchinson, W. H. N., Holly Lodge, Brantingham, Brough, E. Yorks. Immie, Miss J., 3 South View, 37 South Parade, Northallerton. Jackson, Miss M., No. 1 Cottage, Dovenby, Cockermouth. Kilby, B. A., M.A., Ph.D., F.R.I.C., Department Biochemistry, Medical School, Leeds 2. Lillis, Miss N. A., M.Sc., 592 Beverley Road, Hull. Pearson, Miss R. M., School House, Tunstall, Richmond, Yorks. Rushworth, D. A., Woodhouse Grove School, Apperley Bridge, Bradford. Shoesmith, R., Woodlands, Luddenden. Spark, Dr. L. C., 34 Richmond Avenue, Leeds 6. Sunderland, N., Botany Department, Leeds University. Taylor, F. T., 14 Regent Park Avenue, Leeds 6. Tetley, Miss F. T., Beechfield, The Terrace, Boston Spa. Touche, Dr. C. T. P. la., M.Sc., L.A.H. (Dublin), Department Bacteriology, School of Medicine, Leeds 2. Troughton, Miss C. M., Ashcroft, Drighlington, Bradford. Walker, C. S., Swanland Rise, West Ella, E. Yorks.

**New Associated Society**—The East Riding Teachers' Scientific Society.
The Hull College Biological Society has resigned.

**Deaths**—During the past year the death has occurred of the following nine members: J. M. Brown, a past President of the Union; Rev. W. L. Schroeder, at one time a frequent contributor to *The Naturalist*; C. F. B. Shillito, Secretary of the Geological Section; Major R. M. Cattley; Mrs. Leefe; F. W. Mills; J. A. Sweetlove; T. Throup and H. Tulley.
Nine other members have resigned.

**Changes of Addresses :**

Crackles, Miss F. E., 143 Holmegarth Drive, Bellfield Avenue, Hull.
Grist, W. R., 12 Ramshill Road, Scarborough.
Harling, Miss E. J., 48 Beverley Grove, Blackpool.
Holmes, E., 66 Grosvenor Road, Shipley.
Ilderton, Rev. K., Chollerton Vicarage, Hexham, Northumberland.
Lewis, R., c/o 167 Queen Street, Withernsea.
Medlicott, Capt. W. S., Old Fodderlee, Hawick, Roxb.
Owen, Miss D. W., 26 Ventnor Terrace, Manor Drive, Halifax.
Rowntree, M. H., 23 Upland Park Road, Oxford.
Shaw, G. A., 33 Temple Rhydding Drive, Baildon.
Sunderland, S., 61 Errington Road, Mytholmroyd, Yorks.
Wood, T. W. A., Rowan Tree House, Sleights, N. Yorks.
Wood, R. L. M., Lightridge Road, Fixby, Huddersfield.

## FRESHWATER BIOLOGY

(H. Whitehead).—Reports of field meetings at Howden, Yearsley Dam, Deanhead Valley and Thorp Arch held during 1951 and where collecting was done have been printed in *The Naturalist* and further comment is unnecessary. Several papers of interest to students of freshwater biology have appeared in *The Naturalist* for 1951.

The following reports have been received from members of the Freshwater Biology Committee :

(Chris. A. Cheetham).—The following notes refer to the Austwick Beck. This stream has been low most of the year due to the shortage of rainfall from March to mid-June and again from mid-July until October. Many of the springs and small runlets were dried up but mist and drizzle kept the vegetation green.

The sudden rise and fall of the stream after any rainfall, due to the gryping on the moors mentioned in last year's report, has again been a trouble to fishermen.

It may be useful to cite what has been noted on this particular stream. The Caddisflies were scarce at first, the smaller types alone were fairly plentiful, *Tinodes waeneri* L., and *T. dives* Pict. in July and *Psychomyia pusilla* Fab. in July and August. Next, in odd specimens until late in the year, *Odontocerum albicorne* Scop. June to September, *Philopotamus montanus* Don. July to October, *Limnephilus lunatus* Curt. September and October, *Anabolia nervosa* Curt. September and October. *Sericostoma personatum* Spence, was caught on June 13th and July 5th and a single *Mystacides azurea* L. on July 3rd; this was the var. *albicornis* Moseley. Some fine weather in early October added two species, *Rhyacophila dorsalis* Curtis, and *R. munda* McL. Also three species of *Halesus*, *guttatipennis* McL. *auricollis* Pict. and *digitatus* Schr., *Chaetopteryx villosa* Fab. was also plentiful.

Some Stoneflies seemed fairly normal, *Isoperla grammatica* (Poda) and *Chloroperla torrentium* (Pict.) generally present from May though perhaps fewer in number. *Perla cephalotes* Curtis, May 28th. Odd specimens of *Protonemura meyeri* Pict, May 23rd—June 14th. Other species of stoneflies were more numerous but were not identified except *Leuctra hippopus* Kemp. April, *L. geniculata* Steph. August, *L. fuscipennis* Steph. May, *Nemurella inconspicua* Pict. May, *Amphinemura (cinerea) sulcicollis* (Steph.) June.

A few Alderflies were seen in June.

The most frequent Mayflies were species of *Baetis* ; *B. rhodani* (Pict.), April to September, *B. scambus* Etn., June to October, *B. pumilis* (Burm.), June to September, *Paraleptophlebia submarginata* (Steph.), May and June, *P. cincta* (Retz.), July, *Ephemera danica* Müll., June 4th, *Centroptilum luteolum* Müll., May to October, *Ecdyonurus venosus* (Fab.), May to October, *Rhithrogena semicolorata* (Curt.), May and June, *Leptophlebia vespertina* (L.), July, *Habrophlebia fusca* (Curt.), July, *Ephemerella ignita* (Poda), July to September, *Ecdyonurus dispar* (Curt.), *E. venosus* (Fab.), October.

(E. Thompson) Dewsbury.—The season here commenced with a dull period with no activity along our streams until April, when prospects seemed good. On most sunny days aquatic insects have been numerous, and some species have been very prolific. In general, conditions this year in our area seem to have favoured the insects of streamside and pond.

Along the stream at Coxley, the most numerous insect in April was *Baetis rhodani* (Pict.). Some of these insects were observed far into the woods dancing over well-worn paths far from any water. This is most unusual as mayflies spend most of their time very close to the mother stream. Other mayflies noted from this stream were the large *Ephemera danica* (Müll.) with its yellowish subimago, and *Ephemerella ignita* (Poda). Formerly *Cloeon dipterum* (L.) in this area was only known from Coxley, a second station this year was discovered on Emroyd Common.

The swamp behind Coxley Dam yielded a Caddis of some interest, *Limnephilus sparsus* (Curt.). This Caddis seems to favour marshy areas. Mr. Whitehead informs me it thrives at Askham Bog, it was taken also at Terrington Carr, when the Union held its Whit meeting there. Where the insect was found at Coxley the terrain is similar to the above stations.

Small colonies of Entomostraca have lived in a strange habitat for years in a wood at Batley. The wood was felled many years ago, and the trees left to coppice. In doing so small hollows have formed in the original stumps, and by some agent a species of *Cyclops* now inhabits them.

Only the trees along the edge of the wood are occupied and trees in the centre though holed and containing water are empty of life. *Cyclops* when moved from a nearby pond, and placed in centre holes vanished within a few days. This experiment having failed, the whole of the contents from a tree on the margin of the wood, was emptied into a tree hole in the centre, and again the *Cyclops* did not seem happy and soon were gone.

Inhabited trees vary each year in numbers, and the density of life in each separate hole seems to decrease or increase according to the amount of water contained. In warm months a number of holes become dry, but under the damp leaves that collect in the bottom *Cyclops* are still there obviously quite at home. Many insects fall by accident into the water-filled holes, the most numerous are moths, then beetles, including some Weevils, then species of Diptera. One wonders if the flies crawling around the margin of nearby ponds in some way act as agent in the spread of *Cyclops* to this queer habitat.

Batley Park Lake though edged in by concrete walks still produces interest, at times during the year the paths are good places for a small Caddis *Limnephilus vittatus* (Fab.).

Stoneflies are not with us in variety of species, but the warm weather brought us a good number of *Nemoura variegata* Oliv.

Though built-over in many parts this area still provides its quiet nooks, and pure streams where much work remains to be done. Even in a limited area, species have strange distributions, new species arrive, some vanish or become scarce, all to the interest of the naturalist.

Mr. G. Fryer has kindly examined a specimen of the Cyclops and tells me that it is *C. viridis* Jur.

(G. Fryer).—The drying up of a canal ' bywash ' at Golcar was reported last year (*The Naturalist*, 1951, p. 19). Whilst this caused the immediate extermination of most of the organisms present, a very few creatures were able to persist among the wet mosses which formed the substratum of zone 3, a very slight seepage of water assisting in their survival. The amphipod *Gammarus pulex* (L.) persisted in a small trickle of water for almost a year, but has now disappeared. Now a mere film of water remains, but in it are to be found considerable numbers of the little Elmid beetle *Elmis aenea* (Mueller) whose height is approximately that of the depth of water in which they occur. This species was found in zone 2 of the ' bywash ' when the latter was flowing, and larvae were noted in zone 3 where the surface velocity of the water was 7 ft./sec. Comparison of such a habitat with a semi-stagnant film of water strikingly reveals the wide variety of habitats which are tolerated by this species, a feature of its ecology which is borne out by casual observations elsewhere.

(P. F. Holmes).—*Protoclepsis tesselata*. This leech is numerous in a pool at the head of Gordale Beck, and I have also taken it once or twice in Malham Tarn.

*Parachordodes violaceus* (Baird, 1853). One male of this hairworm was found in an isolated pool in a dried-up part of Darnbrook Beck on 5th July, 1951. Identified from the cuticular pattern according to the key and technique in Goodey's *Soil and Freshwater Nematodes*, 1951.

*Ophrydium* sp. (Protozoa). This occurs every year in large quantities along the east shore of the Tarn. The young colonies are found attached to stones in a narrow belt of about 1 to 2 ft. of water, on a gently shelving shore ; they were first noticed this year on June 16th. By the middle of August they were mostly fully grown and masses of them had become detached and were being washed up on the shore, forming a jelly-like mass.

Trichoptera.—*Agraylea multipunctata* Curt. first seen 28th May, large numbers by 5th June. *Hydroptila femoralis* Eaton and *Polycentropus flavomaculatus* Pict. first noted 5th June. These three species seem to be the first to appear at the Tarn and were all later than usual this year. The total numbers of Caddis have been well up to normal.

Plecoptera.—*Leuctra moselyi* Mort. found at about 1,700 ft. in Darnbrook Beck, one male on 22nd August, 1950.

Neuroptera.—*Boreus hyemalis* L. one adult on top of snow at about 1950 ft. on Fountains Fell on 3rd April, 1951. Previously noted near Tarn House on 13th November, 1949.

## MAMMALS, REPTILES, AMPHIBIANS AND FISHES COMMITTEE

**Mammals** (Mrs. A. Hazelwood) : CHIROPTERA : Mr. Garnett observes that the Noctule Bat is usually to be seen in the spring or early summer at Thornton-le-Dale but this year the first was not noticed until July 11th when one was flying high over the village at 9.30 p.m. B.S.T. Pipistrelles are noted from Mytholmroyd where a pair of bats, probably Daubenton's, can usually be seen flying over the Lee Mill Dam on summer evenings.

A few specimens of the following Bats were secured in the York district for the British Museum : records by Adam Gordon.

Barbastelle : Well established and increasing ; about fifteen were netted and released in a single outhouse with open windows. The bats use this outhouse to settle in while eating the large moths which they capture outside.

Long Eared Bat : This bat also uses the outhouse where it strips off the wings before eating the bodies of insects. Both this species and the Barbastelle are very fond of the male ghost moths.

Daubenton's : This bat haunts some stretches of the River Rye in numbers.

Whiskered : Several seen but their lair was not discovered.

Noctule : All their old haunts of thirty years ago were visited during May and June but none were found. On July 25th a solitary specimen was seen flying at a great height and this was followed a week later by eight or ten others. Now there are at least three colonies in old trees in Duncombe Park. This is about the limit of its northern range.

CARNIVORA : Reports all agree that foxes are still plentiful, despite persecution. Members of the Dales Fox Fund accounted for 114 foxes last year. Twelve were killed in the Todmorden and Gorple areas on June 4th. A black fox is reported to be running the Gordale Scar district. Lifeboat men from Hull report three parties of fox cubs foraging along the shore each dawn and dusk, picking up what they could find—probably Lesser Terns' eggs—but Mr. Ainsworth found a number of eaten carcases of oiled ducks. Mr. Garnett had an interesting experience on June 15th, while listening for nightjars on Paxton Common, Thornton Dale. He was startled by a loud cry '*Wow*' from a vixen about a hundred yards from him. She repeated this single call about forty times but did not show herself. The keeper considered she was warning her cubs of danger as she must have got wind of Mr. Garnett who was hidden in some low conifers and did not move.

Tracks of Otter have been seen on the sandbanks along the course of the River Rye, and are reported from various other expected localities.

Badgers occupy most of the old setts in the Helmsley area, and occur at Bempton. A new sett is reported from Eston. At least two litters have occurred at Winterburn where one of the cubs was run over by a car during daylight on June 5th. Four badgers were killed at Winterburn during 1950.

There is a record of a Stoat, shot at Masham on July 22nd, which was immediately picked up and carried under cover by a family group of seven other stoats.

Records of Weasels would indicate that they are quite common and of much more frequent occurrence than the stoat.

Common Seals were seen off the Yorkshire coast from June onwards.

INSECTIVORA : Moles are everywhere reported common.

Hedgehogs are also widely distributed in good numbers, though many of these animals meet an untimely end on the roads ; seventeen are reported killed between March 30th and September 10th on a 5½ mile stretch of road between Glusburn and Keighley.

There are a number of records of dead Lesser, Common and Water Shrews found during September, as would be expected ; these species seem to be generally distributed throughout the county.

RODENTIA : Around York, in spite of attempts to control the Grey Squirrel, it has increased. Many small young of late litters (September) are about but it is doubtful if these will survive the winter. Grey Squirrels were seen during August at Sutton-in-Craven. After introduction into a certain part of the Halifax parish in 1921, the species has now entirely disappeared, none having been seen during the last few years. A baby (found by Mr. Green of Thornton Dale) was lying alive below the entrance of an old woodpecker nest in the Village Wood on April 15th. It was then so cold that the many fleas on it were preparing to leave. The animal was furred and the eyes were open so that it was probably about three weeks old.

The Red Squirrel is reported to have increased in the wooded valleys around Halifax and Mytholmroyd, and is still common in the Dewsbury area. A few still occur in Coxley Valley and on Emroyd Common.

A number of white Rabbits, both old and young, have been seen in the grounds at St. Ives—possibly of domestic origin. Some idea of the increase in the numbers of Rabbits at Masham is gathered from the report that 101 animals were caught in 125 snares.

A keeper at Winterburn reports having seen thirty Brown Hares in one field early this season. Around Halifax the Brown Hare is said by many farmers to be more common at present than Rabbits, few of which have been noted since the severe winter of 1947-8. An Alpine Hare was seen in late October, 1950, on the Rishworth Moors ; the last record in the parish was in November, 1936, at Blackstone Edge moors.

Water Voles, once plentiful on the Rivers Ouse and Rye are now rarely seen. Field Voles are reported as ' not very numerous this year ' from Hull.

UNGULATA : A few Red Deer from the Duncombe Park herd still exist in the woods between Ampleforth and Rievaulx. Fallow Deer are more numerous than of late years and have now spread to the Kirbymoorside district.

**Reptiles** (Mrs. A. Hazelwood) : Adders are plentiful on the moors north of Helmsley. A piece of a Common or Viviparous Lizard was found on Gorple moors at an altitude of 1200 feet. Several Slow-worms have been seen on the banks of the moat at Helmsley Castle.

**Amphibians** (Mrs. A. Hazelwood) : From November 1950 until June 1951 the temperature was below average, with recurrence practically throughout August. The winter months brought but little depth of snow, but severe icing conditions were constant. Rainfall was heavy during the first three months of the year. March brought ground frosts (20 degrees on the 6th at Huddersfield and 12 degrees on the 8th and 9th). Gales and snow blizzards were also experienced. April was cold, yet the sunshine was slightly above normal.

The record of frog spawn from Stubb Dam is on March 16th, but at higher altitudes around Mytholmroyd spawning was taking place nearly a fortnight later. Spawn is recorded from Glusburn area on March 17th. At Newsome pond, near Huddersfield, Mr. Wattam says spawning commenced on March 4th and ended on the 19th, nineteen masses altogether. Tadpole emergence commenced on March 28th and young frogs were in evidence on June 21st. At West Wood ponds, Honley, there were masses of both Frog and Toad spawn on March 28th and tadpoles of both, in greatly reduced numbers were emerged on May 2nd. Mr. Butterworth says that on Christmas Day, 1950, after breaking ice on his lily pool, he saw a frog swimming in the water.

Toads are recorded as scarce in the Halifax parish. Several were seen in the vicinity of the old pond sites outside Farnley Mill Wood, near Huddersfield, on June 23rd, in company with both smooth and Crested Newts. The Smooth Newt occurs commonly in many mill dams and ponds around Halifax.

The Palmate and Great Crested Newts are reported from a pond in Whitley Woods near Dewsbury.

## AN INTERIM REPORT ON THE DISTRIBUTION OF MAMMALS IN THE NEIGHBOURHOOD OF ROTHERHAM

RECORDED BY R. BRAMHILL

1. BATS (Chiroptera)

The Pipistrelle is common, and I have disturbed Noctules roosting in holes in trees.

Daubenton's bat is reputed to be in the district and so is the Whiskered, but recognition in flight is virtually impossible.

2. FOX (*Vulpes vulpes crucigera*)

Has always been common in the district and there are signs of their presence in most local woods. Farmers estimated last autumn that over thirty were living very close to Whiston (about two miles south-east of Rotherham). Ten earths are not far away. There is one in Burnt Wood on the hill opposite Ulley Reservoir (1½ miles south-east of Whiston) ; three earths in Long Wood between Whiston and Upper Whiston ; six earths in the twin woods known as Wickersley

Gorse (by the Golf Course east of Rotherham) ; one thousand yards north of there more foxes are to be found in Listerdale.

I saw a fox running and skulking along a road in the suburbs of Rotherham a few minutes after midnight on 11th February, 1951. Others have been seen by day on the road from Rotherham to Whiston. A local farmer shot one about six weeks ago at Oakwood (between Rotherham and Whiston). The circumstances were peculiar. The farmer saw something red shining in the sun, almost hidden by old leaves in a hedge. He crept up and saw it was a fox. A fox sleeping out in Winter seems unusual.

One or two foxes live in the woods around Roche Abbey, and I usually see one every month or so. On 27th January, 1951, I saw one leave its earth under a yew in King's Wood at mid-day.

Open-cast coal operations, impending at Sitwell Golf course and adjoining woodlands will effectively destroy a headquarters from which foxes have previously descended in strength on the village of Whiston.

3. BADGER (*Meles meles meles*)

Common. There are two setts in the twin woods Wickersley Gorse. In July last year one was killed as it crossed the main road north of the twin woods —presumably on its way to Listerdale. These setts are not of long standing, and seem to be used alternately by possibly one pair of badgers.

One mile E.S.E. of Maltby (which is six miles east of Rotherham) is a tongue of woodland. Last autumn I found badger droppings there (mainly beetle elytra) and suspected setts along the wood. This is steep and I have not examined it thoroughly as yet—but last autumn fox hounds killed a young badger at the junction of the tongue of wood and Rough Park.

Keepers in King's Wood one mile south killed a badger at a new sett entrance in the autumn of 1949.

Wadsworth Wood lies four miles north of King's Wood. Badgers must have lived here for centuries, for great trees are growing on ancient excavations. The present setts are within twenty yards of the old sites and I saw a badger here in daylight on February 10th, 1951. Two friends had been looking down the sett entrance, and I had been kneeling about two yards away examining fresh tracks. My friends went off through the undergrowth to another sett about twenty yards away and as the noise of their retreat faded, I heard scrapings from the sett entrance and saw a badger poke his nose out and look in the direction in which my friends had disappeared. I only saw the head, which withdrew immediately, and further scrapings suggested that the badger was retreating backwards. I saw the newly-made tracks at the sett entrance.

At this site (about seven occupied earths) there has been considerable activity all winter, and the usual scratch marks appear on the elders which overlie all but one of the setts. The last is under a very low-spreading yew. All the spoil of excavation is deposited under the umbrella-like growth of the yew, and branches have to be raised to disclose the very large entrance.

There are latrines a few yards away at most times, but I cannot find the one they use at present (if any). Droppings can be seen very often at the intersection of rides. The keeper (or someone else) occasionally stops up the entrances with boulders or branches, and at times rabbit traps are placed in the sett mouths.

Some of the tracks leading away from the setts are more than 200 yards long and I have not reached the end of them yet, but hope that they will lead to further setts.

Cadeby lies about three miles north-west of the last spot. A few hundred yards east of there is a steep wood, the slope facing south. This is Cliff Wood. The biggest badger colony I know of is located in this wood. I estimate that some piles of earth recently excavated (within a year or two) weigh not less than 15 tons at a ton to the cubic yard. The ground is one great mosaic of badger and fox tracks and I am sure that not less than ten pairs of adults live here. I have found sett after sett all occupied, and have not yet explored more than 200 yards of the slope. By crossing one good road and one lane the badgers have access to many acres of woodland.

New setts a mile north-east of Hooton Roberts were found on September 16th, 1951. Together with a friend (A. C. Hoyle) four earths were discovered; more are suspected. There was not a great deal of soil excavated, but we found badger bones and retrieved hairs from the entrances of the setts. The setts are under enormous

tangles of hawthorn, and surrounding bramble, willow-herb, elder, hazel, guelder rose and dogwood make the place a very safe retreat. The patch of scrub is about half a mile square, and is surrounded on all sides by cultivated ground. There is no sign that this scrub has ever been cleared in the past, nor is there evidence of human interference. The badgers are taking great quantities of hay down into the setts so far discovered, although there is an abundance of bracken to be had close by.

Wadworth Wood setts still flourish, though one entrance, 30 yards from the rest, has been dug into presumably by the keeper. He has made a far greater mess than the badgers ever did, but they still use the sett—despite the fact that they must almost have to jump out of it. The keeper dug down about five feet, and the tunnel was still leading down—so he must have given up. He left quite a slit trench, but badger tracks are the last ones to be showing. The keeper must have done his work within the last month.

On Tuesday, September 11th, at 7.20 p.m., I hid, with A. C. Hoyle, eight feet from the main setts. At 7-50 p.m. I saw a badger come up from the left-hand sett. He sat and looked around and then started to scratch. Within a few moments two more badgers came up from the sett and scratched. Then all three went off crackling out of earshot.

Presently, a badger came out of the sett on the right, scratched and went off to the right. Immediately after, one came up from the centre sett and did likewise. Four more badgers came up from the left-hand sett, scratched and went off left. Behind us a badger came out of a sett to our left-rear and another from a sett to our right-rear. Both went off.

The eighth badger to appear from the left-hand sett came up and found a snail, which he crunched. His stomach rumbled audibly. He wandered around after scratching, but was not in a hurry to leave. After about ten minutes he came up the bank slowly. He sniffed at my hands from a distance of about three inches, judging by the feel of his breath on my skin. Then he took fright and rushed helter-skelter down the sett and we came away at a quarter to nine, having heard two more badgers leave a sett about 20 yards away.

Fourteen badgers came from these setts altogether, so although we were bitten by insects until it was almost unbearable, our patience had been well rewarded.

One point—after I saw the first three badgers together, all the others were detected by sound, for it was too dark to see. Despite this, we are certain that each badger was accounted for separately. There was no possibility of counting any twice for each one (except the last) had come up, scratched, and gone off to feed. None had come back.

4. Otter (*Lutra lutra*)

Not well represented, but most winters tracks may be seen in a well-silted culvert, the old outlet at the north-east end of the lake at Roche Abbey where there are many eels. The otter occurs normally a few miles east on the River Ryton (outside the County boundary).

5. Stoat (*Mustela erminea stabilis*)

Very common. A piebald stoat—black, tan, white and yellow—often shows itself on the approach to Wadworth Wood, and it invariably runs in front of us for at least 200 yards before attempting to leave the track.

6. Weasel (*Mustela nivalis nivalis*)

Very common. Excepting in the breeding season, we can call them up by pursing the lips and sucking to make a sound like a cork coming out of a bottle.

7. Mole (*Talpa europaea*)

Extremely common in the district, especially on limestone. One sloping field near Roche Abbey always has many hundreds of tumps. The slope is extremely damp, and there is much underground seepage. A large spring is situate near to the lower edge of the field.

There is much evidence of moles in King's Wood (Roche Abbey) and where the runs reach well-trodden paths the moles seem to surface, cross the path, and tunnel again.

During June I examined a larch tree in Grange Wood (Roche Abbey). At the top of the tree was a sparrowhawk's nest. Four feet from the ground in the same tree was an old blackbird's nest. In this nest was a mole—not long dead. I don't

know how it got there—unless the sparrowhawk had discarded it from the nest above, and it had fallen into this blackbird's nest.

It is common to find tumps of earth freshly turned up, on a carpet of snow, but activity in winter is definitely slowed down.

8. Common Shrew (*Sorex araneus castaneus*)

Common in the woods, and it is usual in September to find dead ones (old age) lying on the woodland rides.

This year I have not noticed so many as in previous seasons.

9. Water Shrew (*Neomys fodiens bicolor*)

I have never seen many, but the river below Roche Abbey usually has a pair. Their regular habits can be their undoing. One could be relied upon to swim in a direct line on the surface, to the middle of the stream, dive to the bottom, and run along the bed up the bank and to its hole. A few years ago I saw a youth time this and shoot one with a ·22 shotgun.

10. Hedgehog (*Erinaceus europaeus*)

Continues to survive in numbers. The keepers do not account for many. By far the greatest mortality occurs on the roads, under the wheels of cars.

11. Red Squirrel (*Sciurus vulgaris leocourus*)

At least one pair occurs two miles east of Rotherham in Grange Park area, but open-cast operations have reduced its habitat.

At the end of June I saw one in Wadworth Wood—a new place. Hazel nuts abound here and so do acorns.

12. Grey Squirrel (*Sciurus carolinensis*)

One male was shot last July in Kings Wood near Roche Abbey and another has been seen. I examined the dead male, which was in perfect condition. We found the drey high up in a yew. The animal(s) had always used the next tree to the drey to gain access. This tree was marked with claws, but the one containing the drey showed no signs. I have unconfirmed reports of the species in Cliff Wood, near Cadeby.

In conclusion, may I thank all those members and their friends who have so kindly co-operated in making the above report possible, and pay tribute to the memory of Charles Procter, who never failed to send in his observations annually over so many years and who was always so kind and helpful towards everyone and everything in the Vertebrate Section of the Union. His death leaves yet another big gap which we cannot fill.

## ORNITHOLOGY

**Interim Report** (Ralph Chislett) : At a joint meeting with the British Trust for Ornithology at York on February 3rd, 1951, Mr. W. B. Alexander spoke on ' Some Recent Changes in the Distribution of British Birds,' and many members took part in the discussion that followed. As some members were absent from this meeting, and several expressed doubt if they were entitled to attend a meeting of a Committee even when held jointly with the B.T.O., it was recommended and approved at the meeting of the Vertebrate Section held in Leeds on October 13th, 1951, that the word ' Committee ' be discarded, since it no longer describes us, and that the term ' Ornithological Division ' be used instead, subject to confirmation by the General Meeting of the Union.

An address under the title ' Whither Ornithology ' was given at our meeting on March 10th by the President of the Vertebrate Section (Alfred Hazelwood). Most sides of the subject were ventilitated, sometimes provocatively, often humorously, and always ably. The subsequent discussion showed promise that some of the President's suggestions might be fruitful.

The Annual Report for 1950, after publication in *The Naturalist* was reprinted and issued separately. A few copies are still available.

Late cold weather interfered with early breeding in 1951 and delayed the average arrival dates of migrants. Abnormally concentrated rainfalls in May caused many casualties among ground-nesting birds. Much of the loss was offset by successful late broods in the dry period that followed.

During the year a pair of Black Redstarts, and several pairs of Little Ringed Plovers have bred successfully. The Temminck's Stint was proved to nest in Yorkshire (and England) for the first time. Spoonbills were seen at Spurn in May and July.

With the third and double-ended trap now working at Spurn, the Union's Bird Observatory is having a successful year. Far more birds have been ringed in 1950-51 than in any previous completed year. Nightingales, Wrynecks, Ring-Ousels and Red-backed Shrikes were included in spring. More recently a Red-spotted Bluethroat and a Great Grey Shrike have been captured. The Spurn Committee was eager to see the effects of the new trapping facilities installed during the year upon results achieved in autumn. When early October brought an easterly wind, and some thousands of Robins, over 600 Robins were trapped. There have also been some useful recoveries of birds previously ringed.

The cost of the new traps was considerable and used up almost all the money in hand. The Warren trap needs complete renewal, and both netting and posts are expensive. Permission to fence off the Cottage and trapping areas against intruders has been given, and fencing costs are also high. Under these circumstances G. H. Ainsworth felt justified at the Vertebrate Sectional meeting on October 13th in asking members for special support. The enterprise was begun and has been carried on by a small group of members. The results achieved bear comparison with those of any of the other Bird Observatories that are gleaning facts to add to the knowledge of migration. Only in respect of the financial support from outside the small group of originators is comparison unfavourable. Visiting ornithologists from southern England have recently generously praised our work. We are doing more to make young naturalists, and to help them to be efficient, than any other side of the Union's activities. Mr. Ainsworth declared he needed £100 to enable the work he has in mind to be carried out. A good proportion of this sum has been either collected or guaranteed ; but the fund is open to all those who feel that this Y.N.U. enterprise has earned their support.

One of our younger members, P. E. Davis, who acknowledges indebtedness to Spurn, has recently accepted the position of Warden to the Lundy Island Bird Observatory. If and when we feel we need and can afford a permanent resident warden at Spurn there will be no lack of applicants.

The detailed Annual Ornithological Report will be considered at the meeting to be held in March, 1952. To enable all the preliminary work to be done in time for circulation of proofs before the meeting, it is requested that notes be sent in immediately after December 31st.

## ENTOMOLOGY

**Lepidoptera** (F. Hewson) : Reports were received from M. D. Barham, S. M. Jackson, D. M. Jesper, Mrs. K. G. Payne, P. Tannett, G. B. Walsh and a joint one from the Bradford Naturalists' Society (C. A. Cheetham, J. Briggs, C. R. Haxby and F. Hewson).

It is not possible to include all the records sent in but the Recorder is pleased to have them for the Record Book.

On the whole all species of butterflies were fewer than usual. From Scarborough Mr. Walsh writes that Vanessids were not common until the autumn when *atalanta* and *io* were seen all over the district. On September 16th, A. J. Wallis saw a stream—about fifty *atalanta* and one *cardui* in an hour—flying steadily south *against* a southerly breeze. Several *E. cardamines* were seen in Forge Valley on July 16th. In July about three hundred *Sesia bembeciformis* were seen round two willow trees in a garden near Hymer's College in Hull. They caused great consternation since they were taken to be a swarm of wasps. They were smoked out, but no comb was found (!) and then the willows were burnt.

*Comacla senex* Huebner (64). Askham Bog, 28/7; S.M.J.

*Diacrisia sannio* L. (61). Skipwith Common, 25/7, one imago; P.T.

*Tiliacea citrago* L. (64). Gledhow, Leeds, 26/9, one imago; T.P.

**Hadena conspersa* Schiff. (63). M.V. light, Bradford, 25/6, 20/7; J.B.

**Hecatera serena* Schiff. (63). M.V. light, Bradford, 20/6; J.B.

**H. chenopodii* Schiff. (63). M.V. light, Bradford, 22/6, 7/9; J.B.

*Melanchra persicariae* L. A widespread increase.

*Ectypa glyphica* L. (62). Pilmoor, August; D.M.J.

*Calothysanis amata* L. (64). M.V. light, Harrogate, July-August; D.M.J. M.V. light, York, 18/7; J.P.
*Comibaena pustulata* Hufnagel (64). M.V. light, Harrogate, July-August; D.M.J.
*Chloroclystis rectangulata* L. ab. *sericeata* (64). Gledhow, Leeds, 7/7; P.T.
*Eupithecia extensaria* Freyer (61). Six larvae obtained near Kilnsea, 30/8; S.M.J.
**Larentia cervinalis* Scopoli (63). M.V. light, Shipley, 15/9, 18/9; F.H. (64). Harrogate, early October; D.M.J.
*Crocota ochrearia* Rossi (61). Kilnsea, 16/6; S.M.J.
*Acherontia atropos* L. (64). One found trying to get into a beehive at Austwick, 23/6; C.A.C. (61). Kilnsea, 1/7; S.M.J.
*Coenonympha tullia* Mueller (63). Thorne Moors, 8/7; P.T.
*Aphantopus hyperantus* L. (62). Numerous, Pilmoor, August; D.M.J.
*Argynnis selene* Schiff. (61). Skipwith Common, 22/7; S.M.J.
*A. aglaja* L. (64). Walkingham Warren, abundant; C.R.H. & D.M.J.
*Aricia agestis* Schiff. (64). Bastow Wood, 15/7; J.B. & C.R.H.
*Gonepteryx rhamni* L. (64). Hook Moor, common in spring; P.T. (61). Skipwith, May 31st; D.M.J.
*Erynnis tages* L. (64). East Keswick and (63) Thorne Moors, in May; P.T. (64). Scotton Banks, Knaresborough, 2/6. (63). Brocadale, Wentbridge, common, 3/6; D.M.J.
*Pyrgus malvae* L. (63). Brocadale, 3/6; D.M.J.
*Procris geryon* Huebner (64). Bastow Wood, 15/7; J.B. & C.R.H.
*Cossus cossus* L. (64). A dead pupa found beneath an Ash tree in Potternewton Lane, Leeds, 14/7/50; M.D.B.
*Orneodes hexadactyla* L. (64). Harrogate, in May; D.M.J.
*Aegeria vespiformis* L. Three bred from larvae found in Oak stumps at Selby; S.M.J.

A very interesting list of Lepidoptera taken at Spurn has appeared in *The Naturalist* this year. This was surprisingly extensive and those of us who did not take part must express our admiration, particularly upon the work of Mr. N. Michaelis with the Micro-Lepidoptera.

* New to the Bradford Naturalists' Society's ' area.'

**Coleoptera** (G. B. Walsh) : A severe winter and late spring put the collecting season very late indeed. Mr. E. G. Bayford and Mr. J. H. Flint who use the easily observed Coccinellidae as a general gauge concur with this opinion. Nevertheless, much good work has been done, and as a result of identifying unnamed species from previous seasons we are able to add 9 species to the County list, and in addition 1 species to V.C. 61 ; 8 to V.C. 62 ; 3 to V.C. 63 ; 5 to V.C. 64 and 1 to V.C. 65, a total of 16 V.C. records. In addition there are a number of unrecorded captures from Spurn.

The initials stand for the following workers : J. H. Flint, E. F. Gilmour, W. D. Hincks, E. J. Pearce, H. M. Russell, W. J. Sanders, A. Smith, W. O. Steel, M. L. Thompson, A. J. Wallis, G. B. Walsh.

The following is a list of the most important captures :
*Asaphidion flavipes* (L.) (62). Huntington Wood, York, 3/8/50 (A.S.).
*Bembidion punctulatum* Drap. (64). Thorpe Arch, 4/8/51 (J.H.F.).
**B. obliquum* Sturm (62). Lake side, Castle Howard, 6/8/50 (A.S.) ; (63) Gunthwaite Lake, Penistone, 29/7/45 (E.F.G.).
**B. prasinum* Duft. (64). Collingham Bridge, 17/7/51 (J.H.F.).
*B. minimum* (Fabr.) (61). Hessle, 31/8/51 (A.S.).
*B. biguttatum* (Fabr.) (62). Yedingham, flood refuse, —/2/51 (E.F.G. and G.B.W.) ; (64) Askham Bog, 3/6/51 (J.H.F.).
*B. unicolor* Chaud. (64). Collingham Bridge, 17/7/51 (J.H.F.).
*B. aeneum* Germ. (64). Collingham Bridge, 17/7/51 (J.H.F.).
*Aepopsis robinii* (Lab.), *Aepus marinus* (Stroem, H.) and *Micralymma marinum* (Stroem). Search was made for these three species at Robin Hood's Bay (V.C. 62) in mid-September and early October. There were a few pupae (*?Aepopsis*) but no larvae or imagines. There were very few examples of its prey (*Anurida maritima* Lub.), but their eggs were abundant.
*Trechus secalis* (Payk.) (64). Thorpe Arch, 14/8/51 (J.H.F.).
*Trechoblemus micros* (Herbst.) (62). Yedingham, —/2/51 (E.F.G.). This confirms an earlier record from flood refuse at Sherburn, —/6/26 (G.B.W.).

*Badister bipustulatus* (Fabr.) (62). Wydale, —/5/51 (A.J.W.).
*Harpalus latus* (L.) (64). Ingleton, 6/6/49 (W.J.S.).
*Acupalpus dorsalis* (Fabr.) (61). Allerthorpe Common, 5/5/50 (W.D.H.).
*Bradycellus harpalinus* (Serv.) (62). Malton Road, York, 20/6/51 (A.S.).
*Amara curta* (Dej.) (62). Yedingham, flood-refuse, —/2/51 (E.F.G.). This confirms two old Yorkshire records—one specimen from Eston on the coast, —/4/1910 (M.L.T.) and two females from the same locality, —/5/11 (G.B.W.).
*A. aulica* (Panz.) (62). Buttercrambe, 1/8/51 (A.S.).
*Stomis pumicatus* (Panz.) (62). Buttercrambe, 27/5/50 (A.S. ; Yedingham, flood-refuse, —/2/51 (E.F.G. & G.B.W.).
†*Feronia longicollis* (Duft.) (61). Near Easington, 2/5/50 (W.D.H.).
*F. macra* (Marsh.) (61). Howden, 14/9/50 (W.D.H.).
*F. oblongopunctata* (Fabr.) (61). Allerthorpe Common, 5/5/50 (W.D.H.).
*Agonum gracilipes* (Duft.) (61). One specimen at Spurn, 1951 (J.H.F.). The only other Yorkshire record is of one taken by Mr. W. K. Bissill at the base of the cliff at Hornsea (*Ent. Ann.*, 1860, pp. 96-98).
*A. mülleri* (Herbst.) (64). Blubberhouses, 18/8/51 (J.H.F.).
*A. obscurum* (Herbst.). Roundhay Lime Hills, 21/1/51 (J.H.F.).
*A. gracile* (Gyll.) (61). Hessle, 31/8/50 (A.S.).
**Risophilus monostigma* (Sam.) (62). Near Pickering, 9/6/47 (W.J.S.).
*Deronectes elegans* (Panz.) (64). Askham Bog, 5/10/50 (A.S.).
*Agabus chalconatus* (Panz.) (62). Yedingham, flood-refuse, —/2/51 (E.F.G.) ; Throxenby Mere (G.B.W.).
*Hydraena gracilis* Germ. (64). Washburndale, 5/11/50 (J.H.F.).
*Sphaeridium bipustulatum* Fabr. (62). Yedingham, flood-refuse, —/2/51 (E.F.G. & G.B.W.).
**Cercyon granarius* Er. (62). Yedingham, flood-refuse, —/2/51 (E.F.G.).
*Necrophorus vestigator* Hersch. (62). Scarborough, —/8/51 (E.F.G.). This confirms the only Yorkshire records from Raincliffe Wood and Seamer Moor (G.B.W.).
*Xylodrepa quadripunctata* L. (61). Allerthorpe Common (A.S.).
*Choleva angustata* (Fabr.) (64). Arthington Bank, 7/1/51 (J.H.F.).
*Scydmaenus tarsatus* Muell., P.W.J. (64). Leeds, 12/5/48 (W.J.S. *det.* E.J.P.).
*Ptenidium pusillum* (Gyll.) (64). Leeds, 9/5/49 (W.J.S.).
*Scaphisoma agaricinum* (L.) (62). Buttercrambe, 2/9/51 (A.S.).
*Megarthrus depressus* (Payk.) (62). Yedingham, flood-refuse, —/2/51 (E.F.G.).
*M. denticollis* (Beck). With the last.
*Oxyporus rufus* (L.) (62). Shipmanthorpe, 19/7/51 (A.S.).
*Stenus tarsalis* Ljungh (62). Yedingham, flood-refuse, —/2/51 (E.F.G.).
*Rugilus orbiculatus* (Payk.) (62). With the last; (64), Leeds, 8/7/49 (W.J.S.).
*Xantholinus longiventris* Heer (62). Scarborough, 24/2/51 (E.F.G.).
*Philonthus splendens* (Fabr.) (64). Leeds, 2/5/48 (W.J.S.).
*P. tenuicornis* Muls. and Rey (64). Leeds, grass cuttings, 26/4/48 (W.J.F. *det.* W.O.S.).
*P. varius* (Gyll.) (64). Ingleton, under stones, 6/6/49 (W.J.S. *det.* W.O.S.).
*P. albipes* (Grav.) (64). Leeds, in manure, 8/7/49 (W.J.S. *det.* W.O.S.).
*P. sordidus* (Grav.)=*pachycephalus* Nordm. (64). Leeds, grass cuttings, 26/4/48 (W.J.S. *det.* W.O.S.).
*Gabrius nigritulus* (Grav.) (64). Leeds, grass cuttings, 14/5/48 (W.J.S. *dst.* W.O.S.).
*Bolitobius inclinans* (Grav.) (64). In a coniferous plantation, Arthington Bank, 7/1/51 (J.H.F.).
**Atheta* (*Chaetida*) *longicornis* (Grav.) (64). Leeds, in manure, 3/7/49 (W.J.S. *det.* W.O.S.).
**A.* (*Coprothassa*) *sordida* (Grav.) (64). Leeds, in manure, 23/6/49 (W.J.S. *det.* W.O.S.).
*A.* (*Acrotona*) *parvula* (Mann.) (64). Leeds, in grass cuttings, 12/5/48 (W.J.S. *det.* W.O.S.).
*Aleochara* (*Polychara*) *lanuginosa* (Grav.) (64). With the last.
*A.* (*P.*) *diversa* (Sahlb.) (64). With the last, 25/4/48 (W.J.S. *det.* W.O.S.).
*Euplectus signatus* (Reich.) (62). Castle Howard, one specimen under bark, 5/9/51 (W.D.H. *det.* H. Britten). The only other Yorkshire record is a specimen from Saltburn, 1898 (M.L.T.).

*Onthophilus striatus* (Forst.) (64). Leeds, grass cuttings, 26/4/48 (W.J.S. *det.* W.O.S.).
*Saprinus semistriatus* (Scriba) (62). Buttercrambe, 31/5/51 (A.S.).
*Hister striola* Sahlb., C.R. (64). Leeds, in grass cuttings, 18/5/48 (W.J.S. *det.* W.D.H.).
†*H. neglectus* Germ. (64). Meanwood Valley, Leeds, 7/10/50 (J.H.F.).
*Dasytes aerosus* Kies. (63). Yearsley Dam, 16/6/51 (A.S.).
†*Tillus elongatus* (L.) (62). Malton Road, York, 20/6/51 (A.S.).
*Korynetes caeruleus* (De G.) (62). Fulford, York, in flood-refuse, 2/6/51 (A.S.).
*Helodes marginata* (Fabr.) (62). Buttercrambe, 29/5/51 (A.S.).
*Dryops ernesti* Des Gozis (64). Askham Bog, 7/6/51 (J.H.F.).
*Limnius tuberculatus* Muell., P.W.J. (65). Woodhall Park, near Aysgarth, 8/6/51 (J.H.F. and H.M.R.).
†*Carpophilus ligneus* Murr. (62). Scarborough, 1950, in dried figs in a store, introduced (E.F.G.).
*Rhizophagus perforatus* Er. (64). Leeds, in a grape-fruit trap, 11/3/48 (W.J.S. *det.* W.D.H.).
**Silvanus unidentatus* (Oliv.) (62). Castle Howard, one specimen under bark, 5/9/51 (W.D.H.).
*Triplax aenea* (Schall.) (62). Castle Howard, common, 26/5/47 (A.S.).
*Telmatophilus caricis* (Oliv.) (62). Throxenby Mere, Scarborough, 23/6/48 (A.S.).
*Cryptophagus pilosus* Gyll. (64). Leeds, in grass cuttings, 13/5/48 (W.J.S. *det.* W.D.H.).
*Corticaria impressa* (Oliv.) (62). Yedingham, flood-refuse, —/2/51 (E.F.G.).
*Endomychus coccineus* (L.) (64). In large numbers under sacking, Hazelwood Castle, Aberford, 1/12/50 (J.H.F.).
*Anisosticta novemdecimpunctata* (L.) (62). Throxenby Mere, Scarborough, 27/9/49 (A.S.) ; (61) Primrose Valley, Filey (G.B.W.).
*Ptilinus pectinicornis* (L.) (62). Forge Valley (G.B.W.) ; Scarborough, 5/6/51 (E.F.G.).
**Trigonogenius globulus* Sol. (62). Scarborough, 1950, in dried figs and soya flour, introduced (E.F.G.).
*Melandrya caraboides* (L.) (62). Malton Road, York, 16/6/51 (A.S.).
*Lagria hirta* (L.) (62). Hayburn Wyke (G.B.W.) ; Warthill, 8/8/51 (A.S.).
*Aphodius erraticus* (L.) (62). Yedingham, flood-refuse, —/2/51 (E.F.G.).
*A. conspurcatus* (L.) (64). Common, Addingham, 4/3/51 (J.H.F.).
*A. pusillus* (Herb.) (64). Leeds, 17/5/50 (W.J.S.).
*A. aestivalis* Steph. (64). Leeds, 3/7/49 (W.J.S.).
*Rhagium inquisitor* (L.) (62). Malton Road, York, 20/6/51 (A.S.).
*Stenocorus meridianus* (L.). Shipmanthorpe, York, 20/7/51 (A.S.).
**Phymatodes testaceus* (L.) (62). Scarborough, in imported timber, 23/7/51, (E.F.G.) ; Earswick, York, 6/6/47 (A.S.).
*Clytus arietis* (L.). Pickering, abundant, 10/4/50 (A.S.).
**Pogonocherus hispidus* (L.) (65). Aysgarth, 8/6/51 (coll. N. D. Barham, *det.* J.H.F.).
*Saperda populnea* (L.) (62). Common at Malton Road, York, 20/6/51 (A.S.).
*Tetrops praeusta* (L.) (62). Haxby, York, 21/6/47 (A.S.).
*Macroplea appendiculata* (Panz.) (64). Harewood Bridge, three miles upstream from the previous known colony at East Keswick, and in identical circumstances, 28/7/51 (J.H.F.).
*Zeugophora subspinosa* (Fabr.) (62). Buttercrambe Wood and Strensall (A.S.).
*Lema cyanella* (L.) (62). Yedingham, flood-refuse, —/2/51 (E.F.G. and G.B.W.).
*L. melanopa* (L.). With the last.
**Cryptocephalus hypochaeridis* (L.) (62). Pickering, 8/5/45 (A.S.).
*C. pusillus* Fabr. (62). Buttercrambe, 4/9/49 (A.S.).
**Chrysolina hyperici* (Forst.) (64). A single specimen, Fairburn, 13/9/51 (J.H.F.).
†*C. menthastri* (Suffr.) (62). York, —/8/51 (A.S.).
*Phytodecta pallida* L. (65). Woodhall Park, near Aysgarth, 8/6/51 (J.H.F. and H.M.R.).
*Galerucella lineola* (Fabr.) (62). Yedingham, flood-refuse, —/2/51 (E.F.G.) ; Forge Valley, Throxenby Mere (G.B.W.).
**Aphthona euphorbiae* (Schr.) (62). Pickering, 7/5/46 (A.S.).

*Longitarsus gracilis* Kutsch. (64). Askham Bog, 16/9/51 (D. Drummond).
*Cassida flaveola* Thunb. (62). Yedingham, flood-refuse, —/2/51 (E.F.G.).
*Bruchus rufimanus* Boh. (62). Buttercrambe, 7/6/51 (A.S.).
*Bruchidius fasciatus* (Oliv.) (64). Etchell, 28/6/50 (W.J.S.).
**Apion hydrolapathi* (Marsh.) (64). Collingham, 28/5/47 (W.J.S.).
*A. cruentatum* Walton, J. (62). Yedingham, —/2/51 (E.F.G.).
*A. seniculus* Kirby, W. (62). Buttercrambe, 28/7/51 (A.S.).
**A. meliloti* Kirby, W. (61). Staxton, —/9/48 (G.B.W.) ; *(62). Buttercrambe, 20/6/48 ; Malton Road, York, 20/5/51 ; Shipmanthorpe, 20/7/51 ; (63) Yearsley, 6/6/51 (A.S.).
†*A. reflexum* Gyll. (62). Yedingham, flood-refuse, —/2/51 (E.F.G.).
**A. craccae* (L.) (61). Allerthorpe Common, 12/9/50, very common (W.D.H.).
*A. nigritarse* Kirby, W. (62). Warthill, 13/8/51 (A.S.) ; Yedingham, —/2/51 (G.B.W.).
*A. assimile* Kirby, W. (62). Yedingham, flood-refuse, —/2/51 (E.F.G. and G.B.W.) ; Warthill, 18/8/51 (A.S.) ; (64) Collingham, 28/5/47 (J.H.F.).
*Polydrusus mollis* (Stroem, H.) (62). Pickering (A.S.).
*Brachysomus echinatus* (Bonsd.) (62). Malton Road, York, 12/6/45 (A.S.).
*Pentarthrum huttoni* Woll. In woodwork in cellar used in the past as a wine cellar, Headingley, Leeds, —/12/50, (H. L. Morgan, *det.* J.H.F.).
*Zacladus geranii* (Payk.) (64). Common on *Geranium pratense*, Thorpe Arch, 14/8/51 (J.H.F.).
*Ceuthorhynchidius quadridens* (Panz.) (64). Leeds, 25/5/50 (W.J.S.).
†*Gymnetron veronicae* (Germ.) var. *nigrum* Waltl. (62). Yedingham, flood-refuse, —/2/51 (E.F.G.).
*G. linariae* (Panz.) (62). Yedingham, flood-refuse, —/2/51 (E.F.G.). This confirms Mr. M. D. Barnes's record of Pickering, 6/39.
†*Rhynchaenus stigma* Germ. (62). Buttercrambe, 4/8/51 (A.S. *det.* E.F.G.).

**Odonata** (J. H. Flint) : The cool weather during the early summer appeared to affect the emergence of the *Zygoptera*, and in the Leeds district species of *Enallagma*, *Coenagrion* and *Ischnura* were present in reduced numbers. *Pyrrhosoma nymphula* Sulz., however, was abundant at Alwoodley and Skipwith in July. From July onwards the common species of the Anisoptera have been present often in large numbers when the day has been favourable and the poor season in general does not seem to have affected them.

The publication of the Spurn list included one species new to the county, *Lestes dryas* Kby., and the only other species of note recorded during the year was *Cordulegaster boltonii* Don. from Osmotherley Moor (V.C. 62), 24/8/51 (P. Tannett).

**Hemiptera** (J. H. Flint) : In the death of Mr. J. M. Brown, the recorder for Hemiptera, which was reported in *The Naturalist* (1951 : 147), the Entomological section has suffered a great loss, but the writer of these notes must pay tribute to the excellent condition in which the records for this order have been left, which will greatly facilitate the work of his successor.

The only important work done during the year has been the publication of the list of Hemiptera taken at Spurn. This list includes five county (†) and five vice-county (*) records, as follows :

HETEROPTERA

**Berytinus signoreti* Fieb.
†*Heterogaster urticae* F.
†*Orius laevigatus* Fieb.
**Corixa concinna* Fieb.
†*C. selecta* Fieb.
**C. panzeri* Fieb.

HOMOPTERA

†*Cicadella atropunctata* Gze.
**Stenocranus minutus* F.
**Psylla hippophaes* Foerst.
†*Lecanopsis formicarium* Newst.

Since the publication of this list the writer has taken specimens of *Notonecta viridis* Delc. in the crater in Marsh Meadow, a species not previously recorded in the county.

Very few notes have been received from other parts of the county, only three being worth noting :
*Elasmucha grisea* L. (61). Filey, —/8/51 (H. M. Russell).

*Saldula orthochila* Fieb. (64). Riffa Beck, near Pool in Wharfedale, 7/10/51 ; (J.H.F.).

*Corixa wollastoni* D. and S. (64). In a pool at 800 ft., Askwith Moor, near Otley, 5/11/50 ; (J.H.F.).

**Diptera** (Chris. A. Cheetham) : Mr. K. G. Payne records *Campsicnemus scambus* Fab. active on a cold windy day, March 24th, at Askham Bog and he agrees with Parent that probably the species hibernates as the imago. At the end of April several Ephydrids were in evidence ; at Howden he took *Hydrophorus praecox* Lehm. on the surface of flood water and *Tipula vittata* and *lateralis* Mg. were caught. On June 1st *Tipula luna* Westf. was plentiful on Askham Bog with *Limnophila ferruginea* Mg. and *Tricyphona immaculata* Mg. *Tipula rufina* Mg. Acaster Malbis, May 21st, *T. vernalis* Mg., Colton, June 9th. *T. alpium* Bergr. was caught at Goathland with *Dolichopeza albipes* Strom. At the Yearsley Dam meeting, June 16th, *Tipula pruinosa* Wied., *T. luna* Westf., and *T. vernalis* Mg. were taken. *Psilopus platypterus* Fab., *Neurigona quadrifasciata* Fab. and *Tachypeza nubila* Mg. were common on a tree trunk at Sand Hutton, July 4th. *Tipula fascipennis* Mg. came to light at Copmanthorpe in July. *T. alpium* Berg. and *Limnophila meigeni* Verr. were on Penyghent early in August. At the tarn on Fountains Fell, 2000 ft. O.D., flies were numerous and included the beautiful *Idioptera pulchella* Mg. *Hydrophorus praecox* Lehm. was there and this species was widely distributed down to sea-level at Hunmanby. Another fly with this distribution was *Hydromia stagnalis* Hal. *Dolichopeza irrorata* Fal. was taken at Hunmanby by sweeping. An interesting capture on York racecourse was *Poecilobothrus nobilitatus* L. This is plentiful where it occurs but is seldom reported. On Skipwith Common in August, *Hydrophorus albiceps* Frey. was plentiful and *Nephrotoma surra* Mg., *Syntormon pallipes* Fab. and the *Poecilobothrus* were taken. Tipulids came to light until the sharp frost of October 21st, amongst them *Tipula czizeki* de Jong. This appeared on October, last year. *T. staegeri* Neilson also came to the light and it was plentiful at Healaugh. Other species taken in 1950 ; *Toxoneura muliebris* Harris, Copmanthorpe, 6/8/50 ; *Platycephala planifrons* Fab., Askham Bog, 29/7/50 ; *Sciopus wiedemanni* Fab., New Earswick, 6/7/50 ; *Rivellia syngenesiae* Fab., Strensall, 2/7/50 ; *Empis grisea* Fab. and *Calobata cibraria* L., Naburn Ings, 1/7/50 ; *Dixa aestivalis* Mg., North Grimston, 29/5/50 ; *Rhamphomyia laevipes* Fln., Terrington Carr, 27/5/50. *Nephrotoma crocata* L. was taken by Mr. Jesper at Pilmoor, June 17th, 1951. At Austwick Tipulids associated with damp ground like the *lateralis* group, *luna, subnodicornis,* and *luteipennis* were all reduced in number and this also applies to Syrphids. A *Bombilius major* was seen emerging from its case on a dry bank side of the road at Austwick by N. A. Burniston on April 23rd. Mr. Bayford caught *Oxycera pulchella* Mg. in his garden in Barnsley, 14/7/51.

**Hymenoptera** (W. D. Hincks) : The long damp winter and poor summer combined with the recorders' few collecting trips in the county this season have contributed to the relative poverty of the present report. The warm sunny autumn however favoured parasitic Hymenoptera which were plentiful in individuals and species, but unfortunately too late for the recorder to take advantage of the improvement.

The Section's Spurn visit in June produced a number of interesting species but it was too early for most Hymenoptera which are at their best there in July. A report on the Hymenoptera of Spurn is in preparation for publication in *The Naturalist* so only a few points in regard to the 1951 visit will be mentioned. An interesting instance of phoresy was noted on June 19th when a queen of *Bombus distinguendus* Moraw. was captured with a specimen of the bees-nest beetle *Antherophagus pallens* (Ol.) firmly attached to the bee's proboscis. A number of fine queens of the all black form of *Bombus ruderatus* F. were observed on the Warren at Spurn and three specimens of one of our largest British Chalcids, *Brachymeria minuta* (F.) were captured. This is new to the county and is probably a parasite of the flies of the genus *Sarcophaga*. During the year a new species of *Bracon* from Spurn has been described by the recorder as *B. spurnensis* (*Ent. mon. Mag.*, 87 : 232) and a new genus and species of Braconid is being described in a forthcoming number of the same journal by Mr. M. W. R. de V. Graham. The Turnip Sawfly (*Athalia rosae* L.) until recently considered extinct in this country has now increased so much since 1947 that it was the commonest sawfly at Spurn in June this

year. The most interesting sawfly captured at Spurn this year was *Dolerus taeniatus* Zadd., a new species for the county which has only been recorded a few times in the south of England. It is a maritime and salt marsh species of which the foodplant does not yet appear to be known.

Dr. Yarrow of the British Museum is interested in northern material of what we have been recording as *Formica rufa* and *pratensis*. He believes that several distinct species have been confused and we have sent him all the available specimens in the Manchester Museum. Further material from Yorkshire localities would be very welcome and could be sent to the recorder or direct to Dr. Yarrow.

Besides the visit to Spurn in June the recorder has collected some Hymenoptera material at Hebden Bridge, Allerthorpe Common, Brantinghamdale, Brough, Howden district, near Ripon and at Robin Hood's Bay during the year. A fuller report of the additions to the county list will be published when this material has been worked out.

The recorder wishes to thank Mr. and Mrs. K. G. Payne and Mr. E. F. Gilmour for sending specimens and records.

**Plant Galls** (E. F. Gilmour): Some galls have been extremely abundant this year. Mr. W. D. Hincks has counted over 350 galls caused by *Neuroterus lenticularis* Ol., on a single leaf of *Quercus robur,* whilst I have counted almost as many of the same species. Abortive Bedeguar galls on Dog Rose appear to have been very common this year.

| | *Agent* | *Plant* |
|---|---|---|
| HYMENOPTERA | *Neuroterus lenticularis* Ol., Grantley Hall, near Ripon, 9/51 (W. D. Hincks) ; Thorton Dale, 10/51. | *Quercus robur* L. (*pedunculata*). |
| | *Rhodites eglanteriae* Hartig., Thornton Dale, 10/51. | *Rosa canina* L. |
| | *R. rosarum* Giraud., Thornton Dale, 10/51. | *R. canina* L. |
| | *R. rosae* L., Thornton Dale, 9/10/51 ; Scarborough, 9/51. | *R. canina* L. |
| | *Pontania femoralis* Cameron, Thornton Dale, 9/10/51. | *Salix viminalis* L. |
| | *Cryptocampus medullaris* Hartig., River Rye, between Pickering and Malton, 20/10/51. | *S. pentandra* L. |
| DIPTERA | *Dasyneura urticae* Perris, Thornton Dale, 7/10/51. | *Urtica dioica* L. |
| | *Dasyneura ulmariae* Brem., River Rye, between Pickering and Malton, 20/10/51. | *Spiraea ulmaria* L. |
| | *D. crataegi* Winn., River Rye, between Pickering and Malton, 20/10/51. | *Crataegus monogyna* Jacq. |
| | *Jaapiella veronicae* Vallot., River Rye, between Pickering and Malton, 20/10/51. | *Veronica chamaedrys* L. |
| | *Urophora jaceana* Her., River Rye, between Pickering and Malton, 20/10/51. | *Centaurea nigra* L. |
| ACARI | *Eriophyes macrorrhynchus* Nalepa., Thornton Dale, 10/51. | *Acer campestris* L. |
| | *E. laevis* Nalepa., Thornton Dale, 17/19/51. | *Alnus rotundifolia* Mill. |
| | *E. nalepai* Focken., Thornton Dale, 10/51. | *A. rotundifolia* Mill. |
| | *E. fraxini* Karp., River Rye, between Pickering and Malton, 20/10/51. | *Fraxinus excelsior* L. |
| FUNGI | *Urocystis anemones* Persoon, River Rye, between Pickering and Malton, 20/10/51. | *Ranunculus acris* L. |

## CONCHOLOGY

(Mrs. E. M. Morehouse): No new records have been made during the year but the following observations are worthy of note.

*Physa fontinalis* L. (64). Pond near Breary Marsh, 22/6/51; E. Thompson.'

*Dreissensia polymorpha* Van Beneden. (64). Bramley Fall Locks; A. S. Appleyard.

*Milax sowerbyi* L. Fér. (64). Garden at Kirkstall; A. S. Appleyard.

*Helicigona lapicida* L. (65). Aysgarth, 9/6/51; A. S. Appleyard.

Mr. S. Cook notes that removal of trees and undergrowth from the railway embankment at Bentley, near Doncaster, has increased the snail population recorded from here.

The recorder has failed to find *Arianta arbustorum* L. in its old habitat at Bramham Cross Roads and suggests the removal of the hedge as the cause of its disappearance. In the same area, *H. nemoralis* L. showed an increase in individuals.

During the excursions of the Yorkshire Conchological Society during the year, there has been noted the persistence of *H. virgata* Da Costa in Broc-a-dale, Wentbridge, and of *Pomatia elegans* Müll at Boston Spa, while numerous examples of *Sphaerium lacustre* Müll of fine texture and size were obtained from the River Foss at York on 14/7/51.

## PHENOLOGY

(W. E. L. Wattam) : The response of those to whom a print of the Recording form was sent is again disappointing. The ten forms received cover V.C. 62 (one) ; V.C. 63 (five) ; V.C. 64 (three) and V.C. 65 (one). No return has been received to the time of writing this report in respect of V.C. 61. The consensus of opinion is that the semi-wintry conditions until early June, and the failure of the gradual development of a normal springtime, gave considerable checks in the development of vegetation, making most plants blossom fourteen to twenty-one days late. When the desired warmth did arrive the response of all vegetation was so rapid that usual flower displays seemed limited in duration. Conspicuous features of the late Spring blooming were the species of Lilac, Laburnum, Pink and Crimson Thorns, Cherries and Weigelias. The Beech, Horse Chestnut, White Beam (*Sorbus aria*), Mountain Ash, Ash, Oak and Sycamore produced scattered displays of blossom, but the expected fruit crops are meagre in comparison with the floral display. The low temperatures, with a paucity of common insect life, was in no small degree accountable for this result. I have in my garden a Mountain Ash which produced sixty-four corymbs of flowers out of which eight only perfected fruit varying from eight to three in number. Most of the boughs of my seedling Goathland Ash tree were thickly encrusted with blossoms, but the tree bears not a single fruit. The Dandelion in whatever situation it was growing produced an extraordinary display of blossom. The only February records for Hazel are by Miss C. M. Rob (V.C. 62) and Mr. H. Rowntree (V.C. 65), all the remainder are for March. Similarly for Coltsfoot, February records number only three (V.C. 65, one ; V.C. 63, two), all the remainder being in March. Mr. A. Malins Smith remarks ' The season 1951 had a remarkably late and cold spring. Even the prolonged snow of 1947 did not check the development of vegetation so much as the prolonged cold of 1951 as the following dates show : Oak (first leafing) 1947, May 8th; 1951, May 26th. Ash (first leafing) 1947, May 13th; 1951, May 28th. Bluebell in blossom, 1947, April 16th; 1951, April 27th. Although the comparison is not between the same individual plants yet the general conclusion is unmistakable.'

Summer again disappointed, spasms of heat and periods of chilly winds and even gales neutralising and destroying any beneficial effect, giving but little chance to normal development of maturing fruits. There is also practical unanimity in regard to wild fruit crops of the Oak and Horse Chestnut as being only moderate, Beech poor, and Ash moderate, although the latter produced a conspicuous display of blossom. That of the Wych Elm is reported as abundant, Mountain Ash and Hawthorn as moderate, whilst the fruit crops of the remaining listed trees as being not at all heavy or only poor. In the Huddersfield district the fruit crop of the Elder has been outstanding, with Hawthorn as a good second. As Mr. A. Malins Smith reports : ' The outstanding fruit crops are found among the orchard fruits, probably because they blossomed so late that they escaped the Spring frosts. Apples, Pears and Plums have all produced good crops.'

In the Huddersfield area the fruiting of Bilberry, Cloudberry, Cowberry, and Black Crowberry were generally poor. That of Wild Raspberry was excellent,

as was Common Bramble, but lack of sunshine has resulted in the greater part of the latter crop remaining unripened. *Rosa canina* and *R. mollis* produced fine displays of flowers and fruit. Mr. A. Malins Smith states that in the Bradford area ' Hips of the Dog Rose are making a poor show, and Blackberries are not as abundant as usual.'

FOOTNOTE

In consequence of the dwindling number of recording forms sent out being returned, it was unanimously resolved that the Phenological Committee be discontinued. No further recording forms will be despatched. This decision corresponds with that of the Royal Meteorological Society which has likewise suspended phenological recording.

## BOTANY

(Chris. A. Cheetham).—In the Craven area the year has been similar in type of weather to that of 1950, starting with a damp and mild winter and turning to an exceptionally dry spring which held up growth until the end of June. Farmers were troubled by lack of grass for the hay crop but July gave rain instead of hay weather and the fields produced a fine growth of grass, resulting in a wonderful hay crop which was gathered in easily. This was not so in 1950.

The vegetative growth of last year has been surpassed this year but trees have not fruited so well except the Ash which has had one of its fruiting seasons.

The flower display has varied with the location of the plants. The dry spring was bad for those growing on the high-level limestone areas, and on Sulber, at 1200 ft. O.D., where an acre of ground is usually pink with Mealy Primrose, this year it was difficult to find a dozen plants in flower. The Mountain Everlasting is free-flowering here, but this year not a flower was noted and the leaves of the plant were not easily seen. The Early Purple Orchid is generally plentiful here but it was not so this year. On these higher places the Autumn Gentian was difficult to find at its time of flowering later in the year.

Some plants that did attract attention may be mentioned. The Spring Whitlow Grass was more than usually plentiful and in many fresh places. Next Thale Cress was far wider spread and more showy than usual. Butterwort flowered well. Later on the fields were unusually whitened by a display of White Clover in the lower areas, to the delight of bee keepers, and the higher pastures were white with the Bedstraws *Galium saxatile* and *sylvestre*, and these latter were followed by noticeable shows of Purging Flax and later of Eyebright. Others which made better growth than they normally do were Ground Ivy, Violets, Wild Thyme, Yellow Bedstraw, Crosswort, Betony, Knapweed, Angelica, Great Burnet, Marjoram, Marsh Gentian, Bartsia. On the other hand Primroses were stunted in growth and less plentiful but they were ahead of Celandines in blooming. The Grass of Parnassus was very late and Orchids on the whole were poor.

The Spring flowers were all late, the Purple Saxifrage only getting into bloom on March 21st at Penyghent. Coltsfoot was not plentiful when seen on March 12th, and the Celandines were almost a fortnight later.

Later in the year Mushrooms were plentiful but other species of fungi in the fields were not as abundant as usual. They were certainly late in appearing and this was possibly due to a dryer September and October than we had in 1950.

**Plant Records** (W. A. Sledge) : New records for the past year include two outstanding discoveries. *Carex capillaris* which was long ago recorded by William West from the upper part of Gordale Scar in its southernmost English station, and where it still grows in very small quantity, has been found in another station on Malham Moor. Two years ago *Deyeuxia neglecta* was found in the same area, a discovery which reinstated this rare grass as a Yorkshire species for it has long since disappeared from the locality at Castle Howard where it was first gathered over a century ago. Miss Crackles' discovery of this species on the Leven Canal near Beverley, where it grows in abundance, is therefore a particularly interesting record and a notable addition to the East Riding flora.

Other records of interest include the following :

*Geranium columbinum* L. (63). Limestone quarry, Lindrickdale, near Lindrick Common, with *Acinos arvensis* (Lam.) Dandy and *Poa compressa* L. ; F. Adams, per J. Brown.

*Epilobium montanum* L. × *obscurum* Schreb. (63). Roadside ditch, Norland Moor ; F. Murgatroyd.

*Galium uliginosum* L. (63). Marshy ground above Forge Dam, Whitely Wood, Sheffield ; F. Adams, per J. Brown.

*Anthemis arvensis* L. (63). Field between Firbeck and Stone, also building site at Ulley, near Rotherham ; J. Brown.

*Senecio squalidus* L. (63). Lime quarry between Askern and Pontefract ; F. Murgatroyd. Roadside near ' Nont Sarahs,' Scammonden ; M. Copley, per F. Murgatroyd.

*S. squalidus* L. × *viscosus* L. (× S. *londinensis* Lousley) (61). Bombed site, Hull ; Miss E. Crackles (63). Has been found in another locality in Sheffield ; J. Brown.

*S. squalidus* L. × *vulgaris* L. (Det. Lousley) (63). Waste ground, Sheffield ; J. Brown.

*Vaccinium Myrtillus* L. × *Vitis-idaea* L. (× *V. intermedium* Ruthe) (63). Heptonstall Eaves and top of Jumble Hole Clough, both in Halifax Parish ; F. Murgatroyd.

*Jasione montana* L. (63). Sandpit at Heck ; F. Murgatroyd.

*Monotropa hypopitys* L. (64). Fountains Abbey wood (*Vide Nat.*, 1951, 170) ; W.A.S.

*Lysimachia punctata* L. (63). A few plants by stream running into River Porter, Whitely Woods, Sheffield, perhaps out-thrown from nearby allotment gardens ; F. W. Adams per J. Brown.

*Orobanche minor* Sm. (64). Abundant on red clover in a field at Esholt ; F. Peverett, per A. Malins Smith.

*Stachys palustris* L. × *sylvatica* L. (× *S. ambigua* Sm.) (63). By the side of the Coley Brook, Halifax ; F. Murgatroyd.

*Leonurus cardiaca* L. (64). Eldwick, near Bingley, growing amongst nettles ; F. Peverett, per A. Malins Smith. Enquiries have failed to account for the origin of the plant here. Some non-indigenous species occur nearby but the Motherwort is not known in cultivation in local gardens.

*Orchis ericetorum* Linton × *Fuchsii* Dr. (Det. Summerhayes) (63). Rivelin valley (F. Adams) and Agden Clough, Bradfield, near Sheffield ; J. Brown.

*Crocus nudiflorus* Sm. (63). ' Apparently wild ' in Bingham Park, Sheffield; A. Morrison, per J. Brown. *(64). Several plants in bushy waste ground on the outskirts of Knaresborough. Known here for at least ten years and apparently absent from all gardens in the vicinity ; J. Rathmell.

*Carex strigosa* Huds. (64). Middleton Wood, Ilkley ; G. A. Shaw.

*C. capillaris* L. (64). Great Close Mire, Malham Moor ; com. E. J. Douglas. A very interesting discovery : it is remarkable that the plant should have escaped detection here for so long.

*C. Pairaei* Schultz (63) (Det. E. Nelmes). Sandy bank in lane below Ulley, near Rotherham ; J. Brown.

**Deyeuxia neglecta* (Ehrh.) Kunth (*Calamagrostis neglecta* (Ehrh.) Gaertn., Mey., and Schreb. (61). Abundant by Leven Canal near Beverley ; Miss E. Crackles. A notable addition to the East Riding flora.

*Brachypodium pinnatum* (L.) Beauv. (63). A small patch in a lane at Ulley, near Rotherham. Common on and practically confined to the magnesian limestone. The Ulley station is on Rotherham red rock ; J. Brown.

Additional alien species either planted or accidentally introduced or of transitory occurrence on rubbish dumps or waste ground, include *Diplotaxis muralis* (L.) DC. (63). Rubbish tip, near Spring Wood, Shipley ; E. Jackman, per A.M.S. *Erysimum cheiranthoides* L. (63). Weed in Akroyd Park, Halifax ; F. Murgatroyd. *Erodium Botrys* (Cav.) Birt. (64). Shoddy dump, Stutton, near Tadcaster ; Miss R. Kilby. *Epilobium tetragonum* L. (63). Rubbish tip near Bingley Sewage Works ; F. Peverett, per A.M.S. *Populus balsamifera* L. (63). Several planted trees about St. Ives, Bingley ; Harden Grange ; Harden village; Cottingley; F. Peverett and A.M.S. *Aponogeton distachyos* L.f. (63). Canal, Bingley above Three Rises Locks, no doubt originating as a throw-out from an aquarium or ornamental pond; S. Jackson, per A.M.S. *Nitella flexilis* Ag. (63). Canal, west of Hebden Bridge, accidentally introduced with fish by Angling Society; W. Uttley, per H. Walsh.

**Ecology** (Miss D. Hilary).—The ecological report is a short one this year as there are at present very few workers in this branch of botany.

Mr. Wattam sends the following notes on the degeneration of the Juniper on Moughton.

'The reports of Mr. G. A. Shaw and Mr. C. A. Cheetham appearing in the Annual Report of the Y.N.U. for 1949 and 1950, upon the above matter contain valuable information regarding the age of the trees in the area of Thieves Moss, but furnish no solution as to why the trees on the Moss so suddenly collapsed and died out. I am venturing to assert that the sudden collapse has been caused by the trees being deprived of their water supply, by diversion of the original drainage channels which once fed the root system of the Juniper trees. Where water supply is constant Juniper will continue to grow despite fungal attacks. The trees in Juniper valley are a case in point. I base my assertion from observations during the growing of Juniper plants from seed, and from deductions made in the field. The lack of seedling plants is mainly due to aridity. During walks from the south-east end of Thieves Moss in as direct a line as possible towards Juniper valley, the fissured floors in the mountain limestone pavement reveal a thin humus with numbers of old wind-carried Juniper fruits giving no sign of life, as they depend for moisture on retention of rainfall. Similar observations on Hooker Mill Scar opposite Thwaite, Kisdon Fell and Harkerside Moor, all near Keld in Swaledale, in 1937, produced similar results. The established trees received a good water supply. Useful reference can be made to the Ecological Reports by Mr. A. Malins Smith in *The Naturalist*, 1936, pp. 177-178, and 1937, pp. 168-170. My last visit to Thieves Moss was in May, 1940, when search for seedling Junipers was unsuccessful, due to the arid surface conditions. Harsh wintry conditions appear to have no ill effects upon the Juniper in its seedling stages, judged by the seedling Junipers raised by me.'

Mr. Wattam also records that one of the three Juniper seedlings raised by him from fruits taken at Moughton and planted in his garden in October, 1933, produced an abundance of male bloom in June, 1951. Thus a period of over seventeen years has elapsed between the planting of the seed and the flowering stage.

Mr. Malins Smith is at present engaged in making a complete summary of all our work in the Juniper problem and hopes to send it to the Union shortly.

That this problem is not merely a local one is shown by the fact that during a holiday in the Austrian Tyrol last June, in a district where Juniper was fairly plentiful, I found it very difficult to find one healthy plant.

With regard to the ecological survey of a Heather Moor at St. Ives, Bingley, on a recent visit it was noted that the burnt-out area is now almost a closed association of *Calluna*. The many tiny plants noted last year have all grown considerably, merging in to one another and ousting many of the other plants first noted. The only plants which seem to be holding their own are *Deschampsia flexuosa* and *Juncus squarrosus* on some of the drier parts, and *Eriophorum vaginatum* and *Erica tetralix* on the damper areas. Even many of the birch seedlings, noted last year, have vanished.

In conclusion I should like to plead for workers in ecology, especially among the younger members of the Union.

**Bryology** (H. Walsh) : Summing up the records, there are three new vice-county records for Sphagna varieties, one new county record for a moss variety, two new vice-county moss records and four new vice-county records for hepatics, besides other records of interest detailed below. For these the revised name as given in *An Annotated List of British Mosses*, by P. W. Richards and E. C. Wallace, is used with the name in Dixon's *Handbook* in brackets.

We have had the usual two field meetings when Grassington and Bolton Abbey Woods were visited. The examination of the plants collected is incomplete.

The section has been represented on four general excursions and reports are included in the accounts of the meetings. An article has been contributed to *The Naturalist*, 1951, p. 107 indicating that the moss *Webera proligera* Bryhn. is increasing in a semi-industrial area and may become more plentiful in S.W. Yorks.

Two notes on mosses are published in the *Transactions of the Brit. Bry. Soc.*, 1951, in connection with material collected in Yorkshire; one note reports synoicous inflorescence in *Orthodontium lineare* Schw. (*O. gracile* Schw. var. *heterocarpum* Wats.) and the other on the dung moss *Splachnum sphaericum* L. fil., gives an account of wind dispersal of spores. Previous accounts only deal with insect dispersal.

I have been making enquiries about the moss herbarium of J. Nowell of Todmorden (1802-1867), in his time one of the most active Yorkshire bryologists. On his death the herbarium passed into the care of the town, and was until recently

housed at the Public Library. I am informed that it cannot be now traced. Apparently the collection has been lost or destroyed.

### Hepatics

**Riccia glauca* L. var. *subinermis* (Lindb.) Warnst., (62). Catton ; J.A., C.M.R.
**R. sorocarpa* Bisch. (62). Catton ; J.A., C.M.R.
**Eucalyx paroicus* (Schiffn.) MacV. (63). Cattywell Clough, Wainstalls ; J.A., *teste* P. W. Richards, *Trans. Brit. Bry. Soc.*, 1951.
**Lophozia atlantica* (Kahl.) Schiffn. (65). Holme Fell, Dentdale ; G.A.S. The status of the plant is uncertain, the gathering agrees with MacVicar's description.

New to locality :
*Metzgeria furcata* (L.) Dum. (62). Between Falling Foss and Littlebeck, Whitby ; G.A.S.
*M. conjugata* Lindb. (64). Halton East Gill ; G.A.S.
*Fossombronia pusilla* (L.) Dum. (62). Yearsley Dam ; J.A.
*Nowellia curvifolia* (Dicks.) Mitt. (62). Falling Foss ; G.A.S.
*Lophocolea cuspidata* Limpr. (62). Hayburn Wyke ; G.A.S.
*Lejeunea patens* Lindb. (65). Holme Fell, Dentdale ; G.A.S. Not typical but confirmed by B.B.S. referee.

### Mosses and Sphagna

**Sphagnum fimbriatum* Wils. var. *robustum* Braithw. (65). Birk Gill, Colsterdale ; A.T. *Trans. Brit. Bry. Soc.*, 1951.
**S. squarrosum* Pers. var. *imbricatum* Schp. (64). Wharfe Wood, Austwick ; A.T. *Trans. Brit. Bry. Soc.*, 1951.
**S. fallax* K.L. var. *plumosum* Warnst. (65). Birk Gill, Colsterdale ; A.T. *Trans. Brit. Bry. Soc.*, 1951.
**†Ephemerum serratum* Hampe. var. *angustifolium* B. & S. (63). Luddendenfoot and Mytholmroyd ; H.W. *Nat.*, 1951, p. 91.
**Bryum erythrocarpum* Schw. (62). Catton ; J.A., C.M.R.
**Webera rothii* (Correns) Broth. (*W. annotina* (Hedw.) Bruch. var. *erecta* (Roth.) Correns) (62). Catton ; J.A., C.M.R.

Other interesting records :
(61) Skipwith : *Polytrichum piliferum* Schreb., *Dicranum spurium* Hedw., *D. rugosum* Brid. (*D. undulatum* Ehrh. non Turn.), *D. bonjeani* De Not.
(61) Wressle : *Tortula latifolia* (Bruch) Hartm. (*T. mutica* (Schultz) Lindb.), *Barbula convoluta* Hedw., *Cinclidotus fontinaloides* P. Beauv., *Orthodontium lineare* Schw. (*O. gracile* Schw. var. *heterocarpum* Wats.).
(61) Saltmarsh : *Pottia heimii* Furnr.
(62) Hayburn Wyke : *Orthotrichum pulchellum* Smith ; G.A.S., *Ulota phyllantha* Brid. ; G.A.S.
*Tortula laevipila* Schw. (65). Walden Beck ; J.A.
*Gymnostomum calcareum* Nees & Hornsch. (63). Anston Stones Wood ; J.B.
*Funaria attentuata* (Dicks.) Lindb. (*F. templetoni* Wahl.). A packet of this moss was found in a collection received by the Hebden Bridge Sci. Soc. and apparently formed part of J. Nowell's herbarium. The record is not given in Lees' *Flora, The Flora of Halifax Parish* (1904) or *The Todmorden Flora* (1911), and there is no recent record. The locality given is ' Below Crib, Gorple (V.C. 63), August, 1867.' J. Nowell. Nowell died October 28th, 1867.
*Physcomitrella patens* (Hedw.) B. & S. (63). Harthill reservoir and Woodhall ponds, near Sheffield ; J.B.
*Schistostega pennata* (Hedw.) Hook. & Tayl. (63). Sandy hollows on banks in Wyming Brook, Rivelin valley ; J.B.
*Mnium stellare* Reich. (64). Halton East Gill ; G.A.S. (64) Hebden Gill ; G.A.S. (63) Eaves Wood, Heptonstall ; H.W. (63) Sun Wood, Shelf ; H.W. (63) Hebden valley, 1898 ; J.N., the latter in *Flora of Halifax*, 1904.
*Myurella julacea* B. & S. (65). Dalehead Scar, Bishopdale ; G.A.S.
*Eurhynchium Swartzii* Hobk. var. *rigidum* Boul. (62). Dry calcareous bank, Ashbury Top ; J.A., *certe* Dr. E. W. Jones. Mrs. Appleyard says the locality is not far from Kirkdale, where W. Ingham recorded it in 1899.

* New county record. † New vice-county record.

**Mycology** (Miss J. Grainger): The year has been one of steady progress. At our Spring Foray we welcomed members of the newly-formed Mycological Committee of the North Western Naturalists.

At the Autumn Foray we made the experiment of having headquarters at the W.R.C.C. Adult College, at Grantley Hall. The situation and amenities were delightful but the necessity of early booking caused one or two people to be left out and we had more than the usual number joining us for days. It was decided that Foray Lists appearing in *The Naturalist* shall in future contain only noteworthy species and new records. Complete lists of finds will be kept by the Recorders.

Soon after the last report, the long-awaited *Common British Fungi* by Miss E. M. Wakefield and R. W. G. Dennis appeared. This will prove valuable in leading beginners along the right road.

Students of Discomycetes will welcome the ' List of Discomycetes recorded from Britain ' by J. Ramsbottom and F. L. Balfour Browne in *Trans. Brit. Mycol. Soc.*, vol. 34, Pt. I, pp. 38-137. Also of interest to students of Discos is ' Some New Discomycete Records ' by W. D. G. Graddon, *Ibid.*, Vol 34, Pt. II, pp. 190-194.

We welcome Mr. Graddon as our new referee for Discomycetes.

# YORKSHIRE NATURALISTS' UNION

## Income and Expenditure Account for the year ended 15th October, 1951

### EXPENDITURE

| | £ s. d. | £ s. d. |
|---|---|---|
| PRINTING: | | |
| General (Circulars, etc.) | 105 11 2 | |
| *The Naturalist* .. | 292 12 2 | |
| | 398 3 4 | |
| *Less* discounts received | 9 17 3 | |
| | | 388 6 1 |
| SUNDRY EXPENSES: | | |
| Bank Charges, Rent of Rooms, Excursion Expenses, Sectional Expenses, Stationery, etc. .. .. | 13 15 10 | |
| Secretary's & Treasurer's Petty Cash .. | 17 4 11 | |
| | | 31 0 9 |
| | | £419 6 10 |

### INCOME

| | £ s. d. | £ s. d. |
|---|---|---|
| Members Subscriptions adjusted to allow for arrears and payments in advance .. .. .. | | 298 14 9 |
| Levies from Affiliated Societies .. | | 13 1 11 |
| Sale of Publications .. .. .. | | 4 6 5 |
| DONATIONS: | | |
| Durham & Northumberland Ornithologists .. .. | 25 0 0 | |
| S. D. P. Fisher, Esq. (Spurn Entomological Report) .. .. | 12 0 0 | |
| Entomological Section of *Y.N.U.* and *Entomologist's Monthly Magazine* .. .. | 10 0 0 | |
| | | 47 0 0 |
| Interest from Investments .. .. | | 21 7 6 |
| Deficit of Income to meet Expenditure for the year carried to Accumulated Fund .. .. .. .. | | 34 16 3 |
| | | £419 6 10 |

## BALANCE SHEET as at 15th October, 1951

### LIABILITIES AND FUNDS

| | £ s. d. | £ s. d. |
|---|---|---|
| Invested Funds .. .. .. | | 300 0 0 |
| Accumulated Interest on Ornithological Fund .. .. .. .. | | 1 12 3 |
| Life Members Account as in 1950 .. | | 462 0 0 |
| Publications Fund at 15/10/50 .. .. | 196 0 0 | |
| Donations during 1951 | 0 16 0 | |
| | 196 16 0 | |
| *Less* Special Mycological Publications, 1950, £89/11/- Deduct Sales to date, £41/6/6 .. .. | 48 4 6 | |
| | | 148 11 6 |
| | | £912 3 9 |

Audited and found correct.
W. A. WILSON } *Hon.*
W. BENNET } *Auditors*

### ASSETS

| | £ s. d. | £ s. d. |
|---|---|---|
| Investments of Funds (Govt. Securities Nominal Values) .. .. .. | | 300 0 0 |
| General Investments (Govt. Securities —Nominal Values) .. .. | | 359 10 11 |
| Subscriptions & Levies outstanding (less reserve) .. .. | 42 7 9 | |
| *Less* paid in advance | 12 10 0 | |
| | | 29 17 9 |
| Westminster Bank Ltd. .. .. | | 187 18 10 |
| Accumulated Fund, Amount fd. (Dr.) 15/10/50 .. .. | 13 12 6 | |
| *Less* donation from R. C. Fowler-Jones, Esq. .. .. | 13 12 6 | |
| | — | |
| Deficit for the year from Income & Expenditure Account .. .. | | 34 16 3 |
| | | £912 3 9 |

J. D. HARTLEY,
*Hon. Treasurer*

## BRYOLOGICAL EXCURSIONS IN 1951

H. WALSH

GRASSINGTON, April 21st-22nd

THE Section was fortunate in having fine weather for this excursion. One day was spent in the Bastow Wood and Dib Scar area and another at Hebden Gill. Much material was collected, for both districts are good bryophyte country, but few outstanding finds were made, most having been already recorded. In the Grassington area *Tortula subulata* Hedw. was a very prevalent moss, made conspicuous by its long capsules. While crossing the pastures to Bastow Wood *Encalypta vulgaris* Hedw. with immature capsules was seen but it was the non-fruiting *E. streptocarpa* Hedw. that was more generally distributed. A fine fruiting patch of *Pleuridium subulatum* Rabenh. was noticed and along with it, *Bryum erythrocarpum* Schwaeg. Only the edge of Bastow Wood was traversed, and here on the boulders, tree bases and ground was a wealth of bryophytes mainly of the commoner kinds met with on limestone, with *Camptothecium lutescens* B. & S., *Eurhynchium striatum* B. & S., *E. pumilum* Schp., *Hypnum chrysophyllum* Brid., and *Trichostomum mutabile* Bruch more local, while on the boulders *Frullania tamarisci* (L.) Dum. was prominent. Near the top of Dib Scar a fruiting *Bartramia* proved to be *B. oederi* Swartz, recorded for this area in 1900 and 1924. At the base of the scar *Cololejeunea calcarea* (Lib.) Schiffn., recorded in 1927, was found intermingled with *Trichostomum mutabile*. Also present were *Funaria calcarea* Wahl. recorded in 1900, *Weisia verticillata* Brid., *W. rupestris* C.M., *W. curvirostris* C.M., *Eurhynchium tenellum* Milde, recorded in 1924, *Fissidens decipiens* De Not., and *Metzgeria pubescens* (Schrank) Raddi. Following the stream the rarer plants collected were *Eurhynchium crassinervium* B. & S. in several places, *Hypnum falcatum* Brid. and *Amblystegium irriguum* B. & S. mixed with *Aplozia riparia* (Tayl.) Dum. A gathering of *Dicranoweisia cirrata* Lindb. had numerous gemmae up the stem and in this condition it has been found in several Yorkshire localities as commented upon in previous reports. The presence of gemmae in this species is the subject of a note in the *Trans. Brit. Bry. Soc.*, 1950, where it is stated that they occur on both fertile and sterile plants. They have been found in widely separated localities in England and the West and East of Scotland, and although not mentioned in Dixon's *Handbook* they are described in European floras and are probably generally present. On the second day Hebden Gill was approached over moorland and provided a different flora as most of the area is non-calcareous, although *Hypnum commutatum* Hedw. was in quantity in a stream coming from hilly ground through a tunnel and near the top of the gill were limestone mosses, among them being *Hypnum molluscum* Hedw., *Trichostomum tortuosum* Dixon and *Neckera complanata* Huebn. Working down the gill, along with more common mosses, were *Leptodontium flexifolium* Hampe, *Rhacomitrium heterostichum* Brid., *Mnium stellare* Reich., *M. orthorrhynchum* B. & S., *Polytrichum juniperinum* Willd., *P. piliferum* Schreb., *Orthotrichum diaphanum* Schrad., *Grimmia apocarpa* Hedw. var. *rivularis* W. & M., *G. trichophylla* Grev., *Weisia curvirostris* C.M., *Orthodontium lineare* Schwaeg. and *Hypnum exannulatum* Guemb.

Hepatics were more common than on the previous day, and among those collected were *Aneura pinguis* (L.) Dum., *Leptoscyphus taylori* (Hook.) Mitt., *Aplozia sphaerocarpa* (Hook.) Dum., *A. crenulata* (Sm.) Dum. var. *gracillima* (Sm.) Heeg, *Lophozia attenuata* (Mart.) Dum. devoid of gemmae leaves, *L. floerkii* (W. & M.) Schiffn. and forma *naumanniana* Nees, *Cephaloziella starkii* Schiffn., and *Scapania nemorosa* (L.) Dum. Many of the plants mentioned had not been previously recorded for this area. For many of the moss records I have to thank Mr. G. A. Shaw.

BOLTON ABBEY WOODS Sept. 19th

FOR the autumn excursion to Bolton Abbey Woods a small party had a fine sunny day after much rain, which was ideal for collecting. From Barden Tower it was decided to work down the left side of the river and mainly the ground covered did not extend far from the path. Rock outcrops, riverside boulders and the wood edge provided a wealth of moss life but in the main not as rich in variety as the other side of the river worked on previous visits. The two dendroid mosses, *Climacium dendroides* W. & M. and *Porotrichum alopecurum* Mitt. were fairly plentiful and a small area with numerous patches of *Leucobryum glaucum* Schp.

was searched in the hope of finding fruiting plants, but neither this nor *Climacium* obliged. *Hypnum cupressiforme* L. and its varieties were very plentiful and in places the soil and boulders bore calcareous species, and this was reflected in the greater abundance of *Pellia fabbroniana* Raddi compared with *P. epiphylla* (L.) Corda. Others of the thalloid hepatics were *Conocephalum* (an extensive patch of which bore archegonia on the thallus), *Lunularia* and *Marchantia*. A feature of the riverside is the large amount of sandy deposits and the mosses growing here show features enabling them to grow up through the sand. An interesting paper on this subject in relation to the fixation of sand dunes is contained in the *Brit. Bry. Soc. Trans.*, 1948. One of the mosses there dealt with, *Barbula fallax* Hedw., was in some quantity by the river here. The free growth of rhizoids from the buried stems is a feature of these mosses, but *Barbula fallax* also produces rhizoids from the tips of the lower leaves, and although this feature is not stated in the paper mentioned, I have seen this in plants collected in various localities. It is the only *Barbula* in which I have seen such a development. Other mosses partly buried in sand were *Swartzia montana* Lindb., probably from sand deposited on boulders (the habitat for this is stated to be rock crevices), *Fissidens adiantoides* Hedw., and *Dichodontium flavescens* Lindb. A survey of the riverside from this angle would no doubt furnish many others. Mainly the material collected had been recorded, but those not were *Metzgeria pubescens* (Schrank) Raddi, *Lunularia cruciata* (L.) Dum., *Polytrichum gracile* Dicks., *Rhacomitrium heterostichum* Brid., *Leskea polycarpa* Ehrh., *Brachythecium glareosum* B. & S., and *Fontinalis squamosa* L. *Fissidens rufulus* B. & S. c. fr., certified by the B.B.S. referee, was collected. This is one of the stations for this rare moss, but a few gatherings could not be safely placed as this or *F. crassipes* Wils., which is also recorded. Others of interest were *Pedinophyllum interruptum* (Nees) Pears. collected on riverside boulders near the Strid, *Barbula sinuosa* Braithw., *Cynodontium bruntoni* B. & S., *Trichostomum crispulum* Bruch (recorded in 1903) and *Eurhynchium myosuroides* Schp.

For many of the moss records I have to thank Mr. G. A. Shaw.

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## BOOK REVIEWS

**British Bird Books. An Index to British Ornithology, 1481—1948,** with Supplementary List, 1949-May 1950, by **Raymond Irwin.** Pp. 398. Grafton & Co., £3/3/- net.

This ornithological bibliography is divided into five parts. Part I deals with books and papers arranged subjectively (51 pp.); II is concerned with regional lists (34 pp.); III indexes specifically and systematically in Wetmore's order (66 pp.); IV lists authors and their works (176 pp.); V is an 'index of subjects, species, places,' with sectioned and paged references to other appropriate parts of the book (14 pp.). Appendix A lists societies, unions, periodicals, etc., and Appendix B lists 'a selection of the more important material which appeared between January 1949 and May 1950,' under the headings of authors.

Prodigious! The most useful book to an English ornithologist that I have handled since *The Handbook* appeared! I have made many tests and found surprisingly little of importance to be omitted. Concerning Ireland I think G. R. Humphrey's *List of Irish Birds* (1937) might have had mention instead of being a 'later ed.' of Ussher's work. As Irwin says, 'one cannot hope for absolute completeness.' Material from periodicals, although referenced numerously, is necessarily incomplete—'such an attempt would defeat its own ends by its very immensity.' Future writers who use the book (as many will) should bear such in mind, and not conclude they have covered every source of information by consultation of 'Irwin,' or that an observation of any species is new because it is not mentioned in any of the cited works. Short notes and letters often contain useful information. They should however be saved much time and trouble, and be grateful, as I am.

The book will be invaluable to students. Every library should have a copy available for reference. The emphasis is on field ornithology rather than on anatomy, physiology or taxonomy, although these are not overlooked. Some of the work of many photographers is referenced though completion is this respect would be even more difficult to attain than of literary contributions to periodicals. The Zoological Photographic Club, which from 1899 has set the standard that impelled

a leading continental worker to admit the existence recently of higher quality in British bird photographs than in those of any other country, is a notable omission from the list of societies, etc., although a book that relates the club's history in a chapter specially contributed has several mentions. There are many references to matter that has appeared in *The Naturalist*, but an article of 1937 should have been omitted or the withdrawal that followed hard after also have been included. What a lot of trouble some of us who have scattered published work in so many directions must have caused Mr. Irwin ! R.C.

**Wild Wings,** by **Frank Stuart.** Pp. 191. Victor Gollancz, 14/-.

The author who sets out to write the life-history of a living creature by recording the adventures and day-to-day incidents of one individual's existence, treads a prickly path. On the one side he is beset by the danger of anthropomorphism, on the other by the need to conjure up frequent and exciting incidents to keep his narrative alive. Into the first pitfall he runs headlong because his story demands that he puts some interpretation on the ' thoughts ' of his chief character—for mere ' instinctive reactions ' make dull copy—while his urgent need for variety of adventures too easily leads to extravagance. At the same time it must be admitted that this approach to the recording of natural history lends itself well to fine and imaginative writing, and gives a good prose-writer full scope. Viewed in this light, it is only fair to give an author a little poetic licence in his interpretation of his subject's thoughts.

Mr. Frank Stuart tells in this book of one year in the life-history of a pintail drake, and it must be confessed that he has very successfully avoided the worst of the pitfalls inherent in his approach. He is to be congratulated on not giving his ' hero ' a Christian name. Very few writers have done so and yet managed to keep their subjects from degenerating into something very like household pets. Mr. Stuart's hero from first to last remains anonymously ' the pintail drake.' Nor are his adventures too far-fetched. We have storms and tornados and whirlpools, and all sorts of killers from lynx to forest fire, man to lighthouse, but none are forced upon the reader, and if at the end one feels that that pintail certainly led an adventurous year, it would be unfair to say that it was an impossible one.

Mr. Stuart has of course to trespess into the dangerous ground of interpreting his pintail's mind, its 'thoughts' during migration's perils, its responses to the sex-impulse, its reaction to its own young, its ' fears ' during eclipse. In short, he has to interpret its behaviour, and, grant him the fair share of poetic licence to which his approach entitles him, he has handled this difficult problem very well indeed, and produced a most readable story with some fine patches of vivid writing.

Although no country is even mentioned, the introduction of blue geese proclaims that the scene is set in the New World. It starts with the pintail being decoyed and ringed in the spring in the south ; it follows the bird north into the Arctic where mating, nesting, hatching and eclipse take place ; and then brings the bird back on its fall-migration to be caught again in the same decoy wherein it was ringed in the opening chapter.

In brief, it is a good story well told. If Mr. Stuart is sure to have his critics, the present reviewer thinks that he has trodden his prickly path very successfully, and ventures only one criticism, that this pintail seems to have led a life very shut off from all other birds except pintails. Little mention is made of the waders and other birds which must necessarily have been its neighbours during its year, not even of the other species of ducks in the company of which any pintail must of necessity find itself during its journeyings, except a white mallard which plays the villain of the story. G.K.Y.

**The Land of the Loon,** by **G. K. Yeates.** Pp. 156 with 30 photographic illustrations. Country Life Ltd. 18/-.

**Wandering Albatross,** by **L. Harrison Matthews.** Pp. 131 with 14 photographs. Macgibbon and Kee, with Reinhardt and Evans. 15/-.

Though neither Iceland nor South Georgia are strictly Arctic and Antarctic, both are sufficiently near to their respective circles to make comparisons interesting. In both regions the scenery is extremely wild ; and the going, rough on rock and snow, demands fitness and stamina. Weather conditions may change with alarming suddenness. Our authors, too, are comparable in some respects. Both are bird

students, and relate their adventures to their not dissimilar scenic backgrounds ; and each writes vigorous, vivid, racy English.

G. K. Yeates tells the story of two strenuous trips to Iceland. Some of the birds encountered are British breeders, and the effect upon species of differing habitats is discussed in relation to habit and race. Eminently readable, the book is illustrated by the author's superb photographs (Great Northern Diver, Red-throated Diver, Whooper Swan, Northern Golden Plover, Long-tailed Duck, Snow Bunting, Redwing, Black-tailed Godwit and Purple Sandpiper) which are admirably reproduced, especially the one in colour of the Loon (Great Northern Diver). The northern plant-life was not forgotten ; *Dryas, Silene acaulis*, and two saxifrages were photographed beautifully. The ability to be poetical more convincingly in Iceland than under Mediterranean glares gives Yeates true northern status.

L. H. Matthews tells his experiences, ornithological and otherwise, during three years spent on and around South Georgia, mingling bird-watching with adventure afloat, on rugged bleak coasts and islands, and in the mountainous hinterland. Most of his birds belong to the order Tubinares (13 species of Albatross and Petrel), with the Antarctic Skua, Dominican Gull, South Georgian Tern and Teal, Blue-eyed Shag, Gentoo Penguin, and the Antarctic Pipit. The author has as observant an eye and as graphic a pen for his tough whaler companions as for his birds. ' The inevitable inquisitive and destructive instincts of human nature ' had full play. A few passages are not for the squeamish. Albatross eggs and flesh were eaten frequently. Whalers and sealers have never had much regard for the preservation of wild life, even that which they hunt. Such is the background to intimate descriptions of some birds that few of us are likely to meet. The photographs (supplemented by some black and white drawings) show the birds depicted fairly adequately despite evident enlargement from small negatives.

R.C.

**The Bird. Its Life and Structure,** by **Gertrud Hess.** Translated from the German by Phyllis Barclay-Smith. Pp. 244, with numerous drawings in the text. Herbert Jenkins. 18/-.

This is a rather unusual book with Chapters on I Migration, II Reproduction, III Structure and Function of the Bird's Body, IV Classification, V The Ancestry of Birds, and VI Extinct and Vanishing Birds, followed by some tables of comparative figures relative to weights, and frequencies of various actions, and an index.

It is necessary to remember that, except where stated otherwise, Chapters I, II and VI refer to birds in Switzerland. Concerning trapping and ringing it is stated—' as long as a trap is in use it is visited *every quarter of an hour* ' ; and ' in many countries bird-ringers must have an official permit which is only issued to reliable people whose good reputation is a guarantee,' etc. Would that these rules were always observed in Britain. I have yet to find a Kestrel that has built even a ' carelessly made ' nest (*vide* p. 101) ; whilst the remark that ' Blackbird and Song-Thrush nests are also occasionally found in shrubs and bushes ' is a distinct understatement applied to Britain. Although such Swiss variations from the habits of British birds are interesting to note, Chapters III, IV and V will be the most useful to English readers, since they apply universally. The subject-matter of these chapters is presented simply and realistically, and many field ornithologists could read and digest them with advantage. The translation is excellent, and being free from unnecessary scientific jargon is easy to read.

R.C.

**Parasitic Animals,** by **Geoffrey Lapage.** Pp. xxii+352, with 8 plates and 113 figures. Cambridge University Press. 21/-.

This book deals firstly with a series of representative life cycles of flukes and tapeworms, roundworms, insects and protozoa ; then with the effects of the parasitic life both on the parasite itself and on the host. Various aspects of the host-parasite relationship, and control and preventive measures are discussed. The parasites dealt with are chiefly those of man and his domesticated animals but though the importance of these in human affairs is stressed and many interesting facts and figures are given, the outlook throughout is that of the pure biologist rather than the economic parasitologist.

This is a very good book. Dr. Lapage is a specialist in the field of animal pathology, and in this book he has combined strict factual accuracy with such an easy manner of presentation that no background of zoological training is essential for its understanding. Technicalities are reduced to a minimum and where introduced their use is always explained. The lives of the creatures he describes are, by ordinary standards, always strange and often complicated and adventurous ; their effects on their hosts are all too frequently disastrous. Dr. Lapage has aimed at—and fully succeeded in—treating of these things in a manner interesting to intelligent readers in general as well as students of biology in particular. The book will open a new world to many of the former and it is equally certain that the latter will find in it much which will both widen their knowledge and sharpen their interest in parasitology.

**Man and the Animal World,** by **Bernal R. Weimer.** Pp. x+570, with 16 plates and 296 figures. Chapman and Hall, Ltd. 40/-.

Elementary courses on zoology in American colleges are rather widely different from those in British universities. Comparative morphology and anatomy based on a small number of types which receive fairly detailed study form the main content of British courses. American courses cover a wider field in—inevitably—considerably less detail. This book is intended for undergraduate students in American colleges. As a text-book for zoology students in this country it would be inadequate, though as supplementary reading—if they can afford it—it will not be without its uses.

The first half of the book deals mainly with human anatomy and physiology and is designed as an introduction to the fundamental life processes common to all animals. Brief comparative accounts of nervous, excretory, alimentary and reproductive systems are included in this part. In the taxonomic section which follows, emphasis is placed on the biology and economic aspects of the several classes of animals rather than on anatomy. There are chapters devoted to the mechanism of heredity, human heredity and eugenics, and ecology. In a book which emphasises throughout the importance to man of the animals described and which is sufficiently up-to-date to include cortisone in the account of hormones and a discussion of the Lysenko controversy in the chapters devoted to evolution, one would have expected to find the account of the malarial parasite correctly described so as to include recent work which has modified previously accepted views of the life cycle of this important parasite.

The book is generously illustrated by photographs and diagrams.

W.A.S.

**A Natural History of Man in Britain,** by **H. J. Fleure.** Pp. xviii+350, with 38 colour photographs, 38 monochrome photographs and 76 line drawings. *New Naturalist,* Vol. 18. Collins. 21/-.

There is not a single chapter in this book the subject-matter of which has not already got a copious literature of its own. It covers the history of man in Britain from the Ice Age onwards to modern times, the racial composition of its people (and here the author gives a first-rate summary of original work in a field wherein he is an acknowledged master), types of clothing throughout the ages, ancient and mediaeval dwellings and villages and modern towns, the architectural style and social significance of our churches and castles, the rise and progress of communications and transport, and past and present population changes and trends. The subject is vast, and it is doubtful if anyone but Professor Fleure could have reviewed such a varied and extensive range of topics so competently. The theme which knits these topics together is the ' changing relations between men and environments.' The result is a very informative and interesting mixture of archaeology, anthropology, history, geography and sociology. But it is *not* natural history, and to call it so seems a quite needless way of seeking to justify its inclusion in the present series.

W.A.S.

**Vertebrate Sexual Cycles,** by **W. S. Bullough.** Methuen's Monographs on Biological Subjects. Pp. viii + 117. 6/-.

The continuity of life depends on reproduction and a knowledge of its processes requires an understanding of some of the most fundamental problems in biology.

Observation and experiment have provided much vital information but there is still much that is unknown.

During the last few decades increasing attention has been directed to the study of reproductive cycles and their relation to the environment, especially in the Vertebrates, following the work of Rowan showing the effects of light on sexual development in the junco and some finches, and the revelation of the vital rôle of the pituitary and hormones in reproduction. The knowledge so gained has been collected and examined in this book and as a result the reader is presented with a clear, stimulating, well-balanced but critical account which is easy to read and follow. Within a small compass a wide field is surveyed, but proper emphasis is given to essentials and unnecessary details avoided. The seasonal nature of sex activity is reviewed and the effect of environmental factors such as light, temperature and latitude are analysed and discussed. An account of hormones and internal reproductive rhythms follows and includes an outline of the activity of pituitary and sex hormones in relation to the various phases of the reproductive cycles. Finally, a cautious appraisal of the evidence linking the external and internal rhythms is given, leading to an account of the influence of hormones upon sex behaviour, with a special reference in this connection to migration.

Naturalists, teachers and students, should be particularly indebted to the author for the great amount of useful and valuable information, hitherto scattered in numerous scientific journals often inaccessible, which he has collected into this small book, and for his orderly presentation and analysis which provide clarification as well as perspective and understanding of many intricate and complex problems of present-day biology.

E. A. S.

**Wild Mammals and the Land,** by **F. Howard Lancum.** Ministry of Agriculture and Fisheries Bulletin No. 150. Pp. 59, with 44 photographic illustrations. H.M. Stationery Office. 2/6.

This publication reflects the scant attention which has been paid to the economic significance of the mammals of Great Britain.

As a survey, it is by no means comprehensive, no mention being made of the deer which are in some localities no blessing to the farmer and are allowed to live unmolested only out of good will to the local Hunts. The Pine Marten is mentioned though not as a potential control of the Grey Squirrel, but the Wild Cat is not referred to although it is by far the more abundant animal. The fox is commended for destroying rabbits and condemned for killing lambs, but no attempt is made to balance one against the other. Even the few lamb-killing foxes may destroy a hundred rabbits for every lamb and thus provide grazing for a dozen or more sheep. The tremendous upsurge in the numbers of the rabbit in the nineteenth century coincides with the banishment of the polecat, a fact seldom acknowledged and not in the work under review which nontheless acknowledges the former beast as 'one of the greatest of all pests of agriculture.' The great virtue of predator control is that it is incessant and presses more heavily when the pest is more vulnerable in times of periodic scarcity. The smaller rodents are discussed and many are condemned although it is doubtful whether, except in plague years, it is worth while attempting to reduce their numbers other than by encouraging rather than destroying the owls, kestrels and weasels which make of them their mainstay.

The booklet contains many personal observations of the author but nothing of any research sponsored by the Ministry and no assessment is made of the value of the shoots organised by Pests Officers, often so undisciplined that many other forms of wild life than the quarry are destroyed.

All in all, the publication avoids being judicial. Evidence is presented for the prosecution and the defence but the verdict is left in the hands of the reader whom prejudice may make selective in the facts he may consider vital, and biased in his verdict.

E.H.

**Handbooks for the Identification of British Insects. Vol. 6, Part 2 (a). Hymenoptera 2. Symphyta.** Section (a). By **R. B. Benson.** Pp. 49, 127 figs. Published by the Royal Entomological Society of London, 10/-.

This is the first part of Mr. Benson's long expected synopsis of the British sawflies and deals with the eleven smaller families of the Symphyta but excludes the Tenthredinidae or true sawflies.

The treatment is thorough and the keys are sufficiently detailed to ensure correct determinations. Brief indications of habits and food-plants, etc., are included where possible. The information given regarding distribution appears to be fairly comprehensive but in a few instances does not appear to take cognizance of the published northern records. The numerous illustrations are excellent and clearly elucidate the text. A useful feature in regard to the Siricidae (Wood Wasps) is the inclusion of the foreign species more commonly imported in timber.

It is to be hoped that the remaining sections of this much-needed work, dealing with the Tenthredinidae, will soon be available.

W. D. H.

**Practice of Wildlife Conservation,** by **Leonard W. Wing**. Pp. xii+412, with 51 figures. Chapman & Hall, Ltd. 44/-.

The book refers chiefly to conditions in the United States of America but can be read with interest and benefit elsewhere, the principles of conservation being similar wherever wild life be under consideration. The presentation is based evidently on a wide experience of the outside world and considerable reading, the reference lists at the ends of the various chapters being extensive. Illustrations in the form of reproduced photographs and diagrams are clear and abundant, while many tables provide facts by which statements may be tested. There is a preparatory portion in which the reader is introduced easily to technical terms dealing with ecology and population studies and to an appreciation of the economic aspect of wild life conservation and exploitation, as well as to an understanding of the aesthetic value of animate nature. Land owners, interested in conservation of terrestrial animals, and riparian owners, with their concern with the well-being of fishes, will find much to interest them. The fact that the animals are chiefly American, and that the important section dealing with game laws refers to American legislation, need not deter the reader from appreciating those portions which give a good idea of the immense problem in relation to man, and its importance, which American wild life presents. There is a very good index.

E.P.

**The Intelligent Use of the Microscope,** by **C. W. Olliver.** Second Edition. Pp. 192, with 59 figures. Chapman & Hall. 15/-.

In the second edition of this book a chapter has been added dealing with phase contrast microscopy. Several relatively inexpensive devices are now available which can be adapted to existing instruments so as to enable the use of this comparatively new and important development in microscopical technique. The value of phase contrast microscopy is so great, to biologists especially, that the description of its principles and practice form a useful addition to the book. In other respects the book is unchanged and it remains one of the best works in its field which has yet appeared.

**A Pocket Book of Garden Birds,** by **Eric Pochin. A Pocket Book of Forest Trees,** by **Eric Pochin. A Pocket Book of Wild Flowers,** by **James Watson.** Pp. 32, with 28 coloured illustrations. Brockhampton Press, Ltd,. Market Place, Leicester. 2/- each.

Each of these pocket-sized books (6×3 in.) contains coloured illustrations of 28 common species with brief notes on habitats and characteristics. The illustrations are realisitic enough to prove of real use to young beginners in bird and flower spotting though the usefulness of the flower book will be much restricted by the limited selection of species portrayed.

**Filmstrip. British Birds. The Barn Owl.** Strip 4. Photographed by John Warham, notes by P. E. Brown. Produced in collaboration with the R.S.P.B. by Educational Productions, Ltd., 17 Denbigh Street, S.W.1.

Two nest sites are shown, a hide, some castings, and many attitudes of adult and young Barn Owls. The photography is excellent, and the strip and accompanying notes will serve their purpose admirably.

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# SOME ASPECTS OF THE QUATERNARY PERIOD IN NORTH LANCASHIRE

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AND
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## Introduction

The area to be discussed in this paper extends from Morecambe Bay to Burn Moor and is mainly within the borders of the northern part of Lancashire.

A large part of the area is occupied by the Bowland Fells which rise to over 1800 feet O.D. This high land, which forms a westward bulge of the Pennines, slopes gently to the low-lying Ingleton Coalfield in the north and to Lonsdale and Morecambe Bay in the north-west and west. In the south-east it falls rather

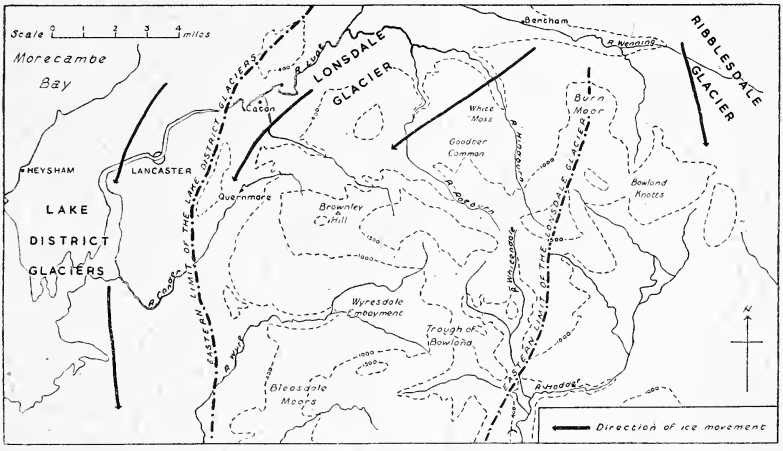


Fig. 1. Introductory map to the Quaternary Period in North Lancashire.

more abruptly to the Hodder Valley. Its margins are deeply dissected by streams which rush through steep gorges to join the rivers Lune, Wyre and Hodder.

Structurally, the area is a broad asymmetric syncline, flanked by the Sykes and Slaidburn Anticlines in the south-east and the Kellet-Lancaster anticlinal area in the north-west.

Almost the whole region is underlain by alternating grits and shales of the Millstone Grit Series, although these are concealed in the north and west by deposits of glacial drift.

The gentler slopes of the upland districts are covered by wide expanses of peat which are now being subjected to considerable erosion. It is important to note that there are no extensive coastal peat flats in this district such as those developed in the Fylde and in the estuaries feeding into the north of Morecambe Bay.

The description of the area outlined above falls naturally into two parts. Part 1 is devoted to the Glacial Period, emphasis being placed on the retreat phenomena which are especially well developed in the fell country. In Part 2 the sequence of events during the Post-Glacial Period is described. Pollen analytical investigations of peats and muds in both upland and lowland regions are reported and problems of river terraces and recent drainage are discussed.

## Part 1.—The Glacial Period.

### A. Historical

R. H. Tiddeman (1872) was one of the first to observe the effects of glaciation in North Lancashire. He recorded a number of glacial striae and observed that

the general ice movement had been from north to south. He was followed by T. Mellard Reade (1904) who noted several interesting features, including a lower and an upper boulder clay on the coast near Heysham. More recently Dr. A. Raistrick (1933) has dealt with the Craven Lowlands immediately to the east of the area herein described and F. Slinger (1936) has noted the presence of retreat phenomena in Southern Lonsdale.

B. The Older Glaciation

There is little to suggest an older glaciation in this district. Only one boulder clay can be discerned in existing coastal sections. An apparent upper boulder clay at Heysham, which overlies peat and sands, is nothing more than recent hill-wash from an adjacent drumlin and is described more fully in Part 2. A river terrace in the Conder Valley may doubtfully be related to an older glacial period, during which ponded meltwaters from Lonsdale escaped to the south. The significance of this is discussed in Part 2.

C. The Newer Glaciation.

During the final glacial episode, the north Lancashire area was influenced by two major ice masses, which originated from the Lake District and the Pennines respectively. The Lake District ice sheets moved from north to south across Morecambe Bay and the coastal plain and deposited masses of boulder clay. This may be seen to-day as north to south trending drumlins near the coast and as eroded relics or skeers in the bay. The boulder clay contains such distinctive erratics as Eskdale Granite, Ennerdale Granophyre, and andesite, rhyolite and agglomerate of the Borrowdale Volcanic Series, as well as Silurian grits and Carboniferous rocks. The eastern limit of this erratic assemblage is near Lancaster and determines the boundary between the Lake District and Pennine ice sheets.

The erratics, glacial striae and drumlin trends show that the Pennine ice swept southwards from the Howgill and Craven districts, and was then deflected to the south-west and south-south-east by the high ground of the Bowland Fells. At maximum glaciation it probably overrode all but the summits of the Bowland Fells, but as retreat developed, separated into two distinct units on Burn Moor. One glacier flowed to the south-south-east down Ribblesdale, gave rise to systems of marginal channels on its western flank and deposited gravel and morainic debris during several minor pauses in retreat. The Lonsdale Glacier, with which this chapter is mainly concerned, formed the other unit, and was composed of most of the Howgill Fells ice, together with tributary streams from the Whernside and Ingleborough districts. It flowed in a south-westerly direction as far as Caton and Halton, where it encountered the enormous barrier of Lakeland Ice, and was deflected southwards through the Quernmore Valley.

The boulder clay deposited by this ice extends from Upper Lonsdale and the Ingleton Coalfield to the Southern Conder Valley and the Wyresdale Embayment. It is thickest in the low lying ground of the Ingleton Coalfield north of Bentham and extends from here, as south-westerly trending drumlins, as far as Farleton. Between Farleton and Caton boulder clay is irregular in distribution, but from Caton to the southern part of the Conder Valley it becomes thicker and is interspersed with gravel ridges. Quernmore Church in this last district, is built on a prominent terminal moraine. There is usually very little drift on the higher ground of the Bowland Fells although exceptions to this rule occur. Perhaps the most notable of these is on Goodber Common, where thick banks of boulder clay and lateral moraine occur between 600 and 800 feet O.D.

The erratics in the Lower Lonsdale boulder clays consist mainly of Millstone Grit fragments of local origin. In addition, Carboniferous Limestone pebbles and Lower Palaeozoic grits and flags of the Austwick type are fairly common.

D. Stages in the Retreat of the Lonsdale Glacier

Several stages in the northward retreat of the Lonsdale Glacier can be visualised by plotting the well-developed systems of marginal channels and spillways. The streams which flowed in these channels appear to have been quite small, and drained in a south-westerly direction from Burn Moor, which formed the watershed between the Lonsdale and Ribblesdale drainage systems.

(i) *Maximum Glaciation.* At the time of the maximum of glaciation, the Bowland Fells were ice covered at least as high as 1400 feet O.D., as shown by the

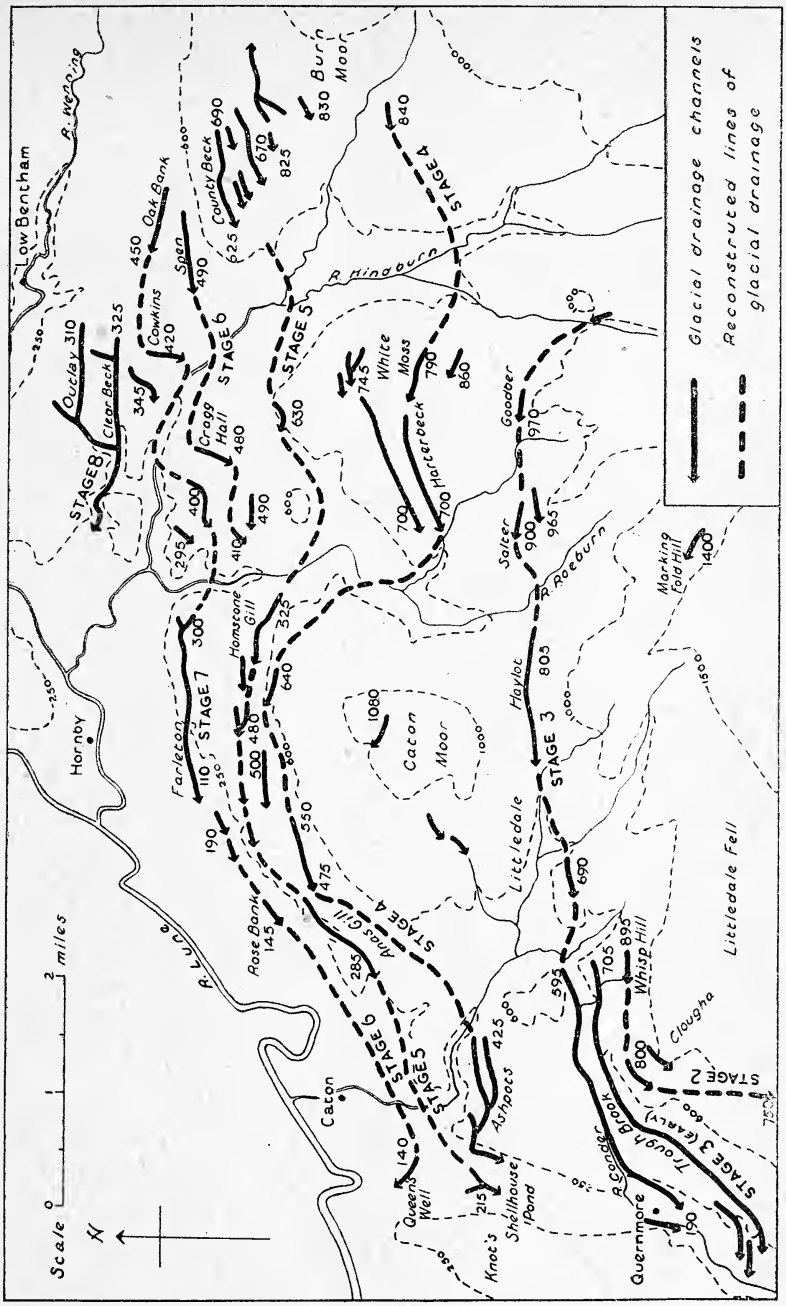


FIG. 2. Map illustrating the retreat of the Lonsdale Glacier.

presence of a marginal channel at this height on Marking Fold Hill. Evidence of glaciation on the highest parts of the fells is, however, rare. Indeed, very little sign of abundant meltwater activity exists above 1000 feet O.D. It can be assumed therefore that during the early stages of retreat the recession of the ice must have been relatively slow, and that several ice streams probably crossed the watershed and flowed into the Hodder Valley.

(ii) *Stage* 1. During this period the spillways of Bowland Knotts and the trough of Bowland were formed, the latter probably having been fed by a small

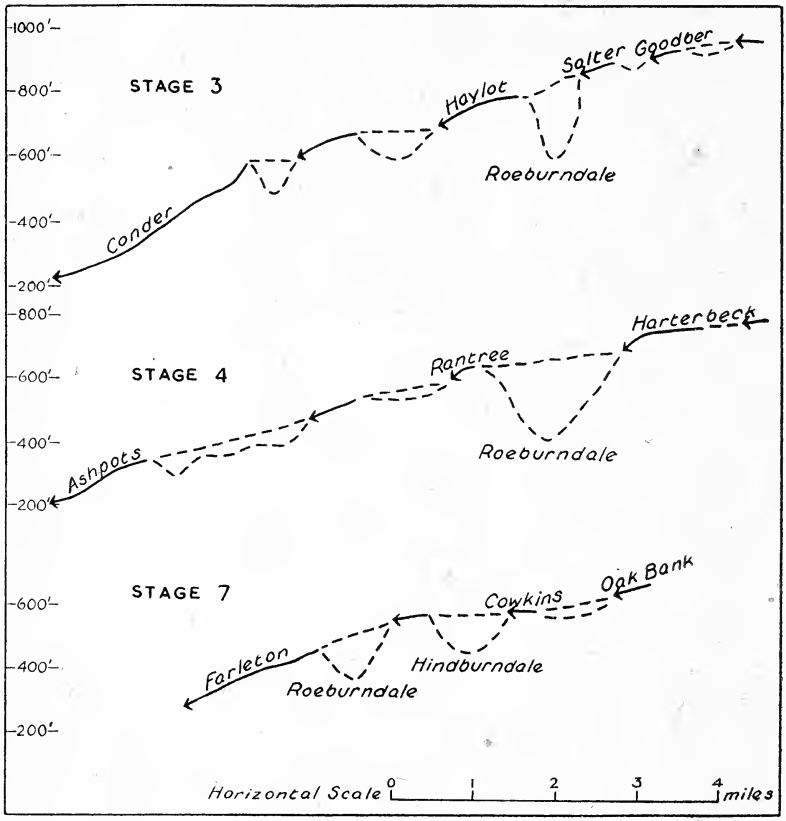


FIG. 3. Long profiles of the marginal systems of drainage in the Northern Bowland Fells.

lake in Upper Wyresdale. Both spillways discharged into the Upper Hodder Valley, which would appear to have become free from active ice.

A series of small depressions on the northern slopes of the fells were probably used by marginal streams, but the absence of well defined channels indicates that these streams were rather insignificant.

The ice margin must have extended in a south-westerly direction from Burn Moor to Littledale Fell, and then south-east into the Wyresdale Embayment. The great pressure exerted by the Lake District Ice was probably responsible for this eastward bulge.

(iii) *Stage* 2. The series of small marginal channels from Wisp Hill (890 feet O.D.) to Appletree (750 feet O.D.) were formed during this period, whilst it is probable that the Wyresdale Embayment supported a lake drained by channels on the western flanks of the Bleasdale Moors. It is almost certain that Caton Moor

had by this time emerged from the ice as a nunatak, whilst the glacier passing between it and Littledale Fell continued to erode a U-shaped depression.

Dr. Raistrick's (1933) correlation of glacial retreat stages across the Pennines makes it possible to relate this stage approximately to the period of formation of the Escrick Moraine of the Vale of York.

(iv) *Stage* 3. The edge of the ice at this stage is marked by a magnificent series of marginal channels and spillways, which can be traced for nine miles along the north-western flanks of the Bowland Fells.

The highest channel is on Thrushgill Fell at 990 feet O.D. This can be traced *via* a deep peaty trough on Goodber Common to the Salter Channel, which was cut through a prominent grit outcrop at 900 feet O.D. A small lake probably existed in Roeburndale at this period, and escaped through the Haylot Spillway at 810 feet O.D. The ice margin must have passed from Haylot to the north of Caton Moor and thence into Littledale, where it was once again joined by the marginal stream. This stream swept round the contours of Clougha and was responsible for a continuous, very well defined channel from below Wisp Hill at 700 feet O.D. to Trough Brook.

Towards the end of stage 3 the Haylot Spillway drained into what was possibly a small Lake Littledale and then through the well defined Conder Channel. This leads round the flank of the Quernmore Moraine and merges into the outwash material in front of it. The Lonsdale Glacier extended tongue-like into the Quernmore Valley at this time. The morainic dumps show that it stood in this position for some time, whilst the higher ground of Knots Plantation must have separated it to some extent from the southern lobes of the Lake District Glaciers.

(v) *Stage* 4. This period was notable for the abandonment of the Haylot Spillway and the development of marginal drainage round the north of Caton Moor.

The highest channel of the series was formed south of White Moss, where a wide boggy depression (see Part 2) narrows into a characteristic channel towards Harterbeck as it crosses a resistant outcrop of grit. It was cut between the hillside of shale, flags and grit to the south, and lateral moraine and boulder clay to the north, and fed into a possible small Lake Roeburndale.

This lake must have been drained through a series of marginal cuts on the north side of Caton Moor between 650 and 480 feet O.D. Eventually the meltwaters reached the Ashpots Channel and passed through a deep gash in a grit escarpment into the Quernmore Valley. The end of the glacier at this stage was probably marked by a certain amount of stagnant ice in this valley.

A sub-stage towards the end of this period can be recognised to the north of White Moss, where meltwaters passed through a lateral cut into what is now a peaty depression. The stream then flowed to Roeburndale between hillside and ice margin, so that only one side of the drainage line can now be seen.

(vi) *Stage* 5. The series of marginal cuts which mark stage 5 run parallel to those of the previous stage.

Seven small channels on Burn Moor between 820 and 630 feet O.D. show that the glacier was retreating steadily at this period. It extended down Lonsdale as far as the Crook o'Lune, its margin being marked by the well-formed channels of Hamstone Gill and Anas Gill. In the Shellhouse Pond district strips of alluvium separated by gravel ridges and patches of boulder clay wind across the low divide. The alluvium was doubtless laid down by meltwaters, forced into the Quernmore Valley by the ice dam still blocking lower Lonsdale. The strips of alluvium lead into a wide alluvial flat which was once the site of a small lake impounded behind the Quernmore Moraine. Lake deposits have been obtained from this area and are described in Part 2. Unfortunately the fauna and flora obtained do not give definite evidence of the age of the deposit. The lake was drained through a deep trench cut across the Quernmore Moraine, now followed by the River Conder, and was subsequently filled completely with alluvium.

(vii) *Stage* 6. Continued recession of the glacier resulted in the formation of the Spen and Cragg channels in the east of the area. Near Caton the meltwaters escaped through Queen's Well Wood into Lower Lonsdale, which must therefore have been free from both Pennine and Lake District ice. The torrential streams from Littledale added their volume to the glacial streams and spread a boulder fan along the flank of the glacier to initiate the river terrace at Caton.

(viii) *Stage* 7. The marginal streams were responsible for another well-formed series of channels.

The Oak Bank Channel was developed in the east ; two parallel cuts were incised across the spur between the Hindburn and Roeburn below the Cragg Hall trough, and the extremely well defined channel, now followed by Farleton Beck, led to the snout of the glacier in the Lune Valley. It seems probable that there was a large ice pool in the Ingleton Coalfield area at this time, a small tongue of which projected into Lonsdale as far as Farleton. To the east it is probable that the ice had become separated from the stagnant ice of the Craven Lowlands south of Settle.

(ix) *Stage* 8. The well developed lateral drainage lines of Outlay and Clear Beck indicate that the ice had practically retreated from the area under consideration. These channels lead into the Wenning Valley near Hornby.

### E. General Consideration of the Retreat Phenomena

By considering the various systems of marginal channels described above, the rate of fall along the margins of the glacier can be estimated.

The longitudinal profiles of the different marginal drainage systems are rather convex (see Fig. 3), the gradients for the most part being steepest near to the nose of the glacier. The average gradients of the profiles of the various retreat stages reveal a fall ranging from 150 feet per mile near the nose of the glacier to 80 feet per mile at about 800 feet O.D. and thus show clearly the general character of the terminal regions of the Lonsdale Glacier. Furthermore, the paucity of well-defined channels above 1000 feet and the maximum length of the lines of drainage described above, show that the erosive activity of the meltwaters was restricted to a belt within 10 to 20 miles of the nose of the glacier. This would appear to have been the zone of wastage of the glacier, and migrated with it as it receded.

Again, the small amount of meltwater activity above the 1000 feet contour noted above shows that the wastage above this height was small, and therefore that the gradient of the ice was also small.

The broad picture of the retreating glacier then, is of open, fairly flat snow-fields above 1000 feet O.D., buttressed against high ground towards the south-east and descending in a convex curve to the snout of the glacier in the south-west as the zone of wastage was reached. With the passage of time this pattern migrated northward across North Lancashire and gave rise to the features described above.

## Part 2.—The Post-Glacial Period

The Post-Glacial period has been characterised in this area by the aggradation of alluvium, the formation of river terraces and the accumulation of muds and peats. The drainage features will be dealt with first and followed by an account of the peat deposits and the history of the vegetation of the area.

### A. Modification of Drainage by Glacial Features

The courses of the smaller streams have been profoundly modified by the systems of marginal channels described in Part 1 of this paper. The streams are often deflected by these channels and flow along them for distances varying from a few yards to a few miles. As a rule, they finally break out through small gorges, either where the channels become ill defined or where the streams have been captured by others. A few examples of this type of phenomenon are cited below.

(i) At 700 feet O.D. the River Conder is deflected by the Trough Brook Channel for 400 yards. It then breaks out through a gorge to join the Conder Channel at 550 feet O.D. This it follows for two miles before escaping through a small gorge which leads to the Quernmore lake flat, and finally to the trough cut through the moraine near Quernmore Church.

(ii) The stream at Haylot originally flowed westwards along the spillway for half a mile and thence into Littledale. It has now been captured by a tributary of the more powerful River Roeburn and turns abruptly to flow north-eastwards into that river.

(iii) Clear Beck, lying between the rivers Hindburn and Wenning, flowed west-north-west along a marginal channel and into the River Wenning immediately after the Glacial epoch. It has since been captured by a small tributary of the

River Hindburn and changes course abruptly near Feathermire to flow in a southerly direction into that river.

There are many other modifications of drainage within the area, *e.g.* County Beck, Mewith, the stream at Ashpots, and Harterbeck.

B. River Terraces

(i) *The Conder Terrace.* This terrace can be traced from the low divide between Caton and Quernmore, where it is at 230 feet O.D., to the southern part of the Conder Valley where it has fallen to 200 feet O.D.

It is composed mainly of gravel, with patches of clay, and in places appears to have been fashioned from boulder clay, which it therefore post-dates. At Quernmore on the other hand, the lake flat, various overflow channels and the moraine, lie as much as 30 feet below the level of the terrace and must therefore be of later date. North of Quernmore, the distinctive flat-topped terrace must have been formed by a stream of considerable size, but at present there are no streams of any importance in the locality.

The evidence suggests the possibility that the lower Lune Valley was blocked by ice in the past, thus forcing the meltwaters to flow into the Quernmore Valley (cf. Stage 5 of retreat, Part 1). The relationship between the terrace and the moraine would suggest an interglacial age for the terrace, but it is difficult to imagine how the newer ice sheets could have passed over it and created so little disturbance.

(ii) *The Halton and associated Terraces.* Between Lancaster and the Crook o'Lune, near Caton, river terraces are developed on both sides of the Lune. Above Caton they have been largely destroyed by erosion, but can be seen again near Hornby. Their height varies from 70 feet O.D. near Lancaster to 105 feet O.D. at Hornby and they represent a period when the river was graded to a sea-level about 50 feet above that of the present day.

The Caton Terrace is a related feature, but was formed by Artle Beck which drains the Littledale area. It ranges in height from 154 feet O.D. in the south to 70 feet O.D. just north of Caton, and is composed mainly of large boulders, as the steep fall might lead one to expect. One branch of the terrace leads to the Queen's Well Overflow Channel which shows that it was initiated during the retreat of the ice. At a later date it must have been graded to the Halton Terrace, but its minimum height demonstrates that its formation continued after the Lune had cut down below this feature.

These terraces indicate a sea level considerably higher than that of the present day, and must be tentatively assigned to the period between the glacial retreat and the formation of the forest bed on the present foreshore at Heysham.

C. The Present Drainage of the Area.

The drainage is shared by the systems of the rivers Lune, Wyre and Hodder, but that of the lower Lune is the only one with which this paper is directly concerned.

Apart from the fact that tidal silt extends upstream almost to Halton (Reade, 1904) the greatest interest is provided by the extensive flood plain above Caton.

From immediately south of Kirkby Lonsdale to Caton, a distance of 11 miles, the river falls from 120 feet O.D. to 40 feet O.D., and the flood plain averages about half a mile in width. At the Crook o'Lune, near Caton, the steep eastern limb of the Knots Anticline crosses the river and brings to the surface the thick and massive Pendle Top Grit. This resistant outcrop has acted as a local base level to which the Lune has been graded, and through which it has cut a small gorge. Below this the river is quite youthful, as the absence of a flood plain and the presence of weirs testify.

D. Peats, Muds and Vegetational History

(i) *The Brownley Hill site.* In common with much of the highland of Great Britain, that within this area is or has been covered with a blanket of peat which is now undergoing more or less rapid erosion. Pearsall (1950) has recently discussed such erosion and the conditions which may have led to its inception. In the area under consideration the physiographic effects of this erosion vary with altitude and gradient. Thus, on the plateau-like summit of Ward's Stone, most traces of peat have been removed, leaving a stony detritus overlying the Millstone

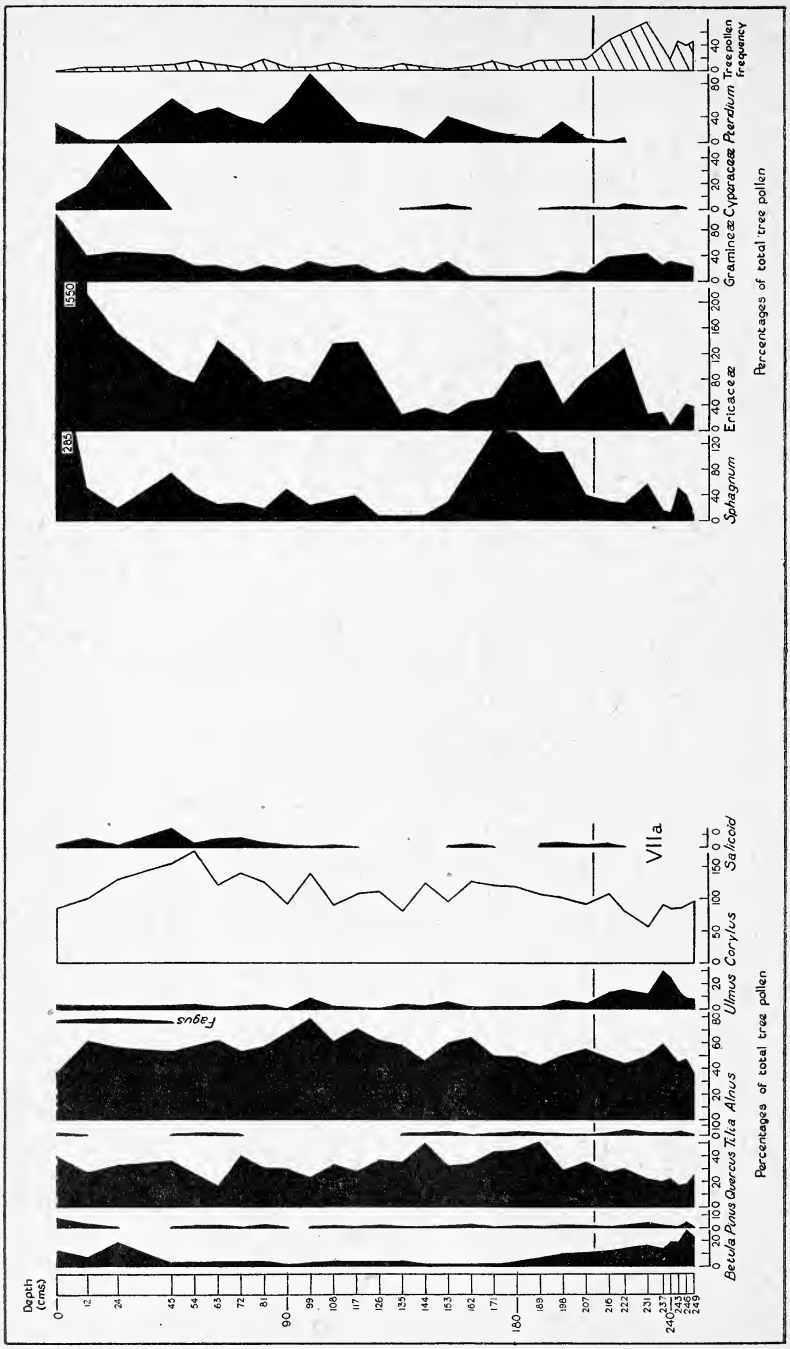


Fig. 4. Pollen diagram for Brownley Hill, Lancashire.

Grit, although tall, isolated, pillars of peat, a little to the east bear witness to the former cover. In the shallow col between Ward's Stone and Grit Fell, much of the original peat remains, but it is dissected by a system of deep channels, some of which penetrate the peat completely and expose the underlying rock in their beds. Towards the steeper hill slopes further north, the peat becomes less thick and there is a tendancy for the channels to coalesce thus giving rise to the head-streams of Udale Beck.

In 1946 most of the area lying above 1000 feet O.D. was burnt and the greater part of the surface vegetation destroyed. Prior to this date, however, the dominant species on the dissected peat were *Calluna vulgaris*, *Eriophorum vaginatum* and *Vaccinium myrtillus*. (Wheldon & Wilson, 1907). A few small patches of particularly wet peat, bearing, for the most part *Sphagnum papillosum* and *Eriophorum angustifolium* escaped fire damage, however, and it was in one such locality that samples for pollen analysis were taken.

The numerous profiles occuring between 800 and 1800 feet O.D., and varying in depth from one to three metres do not offer very much information about the vegetational history of the area. It is true that the lowest metre of peat frequently includes stumps and branches of tree birches, but the exact stratigraphical position of these remains is rarely certain. The remains of *Eriophorum vaginatum* are not infrequent throughout the profiles, but it is rarely possible to correlate directly the levels of patches of this sedge in closely adjacent peat faces. There is no doubt that much of this apparent stratigraphical confusion is secondary and is the result of erosion which at first tends to be selective.

The samples for pollen analysis were obtained from a boring at a site as far away from an erosion channel as was practicable and at a place where fire had not removed the upper layers of peat. In this way the risk of sampling from a truncated profile was reduced. The site lay about 200 metres east of Brownley Hill at 1400 feet O.D., and some 30 metres from the nearest erosion channel. Here, within an area of about 100 square metres, three separate borings showed total peat depths of 250, 250 and 200 cms. respectively, the peat overlying about 20 cms. of grey-brown sandy clay which was in turn superincumbent upon the Millstone Grit. Samples were taken at 3 cm. intervals from one of the deeper borings, using a Hiller type peat borer. These samples were treated in the laboratory by a simple potash maceration method (Conway, 1947) and the washed suspension mounted in glycerine jelly and examined in the manner in general use amongst pollen analysts (Godwin, 1934). The results of the analyses are shown in the pollen diagram, Fig. 4.

The high proportion of alder pollen and the low frequency of pine pollen throughout the diagram clearly indicate that the whole of the peat has formed since the Boreal-Atlantic Transition. The relatively high frequency of elm pollen in the basal samples, however, and the marked and sustained fall in the elm curve at 210 cms. suggests that the peat below this level belongs to Zone VIIa (Godwin, 1940). The curve for birch pollen begins at rather high values (22% of the total tree pollen) and falls steadily to 3% at 180 cms. The fall in the frequency of this pollen type gains singificance from the restriction of birch twigs and stumps to the lower layers of peat, and appears to reflect a retreat of the birch from the vicinity as bog conditions spread. Within the lowest zone of the diagram, the oak curve is rising steadily but this can probably be attributed to a secondary effect of diminishing birch and elm, rather than to any actual increase in the abundance of oak trees. Since the pollen of the lime (*Tilia cordata*) is also continuously present in this lowest zone, all the arboreal constituents of the mixed oak forest are represented, and it must be supposed that this community occupied the lower hill slopes and the valleys during the Atlantic Period.

The zoning of the diagram above the VIIa—VIIb transition (the '*Ulmus* horizon') is not so clear, and no rigid zonation scheme has been attempted, particularly as few diagrams from similar sites are available for comparison. Some of the features of the tree pollen curves are nevertheless worthy of attention.

The most striking features of the middle and upper parts of the diagram are the discontinuity of the lime curve and the appearance, albeit in small quantities, of beech pollen. These features strongly suggest that zones VIIb and VIII are represented in the diagram, although other considerations make it difficult to decide where the division between the two zones should be drawn. For instance,

the opening of zone VIII is usually marked in British pollen diagrams by an increase in the frequency of birch pollen. A small increase can, in fact, be detected at Brownley Hill, but it does not seem to be great enough to justify any definite decision. The sudden peak in the hazel curve, associated as it is with a maximum of willow pollen, may have some significance. Thus, Conway (1947) found that at Ringinglow Bog, near Sheffield, the transition between zones VII and VIII was characterised by high hazel values and by a sudden maximum of ash pollen. The ash is not represented in the Brownley Hill diagram, however, and hence there is no confirmation of the possible significance of the hazel maximum. In general terms however, it seems clear that this pollen diagram represents a period from some time shortly after the Boreal-Atlantic Transition up to the present day. There is no indication of disturbance by erosion at any point in the diagram, although the possibility that this has indeed happened cannot be completely ruled out.

The curves for non-tree pollens and spores must now be briefly considered. The most notable features are the coincident minima for *Sphagnum* spores and ericaceous pollen of the *Calluna* type between 153 and 135 cms. although the low *Sphagnum* values continue upwards to include the 126 cm. level. The earliest part of this phase is also characterised by a temporary maximum of grass pollen and a temporary fall in the hazel frequency. The high values for *Sphagnum* and *Ericaceae* immediately prior to this, suggest that wet *Sphagnum* bog occupied the ground, and it may be that a subsequent decrease in precipitation, or some phenomena leading to the drainage of the bog, would account for the peculiarities of the pollen curves already mentioned. It appears, however, that there is no parallel case on record for this period, so that a climatic change is probably not involved. Above 126 cms. the pollen frequency of *Ericaceae* consistently exceeds that of *Sphagnum* spores, but the most spectacular feature of the whole diagram is the way in which *Sphagnum*, *Ericaceae* and *Gramineae* curves rise in the surface samples. At the same levels, the tree pollen frequency (assessed as the number of $\frac{7}{8}$ in. traverses involved in the counting of 150 tree pollen grains divided into 100) reaches very low values, so that it seems as though a genuine deforestation phase is represented, coupled with the spread of the bog inhabiting plants. Conway (1947) has noted a similar feature in the youngest layers of peat in Ringinglow Bog, and has used it to characterise a zone in her diagrams, *viz.* VIII mod., to the beginning of which she ascribes the date 1100 A.D. Although the similarity is very striking, it is not intended to force a direct correlation at this stage, since insufficient data are available from which to calculate a precise date for what appears to have been the beginning of recent deforestation in the area.

The suggestion that this upland peat began to develop in early Atlantic times conforms with Conway's findings at Ringinglow (1947) and with the suggestions of Raistrick and Blackburn regarding High White Stones in the Lake District (1932a), Heathery Burn Moor, Northumberland (1931), Kilhope Moor, Northumberland and Mickle and Barden Fells in Yorkshire (1932b). Many more sites on the Pennine fells have been investigated, but the data obtained suggest either a more recent age for the deepest peats than in the Bowland area, or are quite inconclusive (*e.g.* Woodhead and Erdtman, 1926).

(ii) *The White Moss Site.* During an investigation of the surface ecology of a shallow depression, lying between the northern slopes of Goodber Common and the south-western slopes of White Moss, west of the upper Hindburn, a large number of borings was made in the peat in order to attempt a reconstruction of the vegetational history. The depression lies a little below the 800 foot contour and has already been referred to in Part 1 of this paper.

The peat on the sides of the depression is of variable thickness, but rarely exceeds one metre in depth, whilst the thickest peat in the centre of the depression reaches a depth of almost three metres. The details of peat depth and stratigraphy are only of severely local interest, and are not reported here. They show, however, that peat formation began in the mire common to the head-streams of two becks, one running eastwards into the River Hindburn, the other northwestwards into the River Roeburn. In comparatively recent times there has been considerable peat cutting in the vicinity.

Samples for pollen analysis were obtained from a boring made through a total

depth of 78 cms. of peat overlying a stiff light blue clay superincumbent on Namurian Shale. A pollen diagram was prepared from the results of the analyses of these samples, but the effect of the local component of the tree pollen rain was so great that no conclusions regarding the regional development of vegetation could be drawn. Table I shows the results of the analyses of five of the samples taken.

TABLE I

| *Sample depth in cms.* | *Betula* | *Pinus* | *Ulmus* | *Quercus* | *Alnus* | *Corylus* | *Gramineae* | *Cyperaceae* | *Ericaceae* | *Sphagnum* |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 55 | 10 | 4 | 12 | 19 | 75 | 22 | 128 | 18 | 14 |
| 30 | 35 | 10 | 7 | 8 | 40 | 80 | 10 | 5 | 15 | 15 |
| 48 | 20 | 2 | 5 | 19 | 54 | 125 | 0 | 12 | 149 | 12 |
| 66 | 46 | 6 | 3 | 14 | 31 | 76 | 15 | 7 | 37 | 11 |
| 78 | 21 | 8 | 4 | 14 | 53 | 176 | 0 | 1 | 60 | 18 |

The only conclusion which may safely be drawn from these data, is that the earliest peat here belongs to the post-boreal period generally.

(iii) *The Quernmore Site.* The moraine near Quernmore Church has already been mentioned in Part I of this paper. North of this moraine there is an extensive alluvial plain lying a little below the 200 foot contour and crossed by

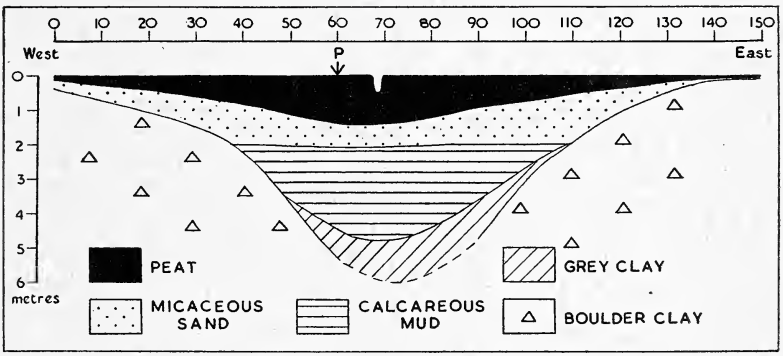


FIG. 5. Section through the lake deposits at Quernmore, Lancashire, compiled from a series of borings.

Mother's Dike and the River Conder. A considerable number of borings was made on this alluvial flat, in the hope of discovering the site of a late-glacial lake ponded up behind the moraine. A lake deposit was in fact found, but it is very limited in extent; not 100 metres in length and only some 65 metres wide. A section of the lake is shown in Fig. 5, the line of section running at a right angle across Mother's Dike 150 metres above the Lancaster to Littledale road bridge. Four main stages of aggradation are indicated since the formation of the basin, *viz.*:

(1) A period of deposition of a grey stoneless clay, presumably derived from the rewash of the basal boulder clay.

(2) A period of deposition of a grey-green calcareous *Chara* mud, containing silty bands and two bands of blue-black micaceous silt.

(3) A period of deposition of blue-black micaceous silt.

(4) A period of peat accumulation.

The sequence of events leading to the deposition of these various sediments cannot be certain. The occurrence of the main silt layer, 3, is puzzling. The discovery of a fruit stone of *Potamogeton* sp. in the lowermost layer of peat suggests that there was still some open water immediately after the deposition of the silt, but the latter was probably rapidly colonised by fen plants (wood of *Alnus* was found) and peat formation begun.

Samples for pollen analysis were taken from a boring in the position marked P in the section (Fig. 5). In general terms the stratigraphy at this point was as follows :

| | |
|---|---|
| 0-135 cms. | Dark brown peat. |
| 135-209 cms. | Blue-black micaceous silt. |
| 209-299 cms. | Grey-green calcareous mud. |
| 299-300 c.ms | Blue-black micaceous silt. |
| 300-365 cms. | Grey-green calcareous mud with shells. |
| 365-380 cms. | Blue-black micaceous silt. |
| 380-445 cms. | Blue-green sandy mud. |
| 445-530 cms. | Grey clay. |
| 530 cms. | Boulder clay. |

Most of the samples contained so little pollen that a full count was impracticable,

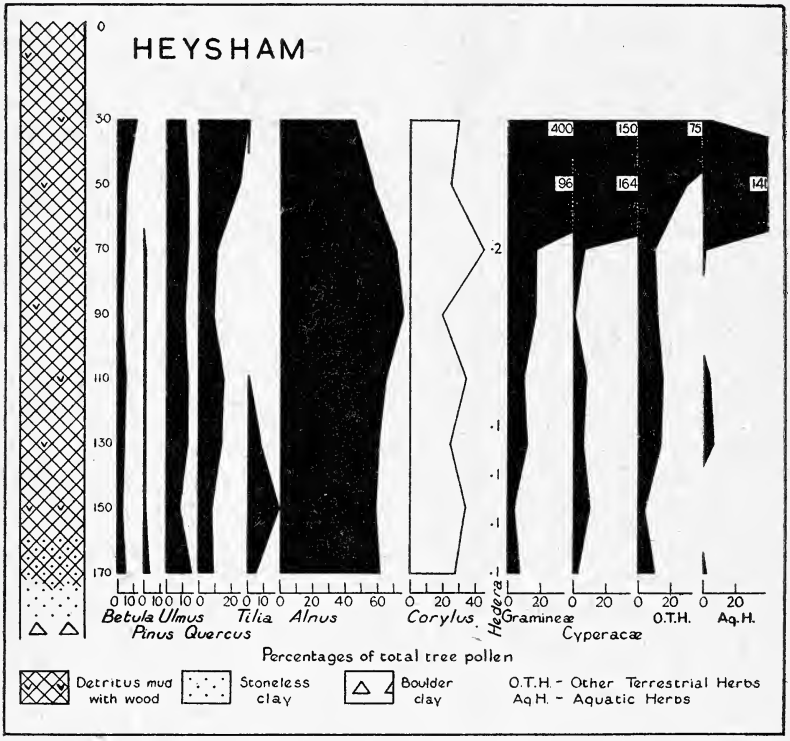


FIG. 6. Pollen diagram for the mud bed at Heysham, Lancashire.

but Table 2 shows some results obtained from three samples with a pollen content great enough to allow a total of 150 tree pollen grains to be counted.

TABLE 2

| *Sample depth in cms.* | *Betula* | *Pinus* | *Quercus* | *Tilia* | *Alnus* | *Corylus* | *Salix* | *Herbs.* |
|---|---|---|---|---|---|---|---|---|
| 110 | 27 | 8 | 11 | 0 | 54 | 34 | 4 | 224 |
| 130 | 66 | 27 | 0 | 1 | 6 | 29 | 12 | 438 |
| 350 | 72 | 2 | 0 | 1 | 25 | 26 | 4 | 280 |

These figures tell little about the time of formation of the deposits ; the percentages for the separate species do not appear to follow any recognisable drift.

The considerable values for alder pollen in two of the samples, however, seems to indicate that all the organic deposits in the basin are post-Boreal in age. The faunal evidence of the shells washed from the calcareous muds is similarly uninstructive, all the species represented being of modern British type, although some have a much wider range. All the Mollusca and Ostracoda are characteristic of fresh, clear, shallow water. The following have been identified :

*Limnea pereger* (Müller).
*Planorbis* sp.
*Cypridopsella villosa* (Jurine).
Unidentified Lamellibranch.
*Pionocypris elongata* (Kaufmann).
*Candona candida* (O. F. Müller).

Whilst positive conclusions from the above data are not justified, it is clear that any late-glacial or early post-glacial organic deposits laid down behind the Quernmore moraine have since been removed by erosion.

(iv) *The Heysham Site.* Submerged forest and peat beds at various levels near Heysham were first described by Reade (1904) and more recently Godwin (1945) included the locality in his map of such deposits. The ' submerged forest ' and mud bed herein described does not correspond with the localities suggested by either of these authors, however, but lies in a small bay and is about 450 metres north of the point where the road from Heysham village meets the shore.

The mud includes the upright stumps of trees, rooted in an underlying clay, and lies against the flank of a drumlin which has been eroded by the sea. Indeed, downwashed sand and pebbles from higher up the drumlin have covered the thinning edges of the mud bed. The section near the northern end of the drumlin is as follows :

| | |
|---|---|
| 0-120 cms. | Yellow brown sand, with many small pebbles. |
| 120-160 cms. | Grey-brown mud with some pebbles. |
| 160-200 cms. | Grey-brown mud with large boulders. |
| 200-220 cms. | Grey-green sandy clay with boulders. |
| 220+ cms. | Red-brown boulder clay. |

Thirty-eight metres north of this section the topography has been greatly disturbed by the building of a narrow promenade, but the mud profile itself does not seem to have been seriously truncated. The following section from this point is compiled from a spade cut profile and a boring :

| | |
|---|---|
| 0-158 cms. | Grey-brown fine detritus mud with a few small reed and wood fragments. |
| 158-167 cms. | Grey clayey mud with some silt and plant fragments. |
| 167-173 cms. | Brown clayey mud. |
| 173-183 cms. | Blue clayey silt. |
| 183+ cms. | Boulder clay. |

The mud bed runs northwards from this point for a further 70 metres, but tapers out seawards within 20 metres of the promenade. At the seaward edge the underlying boulder clay either comes to the surface or is covered by shingle. The organic muds lie across the high water mark of ordinary tides.

Macroscopic remains of the following plants have been obtained from the muds, along with numerous fragments of small reeds and wood :

*Chara* sp.
*Eleocharis palustris.*
*Juncus* sp.
*Phragmites communis.*
*Ranunculus* sect. *Batrachium.*
*Scirpus lacustris.*

Samples for pollen analysis were taken from the point described above, and the results are shown in the pollen diagram, Fig. 5.

The pollen diagram calls for little comment. The high alder values and the insignificant pine curve identify the deposits as of post-Boreal age. Compared with the other components of the mixed oak forest assemblage, the elm shows very considerable frequencies throughout the diagram, and it is therefore suggested that all the deposit belongs to the Atlantic period, Zone VIIa. The frequent occurrence of ivy pollen is in complete conformity with this view (Iversen, 1944). The marked rise in the frequency of herbaceous pollens between 70 and 50 cms. must represent a local regression of woodland (pollens of *Atriplex* sp., *Galium* sp., *Plantago* cf. *major*, Ericaceae and Ranunculaceae are included amongst these

herbs.) which may be correlated in some way with the maximum of the pollens of aquatic herbs (mainly *Myriophyllum alterniflorum*) at 50 cms.

The presence of freshwater muds in such a position, their erosion, and the exposure of tree stumps in their lowest layers, all argue a change in the relationship of land and sea level in this locality since the growth of the trees and the deposition of the mud. Indeed, it may be that the conversion of a woodland into a small lake was the direct result of a rising sea level causing fresh water to be ponded up in a hitherto dry hollow. The data so far accumulated do not permit any further conclusions, but it seems clear that whatever the changes between land and sea level since Atlantic times, the nett result has been a marine transgression.

There are many similar deposits around the British coasts, most of them of unknown age. From a consideration of such pollen analytical data as then existed, however, Godwin (1943) was able to recognise a post-glacial eustatic rise of sea level, which culminated in Zone VIIa. The date recorded above are in complete agreement with this conclusion. A discussion of the significance of the raised beach (25 feet, ' Neolithic ' beach), the zero isobase of which passes across Morecambe Bay, and which may be recognisable on the coast near Sunderland Point, has been purposely avoided. The data presented have no bearing on the age of this beach, and the emergence it suggests in no way affects the general conclusion about the nett change in sea level since Atlantic times.

## Summary of Conclusions

(1) The glaciation of the area under consideration was carried out by two contemporaneous ice streams, from the Lake District and from the Pennines.

(2) The de-glaciation of the north Bowland Fells and the Lune valley can be traced in eight stages, each stage marked by a series of marginal channels and morainic deposits.

(3) Many minor features of the present day drainage systems are the direct results of glaciation.

(4) The post-glacial period has been characterised by the formation of river terraces, changes in sea level, and the accumulation of muds and peat.

(5) The post-glacial organic deposits examined are all of post-Boreal date.

(6) Suggestions about the vegetational history of the area are in substantial agreement with other results from the North of England.

We wish to express our thanks to Dr. Verona M. Conway, Mr. W. H. Wilcockson, Prof. A. R. Clapham, Prof. F. W. Shotton and Dr. H. Godwin for their advice and criticisms. In the field we have been materially helped by Mr. A. Hodgkinson and Mr. G. Crowther. Finally, our thanks are due to Miss Margaret E. Beatson, who performed most of the pollen analyses for the White Moss site and prepared the maps and diagrams for publication.

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# A NEW BRITISH ALGAL RECORD: *PYRAMIMONAS RETICULATA* KORSCH.

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THE cells (8-21$\mu$ l; 7·5-13$\mu$ br.) of the English material are usually obconical (fig. 1 E-G, P, S-U, fig. 2 E) but also ovoid (fig. 1 L, Q), oblong-ellipsoid (fig. 1 H, R), subspherical (fig. 2 C) or more or less irregular (fig. 1 D, fig. 2F). Metaboly may be considerable, particularly on a substratum when the cells often become *euglenoid* in shape (fig. 2 I-K). The anterior lobing, characteristic of the genus, is but weakly developed (fig. 1 A, T) and usually only clearly seen when the cell is viewed obliquely or from above (fig. 1 O). The cells become spherical on the addition of a little chloroform to the water but motility is soon lost and the flagella cast off. On treatment with iodine and 70 per cent. sulphuric acid there separates from the protoplast an outer membrane which Dr. R. D. Preston kindly examined under the polarising microscope and from the absence of birefringence concludes that cellulose is absent. Four flagella are usually present but in one sample collected in 1943, most of the cells had eight flagella arranged in pairs (fig. 1 S-V). That latter state may be related to the rapid multiplication then taking place and slight invagination of the posterior end of a few large individuals was seen but no advanced stage of division. The flagella vary from slightly shorter to slightly longer than the cell. There are two anterior contractile vacuoles (fig. 1 P). The stigma usually lies about half-way down the cell (fig. 1 I-L), it is rather variable in shape, often a more or less rectangular, or rounded triangular, plane or curved plate so that it is broad in surface view (fig. 1 I, J) and more or less rod-shaped in side view (fig. 1 K, L) or from above or below (fig. 1, M). The large nucleus is always anterior and its flask shape is common to, if not characteristic of the genus; there is a well-marked nucleolus. The chromatophore is variable and somewhat complex in shape. It is parietal and basically cup-shaped but always more or less fenestrated and varying in thickness in different areas (fig. 2 A-G). Thus, in optical longitudinal section a number of lobes, short (fig. 1 P, fig. 2 A, D, E, F) or elongate and strap-shaped (fig. 1 Q, R, fig. 2 B), appear. These lobes are often particularly well-developed in the basal region of the cell and give the impression of radiating from the pyrenoid there located. This is due to the relative solidity of the basal part of the chromatophore and the perforations or thinner areas therein so that the whole has a sponge-like consistency. Viewed from the surface the fenestration of the chromatophore may be seen to vary from minute rounded or angular perforations to elongate slits of varying width (fig. 2 A-G). That the chromatophore is not stellate is shown by the lack of continuity between the lobes in the apical portion of the cell with the pyrenoid. In a few cells lobing is but feebly developed (fig. 2 C) and the chromatophore then appears basin-shaped. The lobing appears clearly in specimens stained in iodine (fig. 1 S, T, fig. 2 I, J) or picronigrosin (McLean and Cook, 1941). In the latter, the chromatophore contracts somewhat (fig. 1 V). The pyrenoid is rarely visible as such but its position is clearly shown by the prominent starch sheath. It may be that true starch is not always formed for sometimes on treatment with iodine a brown colouration is obtained.

Small vacuoles in the cell take up dilute neutral red; some cells have one larger vacuole, others several smaller ones. The cells may burst when under a coverglass and numerous granules be released. Evidently they are of more than one kind as Dr. Preston has shown that only one-third or fewer are birefringent. Their nature is unknown, they do not give a starch reaction.

Division of quadriflagellate individuals takes place at rest in small palmellae. Spherical akinetes (fig. 2 H) with smooth walls not composed of cellulose are sometimes formed.

The alga grows well in biphasic culture (Pringsheim, 1946) using soil or lake mud and enriching with a little of Chu's (1942) solution No. 10.

The English specimens agree well with those of Korschikoff (Pascher, 1927, p. 94) but we have not observed cells with four contractile vacuoles or isogamous

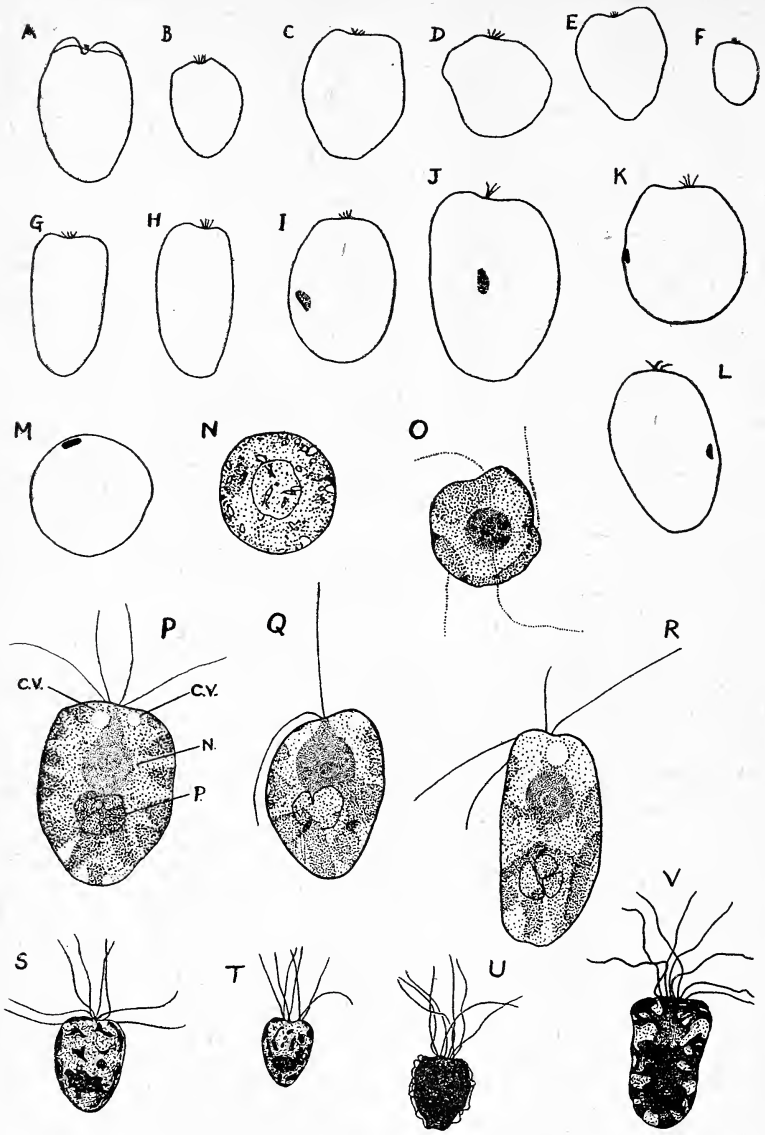


FIGURE 1. *A-H*, variation in cell-shape and size; *I-M*, location and shape of stigma, *I*, *J*, from the broad, *K*, *L*, from the narrow side and *M* from below; *N* cell from below and *O* from above; *P-R*, cells with diverse thickenings in the chromatophere; *S-V*, cells with eight flagella, *S*, *T*, in iodine, *U*, in iodine and 70% sulphuric acid, *V*, in picronigrosin. The cells shown in *Q* and *T* have two and one flagella missing respectively. *A-L* location of flagella merely indicated. *N-R*, killed in 2% osmic acid. *C.V.* contractile vacuole, *N*, nucleus, *P*, pyrenoid. *A*-H, *V* × 830; *I-R* × 1250; *S-U* × 600.

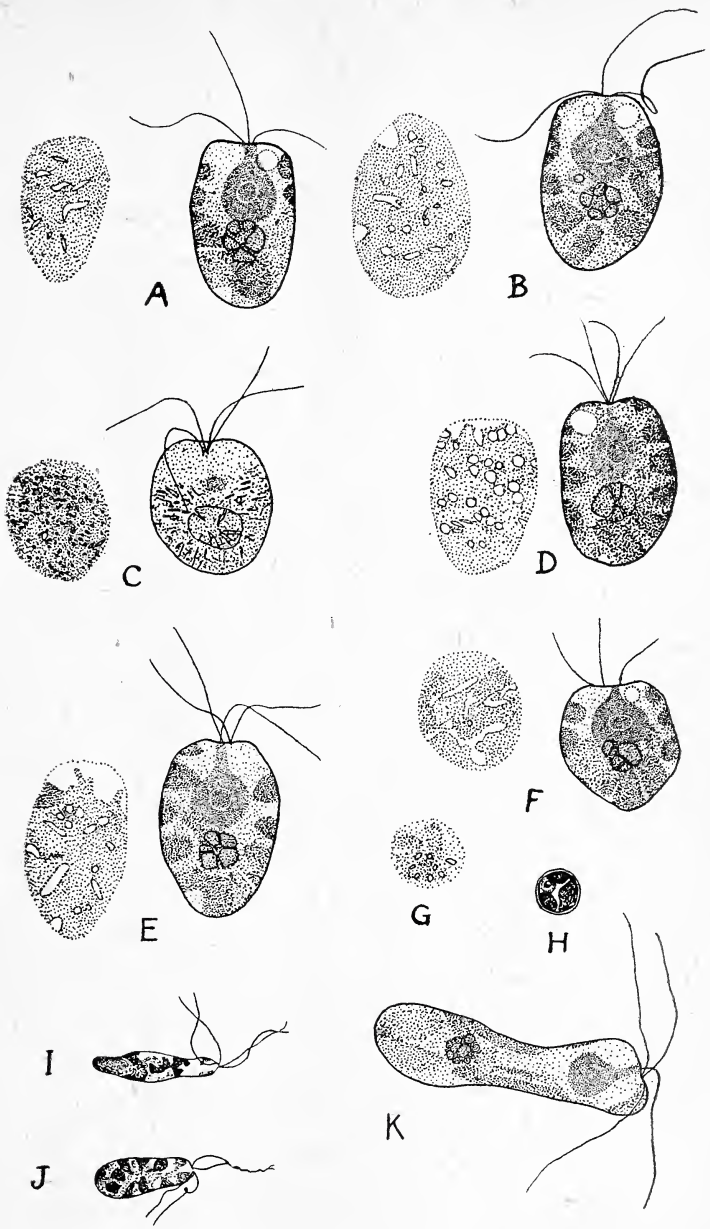


FIGURE 2. *A-F*, variation in chromatophore structure, right hand of each pair of figures = optical longitudinal section, left hand = surface view of same cell; *G*, surface view of chromatophore at base of cell, *H*, cyst, *I-K euglenoid* cells. One flagellum missing in *A*, *B*, *F*; *A-H*, *K* cells killed in 2% osmic acid. *I*, *J* in iodine. *A-G*, *K* × 1250; *H* × 400, *I-J* × 600.

sexual reproduction resulting in thick-walled zygospores. Pascher (1927, p. 94) states that the fenestration of the chromatophore may reach such a degree that a number of irregularly discoid chromatophores occur. We, like him, find that in preserved material the cell structure may be so altered that the species is hardly recognisable. In the reduction of the four anterior lobes of the cell, this species approaches *Tetrachloris* Pascher and Jahoda (1928, p. 243) in which lobing is absent and *Polyblepharides* Dangeared (Pascher, 1927, p. 88) which possesses eight flagella but is imperfectly known. The latter character sometimes seen in *P. reticulata*, is also recorded rarely or regularly for other species of the genus (*e.g. P. octociliata* Carter, 1937).

The Chief Engineer of the Otley Road Filtration Works of the Leeds Corporation Waterworks Department first drew our attention to this alga in May, 1943, when it formed a conspicuous green colouration on several of the beds. He said that he had seen a similar colouration appear suddenly in various beds during the previous four or five years. Colouration was most conspicuous in those in direct sunlight. Similar large growths have occurred at intervals during the succeeding years.

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**The Freshwater Life of the British Isles.** A Guide to the Plants and Invertebrates of Ponds, Lakes, Streams, and Rivers, with an additional chapter on the Vertebrates, by **John Clegg.** Pp. 352, with 16 colour and 51 half-tone plates from photographs by the author and 95 text figures. *Wayside and Woodland* Series. Frederick Warne & Co. Ltd., 1952, 21/-.

Amateur students of freshwater biology are less favourably placed than are those of many other branches of natural history; for despite a copious scientific literature dealing with the wide variety of organisms frequenting lakes, ponds and streams, there are yet few good introductions to freshwater biology which are reasonably comprehensive and at the same time attractively produced and reasonably priced. Mr. Clegg's book is intended to provide such a need. It is designed to facilitate the recognition and explain the biology and ecology of all those organisms which are most likely to be met with by naturalists interested in aquatic life.

The introduction deals with chemical and physical factors, the main types of freshwater habitats—primitive and evolved lakes, ponds, streams and rivers—and the factors operative in deep waters in causing seasonal fluctuations of plankton. The major part of the book is devoted to invertebrate animals with single chapters on vertebrates and on vascular and non-vascular plants. The book concludes with a very useful account of technique and equipment for collecting and examining material and a chapter on the practical importance of freshwater biology to man as illustrated by problems and practices associated with water supplies, sewage disposal and other applied aspects of the subject.

Mr. Clegg is to be congratulated on this competent survey. It is a most useful addition to the *Wayside and Woodland* volumes, worthy to rank with the best of its predecessors. The utility of the text is enhanced by the figures and excellent photographic illustrations of many of the organisms described. There appear to be no really important omissions or misnomers though *Azolla caroliniana* is an error, *A. filiculoides* being the species intended. Amateur naturalists interested in freshwater biology should certainly acquire a copy of this book.

# A LANDMARK IN BRITISH BOTANY

W. A. SLEDGE

For over three centuries the study of the flora of the British Isles has been pursued by ever-increasing numbers of people. The acute observations and devoted study of a long succession of distinguished amateurs have contributed equally with those of professional botanists to the ever-growing knowledge of the composition of our flora, the status and distribution of the species and the detailed study of individual groups. At no time has this study been more widespread or more productive than at present, for recent years have witnessed a marked revival of interest in systematics amongst academic botanists.

One of the handicaps which students have long had to contend with has been the absence of a good handbook to the British flora. Monographs and up-to-date accounts of many difficult groups are only available in papers contained in journals or in separate publications, and reference to continental Floras has long been indispensable to serious students of our own flora. This handicap has been progressively aggravated by the rapid advances in knowledge which have been made in recent years during which cytology, genetics, ecology and experimental taxonomy have contributed valuable information and often made possible greater precision in the analysis of complex groups than was possible by field and herbarium studies alone. Increasing specialisation has in its turn increased so formidably the difficulties which confronted anyone tempted to compile a comprehensive British Flora that no one has ventured to make the attempt. The most recent—or least out-of-date—of the standard British Floras appeared thirty years ago when the last edition of Babington's *Manual of British Botany* was published; but the inadequate descriptions and absence of keys in that work never made it very satisfactory as a ready means for identifying species. Apart from the costly third edition of Sowerby's *English Botany* (1863-72), by far the best account of the British flora was Hooker's *Students Flora of the British Islands* and the last edition of that work appeared in 1884. Bentham and Hooker's *Handbook of the British Flora* whilst excellent as an introductory work, is too uncritical for use by serious workers. Nearly twenty years ago an attempt was made to meet the pressing need for a new Flora by securing the collaboration of a wide circle of British botanists each of whom was made responsible for the writing up of one or more families; but the difficulties and delays attendant upon a scheme which involved the co-operation of over forty contributors, together with the disruptions caused by the war led to the abandonment of the project.

The publication of this new *Flora of the British Isles** is thus an event of major importance in the history of British taxonomic botany. The writing has occupied ' three and a half years in the intervals of teaching and other duties '; the printing has apparently occupied almost as long for the acknowledgments page is dated November 1948. The book is ' intended primarily for students and amateur botanists . . . It does not attempt to describe all named varieties or to give other details which a specialist might reasonably desire.' Despite this modest claim it will be invaluable alike to the specialist and the amateur field botanist.

The classification adopted is neither that of Engler nor of Bentham and Hooker. Pteridophytes and Gymnosperms precede Angiosperms and the Dicotyledons are placed before the Monocotyledons. The Dicotyledonous families are grouped into archichlamydeous and sympetalous divisions, and we note with satisfaction that the Ranunculaceae and not the amentiferous families are treated as the most primitive Dicotyledons. A synopsis or conspectus of some of the larger families precedes the key to the genera. The keys both to genera and species have all been newly constructed and great care has clearly been taken to make these really efficient instruments for accurate identification. Readily observed characters are employed wherever possible and in certain families, notably the Umbelliferae and Cruciferae, difficulties which have invariably attended identification of immature plants have been overcome by judicious selection of reliable vegetative characters in the construction of the keys; indeed we are provided for the first time with a key to the Umbelliferae wholly based on characters pertaining to the leaves, stems and inflorescences. The descriptions are admirably drafted; they are precise yet concise. Differentiating characters are italicised, measurements of parts are consistently

* **Flora of the British Isles** by **A. R. Clapham, T. G. Tutin and E. F. Warburg.** Pp. lii + 1592, Cambridge University Press 50/-.

included and the descriptions terminate with condensed information as to time of flowering, fruiting, germination of seeds, chromosome number, life form and pollination methods. As further aids to diagnosis we are provided in several of the more difficult genera, with outline drawings of leaves, fruits or other parts which are vital in discriminating the species. The drawings of the leaves of all the *Alchemillas* and fruits of all the species of *Carex* will be a great help as will the drawings showing the sculpturing of the testa in *Chenopodium* seeds. References to illustrations are given after each specific name and the status, habitat and distribution both within and beyond the British Isles are clearly defined. This is often followed by a brief supplementary paragraph in which differences from allied species are emphasised and additional biological information is given.

As regards the treatment of the so-called critical genera, those whose taxonomic horizons had been bounded by the covers of the standard British Floras may experience surprise to find that *Sorbus* and *Euphrasia* have now outstripped *Rosa* in the number of species recognised, or that the space required by *Alchemilla* is almost equal to that allocated to the Roses. Apart from *Carex*—the largest single genus of ' good ' species—*Hieracium* and *Rubus* remain the largest groups. In each of these genera keys to the sections are provided and descriptions given of one or more of the best marked or most widely distributed species in each—doubtless the best way of dealing with these distressing groups. The habit drawings of the Hawkweeds should prove helpful.

References are given to some important taxonomic papers covering particular groups and this feature might well have been extended; notable papers such as Pugsley's on *Orobanche* and *Gentiana amarella* agg., and Dandy and Taylor's important papers on *Potamogeton* receiving no mention. And why single out for reference one only of the many autecological papers which have appeared in the Biological Flora? A much larger number of adventive plants, garden escapes and other alien species are included than have received mention in any previous British Flora. Inevitably the problem here was where to draw the line, but though we welcome this valuable additional matter some plants have been omitted which surely have considerably better claims for inclusion than others which have been admitted. *Eragrostis* and *Amsinckia*, to mention two which are omitted, are represented in the former case by at least three species which have repeatedly been found as aliens and species of *Amsinckia* occur sometimes as cornfield weeds as well as inhabitants of refuse tips and waste places.

Comparatively few varities are included, most ultra-specific units being accorded the rank of sub-species. These include many plants which had previously been treated as varieties, but also some which had been given full specific rank. Amongst the Water Buttercups for instance *R. aquatilis* L. is re-instated and five distinct types formerly treated as species are placed under it as sub-species. Closer and more critical study of plants leads inevitably to increases in the number of different types recognisable within each aggregate species. But not all the species which have been founded as a consequence of detailed study are sound, and a considerable number which have been recognised in some genera are here rejected. Three segregates only are recognised—as sub-species—under *Thalictrum minus*, an arrangement which, pending a proper analysis by cytological and experimental techniques, we are fully convinced is sounder than the patently unworkable framework of pseudo-species which has been built up around this plastic aggregate. The numerous ' species ' of *Viola arvensis* are likewise rejected and one species only of *Zannichellia* is recognised. The status of some other species of more recent date which have been accepted as such in other genera—*Rhinanthus* for example—is obscure and reduction may well have to be effected in due course. Sometimes rejection affects species of long standing. Babington's Dodder *C. Trifolii* is no longer maintained and in place of the three Stonecrops *Sedum rupestre, reflexum* and *Forsterianum*, two only survive, the first being absorbed into the last.

Due weight has been given to cytological evidence in forming decisions affecting generic and specific limits. Presumably the very thorough investigations of Professor Manton on the Pteridophytes were available too late for full use to have been made of them for *Gymnocarpium* is merged in *Thelypteris*, a cytologically indefensible arrangement. It is disappointing too to find the much misunderstood *Athyrium flexile* dismissed as a variety of *A. alpestre*. It is as distinct from *A. alpestre* as that species is from *A. Filix-foemina* and after five years in cultivation at Leeds retains

all its peculiarities unchanged. Here we have an example of how the negative evidence of identical chromosome numbers may militate against the specific recognition of a plant which is too inaccessible for study in the field. Contrast the treatment here with the elevation of the glabrous and hairy forms of *Monotropa* to distinct species mainly on the basis of one being diploid and the other hexaploid. There are no such cytological grounds for treating the northern and southern forms of *Spiranthes Romanzoffiana* as distinct. The grade of sub-species is surely unjustified when both forms are admitted to be connected by intermediates in America where they are ' not considered taxonomically significant.' To invoke differences in ecology and geographical distribution in support of such a treatment but not to do so in the equally distinct case of the dune and fen forms of *Liparis* is illogical. A stronger case could be made out for *Gymnadenia densiflora*. This is briefly referred to as a variety which occurs in ' Anglesey and the Isle of Wight.' In reality it is a far more widespread plant especially in the north. The late P. M. Hall considered that Scottish specimens of the Fragrant Orchid all belonged to *densiflora* and that it had strong claims to be considered a distinct species. Amongst the Thistles, the treatment of the polymorphic *Cirsium arvense* and of *Carduus crispus* and *acanthoides* leaves these troublesome species just as troublesome as before. Nine hybrids are listed after the genus *Cirsium*. It is true that these ' have been recorded,' but three of them erroneously so whilst four more, *acaule* × *palustre*, *acaule* × *vulgare*, *palustre* × *tuberosum* and *eriophorum* × *vulgare* are omitted though some of these have been collected on several occasions.

A valiant attempt has been made to summarise accurately the distribution of each species, and the standard of efficiency here is in keeping with the high level of merit which pervades the whole work. But *Topographical Botany* and the *Comital Flora* were bound to form the basis of such an attempt and it was manifestly impossible to check all the relevant data. Botanists with specialised local knowledge will therefore detect some inaccuracies. *Anemone Pulsatilla*, *Trichomanes* and *Dryopteris cristata* are quoted as occurring in Yorkshire though all have long ago been extinct—well before the close of last century. The last named is also given for Nottingham where it has likewise long been extinct, but the Scottish locality where it still grows is omitted. *Veronica triphyllos* may still grow in Yorkshire but no living botanist has seen it though repeated searches have been made in its former stations. *Saxifraga umbrosa* does not grow at Ling (not Linn) Gill now and has not done so in living memory. I have yet to see a specimen from there or one of *Carex arenaria* from an inland locality in East Yorkshire. *Oenanthe fluviatilis* and *Salicornia perennis* are both indigenous in the county, and Ingleborough and Malham to which the records for *Poa alpina* and *Calamagrostis neglecta* refer are in the West Riding not N.W. Yorks. The last named has recently been found in abundance on the Leven Canal in East Yorkshire. The reputed occurrence of *Euphrasia salisburgensis* in Yorkshire is omitted, and rightly so I feel sure. A notable omission is the Irish locality for *Hydrilla* which is accepted as native; and the statement that *Fritillaria* is very local ' especially in the south of its range ' is presumably a slip, north being intended for south.

The notes on habitats incorporate useful ecological information especially as to the preference of species for acid or basic soils; but *Anthemis arvensis* is surely a plant of porous rather than calcareous soils and *Senecio sylvaticus* is not habitually (or even preferentially?) a plant of calcareous sands. In East Yorkshire it grows on sandy commons highly deficient in bases. *Carex contigua* is said to affect ' acid but base-rich soils,' a remarkable ecological adaptation which must confer on it a singularly small survival value! The habitat of *Platanthera bifolia* ' grassy hillsides and open woods on base-rich calcareous soils ' is contrary to ones experience in the north where it is normally associated with base-deficient peaty ground of heaths and ' mosses.'

The feature of this book which will perhaps be least relished by many of those who will use it is the large number of unfamiliar names which it contains. Those who have kept abreast of modern work will be well prepared for the majority of the changes, but to many others both amateurs and those academic botanists whose primary interests lay in some other branch of the subject, the number of changes may well cause dismay. It is instructive to compare the nomenclature used with that employed in Fernald's recent edition of Gray's *Manual of Botany* and with the *Check List of British Vascular Plants* issued in 1946. Even taking into account the fact that many of the names used in the latter work were provisional there are

plenty of discrepancies. Some are surely open to objection. In his recent work on British Orchids, Summerhayes has rejected the name *Ophrys insectifera* for the Fly Orchid. Here it is adopted. Would it not have been advisable to retain the more familiar name until the point was settled? *Orchis latifolia alias O. incarnata* the correct designation of which one thought had been finally settled in favour of the former name is now called *O. strictifolia*. New genera appear in unexpected places, *Lysimachia thrysiflora* becomes *Naumbergia thrysiflora* though *L. ciliata* is not transferred to *Steironema*. Would not Fernald's adoption of generic sections have been preferable? *Pyrola secunda* becomes *Ramischia secunda*—another disagreement with Fernald—*Gentiana amarella* s.l. and *G. campestris* are now placed in the genus *Gentianella*, *Bromus sterilis* becomes *Anisantha sterilis* and *Bromus ramosus* and *erectus* change to *Zerna ramosa* and *Z. erecta*.

It would be wearisome to cite further examples. Some botanists will question the wisdom of some of these changes; not on the indefensible grounds of mere conservatism but because generic standards are progressively debased by the progressive elevation of sub-genera and sections to independent rank. And let no one suppose that the new names have all come to stay. Many will as surely be changed in the future as they have been now and in the past. At least two—and it may well be more—of the names employed here have already been altered.

The perennially vexatious topic of nomenclature is referred to by Sir A. G. Tansley in his Foreword to the Flora. There is a distinct aroma of despair in his remarks. The great majority of those who use botanical names would unquestionably endorse the view that the principle of conserving specific names should be adopted. There is as Sir Arthur Tansley says no end to ' literary research, often in obscure historical works ' the results of which under the present rules compel substitution. Some botanists contend that it is a monstrous imposition to enforce, on the grounds of priority or some other technical point, the employment of an unknown name in place of one wholly free from ambiguity and sanctioned by long usage. The inflexibility of the rules in such cases, it is argued, deliberately increases the burden of students by promoting confusion where none existed, and have no compensating merit other than the preservation of uniformity in procedure. The point is highly controversial and apt to generate some heat. Dr. Leonard Cockayne, the distinguished New Zealand botanist, and a vigorous protagonist of the principle of conservation applied to specific names, once concluded a characteristically pungent assault on nomenclatural rules by denouncing ' botanical Frankensteins ' who ' rashly breathe life into the inert and harmless bodies ' of long defunct names! But powerful if less convincing arguments can be advanced for the opposite view and a no less vigorous defence of the rules is urged by professional systematists some of whom would well nigh go to the stake in defence of the law of priority. So, as Sir Arthur Tansley concludes, ' the present generation of students has still to suffer in this respect,' though his wish that their suffering may be transient is more an expression of hope than of conviction.

It remains only to say that the format and printing are excellent and the same meticulous care has been given to the proof reading as to the writing. In its 1,644 pages I have detected only three errors. Adle Dam—the former station of *Tillaea aquatica*—appears as Acle Dam and the variety *longibracteata* of *Carex pilulifera* has inadvertently been transferred to *C. caryophyllea*. Beginners who attempt to use the key to the Pinaceae will be perplexed by the absence of guide numbers in the right-hand margin. A bibliography, a list of authors responsible for the accounts of individual families, a note on life forms and a glossary are appended, and we are glad to find that English and Latin names are combined in a single index.

The value of this book will become more fully appreciated when it has been well tested in the field and in laboratory classes. Some defects are sure to emerge; for handbooks are like watches, the best cannot be expected always to go quite true. Its immeasurable superiority over all other existing British Floras is however at once apparent. To say that all serious students of our flora should acquire this book would be a gross understatement. Once their bare and immediate necessities of life are satisfied it should be their first purchase, for in relation to its value its price is small. We salute the three authors for the consummate skill and unflagging perseverance with which they have brought a formidable task to a triumphant conclusion. Minor improvements may be expected in future editions but few of us are likely to see its usefulness outgrown in our lifetime.

# *DACTYLOSPORIUM* IN BRITAIN

S. J. HUGHES
*Commonwealth Mycological Institute, Kew, Surrey.*

THE generic name *Dactylosporium* was proposed by Harz in 1871 for the single species *D. macropus* (Corda) Harz (≡*Mystrosporium macropus* Corda) which has not hitherto been recorded for Britain under this name. However, *Dactylosporium macropus* is considered by Mr. E. W. Mason and myself to be an earlier synonym of *Helminthosporium tingens* Cooke which was described from a British collection. The generic name *Dactylosporium* Harz was introduced into British literature by

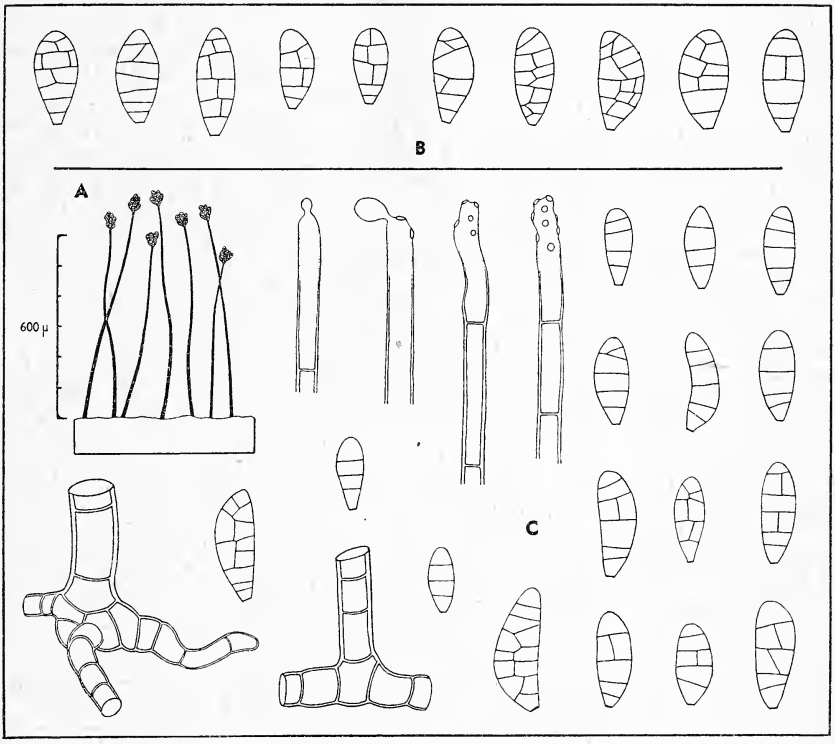


FIG. 1. ***Dactylosporium macropus:*** **A,** conidiophores, each with a bunch of conidia, from Herb. I.M.I. 31431(b); **B,** conidia from the type collection of *Helminthosporium tingens* Cooke in Herb. R.B.G., Kew; **C,** bases and apices of conidiophores, and conidia, from Herb. I.M.I. 31431(b); ×500, except **A** which has a scale provided

W. B. Grove in 1886 (*J. Bot., Lond.*, xxiv, p. 205) when he described and figured his new species *D. brevipes*; this species is not known in Herb. I.M.I.

***Dactylosporium macropus*** (Corda) Harz.

No material authenticated for the name *D. macropus* has been seen but four recent collections I have made in Yorkshire agree well with Corda's diagnosis and illustration. According to Pilát (*Sborník Národního Musea v Praže*, i B(1938), No. 10, Botanica No. 3, p. 155, 1938) there is no collection assigned to this name by Corda preserved in the National Museum at Prague.

The type collection of *Helminthosporium tingens* Cooke is preserved in the *Brachysporium tingens* folder in Herb. R.B.G. Kew,, and was examined through the kindness of Miss E. M. Wakefield; it consists of a piece of rotten wood tinged a pale reddish purple and which bears abundant conidiophores and conidia; it is

labelled by Berkeley ' *Helminthosporium* . . . Staunton, 1860 ' whilst Cooke has added ' *tingens* Cooke.' This collection matches the four recent collections assigned here to *D. macropus*.

It appears best to classify the fungus as a *Dactylosporium*, of which it is the type species, rather than as *Mystrosporium*, *Helminthosporium* or *Brachysporium*.

NOMENCLATOR

*Dactylosporium macropus* (Corda) Harz in *Bull. Soc. Imper. Nat. Moscow*, xliv, p. 131, 1871.

≡*Mystrosporium macropus* Corda in *Icones fungorum*, iii, p. 10, 1839.

=*Helminthosporium tingens* Cooke in *Grevillea*, xii, p. 37, 1883.

≡*Brachysporium tingens* (Cooke) Saccardo in *Sylloge Fungorum*, iv, p. 427, 1886.

## Description of *Dactylosporium macropus*

The *colonies* are effuse, black and sometimes velutinous.

The *mycelium* is mostly immersed, composed of hyaline to very pale brown, branched, septate hyphae 2 to 4$\mu$ wide ; towards the surface of the substratum the hyphae may become wider, up to 11$\mu$, and dark brown. It is from small aggregations of these larger hyphae that the conidiophores arise.

The *conidiophores* are sparse or crowded, arising usually solitarily but sometimes in pairs, simple, erect, usually straight, up to 900$\mu$ long, 8 to 12$\mu$ wide just above the slight basal swelling, then tapering subulately to 3·5 to 7$\mu$ wide at the apex, dark brown for most of their length but becoming paler towards the immediate apex which bears conidial scars, thick-walled, regularly and closely septate below, more distantly septate above.

The *conidia* develop singly as a blown-out end of the apex of each successively produced growing point to produce a dry bunch at the apex of the conidiophore. At maturity they are subhyaline to brown, smooth, oval, sometimes inequilateral, with a flat basal scar 2 to 3$\mu$ wide, with three to five transverse septa ; during development the basal cell of the conidium remains continuous whilst the other cells or often only the central cells develop longitudinal or oblique septa. They measure 17 to 33 by 9 to 12$\mu$. Occasional conidia have a small thickened area of the wall at the apex of the conidium ; this resembles a conidial scar but in no instance have chains of conidia been observed.

*Habitat* : on rotten wood of *Acer pseudoplatanus*, *Ilex aquifolium*, *Quercus* (British Oak) and unidentified wood. All four recent collections preserved in Herb. I.M.I. were made in Yorkshire.

### Collections maintained as *Dactylosporium macropus*

| *Date* | *Substrate* | *Locality* | *Herb. I.M.I. No.* |
|---|---|---|---|
| 16/9/1946 | *Acer pseudoplatanus* | Forge Valley | 7014(a) |
| 9/4/1948 | wood | Roche Abbey | 27712(a) |
| 27/9/1948 | *Ilex aquifolium* | Swinton Park, near Masham | 31431(b) |
| 15/4/1950 | *Quercus* | Swinton Park, near Masham | 40682 |

## British Records of *Brachysporium tingens*

Cooke's (loc. cit.) original record was based on a collection made at Staunton (Gloucestershire) and described in *Helminthosporium*. Cooke did not describe any longitudinal septa but these are present in the type collection (Fig. 1) ; he remarked that it was difficult to determine whether the stain of the wood was due to the fungus. The substrate in the four recent collections lacks any purplish tinge which suggests that the colouration in the original collection was due to something else.

Massee & Crossland (*Fungus Flora of Yorkshire*, p. 342, 1905) recorded *B. tingens* from ' Elland Park Wood, on rotten wood.' I have not seen this collection ; it is not in Herb. R.B.G.Kew.

Massee (*British Fungus Flora*, III, p. 414, 1893) compiled the species and described it as ' remarkable for imparting a purplish tinge to the matrix.'

Two recent records from Yorkshire are based upon collections preserved in Herb. I.M.I. ; *The Naturalist*, 1948, p. 12—Herb. I.M.I. 27712(a) from Roche Abbey : *The Naturalist*, 1948, p. 82—Herb. I.M.I. 31431(b) from Swinton Park, near Masham.

# THE AMPHIPOD *EUCRANGONYX GRACILIS* (S. I. SMITH) AND ITS OCCURRENCE IN YORKSHIRE

G. FRYER

In some notes on certain Amphipoda published in a recent issue of *The Naturalist* (1951, p. 105) attention was drawn to the spread in Britain of *Eucrangonyx gracilis* (S. I. Smith), and the desirability of recording this species from Yorkshire should it occur was emphasised. Since the publication of these notes I am able to report the finding of *E. gracilis* in various parts of the Huddersfield-Ashton canal between Huddersfield and Marsden. A preliminary note has already been published elsewhere (Fryer, 1951).

The first find was made on July 5th, 1951, when a female carrying embryos was taken at Golcar. Subsequent search in various parts of the canal has revealed that this species is widely distributed over a distance of at least six miles, and in some places is quite abundant. Most of the specimens taken have been found beneath submerged stones, and are fairly readily captured by lifting the said stones and

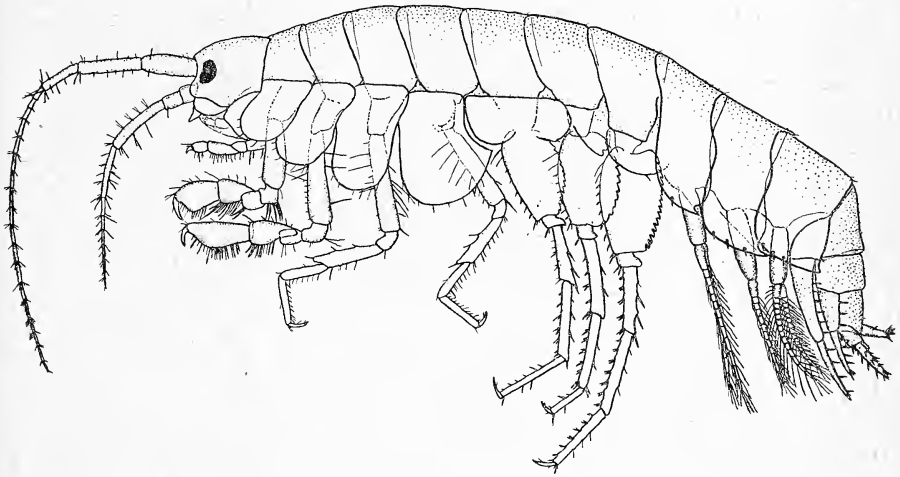

Fig. 1. *Eucrangonyx gracilis* (S. I. Smith). Adult ♀ lateral aspect—oostegites and gills omitted for clarity. From canal at Golcar, 10/9/51.

quickly sweeping the area which they occupied with a hand net. In places where aquatic plants are abundant it is to be found among these. At Huddersfield it occurs in artificially warmed water, in which it appears to thrive. It is perhaps worthy of note that at one point where it occurs, the semi-terrestrial Amphipod *Orchestia bottae* (M. Edws.) is to be found on the ' shore,' the occurrence of these two Amphipods together at this one point being perhaps unique for this country.

The history of *E. gracilis* as a British species is of considerable interest. The first official record for this country was that of Crawford (1937) who announced the finding of this species by A. C. Gardiner in October and November, 1936, in abundance in culverts below the filter beds at Lea Bridge waterworks, London. Before this, however, a single specimen, which was not recorded at the time, had been found, this coming through a tap in London. Since 1936 records of its occurrence seem to indicate a rapid northward spread, the present record being the most northerly made to date. In Canada and the U.S.A. from whence the British specimens are believed to have been imported, it is a widely distributed species.

It is desirable that a look-out be kept for specimens from other localities, and to enable the species to be recognised I have made drawings which are reproduced here. This step has been taken as no accurate illustration of the whole animal is readily available, Crawford (op. cit.) summing up the matter by saying ' The only

published figure of the whole animal is that of Kunkel, which is crude and in some respects incorrect.' The work referred to is in a relatively inaccessible American publication issued in 1918. Quite recently Mackay (1951) has published a sketch of *E. gracilis* in a school Natural History magazine, but this is unsuitable as a means of identifying the species, and is not generally available.

The drawings, which I have tried to make as accurate as possible, were made from a mature female with eggs in the brood pouch, but I have omitted the eggs and the brood plates (oostegites) as these would tend to confuse the drawing (fig. 1) and render it unnecessarily complex. For the same reason the gills have also been omitted. Many specimens taken are damaged in some way, and while the antennules and antennae are the organs which most usually suffer, the legs too are sometimes damaged. Thus, in the specimen illustrated the distal part of leg 4 has been broken off and is in the process of regeneration. Fig. 1 may appear slightly flattened and elongated due to compression beneath a cover slip whilst the drawing was being made, but as anyone examining specimens microscopically will presumably subject them to similar treatment this effect will be nullified.

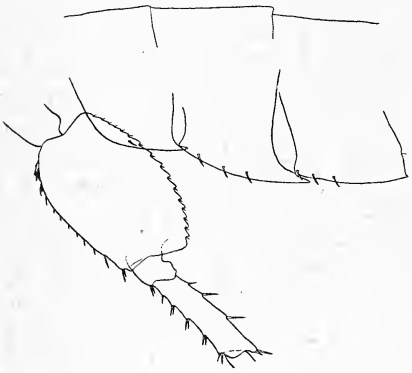

FIG. 2. *Eucrangonyx gracilis* (S. I. Smith) the epimeral plates & proximal segments of leg 5

The features by which *E. gracilis* may be most readily separated from the freshwater species of *Gammarus*, which are the only British Amphipods with which it can possibly be confused, are the small size, adults measuring about 9 mm., its habit of, unlike the rest of the Gammaridae, crawling in an upright position, the pointed nature of the epimeral plates and the posterior serrations of the basal segments of legs 3-5 (fig. 2), and by other features listed by Reid (1944). A female with its brood pouch bulging with embryos can hardly be mistaken for any other species even with the naked eye. There is no risk of confusing this species with the subterranean *E. vejdovski* (Stebb.) which is eyeless and only 4 mm. in length. Stebbing (1906) gives a detailed description of the species.

Insufficient observations have as yet been carried out on *E. gracilis* in its Yorkshire station to justify any remarks being made upon its general habits, but it is hoped that this may be possible at some future date.

I would like to thank Mr. D. M. Reid who kindly checked the identity of my first finds and who has drawn my attention to many interesting points concerning this and other Amphipoda.

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***Lilium Martagon* L.**—In June 1951 a clump of this plant was found in a wood near Crakehall (V.C. 65). From its situation it seemed unlikely to be a garden escape. There were a number of stems each of which would have about eight blooms.—J. P. UTLEY.

**Late Flowering of Marsh Marigold and Red Campion.**—On November 18th, 1951, at Ainderby Bottoms a clump of Marsh Marigolds was found which had six fully open blooms and a number of buds. No other clumps were seen. On December 15th, at Kirkbridge, about six plants of Red Campion were found in bloom in a small, sheltered plantation.—J. P. UTLEY.

## YORKSHIRE NATURALISTS' UNION (VERTEBRATE SECTION) ORNITHOLOGICAL DIVISION

*Chairman:* R. M. Garnett.

*Recorders:*

North Riding—*East:* R. M. Garnett, Thornton-le-Dale.
*West:* J. P. Utley, B.Sc., M.B.O.U., 24 Neile Close, Romanby, Northallerton.
East Riding: G. H. Ainsworth, 144 Gillshill Road, Hull.
West Riding: R. Chislett, M.B.O.U., Masham.
York District: E. W. Taylor, C.B.E., F.R.S., M.B.O.U., 11 The Avenue, York.

*Hon. Secretary and Editor of Records:*
Ralph Chislett.

### Report for 1951

Having outgrown the significance of the term 'Committee,' we have ceased to use the name, and have become a Division of the Vertebrate Section, with the Union's consent. The affairs of the Division will be delegated to a working Committee, whose decisions will naturally be subject to confirmation by the general meeting.

Once again I have to decide what facts of the year deserve space in the Report, to ensure availability in the future for any and all to use. Printing space is more costly to-day than ever before, and cannot be used for items that are yearly recurrent, except when the time and quantitative factors are exceptional. For distributional extensions, and contractions, of some species; for unusual occurrences of many; and for data for migrational comparisons over periods of years of which 1951 is a part, some space has to be found. Only of species that are becoming, or have become rare, or are newly established, can the status be given in detail; and in some cases it is inadvisable to do that!

Spring came late in 1951. Some of our hillsides had shown patches of snow since November. On April 15th, J. P. Utley and I hunted for a Willow-Warbler in lower Swaledale without finding one. Snow fell on April 29th at Spurn; and on April 30th at Masham. Daffodils failed to 'take the winds of March with beauty' in 1951, and bloomed in May. A few Swifts and other species came to time, but most individuals, and the general body of migrants were much later than in average years. Forty-eight hours of heavy rain in north-west Yorkshire on May 5th and 6th produced floods, and for two days and nights Blue-Tits huddled in a row on a clothes-line across my veranda; and bushes that held nests by the river were laid flat. After further heavy rain on May 26th—27th, floods were out again, and numerous young birds were drowned, and ground-nests destroyed. Afterwards, summer began and continued fairly normally, and late nests did well. A pair of Temminck's Stints produced eggs but were unlucky. Black Redstarts bred. The greatest autumnal coastal rush of migrant passerines came in the first week of October, with Robins predominating; but other species appeared inland at the same time, no doubt influenced by the same conditions.

#### The Spurn Bird Observatory

(By G. H. Ainsworth and R. Chislett)

The purposes for which the enterprise was planned have been well upheld during the year. A good contribution has been made towards the study of migration, as it can be seen in progress at Spurn, by the accumulation of data recorded daily; and by birds ringed with a view to recovery at other places and stages in their lives.

Since the first bird was ringed at Spurn in November 1945, slightly more than 9,000 birds have been ringed; of which the contribution for the year to October 31st, 1951, was 3,514, covering 64 species. Ten Spurn-ringed birds were recovered abroad in 1951 (Italy, France, Portugal, Spain, Tunisia, Denmark, Norway). A Greenfinch was recovered in north-east Yorkshire. A German-ringed Black Redstart was caught, and many birds that had been ringed in previous years were re-trapped as they passed the same way again.

The observatory was manned ornithologically on eight days in February, continuously from March 17th to May 27th with the exception of five days in April and May; and from July 8th to November 30th, excepting ten days in November. To maintain absolute continuity is not always easy, but is very important. No one can say when conditions at Spurn, or to south or north of us, will impel waiting birds to resume their journeys, or to make a halt.

Upwards of 80 people stayed at the cottage for periods ranging from one or two days to several weeks. A number of people came for several periods. Among our visitors, one came from Sweden, and another from South Africa. Y.N.U. members predominated; but others came from many parts of the country. Distinguished ornithologists and beginners were both included. Every effort is made to have an expert ringer in charge, but for a very few days it was not possible. For 1952 a panel of Honorary Wardens is being formed, planned to cover the important periods, who will be prepared to instruct in the handling and ringing of birds, in the identification of birds in the hand from wing-formulae, and in the other various matters pertaining to ringing. It is hoped that people wishing to be accepted as ringers by the B.T.O. Ringing Committee will do as that committee wishes, and take advantage of this scheme.

Activities at the Warren trap suffered somewhat from the presence of workmen nearby, except at weekends. When we met Mr. Davies of the Northern Command, Lands Department (our landlords), and the Clerk of Works, Mr. Iveson, we found them very considerate and willing to avoid our area as far as they possibly could. The presence of a caretaker may be helpful; but further building is planned, despite which we decided to do the repairs to the Warren trap that were urgently needed. Fortunately, the new traps, which were only worked during the latter half of 1951, are two miles away, and will be working throughout 1952. As long as the trees and bushes remain about the cottage and Warren trap, birds will visit them.

All material facts will be found hereafter, under the headings of the species concerned, in the 'Classified List' where all ornithological records of importance concerning Yorkshire for the year are placed together, for ease of accessibility, and for the convenient use of students. The numbers cited are those of Witherby's Hand-list.

Birds ringed November 1st, 1950 to October 31st, 1951:

| | |
|---|---|
| Rook | 1 |
| Magpie | 3 |
| Starling | 97 |
| Greenfinch | 260 |
| Goldfinch | 1 |
| Siskin | 1 |
| Linnet | 461 |
| Chaffinch | 146 |
| Brambling | 47 |
| Yellow-Bunting | 4 |
| Reed-Bunting | 114 |
| House-Sparrow | 282 |
| Tree-Sparrow | 2 |
| Skylark | 17 |
| Tree-Pipit | 2 |
| Meadow-Pipit | 112 |
| White Wagtail | 1 |
| Great-Tit | 4 |
| Blue-Tit | 6 |
| Great Grey Shrike | 1 |
| Red-backed Shrike | 2 |
| Spotted Flycatcher | 12 |
| Pied Flycatcher | 74 |
| Goldcrest | 33 |
| Chiffchaff | 20 |
| Willow-Warbler | 173 |
| Sedge-Warbler | 20 |
| Icterine Warbler | 1 |
| Garden-Warbler | 11 |
| Blackcap | 14 |
| Whitethroat | 155 |
| Lesser Whitethroat | 4 |
| *Carried forward* | 2081 |

| | |
|---|---|
| *Brought forward* | 2081 |
| Fieldfare | 1 |
| Mistle-Thrush | 1 |
| Song-Thrush | 180 |
| Redwing | 15 |
| Ring-Ousel | 2 |
| Blackbird | 279 |
| Wheatear | 17 |
| Whinchat | 17 |
| Stonechat | 4 |
| Redstart | 52 |
| Black Redstart | 4 |
| Nightingale | 2 |
| Robin | 679 |
| Bluethroat | 1 |
| Hedge-Sparrow | 65 |
| Wren | 9 |
| Swallow | 27 |
| Sand Martin | 2 |
| Wryneck | 2 |
| Cuckoo | 33 |
| Long-eared Owl | 1 |
| Kestrel | 2 |
| Sparrowhawk | 1 |
| Woodcock | 1 |
| Dunlin | 1 |
| Green Sandpiper | 1 |
| Ringed Plover | 17 |
| Little Tern | 8 |
| Guillemot | 1 |
| Razorbill | 1 |
| Common Partridge | 2 |
| Red-legged Partridge | 5 |
| | 3514 |

The analysis of birds ringed speaks for itself. Facts reflected by the figures are: the use made of the new traps at the Wire Dump and Chalk Bank; the fact that all the traps were worked through most of July, when so many Linnets were ringed that it became unusual at the end of the month to catch one that was not already ringed; the Robin invasion of early October; and the fact that Song-Thrushes were more numerous in autumn than we have previously known them. Most of the Skylarks and Pipits were caught in the small portable traps.

Another matter we feel compelled to mention, not without diffidence. The records of 1951 included one or two that were insufficiently authenticated. Such items necessitate subsequent correspondence to elucidate facts that should have appeared in the book-entries for the day concerned. The bare statement that an unusual bird was seen is not enough, and should be accompanied by mention of the diagnostic details that enabled identification to be definite. The real experts never fail to make such necessary entries; they know how important it is for our records to carry conviction; and how easy it is to ' jump ' to conclusions that should have been carefully ' stalked,' as Mr. Temperley would say. We ourselves never record a ringed bird as a Chiffchaff without having made sure from its sixth primary that such it was. *British Birds* for January 1952, appropriately begins with an excellent leader on this subject which every one should study. We have a very high standard of accuracy to maintain in Yorkshire, and we look to all our visitors to help us to do so.

May we ask those who write up the log at Spurn to cite the names of their helpers in full at the beginning of each days' entries, at least on the day of their first appearance; and afterwards if initials are used, to give them without omission of one or more letters.

### The High Royd Trap (Halifax S.S.)
(G. R. Edwards)

Birds ringed in the year numbered 430, and covered 28 species, of which Reed-Warbler, Tree-Pipit and Brambling were new to the trap. Included were—Pied-Wagtail 74, Greenfinch 52, Blue-Tit 50, Willow-Warbler 46, Yellow Wagtail 38, Great-Tit 23, Meadow-Pipit 23, Blackbird 17, Robin 15, Chaffinch 14, Moorhen 11, Reed-Bunting 11. The total of birds ringed since the trap was opened on January 10th, 1947 to just short of 2,000. Of the ringed birds recovered in 1951, two were Pied Wagtails recovered abroad, particulars of which, and of other interesting items, will be found in the ' Classified List."

### Wharfedale N. S. Ringing Report
(W. F. Fearnley)

During the year to September 30th, 1951, 592 birds of 33 species were ringed. Blue-Tits headed the list with 137. Other notable numbers were: Starling 64, Blackbird 63, Great-Tit 61, Robin 43, Chaffinch 39, House-Sparrow 30, Song-Thrush 24, and Swallow 20. Among others ringed were: Reed-Bunting, Yellow Wagtail, Swift, Cuckoo, Little Owl, Tawny Owl, Teal, Lapwing, Redshank, Curlew, and a Black Redstart ringed in London. The case of a Blackbird ringed in Ilkley on March 10th, and recovered in Denmark on July 5th is referred to in its appropriate place, as are many other records by Wharfedale Naturalists.

Other individual members, such as Mr. R. Slater, have done much ringing, both of young birds at the right ages, and of adults trapped. Heligoland-type traps are used as well as ' Potters ' and ' Greenriggs.' In addition, R. F. Dickens, P. E. Davis, D. B. Iles, and J. K. Fenton have visited gulleries and ringed many young gulls. My own trapping box and netting, into which birds are driven, is not erected until mid-July, when the young birds of the year are on the wing, and wandering.

It only remains for me to thank all who have contributed to the Report, on behalf of my co-Recorders and myself. Without such help, the preparation of a report to cover the county in any degree adequately would not be possible. Some of the most active observers supply interim lists of their records during the year; and almost all were prompt with material in the first few days of January, without which proofs could not be available for the March meeting, whereby accuracy of details is doubly checked. From the following list a few names may have been omitted, which were not cited in the Spurn log, or who contributed collectively through their societies.

G. H. Ainsworth, Ackworth School N.H.S., A. F. Airey, J. Appleton, Miss P. Andrews, Miss C. M. Acland, G. Arthur, C. B. Ashby, J. Armitage, P. Baldwin, A. Baldridge, W. Bennett, Bradford N.S., Batley N.S., R. Bramhill, W. Bunting, H. O. Bunce, C. E. A. Burnham, E. B. Burstall, J. P. Busby, I. G. Brown, K. Brown, B. W. Brownsey, W. A. Butterfield, H. W. Bracken, J. E. Beckerlegge, Lord Bolton, A. D. Bateman, R. S. P. Bates, H. G. Brownlow, R. W. Crosland, R. Crossley, Miss F. E. Crackles, J. Cudworth, L. Carr, V. S. Crapnell, K. C. Crosbie, J. A. Chadwick, G. Carr, S. Cramp, R. W. Crowe, A. L. and R. Chislett, W. Cunningham, E. A. Croft, Mrs. L. J. K. Crawshaw, I. D. Dougill, P. E. Davis, R. F. Dickens, K. Dawson, F. Dean, A. C. M. Duncan, G. R. Edwards, J. C. S. Ellis, J. K. Fenton, K. Fenton, W. F. Fearnley, W. F. Flesher, A. E. Falgate, R. M. Garnett, J. B. W. Gardiner, F. C. Griffith, J. S. Griffith, H. Goodall, A. Gordon, W. Greaves, L. A. Greensmith, W. H. N. Hutchinson, J. R. Govett, E. Grace, A. W. Goodin, P. Goodson, G. G. and L. Green, P. A. Humble, Harrogate N.S., O. C. Hill, J. H. Hyatt, H. Heald, E. Holmes, J. D. Hartley, G. Harrison, V. Huddlestone, G. E. Hyde, E. J. Hosking, R. Hewson, H. Hodgson, Halifax S.S., N. M. Hepworth, P. F. Holmes, A. C. Hoyle, A. Hazelwood, D. B. Iles, K. Ilderton, D. A. Illingworth, H. Jenkins, D. M. Jesper, F. Jefferson, S. Jackson, F. E. Kennington, J. C. Leedall, J. M. Laws, M. J. M. Larkin, A. Lee, J. Lord, W. K. Mattinson, B. S. Milne, C. W. Mason, N. V. Mendham, R. W. Mackay, A. Macallister, M. F. M. Meiklejohn, J. R. Mather, I. Morley, B. Mitchell, H. Marjoram, Misses R. E. and D. M. Neal, J. C. Niven, J. B. Nelson, C. Nelson, H. Pickles, B. Pickering, F. E. Peach, A. G. Parsons, E. R. and Mrs. Parrinder, A. Pilkington, D. B. Peakall, Mrs. O. M. Pennock, P. C. Quinn, E. D. Robinson, E. C. J. Swabey, J. R. Scott, L. Smith, B. Speake, R. Slater, P. J. Stead, R. Sykes, Miss C. Shaddick, S. G. Smith, K. G. Spencer, J. C. Skinner, E. S. Skinner, D. R. Seaward, E. W. Taylor, A. F. Taylor, G. W. Temperley, C. F. Tomlinson, S. Ulfstrand, D. C. Urquhart, J. P. Utley, D. Vaughan, A. F. G. Walker, A. B. Walker, D. F. Walker, A. J. Wallis, H. F. Woods, F. Wilcock, D. R. Wilson, C. Webb, H. J. Williamson, C. Williamson, T. W. A. Wood, Wakefield N.S., Wharfedale N.S., J. W. Wainwright, H. Wagstaffe, R. S. Wood, Miss Wood, A. T. and S. J. Wells, G. K. Yeates, P. Young.

## Classified List

1. Raven.—Seen not infrequently in some north-western areas at various seasons. Young were reared; and at least one nest robbed. One was seen near Goathland on October 13th by H. M. Batten (A.B.W.). On November 15th Rooks and Jackdaws mobbed a Raven in a field near North Dalton (W.A.B.).

2. Hooded Crow.—Occurred regularly at Spurn and about Hornsea Mere up to mid-April, with a maximum of 40 on March 20th. In the Cleveland area the species was scarcer than usual (R.S.). West of the central plain, birds occurred on Malham Moor in January (P.F.H.), near Blubberhouses on March 24th (C.S.), at Snowden (Wharfedale) on April 14th. One was found dead above Nidderdale on April 22nd (D.B.I.); and one was seen on Filey Brigg on May 12th (A.J.W.). A bird on the Briscoe Moors on October 6th (J.R.S.) was early. Birds occurred at Spurn from October 3rd, but regularly only from the last week of October.

3. Carrion Crow.—A keeper's gibbet in the north-west held 110 birds on July 7th (P.E.D.). The maximum in one day at Spurn was *c.* 50 on May 8th.

4. Rook.—There were *c.* 200 at Spurn on April 14th; where Rooks and Jackdaws occurred regularly. At the West Burton meeting a rookery was located at an altitude of 1,200 feet (J.D.H.). On November 18th J.K.F. noted a white bird at Gargrave.

8/9. Nutcracker.—On April 27th, at 7.5 a.m., K. Dawson was awakened to inspect two strange birds on the chimney-pots of the house opposite in Marley Place, Leeds. To his amazement they were Nutcrackers; and appeared tired, remaining motionless for ten minutes before flying away. Inspected at less than 20 yards range through × 10 binoculars, they showed long slender bills, chocolate-brown plumage heavily streaked and spotted with white on head (except for uniform crown), breast and mantle; white under tail-coverts, dark brown short tail with white tips; black legs, feet and bill. The general appearance was corvine and plump.

In *The Field* of 16/6/51, Mrs. E. K. Phillips wrote of a bird seen in her garden at Scotton, Knaresborough during April which she concluded must be a Nutcracker, after consulting *The Handbook*. The bird was seen again in May; and in mid-May

two birds appeared with a juvenile which they fed. I saw Mrs. Phillips after June 16th but could not rid myself of the suspicion that a mistake might have been made

14. STARLING.—All nests at Bronte House were a fortnight later in 1951 than in 1950 (R.F.D.). A bird ringed at Shadwell, Leeds on January 2nd, 1951 was shot near Taastrup, Zealand, Denmark, on July 2nd, 1951 (J.R.G.). At Spurn the largest numbers occurred on March 18th when *c.* 500 were moving south; from August 21st to 26th (500-1,000 daily); and on October 25th and November 10th. Flocks came in from sea at Bridlington at 9.45 a.m. on October 27th (G.H.A.).

18. HAWFINCH.—Birds have been located in a number of wooded localities, with breeding occurrences in several (Bretton, Wharfedale, Ripley, Barton, Beverley, etc.). Mr. Tomlinson's Hawfinches nip off the ends of yew twigs and carpet the ground below. Is this pruning beneficial? Colonel Bates recorded a flock of 11 at Ben Rhydding on March 7th.

19. GREENFINCH.—Up to 1,000 birds roosted in company with Redwings in firs at Catterick Camp through the 1950/51 winter (M.J.M.L.). At Malham Tarn House, after being first seen on March 22nd, five pairs bred; and none was seen after August 9th—the altitude is 1,300 feet (P.F.H.). At Spurn, the few present daily increased to 100 from early October to mid-November. A bird ringed at Spurn on October 27th, 1946 was caught injured on May 19th, 1951. Another ringed at Spurn on October 15th, 1949 was killed by a cat near Loftus, North Riding, on June 17th, 1951.

20. GOLDFINCH.—Two pairs bred in the grounds of Rowntree and Co's factory at York (F.J.). With this species now again distributed in many areas not rarely, I can only mention parties. Most such occurred in the Spring—*c.* 30 near Boynton on March 9th (F.W.); *c.* 20 by the river at Otley on March 3rd (J.P.B.); 32 near Wassand on April 5th (F.E.C.); at least 50 near Cliffe during the first week of April, and even more on April 29th (E.B.B.); 11 at Apperley Bridge on April 28th (R.F.D.). Such flocks probably consist of birds bred not very far away; but we have no certain knowledge of the extent of the winter wanderings of the species, nor if any of the birds that occur on the coast are immigrants. Only odd birds occurred at Spurn in May, and from September to November. Fifteen fed on the ground with Redwings near Menston on January 15th (J.P.B.); and *c.* 20 fed in a garden near Wakefield on December 24th (E.G.). P. F. Holmes has found a few birds each autumn from 1948 about Malham.

21. SISKIN.—Only a very few small winter parties were recorded. At Spurn only odd birds occurred on four days in October. A flock of 40-50 occurred at Flaxton on December 16th (F.J.).

25. LESSER REDPOLL.—A flock of 150-200 birds, two miles west of Harrogate on October 14th, appeared to be entirely of this race (A.F.G.W.).

29. TWITE.—J. P. Utley watched a pair of Twites feeding fledged young at Osmotherley on June 25th. At least four pairs bred in heather and bilberry near Huddersfield (E. C. J. Swabey). *C.* 30 Twites at Spurn on April 4th (J.C., P.E.D.) was unusual.

30. LINNET.—*C.* 100 fed on seeds of mugwort at Keighley ' tip ' on September 19th (H.H.). Always present at Spurn and a plentiful breeder as well as passage migrant; numbers were estimated to reach 600 on two days in mid-September. Many Linnets that had been ringed in 1949 and 1950 were re-captured at Spurn in 1951. A bird ringed as a juvenile male on April 25th, 1951, was recovered in France (La Re'ole, Gironde) on November 7th, 1951.

32/33. BULLFINCH.—Birds noted by R. Slater at Loftus on February 28th and March 1st were believed to be of the northern race, from size and coloration.

40/41. CHAFFINCH.—A female (or a male in female plumage) sang a normal song near Keighley on April 3rd (J.E.B.). On March 23rd at least 3,000 birds in flocks of up to one hundred, were moving southward along the Spurn peninsula throughout the day—' the outstanding feature of the day ' (R.F.D., H.G.B., D.A.I., P.C.Q.). A bird was captured at Apperley Bridge on March 18th, 1951 that had been ringed there on February 4th, 1947 (R.F.D.).

42. BRAMBLING.—In D. A. Illingworth's garden near Harrogate *c.* 150 stayed for several days in mid-January. At High Hoyland on April 7th a Brambling uttered ' a few flat notes followed by a very wooden trill ' (J.C.S.E.). Large flocks of *c.* 500 birds frequented Ellerburn Wood until early April; beech-mast was abundant. By mid-April numbers had fallen to *c.* 100 on April 14th, 30 on April 18th, and only one on the 20th. Scarcity of the species in autumn was no doubt due

to the failure of the beech-mast crop (R.M.G.). Flocks exceeding 100 birds fed on 'fat-hen' growing among kale at Easingwold on December 15th (F.J.). The maximum number noted at Spurn was *c.* 200 on October 15th.

43. Corn-Bunting.—After the one or two local birds had apparently settled in, further birds were evident at Spurn, including *c.* 40 on March 30th and April 17th. A flock of 28 were in the Rowley Rectory garden on April 6th (D.C.U.).

[58. Lapland Bunting.—A bird flushed at Teesmouth on January 28th by M. J. M. Larkin, resembled a Snow Bunting in shape and flight but was uniform medium-brown with white outer tail-feathers. As it uttered a metallic 'tut-ut-ut-ut' in flight, and he had heard this note before from a party of Lapland Buntings in Norfolk, the observer considers the bird was of this species.]

59. Snow Bunting.—M. J. M. Larkin counted 113 at Teesmouth on January 28th; which were still there on April 8th, when there was one in Gristhorpe Bay (A.J.W.). The first of autumn appeared (Teesmouth) on October 7th (A.B.). At Spurn *c.* 50 occurred on February 18th, and *c.* 60 on November 10th—odd birds began to appear from September 30th. Eight birds were noted near Tan Hill on January 1st (P.Y.); and ten on December 26th on the Cotherstone Moors (J.R.S.); and one on the Otley Moors on December 1st (F. E. Peach). Two were on the Whitby shore on October 14th (A.B.W.); three on Silpho Moor on November 3rd (A.J.W.); and four above Rosedale on December 26th (H.O.B.).

62. Tree-Sparrow.—Present at Spurn on May 5th (11), 12th (6), and 15th (6); and odd birds in late September and early October.

69. Woodlark.—No nest was found but birds were heard singing in at least three areas, during March to June.

70. Skylark.—September 16th, October 8th and 28th, and November 5th and 10th, were the dates of the largest numbers recorded at Spurn. Small flocks passed north over Malham Tarn on February 24th; and such passed south there on October 24th (P.F.H.).

72. Shorelark.—One was seen at Teesmouth (Yorkshire side)on January 1st, and on several days, with ten on March 1st (A.B., P.J.S.). One occurred at Spurn on October 18th, with up to four birds from October 25th to November 2nd (R.C.).

75. Tree-Pipit.—A bird in the Vale of Mowbray on April 1st (J.P.U.) would have been the first in most years. The next occurred at Ackworth (N.V.M.), and at Esholt, on April 18th (J.B.N.). A few odd birds passed at Spurn from May 5th to 15th; and from October 1st to 3rd.

76. Meadow-Pipit.—Largest numbers recorded at Spurn—*c.* 100 September 8th—10th; and *c.* 200 on September 26th. On October 7th there was a very strong passage, S.S.E. over Harrogate Stray; possibly thousands passed, together with Chaffinches, Skylarks and Redwings journeying in the same direction (A.F.G.W.). A Meadow-Pipit ringed at Spurn on July 26th, 1951, was shot on November 28th, 1951, at Jerez de la Frontera (Cadiz, Spain).

81. Rock-Pipit.—A few birds occurred at Teesmouth and Spurn in the winter months. Last noted at Teesmouth on March 15th (four), and in autumn one on September 30th (A.B.); at Spurn on March 28th and September 7th. Common near Bridlington, increased in late autumn and winter (F.W.).

84/88. Yellow Wagtail.—The first birds of spring were on passage on April 14th—four at Wintersett Reservoir (J.C.), two at Dewsbury Sewage Farm (H.H.); and one at Dowley Gap on April 15th (W.B.). Passage at Wintersett continued until mid-May, with *c.* 40 on May 6th (J.C.). At Dewsbury Sewage Farm there were *c.* 100 on April 29th (E.G.); and *c.* 200 on August 24th (G.C.); and the last reported bird of autumn was seen there on October 17th (J.C.). On April 29th and May 13th 14 birds hunted in pastures near Hornsea Mere (F.E.C.). Spring passage at Spurn was slight from April 24th; and in autumn extended from July 28th to September 23rd, with ten on August 23rd and September 16th.

Birds with blue-grey crowns and whitish eye-stripes were noted: one near Ponden Mill, Bradford, on June 24th (C. Williamson); one at Skirlaugh on May 18th (F.E.K.); and four at Dewsbury Sewage Farm on September 8th (G.C.).

90. Pied Wagtail.—Birds ringed at the High Royd trap on 19/9/48, and 13/8/51, were recovered respectively at Arthon (France) on 14/2/51, and Moliets (Landes, France) on 6/10/51 (G.R.E.) ; and one ringed August 12th was recovered on November 26th near Faro, S. Portugal.

Knostrop Sewage Works, Leeds, showed *c.* 40 on January 24th (J.R.G.). Twelve were on Bridlington beach on March 23rd (F.W.). Twenty-six were disturbed from

a reed-bed at Rise on April 21st and 25th (F.E.K.). There was small passage at Spurn from March 22nd to April 20th; and from late July into October, with occasional single wanderers later.

91. White Wagtail.—Birds occurred in April at Wintersett (J.G.), Barnoldswick (A.P.), High Royd S.F. (G.R.E.), Dewsbury S.F. (H.H.) and Newmillerdam (E.G.), and Ackworth (N.V.M.). Odd birds were seen at Thoralby, Wensleydale, on May 13th (J.R.G.); and High Royd S.F. two on May 2nd (I.M.). Several birds passed at Teesmouth from September 16th—30th (A.B.). At Spurn there were single birds on April 7th and 12th; and three at Hornsea Mere on May 6th (F.E.K.).

93. Tree-Creeper.—W. Greaves reports a case, from the Halifax area, of building by this species in a wall (cf. *Nelson's B. of Y.* p. 120, quotation from T. Allis of 1844).

96. Nuthatch.—' I was very surprised to hear a Nuthatch singing in Houghton Woods ' on May 12th (E.B.B.). Five broods were reared in Roundhay Park, Leeds (J.R.G.). A bird was noted at Bretton on July 14th (J.C.S.E.).

100/101. Blue-Tit.—A bird ringed in August 1951 at Rawdon was found dead at Kirkstall on October 28th, 1951 (D.B.I.).

114. Great Grey Shrike.—This species was noted in a number of areas: Ben Rhydding on January 7th (E.S.S.), Ruswarp on January 8th (A.B.W.), Maltby Common on March 4th (R.B., F.C.G., A.C.H.), Sleights on March 13th (A.B.W.), Whiteley Wood, Sheffield, on March 24th (D. R. Wilson); near Wass on May 3rd (Mr. Vergette); Spurn up to three from October 3rd to 6th, and one on October 11th and 14th; one Whitby, December 18th (C.E.A.B.); and one Sleights, on December 29th (A.B.W.).

119. Red-Backed Shrike.—Recorded at Spurn, one May 12th to 15th; and one, sometimes two, on most days from September 9th to October 5th. A male occurred at Teesmouth on May 21st (P.J.S.).

120. Waxwing.—Nearly all the Waxwings recorded occurred in the North-East. A party of 18 at Thornton Dale in December 1950 stayed until January, and may have joined with others to form a flock of 30-40 near Pickering on January 9th. On February 10th there were six at Thornton Dale, and 33 near the Costa Beck at Pickering (R.M.G.). Two were noted near Sleights on January 25th, two near Whitby on March 23rd (A.B.W.); a small flock in Bilsdale in January (P.J.S.); three near Great Ayton on March 23rd (E. Appleton); and *c.* 12 on March 24th (A. E. Felgate).

About 24 fed on cotoneaster berries at Kirby Moorside on November 12th (R.M.G.), a bird was seen at Cloughton in November, and two at Scarborough on December 26th to end of year (A.J.W.); and two at Whitby on December 5th (A.B.W.).

Rotherham Naturalists saw three Waxwings near Roche Abbey on November 29th (R.B.). Mr. and Mrs. Hoyle took one from bird-lime on a guelder-rose branch on December 1st—the bird-catcher fled. The bird was taken home, cleaned with 'Thawpit,' fed on guelder berries, hips and sliced grapes, and was ringed by R. Bramhill and released.

The only bird reported in the East Riding came down the chimney of 146 Gillshill Road, Hull on February 5th and was ringed by G.H.A. W. Foggitt reported in the press a few near Thirsk in December.

121. Spotted Flycatcher.—The earliest noted occurred at Chevet Woods, Wakefield, on May 5th (J.C.); and near Barnoldswick on May 6th (K.G.S.); but most birds did not arrive until mid-May or later. Odd birds passed at Spurn from May 12th to the end of the month; and from September 9th to October 5th.

123. Pied Flycatcher.—A male seen by C. Webb near Knaresborough on April 18th was the first reported. Luddenden Dene, Halifax, had a pair (W.G.) (see *Birds of Yorkshire* p. 150). Records at St. Ives, Bingley on June 6th (J.F.K., E.D.R.); near Apperley Bridge on May 9th (R.F.D.) ; at Ackworth on May 5th (N.V.M.); at Aysgarth on May 13th (J.R.G.); and at Gargrave on May 29th (A.P.) were possible evidence of the tendency to spread. In its old-established haunts the bird was plentiful. A few birds passed at Spurn from May 4th to 9th, and one on May 27th. One occurred below Boulby Cliffs on May 29th (R.S.). In the East Riding a hen was seen at Cliffe on May 14th; and a male in Houghton Woods on the same day (R.W.M.); and one just north of York on May 8th (F.J.).

Autumn passage began with two birds at Spurn on August 4th; and was fairly regular from August 17th to September 13th, with by far the most present on August

24th (*c.* 200 G.H.A.); and with odd birds continuing to appear until October 15th. There was a bird on the beach at Redcar on September 30th (A.B.). A Pied Flycatcher ringed at Spurn on 21/8/51 was at Braganza, N. Portugal, on 12/9/51.

126/7. GOLDCREST.—Re-established in most coniferous areas. Odd birds occurred at Spurn in latter half of March and early April. Appeared at Spurn in autumn on September 30th, *c.* 50 on October 2nd; a further wave began on October 11th, *c.* 100 on the 12th, and remained fairly numerous throughout October. There were unusually large numbers near Helmsley during December (A.G.).

129/131. CHIFFCHAFF.—A bird at Ben Rydding trap on April 1st (W.F.F.); and one at Bretton on April 7th (J.C.S.E.) were the earliest recorded. The Bretton bird was a week or more later than usual; one sang there as late as September 29th (J.C.S.E.). On May 12th two Chiffchaffs were singing in Houghton Woods; and two on June 17th (E.B.B.); the species was recorded there in 1940. At Spurn more migrant *phylloscopi* were diagnosed as Chiffchaffs from October 1st to 11th than at any other time (ten on October 3rd); one or two odd birds occurred afterwards—one on October 28th. Such birds when caught should always be examined for wing-formula, and for racial characteristics.

132/3. WILLOW-WARBLER.—Dates of arrival were late. A bird at Saltaire on April 13th (D.F.W.) was the first noted; but the middle of the month had passed before the species became distributed generally. Numbers were fewer than usual. Two nests at Cliffe were 19 inches and 10 inches above ground; the former was almost a ' cup ' nest (E.B.B.). Passed through at Spurn from April 18th to May 15th, with 25 on April 24th; in autumn from August 1st to September 13th (*c.* 150 on August 31st), and a second small passage from October 1st to 4th, and one bird on October 20th.

135. WOOD WARBLER.—Birds at Cliffe on April 23rd (E.B.B.); and near Harrogate (A.F.G.W.), and Farnley (D.F.W.) on April 28th, were in advance of their fellows.

145. GRASSHOPPER WARBLER.—A bird singing at Harewood on May 22nd (P.E.D.), one on Yearsley Moor on May 28th (J.P.U.); one in Haw Park, Wakefield, on May 30th (J.C.), and one at Loftus on June 19th and 26th, were the only records I received.

149. REED-WARBLER.—A bird caught in the High Royd trap on June 30th (B.M.) was the first record of the species for the Halifax area. Present at Scarborough Mere as usual but no proof of breeding (A.J.W.).

153. SEDGE WARBLER.—April 24th at Spurn, and April 25th at Methley (P.B.) were the dates of the earliest records. The last at Spurn occurred on September 17th.

155. ICTERINE WARBLER.—A bird caught at Spurn on September 3rd, with a total length of 152 mm., had olive-green upperparts, lemon-yellow throat spreading to pale whitish-yellow on belly, yellow eye-stripes, slatey blue-grey legs, pale edges to secondaries, bright orange gape, and bill broad at base with bristles. The 3rd and 4th primaries were emarginated. It made a harsh churring note rather like alarm note of Whitethroat (J. B. Mather, G. Harrison, D. B. Iles). W. A. Butterfield described a ' large phylloscopine-looking warbler, with wholly yellow underparts, seen on August 30th at North Dalton, at ranges down to three yards,' as probably of this species. The upper parts were olive-brown, eye-stripe dull buff, bill and legs dark.

161 GARDEN WARBLER.—Noted in the Vale of Mowbray on April 29th (J.P.U.), the main arrival at Bretton came on May 26th (J.C.S.E.). At Spurn an odd bird was noted on May 5th and two on the 26th. Single birds occurred at Spurn on August 18th, and on a number of days until September 13th; and on October 1st and 2nd.

162. BLACKCAP.—The earliest birds were noted at Farnley (P.E.D., D.B.I.), near Knaresborough (J. R. Mather); and near Beverley on April 18th—a good fortnight before the average date. Single birds were seen at Spurn on April 5th and 6th; and in autumn on September 12th, 25th, October 1st, eight on October 2nd, and one on the 3rd, 8th and 14th.

163. WHITETHROAT.—The first were noted on April 18th in the Vale of Mowbray (J.P.U.), at Burton Constable on April 22nd (F.E.K.), on April 23rd near Wakefield (E.G.), and at Catterick Camp where most arrived on the 25th (M.J.M.L.). The species was present at Spurn from April 19th (one) to September 24th (one). The main movements took place from May 4th—14th, and in early August, and again in early September. From October 1st to 7th odd birds occurred with eight on the 2nd.

164. Lesser Whitethroat.—A few passed at Spurn from April 24th to May 9th; and single birds on August 28th and September 9th. F. Jefferson recorded one on April 28th near Haxby. Birds occurred in several areas of the East Riding where it was considered unusual—Haltemprice Lane, South Cave Wold, and Kelleythorpe (F.E.C.), Camerton (J.M.L.), Cliffe (E.B.B.), Beverley and Houghton Woods (G.H.A.). Young were reared at Dormanstown (J.P.U.).

173. Fieldfare.—Fieldfares remained late in spring with many flocks up to May 13th (eight, Grassholme Reservoir, M.J.M.L.); and a bird near Kilnsea on the 14th. A flock of *c.* 100 in Wharfedale between Beamsley and Nesfield on May 25th (W.F.F.) was quite abnormally late. A bird was noted at Spurn on September 19th. Fifteen birds at Malham Tarn woods on October 2nd (P.F.H.), and some at Masham on October 4th, were the first noted inland in autumn. In late October and November the species was very numerous in many areas. On November 4th Fieldfares and Redwings ' covered every bush and tree for half a mile ' by the Calder at Ossett; but Redwings predominated until late December when the positions became reversed (E.G.). A large passage south-west occurred at Methley on November 15th (P.B.). O. C. Hill noted parties of 10/20 coming in direct from sea at Teesmouth on October 27th; as J.K.F. and R.F.D. did at Spurn on November 12th, when G.H.A. estimated the Fieldfares passing south over the Warren at *c.* 800. A bird found dead in a motor lorry at Driffield on November 20th, 1951, and notified to G.H.A. by D. Nicholson, son of driver, had been ringed in central Finland (62° N., 26° 40′ E.) on June 29th, 1951, as young.

174. Mistle-Thrush.—' As numerous as I ever remember it ' around Hull (G.H.A.); and generally, numbers now seem to be restored to those of pre-1947.

175. Song Thrush.—This species was more in evidence about Masham in spring than in any year since 1945, and in some other areas too. A bird that reared a brood of five at Bronte House had been ringed there in January 1947 (R.F.D.). At Malham Tarn several residents arrived in the night of February 23rd-24th and sang on the 24th (P.F.H.). Passage birds at Spurn were more numerous than the Observatory has previously known them, with *c.* 150 on October 15th as the maximum recorded for one day. Birds ringed at Spurn on 9/10/49, and 18/10/51, were recovered respectively at Beynes (Seine and Oise), south-west of Paris, in early November, 1951, and at Sondica, Vizcaya, Spain on October 26th, 1951, the latter bird being in Spain only eight days after it was ringed at Spurn; as was another ringed 10/11/51 to be recovered near Agen (Lot et Garonne), France, on 18/11/51.

178. Redwing.—Several thousand Redwings roosted nightly in fir plantations at Catterick Camp during the 1950-51 winter (M.J.M.L.). A group of Redwings in Whitby Park sang on fine mornings in February from about the 8th—sub-song only (A.B.W.). April 8th at Long Preston (J.K.F.), and near Shipley (P.C.Q.), and April 9th at Spurn were the latest dates reported. The early October rush of passerine migrants included Redwings. On September 30th, 50-60 appeared by the Lockwood Reservoir (R.S.), and twelve appeared at Spurn, and five came off the sea at Teesmouth (A.B.). Birds at Spurn on October 1st were estimated at *c.* 150, and at 200 on October 8th. On October 2nd birds passed over Leeds (K.G.S.), and some appeared near Halifax (B.M.); and in many places during the next few days. A very dark bird seen on February 17th at North Dalton in a good light through ×25 telescope at 50 yards range was considered by W. A. Butterfield to be most probably of the Icelandic race. The mantle and wings and breast were very dark brown. The head was typical and the red flanks dusky and much darker than other birds in the flock. Also see comments on Fieldfare by E.G.

182. Ring-Ousel.—A bird at Walden on March 23th (J.P.U.) was the first reported, the next being one at Gorple on March 25th (G.R.E., B.M.). Passage migrants were noted at Spurn from May 4th to 10th; and on May 6th (M.J.M.L., P.J.S.) and May 10th (A.B.) at Teesmouth. A Ring-Ousel included with a large flock of Fieldfares on Rombald's Moor, Ilkley, on April 29th was also probably a passage migrant. In the autumn birds appeared at Spurn from October 1st to 4th (three), and three on October 12th, and one on October 27th. Three seen at *ca.* 1,900 feet on Malham Moor on October 6th (P.F.H.) were late for British breeders, if such they were.

184. Blackbird.—An old friend at Spurn, T.E.403, ringed on April 12th, 1947, was last seen on June 9th, 1951. Other useful recoveries are:

Ringed 31/10/47 at Spurn, recovered 6/4/51 at Meldorf, Schleswig- Holstein.

Ringed 10/5/47 at Bronte House, Apperley Bridge, re-trapped 7/6/51 (R.F.D.).

Ringed 30/3/49 at Horsforth, found dead, Great Eccleston, Lancs. 11/4/51 (P.E.D.).

Ringed 10/3/51 at Ilkley, by Wharfedale Naturalists, recovered Hillerōd, Zealand, Denmark, 5/7/51.

This last bird was caught the furthest west of any Blackbird that has homed across the North Sea after being ringed in Yorkshire. A bird that was adult when ringed on 8/1/48 had his third known mate in 1951, by which he had two broods (P.E.D.). In a nest in the bottom bracket axle of an upturned cycle standing on a table near an open window at Thirsk, four broods were reared, despite three ferrets in a cage in full view (N. M. Hepworth).

P. F. Holmes sums up the Blackbird's 1951 year at Malham Tarn thus: A small resident winter population, a small influx at end of February, small passage through about March 29th, an influx of more breeding birds in the beginning of May. Suspected further influx of singing males at end of May. October 2nd to 10th, a distinct passage that had gone by the end of the month.

A Blackbird at Hull (144 Gillshill Road) with a clutch of two, swallowed the *faeces* of the young until they left the nest; and on the following day the first egg of a clutch of five was laid in the same nest.

186/7. WHEATEAR.—A bird at Malham Tarn on March 21st (P.F.H.) and two at Wintersett (J.C.) were the earliest recorded. The first at Spurn occurred on March 30th, after birds had been seen in a number of inland areas; and the latest on November 4th and 21st. There was one on the beach at Auburn on November 1st (F.W.) and one on Rowley Hill on November 9th (D.C.U.). Thirty-six birds occurred in one area near Redmires Dam, Sheffield, on April 9th (D. R. Wilson).

A curious Wheatear at Spurn on July 31st 1951 was described by W. A. Butterfield as resembling a common Wheatear whose head had been dipped in flour. Subsequently Dr. Ennion told W.A.B. that a juvenile near Seahouses, moulting to first winter plumage, seemed exceedingly similar, and on comparing descriptions it was thought they might have been the same bird. A bird picked up at Spurn by C. Skinner on May 5th—7th week-end and sent to A. Hazelwood was a male Greenland Wheatear with a wing measurement of 103 mm. (or three in excess of the maximum recorded in the *Handbook* for the typical race).

197. WHINCHAT.—Passage took place at Spurn from April 24th to May 25th, and from August 9th to 12th, September 1st to 4th, 17th to 19th, and 27th to 28th. April 22nd at Walton (J.C.), Gargrave, Dewsbury S.F. (H.H.) and at Malham Tarn (two) was the earliest date.

198/200. STONECHAT.—Odd birds were seen in several places without any evidence of breeding: Foggathorpe, one on March 17th (E.B.B.); one on Boulby Cliffs on April 13th (D.R.S.); one near Stamford Bridge on June 14th (A.F.A.); one Whitby, August 11th (T.W.A.W.); two (male with female or juvenile) at Swillington Ing on August 12th (I. G. Brown, R. Cr.); one Allerton, Bradford, on October 16th (W. Cunningham); a male on Ilkley Moor on October 13th (E.D.R.); two males, Auburn (Bridlington) on October 1st (F.W.); and a few periodically at Spurn up to February 18th, and from September 22nd to the year end. A bird ringed at Spurn on 16/10/50 was re-captured on 28/10/51.

201. REDSTART.—A nest was found at Millington (scarce in East Riding) on July 12th (H.O.B., W.A.B.). The first occurred at Farnley on April 18th (P.E.D., D.B.I.). At Spurn two appeared on April 20th and odd ones continued until May 20th, with the main spring passage from May 9th to 13th. In autumn birds passed from August 23rd, the main passages from September 7th to 13th, and September 30th to October 6th, with odd stragglers from October 12th to 16th. Three passed at Teesmouth on May 10th, and one on September 23rd (A.B.).

202. BLACK REDSTART.—On May 15th a Black Redstart was seen on the old blitzed buildings in Hull Market Place where it could generally be found until mid-July. G.H.A. and F.E.C. heard two birds singing there.

On July 4th, 1951, H. Pickles watched a hen bird feeding feathered young in a crevice of an old wall in ruins near Helmsley, which R.M.G. confirmed on the 7th, and E.W.T. saw on the 8th.

A male was reported several times near Northallerton in early summer by a man familiar with the species in Austria (J.P.U. who was unable to locate the bird). A female was seen on Boulby cliff on April 13th (D.R.S.). Occurred at Spurn on several days in April and May; and in October. I caught a bird at Spurn on October 27th,

1951 which bore a Heligoland ring, and proved to have been ringed at Halle, Saxon-Anhalt, Germany, as young on July 15th, 1951 (Miss E. P. Leach).

203. NIGHTINGALE.—Noted in three places in south Yorkshire in spring (G.E.H.); and nested (W. Bunting). Single birds were caught at Spurn on April 24th and May 6th. A bird was reported as singing near Wass in May but was not confirmed when R.M.G. investigated on May 22nd.

205. BLUETHROAT.—Three occurred at Spurn during the first week of October, one of which was ringed. Although the observers did not think it possible to diagnose from the juvenile plumage whether *suecica* or *cyanecula* was involved, there can be little doubt the bird was a Red-spotted Bluethroat.

207/8. ROBIN.—One ringed at the High Royd trap on April 14th, 1947 was not seen again until found dead 400 yards away on June 22nd, 1951.

A bird ringed at Spurn 23/10/49 was recovered at Seaterstöa, Central Norway, on 7/4/51.

A bird ringed at Spurn 1/10/51 was killed at Piombino, Italy (*c.* 40 miles south of Leghorn) on 12/11/51.

These two recoveries are highly interesting, connecting passage migrant Robins at Spurn in both directions. The Italian-recovered bird is likely to have travelled south-westerly to Spurn, then south-easterly to the Italian coast. It might have travelled much further south—Robins have been known to come on to ships in the Mediterranean—and some of its fellows may have done so. Conjectures are awakened whether at Piombino the bird had got back to a normal route to winter quarters from which it had been diverted towards Spurn by the westward drift across the North Sea. The Robin was one of a very large number at Spurn in the first week of October, an 'invasion' that affected the whole Yorkshire coast-line, and far to the north and south of it. Hundreds were noted in the dunes at Teesmouth during the first few days of October (A.B.) 50—60 at Cayton Bay on October 2nd (E. A. Wallis); and many at Robin Hood's Bay. Major Batchelor noted unusual numbers at Holmpton. Numbers recorded in the Spurn books were October 1st 300+, 2nd 500+, 3rd 500+, 4th 300+, 5th 300+, 8th *c.* 100, after which numbers declined. Some 600 birds were trapped in the week, from which it would appear the log-book figures were probably heavily under-estimated. Passage migration of Robins occurs every year at Spurn varying in strength and as to date; and more frequently there are two waves, the strongest towards the end of October; but only one occurred in 1951. Information from other Observatories and from abroad is being collected for collated study and subsequent publication. Without continuity of watching such 'invasions' may pass unobserved. This was certainly the largest 'invasion' since 1945; but history records others on similar scales. Such migrational waves may include birds of more easterly origin than we yet know.

210/212. HEDGE-SPARROW.—Two birds I examined at Spurn on October 30th and November 1st showed bright rufous upper parts, and greater differences between the lengths of the 6th and 7th primaries than between the 2nd and 3rd, and were presumably of the continental race. Another one on October 31st had the characteristics of the British race.

220. SWALLOW.—The first birds of spring were noted on April 7th—at Ripley (A.F.G.W.), Mickle Ing, Wharfedale (W.F.F.), Thorner (P.B.), Cliffe (E.B.B.), and one at Spurn, where the next occurred on April 15th. Many areas were not colonised until late in April. Thousands of Swallows and other hirundines were congregated at Wintersett Reservoir on May 6th in a cold N.E. breeze (E.G.); and smaller numbers at Swillington Ing (J.R.G.). On the 12th *c.* 150 passed south down the Spurn peninsula; and *c.* 500 on May 19th; and *c.* 200 on May 24th—similar southward passage occurs there in most years. The peak autumnal movement southward at Spurn passed on August 22nd (*c.* 4,000); and considerable passage took place from September 1st to 5th. There was strong and continuous passage south-easterly at Ossett on September 7th from 3.30 p.m. to 6.0 p.m. (G. Carr). A bird at Cleasby on November 2nd was the last recorded (J.P.U.). The hen bird of a pair (both ringed) at Kirkby Fleetham, nesting in the same spot where a brood had been ringed in 1950, proved to be one of the 1950 brood (J.P.U.).

222. HOUSE MARTIN.—April 17th at Catterick Camp was the earliest date for the species; and birds continued to be reported as 'first seen' in some areas until early May, with main arrivals later (May 10th North Dalton W.A.B.). At Spurn, October 3rd (*c.* 200) was the date of the largest passage; and the species was last seen on October 18th (two). Five birds flew over Sleights on November 21st (A. B.W.).

223. Sand Martin.—The first occurred on April 2nd at Thirsk (N.M.H.), and Dewsbury S.F. (H.H.). The bulk arrived in the Catterick Camp area on April 18th (M.J.M.L.). Six were at Hornsea Mere on April 5th (F.E.C.); and on April 8th, two at 1.30 p.m. had increased to 20 by 4.0 p.m., on which date the first occurred at Spurn. There were four over Boynton Lake on April 6th (F.W.), and ten at Ripley on the 7th (A.F.G.W.). There was continuous passage south in waves of 10—20 at Swillington Ing on July 18th (E.G.); and *c.* 800—1,000 congregated there on August 8th—the only ' hirundo ' present (B.S.). A few still flitted about nest-holes at Gouthwaite on September 2nd (A.F.G.W.). Many (*c.* 200+) moved south at Spurn on August 22nd, where the last occurred on September 26th.

225. Swift.—Odd Swifts appeared on April 21st at Wintersett (J.C.); on April 22nd at Bolton Woods (E.G.), and at Bradford (D. Vaughan); on April 23rd at High Royd (G.R.E.); on April 23rd (one) at Thornton Dale (R.M.G.); and on April 28th at Ripley (D. M. Jesper); at Methley (two) (P.B.); and six at Wintersett Reservoir (J.C.). Why so many April Swifts in such a late cold spring? Most birds did not arrive until well into May. At a small colony near Danby (Cleveland) the first was seen on May 20th; ' this colony generally seems late,' the young had flown by August 13th (J.L.). On July 19th between 6.45 and 8.0 p.m., 150+ passed N.W. over Apperley Bridge, perhaps a movement via the Aire Gap (R.F.D.). 200—300 birds passed easterly at Dewsbury S.F. on August 19th (G. Carr). At Winestead the earliest were six on May 6th (H.O.B.). (One Hornsea Mere same date F.E.K.). From July 9th to 18th there was heavy southward passage at Spurn with estimates of 2,000 birds on the 9th and 12th; and again on a smaller scale from July 26th to August 7th, after which a few birds were seen almost daily until September 19th, with one on September 27th, and on October 17th (the last bird of the year).

227. Nightjar.—Nested near Tickhill—' there wasn't an egg when the bird was put up at 2.30 on July 14th but there was at 5.0 p.m.' (H. Heald, A. C. Hoyle, J. S. Griffiths); and probably in the Garsdale Valley—the first for 20 years (H.W.B.); and in areas of the East Riding. One flew by the roadside at Weeton (Patrington) on September 2nd (F.E.K., J.M.L.). General distribution was normal.

232. Hoopoe.—Mr. A. Pilkington informs me that two Hoopoes were seen between Skipton and Embsay on September 19th by Mr. N. Frankland whom he regards as perfectly reliable.

234. Kingfisher.—Of three birds that came to grief in a mill reservoir at Bradford, two were covered with oil and the third was thought to have dived into hot water from the engine house (F. Brock). The species was fairly frequent on streams in many districts.

236/7. Great Spotted Woodpecker.—One at Spurn on July 29th.

238. Lesser Spotted Woodpecker.—Recorded from Lindley Wood where bred (H.J.W., P.E.D.), Bretton, Chevet Woods, Roundhay Park, and near Keighley, and Masham.

239. Wryneck.—Recorded at Spurn on April 24th and 25th, and on May 10th and 11th. Two were ringed.

240. Cuckoo.—A bird at Riffa (Wharfedale) on April 16th was the first reported (H.M.). Two Cuckoo's eggs were found in a Hedge-Sparrow's nest (four blue eggs) at Cliffe, but only one young Cuckoo remained when next inspected—the rival egg or young bird could not be found (E.B.B.). From April 24th to June 18th Cuckoos were recorded daily at Spurn; and from July 12th to September 3rd. A bird ringed at Spurn 16/5/49 was recovered near Souk-el-Cerba, Tunisia, on 17/4/51. A bird ringed at Spurn 6/6/49 was re-trapped there on 22/5/51.

249. Little Owl.—Nested in hedgerow ash at Kilton, Cleveland (R.S.); and at Wigginton (F.J.). Reported at many places. One was caught in a stoat trap near Dale Head, Penyghent (1,400 feet altitude) in April; and others were seen in the Malham Tarn area (P.F.H.). One was caught roosting in a hole at Esholt on May 3rd—the hole held three field voles, one common shrew, one long-tailed field-mouse, and beetle remains (D.B.I.). Several were noted in Wharfedale between Otley and Ilkley (Wharfedale N.S.). A bird picked up from the roadside near Patrington on November 7th was released in good condition at Apperley Bridge (R.F.D.). A bird occurred at Spurn on April 7th, and on many days from September 23rd to November 29th.

250. Long-eared Owl.—Noted at Spurn on five days from March 24th to April 15th; perhaps returning birds that occurred in late October, 1950. None was noted in Autumn 1951. The only nest recorded was in an old pigeon's nest in

the East Riding (E.B.B.); but R. Slater saw the species in three localities in the North East in spring. A bird was seen near Keighley on June 24th (E.D.D.); and near Sutton in the Forest on December 27th (F.J.); and at Stocks Reservoir on June 10th (J.K.F.).

251. Short-eared Owl.—Two pairs each produced six eggs in the North East, one nest being subsequently deserted (R.S. & A.B.W.). The species was noted in several other areas in spring without breeding being proved. A bird remained about Swillington Ing for a month from March 11th (I.G.B., K.D.). There were a few occurrences in autumn and winter.

253. Tawny Owl.—Recorded at Spurn on September 10th (J.L., G.H.A.), and on September 29th (G.R.E.).

254. Barn Owl.—A pair bred at Lower Dunsforth in the same cote with pigeons (J. R. Mather).

259. Peregrine Falcon.—At least three pairs frequented crags in the breeding season; but there was no evidence of young reared, and two pairs were known to be robbed. On the Briscoe Moors, pigeons, Black-headed Gulls, and only an occasional grouse, were the prey of a visiting bird (J.R.S.). Odd birds were seen at Marishes (Thornton Dale) on February 7th (R.M.G.); at Spurn—March 20th to 27th and on May 7th; August 22nd, September 15th and October 2nd/3rd; at Teesmouth on September 23rd (A.B.); at Cayton Bay on December 16th (A.J.W.); and near Cotherstone on December 16th (J.R.S.).

262. Merlin.—Young were reared from two nests in the north-east (R.S., P.J.S., A.W.B.). J. R. Scott watched the plucking posts of a pair in the north-west, finding remains of many pipits, a few Wheatears, and one Blackbird. A pair nested near Ilkley (W.F.); and on the Howgill Moors (H.W.B.). Merlins were noted several times in the winter months—at Spurn, Teesmouth, near Rawdon, and Esholt. A starling was snatched from a large flock at Marsh Ghyll by a Merlin on March 18th (A.C.M.D.).

263. Kestrel.—A pair bred on the side of a Middlesbrough slag-heap (M.J.M.L.). Always present at Spurn, maximum passage from September 11th to 17th (12 birds noted on the 17th).

268. Rough-Legged Buzzard.—With T. M. Fowler I inspected the remains of one near Semerwater on September 26th.

269. Common Buzzard.—Three pairs reared young in the north-west; and three more were unsuccessful; whilst another pair nested most probably (H.W.B.). Odd birds were seen in several moorland areas; and one at Spurn on September 16th/17th (M.J.M.L., F.E.K.); and one on April 7th.

271. Marsh Harrier.—A bird sent to the York Museum had been shot on Skipwith Common on May 5th (F.J., E.W.T.). A bird was seen near Warren Cottage, Kilnsea on May 6th (R.B., C.G.).

272. Montagu's Harrier.—A young bird was shot near Pateley Bridge in late August and the remains identified by A.F.G.W. A bird occurred at Spurn on April 17th (R.F.D.). Breeding in Yorkshire was not proved; but birds were seen occasionally from spring to late summer, and it is believed that a pair bred.

273. Hen Harrier.—A female occurred near Rosedale on February 10th (H.O.B.). One was watched soaring above Saltersgate on March 18th (R.M.G., E.W.T.). A female that had been wounded and kept in a large cage in the Doncaster area was inspected in early May (G. E. Hyde). One occurred at Hornsea Mere on February 25th (F.E.K.); and one at Spurn on March 26th (H.G.B., P.C.Q., D.A.I., R.F.D.).

277. Sparrow-Hawk.—' As usual an influx ' to the Methley area in September (P.B.). Occurred at Spurn on a number of days in spring and autumn.

284. Osprey.—One flew over the Spurn lighthouse on May 5th (R.M.G., B. Pickering). One was shot by a keeper near Driffield on May 6th and sent to the York Museum (J. Stockhill, F.J.). The dark eye-stripe, light underparts and other features of a bird at Spurn on July 8th were clearly seen (M.J.M.L. and A.McA.). One trapped by a farmer at Newton-in-Bowland on September 17th in an emaciated condition, was preserved (A.P.).

287. Spoonbill.—Yorkshire Spoonbills are exceedingly rare, and Nelson only recorded nine occurrences, to which, prior to 1951 I could only add two more. Ten flew south over Warren Cottage, Kilnsea, on May 24th, 1951, at 9.10 p.m., and were fully described by B. Pickering and Mr. and Mrs. Green, who clearly saw the distinctive bills. A. Baldridge saw one on Teeside on April 19th. On July 15th,

four members of the Spurn Committee watched an immature bird at their leisure for an hour, in the air, and as it consorted with Great Black-backed Gulls on the mud near to the Chalk Bank. As the tide advanced the Spoonbill still waded when the gulls had to swim. I also saw the bird on July 20th and 25th. On September 17th three birds were described in the Spurn Log as ' probable Spoonbills.' They flew very high over the lighthouse, and if not Spoonbills ' must have been ' White Storks.

289. COMMON HERON.—Occupied nests were recorded for Yorkshire heronries as follows: Scampston, 10 (R.M.G.), Ripley, 3 (A.F.G.W.), Kiplin, 2 (J.P.U.), Healaugh, 20 (W.B., P.E.D.), Harewood, 12 (P.E.D.), Gargrave, 22 (W.F.F.), Hornsea Mere, 27 (B. Sterriker, F.E.C.). Several nests were robbed at Harewood. Four nests at Healaugh contained only one young each on April 7th (B.S.).

[295. NIGHT HERON.—Mr. R. Scrope described a bird in his grounds at Yarm for about a week up to May 13th. It was about two-thirds of the size of the Common Heron, stouter build, shorter legs, darker mantle, and appeared to have light underparts and quicker wing-beats. It perched in trees for most of the day and seemed to feed in evenings. Unfortunately Mr. Scrope was then absent for a fortnight during which the bird disappeared (J.P.U.)]. Although a more detailed description was desirable it is difficult to imagine what other species the bird could have been.

297. BITTERN.—A single bird at Hornsea Mere on January 7th (R.W.M.).

300. WHOOPER SWAN.—Occurred on the usual waters on various dates. The largest numbers were at Gouthwaite—18 on February 25th, 13 on December 6th—where the first of autumn came on October 21st, two birds and a third later in the day (A.F.G.W.). A bird at Farnley Lake during most of the summer may have derived from Harewood; or have failed to migrate north for health reasons. Three occurred at Hornsea Mere on January 7th and 13th (F.E.C., R.W.M.). There were 40 at Boynton on March 14th (F.W.).

301. BEWICK'S SWAN.—Five birds at Wintersett from February 7th to March 10th (J.C. and others). On March 19th three appeared, and were still there on March 24th (J.R.G.). There were five at Stocks Reservoir on February 27th (A.P.). Three appeared on the Wharfe near Nesfield on March 4th (A.C.M.D.) and on the 22nd (H.J.W., O.M.P.). At Thornton Marishes, seven birds (2 immature) on January 13th became eight from February 7th to 13th; and on the 24th there were nine (two immature) (R.M.G.).

303/307. GREY GEESE.—Skeins of wild geese always fascinate; but those recorded cannot all be detailed. No doubt the Pink-footed Goose predominated since it is the typical goose of the Humber-side; but other species occur on occasion. Records are always more frequent towards the end of the year than in the early months when skeins were reported only from Bingley on January 12th (S.L.), Cottingley, January 15th (D.F.W.), York February 3rd (E.W.T.), Cliffe, on March 16th and 24th (E.B.B.); 66 southward over Hornsea Mere at 12.55 p.m. on February 10th and another skein ten minutes later (F.E.K.). Autumnal geese were first seen in the north east on September 18th at Thornton Dale; and on December 11th 500—600 birds flew N.W. to ' milder conditions on Solway ' as the day's weather report had it (R.M.G.). The many records from the East Riding included a note by W. A. Butterfield that morning flights from the Humber over North Dalton were very much more frequent and regular than return flights southwards towards evening. Forty-two occurred at Spurn on October 29th, and odd birds on other dates. The notes that reached me indicated no diminution in numbers.

303. GREY LAG-GOOSE.—One occurred at Thornton Marishes on May 1st (R.M.G.). Forty-five flew westward over Briscoe Moor on October 18th (J.R.S.).

307. PINK-FOOTED GOOSE.—There was one with Canadas at Harewood on October 28th (D.B.I.); and of two there on December 26th, one wore a green ring on its right leg. Green being the colour of the rings used by Mr. P. Scott in 1951 we are informed it is practically certain that this bird had been ringed on the Solway-side in October (P.E.D.).

[BLUE SNOW-GOOSE.—A strange goose near Filey, seen and described by W.A.B. and H.O.B. to Mr. P. Scott was thought by him to ' sound like a Blue Snow-Goose, but more probably a hybrid ' and ' an escape anyway.']

312/13. BRENT GOOSE.—Two occurred in the south bay Bridlington, on April 9th (F.W.).

314. CANADA GOOSE.—Birds bred as usual by a number of waters—Walton Hall, one pair; Nostell Dam, one pair (J.C.); Bretton Lake, 55 adults and 38

young on June 6th (H.H.); Fewston, one pair; and many pairs in Swinton Park. On May 18th Lord Swinton showed me two apparent broods of 13, each attended by a pair of adults. Other smaller broods were in evidence.

The count of wildfowl organised by A. F. G. Walker to cover 15 waters around Harrogate only produced 92 Canadas on October 28th, 1951 as against 218 on October 22nd, 1950. On December 2nd, 45 birds at Gouthwaite were the first for weeks (A.F.G.W.). The decline may be only apparent; the Swinton birds seemed to remain in their home district until December.

315. SHELD-DUCK.—Five appeared on Ogden Reservoir, Halifax, on February 26th (H. Rhodes). There were two at Swillington Ing on March 20th (P.E.D.), and on May 14th (did not breed there); and ten at Wintersett on March 20th (P.E.D.). The species was common about the confluence of the Ouse and Trent on May 13th (P.A.H.). Odd juveniles appeared in autumn at Dewsbury S.F. from August 19th to 23rd (H.H.); at Swillington Ing on September 4th (B.S.); and at Blackton Reservoir on November 6th (J.R.S.). With Spurn watched consecutively from July 8th, a little was seen of the moult-migration, with several parties passing seaward on July 15th totalling to 260 birds; and smaller parties on the 24th, and 25th, and two parties on the 31st. Birds occurred on a number of days on Cherry Cob Sands (20 on June 1st F.E.K., J.M.L.). On February 25th *c.* 100 crossed the south bay, Bridlington in small parties and others on March 1st and 20th, and five on December 4th (F.W.).

317. MALLARD.—Space will allow no more than citation of maxima of the common ducks, with features of special interest. Eccup, *c.* 525 Mallard on January 14th (P.E.D.), and *c.* 1,000, December 16th (J.R.G.); Swillington Ing, *c.* 650, September 30th (K.D.); Copgrove, 180, November 24th (A.F.G.W.); Hury, *c.* 125, in mid-November (J.R.S.); Langsett, *c.* 250, on December 23rd (J.C.S.E.); Castle Howard, *c.* 480, on December 30th (E.W.T.) ; and Stocks Res. *c.* 400 on December 6th (J.K.F.). At Wassand, *c.* 400 on January 21st decreased to *c.* 150 by January 28th and until March 25th. On April 8th two pairs were present; on November 4th *c.* 900 (F.E.K.). Great numbers frequented floods near the Market Weighton canal nightly in January, together with large numbers of Teal and Wigeon (E.B.B.).

319. TEAL.—Hornsea Mere, *c.* 300, January 21st—only six on April 8th (F.E.K.); Swillington Ing, *c.* 500 flew out of an area of reeds on December 30th (E.G., G.C.), and on December 2nd 683 birds included 467 males, 216 females (K.D.).

320. GREEN-WINGED TEAL.—A bird was seen near to a pair of common Teal on March 20th and 21st at Wintersett Reservoir by J.C., P.E.D., I.G.B. (for details see *The Naturalist*, 1951, p. 138).

322. GARGANEY.—A pair remained at Swillington Ing from April 27th through May, with a third bird present on May 18th (W.B., J. Armitage, P.E.D., J.C., K.B., K.D., H.H.). Two were noted there on September 9th (K.D.).

323. WIGEON.—Maxima—*c.* 200 at Hornsea Mere on January 21st, *c.* 400 on the 28th. (F.E.K.). Swillington Ing, 212 on September 30th (K.D.); Stocks Reservoir, *c.* 300 on December 6th (J.K.F.); Cawton Bottoms, *c.* 320 on November 29th (A.B.); Gouthwaite, *c.* 150 on October 28th (A-F.G.W.). At Swillington Ing last seen on April 11th, and next on September 2nd (K.D.). At Spurn last seen on May 17th, and first noted on September 9th, with *c.* 400 on October 30th. There was an adult drake in breeding plumage at Gouthwaite on June 24th (A.F.G.W.). Three were on Fairburn Water on August 23rd (P.E.D., D.B.I.), and 24 at Stocks on July 24th (J.K.F.).

325. PINTAIL.—Inland occurrences were: Eccup, five on January 14th (P.E.D., D.B.I.); Gouthwaite, a male on January 21st (P.E.D., I.G.B.), two on August 5th and 7th (A.F.G.W.); Ripley, a male on December 23rd to 25th (A.F.G.W.); High Royd S.F., two ducks on September 23rd (G.R.E., B.M.); Swillington Ing, a drake and two ducks on February 25th (K.D.); at Wintersett, a drake on March 21st (K.D.); at Cherry Cob, 15 on January 7th, three, September 4th, eight September 19th, two, September 25th (J.M.L.). At Hornsea Mere—three males, two females on February 25th, another on March 4th, a female on September 23rd, a duck and drake on October 21st, and one drake and three ducks on November 4th (F.E.K.). There were seven at Teesmouth on March 11th (M.J.M.L.). At Spurn four occurred on September 12th, and odd birds on September 14th, October 24th and 27th.

326. SHOVELER.—Birds were recorded: three High Royd S.F. July 15th (B.M.); 12 Ripley, September 29th, and five in October to November 3rd; four Gouthwaite, September 30th and to October 28th (A.F.G.W.); 60 Swillington Ing,

September 30th (K.D.), and five on December 2nd (K.D.), four on December 26th (K.B.). Hornsea Mere seven males, four females on March 3rd (F.E.C.), and up to April 15th, and in autumn (F.E.K.); Cherry Cob Saltings, several in August and September (J.M.L.).

328. POCHARD.—At Wintersett *c.* 436 on March 3rd, decreased to *c.* 350 March 20th, *c.* 150 March 24th, *c.* 85 March 27th, three males only April 11th (J.C., P.E.D., E.G., H.H., etc.). Bred at Fairburn (K.B.) and at Rise (F.E.K.). Maximum at Hornsea Mere *c.* 200 January 21st (F.E.K.).

329. FERRUGINOUS DUCK.—A drake was seen at Wintersett Reservoir on March 18th and 20th (Dr. I. G. Brown, P. E. Davis, J.C.). For details see *The Naturalist*, 1951, p. 138.

330. TUFTED DUCK.—Maxima—Fairburn, 200+ on February 11th, 55, Wintersett, on November 6th. Bred by a number of waters.

331. SCAUP.—There were two males and two immature birds at Swillington Ing on February 21st (P.E.D., D.B.I.); three first-winter males at Stocks Reservoir on February 27th (A.P.); one with Tufted Ducks at Malham Tarn on October 28th (A.P.); two on the Calder by Dewsbury S.F. on October 17th (J.C.); one at Hornsea Mere on March 18th, 25th, 27th, two on April 8th and on October 7th and 14th (F.E.K., J.M.L.); and three at Spurn on September 23rd (M.J.M.L.).

332. GOLDENEYE.—The usual few birds occurred on most of our deeper waters up to late April and in autumn. Two drakes and four ducks were at Fewston on May 11th (E.S.S.). The first appeared at Gouthwaite on October 14th, where 17 on January 21st was the maximum (P.E.D.). E. D. Robinson timed 20 dives on November 10th at Oxenhope the longest being 33 seconds and the average 23.2 seconds. There were 25 males and 10 females at Hornsea Mere on February 17th (F.E.C.).

334. LONG-TAILED DUCK.—Three adult males flew across the South Bay, Bridlington, on January 17th (F.W.). One lived in Filey Bay during the latter half of December (A.J.W., P.G.).

337. COMMON EIDER.—A bird remained about Teesmouth all through the 1950/51 winter; a drake occurred on May 10th and stayed for some weeks (P.J.S., A.B.); two drakes occurred on August 30th and one on September 16th (A.B.). A male was seen offshore near Skinninggrove on February 28th (R.S.).

339. COMMON SCOTER.—The spring maximum occurred at Teesmouth with *c.* 200 on March 1st and 15th; and on August 30th and September 3rd *c.* 100 were present (A.B.). Birds were noted at Spurn fairly regularly from July 15th with *c.* 300 on August 1st. Inland occurrences were fairly numerous from July 14th when one was seen at Newmillerdam (G.C.). Some other records were: Swillington Ing, a male and female on August 12th (H.H.); a juvenile at Ogden Reservoir, Halifax, on October 16th (I.M.); and a female at Fewston, and one at Gouthwaite on October 28th (A.F.G.W.).

340. VELVET SCOTER.—A bird consorted with Common Scoters at Teesmouth on January 1st. There was a duck at Chelker Reservoir on February 4th (W.F.F.). At Spurn six were recorded on July 10th (H.G.B., R.C.) and three on August 7th (J.C., S.U.). Five flew south across Filey Bay on October 21st (A.J.W.).

342. GOOSANDER.—Records of Goosanders were numerous. Eccup Reservoir with 33 on February 14th (I.G.B.) and on March 11th (P.E.D.), and 35 on February 25th (D. A. Illingworth); and Stocks Reservoir with 41 on February 24th, and 54 on April 8th, retained their titles to be considered as headquarters for the species. E. Grace recorded five 'redheads' at Gouthwaite on July 8th. Miss Crackles watched display at Hornsea Mere on February 24th—all the saw-bills seem to pair before leaving this country. Fifteen males and 28 females on February 17th was the maximum at Hornsea Mere (F.E.C.). A female appeared on Scarborough Mere from November 25th to December 25th (A.J.W.). There was a 'redhead' at Thornton Marishes on December 7th (R.M.G.).

343. RED-BREASTED MERGANSER.—A bird occurred at Hornsea Mere on February 17th and March 3rd (F.E.C.). There was an adult male at Gouthwaite on December 2nd (A.F.G.W., D.A.I.); and on December 26th a male and a female at Harewood (A.F.G.W., D.B.I.). A. Baldridge saw three 'redheads' at Teesmouth on October 28th.

344. SMEW.—At Harewood a party of four on January 14th and February 11th included one male (P.E.D.). At Gouthwaite there were a male and two females in January and February; which were last seen on March 4th (A.F.G.W.). In autumn

a ' brownhead ' appeared on November 11th, an immature male on December 2nd, and an adult male on December 16th stayed until the year end (A.F.G.W., D.A.I.). There was a pair of adults at Malham Tarn on January 23rd (P.F.H.). A female at Wintersett on December 29th, and for a few days thereafter, consorted with six Goldeneyes (J.C.). One appeared at Hornsea Mere on February 17th and March 3rd (F.E.C.); and one on Scarborough Mere on December 16th (E. A. Wallis).

346/7. Cormorant.—The species occurred normally both on the coast and inland.

348. Shag.—The species was seen during spring and summer about Bridlington and at Bempton (eight on April 18th F.W.). There were nine at Flamborough Head on March 28th (E.G.); one off Teesmouth on September 25th (A.B.); and one at Spurn on September 16th (F.E.K.).

349. Gannet.—M. Darlow reported three pairs at Bempton each with a young one in mid-August. H. O. Bunce saw five adults and two young on August 4th. F. Wilcocks also saw young. Many people saw the adults sitting (W.H.N.H., E.C.J.S., H.H.). Coastal passage, and occasional birds fishing were normal. On June 23rd, 18 birds fished in Bridlington South Bay (F.W.).

350. Storm Petrel.—A bird found dead below wires in the garden of Mr. G. H. Smith at Riddlesden on December 30th was taken to Keighley Museum.

363. Sooty Shearwater.—G. R. Edwards described two birds that passed south offshore at Spurn on November 21st as having typical shearwater flight-action, being considerably smaller than immature gannets, and with an entirely black plumage. This left him ' in no doubt that they were Sooty Shearwaters ' (*Puffinus griseus*). Records of this species off the Yorkshire Coast have mainly occurred from August to October, but Nelson cites two records for November, and two for December.

368. Fulmar.—Birds were back on Scarborough Castle Rock by December 26th, 1951, when a pair were ' courting.' Odd birds were seen at Spurn in April; and regularly from July 28th to August 15th.

370. Great Crested Grebe.—Up to 100 birds inhabited Yorkshire waters in summer. Fairburn waters supported 12 pairs, of which a number bred successfully (W.B.). At Malham Tarn, with nine birds present, three pairs bred—on July 29th there were three young nearly fully grown, three aged about three weeks; and three small young (P.F.H.). At Hornsea Mere a single bird appeared on February 11th; others came until there were 28 on April 8th. Several pairs bred and a nest held three eggs on April 29th (F.E.K.). Two pairs had five young each on June 23rd (B. Sterriker, F.E.C.). Eight birds were there on November 11th. On February 9th and 10th there were *c.* 70 grebes in Bridlington Bay of which the majority were of this species (F.W.).

371. Red-necked Grebe.—On Chelker Reservoir on March 19th, J. R. Govett had good views of a grebe smaller than *cristatus* but too large for *nigricollis*. It was just beginning to change its plumage, and had a straight black bill. Grebes of this species appeared in Bridlington Bay on January 25th, *c.* 20, January 31st, *c.* 10; and several with Great Crested Grebes on February 9th and 10th (F.W.).

373. Slavonian Grebe.—A grebe at Roundhay Park Lake on October 24th in transition plumage was diagnosed as Slavonian from size and straight bill (J.R.G.). Two small grebes at Hornsea Mere on October 28th had short straight bills, and white cheeks almost meeting on the napes below the dark crowns, which did not extend below the eyes (F.E.K.). One occurred at Harewood on 16/1/51 (J.K.F.).

374. Black-necked Grebe.—There was a pair on Lindley Reservoir on April 17th (P.B.).

376. Great Northern Diver.

378. Black-throated Diver.

379. Red-throated Diver.

Very few of the considerable number of divers that pass on the coast at Spurn, Teesmouth, and between, are seen closely enough for the species to be determined with certainty. The great majority are Red-throated Divers. Of three red-throats passing north on March 15th at Teesmouth, one was in summer plumage (A.B.). Out of 20 passing at Teesmouth in four hours on September 16th four were red-throats in summer plumage (M.J.M.L.). A bird with a length of 23.5 inches was brought to E. A. Croft at Wressle on January 27th. At least nine red-throats were found oiled at Hornsea Mere between January 20th and March 3rd; and three others visited the mere during the period (F.E.C.). Two divers at Hornsea Mere on March

27th had speckled black backs and white breasts, and were thought by E. Grace to be Black-throated Divers.

380. Wood Pigeon.—A nestling ringed at Riffa, Wharfedale by D. B. Iles on August 18th 1949, was shot near Tadcaster on March 27th, 1951 (P.E.D.). J.P.U. saw a flock of *c.* 500 near Manfield on November 7th. Large flocks came in from sea near Boynton in the latter half of December. Numbers near North Dalton were largely increased in late December, *c.* 1,000 being seen together on December 29th (W.A.B.).

381. Stock Dove.—Large numbers roosted near to the heronry at Wassand in the latter half of October. On the 21st and 28th several small flocks repeatedly attempted to alight on the smooth surface of the mere (F.E.K.).

383. Turtle Dove.—T. W. A. Wood reported a Turtle Dove at Sleights on April 21st; and K. Ilderton one at Scotton on April 25th; when J. Cudworth also saw one at Walton Hall. May 4th at Spurn was a more normal first date. A pair with two eggs at Swillington on May 19th, which hatched about May 23rd (P.E.D.) were very early. Near Northallerton a bird apparently roosted in the same tree-branch for five weeks up to September 9th (J.P.U.). The species is now well established in some northern Cleveland valleys (R.S.).

386. Bar-tailed Godwit.—Up to 20 regularly at Teesmouth in winter, with *c.* 120 on April 8th, and *c.* 40 on May 6th; in the autumn *c.* 70 on August 30th, and *c.* 100 from October 7th to year end (A.B., M.J.M.L.). At Spurn, numerous on February 19th and 20th (*c.* 150); only occasional birds after April 1st; and in the autumn when four on October 7th was the maximum recorded.

387. Black-tailed Godwit.—At Cherry Cob Sands there were five or six from September 3rd to 15th (H.O.B., M.J.M.L.). Single birds were recorded at Spurn on May 12th and November 1st.

388. Common Curlew.—A young bird ringed at Roxby on June 6th was recovered at Dripsey, Co. Cork, on November 18th (R.S.). A young bird ringed near Slaidburn on June 10th, 1951, was recovered in Co. Clare on August 29th (J.K.F.)). About 80 passed easterly, seaward, at Spurn early in the morning of April 17th. At Stone Creek *c.* 20 occurred on June 3rd (J.M.L., F.E.K.). There were large numbers at Cherry Cob in both spring and autumn—*c.* 500 March 18th, *c.* 300 July 29th (J.M.L.). At Teesmouth maxima were *c.* 400 on January 7th, *c.* 350 on March 15th, *c.* 200 on August 30th. Nested as usual on agricultural land in many places.

389. Whimbrel.—Odd birds occurred at Spurn in Spring with the first on April 19th—17 on May 8th; and in autumn regularly from late July to September, and occasionally thereafter. Inland records were: Blackmoorfoot, one on July 21st; Malham Moor, one called from among Curlew on July 31st. Ossett, one flew over calling on September 1st (G. Carr). At Teesmouth, the first of autumn was seen on July 12th; and seven on September 2nd was the maximum (A.B.).

393. Woodcock.—Roding at Cliffe Wood began on February 25th (E.B.B.); at Malham on April 9th (P.F.H.). Three nests at Cliffe met with disaster, but the species appears to be increasing (E.B.B.). A bird was seen on May 2nd carrying a small chick between its lower tarsi (P.E.D., D.B.I.). At Malham on March 17th two birds flew wing-tip to wing-tip, 15 feet above ground, swaying from side to side and only uttering the ' squeak ' part of the roding call (E. J. Douglas per P.F.H.).

395. Common Snipe.—Near Kexby, hounds drew a boggy piece of scrub in December and put up well over 100 snipe (E.B.B.).

398. Jack Snipe.—Odd birds were noted at Wintersett on January 7th (J.C.), at Guiseley on January 6th (trapped, ringed, and re-trapped January 31st, D.B.I.), at Chevet Park, Wakefield, on January 16th (E.G.); one at Hornsea Mere on March 27th (EG.); and at Spurn on April 13th, and on three days in late October. One was picked up dead near Oswaldkirk in December (E.W.T.); and near Masham on December 15th (W. A. Thwaites, R.C.).

400. Grey Phalarope.—At Gouthwaite on September 16th, J.C. and Mrs. Skinner watched a bird swimming, in flight, and on land, of which the bill was too stout for *P. lobatus*.

402. Turnstone.—A juvenile occurred at Swillington Ing on August 12th (I.G.B.); and an adult in breeding plumage at Gouthwaite on August 12th (A.F.G.W., I.G.B.). At Teesmouth *c.* 25 on January 7th was the largest number seen in the early months, with *c.* 50 on August 30th as the maximum of autumn (A.B.). At Spurn *c.* 200 were recorded for August 10th and October 25th.

403. Knot.—One occurred at Redmires Dam, Sheffield, on August 25th (D. R.

Wilson) ; and a male in breeding plumage at Stocks Res. on July 21st (J.K.F.). The largest flocks at both Teesmouth and Spurn occurred in the early parts of the year—maxima, Spurn, *c.* 5,000 March 19th—22nd, Teesmouth, *c.* 7,000 January 7th ; *c.* 500 was the maximum of autumn at each place.

404/5. DUNLIN.—First seen on the moors near to the Westmorland boundary on April 24th (P.Y.). Flocks at Teesmouth reached their maxima with *c.* 3,000 on March 1st; and with *c.* 1,000 on October 7th (A.B.). At Spurn, maxima were *c.* 500 on March 13th and 25th; and *c.* 500 from August 27th to 30th, and on October 30th.

406. CURLEW SANDPIPER.—At Teesmouth the species occurred—one September 2nd, four September 16th, two September 23rd, two September 30th (A.B.). At Spurn an odd bird was seen on September 8th, 10th and 12th, and up to seven from September 22nd—28th. Inland occurrences were: two at Wintersett Reservoir on September 14th; two Dewsbury S.F., September 15th—19th (J.C., H.H., etc.).

407. LITTLE STINT.—There was one at Dewsbury S.F. with Dunlins from September 13th to 16th (J.C., H.H., E.G.). At Teesmouth two on September 2nd., one on September 23rd, and one on October 7th )A.B.). None was recorded at Spurn.

409. TEMMINCK'S STINT.—A pair of Temminck's Stints nested in Yorkshire this year. On July 1st, 1951 A. Lee and S. Jackson noticed a small grey-brown wader apparently aimlessly fluttering about an area of barren ground in central Yorkshire, with water 150 yards away, apparently unable to fly; but shortly afterwards it flew out of sight. A close search revealed four eggs in a cup-shaped nest (or hollow lined with a few dried grasses) $2\frac{3}{4}$ inches in diameter. The eggs were greenish-brown marked with darker brown, and pyriform in shape. After the observers had retired a few yards, the bird returned to renew the 'broken wing' display; and eventually to walk up to and sit the eggs. Resembling a miniature Common Sandpiper, the bird had grey-brown upperparts marked with almost black striations and spots, and white underparts marked greyish-brown on sides of and across the upper breast. The outer tail-feathers were white, the legs a dark yellowish-olive, and the bill a dark horn colour. I watched the bird return to its eggs on July 3rd; and it was seen by R. M. Garnett and others; all of whom agreed as to its identity. On July 12th the bird was found mauled and dead nearby, probably the work of rat or weasel. The eggs were taken to the York Museum and proved to be highly incubated. A bird was seen in the area on July 14th. It was the first known attempt by the species to nest in England; and the fourth for Britain.

411. AMERICAN PECTORAL SANDPIPER.—A bird occurred at Cherry Cob from September 4th to 8th. First noted by J. M. Laws, it was subsequently inspected by J. Lord, G. H. Ainsworth, H. O. Bunce, and Miss F. E. Crackles, who agreed that the bird was typical of its species as described and illustrated in *The Handbook*. The bird associated at different times with Ruff, Dunlin, and Green Plover. It was seen to peck on several occasions at *Salicornia*.

415. PURPLE SANDPIPER.—There were still four birds at Bridlington on May 17th. First noted in autumn on October 21st, five on Filey Brig (E.G.); and on October 24th, six at Bridlington. Away from rocky shores this species is scarce; and is seen very seldom at Spurn, so that possible occurrences should be described carefully and confirmed if possible.

416. SANDERLING.—Maxima at Teesmouth *c.* 70 January 7th, *c.* 90 May 10th, *c.* 300 September 2nd; and down to *c.* 30 at year end (A.B.). At Spurn *c.* 50 February 17th/18th, and March 22nd; *c.* 125 July 28th; *c.* 100 September 30th. The species was very numerous on the Bridlington South Sands in February and late December (G.H.A.). Inland, Sanderlings appeared—one near Fairburn Ing on March 23rd (K.D.), two at Dewsbury S.F. on September 12th (E.G.); and one at Chelker Reservoir on December 30th (W.F.F.).

417. RUFF.—Seen in autumn on various dates from August 16th (a reeve at Thornton Marishes, R.M.G.) until early October, including Dewsbury S.F., Teesmouth, Wintersett Reservoir, Cherry Cob Sands, and Beverley S.Beds. Numbers reached 14 at Teesmouth on September 2nd (A.B.), and five at Cherry Cob on September 6th and 15th (J.M.L., M.J.M.L.). Two ruffs at Thornton Marishes on November 16th, and one on December 2nd (R.M.G.), were unusual.

421. COMMON SANDPIPER.—The first was seen at Swinsty Reservoir on April 8th (D.A.I.). The latest occurred at Swillington Ing on October 7th (K.D.). On the coast occurrences were mainly in May, and in autumn.

423. Wood Sandpiper.—A bird at Teesmouth on September 2nd showed its plumage clearly, including barred tail, and freckled upperparts to A. Baldridge, who was able to compare it with two others at Darlington S.F. on the next day. A bird at Knostrop S.F., Leeds, on September 23rd called and showed its speckled mantle (K.D.).

424. Green Sandpiper.—The species was recorded from July 3rd at Swillington Ing onward to October, at many places. Less usual occurrences were—April 10th to 17th at Chevet, near Wakefield (J.C.); May 8th at Swillington Ing (J.R.G.); February 3rd at Dewsbury S.F. (H.H.); June 24th one at Royd Moor (J.C.S.E.); November 2nd two on the Tees near Cleasby (J.P.U.). A. Gordon found the species unusually plentiful in autumn by the Rye. Coastal birds were all reported in August and September.

428/30. Redshank.—Fourteen pairs bred at Teesmouth, where the maxima were *c.* 150 on February 1st, and *c.* 200 on October 21st (A.B.). At Spurn there were *c.* 100 on April 7th, and *c.* 250 on October 8th.

431. Spotted Redshank.—Recorded at Dewsbury S.F. on September 3rd, 6th and 8th (J.C., G.C., H.H., etc.). Occurred twice at Teesmouth—four on August 30th, two on September 2nd; the distinctive note being heard frequently (A.B.).

432. Greenshank.—A bird occurred at Spurn on May 12th (J.C., P.E.D., etc.). After the first at Swillington Ing on June 30th Greenshanks were noted until early October at a number of places inland; and less frequently on the coast.

435. Ringed Plover.—Eggs were laid near Whitby but were robbed (A.B.W.). About 100 birds were about Stone Creek on June 3rd (F.E.K., J.M.L.). Always present at Spurn—*c.* 100 on March 27th, *c.* 50 on August 25th, *c.* 60 on September 8th and 14th were the largest numbers recorded. At Teesmouth, where *c.* 8 pairs bred, peak numbers appeared on May 10th, *c.* 60; on August 19th *c.* 380; on September 2nd *c.* 270 (A.B.).

438. Little Ringed Plover.—Seen in breeding areas from April 11th to mid-August; with one at Dewsbury S.F. on September 10th (E.G.). A bird turned up by Malham Tarn on June 2nd (P.F.H.). There were six breeding pairs in one area; and at least one in another. Young or eggs of five pairs were found. Two pairs were not successful until the third attempt. Considering the unsatisfactory nature of the breeding sites the species is doing well to establish itself.

440/41. Golden Plover.—Of the flocks of Golden Plovers recorded in spring the following are interesting comparatively. About 500 on agricultural land at Winn Moor, Leeds, on March 24th were of the southern race in appearance (J.R.G.). *c.* 140 at Dewsbury S.F. on April 8th included eight definitely ascribable to the northern race. On April 14th at Ossett S.F. *c.* 180 birds included 45 typical northerners. On April 17th near Ossett 154 birds all had black faces and were typical of the northern race (J.C.). There were *c.* 80 in a field at Addingham on April 29th (L.J.K.C.). Golden Plovers are well spread over their moorland breeding grounds by early April. The moult to spring plumage is stated to take place from February to May. No May flocks were reported this year; and April 30th is given as a very late date for the species at Rowley (D.C.U.). There was a party of twelve at North Dalton on July 12th (W.A.B.).

The return of Harrogate Stray to grass has been accompanied by considerable reduction in numbers of Golden Plovers there in winter; Lapwings have been less affected. Land at Pool in Wharfedale as usual had large numbers of Golden Plovers on various dates; with *c.* 1,500 on November 17th as the maximum (*c.* 2,200 Lapwings were also there) (A.F.G.W.).

444. Grey Plover.—At Teesmouth *c.* 170 were present on January 1st, and *c.* 70 on April 7th (A.B.). At Spurn numbers varied—February 17th *c.* 150, February 18th, nil, *c.* 150 March 22nd, *c.* 100 April 7th, April 28th one. A few reappeared on July 17th, 20 on August 19th, 100 on September 2nd, 17th, and 22nd, with some always present thereafter (50 on November 20th).

446. Dotterel.—J. C. Leedall noted a bird near the Spurn Chalk Bank on August 26th, which remained until the 29th and was seen by G.H.A. and others.

449. Lapwing.—'Less common in all areas this year' (J.P.U.); but autumnal flocks were undiminished. There were no flocks recorded at Spurn after mid-March until September 5th, *c.* 80; October 20th, *c.* 30; the largest came in November (*c.* 200 November 3rd and 20th); whilst November 17th was the date recorded for the largest inland flock, *c.* 2,200 at Pool (A.F.G.W.). At Bainton there were

*c.* 2,000 on September 22nd (W.A.B.). A bird ringed as young at High Royd on May 25th, 1948 was picked up dead there on May 13th, 1951 (B.M., R.Cr.).

452. Oystercatcher.—Some eight pairs bred in Airedale and full clutches of eggs were seen as early as April 22nd (C.N.). A brood was reared in Swaledale (J.P.U.); and the species is now well established in other western dales, where the sound of birds flying over in summer no longer occasions surprise. A bird was present on the Rye throughout March (A.G.). Peaks of numbers of coastal passage birds were—Teesmouth, *c.* 50 January 7th, *c.* 70 August 17th and *c.* 85 on September 16th (A.B.). At Spurn *c.* 45 on July 31st and 44 on August 7th, and small flocks on August 13th, with 25 on November 10th were the principal occurrences. Seventeen birds at Gouthwate on August 6th (A.F.G.W.) may have consisted of a few families of dale's breeding Oystercatchers.

456. Stone Curlew.—A wounded male Stone-Curlew was found on the shore at Sandsend on August 22nd, 1951, which died the same night (A.B.W.).

462. Black Tern.—Single birds occurred in spring at Wintersett Reservoir on May 19th and 30th (J.C.); and two at Swillington Ing on June 2nd (P.E.D., J.C.). Only recorded inland in autumn at Dewsbury S.F. on August 27th (E.G.) and September 7th (J.C., H.H.). At Spurn a bird with some black on chest was seen on July 22nd (H.O.B.); and one on the 26th (S.U.); on August 7th three adults and five juveniles were seen (J.C., S.U.); and one on September 16th.

467. Sandwich Tern.—At Spurn, a few were noted from May 11th to 27th; and from July 9th to September 30th daily, with the largest numbers from August 26th to September 13th (*c.* 150 September 9th and 10th).

469/70. Common and/or Arctic Tern.—Inland passage occurred on May 6th, one over Wakefield, and on May 10th 11 at Wintersett, and one there on May 17th (J.C.). There was an Arctic Tern at Swillington Ing on June 3rd (K.D.). Seven appeared over Brotherton Marsh on July 3rd (N.V.M.). About ten pairs of Common Terns attempted to breed on slag at Teesmouth; rats caused havoc among eggs and young (A.B.). *c.* 150 birds at Teesmouth on September 2nd, and *c.* 100 on the 16th, were mostly Arctic Terns (A.B.). A bird at Spurn on April 6th was early and no more were seen until the 22nd. From July 9th some were noted daily until September 11th; and the last, a Common Tern, appeared on October 8th. Maxima appeared with *c.* 200 on August 2nd and 7th. Inland, several birds appeared at Wintersett Reservoir, Dewsbury S.F., and Swillington Ing from September 6th to 14th, covering both species. There was an Arctic Tern at Wintersett into October which had a damaged wing—it could fly but probably not very far (J.C.S.E., J.C.).

471. Little Tern.—Five pairs nested at Teesmouth, only one pair probably successfully (A.B.). The Spurn colonies had a poor year, and not very many reared young; as the result of much disturbance. Birds were present from April 21st to mid-August, with odd subsequent occurrences to September 4th.

477. Little Gull.—A bird present at Dewsbury S.F. from September 7th to 12th, fed on insects taken from the surface of the water both when flying and swimming. It was evidently a juvenile with dark mantle and dark diagonal bar across upper wings, and black terminal tail-band (J.C., E.G., H.H., etc.). An immature bird appeared with Black-headed Gulls near Bridlington on March 7th (F.W.).

478. Black-Headed Gull.—A bird ringed at Swillington Ing as young on July 20th 1949 was dead in the Haworth-Colne colony on June 27th, 1951 (P.E.D.). The Haworth colony suffered much persecution, many adults and young lying about dead on June 27th (R.F.D.). On May 12th, P. Young estimated the Bowes Moor colony at *c.* 1,200 pairs. Two birds ringed as young by D. B. Iles at Swillington Ing on July 14th, 1950 were found dead respectively near Wigan on December 23rd, 1950, and near Ramsey, Hunts. on January 13th, 1951 (P.E.D.). About 200 birds used the roof of Kirkstall Forge to roost upon in autumn (J.R.G.). A Danby Moor colony of 80—100 birds was re-occupied after a lapse of some years (J.L.); and some 50 pairs nested in a worked-out gravel-pit in south Yorkshire (G.E.H.). Of *c.* 8,000 gulls at Eccup on February 15th, the great majority were ' blackheads ' —4,000—5,000 left eastward in flocks of *c.* 200 during half an hour to 7.15 a.m. on October 30th (J.R.G.).

482/3. Herring Gull.—A Herring Gull picked up by F. Dean at Mytholmroyd and sent to A. Hazelwood on April 8th, 1951, was a first summer female, with a wing measuring only 380 mm., bill 44 mm., and an overall measurement of *c.* four inches less than an average skin, and very little bigger than a Common Gull. Large numbers roosted at Eccup (*c.* 2,000 December 26th C.N.). At Stocks Reservoir

during the last hour of light on December 16th *c.* 5,000 gulls, mostly *argentatus*, assembled (J.K.F., D.F.W.); and *c.* 1,000 were roosting there on February 24th. Herring Gulls again bred among chimney stacks at Whitby (A.B.W.).

484/5. Lesser Black-backed Gull.—The Roeburndale Gullery numbered 1,500—2,000 pairs, an increase over 1950, but there were fewer inside Yorkshire. Several ringers ringed 1,200—1,300 young birds. Items brought by the birds included metal milk-bottle tops, pink shells, feet and heads of fowls, bones, hen's eggs, worms, fried potato chips, orange peel, and the usual fish and crabs (P.E.D.).

One ringed 16/8/50 was shot at Agadir, Morocco, in April, 1951 (P.E.D.).

One ringed 27/7/50 was found in Granville, Mouche, France, on 31/8/51 (D.B.I., P.E.D.).

One ringed 21/7/50 was found at Hayes, Middlesex, on 5/9/51 (D.B.I., P.E.D.).

One ringed 27/7/51 was found at Santander, N. Spain, on 5/9/51 (D.B.I., P.E.D.).

One ringed 27/7/51 was found at Towyn, N. Wales, on 17/9/51 (D.B.I., P.E.D.).

One ringed 22/7/50 was found at Tilbury, Essex, on 22/9/51 (D.B.I., P.E.D.).

One ringed 27/7/51 was found at Cheltenham, Glos., on 7/10/51 (D.B.I., P.E.D.).

One ringed 27/7/51 was found at Oporto, Portugal, on 7/10/51 (D.B.I., P.E.D.).

One ringed 21/7/51 was found near San Fernando, Cadiz, Spain, on 24/10/51 (D.B.I., P.E.D.).

One ringed 15/7/51 was found near Wetherby on 16/11/51 (D.B.I., P.E.D.).

One ringed 15/7/51 was found at Pilling, Lancs, on 3/9/51 (D.B.I., P.E.D.).

One ringed 30/7/50 was found at Asturias, N. Spain, in October, 1950 (J.K.F.).

Birds were reported in the winter months—eight at Eccup on January 18th (J.R.G.); *c.* 40 at Eccup on December 31st, one *graellsii* at Farnley, January 21st (I.G.B.), 27 at Wintersett on December 26th may have been *fuscus* but light was poor (J.C.S.E.); four *fuscus* at Swillington on December 16th (K.D.), and one at Eccup (J.R.G.).

486. Great Black-backed Gull.—Large numbers passed down the coast and at Spurn following the usual pattern, with maximum *c.* 360 on August 27th; and at Teesmouth *c.* 100 on August 30th (A.B.). Eighteen were at Stocks Reservoir on December 31st (K.G.S., D.R.S.), and 25 on February 24th (J.K.F., D.F.W.). Seventeen roosted with Herring Gulls at Eccup on December 26th (C.N.). Odd birds occurred inland elsewhere.

487. Glaucous Gull.—A pale biscuit bird at Teesmouth on March 1st was slightly larger than a Herring Gull; the wings were broad and relatively short and the wing-beats slow and heavy. A Baldridge considered it to be of this species.

A dead bird found on the Humber shore at Kilnsea on February 20th was highly decomposed; but the bill measured 62 mm., and the tarsus 71 mm. ' I judged it to be a fourth winter bird ' (R.F.D.).

491. Great Skua.—On August 12th excellent views of the wing flashes of a bird at Spurn were obtained (S.U., J.C., H.O.B.); and other Great Skuas were recorded on September 21st and 23rd.

493. Arctic Skua.—Two light-form and one dark bird passed north at Spurn on May 5th (R.M.G.). The species was seen frequently in August and September (eight on August 10th). At Teesmouth birds passed in the same months. On September 16th 26 Arctic Skuas flew in from S.E. and settled in a group on the water; four light-form birds were included. This was A. Baldridge's highest number there.

498/9. Guillemot.—Oiled birds were found at various places including a ' bridled ' bird at Whitby on March 5th (A.B.W.). Reports indicate continued decrease at Bempton.

501. Black Guillemot.—Dr. I. G. Brown reported a bird in summer plumage flying north at Runswick Bay on April 25th.

502. Little Auk.—One came down at Baldersby, Thirsk, in late November (C. H. Potten in *The Field*. There were several in Filey Bay on December 10th (P. Goodson).

504. Corncrake.—More reports of the Corncrake have reached me in 1951 than for some years past. Two pairs nested in the north-west and had their nests destroyed, and one of the sitters, by a reaper (H.W.B.). At least three pairs nested near Cotherstone (J.R.S.). Well-grown young were seen near Burley (W.F.F.). Birds were heard calling near Rievaulx (A.G.), in and north of the Vale of Pickering (R.M.G., R.S.), near Scarborough (A.J.W.), in Nidderdale, Dentdale, Teesdale, Eskdale, Wensleydale, Wharfedale, and Airedale, in some of these dales at several

places. Birds calling at two places near Barnoldswick were described by A. Pilkington as the first heard there since 1937. One or two birds were also heard in the south of the county.

505. Spotted Crake.—A bird found dead east of Doncaster and brought to Mr. W. Bunting on September 14th, 1951, was confirmed as of this species by P. E. Brown, and by the British Museum (*Natural History*).

509. Water Rail.—A pair nested in mid-Swaledale (J.P.U.). One occurred near Ruswarp on January 13th (A.B.W.); and near Hornsea Mere on several days in January and February (F.E.C.). Odd birds occurred at Spurn in February and March, and in October. An injured Water Rail found walking along a Hull road on October 15th was brought into the Malet Lambert High School, and afterwards liberated (F.E.C.). Single birds were :—found dead on October 29th at Gomersall (J.C.), noted near Newmillerdam on October 28th (E.G.), watched by the Aire near Keighley on November 3rd; observed at Swillington Ing on November 11th (E.G.); and seen near Haxby on December 20th (F.J.), and at Faxfleet on November 30th (E.C.J.S.).

510. Moorhen.—A bird obtained near Driffield on January 31st, 1951, had been ringed on May 18th, 1950 as a young bird near Viborg, Denmark (P. Skovgaard and G.H.A.). A bird ringed at High Royd on February 10th, 1951 was recovered on Steeton Moor, Keighley, on April 20th, 1951. G. R. Edwards points out that on April 20th this bird was on the same line as, and one day earlier than, the bird recovered at Gretna in 1950. There were 33 together at Knostrop S.F. on January 24th, 1951 (J.R.G.). Four young in the Washburn Valley were only a few days old on October 28th (J,K.F.).

511. Coot.—Winter flocks seem to be smaller generally than a few years ago. At Hornsea Mere there were *c.* 200 on January 13th (F.E.C.), and *c.* 200 on September 23rd (F.E.K.). At Wintersett 124 on December 15th (J.C.).

513. Black Grouse.—Fifteen cocks were seen together on an early morning in May near Stocks Reservoir (P.E.D.). Three cocks and three hens were recorded on Bowes Moor on September 27th (P.Y.). Odd birds noted were—a male near Semerwater on March 4th, and a hen near Cronkley Scar on May 12th (M.J.M.L.); and a male in upper Teesdale on April 26th, and a hen in mid-May (A.B.).

514. Red Grouse.—In the Cotherstone area disease denuded the high moor of birds, but they did well on the lower ground (J.R.S.).

517. Pheasant.—A cock occurred at Spurn on October 24th; had it flown from Lincolnshire? In 200 yards of the central, grassed reservation between carriage-ways on the Great North Road near Sinderby, there were five nests of Pheasant and one of Partridge (J.P.U.).

518. Common Partridge.—A bird sitting near Scruton was picked off her brood of 17 chicks. Before she could be replaced the cock bird flew at the man's face until he left, with his face torn and bleeding (J.P.U.).

520. Quail.—A male was killed at Rawthorpe Green, near Huddersfield on June 1st (E. C. J. Swabey).

## BOOK REVIEWS

**A History of the Birds of Durham,** by **G. W. Temperley.** Transactions of the Natural History Society of Northumberland, Durham and Newcastle-on-Tyne, New Series Vol. IX, 1951. Pp. 296 and map, paper covers. 15/-.

The author is to be congratulated upon the successful completion of a worthwhile but exacting task, for which sustained effort and special knowledge of both past and present in the north-east were required. It is doubtful if any other man could have performed the task so successfully. The result amply deserves a place alongside any other British regional history of birds. Students of birds in Durham certainly cannot afford to remain without it.

In respect of recent years Mr. Temperley could depend upon his own knowledge, and that of contemporaries with whose qualities he was familiar, whose records since 1936 have been gathered into *The Ornithological Report for Northumberland and Durham* under his editorship (published yearly in *The Naturalist* from 1941). For the earlier times he was dependant upon the records left behind by previous generations of ornithologists and these needed consideration by an experienced mind.

Mr. Temperley was fortunate. An introduction describes the sources whence the historical details have been derived. Published lists of Durham birds date

back to 1831, when the same society that has now published Temperley's work (with the aid of the Royal Society) produced Vol. I of its first issue of Transactions. Included was a paper by P. J. Selby entitled ' A Catalogue of the Birds hitherto met with in the Counties of Durham and Northumberland.' Material previously unpublished has been obtained from manuscripts by several old-time ornithologists dating back to 1834 when Edward Backhouse compiled ' A Catalogue of the Birds of the County of Durham ' and was the first to confine himself to that county. Among the old naturalists whose works have supplied material for this book, published and unpublished, sometimes covering two counties sometimes only one, and often confined to re ricted areas of Co. Durham, may also be mentioned John Hutchinson, William Procter, John Hancock, Canon H. B. Tristram, James Backhouse, T. H. Nelson, Abel Chapman, and especially George Bolam.

Durham has about half the acreage of Northumberland. Two of Durham's three main rivers form the county boundaries ; and the Wear and its tributaries form the only river system completely within the county. All three rivers arise, and for some two-fifths of their courses flow through far-flung heathery moorlands, with typical ' mosses ' and ' flows,' continuing through agricultural land and industrial areas to the coast. Further to explain the longer list of birds observed in Northumberland as compared with Durham the fact is cited that Flamborough Head and Spurn Point (thus more truly descriptively differentiated than by the Ordnance Survey) lie more than 40 miles farther eastward than any part of the Durham coast, which latter may be bypassed by coastal migrating birds as they travel between these Yorkshire places and the Farne Islands. Many birds still visit the wide mud-flats of Jarrow Slake, and the marshes of the north bank of the Tees' mouth, despite industrialisation.

Temperley explains northerly coastal movements of gulls and other species in the sentence—' In a gale from the north-east all birds on the wing over the North Sea are being steadily drifted towards the coast of Great Britain.' ' When this is reached, the birds in order to avoid being driven on to a lee shore, must fly into the wind.' We are familiar with this phenomenon in Yorkshire, and with the many species that take refuge along the coast when such conditions occur at migration times, sometimes sending ornithologists hastily to Spurn.

The past and present status of birds in Co. Durham are given concisely. The order followed is that of Witherby's *Handbook*, whose trinomials are preserved. Sub-species are treated separately. It is curious to find the Scandinavian race of Chiffchaff included, but not the Northern race of Willow Warbler, although some of the latter must traverse the coast in late spring and summer.

After being fairly common in the early part of the nineteenth century, the Green Woodpecker declined and ' for a long period was considered to be rare.' Not until the second and third decades of the present century did its numbers begin to show any increase. At the present time it is ' common in most well-wooded districts,' which recent increase is associated with a possible increase in the supply of wood-ants, following the widespread planting of conifers.

There is only one record for Co. Durham of breeding by the Lesser Spotted Woodpecker. The Little Owl is spreading rapidly but as yet is chiefly confined to the lower-lying eastern side of the county. The Barn Owl slowly declines as elsewhere. The Stonechat's recent history resembles that for Yorkshire. The Sheld-duck now uses holes in concrete and slag in lieu of dunes. Although Temperley says the departure of ' non-breeding ' Sheld-ducks in July needs some explanation, no mention is made of the moult-migration of the species recently described by R. A. H. Coombes.

Among the ornithological gains to Durham may be mentioned the Goosander which has bred since 1941 ; and from 1945 has become established in two localities. The Montagu's Harrier tried to breed in 1929, and renewed the attempt successfully in 1947 and subsequent years. G. W. Temperley first recorded the Fulmar in the north-east at Bempton in 1919, since when the species has become firmly established on the Durham coast.

Of three Sabine's Gulls recorded at Teesmouth by T. H. Nelson on September 30th, 1911 (*British Birds*, V, p. 170) Temperley says ' the record has been claimed for Yorkshire.' May I remove even the shadow of doubt about the justice of that claim? In point of fact the three birds were shot by a local gunner on Coatham Sands, well inside Yorkshire.

The book should be of special interest to us in neighbouring Yorkshire as well

as to Durham ornithologists. I know that I shall find it as useful for reference as I have found it interesting to read. R.C.

**Birds as Individuals,** by **Len Howard.** Pp. 223, with 32 plates of photographs by Eric Hosking and a Foreword by Julian Huxley. Collins, 1952, 10/6.

Here is a book which will delight all bird lovers and interest every bird watcher. Its scene is laid in the writer's own house and garden, where she has been able to establish such sympathetic relations with individual wild birds that they know no fear of her.

The first part of the book treats of bird behaviour and gives a series of detailed biographies of individual birds; chiefly of Great and Blue Tits, Blackbirds and Robins, but other species are also dealt with. Miss Howard is able to tell the life stories of her birds because she knows them as individuals. There is no need to distinguish them by rings, for she is able to recognise them unfailingly, sometimes by slight variations in their plumage or song, but chiefly by the individuality displayed in their actions and poses.

The ornithologist, who would define a strict ' pattern ' of behaviour for each species, will here find that a closer study of the habits of birds proves that the patterns are much more varied and elastic than he had imagined. As Miss Howard puts it—' Individuality among birds is so strong that they are for ever over-stepping their reputations and putting wrong all formulated theories.'

Drawing from her own unique experiences, she writes of the birds' powers of memory, of their recognition of one another and of herself, of their reactions to human beings and of their capacity for ' play.'

Then follows an interesting chapter on ' The Mind of a Bird ' in which the writer describes actions which satisfy her that birds possess a great deal more ' intelligence ' than is normally credited to them. As she puts it—' The fact that all this variation of intelligence, memory, emotions, etc., occurs within the species, affecting their behaviour, shows that although certain fundamental laws are obeyed instinctively, in the main, actions are not automatic, but controlled by the mind of the bird according to its character.'

In part two, Miss Howard, who is a trained musician with an extraordinarily sensitive ear, gives an analysis of the technique of bird song. Her approach to this subject will be helpful to all those who are interested in the variety and range of bird song and to those who need help in distinguishing between the songs of different species; but it will be enjoyed particularly by those to whom bird song makes an aesthetic appeal.

The beautiful prose in which the book is written is well adapted to impress upon the reader the wonderful charm of birds and the loveliness of their song.

The book is most beautifully and aptly illustrated by photographs by Eric Hosking, than whom no one has ever more successfully portrayed the living bird, vibrant with life and glowing with intense individuality. G.W.T.

**The Birds of the Malay Peninsula, Singapore and Penang,** by **A. G. Glenister.** Pp. 282, with 16 plates, 8 in colour. Geoffrey Cumberlege, Oxford University Press, 1951, 35/-.

This short but competent work should prove useful to residents in Malaya who wish to identify the birds they see. After two brief generalising chapters, Chapter III contains a summary of the characters of the bird species and bird families of Malaya: here the planning of the book is confusing and uneconomical, since much of the plumage description in Chapter III is repeated in the ensuing systematic list, which forms the bulk of the volume. It would have been better if this repetitiousness had been avoided in favour of more extensive field notes.

The text illustrations and photographs are frankly amateurish; the coloured plates, by the author's wife, are more helpful but, as so frequently in books of this type, tend to illustrate those birds that are easy to identify rather than those which present difficulties. Nor does it make the beginner's task any easier to have birds of different families (and even orders) shown on the same plate, rather than with their relatives—those birds that are more likely to be confused with them. The type of tabulated character chart included as Table A may be useful in the botanical sphere but has never, so far as I know, assisted beginners to distinguish living birds —except wrongly—one from the other.

The plumage descriptions are not always accurate: *Emberiza aureola*, male, summer, is said to have a buff line over the eye; *Pernis apivorus* is credited with a long black crest. M.F.M.M.

**Breeding Birds of Kashmir,** by **R. S. P. Bates** and **E. H. N. Lowther.** Pp. 367, with 151 photographs by the authors, and five coloured plates by D. V. Cowen. Geoffrey Cumberlege, Oxford University Press, 1952, 38/-.

This is a first rate book. The authors not only know their birds thoroughly, but are capable of describing them thoroughly, so that they have produced not only a valuable text-book, but also a book that is worth reading. As they have included photographs of scenery, so also they have included descriptions of scenery in the text, so that the reader's imagination is given a complete picture of the bird in its setting. Good examples of the authors' method are the description of the Vale of Kashmir on p. 9 or that of a bird foraging party working its way through the forest (p. 26). Reading passages such as these brought many pleasant memories back to the reviewer. The authors are, I think, the first to point out the loud, harsh calls possessed by birds which live in the vicinity of rushing water (p. 95). On p. 110 is a curious error: words are reported said to have been uttered by the poet Firdausi on beholding the Taj Mahal. Since the poet died a good six hundred years before the Taj Mahal was built, these words have as much relation to reality as would Geoffrey Chaucer's remarks on the atomic bomb.

Mrs. Cowen's plates are more than competent and the photographs are superb, being the cream of two men's work over many years. How pleasant it is, too, to have photographs of unfamiliar birds, instead of the perpetual short-eared Owls and Red-throated Divers of British photographers. British ornithologists will be interested to find here what is probably the only photograph of Baillon's Crake.

If I have an adverse criticism to make, it is of some of the names—both scientific and English—employed. Ornithologists in India have for long been accustomed to use peculiar names for birds, thereby causing a certain amount of confusion elsewhere. There can surely be little point in giving the name ' Large White Scavenger Vulture ' to a bird that is everywhere else called ' Neophron ' or ' Egyptian Vulture.' The genera in which the Mistle Thrush and the Alpine Accentor find themselves will astonish some readers. The authors also have an unnecessary habit of expressing subspecific differences by means of an alteration in the English name: this produces strange results among the breeding birds of Kashmir, such as ' European Little Ringed Plover ' and ' Japanese Wryneck '; ' Little Ringed Plover ' and ' Wryneck ' would be amply sufficient. M.F.M.M.

**Bird Recognition Vol. 2** (Birds of Prey and Waterfowl), by **James Fisher.** Pp. 182, including habitat and field character keys, year-cycle charts, 82 distribution maps by W. B. Alexander, and 85 monochrome illustrations by ' Fish Hawk.' Penguin Books Ltd., Harmondsworth, Middlesex, 1952, 3/6.

The wait since 1947, when Vol. 1 appeared, has been long. The value offered is still amazingly high, despite the need for a rise in price of 1/-. Compressed paragraphs are labelled—' Recognition,' ' Distribution,' ' Breeding,' ' Movements,' etc. More matter is included extraneous than relevant to recognition. At least one species noted in Yorkshire twice in 1952 is omitted. An impression of excessive breeding frequency is given by some maps (*e.g.* Wigeon); and it should not be concluded that because an area is shown white the species concerned does not occur there (*e.g.* Goldeneye in V.C. 65). Not all ' Fish-hawks ' illustrations all equally useful as aids to recognition; on page 57 is a drawing labelled ' Montagu's Harrier, Male (for female see page 163),' but the ' Montagu's Female ' on page 163 was presumably immature; which may mislead, for adult female Montagu's and Hen Harriers do not differ as here depicted. The keys will be useful to those without a firm knowledge of family and generic characteristics. The compression has been skilful, and everyone will want a copy. We are still without the pocket book of bare essentials for quick reference, in a single smaller volume, which should include diagnostic differences between wing formulae, soft parts, etc.; and between juveniles and adults, and racial forms, for use (*inter alia*) by those who trap birds for ringing. R.C.

**Dawn Song and All Day.** February, 1952. No. 6. Bird Research Station, Glanton, Northumberland. Pp. 12, 1/6.

Observation of ' Dawn and Dusk Choruses ' at many places are summarised, considered, and analysed under the heads of ' Alpha Song ' (communal), ' Beta Song ' (celibate); and ' Gamma Song ' (in the presence of hens). ' Celibate ' is used here in the sense that birds return for a short time, to the unmated *condition* ' (italics ours)—temporary separation seems more factual than celibacy. R.C.

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# The NATURALIST

## A QUARTERLY ILLUSTRATED JOURNAL

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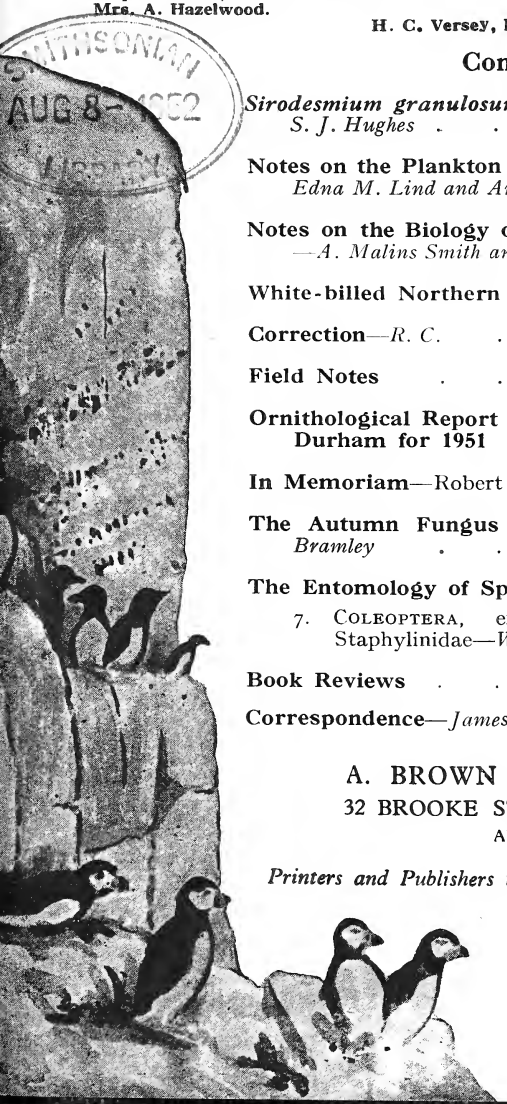

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# *SIRODESMIUM GRANULOSUM* AND *TORULA DIVERSA*

S. J. HUGHES
*Commonwealth Mycological Institute, Kew, Surrey.*

SUMMARY

THE type species of *Sirodesmium*, *S. granulosum*, is here identified with *Septonema spilomeum* and *Bonordeniella aspera*. *S. spilomeum* has been recorded for Yorkshire on one occasion but the collection has not been traced. This type species is re-described and illustrated. Dr. Marion L. Lohman in the United States found that ' *Septonema spilomeum* ' was produced by culturing the ascospores of *Hysterium insidens* and this has been confirmed by Dr. G. R. Bisby on material from South Africa. The conidia are here referred to as the *Sirodesmium* conidia of *H. insidens*. *Torula diversa* is illustrated, briefly described and reclassified in *Sirodesmium*.

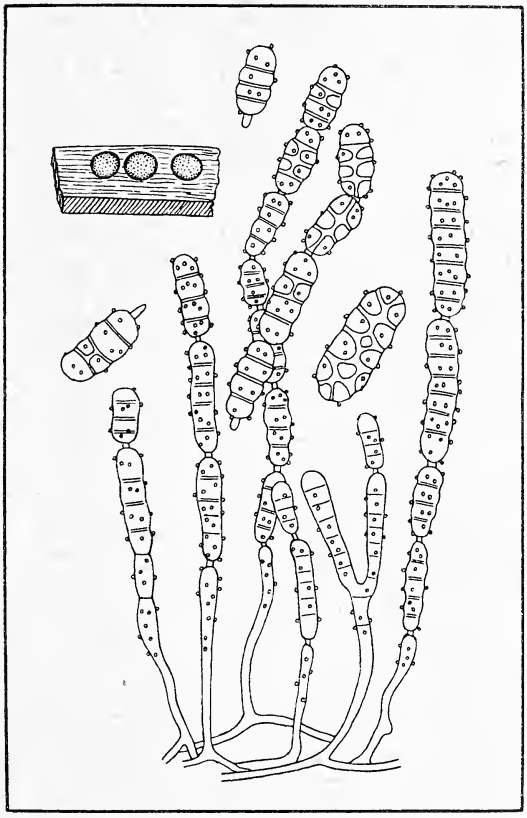

Fig. 1. ***Sirodesmium granulosum*** after de Notaris (1849). Some of the original figures reduced so that the detailed drawings are ×500.

## 1. *Sirodesmium granulosum* de Notaris

In 1849 de Notaris published the generic name *Sirodesmium* for his single species *S. granulosum* with excellent diagnoses and observations, and with figures at a magnification of 700. Parts of his description are quoted below and some of the illustrations are reproduced as Fig. 1 ; ' Ad trabes, palos, ligna fabrefacta quaecumque aëri exposita et vetustate, exesca in collibus taurinensibus toto anno. 1838 ' . . . . ' Acervuli disciformes deplanati, vel convexiusculi subpulvinati ' . . . .

' Flocci erecti, subsimplices rigidi, in acervulum disciformem vel pulviniformem collecti, inferne continui, sursum incrassati, obscure septati, dein in phalanges oblongas cylindraceasve, isthmis brevissimis, pellucidis, filiformibus concatenatas diffracti. Phalanges 3-4-5 pluri articulato-constrictae, loculisque septis verticalibus divisis, torosae, demum solutae. Sporae ex articulorum iuxta dissepimenta horizontalia divisione enatae, subdisciformi-lobatae ' . . . . ' et in phalanges oblongas, cylindraceas, diametro duplo-quadruplove longiores, isthmisque pellucidis filiformbus brevissimis concatenatas, gradatim ab apice ad inferiora versus abeuntes.'

From a consideration of collections preserved in Herb. R.B.G. Kew and Herb. I.M.I. it is concluded that *Sirodesmium granulosum* was based on conidial *Hysterium insidens*.

### Nomenclator

*Hysterium insidens* Schweinitz in *Trans. Amer. phil. Soc.*, N.S., iv, p. 244, 1832.
≡*Hysterographium insidens* (Schw.) Sacc. in *Sylloge Fungorum*, ii, p. 778, 1883.
=*Septonema spilomeum* Berkeley in *J. Bot. Lond.*, iv, p. 310, 1845.
=*Sirodesmium granulosum* de Notaris in *Mem. Accad. di Torino*, ser. 2, x, pp. 347-48, 1849.
=*Bonordeniella aspera* Linder in *Mycologia*, xxvi, p. 439, 1934.

Lohman (*Mich. Acad. Sci. Arts & Lett.*, xvii, pp. 262-66, 1933) was the first to show that ' *Septonema spilomeum* ' is based on conidial *Hysterium insidens*. In 1949, Dr. G. R. Bisby obtained a culture from an ascospore of *H. insidens* [Herb. I.M.I. 37944] and this, too, produced what are here called the *Sirodesmium* conidia ; these dried cultures are preserved in Herb. I.M.I.

### Description of Conidial *Hysterium insidens*

The *mycelium* is immersed and composed of branched, septate, hyaline to subhyaline hyphae 1·5 to 3$\mu$ wide.

The *conidial fructification* (Fig. 2) consists of a partially immersed, hyaline, plectenchymatous, pulvinate stroma on the surface of which is borne a palisade of conidiophores bearing chains of conidia. When the conidia and conidiophores are scraped away, the stroma shows up to the naked eye as a white dot. The mature fructifications are dark brown or almost black, scattered, and up to 1·5 mm. in diameter ; the chains of conidia secede readily when disturbed to form a black powder of conidia on the substratum.

The *conidiophores* are simple or rarely branched, up to about 50$\mu$ long, 3·5$\mu$ wide at their origin from the plectenchymatous central stroma and increasing to about 4 to 4·5$\mu$ wide above, although the distal end of the conidiophore merges imperceptibly into the chain of conidial initials which mature basipetally. The conidiophores are septate, pale brown to brown, thick-walled and very coarsely warted. Towards the distal end, constrictions at the septa are made evident by the increase in the width of those cells which can be differentiated as conidial initials.

The *conidia* are thick-walled, very coarsely warted, oval-oblong with rounded ends, straight or slightly bent with three to nine (mostly three to five) transverse septa at which they may be slightly constricted ; in some, the cells have one or more longitudinal septa as well. The conidia measure 16 to 55$\mu$ long and 8 to 18$\mu$ wide but those conidia, presumably immature, which have only three transverse walls usually measure about 16 to 28 by 8 to 13$\mu$. The conidia are sometimes seen to be held apart by a narrow, hyaline, disjunctor-like disc.

*Development of conidia* : the conidia develop in chains which mature basipetally, that is, the most mature conidium is to be found at the distal end of a chain which may be composed of a maximum of at least 15 conidia or conidial initials. Thus, in an unbroken chain, the upper conidia are seen to be dictyospores, below which in succession are found variable numbers of phragmospores, then didymospores and the lowermost initials which merge imperceptibly into the conidiophore are continuous. It seems very probable to me that the conidiophore increases in length by intercalary growth and the appearance of septa results in the production of conidial initials ; but I have seen only very mature collections and very young fructifications would seem essential in order to observe the nature of the conidiophores which have produced none or few conidia. If such intercalary

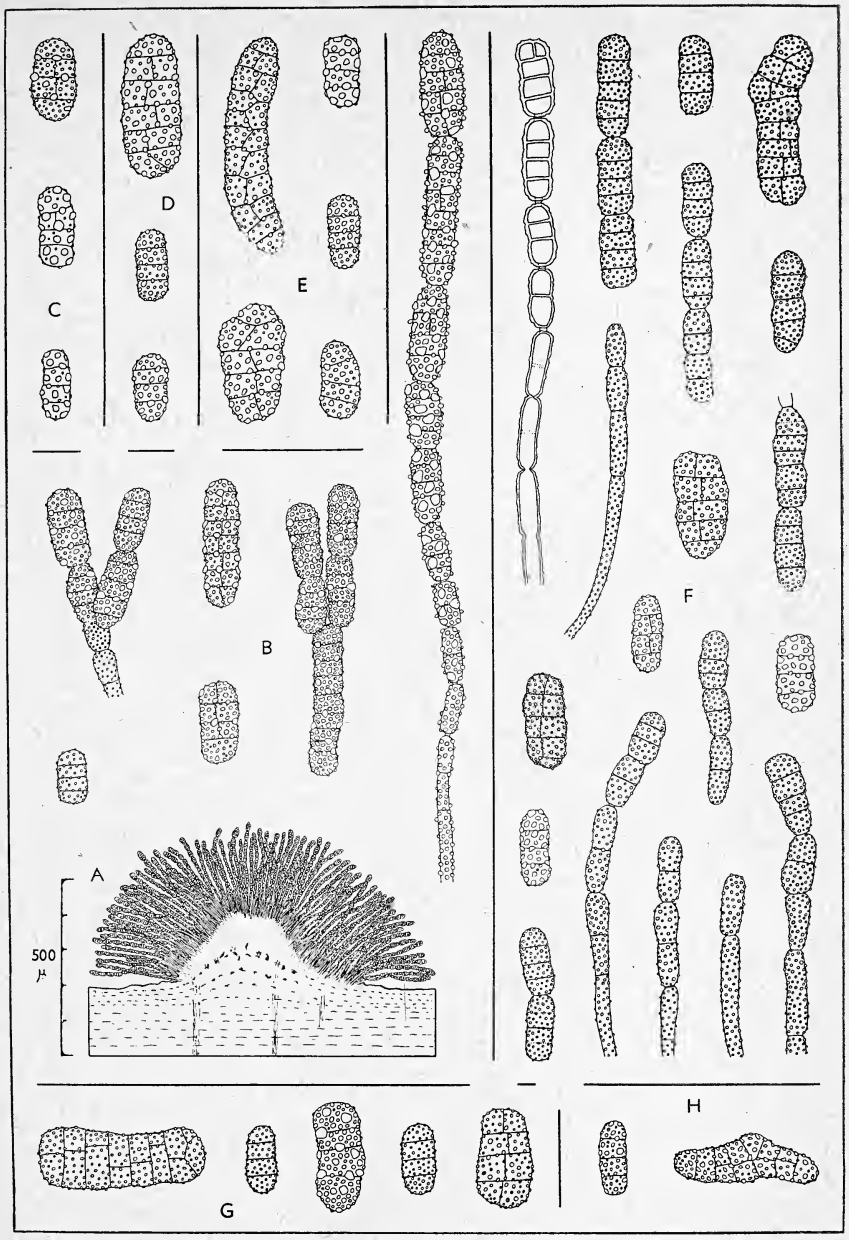


Fig. 2. ***Hysterium insidens*, *Sirodesmium*** state: **A,** section through fructification on wood from Herb. I.M.I. 39826; **B-H,** conidiophores, chains of conidia or loose conidia; **B,** from Herb. I.M.I. 39826; **C,** from the type collection of *Septonema spilomeum* (in Herb. R.B.G. Kew; 45267); **D,** from Klotzsch, *Herb. viv. mycol.* 1962 sub *Sirodesium granulosum* (in Herb. R.B.G. Kew; 45262); **E,** from Ellis, *North American Fungi* 353 sub *Septonema spilomeum* (in Herb. R.B.G. Kew; 39827); **F,** from collection on an old post from Guernsey in Herb. Berk. [in Herb. R.B.G. Kew; 45170(a)]; **G,** from the type collection of *Bonordeniella aspera,* part in Herb. I.M.I. as 39894; **H,** from Roumeguère, *Fungi Gallici exsiccati* 1157 sub *Sirodesmium granulosum* [in Herb. R.B.G. Kew; 45261]; all ×500 except **A,** which has a scale provided.

growth takes place then the mode of development is reminiscent of that described so nicely by Yarwood (*J. Agric. Res.*, lii, 9, pp. 645-57, 1936) for the *Acrosporium* (*Oidium* Auct.) conidia of the powdery mildew *Erysiphe polygoni*. By the ingenious method of folding a leaf with the undisturbed conidiophores on the upper surface of the leaf projecting beyond the edge of the fold, Yarwood observed with a low- or high-power objective of the microscope the changes undergone by the mature conidiophores throughout the day. The interest of his direct observations lies in his observing the presence of a generative cell elongating and dividing to produce a conidial initial at the apex and a lower cell that retains its generative capacity. In all probability, a somewhat similar generative region will be found in the conidiophores of *Hysterium insidens* resulting in a supply of conidial initials for basipetal maturation.

*Habitat* : collections examined have been on dead wood and bark including worked wood of various trees from America, Europe, Australia and South Africa. In Europe the fungus has generally been referred to ' *Sirodesmium granulosum* ' whilst in America where ' *Septonema spilomeum* ' was first found, this has been the name usually used. The hysterothecia have not been found in Europe. It appears from the literature that the fungus favours weathered fence posts and rails especially of oak ; *Septonema spilomeum* was originally described on ' fence rails,' *Sirodesmium granulosum* ' ad trabes, palos, ligna fabrefacta . . . . [see p. 93] ' and *Bonordeniella aspera* ' on well weathered fence post.'

### Collections Maintained as *Hysterium insidens*

#### (*a*) Hysterothecia

(i) On wood, ? Georgia, United States, communicated by J. H. Miller ; Herb. I.M.I., 22893.

(ii) On wood of *Castanea* sp., Bethlehem, Pa., United States, October 1880, coll. J. B. Ellis & H. W. Harkness ; ex U.S.D.A. Mycol. Collections 61186 ; Herb. I.M.I. 22894.

(iii) On dead branch of *Acacia mollissima*, Athol Expt. St., E. Transvaal, South Africa, coll. P. H. B. Talbot, 18/2/1949 ; ex Mycol. Herb. Union Dept. Agric. 36993 ; part in Herb. I.M.I. as 37944. The *Sirodesmium* conidia were obtained when Dr. G. R. Bisby grew an ascospore of this collection in pure culture.

These three collections were assigned to *H. insidens* by Dr. G. R. Bisby.

#### (*b*) *Sirodesmium* conidia

(iv) the type collection of *Septonema spilomeum* in Herb. R.B.G. Kew [45267] labelled by Berkeley ' *Septonema spilomeum*, Berk., 92. Ohio.' Fig. 2**C.** Berkeley (*loc. cit.*) described his species ' on fence rails. March. Ohio. No. 92. T. G. Lea, Esq.' Lohman (*loc. cit.*) identified this fungus with conidial *Hysterium insidens* by culturing ascospores and conidia of field material ; the conidia were then referred to as the *Septonema* conidia. In a study of the type species of *Septonema* (Hughes, *The Naturalist*, 1951, pp. 173-176) I showed that *S. secedens* Corda differs from this fungus in producing its phragmospores in acropetal succession, and there is no intercalary development of conidial initials.

(v) A fragment of the type collection of *Bonordeniella aspera* in Herb. I.M.I. (39894) through the kindness of Dr. Lawrence White, Farlow Herbarium, Harvard University ; ' Haverhill, Massachusetts [U.S.], on well-weathered fence post (probably oak), Oct. 29, 1933, S. K. Harris.' Fig. 2**G.**

(vi) Collection from Guernsey in Herb. Berk. in Herb. R.B.G. Kew [45170(a)] labelled by Berkeley ' *Septonema spilomeum*, Berk. var. *Septonema salweii* Berk. [nomen nudum], on an old post. Guernsey. Green when fresh.' Fig. 2**F**.

(vii) Ellis, *North American Fungi* 353 sub *Septonema spilomeum* Berk. on old oak wood, near Philadelphia, Pennsylvania, coll. J. W. Eckfeldt ; in Herb. R.B.G. Kew [39827]. Fig. 2**E**.

(viii) Klotzsch, *Herb. viv. myc.* 1962 sub *Sirodesmium granulosum*, ' Bugellae : ad palos castaneos in vineis. Aug. 1854. Brixiae, in illo tempore, frequentiss. vidi hunc Coniomycetem. Cesati ' ; in Herb. R.B.G. Kew [45262]. Fig. 2**D**.

(ix) Roumeguère, *Fungi gallici exsiccati* 1157 sub *Sirodesmium granulosum* ' Sur les vieulles barrières en bois de Pin. Vic Bigorre (Hautes-Pyr.). Mars 1880. C.R.' ; in Herb. R.B.G. Kew [45261]. Fig. 2**H**.

(x) On wood and bark of *Acacia mollissima*, Athol Expt. Sta., E. Transvaal, South Africa, coll. P. H. B. Talbot, 2/1949 ; ex Mycol. Herb. Union Dept. Agric. 36972 ; part in Herb. I.M.I. as 39826. Fig. 2**A-B**.

(xi) Ravenel *Fungi Carol. Exsic.* No. 4. '87. *Septonema spilomeum*, Berk. ad lignum vetustum *Quercus*. Ex Alabama quoque, misit Beaumont' ; in Herb. R.B.G. Kew [45649].

(xii) '*Septonema spilomeum* Berk. on *Eucalyptus* batten. Nowra, N.S.W. [Australia], coll. F. A. Rodway, July 1928 [det. Miss E. M. Wakefield] ' ; in Herb. R.B.G. Kew [45648].

(xiii) '*Septonema spilomeum*, Berk. [on wood] 273. Carol. Sup. [North Carolina, U.S.] M. A. Curtis [scripsit Berkeley] ' ; in Herb. R.B.G. Kew [45652].

(xiv) '*Septonema spilomeum*, B. var. [on wood], 5868 bis, New England [U.S.], Russell [scripsit Berkeley] ' ; in Herb. R.B.G. Kew [45650].

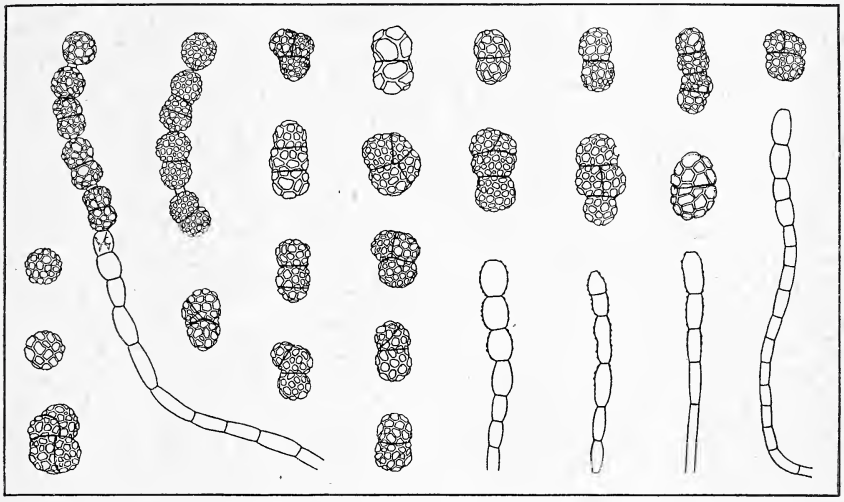

Fig. 3. ***Sirodesmium diversum*** : conidiophores and conidia from Herb. I.M.I. 31634 ; ×500.

(xv) '*Septonema spilomeum*, Berk. [on wood] 302. 221. Carol. Sup. [North Carolina, U.S.] M. A. Curtis [scripsit Berkeley] ' ; in Herb. R.B.G. Kew [45651].

British Records sub *Septonema spilomeum*

This name has appeared four times in British literature :

Berkeley & Broome (Notices of British Fungi, 466 in *Ann. & Mag. Nat. Hist.*, Ser. 2, v, p. 461, 1850) recorded Rev. T. Salwey's collection from Guernsey. This collection is illustrated in Fig. 2**F** ; it is conidial *Hysterium insidens*.

Cooke (*Handbook of British Fungi*, Vol. I, p. 481, 1871) compiled Berkeley & Broome's record of the fungus from Guernsey.

Massee (*British Fungus-Flora*, Vol. III, p. 404, 1893) recorded the fungus 'on fallen wood, sawdust, etc.'

Massee & Crossland (*The Fungus Flora of Yorkshire*, p. 341, 1905) recorded this from 'Saltaire, on firwood (Lees' Fl.)' ; I have not traced this collection.

### 2. ***Torula diversa*** Cooke

It is considered that *T. diversa* is congeneric with *Sirodesmium granulosum* and the following new combination is proposed :

***Sirodesmium diversum*** (Cooke) Hughes comb. nov.

≡*Torula diversa* Cooke in *Grevillea*, vii, No. 41, p. 33, 1878.

*S. diversum* forms dark brown to black, powdery, pulvinate fructifications on dead leaves of *Agave* sp. ; to the naked eye they closely resemble those of conidial *Hysterium insidens*.

The *conidia* are in unbranched chains (Fig. 3) and mature basipetally; the lower initials merge imperceptibly into the straight or curved hyaline to subhyaline conidiophores. At maturity they are mostly didymospores but amerospores, two- and three-septate phragmospores, and dictyospores are also produced. They are coarsely warted, dark brown, constricted at the septa, thick-walled, and here and there neighbouring conidia are seen to be separated by a narrow, hyaline to subhyaline disjunctor-like disc. The conidial chains secede readily to form a black powdery deposit around the fructifications. As in conidial *H. insidens* I consider that intercalary growth occurs in the conidiophores of *S. diversum* supplying a number of initials which then mature basipetally.

This species was based on a single collection on *Agave* sp. from Darien, Georgia, United States. The above notes were prepared from Herb. I.M.I. 31634 which is part of a collection made by F. J. Seaver and J. M. Waterston on dead leaves of *Agave* sp. in Bermuda, 26/11/1940 and assigned by them to *Torula diversa*.

**Postscript.** In 1922 (*Ann. Roy. bot. Gdns., Peradeniya*, vii, p. 318) Petch described his new species *Trichocladium olivaceum* on decaying leaves of *Furcraea gigantea* (Amaryllidaceae) from Ceylon. Part of the type collection (Petch No. 5626), preserved in Herb. R.B.G. Kew, has been examined and is considered to be based on *Sirodesmium diversum*.

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**Bryology Section at Bramham Park.**—On March 26th a few members visited Bramham Park and were favoured in the early part of the day by pleasant sunny weather which, however, degenerated later into cold rain that shortened the collecting time. The Wothersome Lake area was worked in the hope of re-recording the rare hepatic *Riccia crystallina* L. found here in 1929, but we were not successful in meeting with it. Although much material was collected there was little that had not been recorded many times for V.C. 64, although *Tortula mutica* Lindb. was an exception. In the Park an area was visited from which *Blasia pusilla* L. had been recorded in 1929, and young material was collected which was thought to be this species but which, on microscopical examination proved to be an *Anthoceros*. There are two species recorded for Yorkshire, both rare. Judged by the vegetative characters the Bramham plant appears to be *A. laevis* L., for which there are two previous Yorkshire records: Sheffield, 1876, and Ingleby Greenhow, 1947.

The numerous wide paths or rides are a feature of the woodland and a short time spent in one of the damper parts indicated that a detailed study of the bryophyte association would be of interest. Fringing the trees was a large amount of *Polytrichum juniperinum* Willd. crowded with immature capsules; on the wet ground were the hepatics *Lophocolea bidentata* (L.) Dum., *Alicularia scalaris* (Schrad.) Corda, *Calypogeia trichomanis* (L.) Corda, *Conocephalum, Cephalozia bicuspidata* (L.) Dum., *Aplozia crenulata* (Sm.) Dum. var. *gracillima* (Sm.) Heeg, *Cephaloziella starkii* Schiffn., mixed with *Campylopus pyriformis* Brid. Among other mosses were *Pleuridium subulatum* Rabenh., *Catharinea undulata* W. & M., *Thuidium tamariscinum* B. & S., *Hypnum cupressiforme* L. (agg.) and *Hylocomium squarrosum* B. & S. *Orthodontium lineare* Schwaegr. (*heterocarpum*) was present on tree bases.

H. Walsh.

**A Point of Honour. Botanists and Entomologists Please Note.**—Pug moths are small insects with sharply-pointed wings. There are many British species, a number found commonly in Yorkshire. The possibility that two foreign species may be found in Britain was mentioned in *The Entomologist's Record* for January 1952 (pp. 11-12). Neither of these has an English name; one is called *Eupithecia acteata*, the other *E. immundata*. The caterpillars of both feed only on leaves or berries of Baneberry (*Actaea spicata* L.), a scarce plant known to grow in Britain only in Yorkshire, West Lancashire and Westmorland. Mr. E. W. Classey and Mr. H. S. Robinson, having searched a number of localities, concluded that if these moths ever occurred here they do so no longer. Mr. F. Hewson (who represents the Lepidoptera Committee on the Y.N.U. Executive) thought the conclusion was too positive and that a careful search may yet reveal one or both species. A postscript agreeing with this appears in *The Entomologist's Record* for April 1952 (pp. 104-6). Probably the best method would be to search for the caterpillars from mid-August to mid-September. Fuller details may be obtained from the above magazine or from Mr. Hewson, who would be grateful for any information, even of a search in vain.

F.H.

# NOTES ON THE PLANKTON OF OAK MERE, CHESHIRE

EDNA M. LIND AND ARTHUR L. GALLIFORD

Oak Mere is situated on the edge of Delamere Forest in Cheshire just north of the road from Chester to Winsford. It occupies a basin in the glacial drift which overlies the Keuper Sandstones and is 52 acres in extent and reaches a depth of about 18 feet.

The more northerly end of the basin is composed of an extensive bed of peat partly exposed and partly submerged and the shores of the lake in this area are also peaty. The other end of the lake is sandy and surrounded by agricultural land. There is no natural inflow or outlet to the basin which must be largely spring fed through the peats and gravels of the lake bottom. Throughout the last 20 years, and probably before, there have been considerable fluctuations of water level.

## Phytoplankton

Interest in Oak Mere was first aroused when collections of phytoplankton made from 1941 to 1943 proved to be quite different in composition from those of other Cheshire meres under investigation. The main constituent was *Botryococcus Braunii* Kütz. and very few additional plankton algae were seen although zooplankton was abundant. Further collections were made at monthly intervals during the years 1949 to 1951 and the same characteristics were noted. As there was no boat on the mere, collections were made by throwing the plankton net from the end of the peninsula where the water deepened rapidly from about 18 inches to 4 or 5 feet. This was at the peaty end; but collections made for comparison at the sandy end showed no difference. When a strong wind blows down the mere, pieces of peat dislodged from the edge of the peninsula are carried down the lake and deposited at the other end; the water must therefore get well mixed.

Besides *Botryococcus Braunii* the only other species recorded in any of the collections of 1941-43 and 1949-51 were as follows:

*Pediastrum Boryanum* (Turp.) Menegh.
*Phacus longicauda* Duj.
*Trachelomonas* sp.
*Closterium intermedium* Ralfs
*C. striolatum* Ehremb.
*C. Leibleinii* Kütz.
*Euastrum affine* Ralfs
*Cosmarium punctulatum* Bréb.
*Staurastrum anatinum* Cooke and Wills (empty semi-cells)
*Tabellaria flocculosa* (Roth.) Kütz.
*Surirella biseriata* Bréb.
*Ceratoneis Arcus* Kütz.
*Merismopedia glauca* Näg.
*Anabaena Lemmermanni* P. Richter
*Coelosphaerium Naegelianum* Unger

None of these species was ever abundant and indeed, except for *Ceratoneis Arcus* and *Anabaena Lemmermanni* in October 1942, most of them were seen only once or twice in three counts.

## Zooplankton

The zooplankton was on the other hand abundant all through the year. The principal species was *Bosmina obtusirostris* which reached a maximum in the summer months and was often present in great quantity. *Diaptomus gracilis* was also present throughout the year, becoming abundant in the autumn and winter. *Diaphanosoma brachyurum* sometimes became as numerous as the *Bosmina* in the summer and autumn, and from June to September *Polyphemus pediculus* also formed a high proportion of the zooplankton, though this species is usually found in the littoral zone of lakes. The presence of *Polyphemus* is no doubt due to the fact that, owing to the absence of a boat, the plankton net was necessarily drawn through the littoral zone. *Ceriodaphnia quadrangula* was noted from June to October and again in December of the year 1951, but only in September and October did it reach a proportion as high as four per cent of the total number of zooplankton organisms. Males and ephippial females of this species were present in October; this is generally an indication that the species is about to become dormant for a season. The other species of Cladocera and Copepoda were less frequently met with.

The Rotifera were only on one occasion abundant enough to form an appreciable proportion of the zooplankton; in October 1951 the specimens of *Synchaeta* spp. amounted to about five per cent. of the whole in number (but very much less of course in bulk owing to their relatively small size). Most of the samples were

preserved in formalin and owing to the resulting contraction of the specimens it was not always possible to identify the illoricate Rotifera.

It is a remarkable and significant fact that, in spite of the general abundance of animal life, many of the typical zooplankton organisms of oligotrophic and eutrophic waters were totally absent from Oak Mere; such species, for instance, as the Cladocera *Daphnia hyalina, D. galeata, D. cucullata, Bosmina longirostris* and the Rotifera *Keratella cochlearis, K. quadrata, Notholca longispina, Asplanchna priodonta, Polyarthra trigla, Filinia longiseta, Brachionus calyciflorus, B. angularis* and many others which are so frequently found in the plankton of most lakes. It is also worthy of note that *Bosmina obtusirostris* is a northern form common in the oligotrophic mountain lakes of Scotland, the Lake District and North Wales but rare in the lowland waters of England where it is usually replaced by *Bosmina longirostris* or (less frequently) by one or more of the varieties of *Bosmina coregoni*. Yet Oak Mere is only about 250 feet above sea-level and *B. obtusirostris* has not been recorded from any other mere in Cheshire (a record of this species from Rostherne Mere by Tattersall appears to be an error for *B. coregoni* var. *lilljeborgi*).

The only earlier records of zooplankton from Oak Mere known to the writers are those of Entomostraca collected in 1921 by the late D. J. Scourfield, a well-known authority on these organisms. The species marked * and ** in the list were recorded by Scourfield and only those marked ** were not refound by the writers. It seems therefore that there has been little if any change in the specific composition of the Cladocera in the last thirty years. If this is equally true of the other organisms, the lake would appear—in spite of its unusual characteristics—to be in a reasonably stable and not in a transitory condition.

COPEPODA

*Diaptomus gracilis* Sars
*Cyclops strenuus abyssorum* Sars
*C. vernalis* Fischer s. str.
*C. agilis* Koch
***C. nanus* Sars

CLADOCERA

**Diaphanosoma brachyurum* (Liéven)
*Scapholeberis mucronata* (O. F. Müller) and var. *cornuta*
*Ceriodaphnia quadrangula* (O.F.M.).
**Bosmina obtusirostris* Sars
**Ilyocryptus sordidus* (Liéven)
**Drepanothrix dentata* (Eurén)
***Acantholeberis curvirostris* (O.F.M.)
**Alonopsis elongata* Sars
***Alona guttata* Sars
**Rhynchotalona falcata* (Sars)
**Graptoleberis testudinaria* (Fischer)
**Alonella excisa* (Fischer)
**A. nana* (Baird)
*Chydorus ovalis* Kurz
**C. sphaericus* (O.F.M.)
*Monospilus dispar* Sars
**Polyphemus pediculus* (Linnaeus)

ROTIFERA

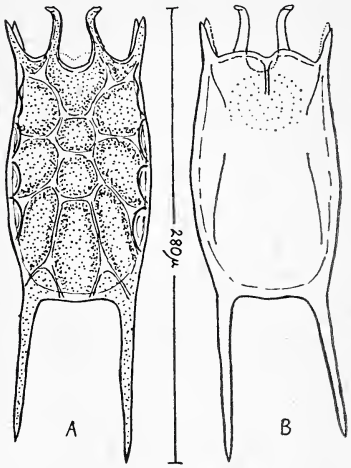
*Proales falaciosa* Wulfert
*Cephalodella* sp.
*C. gibba* (Ehr.)
*Synchaeta pectinata* Ehr.
*S.? oblonga* Ehr.
*Trichocerca cristata* Harring
*Keratella serrulata* (Ehr.)
*K. valga* (Ehr.)
*Euchlanis dilatata* Ehr.
*E. triquetra* Ehr. (=*E. pellucida* Harring)
*E.* (*Dapidia*) *deflexa* (Gosse)
*Lecane lunaris* (Ehr.)
*L. brachydactyla* (Stenroos)
*L. aquila* Harring and Myers
*Lepadella ovalis* (Müller)
*Trichotria tetractis* (Ehr.)
*Rotaria macrura* (Ehr.)
*Dissotrocha aculeata* (Ehr.)

NOTE ON *Keratella valga* Ehr.

The examples of this species found in Oak Mere differed in some respects from any described by E. H. Ahlstrom (A Revision of the Rotatorian Genus *Keratella*, in *Bull. American Mus. Nat. Hist.*, vol. LXXX, 1943, Art. XII, pp. 411-457) and it is at the suggestion of Dr. Ahlstrom that a description and illustration are given here.

*Keratella valga* is sporadic in occurrence in Europe and North America but seems to be abundant and widely distributed in most tropical and semi-tropical countries. It is not characteristic of acid waters as is *Keratella serrulata*; in fact it seems to have a preference for alkaline waters as a general rule.

The foundation pattern of the dorsal plate of the lorica is very similar to that of *Keratella quadrata* but the two species differ in the ratio $A/B$, where $A$ is the width across the bases of the anterior spines and $B$ the width across the bases of the posterior spines. In *K. quadrata* this ratio is less than 1; in *K. valga* greater than 1. Another characteristic of *K. valga* is that the two posterior spines are unequal in length, the left spine being invariably shorter than the right and sometimes completely absent. Thus if $C$ be the length of the left posterior spine and $D$ that of the right, the ratio $C/D$ is less than 1.




KERATELLA VALGA
A. Dorsal view B. Ventral view A.L.G.

The posterior spines of the examples from Oak Mere, however, were unusually long and sub-equal, the ratio $C/D$ being as high as 0·90. Ahlstrom tables the measurements of examples from all over the world, but the highest $C/D$ ratio he gives is 0·84 (left spine 54$\mu$; right spine 64$\mu$) for a specimen from Argentina. Some of his examples had longer right spines (e.g. 119$\mu$ for a South African specimen) but none had such a long left spine (the longest he quotes is 70$\mu$, again for a South African specimen).

The foundation pattern of the dorsal plate of this species is fairly constant, but otherwise the figuration is variable and the dorsal surface in particular may be smooth, reticulated or pustulated. The Oak Mere examples were distinctly but thinly pustulated over the whole of the dorsal surface including the spines but excluding the raised edges of the foundation pattern. The distance between adjacent pustules was approximately 2 to 3$\mu$. The ventral surface was only slightly pustulate in the median anterior region.

Details of the largest specimen measured are as follows:

| | |
|---|---|
| Total length | 280$\mu$ |
| Tip of median anterior spines to bottom of central sinus | 44$\mu$ |
| Length of lateral and intermediate anterior spines | 24 to 28$\mu$ |
| Width across bases of anterior spines | 80$\mu$ |
| Width across bases of posterior spines | 70$\mu$ |
| Maximum width | 88$\mu$ |
| Length of right posterior spine | 100$\mu$ |
| Length of left posterior spine | 90$\mu$ |
| Ratio $C/D$ | 0·90 |

## Chemical Nature of the Water

Analyses were made in 1942 by the Manchester Public Health Laboratory and in 1948 and 1951 by the Mid and South-East Cheshire Water Board. They revealed the following figures for dissolved substances of biological interest.

| Date | 3/43 | 8/43 | 12/48 | 5/51 | |
|---|---|---|---|---|---|
| Free $NH_3$ ... ... | ·28 | ·072 | ·01 | ·04 | Figures in parts per million |
| Albuminoid $NH_3$ ... | ·24 | ·164 | ·18 | ·18 | |
| Nitrate N ... ... | nil | ·2 | nil | 1·0 | |
| *p*H ... ... ... | 4·0 | — | 4·7 | 4·6 | |

## Discussion

The lake shows two unusual features for natural water. The first is its high acidity, no doubt due to the presence of submerged peat and the absence of silting. The second is the low nitrate content in winter and in spring when nitrate is usually

at its highest. These conditions are clearly not conducive to the growth of phytoplankton. One would not expect diatoms in such an acid lake, poor in nitrate; nor is the scarcity of Myxophyceae surprising as these algae are usually most abundant following the decay of another algal crop. But one might have expected some pelagic desmids in such a lake; yet apart from a few doubtful empty semi-cells they were completely absent. The same extreme paucity of species has been noticed in some Scottish lochs with strong peaty influence and little soil drainage. The conditions are, however, clearly favourable to some zooplankton organisms, more particularly to *Bosmina obtusirostris* and a few other species of Cladocera and to the Copepod *Diaptomus gracilis*. But other species of Entomostraca and the Rotifera were poorly represented and it was significant that many of the zooplankton organisms common in most lakes were absent from Oak Mere.

In concluding we would like to express our indebtedness to Mr. G. Fryer of Huddersfield for determining the Copepods.

## NOTES ON THE BIOLOGY OF THE LESSER BROOMRAPE

THIS plant (*Orobanche minor* Sm.) was found by Mr. F. Peverett in a clover field at Esholt on August 23rd, 1951. The information obtained throws light on the germination processes of *Orobanche*, at least so far as to set them within certain limits of time. Since Broomrape germination is still not fully understood, the following fuller details of this occurrence seem to deserve statement.

The field was made ready for the 1950 crops by cultivation in March, 1950. About the end of the month it presented a surface of bare soil, ready for the sowing of oats, which were put in in early April. About a month later seeds of Red Clover and Ryegrass were sown among the growing oats. The clover grew under the oats and a good deal of the 1950 crop was cut and harvested with the oats. The lower parts of the plants of course remained and from these the clover crop of 1951 grew. This was cut, dried and stacked as clover hay twice in 1951, in late June and early August. There was in mid-September a third crop which is to be ploughed in, in preparation for another corn crop next year.

It is clear then that in April, 1951, when the soil was ready for oats there was no visible Broomrape. It is improbable that there was any Broomrape seed in the soil since (1) the farmer had never seen Broomrape before either in this field or anywhere in the district (2) Botanists of the Bradford Natural History Society have searched the area regularly for many years and no Broomrape has been seen in Esholt since 1901 and there is no evidence that this was in or near the same field. (3) it is very unlikely that the seeds of Broomrape which are very small are very long-lived. (4) Seeds of Broomrape can scarcely have come in the manuring which was mainly by artificial fertiliser and the small portion of the field which received farmyard manure did not differ from the rest as to Broomrape.

It seems then that much the likeliest source of the parasitic Broomrape is the seed of clover sown in May, 1950. Although clover-seed merchants no doubt take every precaution to sell seed free from such parasites as Broomrape and Dodder, yet mistakes are liable to occur. The clover seed came from the south where the clover Broomrape is much commoner than it is in Yorkshire and where constant vigilance is thus necessary. The following course of events is therefore likely to have occurred:

May, 1950, germination of clover seed. May, 1950 (at the same time or a few days later) germination of Broomrape seed. Attachment of the Broomrape seedlings to clover roots, probably followed in a few days and the rest of the growing season of 1950 would be occupied by the formation of the warty tuber of the Broomrape by extraction of food from the root to which it is attached. Adventitious growths would spring from some of the tubers and make additional connections to other clover roots. We can visualise then I think the tuber, developed to almost full size and attached to one or more roots of clover, as the stage which goes into the winter rest.

When the 1951 growing season began, the tuber would resume the absorption of food and later would develop into a flowering shoot. No flowering shoots appeared in the first crop of clover which was cut about the end of June. The second crop, cut before the middle of August showed large numbers of Broomrape flowering stems, so numerous that they scattered out of the dried clover on to the road as they were being carted home. The third crop, which is to be ploughed in, showed at least a hundred flowering spikes in the third week of September.

The time between the sowing of the clover with Broomrape seeds in May, 1950, and the appearance in full flower of the first Broomrapes in August, 1951, is fifteen months. Other stems arose and went on flowering through September. The ploughing-in of the clover ready for another corn crop will presumably end the occurrence of Broomrape in this field. The whole life-cycle is thus limited to eighteen months. As the above is a common method of cultivating red clover in this country, viz.—as a one-year ley, this is probably a usual length of life of this species of Broomrape.

That the plant is capable of a much longer persistence on one site is shown by its history at the locality above Redburn Road, Shipley (see *The Naturalist*, 1946, p. 13) where it persisted for nine years at least, with a three years interval of absence. Here it grew on perennial Red Clover on an undisturbed site.

A. Malins Smith.

The nature of the germination process in angiospermous root parasites has been investigated for some time, under the direction of Dr. R. Brown, in the Department of Botany of Leeds University. My particular interest has been in the genus *Orobanche* upon which work was commenced in the autumn of 1948. As some of the data collected have relevance to Mr. Smith's observations I am grateful for the opportunity of commenting on some points raised in his interesting paper.

(1). I visited the field at Esholt on September 21st, 1951, in company with Mr. G. A. Shaw, who had told me of it, and Dr. L. C. Spark, both of this Department. As the result of intensive search we picked 350 spikes of *O. minor* to provide a new stock of seed. We did not pick young shoots and consider we probably left about as many as we picked. It seems fair to suggest that on this date there must have been several hundred Broomrape plants in the field.

(2). It is my impression that *O. minor* (like a number of other species in the genus), is much more common at least in Northern England, in soils over limestone or chalk than in those on more ' acid ' formations. The five other records quoted by Mr. Smith in his first account of the Redburn Road site at Shipley (*The Naturalist*, 1937, p. 209), were all from areas over magnesian limestone. This new record at Esholt and the earlier one of 1901 and the Redburn Road Station, are of great interest because they appear to be the only Yorkshire ones for *O. minor* which are not on limestone or chalk. I have only one Yorkshire record of *O. minor* to add and this was in October, 1949 on cultivated carrots at Beech Tree Farm, Fangfoss, in the East Riding on the border of the chalk. Undoubtedly *O. minor* can be grown in culture in soils not very high in lime, but it may be that lime content is ecologically important, affecting the ability of the parasite to persist on a given site.

(3). Whilst there do not appear to be records of Broomrape seeds remaining viable for so long as fifty years (which would be required to explain the present outbreaks as caused by seed from the plants of 1901), it is noteworthy that the minute seeds of this plant do have a remarkable degree of viability which must be important in their ecology. We have found that seed one year, two years, three years and seven years old (stored air dry at room temperatures), and seed harvested only two months before testing, do not differ in capacity (up to 90 per cent.) or in ease of germination. Furthermore a sample of seed kept on moist filter paper at 25° C. maintained its quality in these respects for over a year. The seeds do not germinate in water but in all cases respond three to four days (at 25° C.) after application of a stimulant prepared from root washings of a number of different plants. These results suggest that whether kept dry or moist the seeds do not quickly lose their dependence upon an external stimulant (normally provided by suitable nearby roots), for germination. It would seem at least possible that the seed may remain dormant for a number of years in the soil, provided that they escape germination by the proximity of roots which can stimulate them.

Farmers in areas where *Orobanche* is common have told me that they believe the seed can remain dormant in the soil from one sowing of clover to the next but this is clearly difficult to prove where seed may blow in or be otherwise transferred from other fields in the intervening years. Mr. Malins Smith's record of a gap of three years without *Orobanche* flowers during his observations at Redburn Road over a nine-year period (*The Naturalist*, 1946, p. 13) is important because it relates to undisturbed ground in an area in which *O. minor* is very uncommon and re-introduction of seed improbable. There is an American record of tests showing that *O. ramosa* can remain dormant in soil for ten years.

Many plants upon which *O. minor* does not grow to maturity or even become attached at all, can produce a stimulant for germination (R. Brown, A. D. Greenwood, A. W. Johnston and A. G. Long, 1951, *Biochem. Journ.*, vol. 48, pp. 559-564). The radicles of the seedlings do not appear capable of growing on their own to more than about 2 mm. in length and further development does not occur unless they are in contact with and become attached to a suitable host root. These facts suggest that even in years when no clover or other full host is present, seeds in the soil may be germinated and that in this way the reserve of viable seeds will be constantly depleted because it is most unlikely that the seedlings can live for any length of time unless they become attached to a host. In the seedling stage, at least, some of these ' non-host ' plants such as linseed, are much more abundant producers of stimulant than clover itself and this raises the question whether suitable non-host plants could be found which might be used to hasten the removal of viable seeds during years in which clover is not planted (such cereals and grasses as we have tried are poor producers of stimulant). The stimulant is quickly inactivated in alkaline solutions but is much more stable under acid conditions and it is possible that in acid soils more seeds will be germinated by a given root than would be in alkaline ones.

(4). The growth period postulated by Mr. Malins Smith agrees with what I have been told by several farmers, namely that in short-term leys where oats or barley are sown as a ' nurse ' crop for the first year, the *Orobanche* flowers are not seen until after the June hay crop in the second summer. There is, however, no doubt that *O. minor* can be brought to flowering on clover in a single year. Holdsworth and Nutman (*Nature*, 1947, p. 223), at Rothamstead, found that on clover sown between November and February, Broomrape flowered from early August onwards even if sown as late as June. Clover sown in April, May or June flowered in September, and *Orobanche* flowered at about the same time. We have had similar results in Leeds in experiments involving 21 different strains of red clover and 14 whites or wild whites all tested with 5 stocks of *O. minor* seed, each from a different locality. In all cases flowers appeared in less than 12 months, the shortest interval being for September flowers from seed sown in May on seedling clovers. These experiments suggest that even in the assumed favourable conditions of pot culture, flowers cannot be expected before September or October if the clovers are in the seedling stage in May or June. In such cultures although the clovers are definitely impoverished if they bear parasites on the roots, there does seem to be a well balanced host-parasite relationship during the subterranean growth of the *Orobanche* and the clover is not seriously weakened until the parasite flowers when there is sometimes quite a dramatic setback to the host. From our trials in Leeds we found that on young or small plants development of the parasites is slow and we have some evidence that incompletely developed plants can winter over on the roots of the host, although they are often killed if exposed to a hard frost.

In the Esholt field where the clover would only be in the seedling stage in late May of 1950, it might be well into June or later before the parasites were becoming attached in any number. Mr. N. Sunderland working in this Department finds that under laboratory conditions the process of attachment of the seedlings may take several weeks after the seeds have germinated. Under these circumstances with, in addition, the competition from the oats and the rye-grass and where the first clover growth is cut with the oats, it is reasonable to believe that the host plants would not be vigorous enough to bring the parasites to flowering in the first season. It may be surmised that the flowers eventually found in quantity in August and September were those partly from parasites germinated in 1950 but many of them, in view of the facts set out above, could equally well be from seed which germinated at any date up to perhaps May or June of 1951, the developmental periods therefore varying from fifteen or sixteen months to as short as four or five months between germination and flowering.

We have confirmed the findings of Tate (*New Phytologist*, 1925, XXIV, 284), that *O. hederae* on ivy does require a full twelve months below the soil and flowers did not appear until the second summer after sowing even under the most favourable conditions we could arrange. The same period probably applies to *O. elatior* because we had flowers in August, 1951, for the first time from seeds which had been sown on well developed plants of *Centaurea scabiosa* in November, 1949. *O. ramosa* (on tomatoes, *Pelargonium* and *Coleus*), and *O. speciosa* (on broad beans) on the other hand resembled *O. minor* (on clover, *Pelargonium*, *Plantago*, teazle, black

medick, *Strobilanthes* and *Aralia*), and have come to flowering in one season here in Leeds.

This outbreak at Esholt and the Redburn Road record (observed by Mr. Smith for nine years), are of particular interest because of the rarity of the plant in this neighbourhood, particularly on sites not over limestone or chalk. Continued observations of this field at Esholt may give valid data for the longevity of the seed in the soil. It may be assumed there are at present many seeds in the ground. If, when clover is next planted, flowers appear again in large quantities this will give a minimum period for the life of the seed in soil provided flowers have not been seen in the intervening years and provided that re-introduction again with the clover seed can be ruled out. It must be remembered that climatic conditions may be as important as the soil in contributing to the factors which account for the rarity of *Orobanche* hereabouts but records of soil *p*H and lime content would be of great interest.

A. D. GREENWOOD.

## WHITE-BILLED NORTHERN DIVER
### and other unusual sea-birds seen at Scarborough and Filey during the winter of 1951-52

A. J. WALLIS

In 1916 the late W. J. Clarke watched a White-billed Northern Diver (*Colymbus adamsii*) in Scarborough Harbour (see *The Naturalist*, 1916, pp. 217-219). This was the first authentic record for the Yorkshire coast, and now the second record has been made. On January 30th, 1952, Mr. Eric Sigston found a dead specimen on Scarborough sands, and it was brought to the writer for identification.

The bird had died through oiling of its plumage and was, in general, in a very bad condition when received. So much so that it was only possible to preserve the head and feet. It had an overall measurement of 33 inches, but it was impossible to take any other measurements which would have been of any value. The second and third primaries were missing from both wings, and the tip of the upper mandible was broken off. The bill was white in colour, shading to dark horn at the base of the upper mandible, which had the typical straight upper line, whilst the uptilt of the lower mandible gave the bill the *retroussé* effect which is so characteristic of this species.

A few days after this bird had been found (the exact date is not certain), Mr. Brian Fewster found another diver on the shore. This bird was also badly oiled, but was alive when picked up. It died soon afterwards and was buried in his garden. Mr. Fewster had identified the bird as a Black-throated Diver (*Colymbus arcticus*), and this identification was confirmed by the writer when, about a week later, the existence of the bird came to his notice and it had been retrieved from its resting place.

The Black-throated Diver is the second rarest of the four species to be recorded on the Yorkshire coast, and the records of the Scarborough Field Naturalists' Society give no mention of any between 1937 and 1952.

It is a sad reflection that both these records are only made possible because of the ever-present menace of oil ejected so unnecessarily by ships passing close to the shore along our coasts.

Several other sea-birds which are not an everyday occurrence have been recorded this winter. On January 9th, 19th, and February 8th, 1952, a juvenile Glaucous Gull (*Larus hyperboreas*) was seen in Scarborough Harbour, although there is no indication that it was the same bird on each occasion. On January 19th, 1952, there was also present an Iceland Gull (*Larus glaucoides*), and a comparison of the two birds was possible, as they were seen close together on the mud bank in the centre of the harbour. Both were juveniles in the mottled brown plumage, but in both birds the shade of brown was paler than that of the juvenile Herring Gull (*Larus argentatus*). The mottling of the Iceland Gull was, however, more bold in its patterning, and had not quite the smooth texture so common in the plumage of the Glaucous. A comparison of their relative sizes was also possible as they were in company both with Herring Gulls and Great Black-backed Gulls (*Larus marinus*). The Glaucous was clearly the larger of the two birds.

An Iceland Gull was also present on February 5th, 1952, the day on which an adult Little Gull (*Larus minutus*) was first seen. It was feeding in company with a flock of Black-headed Gulls (*Larus ridibundus*), but the difference in its call attracted immediate attention. After hearing the call it was easy to pick out, the slate-grey of the underwing showing clearly as it flew gracefully to and fro over the outlet of the town sewer. It was still present on February 8th, when it was again seen outside the harbour apparently unhindered by the strong gale blowing at the time.

Two species of ducks which are only rarely recorded for this area have been seen this winter. On October 21st, 1951, five Velvet Scoters (*Melanitta fusca*) were seen flying south across Filey Bay, and on December 15th, 1951, a juvenile (?) Long-tailed Duck (*Clangula hyemalis*) was watched feeding close to the south shore of Filey Brigg. This bird was still present on December 27th, 1951, when it was seen in the same locality as on the previous occasion. On January 20th, 1952, a male and a female of this species were present, and they stayed for not less than a week, whilst on March 9th, 1952, two females were seen, again in the same locality.

It is interesting that all these five birds were seen near the same stretch of shore, a stretch of not more than 100 yards in length, indicating that it offered the best type of feeding ground for the species. The shore at this point is relatively level rock thickly covered with seaweed of the various *Fucus* species. At one end this stretch of rock becomes strewn with boulders, and at the other it gives way to a sandy beach, but the ducks were never seen to feed beyond the limits of the chosen stretch of shore.

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**The Bird-lover's Week-end Book,** by **Eric Hardy.** Pp. 443. Decorated by Thomas Beck. *The Week-end Library Series.* Seeley Service & Co., London, 1952, 15/- net.

It is quite evident from this excellent *Week-end Library Series* that even the modern five-day week does not provide a sufficiently long ' week-end ' to enable the toiler to give adequate attention to the many absorbing sports, pastimes, hobbies and more serious studies which demand his attention. But the volume under review calls for special mention as it introduces the week-ender to a subject of engrossing interest, which the photographer and artist can pursue from the ' hide,' the saunterer can study at leisure and the hiker can take in his stride. The author approaches his subject in such an attractive manner and from so many angles that he can hardly fail to lure many lovers of the wild to become bird-watchers.

In his opening chapter the writer describes some of his own experiences as an all-the-year-round bird-watcher in such a way as to make the reader long to follow in his footsteps and share his delights. As a preliminary aid, the reader is given a very original ' key ' by which to identify the various species, the tools of his craft are described and he is told what birds he is likely to find in any part of the British Isles to which he may turn his steps. Some of those aspects of bird life which he may profitably study are then introduced to him, bird behaviour, migration, distribution and the like. There is a chapter on the books recommended as helpful, a glossary of bird-watchers' terms and a long list of local bird names. But even this does not exhaust the mine of informative material provided; and when the strenuous week-ender requires rest before turning in to his sleeping-bag, he can dip into the anthology (Chapter 8) and read how the poets responded to the delights of bird-watching; and when the light fails and the small, close print becomes unreadable, he can still enjoy the choice black-and-white illustrations with which Thomas Beck has so charmingly decorated the pages; and as he lays down the book at last he will be conscious of his gratitude to Eric Hardy for having so pleasantly and efficiently induced him to become a bird-lover.

The reviewer's chief criticism is the complete inadequacy of the index provided; but on consideration it is obvious that, owing to the very multiplicity of the subjects referred to in the text, a complete index would have so enlarged the volume that room could not possibly have been found for it in the week-ender's rucksack, which is, without doubt, its appropriate place. G.W.T.

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**Correction.**—In my review of *A History of the Birds of Durham* (*Naturalist*, 1952, p. 90) I find that I wrongly ascribed the Goosander as a breeding bird to Durham instead of to Northumberland. I regret the error which was mine and not Mr. Temperley's. R.C.

## FIELD NOTES

**White-billed Northern Diver near Whitby.**—An oiled Diver found on the beach at Sandsend on February 10th, 1952, was taken to Mr. A. B. Walker for de-oiling. Although Mr. Walker is well-known locally for his skill in dealing with damaged birds, this one soon died. In view of its great rarity the specimen was sent to the Hancock Museum, Newcastle, for preservation for the Whitby Museum. At Newcastle the specimen was compared with the first White-billed Northern Diver to be obtained in Britain (see *British Birds*, XVI, pp. 9-12), and confirmed as *Colymbus adamsii*. Mr. Walker informs us that the bird was an adult female assuming summer plumage. The primaries were completely moulted, and the back plumage showed only a few medium-sized white spots. The bill was of horn-colour with a yellowish tinge, becoming grey-brown above and behind the nostrils, and measured 75 mm. from front of nostrils. The top line of the upper mandible is straight almost to the tip, the bottom has the typical upward curving tilt in the lower line.

Known in Canada as the Yellow-billed Loon, this probably geographical variant from the typical Great Northern Diver, ranges, according to *The Handbook of British Birds* and to Taverner's *Birds of Canada*, from Western Canada and Alaska across arctic Siberia, and westward to an unknown extent into north-east Europe. At the meeting of the Y.N.U. Vertebrate Section held in Leeds on March 15th, members had an opportunity of seeing a magnificent set of photographs of the Great Northern Diver (*C. arcticus*) taken by G. K. Yeates in Iceland.—R.C.

**The Lesser Grey Shrike (*Lanius minor*) near Maltby.**—On January 26th, 1952, a bird was seen by my wife and myself to fly to the top of a dead tree near the path which runs from the Roche Abbey ruins to Stone; when observed through the binoculars (Kershaw × 10·5) it was noted to have a long tail and a slightly hooked beak, also black eye streaks. The bird was approximately 30 yards away but the light was poor. The bird quickly flew to a more distant tree, again perching on the top, and shortly after being picked up again in the glasses, flew away and was lost. I concluded that we had seen a shrike but considered it too small for the Great Grey Shrike, which we have seen on previous occasions.

On February 3rd, 1952, as my wife and I returned from Roche along the top of the Norwoods a bird was observed on the very top of a tree, and was immediately recognised as the small shrike we had seen the previous week-end. While still under observation through the glasses the bird flew in our direction and alighted on the pylon wires about 20 yards distant from where we stood. The bird was in very good light and the following features were noted: (*a*) a white breast with a decided rosy tinge on the lower part; (*b*) the black eye stripes were joined together across the forehead; (*c*) black wings with a white patch on the front edge; (*d*) black tail and grey back. In size it appeared to be about the size of a Hawfinch except for the longer tail. The bird was observed and followed round for half an hour as it flew from one position to another; it invariably perched on the very top of the trees, or on the wires. On one occasion whilst observed on a yew it pounced almost vertically down to the ground and after remaining on the ground for some three minutes, flew half-way up the tree, cleaned its bill, and then went to the top of the tree again. The bird was out of sight whilst on the ground. The bird was followed back towards Roche during these observations and eventually flew across the fields and was lost to sight.

From the above observations I concluded that the bird was a Lesser Grey Shrike.—A. C. Hoyle.

[I could not find the bird on February 10th, but it was seen on March 16th by R. Bramhill, who confirmed the identification, with which I entirely agree after discussing the matter with the observers. Obviously, it was a male bird. The only previous authenticated occurrence for Yorkshire was shot at Sleights, near Whitby, on September 20th, 1905.—R.C.]

**Large Gathering of Waders on Filey Brigg.**—Filey Brigg is not the most suitable type of locality for any study of the wader family, except for those species which have a preference for a rocky shore, such as the Purple Sandpiper. A small flock of this species, usually numbering from eight to twelve birds, lives on or about Filey Brigg each winter, and may be watched feeding in the rock pools, or amongst the seaweed close to the tide line on any visit between late October and early April.

They are usually accompanied by a few Turnstones and Dunlins, but the numbers of these species vary from week to week, indicating that they only rest on the Brigg during migratory movements up and down the coast. Many of the other waders which use the east coast route on migration may be seen on occasions, but their appearance is quite erratic, and they never occur in more than small flocks, and more often than not just in ones and twos.

On January 27th, 1952, there was an exceptionally high tide, accompanied by rough seas, caused by a strong northerly wind. The result was that ' High Brigg,' the portion of the Brigg which normally forms an island at high tide, and affords the birds a safe resting place, was completely covered by the sea, and the birds were forced to rest on the shore close beneath the cliffs. The height of the tide must also have prevented waders from other nearby parts of the coast from finding a resting place at the cliff foot to the north of Filey, and in consequence a phenomenal gathering of waders was seen at the foot of Carr Naze. The total number of waders was about 130, comprised of ten different species. Sitting not more than 20 yards from where the birds were resting, it was a unique occasion for this part of the coast. The flock was made up of 22 Curlews, 4 Whimbrel, about 20 Turnstones, 2 Knots, 25 Purple Sandpipers, 4 Sanderlings, 12 Redshanks, 4 Golden Plovers, about 20 Lapwings, and about 20 Oyster-catchers. The flock was roughly divided into two parts, the larger species keeping as far from the cliff and as near to the water as possible, whilst the smaller species slept quietly on a level patch of rock immediately beneath the cliff. In fact, some of the larger birds were so restless that they were continually taking wing, flying round for a few minutes, only to return again to the one dry part of the shore. The Curlews and the Lapwings were the most nervous, and, in fact, during the time the flock was under observation, never once were all the Lapwings settled at the same time. Minor squabbles took place as the birds were forced to move by an extra strong wave, the Turnstones being the most pugnacious. One of the Knots was seen to have a ring on its leg.—A. J. Wallis.

**Glaciated Pavement in Kneeton Hall Quarry near Scotch Corner.**—A beautiful example of a glaciated limestone pavement may be seen in the upper workings of this quarry. The surface over a fairly wide area is smooth, almost polished, and covered with a multitude of fine parallel striations, all pointing in the same direction, ca. 40° W. of N. A compass reading gave 30°, and from Ordnance Survey data the magnetic deviation on January 1st, 1952, was 10° 15′, both W. of N. The pavement is ca. 400 ft. O.D., and it is interesting to note that the striations are in the same general direction as the contour-lines in the neighbourhood of the quarry, and not at right-angles, as might have been expected. The striations show, of course, the latest direction of the passage of ice over the site, any earlier striations will have been erased, owing to the softness of the limestone rock: we have to deal, therefore, with a late stage in the glaciation of the district.

Large glacial boulders of local origin were seen embedded in glacial clay to the left of the entrance from the main road to Piercebridge. No far-travelled rocks were seen either here or in the dumped clay near the lower quarry workings. The pavement is not level throughout, and must have been uneven at the time of the ice-flow: this is shown by a large block of limestone near the quarry face, which is striated on top, and stands at a higher level than the rest of the striated area. Some of this block has been removed by the quarrymen, and the newly-formed surface is, of course, not striated.

The Kneeton Hall Quarry exposure is one of the most extensive striated areas we have yet seen, and is well worth a visit by any geologist interested in the glacial history of Yorkshire. The site is not far from the Barton Quarries, which are at a lower elevation and more to the north, and where formerly similar striations, and also some glacial erratics of Lakeland rock formations were to be seen. One has to be on the spot within a few months of opening up these exposures. Even then, unless the cover has been good solid moraine laid down by the glacier, any original striations are likely to have been rotted off, particularly if the subsequent cover is peaty.

We shall be glad to hear of any other recent exposures of glaciated pavements, more especially in the Swaledale and Wensleydale areas, which were first shown to have been widely and heavily glaciated by the researches of Dr. A. Raistrick, cf. ' The glaciation of Wensleydale, Swaledale and adjoining parts of the Pennines ' in *Proc. Yorks. Geol. Soc.*, **20**, 366-410, 1926.—G. F. Horsley, J. P. Utley and C. Walker.

# ORNITHOLOGICAL REPORT FOR NORTHUMBERLAND AND DURHAM FOR 1951

Compiled from the records of members of The Natural History Society of Northumberland, Durham and Newcastle upon Tyne and many other local observers, by George W. Temperley.

A key to the initials used in this Report will be found at the end of these notes. Abbreviations used: N.=Northumberland; D.=Durham; *B.B.=British Birds; O.R.=Ornithological Report*; *F.I.O.R.=Farne Islands Ornithological Report.*

The number preceding the name of each species refers to Witherby's *Handbook of British Birds*, where the full scientific name will be found.

It is essential that this Report should maintain a high standard of accuracy and reliability. In order to do so it has been necessary to omit a few records about which, owing to the unfavourable conditions under which they were made, or owing to the inexperience of the observers, some doubt exists as to the accuracy of the identification. Others, for similar reasons, are placed in square brackets.

Notes have been received from over 150 observers, but, owing to lack of space, only records from some 100 have been included in this Report. *All* notes and observations are welcome, as they are helpful in assessing the status and distribution of the various species in the two counties. Notes should be tabulated under the name of the species concerned and addressed to G. W. Temperley, Hancock Museum, Newcastle upon Tyne.

Records of unusual interest dealt with below are: Red-breasted Flycatcher (125), Scandinavian Chiffchaff (130), Yellow-browed Warbler (137), Pallas's Warbler (138), Aquatic Warbler (154), Hoopoe (232), Lesser Spotted Woodpecker (238), Wryneck (239), Golden Eagle (266), Montagu's Harrier (272), Osprey (284), Spoonbill (287), Bittern (297), White-fronted Goose (304), American Wigeon (324), Storm-petrel (350), Sooty Shearwater (363), Great Crested Grebe, breeding (370), Black-necked Grebe (374), Great Snipe (394), Red-necked Phalarope (401), Corncrake, unusually numerous (504).

## Weather Conditions in 1951

The year opened with a long period of cold, raw weather, which continued without a break until nearly the end of April, when a few bright sunny days encouraged the very backward vegetation and brought a smattering of early migrants; but the month closed with a return to N.E. and E. winds with sleet and hail, and the main arrival of migrants was much delayed. Winter visitors were late in departing. May was cold and sunless with much rain and both resident and visiting birds were late in breeding, ground-nesting species being particularly affected. It was not until the first days of June that any warmth was experienced and it was but short-lived, and, except for a few days in July and August, there was very little sunshine. September and October were cold and wet, with much unfavourable wind affecting the arrival of passage migrants and winter visitors. Crops ripened late and, owing to rain, the harvest was long delayed, some corn standing out in the fields, too wet to cut or lead, far into the winter. November and December were comparatively mild, with little frost or snow. The whole year was remarkable for the lack of extremes of temperature—no summer heat or winter cold, but a continuous period of cloudy, damp and sunless weather. How these conditions influenced bird life is clearly brought out in the classified notes which follow below.

## Bird Ringing

*Farne Islands.* Four organised ringing expeditions took place and a total of 1,748 birds was ringed, 26 being adults and 1,722 nestlings, of 13 different species. (For full particulars of species ringed and of recoveries reported see *F.I.O.R.*, 1951.)

*Forestry Commission Plantations near Hamsterley, Durham.* A visit was paid on June 30th when ten nesting boxes were found to contain young birds at the right age for ringing—Great Tit five broods, 31 birds ringed, Pied Flycatcher four broods, 16 ringed, Redstart one brood of four ringed. Total 51. An adult Long-eared Bat was found in one otherwise empty box.

*Forestry Commission Plantations near Kielder, Northumberland.* A first visit was paid on July 8th with a view to exploring the conditions for regular work next season. Blue Tit nestlings, seven ringed, Pied Flycatcher nestlings, four ringed.

*North Shields Kittiwake Colony on warehouse window-ledges.* This colony was visited on July 4th when 19 nests were seen on the ledges. Thirteen of these contained young, one had two eggs just chipping and five were inaccessible. In all 17 nestlings were ringed.

## Nesting-box Experiments

In the Forestry Commission's plantations near Hamsterley mentioned above, 323 nesting-boxes were put up for the 1951 season. Of these only 88 were occupied; 14 were later deserted and 74 broods were reared. This compares with 102 broods in 1950. The following shows the number of each species reared and the average brood size:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pied Flycatcher | 20 | nests with | 94 | young, | average brood size | 4·7 |
| Great Tit | 19 | ,, ,, | 122 | ,, | ,, ,, | 6·4 |
| Redstart | 15 | ,, ,, | 75 | ,, | ,, ,, | 5·0 |
| Blue Tit | 12 | ,, ,, | 86 | ,, | ,, ,, | 7·3 |
| Coal Tit | 8 | ,, ,, | 61 | ,, | ,, ,, | 7·6 |

It will be noted that, as compared with last year, the principal reduction is in the number of Pied Flycatchers breeding, only 20 pairs breeding successfully instead of 40. In each species the average brood-size was reduced by about one, doubtless due to unfavourable weather conditions. The attempt to persuade birds to occupy boxes in the depth of the coniferous plantations was only very partially successful; but one Great Tit's nest was at least 150 yards from the nearest water and a Pied Flycatcher had a brood of five in a box on a bare tree-stump about 300 yards from a stream, but not under the normal close canopy of a plantation. We are indebted to C. H. Longstaff for this information.

## The Wildfowl Census

This Census has been continued with unflagging zeal during the year, in spite of the hinderances of bad weather and the difficulties of transport to outlying waters. The International Wildfowl Inquiry Committee is most grateful to all those members who are taking part in it.

## Monks' House Bird Observatory and Field Study Centre

At this Bird Observatory, established by Dr. E. A. R. Ennion near Seahouses on the Northumberland coast in April last, bird life on the coast is being very thoroughly studied. Traps have been erected in which many passage migrants and winter visitors have been caught and ringed. From April up to the end of the year, 1,605 birds of 54 different species were caught. Many observations on the distribution, movements and habits of the resident and visiting species on the shore, on the Farne Islands and Holy Island and to some extent on the mainland have already been made. Dr. Ennion, who is a member of the Society, has most generously contributed his records to the compilation of this Report and very many of them are included in the ' Classified Notes ' which follow. With so much valuable information available, this Report is able to deal much more fully with the subject of migration than has previously been possible. The dates given by Dr. Ennion during this season will be of value for comparison with future years. The further development of the work of this observatory will be followed with great interest by all North Country ornithologists, and recovery of the birds ringed should reveal much information as to the origin and destination of those species which pass back and forward along our coast. In this connection it should once more be emphasised that every ornithologist should always make a point of examining every dead bird that he meets with to ascertain whether it bears a ring, either put on in this country or elsewhere.

## Personal

Since the last Report was published, the Ornithological Section has lost, by death, one of its most active and experienced members, Harry Tully. It will be remembered that under his chairmanship and zealous leadership the Section's work was developed and extended. The very first Ornithological Report issued by the Section, that of 1933, was compiled and written by him in the form of a typed circular to members. Since that time he had not only been a constant contributor of valuable notes and records; but had given much help and advice in the selection of the material to be

published. By his death Ornithology in Northumberland has suffered a severe blow. The bequest of his very valuable and comprehensive collection of books, on Ornithology and kindred subjects, to the Society has greatly enriched the Hancock Museum Reference Library.

## Classified Notes

1. Raven.—Successful breeding took place at several Northumbrian sites. Some broods were reared late, probably owing to earlier molestation. On May 13th at one site a nest was found containing young still in the down, the wing quills just sprouting (E.G.T.). At a site in Redesdale three young were reared; the family party of five was seen in August (D.R.). From March to June a pair haunted the cliffs between Dunstanburgh and Bamburgh, but no nest was found (D.S., E.A.R.E. & J.M.C.). In Durham the Teesdale pair had four eggs on March 13th, there being hard frost and deep snow on the fells. The eggs were taken; but the pair bred again on the Yorkshire side of the river where they reared three young on an inaccessible ledge. The young were still in the nest on May 30th; a late date (H.W.).

2. Hooded Crow.—In the early part of the year very few were reported, and usually only single birds; the only flock being one of eight birds on Beal Shore, N. on March 19th (F.B.). Late dates were—on May 31st two at Bamburgh (E.A.R.E.) and on June 2nd one at Craster (W.S.C.). On June 8th a Hooded Crow—Carrion hybrid was shot at Blagdon, N.; it was a bird of the year and showed typical Hooded Crow markings on the breast. It was stated that both parents had been black (M.W.R.).

Again very few reported in the autumn, chiefly single birds. First seen on September 6th near Budle Bay, N. Largest number ten on Boldon Flats on October 16th, and eight at Teesmouth on December 6th (A.B.).

3. Carrion Crow.—In mid-July at West Shaftoe Farm, Middleton, N., two pure white juvenile Carrions were seen being fed by parents both of normal colour. One, found dead, was sent to the Hancock Museum. Though, except for a few dark hairs over the bill, the plumage was pure white, the bird was not a complete albino as its eyes were normally coloured and its bill and legs were pigmented (J. M. Keegan). A pure white bird was taken from a nest near Rothbury. All feathers, legs and bill were pure white, irides blue, like Jackdaw, and pupils pink (R.C. & H.T.).

4. Rook.—Rooks are now nesting far up Coquetdale. At Bygate Hall, over 1,000 ft. above sea-level, *c.* 20 nests (E.M.).

In March a census of Rookeries was carried out over *c.* 40 sq. miles to the south of Bishop Auckland, D., 929 occupied nests were counted in 10 rookeries. This represents *c.* 23 pairs per sq. mile (M.C.). This is a much lower density of population than was shown in the Darlington district in 1945, where in 103 sq. miles there were 5,122 nests, or 50 to the sq. mile. In the same year, in 87 sq. miles around Berwick-on-Tweed, there were 7,000 nests, or a density of 81 pairs per sq. mile.

On February 11th at Whickham (L.G.H.) and on the 28th at Sunderland (Miss J.W.) Rooks were seen carrying building material.

On November 23rd near South Shields a bird was seen breaking twigs off ash trees and carrying them to a fairly substantial nest! (F.G.G.).

On May 15th near Staindrop, Tees Valley, a brown plumaged bird was seen (A.B.).

5. Jackdaw.—About 500 birds roost nightly on Durham Cathedral (R.M.P.). On May 14th, in a field near Scremerston, N., a bird was seen with a distinct off-white streak at the base of the neck, but otherwise coloured like a normal bird; it was considered probable that this was a specimen of the Scandinavian sub-species, as described and figured in the *Handbook* (R.F.L.). It is however impossible to draw a line between the two sub-species with certainty in the field.

7. Magpie.—Increasing in numbers everywhere. At Hexham on March 10th a party of 15 was seen (C.J.G.).

10/11. Jay.—On November 29th and December 1st, three Jays entered a small garden in South Shields and another was seen at Whitley Bay, N. at the same time. As there are no resident birds so near the coast, it is probable that they were immigrants of Continental origin (H.M.S.B.).

14. Starling.—In January a large roost was visited at Fawcethill, one mile north of Sandhoe, Tyne Valley. Birds were traced to this roost from Slaley, six miles to the south, and large numbers were seen flying in from the east. Height of roost 750 ft. in coniferous plantation of trees about 15 ft. high. Estimated number of birds over 30,000 (A.J.C.). This roost was not re-formed in the autumn,

the birds having moved to a coniferous plantation near Styford. On October 3rd the estimated number of birds was *c.* 15,000 and by December 5th the number had increased to well over 100,000 (A.J.C.).

A large roost was established near Sherburn Hill, D., in about three acres of tall bushes, chiefly hawthorns. On February 21st it was estimated to consist of from 30,000 to 35,000 birds. Birds were seen flying to this roost from the neighbourhood of Durham City, four and half miles away, and small flocks were seen flying towards the roost from as far away as Stanley, a distance of 12 miles. Small numbers of House Sparrows, Chaffinches, Linnets and Yellow Buntings were also seen to visit this roost (R.M.P.).

In the early part of July a roost was started in reeds and bushes in Tanfield ponds, near Stanley, D.; by August 4th it numbered *c.* 300; increasing to *c.* 700 by October 14th; but by November 10th the roost was deserted and birds were seen flying *over* the ponds, north-west towards the Derwent Valley (R.M.P.).

At a roost in Bents Park, South Shields, in tall privet bushes, on October 26th *c.* 8,000 birds were estimated to come in (F.G.G.).

On October 27th on Boldon Flats, D. a partial albino was seen (per L.K.).

On the Sewage Farm at Prudhoe, N., birds have been seen sitting in rows on the wires supporting the sprinklers that revolve over the filter-beds, thus riding round and round in circles (H.R.O.).

18. HAWFINCH.—A few pairs and single birds reported; but no nests found. On August 31st at Plankey Mill, near Haydon Bridge, N., a flock of 18 seen in flight (J.C.C.).

20. GOLDFINCH.—Throughout the year many reports from both counties. Adults, and later juveniles, seen on The Banks, Durham City (R.M.P.). Juveniles seen in the Alnwick area (J.E.R.). At Blagdon six or seven pairs were located; in July a nest was found containing a dead bird and two addled eggs. (M.W.R.). Reported from the Coquet Valley as far up as Holystone and Sharperton (E.M. & E.G.T.), and Harbottle, where probably breeding (B.E.C.R.). Adult and immature birds seen at Monks' House, N., in August and September; one of the latter being trapped there on October 31st (E.A.R.E.). The largest flock reported was of 80 birds seen on December 27th near Staindrop, D., ' the most I ever saw together ' (H.W.).

21. SISKIN.—Very few indeed reported in the winter of 1950-51. On February 11th a flock of 35-40 on riverside alders near Holystone, Coquetdale, N. (E.G.T.). On August 26th one, immature, was seen at Langleeford, Cheviot (E.A.R.E.); on November 25th at Blackwell, Darlington, *c.* 15 in alders (A.B.).

29. TWITE.—Very little known about breeding distribution in either county. On July 12th a few were seen along the Roman Wall escarpment—' the first I have ever seen there ' (H.M.S.B.). In July, on the moors west of Wark, a pair and later a family party (H.M.S.B.). On August 26th at least a dozen birds were seen on Cheviot and Hedgehope, including a female feeding chicks just out of the nest (E.A.R.E.).

30. LINNET.—An adult female, ringed at Monks' House on October 12th was recovered in Parthenay, France, on December 23rd (E.A.R.E.).

36. COMMON CROSSBILL.—Very few reported. On February 3rd at Catcleugh, Redesdale, N., a flock of five-six (A.R.H.). Several times between April 14th and 20th a single cock was seen and heard singing in Dipton Wood, N., but no nest was found (A.J.C.). On July 22nd a single bird was seen in Swallowship Woods near Hexham (A. Lamb, per M.D.). On July 31st in an allotment at South Shields, a cock was seen and almost captured (per H.M.S.B.).

41. CHAFFINCH.—A nestling ringed at Blagdon on May 31st, 1949, was killed by a bus at Ponteland, about five miles S.W. on May 24th, 1950 (A. & R.).

42. BRAMBLING.—A few flocks reported early in the year in both counties. Plentiful around Alnwick, where the largest flock noted numbered *c.* 300; this remained in full force from January to the end of March; last seen April 14th, when 150 were still present (J.E.R.).

Autumn arrivals first noted October 3rd, at Westoe, South Shields (J.C.C.); October 7th at Alnwick (J.E.R.); October 11th at Monks' House, a couple trapped (E.A.R.E.). On the same day, one seen on the Inner Farne (per J.M.C.) and up to 20 flying S.W. over Budle Bay (D.W.). Fairly numerous in Upper Coquetdale; first seen mid-November, on the 27th *c.* 100 in a flock by themselves. Many with mixed flocks feeding on un-harvested oat stooks (B.E.C.R.).

43. Corn-Bunting.—On May 3rd at Berwick, on recently ploughed land, a flock of 70; all birds were walking, sometimes with a shuffling gait with tarsi parallel with the ground, not hopping as stated in the *Handbook*. When flushed all flew into trees, where some of them sang. Flight-call a distinct 'tick-tick' (F.B.). In April a large roost was found in sedges, etc., south of Bamburgh Castle; up to 40 were counted. Resident in small numbers in the Monks' House area. On October 1st, nine in the garden there (E.A.R.E.). Numbers decreasing somewhat in the South Shields, D. area, owing to house-building in the districts previously frequented (J.C.C.).

55. Reed-Bunting.—First arrivals in Upper Coquetdale on March 5th; numerous by the 13th; more plentiful up to the end of the year than usual, in flocks with other finches (B.E.C.R.). At Gosforth Park Lake on May 30th, 11 cocks singing (J.A.M.). On August 11th at Tanfield ponds, Stanley, D., a flock of *c.* 30 roosting in the reeds (R.M.P.).

Apart from nestlings, *c.* 120 adult or immature Reed-Buntings were ringed at Monks' House Observatory, a few in almost every week between May and mid-December. With not more than half-a-dozen pairs resident in the vicinity, this indicates a hitherto unsuspected degree of mobility in this species (E.A.R.E.).

59. Snow-Bunting.—Very numerous in the winter of 1950-51. A party of from 20 to 35 wintered near South Shields pier, D. (F.G.G., T.S.D. & L.K.). On February 18th at Holy Island *c.* 50 (F.B.). On the same day at Newbiggin, N., *c.* 60 (W.A.W.). In February at Teesmouth maximum 70 (A.B. & D.S.). Inland—on March 21st near Middleton-in-Teesdale, two on the moors during a heavy snow-storm (per R.P.M.) and on the 29th two on the moors near High Force (J.C.C.).

First autumn record—on September 27th a single cock flying south along the beach near Monks' House, N. (E.A.R.E.). Less numerous than in the previous year. A flock again wintered near South Shields pier, from 4 to 20 birds (F.G.G. & L.K.). At Teesmouth in November and December maximum 40 (C.G. & D.B.; D.S., A.B.). Elsewhere usually single birds; but on November 10th near St. Mary's Island, 11 (D.G. & R.F.L.). No inland records.

70. Sky-Lark.—First seen in Upper Coquetdale on February 22nd; two days later they were widespread. During second and third weeks of March a large passage took place, with flocks on one occasion of from 200 to 300 (B.C.E.R.).

On October 14th a noticeable southward movement in small parties along the coast at Craster, N. (W.S.C.). During October and early November many were seen from the shore of Budle Bay, N., most of them flying S.W. or W. Largest numbers from October 10th to 15th; 28th to 30th and on November 3rd (D.W.). On October 30th and November 1st at Whitburn, D., small flocks, usually of three or four birds, were seen coming in off the sea; on reaching the coast they flew directly inland. There was no wind at the time (T.S.D.).

72. Shore-Lark.—On January 5th on the Old Water, Amble, two; still there on March 4th (A.E.G.). This is the only record for the winter of 1950-51. None reported up to the end of 1951.

75. Tree-Pipit.—Numerous on the cliffs at South Shields on October 1st to 3rd (J.C.C.). On October 21st at Ancroft near Berwick, three seen, a late data (F.B.).

76. Meadow-Pipit.—Spring migration—first seen in Upper Coquetdale on March 8th (B.E.C.R.). On April 17th at Boldon Flats, D., a flock of *c.* 20 increased to *c.* 60 on the 18th (J.C.C.).

Autumn migration: As observed from Monks' House, N., minor passages were first noted on July 5th and continued intermittently until September 15th, when a very extensive southerly passage, parallel with the shore, took place. From dawn to mid-day between four and five thousand birds passed in flocks of from 10 to 150 individuals (E.A.R.E.). On August 31st in the evening at Widehaugh, Hexham, N., 100 to 150 were seen flying from west to east in waves of from 20 to 30 birds (R.T.G. & E.M.L.).

81. Rock-Pipit.—Two pairs nested within the boundary of South Shields, D. (J.C.C.). During September and October, three birds, ringed earlier as nestlings on the Farne Islands, were trapped and released on the shore at Monks' House (E.A.R.E.).

88. Yellow Wagtail.—First seen April 18th at Boldon Flats (J.C.C.). On April 23rd at Darlington Sewage Farm *c.* 40 (A.B.). On April 24th at Monks' House *c.* 20 moving north along the shore (E.A.R.E.). On May 4th near Tanfield

ponds, D., *c.* 40 (R.M.P.). From April 28th to 30th on a field near Boldon Flats, D., up to 39 counted and more present (J.C.C. & L.K.). Many breeding pairs reported from various districts in both counties. Autumn migration: On July 28th on a marshy brick-field near Birtley, D., at least 40 (R.M.P.). On August 11th on Tanfield ponds, Stanley, D., at least 45 (R.M.P.). On October 7th a pair near Shoreston, N., a late date (E.A.R.E.).

89 Grey Wagtail.—Increasing steadily. During the summer nine pairs were located within a radius of two miles from Durham City, three of them along the Banks and one on a stream near the Science Laboratories, where five young were successfully reared (R.M.P.). Near South Shields a nest was found in a wall near a farm, quite a distance from any water (H.M.S.B.).

91. White Wagtail.—On April 5th at Berwick, two cocks—an early date (F.B.). Recorded from Monks' House, N., on April 17th and 24th, May 1st, July 20th, August 20th, September 19th and October 4th (E.A.R.E.). Near Cleadon Village, D., on April 17th one, 18th two, and May 5th five (J.C.C.).

93. Tree-Creeper.—On January 17th one in Westoe Village, South Shields, and on October 12th one in a garden in Readhead Road, South Shields—normally a rare bird in this area (F.G.G.). On February 22nd in school grounds, Ashbrooke, Sunderland, one (L.K.). On July 29th, one, presumably on passage, trapped in Monks' House garden (E.A.R.E.).

96. Nuthatch.—In Darlington, seen and heard regularly; on June 21st a pair watched feeding newly-fledged young (M.G.R. & A.K.B.). On April 23rd one was seen and heard near the house in Whitworth Park, D. (C.G.). Reported this summer from the Bishop's Park, Bishop Auckland (per M.C.). From April to June a pair was seen on several occasions on the Banks, Durham City, but breeding was not proved; seen again in November and December (J.C.C. & R.M.P.).

98/102. Tits.—On migration: On October 4th *et seq.* a steady passage of tit-flocks was noticed moving south parallel with the coast at Monks' House, N. They flew in flocks of from 4 to 10 birds at an average of 60 ft. from the ground, mainly Blue Tits, but some Great and Coal. On October 9th six Coal Tits were seen in a flock together (E.A.R.E.).

98. Great Tit.—A bird, ringed as a nestling at Blagdon, N., on June 2nd, 1948, was re-captured on the nest where ringed on June 1st, 1950 (A. & R.).

100. Blue Tit.—As showing the lateness of season 1951, the following are the dates of ringing week-old nestlings in the South Shields area: **1949**, June 7th; **1950**, June 13th and 14th; **1951**, July 4th and 8th (J.C.C.).

On migration: On November 8th in Cleadon Park, South Shields, D., *c.* 40 with a few Great Tits (F.G.G.).

102. Coal-Tit.—During January, on the Banks, Durham City, a flock of 20 with no other species of Tit in their company (R.M.P.).

108. Willow-Tit.—On April 16th at Spindlestone, Bamburgh, N., one. A new locality (E.A.R.E.). On May 19th near Hedley on the Hill, N., one heard (C.J.G.). On May 11th near Neasham, Darlington, a pair (M.G.R.). On July 20th along the Banks, Durham City, one; seen here also in previous August (R.M.P.).

120. Waxwing.—During the invasion of the winter of 1950-51 more were reported in February and March than in the previous months and, although numbers were not large, the birds were well distributed. The last report was of 16 birds seen near Stocksfield on April 15th.

In the winter of 1951 very few indeed were reported. The first arrivals were seen on November 15th, a single bird at High Horse Close, Rowlands Gill, D., and two at Monkseaton, N. The largest flocks noted were eight at Berwick and *c.* 12 in Ravensworth Park, Team Valley. At the latter place birds were seen feeding on rose-hips, which they swallowed whole, but with great difficulty. One bird was seen to hop along a branch to the trunk of the tree, against which it knocked the hip two or three times to force it down its throat (A.R.H. & R.E.).

121. Spotted Flycatcher.—Reported to have been fewer than usual this summer. Along the coast near Monks' House, N., passages were noted from May 23rd to 31st and from August 21st to 23rd (E.A.R.E.). Several on Holy Island, May 24th to 26th (F.G.G.). On October 1st and 2nd in an allotment near the coast at Whitburn, D., one—a late passage migrant (J.C.C.).

123. Pied Flycatcher.—Well up to normal numbers. Seen on passage along the coast near Monks' House from May 3rd to 23rd—one earlier on April 25th; southward passage from August 24th to September 10th (E.A.R.E.). On April 26th

near Holystone, Coquetdale; an early date (E.M.). Autumn migration along Durham coast continued later than usual; birds being seen in Westoe Village, South Shields, on September 13th, 16th and October 1st and 4th (J.C.C.).

125. Red-breasted Flycatcher.—On June 8th at Craster Tower, Alnwick, N., an adult male was seen. Its red throat and its flycatcher habit of hawking insects were noted. It only remained for one day (Mrs. J.M.C.). This is the first time that this species has been recorded for Northumberland on the spring migration. Only about a dozen have so far been recorded, all on the autumn passage.

On October 1st and 2nd in a garden at Low Newton, N., a female was observed and colour-filmed at close quarters. It was neither as secretive nor so prone to avoid the ground as the *Handbook* suggests. The highly characteristic slow flirting of the tail and the note, intermediate between Spotted Flycatcher and Redstart, were noted (E.A.R.E.).

127. Goldcrest.—Marked influxes on the Durham coast; birds in varying numbers being noted from October 1st to November 17th (H.M.S.B., F.G.G., J.C.C.).

129. Chiffchaff.—First heard April 19th at Dipton Wood, N. (A.J.C.). Reported from Alnwick, Gosforth Park, Cleadon, D., Durham City, Hamsterley and Darlington during the spring.

On April 22nd a Chiffchaff was seen singing near Stocksfield in low birch scrub. Every now and then it introduced into its normal song a phrase resembling the first seven or eight notes of a Willow-Warbler's song, but without the final descending notes. The song was given at about half the speed of a normal Willow-Warbler's song and more chirpily, like the Chiffchaff's normal delivery. On one occasion the variant song was concluded with the normal Chiffchaff notes. The bird was not heard again; though a Chiffchaff, singing the normal notes was seen later in the same bushes (H.R.O.).

130. Scandinavian Chiffchaff.—From October 1st to 4th there was a considerable rush of migrants on the N.E. coast, assisted by the east winds. In the gardens of Westoe Village, South Shields, there was quite a number of Leaf-Warblers —on the 4th, in one market garden, well over 20. There were several Chiffchaffs amongst them, for at least three were heard singing at once. One of these was caught in a trap by J.C.C. and examined by him and by H.M.S.B. who identified it as a Chiffchaff of the Scandinavian sub-species. Its wing measurement was 64 mm. It was thus described by J.C.C.—'The upper parts were quite definitely green tinged, the eye-stripe rather faint and while some of the breast and fewer of the belly feathers had yellow, at least on the tips, there were about 20% of the feathers pure white; the legs very dark brown.' H.M.S.B. writes—'I am sure it was a Scandinavian bird. Indeed, it would surprise me if any of the Chiffchaffs we see about here (South Shields coastal area) in the autumn are of British origin. The species must be quite a rarity north of the Tees in the breeding season.' On October 7th and 9th at the same place up to six birds were seen and others up to the 13th; but it was not possible to ascertain to which sub-species they belonged (J.C.C.). For a previous note on this sub-species see *O.R.*, 1948.

132. Willow-Warbler.—First heard April 19th. Generally distributed by 20th and 21st.

On May 24th to 26th several on Holy Island. 'These were probably of the Northern form since they were sober-hued. One that I watched closely for a long time showed a very distinct eye-stripe, a whitish chin and a suggestion of a faint chestnut tinge on the flanks' (F.G.G.).

As showing the lateness of the season (1951) the following are the dates of ringing week-old nestlings in the South Shields area and the average brood size:

| | | | |
|---|---|---|---|
| **1949** | June 9th, 18th and 19th . . | Five broods average | 5·6 young. |
| **1950** | June 15th . . . . | One ,, ,, | 6·0 ,, |
| **1951** | June 21st, July 4th, 5th and 10th | Four ,, ,, | 3·75 ,, |

No young were seen on the wing in the district before July 10th (J.C.C.). Two broods of four and five respectively, ringed at Ingram, N., on June 24th and July 17th (E.A.R.E.).

135. Wood-Warbler.—First heard April 28th at Alnwick (J.E.R.). Reported to be fewer than usual. Still to be heard in Jesmond Dene, Newcastle (B.W.).

137. Yellow-browed Warbler.—On October 4th in the gardens of Westoe Village, South Shields, D., a small Warbler was observed by J.C.C. catching flies from the top of a tall tree. At first sight it appeared to be a rather pale Goldcrest, but with an obvious dark line through the eye with a pale yellow line above it and

a double yellow wing-bar. A detailed description and sketch were made on the spot; but the bird soon flew away. It was searched for later without success; but on the 8th an unusual song attracted J.C.C. and drew his attention to the missing bird. On this occasion both J.C.C. and H.M.S.B. were able to examine the bird under favourable conditions and established its identity with certainty. The note was surprisingly shrill and penetrating and most distinctive. It was last seen on October 28th. This is the first record for the species in County Durham.

138. Pallas's Warbler.—On October 13th an adult cock of this species was trapped and ringed at the Observatory, Monks' House, Seahouses. It was in the company of a number of newly arrived Goldcrests. Thanks to the kindness of Dr. E. A. R. Ennion, this bird was seen by several local ornithologists, as it remained in the garden for some 24 hours after being released. This is the first record for this species in the County of Northumberland and only the second for the British Isles.

154. Aquatic Warbler.—On August 28th, an unfamiliar Warbler was located in an oat-field near South Shields by J.C.C. and E.W., who made detailed notes and sketches of it on the spot. They immediately reported the occurrence to F.G.G. who thereupon returned with them, scrutinised the bird under excellent conditions and working over the accumulated data reached the conclusion that it was an Aquatic Warbler. Later it was seen by H.M.S.B. who confirmed the identification. The bird was seen at very close range in a very good light and was under observation for several hours, so every detail of its plumage was clearly noted. This is the first record of this species from any part of the North-East coast north of Norfolk.

161. Garden-Warbler.—Seen on passage along the coast from Monks' House, where it is not a resident, on May 22nd, 28th and 30th; June 22nd; September 3rd and 6th; October 1st and 5th, when several were also present on the Farne Islands (E.A.R.E.).

162. Blackcap.—In winter: At Birling Manor, Warkworth, N., from early January until March 4th, a cock came regularly to feed at a bird table on a window-ledge of the house. It was seen to take pieces of cheese (A.E.G.).

Seen on passage along the coast from Monks' House on May 22nd; June 16th; September 26th; October 2nd, 3rd, and 5th, when it was also present on the Farne Islands, 13th and 14th. The June dates for this and the Garden-Warbler (see above) are curious; it is fairly sure that each date refers to a new bird, as many were caught and ringed (E.A.R.E.). Also noted on the coast near South Shields on October 3rd and 4th (J.C.C.).

164. Lesser Whitethroat.—On May 18th an adult female was picked up dead on the Inner Farne and sent to the Museum (E.A.R.E.). Single birds reported from Alnwick, near Warkworth, Durham City and near South Moor, D., but no breeding proved. On July 30th, a late date, a nest with four eggs was found near Rowlands Gill. The nest was 2 ft. above ground-level in a hawthorn bush surrounded by a tangle of undergrowth. It was composed of dried grasses and fine rootlets, but no horse-hair and much deeper than that of a Common Whitethroat (C.H.). This is the first definite record of breeding for some years; usually un-mated cocks are reported. On August 30th at Boldon Flats, D., at least two seen, evidently on passage (J.C.C. & E.W.).

173. Fieldfare.—Very numerous in the early part of the year. On February 27th a flock of over 1,000 in the Shotley Bridge district (C.H.), and other large flocks reported. Many still present throughout April and some remaining well into May. Last reported on Holy Island on May 24th and 25th (F.G.G.).

A few early birds were seen in September, but considerable movements were noted on the coast at Monks' House on the following dates: October 13th, 14th and 29th (accompanied by a few Song-thrushes and a very large number of Blackbirds), November 4th, 9th and 10th, when about 600 or 700 Fieldfares and Redwings, in about equal proportions, came in across Ross Links, skirting N.W. corner of Budle Bay to pass on S.W. in course of half an hour around 11-0 a.m. (E.A.R.E.). In Upper Coquetdale on November 6th a regular movement took place, parties flying over in a S.W. direction; some were present next day, but by the 8th they had gone (E.M.).

174. Mistle-Thrush.—An increase in breeding birds reported from many parts of both Counties.

175-7. Song-Thrush.—From October 1st to 5th at Monks' House, a considerable passage was noted of dark, heavily-spotted birds of the so-called

'Hebridean' type, keeping to rushy meadows (flushed with Snipe) rather than hedges and gardens. On October 9th passage birds were trapped, obviously of British race. On November 12th two exceptionally greyish birds came in from the sea and landed on one of the beach traps, where they spent 10 minutes in preening before going down to the seaweed to feed. Later they passed inland flying high in a S.W. direction. After a careful examination at close range they were judged to be of the Continental form (E.A.R.E.).

178. REDWING.—Large flocks early in the year. Some remained very late. Last seen May 12th, a single bird on the Inner Farne (E.A.R.E.).

First autumn arrivals reported on October 1st and 2nd, when small parties were seen to fly in from the sea on the Durham coast (J.C.C.), where another big influx took place in the last week in October (F.G.G.). In company with Fieldfares (*q.v.*) considerable movements took place at Monks' House on the following dates: October 13th, 14th and 29th and on November 4th, 9th and 10th (E.A.R.E.).

184. BLACKBIRD.—On April 2nd and 4th in Upper Coquetdale, a passage movement was noticed, when a considerable increase in numbers about farms and plantations occurred (B.C.E.R.).

On October 4th, 5th and 6th a considerable passage movement was noticed from Monks' House, followed by some *very* large movements on the 13th, 14th and 29th, November 15th, 16th and 26th. The passage on October 29th was most spectacular. At the first hint of light, birds were all round the house, evidently having come in overnight. A heavy rush came over at 6-30 a.m. (plus many Fieldfares and a few Redwings) when 17 Blackbirds and two Redwings were caught in the first drive of the Heligoland trap. Subsequently rushes, involving *hundreds* of birds visible in the air at once, occurred at 7-15, 7-30 and 9-0 a.m. after which time the passage died. At one period there were at least 100 Blackbirds concentrated in the little vegetable garden, roughly an equilateral triangle 70 yds. a side. An interesting point was the impossibility of driving any of the birds in any direction other than S.S.W. where they were evidently heading. It was possible to drive them from fields to the north into the garden trapping area, but quite impossible to drive a single bird in the reverse direction; when within a few yards of them they got up and flew on S.W., over our heads if necessary (E.A.R.E.). This October movement of Blackbirds was also noted inland, as the following report shows: 'On October 3rd at Stocksfield, Tyne Valley, at 7-45 a.m. our garden seemed full of very excited Blackbirds and in other gardens near Stocksfield station I noticed the same thing' (H.R.O.) and on the Durham coast on October 15th (J.W.).

186. WHEATEAR.—Spring passage noted on the coast at Monk's House from March 25th to May 12th (E.A.R.E.). First seen in Upper Coquetdale at Sharperton March 31st (B.C.E.R.); Carshope, April 6th; Fulhope, April 12th (E.M.). On April 18th near Ebchester, Vale of Derwent, a flock of 15 to 20 birds was seen flying from east to west, evidently on passage (G.A.C.).

Autumn passage noted on the coast at Monks' House commenced July 2nd, reaching peak during the last week of July, when nearly 20 juveniles were caught in the beach traps. A juvenile with silvery-white crown and scapular patches remained at Monks' House for eight days from July 22nd (E.A.R.E.). A similar bird was reported from Foxton Golf-links, Alnmouth, a little later and another is recorded from Spurn Observatory (E. Yorks.). It appears that this aberation is not uncommon in N.E. England; members should be on the watch for it and report any occurrences. At Darlington Sewage Farm passages were noted from July 26th to September 4th (A.B.). Not so plentiful this year in the Wolsingham D. area, but several pairs bred. Some still present on the moors on November 1st—a late date (R.M.). Last reported at Bamburgh on November 18th—a late bird (E.A.R.E.).

187. GREENLAND WHEATEAR.—On April 12th, near Blyth, a pair was seen to fly in from the sea and alight on the sea-wall (A.D.F.). Single birds reported on coast on May 15th and 25th. In autumn single birds on October 2nd, 30th and November 17th.

197. WHINCHAT.—Spring passage was noted from Monks' House from April 24th to May 12th (E.A.R.E.). First seen near Elsdon, N., on April 26th and by May 1st up the Coquet as far as Carshope (E.M.).

Autumn passage was noted from Monks' House from August 6th, with peak during the last fortnight of August when over 30 juveniles were trapped in the garden (E.A.R.E.). On August 28th, near South Shields, on barbed wire round a cabbage-field, 15 (J.C.C. & E.W.).

198. STONECHAT.—For the most part, records refer to single birds seen on the coast during the winter months. A pair bred in the South Shields area, where, on August 8th a pair was seen feeding young about two days out of nest and on the 20th a juvenile was seen in the area strong on the wing (J.C.C. & E.W.). A spring passage was noted on the coast at Monks' House on March 26th, at Bamburgh on the 27th and on the Farnes on May 8th (E.A.R.E.). Inland: On May 23rd at Holborn Moss, N., two pairs were seen feeding young (F.B.). On May 14th near Linbrig, Upper Coquetdale, an adult male was found dead on a Merlin's plucking-stone (R.C.). On July 4th on Pontop Pike, Co. Durham (1,000 ft.) a pair seen (R.M.P.). On July 22nd at mouth of Horden Burn, D., one (W.A.W.).

201. REDSTART.—Spring passage was noted on the coast from Monks' House from April 21st to May 12th; autumn passage from September 10th to October 5th (E.A.R.E.). First seen Upper Coquetdale April 25th (B.C.E.R.).

202. BLACK REDSTART.—On April 21st on the Farnes, a cock; on May 12th on the Farnes, a hen (E.A.R.E.). ' On May 8th at about 7-30 p.m. from a house in Haltwhistle, N., I saw a cock Black Redstart fly on to the front garden fence. This was in a street of houses with small front gardens. It flew away over the house-tops to the north. Weather bitterly cold at the time with a N.E. wind. This is not the first seen in Haltwhistle; on November 4th, 1949, a cock flew into my own garden at Westlands, Haltwhistle; it flitted about on the fence and on the lawn, snapping at insects, for quite half an hour, then flew away across the railway to the south' (M.P.). On the night of October 3/4th a bird came aboard a boat returning from Norway; it was caught, ringed and released on arrival at Newcastle on the morning of the 4th, along with a Hedge-Sparrow (per E.A.R.E.). On October 30th on the Bents, Whitburn, D., a cock and shortly afterwards, on the beach close by, a hen or immature bird (L.K.). On November 6th in a hedge-row, N. of Bamburgh, a hen (D.W.). No others reported.

208. ROBIN.—From October 1st to 3rd a huge influx on the coast from South Shields to Whitburn, D., and from St. Mary's Island to Seaton Sluice, N. (J.C.C. & E.W.). On October 5th a *very* extensive passage was noted on the Northumberland coast following light S.E. winds; the coastal belt was full of birds and at least 500 were present on the Farnes. Many had been seen leaving S. Norway and making west on October 3rd and 4th; but it was not possible to be certain of the identity of the Continental form among immigrants here, though presumption was almost inescapable. A considerable passage again on November 9th (E.A.R.E.). (For further details of this influx see *B.B.*, Vol. XLIV, p. 392).

211. HEDGE-SPARROW.—Considerable passage movements noted on the coast near Monks' House from September 26th to October 5th (E.A.R.E.).

213. WREN.—Considerable passage movements noted on the coast near Monks' House from September 26th to October 5th (E.A.R.E.).

220. SWALLOW.—First recorded on April 4th, Monks' House beach (E.A.R.E.); then on April 7th, one near Lanchester (B.S.), and one over Morpeth (R.G.G.), cold N.W. wind. Not generally distributed until the 18th when many reported. A very marked northerly movement of Swallows, House-Martins and Sand-Martins was observed on the North Northumberland coast on May 12th (F.B. & R.F.L.). Swallows remained very late into the autumn, some reported up to the end of October.

On June 21st a white bird was seen at Beadnell, N. (S.A.). In the late summer at West Fleetham Farm, Chathill, N., a white bird was seen on two occasions (A.M.).

222. HOUSE-MARTIN.—First seen April 14th at Brasside Ponds, D. (L.K.), but not recorded at nesting haunts until the 23rd (M.C.). On May 25th a pair seen building on Holy Island; R. Perry does not record it breeding on the Island (F.G.G.). Return migration first noted at Teesmouth on July 6th, still in progress on September 16th (D.S.). Single birds seen in October, last on October 30th.

223. SAND-MARTIN.—First recorded April 4th at Budle Bay (E.A.R.E.), and April 5th at Hallington Reservoir (R.T.G. & E.M.L.), and several near Monks' House, where there is a small breeding colony in a low ' cliff ' (E.A.R.E.). Odd birds seen on 11th and 12th but not general until 17th and 18th. In August a few were seen visiting holes in the I.C.I. chalk heaps at Prudhoe, as in 1949; none seen in 1950 (H.R.O.). Return migration first noted at Teesmouth on July 7th; still in progress on September 16th (D.S.).

225. SWIFT.—First seen May 1st, 2nd, 3rd and 4th. Return migration first noted at Teesmouth on June 21st (D.S.). A few single birds seen in October and a straggler over Bishop Auckland as late as November 11th (M.C.).

227. NIGHTJAR.—On the coast: On May 29th a cock was accidentally injured while concealed in long grass in a corner of a playing-field at South Shields High School (F.G.G.). In the grounds of Grindon Close, Sunderland (16 acres) a cock spent five days, June 8th to 12th. It was seen during the day-time lying along tree-branches and wooden rails. Each evening it hawked insects over a small pond, permitting a very close approach while flying low over the pond in the presence of observers. It made no call or noise of any kind (H. S. Short). On September 7th, in Westoe Village, South Shields, one was flushed from the top of a wall shaded by trees (J.C.C.).

232. HOOPOE.—On April 23rd one was seen at Fenwick, N. It was perched on a wall within four yards of the observer, who noted all its characteristic features (Mr. Stoddart, per F.B.).

234. KINGFISHER.—Still increasing in numbers in both counties.

235. GREEN WOODPECKER.—Reports continue to show its widening distribution.

238. LESSER SPOTTED WOODPECKER.—At various times throughout the year a cock and a hen, sometimes in company, have visited a garden near the river Tyne at Hexham. Their breeding place has not yet been discovered (H.O.B.). On May 11th at Neasham near Darlington, one was seen in a hedgerow tree. Over twenty years ago a gamekeeper reported that he often saw them in this neighbourhood; so they may have bred here for several years (M.G.R.).

239. WRYNECK.—On May 7th an adult cock was picked up in a dying condition on the Aln at Lesbury by C. E. Crawhall. It bore no signs of injury. It was presented to the Society by the finder and is now in the Hancock Museum. This is the first record for the County since May 18th, 1923, when a single bird was seen by the late Mrs. Hodgkin, near Hepple, Upper Coquetdale. The previous year five had been seen in September on Holy Island.

240. CUCKOO.—First heard on April 20th at Lanchester (B.S.) and near Holystone, Upper Coquetdale (E.M.). On August 26th at Beadnell an erythristic bird was seen on passage (J.S.A.).

249. LITTLE OWL.—Extending its range and increasing in numbers in both counties. ' By far the most common bird of prey in the South Shields-Sunderland area; breeding in holes in cliffs and quarries, and in one instance in a tree' (J.C.C. & E.W.).

250. LONG-EARED OWL.—On May 24th, 25th, and 26th, on Holy Island, one was seen each day at the same spot, during a period of thick fog (F.G.G.).

251. SHORT-EARED OWL.—Frequently reported during the breeding season from moorland areas. ' Much more common on all the N.W. Durham and S. Northumberland moors. One or more were observed on every day on which I shot grouse in August ' (G.A.C.). More than usually common along the coast from January to April and again from October to the end of the year. On January 1st at Blagdon, N., five seen; single birds noted up to May when a pair was present. Probably bred, but no proof (M.W.R.). From August 29th to September 3rd at Darlington Sewage Farm, one (A.B.). During December near St. Mary's Island, N., one or two were frequently seen and on the 19th no less than five were seen in flight at once (L.G.H.).

253. TAWNY OWL.—On April 22nd a bird sitting on three eggs in a hollow elm near Hepple, Coquetdale, was surrounded by nine freshly killed young rabbits, some four inches long ! ! (E.G.T.).

259. PEREGRINE FALCON.—Single birds and pairs were reported from some of the usual sites, but successful breeding was not proved. In some instances eggs were laid but subsequently ' collected.' On one site, where a pair took over a Raven's nest, two eggs were seen on May 13th, but by the 26th only one remained and it was ' chipping ' and a week later the nest was empty (B.C.E.R. & H.W.K.). On June 2nd and subsequently in the Rothbury area a female was seen wearing a bell, which could be heard from a distance. She was no doubt an escape from captivity (R.C.). The following illustrates the difficulties with which our breeding Peregrines have to contend. On April 14th at a well-known eyrie a Falcon was found dead; but a few days later the tiersel had acquired a new mate and on the 28th a nest was found containing four eggs, which were afterwards taken. On May 17th a second nest was found on a nearby crag where three eggs were laid. By July 15th the young were well grown and on August 12th the young were seen

in flight with both parents (H.W.). Single birds, and occasionally pairs were reported from the Farne Islands and from the coast during the autumn and winter (E.A.R.E., J.C.C., etc.).

262. MERLIN.—Successful breeding reported from the moorlands (R.C. & T.G.W.). More frequently reported now than previously.

263. KESTREL.—More artificial 'sun-bathing.' 'At South Shields, a Kestrel has taken to roosting amongst my neighbour's chimney-pots. The other evening I watched it settle between the two chimneys that were smoking—no doubt for the greater warmth. Another Kestrel was settling into a similar roost in another part of the town last week. Is this habit a new one, or has it hitherto been overlooked?' (H.M.S.B., February 6th, 1951.).

A Kestrel ringed as a nestling at Alwinton, Coquetdale, on May 27th, 1945, was found dead at Mintlaw, Aberdeen, on April 28th, 1951. Two other birds from this brood have already been recovered, one in Inverness in 1946 (see *O.R.*, 1946) and the other in Surrey in 1947 (see *O.R.*, 1947) (A. & R.). An adult cock ringed at Blagdon on April 19th, 1948, was re-captured and released at Cramlington on July 28th, 1951. One ringed as a nestling at Kirkley Hall, N., on July 18th, 1948, was found dead at Whitley Bay, N., on February 26th, 1951 (A. & R.).

266. GOLDEN EAGLE.—On April 17th it was reported in the *Newcastle Journal* that a Golden Eagle had been seen a few days previously on Darden Heights in the Elsdon country, N. F. Scott of Eastnook, Elsdon, who saw the bird described it as a 'giant bird . . . of a dark brown or copper colour . . . with no white showing.' Its wing span was estimated at 7 to 8 ft. and its total length 3½ to 4 ft. It will be remembered that from February to May, 1950, a Golden Eagle spent some time in the Keilder and Falstone district (see *O.R.*, 1950).

272. MONTAGU'S HARRIER.—In April a pair returned to the usual west Durham area where breeding has taken place during previous years. The hen was probably shot, as she was not seen later than the middle of the month. Though one and occasionally two cocks were seen in the neighbourhood until the end of June, no hens were seen and no nests found (R.M., E.G.T., A.R.H., B.S., etc.).

273. HEN-HARRIER.—On September 12th at the Northumbrian Loughs, one, hen or immature (H.M.S.B.). Other unidentified Harriers were seen at various places during the autumn and winter, which may have been of this species.

284. OSPREY.—On April 20th an Osprey was seen flying over the North Tyne opposite Chipchase, N. It was identified by the keeper, who had seen birds on the river near Houxty when the late Abel Chapman lived there. In 1927 an Osprey was present from May 23rd until December 2nd (see *Memories*, Abel Chapman, p. 220).

On May 10th an adult female was found dead on the banks of the Derwent, near Muggleswick. It bore no signs of injury, but it was very emaciated, only weighing 2 lbs. 7 ozs. It will be remembered that in 1949 two Ospreys, a cock and a hen, were picked up in a dying condition on May 19th, one on the banks of the Coquet, near Guyzance, N., and the other at Coldingham Lough, Berwickshire (see *O.R.*, 1949).

On May 31st the dead body of an adult male was picked up near the Warks Burn, above Crookbank Farm, North Tynedale, by A. Bowers.

On June 3rd and 4th an Osprey visited Gosforth Park Sanctuary. It was first seen on June 3rd at 3-0 p.m. by W.D.R. who had it under observation or some time. It dived into the lake twice, on the second occasion rising with a large fish in its talons, with which it flew to the dead branch of a tree on the island. With its foot grasping the fish it now began to peck at it as it lay across the branch. Twice it left its perch carrying the fish with it but returned to the same spot. At times it was mobbed by a couple of Carrion Crows. On the following day at 8-0 p.m. it was seen there again by G.R.B. and N.A.R. It was watched circling the lake and diving to the water more than once from an altitude of about 30 ft. and later it was seen to be carrying a hugh fish in its talons, which it carried away to a tree some 200 yds. outside the Sanctuary, where it was seen eating the fish. It was last seen at *c.* 9-0 p.m. flying in a wide circle over the lake, still carrying the fish, disappearing into the trees at the east end of the lake.

287. SPOONBILL.—On April 19th a single adult bird visited Teesmouth. It was first seen from Cowpen Marsh, flying in from the north-west at about 150 ft. It passed near enough for the fully extended neck, long spatulate bill and long black legs to be clearly seen. Its steady flight was interrupted by glides. When

it reached the estuary it was mobbed by a party of Great Black-backed Gulls. It was watched for some time feeding in the pools behind the sea-wall, where the characteristic sweeping motion of the bill was noted. When disturbed it flew out to the Seal Sands. By the following day it had gone (A.B.).

289. HERON.—Northumbrian Heronries: Chillingham, on May 15th only four nests had been occupied (Lady Corisande Bennet). Longridge, Berwick, 17 occupied nests (F.B. & R.F.L.). Boundary Wood, Alnwick, at least eight nests (J.E.R.). Allen Banks, Tyne Valley, one nest only. Durham Heronries: Dyance Wood, near Gainford, on April 7th eight nests contained young (C.J.G.).

297. BITTERN.—On September 25th at Crookfoot Reservoir, D., one was flushed (J.A.A., per P.L.H.).

300. WHOOPER SWAN.—Plentiful and well-distributed in the early part of the year, both inland and on the coast. On January 7th near Holy Island, *c.* 200. On January 28th on Holy Island sands and Fenham Flats, 70 (F.B.). A few remained very late. On May 13th still two on Grindon Lough (R.T.G. & E.M.L.). On May 6th at Holy Island crossing, two (F.B.). From May 29th to June 3rd, a sub-adult bird remained on a pond at Lucker, N. (E.A.R.E. & B.W.).

First reported in autumn on October 19th at Colt Crag, three (K.I.), increased to 17 by the 28th (R.G.T. & E.M.L.), by which date there were 41 on Greenlee Lough (R.V.H.B.), and eight on Holywell Ponds (R.D.S.).

303/307. 'GREY GEESE.'—Many flocks, some of them of considerable size, of 'Grey' geese were seen in flight during the winter of 1950-51 but in most cases the species could not be identified.

303. GREY LAG-GOOSE.—Up to February 12th a flock of from 100 to 200 roosted near Holborn, N. (per F.B.); on April 1st still 17 there feeding in stubble (R.F.L. & D.G.).

From July 5th or 6th until the 18th, ten adults of this species stayed on one of the Farne Islands, four of them moulting shortly after their arrival (E.A.R.E.). On June 13th a flock of eight, which were probably of this species, flew down to the pond at Falloden, N.; they circled it three times calling loudly and then flew off without alighting (reported by the Embleton postman per J.M.C.). This is the third year in succession that a small flock has been seen during the summer months (see *O.R.*, 1949 and 1950).

304. WHITE-FRONTED GOOSE.—On November 10th on Fenham Flats a single bird flew across the observer's front within 100 yds. The conspicuous white frontal patch, the black on bill and very heavily barred abdomen were all clearly seen (per E.A.R.E.). It is not often that this species is definitely identified in the district.

307. PINK-FOOTED GOOSE.—On January 7th near Holy Island *c.* 2,000 (R.H.). On January 18th at Teesmouth a party of seven flew down to feed on a pasture behind the sea-wall; on February 11th one on the same spot. Now very infrequent visitors to Teesmouth (A.B.).

On November 1st near Fenham Flats, 106 and on the 3rd *c.* 200 at Holborn Moss—'this was after a known dispersal of some of the birds at Greenlaw, Berwickshire, where, with Peter Scott, I had seen *c.* 5,000 on October 21st and later on October 31st *c.* 2,500' (E.A.R.E.).

311. BARNACLE GOOSE.—On October 21st a flock of 60 flew S.W. over Budle Bay (D.W.). The only record for the year (*cf.* previous *Reports* for the occurrence of flocks in October).

312/313. BRENT GOOSE.—On January 7th at Holy Island, 12 (R.H.). The only flock reported. On December 10th a single bird only (R.H.).

315. SHELD-DUCK.—Moult migration: In the late summer a watch was kept in the Tyne Valley at Haltwhistle and Haydon Bridge and in Upper Teesdale near Middleton, but no birds were seen. There is evidence that the flocks fly high enough to cross the Pennines at any point and do not select the Tyne Gap or follow the river valleys on their west to east migration.

Breeding: At Teesmouth it is estimated that five pairs bred successfully, rearing about 40 young (D.S.). Owing to the presence of foxes on Holy Island only three pairs bred successfully (R.H.). On Holy Island during the nesting period there are always about 30 to 50 non-breeding birds sitting about on the Snook—they leave at the end of July (R.H.).

Inland: On October 4th on Hallington, two, and on the 5th, four (K.I.).

317. MALLARD.—As usual a flock of *c.* 50 birds spent the winter of 1950-51 off the coast between Whitburn and Seaburn, D. (L.K.). It was again present in the

winter of 1951. At night the birds fly in to Boldon Flats to feed (T.S.D.). Up to the end of the year a flock of *c.* 30 birds haunted the mouth of the Holystone Burn, Upper Coquetdale; at night they go up to the Dueshill woods for acorns (E.M.).

A Mallard, ringed as a juvenile at Blagdon, N., on July 22nd, 1949, was shot at Cramlington, N., on August 30th, 1950 (A. & R.).

318. GADWALL.—During the early part of the summer a small flock, varying from six to eleven, was present on the Tunstall and Waskerley Reservoirs, D.; a few remained as late as the end of November (R.M.). On October 8th at Holborn Moss, N., four, with *c.* 2,000 Wigeon and *c.* 500 Teal (E.A.R.E.). On October 14th at Gosforth Park, a drake (L.G.H.). On October 25th on Hurworth Burn Reservoir, D., four; on the 27th two (A.B.).

319. TEAL.—On June 10th on Cheviot, one was flushed from a small burn at *c.* 2,400 ft. (R.F.L.).

322. GARGANEY.—From April 18th onwards two drakes and a duck were present on Boldon Flats, D.; they were last seen on August 5th. No proof of breeding was obtained (H.M.S.B., T.S.D., A.H.B.). On May 12th an additional pair was seen on a pond some half mile away (J.C.C.). On May 3rd on a pond near Ellington, N., a drake (F.G.G.). On May 15th to June 10th on Shoreston pool, near Monks' House, a drake and on August 17th, at the same place, a duck, or drake in eclipse (E.A.R.E.). On May 24th on Holy Island Lough, a pair (F.G.G.). On August 4th and 18th on Cowpen Marsh, Teesmouth, a pair, possibly the same birds; the drake in partial eclipse (P.J.S.).

324. AMERICAN WIGEON.—On November 8th on Fenham Flats, N., an adult drake was shot out of a flock of Common Wigeon. It was recognised as being an unfamiliar species and was sent to the Hancock Museum by R. Allison, of Holy Island. This is the first record of this rare visitor for Northumberland.

325. PINTAIL.—Single birds and pairs were reported from various waters from January to April and from August to November; but no breeding was proved.

326. SHOVELER.—Present at Gosforth Park during most of the year (J.A.M.). Single birds, pairs and small parties reported from various waters. A pair attempted to breed at Teesmouth; on May 3rd a nest with 12 eggs was found; it was later destroyed by a cow stepping into it (A.B.); but on August 11th a pair was flushed near the same place with four fully fledged young (P.J.S.).

328. COMMON POCHARD.—None bred on the pond in Co. Durham where, in previous years, they have bred successfully. This pond is now much disturbed. On another pond near Stanley in Co. Durham, a pair remained until June 3rd, but no proof of breeding (R.M.P.).

330. TUFTED DUCK.—Only one nest was found at the usual pond in Co. Durham. On May 30th it contained six eggs, but three were broken by crows. Up to a dozen pairs were present, but no successful breeding was proved (F.S.).

334. LONG-TAILED DUCK.—Throughout the winter between Budle Point and Monks' House, N., up to about 25; last seen April 4th (E.A.R.E.). On April 6th at Holy Island, three or four pairs (R.F.L.). On October 28th off the Stag Rocks, Bamburgh, one immature drake, the first record for the winter, increased to seven by November 26th (E.A.R.E.).

337. COMMON EIDER.—Approximately 445 ducks nested on the Farnes (*F.I.O.R.*, 1951). On June 22nd at Seahouses, a ' raft ' of 87 ducklings was counted with 13 ducks in charge (S.A.). In the winter months adults are now frequently reported off the coast as far south as the mouth of the Tees.

340. VELVET SCOTER.—Single birds and small parties seen more frequently than usual off the coast from August to the end of the year. First reported on June 8th, an unusual date, a mature drake off Alnmouth (R.T.G. & E.M.L.). Largest flock on October 31st off the Carr Rocks, Warkworth, 25 to 30 (A.E.G.). The fact that they are so often seen flying north, usually in company with Common Scoters, needs explanation. This movement takes place throughout the season: On August 5th, 6th and 7th many small parties flying north past Monks' House (E.A.R.E.). On August 7th, off Marsden, D., one in a party of 90 Common Scoters and later nine and six, all flying north (F.G.G.). On October 28th, off Whitburn, two, and nine, flying north (F.G.G.). On November 26th off Monks' House, a number passing north (E.A.R.E.). The direction of flight of other parties reported was not stated.

342. GOOSANDER.—More plentiful and widely distributed than ever. On March 4th on Greenlee and Broomlee Loughs a total of 68 birds was counted (J.A.M.).

On March 3rd on Whittle Dene reservoir, 19 (A.M.). Competition for nesting sites:—In Coquetdale a pair was under observation from March onwards; on April 22nd the hen was seen to fly into a hole in an old elm tree; in a few moments she flew out again followed by a Jackdaw. For half an hour she made repeated attempts to enter the hole but without success as it was already occupied by a colony of Jackdaws. On April 29th the two Goosanders were still present near the tree and on the tree being climbed it was found to contain at least two Jackdaw's nests and one of a Tawny Owl with young. On the same day, not far from this site, a Goosander's nest was found in a hollow alder which two years previously had been tenanted by a Tawny Owl. (E.G.T.) In the Thropton area a nest and eggs were washed away from the roots of a tree by flood water after heavy rain (R.C.). On August 26th on the Coquet near Holystone, two broods were seen within a quarter of a mile of one another; the first of nine birds and the second of eight. 'It was interesting to note that both sets of birds preferred to face the danger of passing me, and thus flying into the wind, rather than away from me and with the wind' (E.G.T.). *Note*—It will be remembered that it was only in 1941 that the Goosander was found breeding south of the Border.

344. Smew.—Only one recorded for the winter of 1950-51—in early January on the Wear near Hamsterley, one female or immature (R.M.).

348. Shag.—At least 85 pairs nested on the Farnes as compared with 59 in 1950. Between three and four hundred, including many immature birds, wintered round the Islands (*F.I.O.R.*, 1951).

'On October 18th off Monks' House, N., an extraordinary 'mass movement' was observed. About 125 birds, mostly immature, in two main 'flights,' passed south about 200 yds. off-shore. Progress was by alternately flying all together at *c.* 20 ft. above surface for 300-400 yds. then descending to swim and dive for approximately five minutes before flying on again. They did not appear to be feeding (no accompanying gulls or other evidence of shoals of fish) and presently passed out of sight down the coast. I have never seen anything like this before and got the impression that it was a definite passage movement rather than a fishing expedition' (E.A.R.E.).

349. Gannet.—On August 7th, the date when Scoters were prominent at Marsden, flying north, there was also a marked passage of Gannets. In a morning watch of 1 hr. 10 mins. 147 Gannets were counted, all but half a dozen flying north (F.G.G.).

On November 8th a gale victim was retrieved nine miles inland from Monks' House. It was taken to the coast, ringed and released, when it flew away to the north (E.A.R.E.). On the 20th another adult was found alive in a wood near Blagdon, N.: it lived for a week on a farm pond (M.W.R.).

*Note*.—Stranded Gannets, otherwise apparently sound, should *not* be released on a 'pond,' where, because of their specialised feeding habits, viewing and diving upon fish from the air, they will inevitably starve and where they are unable to take off without the necessary taxi-ing space. They should be released on the nearest wide river or, best of all, on the sea.

350. Storm-Petrel.—On November 7th one was killed against the Longstone Lighthouse lantern (*F.I.O.R.*, 1951).

355. Manx Shearwater.—On May 14th off Marsden, D., three, three, and two; on the 17th one, and on June 29th three, all flying north. On August 7th, one and four going south; on the 10th five and four going north. On the 14th off Hartley, N., two flying north (F.G.G.). On August 7th off Whitburn, D., *c.* six flying well out (A.H.B.). On August 28th and September 19th, birds were seen off the Farnes (E.A.R.E.).

363. Sooty Shearwater.—On September 19th a large fulmar-like petrel, entirely sooty-brown except for pale greyish 'discs' on the underside of the wings, travelled north through the Outer Farne Islands (E.A.R.E.).

*Note*.—In view of the possible occurrence of the Balearic Shearwater (356) *Puffinus p. mauretanicus* (of which 19 have already been recorded off the Yorkshire coast and two off Northumberland) and the similarity between its dark form and the Sooty Shearwater *P. griseus*, observers should pay particular attention to any petrels that they may see (*vide* article by E. M. Nicholson, *B.B.*, Vol. XLV, p. 41).

368. Fulmar.—The colony at Marsden did very well indeed; a total of 64 young being counted. On the coast between Tyne and Wear the grand total of young was 78 (F.G.G.). On August 14th, on a broad limestone ledge on the north

side of the cliff below Tynemouth Priory, N., a well-developed juvenile was seen (F.G.G.). Birds have been seen haunting this cliff since 1934; but this is the first recorded instance of breeding there. On August 14th at Crag Point, Hartley, N., a chick in grey down was seen, but no others were found (F.G.G.). Breeding has been attempted here in previous years, but the eggs have always been ' collected.'

In a small cleft in the cliffs at Marsden Bay, two young were seen together which must have been the product of one female, as the space was too small to have accommodated two sitting adults (F.G.G.). Records of two eggs are very rare and this is the first instance reported from the N.E. coast.

On August 17th, at Frenchman's Bay, South Shields, a bird of the blue-grey form was seen to fly into the bay from the south; it was not present on the following day (F.G.G., J.C.C. & E.W.). This form, more frequently met with further north, is rarely seen on our coast. A specimen in the Hancock Museum was picked up dead on Holy Island on April 27th, 1903, and in March, 1933, J. R. Crawford described a somewhat similar bird seen at Nose's Point, Dawdon, D.

On December 16th, 16 birds came in to the Bamburgh Castle cliff breeding site; many having been seen at sea during the previous week (E.A.R.E.).

370. Great Crested Grebe.—For the first time since 1934 a pair bred successfully on an inland lough and raised two young. The nest was placed a few yards from the edge of the water amongst thick reeds and not floating as usual. It was found on July 5th and contained fresh eggs—a late date (R.C. & N.F.).

373. Slavonian Grebe.—On March 25th off Bamburgh, N., six present, two in full breeding plumage (S.A. & J.S.A.). On the 30th two still present (R.S.).

374. Black-necked Grebe.—On the usual pond in N.E. Durham a single bird was seen on April 14th. No breeding took place and no adults were seen again until a single bird was seen on July 26th (T.S.D. & L.K.).

This pond is now much raided by boys who have five large cork rafts on the water. Tufted Duck and Pochard, which previously bred here, can no longer do so and the Little Grebe population is much reduced (F.S.).

On December 19th, off the coast north of Whitley Bay, N., a couple of Grebes in winter plumage was seen, which, from the detailed description given, appeared to be of this species (L.G.H.).

380. Wood-Pigeon—On October 3rd near Styford, N., a nest was found containing two newly hatched young—a late date (A.J.C.).

A bird, ringed as a nestling at Blagdon N., on September 25th, 1947, was shot at Belsay, N., on April 17th, 1951. Another, ringed at the same place on May 1st, 1949, was shot at Cramlington on March 29th, 1950 (A. & R.).

383. Turtle Dove.—During June birds were seen and heard in the Tyne Valley, S.W. of Stocksfield, but no nests were found (G.A.C. & A.J.C.). On June 1st an adult cock was picked up dead on the Inner Farne; it had been seen about the Island for 10 days or more (*F.I.O.R.*, 1951). At least one pair frequented, and probably bred, in the Budle Bay, N., area this summer.

386. Bar-tailed Godwit.—Inland: On June 7th at Greenlee Lough, N., a single bird seen—a most unusual date (H.M.S.B.). On August 19th at Bolden Flats, D., a flock of six; also seen there on September 3rd, 7th and 10th (H.M.S.B., F.G.G. & J.C.C.).

387. Black-tailed Godwit.—Very few recorded. On March 22nd on rocks at Beadnell, N., one; and on the 23rd, in Budle Bay, one (E.A.R.E.). On April 28th at Holy Island Lough, one, in company with two Bar-tailed (F.G.G.). On September 12th and 14th single birds at Boldon Flats, D.; not present subsequently (J.C.C., E.W. & F.G.G.).

388. Curlew.—On January 1st at Blagdon, a single bird arrived; an early date. The main body did not arrive until the end of February, before pairing. By the end of March a flock of 150 birds (M.W.R.). On February 11th a flock of 15 on the river flats of the Coquet as far up as Holystone (E.G.T.).

389. Whimbrel.—First seen Teesmouth, April 19th two, 22nd three (A.B.). Beal Shore, N., April 28th, two (F.B.).

Autumn passage first noted Teesmouth, June 21st (D.S.), and on July 29th, 21 birds; maximum number seen on August 9th, *c.* 40 birds (A.B.). On August 5th, at Boulmer, N., at least 23 (H.R.O.); and at Budle Bay, a flock of 10 (E.G.T.). From August 7th to 28th at Boldon Flats, two or three present (J.C.C., E.W., F.G. & H.M.S.B.). On August 17th at Monks' House, *c.* 50 passing south off shore (E.A.R.E.).

393. Woodcock.—On October 26th one was picked up exhausted in a West Hartlepool street. After being fed it was released and flew away strongly (P.L.H.). On November 11th, at South Shields, one was seen flying about the pier and shore (F.G.G.).

394. Great Snipe.—On September 8th one was shot near Minsteracres, N., G.A.C. writes—' This was the first Great Snipe I had ever seen. Identification was quite certain even before handling. The immediate impressions on rising were its larger size, darker colour, especially about neck and breast, and slower straighter flight making it a much easier target than usual snipe-shooting provides. On handling it, it was not perceptibly bigger than the Common Snipe shot on the same day; but it was markedly darker in colour on underside from neck, breast and abdomen.' With the exception of one or two rather doubtful sight records, this is the first specimen reported since these Ornithological Reports were started in 1934. Hancock (1874) was only able to give a very few records and John Hutchinson (MS. 1840) wrote—' Many a shooter of long experience in the County has never met with it,' which is as true to-day as when it was written.

[On September 29th a large Snipe was flushed in Gosforth Park: it flew slowly and quite straight for about 50 yards and dropped into the reeds beside the lake. It was not seen again. It is possible that this may have been a Great Snipe (R.G.G.).]

401. Red-necked Phalarope.—From November 11th to 21st, on some flood-water in a grass field adjoining the shore E.S.E. of Howick, N., a very small Phalarope was under observation. It was examined at very close range by several observers, as it was very tame. Its dark crown and the dark streak through the eye contrasted with the otherwise pure white head and throat; its upper parts were dark with conspicuous snipe-like stripes; it had a pale reddish patch on either side of the breast; the bill was very thin and of a uniform colour. It floated high out of the water, where it swam actively, its movements recalling those of a Moorhen (W.S.C.). From the detailed description given this can only have been a Red-necked Phalarope in first winter plumage. This is the first record of this species for Northumberland since 1893 and previous to that date only six occurrences had been reported.

402. Turnstone.—Unusually plentiful on the coast in the winter of 1950-51. On February 24th at St. Mary's Island, N., a flock of *c.* 60 (L.K.). On July 29th at Teesmouth, *c.* 70, all adults except one (A.B.). An unusual date for so many. On October 9th a ringed bird was seen on Monks' House beach (E.A.R.E.).

403. Knot.—On January 28th on Holy Island Sands and Fenham Flats 4,000 to 5,000, on February 18th several thousands and on April 1st *c.* 500 (F.B.). On February 19th near St. Mary's Island *c.* 200 (F.G.G., E.G. & D.G.). A flock of *c.* 200 wintered on Jarrow Slakes, D. (F.G.G.). On January 18th at Teesmouth, *c.* 1,200 (A.B.).

404/5. Dunlin.—Seen on Boldon Flats from July 16th to the end of the year; maximum number 25 (T.S.D., L.K. & F.G.G.). First seen on breeding site in Co. Durham on May 3rd; on the 20th a nest was found with four eggs, two of them sucked by a crow (H.W.). On June 10th on the Cheviot range five or six were flushed, but no proof of breeding was established (R.F.L.). On a Coquetdale breeding site only one pair was seen this year; on June 16th they gave indications of having young, but none were seen (E.G.T.).

A bird ringed at Jaeren, near Stavanger, Norway, on October 7th, 1950, was found dead at Beadnell, N. on January 4th, 1951 (J.M.C.).

406. Curlew-Sandpiper.—Very few indeed reported. First seen August 2nd, an adult in breeding plumage (A.B.), at Teesmouth. From August 31st to September 22nd two were seen on several occasions on Boldon Flats, D. (J.C.C., E.W., T.S.D. & F.G.G.).

407. Little Stint.—The only birds reported were: On September 19th on the Farnes, two, and on the 22nd at Fenham Mill, one (E.A.R.E.). From October 2nd to 9th on Boldon Flats, two (F.G.G., L.K., T.S.D. & J.C.C.). On October 28th at Teesmouth, two (C.G. & D.B.).

416. Sanderling.—Unusually numerous, some large flocks being counted. On March 3rd at Seaton Sluice, N., *c.* 80 (D.G.); on May 24th at Sandon Bay, Holy Island ' a good 200 ' (F.G.G.). On November 10th and 14th at Teesmouth a flock of 48/50 (C.G. & D.B., D.S.). On the 24th near St. Mary's Island, 47 (W.D.R.). One was caught and ringed at Monks' House on August 11th (E.A.R.E.).

417. RUFF.—On spring passage: At the end of April, on a flooded field near Monks' House, N., two to four (E.A.R.E.). On May 3rd at Cowpen Marsh, Teesmouth, one (A.B.).

On autumn passage: Very numerous indeed in both counties; there are no previous records of so many being seen in one season. On September 3rd at Beal, N., eight and on the 7th, five (R.F.L.). On September 11th, at Holborn Moss, N., a male (E.A.R.E. & R.F.L.). From August 13th to October 12th on the flooded field near Monks' House present in varying numbers from two to over twenty (E.A.R.E.)., four being trapped and ringed at the end of August. On August 10th and 23rd at Jarrow Slake, D., one (F.G.G.). On August 23rd, 24th and 30th on Primrose pond, one (F.G.G.). Numerous on Boldon Flats, D., during the whole autumn: first recorded on August 10th two (A.H.B.); on the 15th there were seven and from the 26th until September 20th numbers varied between 20 and 30, with a maximum of *c.* 40 on September 13th. By the 25th all had gone, but a single bird appeared again on October 13th, and lingered until November 2nd (F.G.G., H.M.S.B., J.C.C., E.W., etc.).

421. COMMON SANDPIPER.—First seen on April 16th on the Wear near Whitworth, D. First seen in Upper Coquetdale on the 19th (B.C.E.R.). Not usually found breeding on the Coquet above Alwinton (E.M.), but in early May a single pair was seen a quarter of a mile above Makendon at 1,200 ft. (E.G.).

423. WOOD-SANDPIPER.—On April 26th near Beadnell, one (E.A.R.E.). On August 24th on the flooded field near Monks' House, N., two, one adult and one immature, remained for four days, one being trapped and ringed (E.A.R.E.). From August 21st to September 26th on Boldon Flats, D., from one to five birds were present. On August 30th the four birds seen were in summer plumage (H.M.S.B., F.G.G., J.C.C., E.W., etc.). On September 3rd at Darlington Sewage Farm, two (A.B.).

424. GREEN SANDPIPER.—Spring passage: On April 23rd and May 5th, single birds at Whitworth, D. (C.G.). On May 2nd and 4th on Holy Island, one (J.H.R.B., E.A.R.E.). In autumn, chiefly during the month of August, many were reported, usually single birds, but at Darlington Sewage Farm on August 10th, there were 10, and on the 29th, 12 (A.B.). On various occasions from August 6th to September 27th usually single birds, maximum four, were seen on Boldon Flats, D. (H.M.S.B., F.G.G., etc.).

431. SPOTTED REDSHANK.—Seldom reported on spring passage; but on March 19th at Budle Bay, four were seen (E.A.R.E.).

First reported in autumn on August 28th when three were seen near Monks' House (E.A.R.E.). Between August 30th and November 6th single birds were seen at the following places: Berwick beach, Beal (R.F.L.), Jarrow Slake (F.A.N., J.A.M., F.G.G., D.G.). From August 30th to October 11th at Boldon Flats one or two were seen almost daily, maximum three on September 7th, all birds of the year (H.M.S.B., F.G.G., J.C.C., E.W., L.K., T.S.D.).

432. GREENSHANK.—On the North Northumberland coast during March, May, August and September, many occurrences of single or few birds (E.A.R.E.). From August 18th to November 11th frequently present on Boldon Flats, maximum number seven (J.C.C., E.W., etc.). Becoming increasingly common at Teesmouth on autumn migration, first seen August 4th (P.J.S.) on September 9th, fourteen, 10 in one party (A.B.).

435. RINGED PLOVER.—First seen in Upper Coquetdale on March 15th; pairs present on the Coquet gravels all the summer (E.M.). Attempted to breed near South Shields, where a pair bred successfully last year, but first clutch destroyed. An immature bird seen later may have been bred there. Several pairs attempted to breed at Teesmouth (A.B.).

444. GREY PLOVER.—Some unusually large flocks reported: On March 24th at Fenham Flats, 70 (F.B.); on September 27th, at Budle Bay, 50 (E.A.R.E.); on October 29th at Budle Bay, 20-30 (D.W.).

449. LAPWING.—A great increase in breeding pairs noted this year (R.C.). Numerous in the breeding season about Netherton, Thropton, N. (T.G.W.).

On March 4th at Boulmer, N., in moderately strong S.E. wind at 5-0 p.m., a flock of *c.* 15 was seen to fly straight out to sea; it was watched until out of sight and was not seen to change direction (H.R.O.).

Injury-feigning extraordinary: 'On April 8th near Thropton, N., I saw a Lapwing in a field apparently sitting on a nest. I walked across to it with my

camera to take a photograph; but when I was about 30 ft. away it got up and stumbled away as if injured. It then lay perfectly still and allowed me to pick it up. There was no nest or eggs. It lay quite still on my open hand. I put it down on the ground again, but it remained in the position in which I set it. My friend took a photograph of it lying on my hand and we were discussing what to do with the helpless creature when it suddenly stood up on my hand, raised its wings and flew away. Its flight was quite normal and it settled and began to feed ' (R.C.).

A Lapwing ringed as a nestling at Beadnell, N., on June 20th, 1948, was found dead at West Chevington, N., 20 miles south, on April 20th, 1951 (A. & R.).

452. Oystercatcher.—First pair seen in Upper Coquetdale on February 28th (B.C.E.R.). None found breeding above Alwinton; but along about a mile of river-gravel six pairs established themselves at a distance of about 300 yards apart, each pair claiming its own territory (E.M.).

Bred successfully on river-gravels on the Tyne below Hexham (R.T.G. & E.M.L.). On May 26th a nest with four eggs was found at Teesmouth; but the eggs were destroyed by gulls. On June 3rd another nest was found containing *six* eggs. ' Two birds near the nest appeared to be anxious and a third was feeding a short distance away. This third bird may have been responsible for the extra eggs ' (A.B.).

462. Black Tern. On August 1st at Teesmonth, one feeding with Common and Little Terns; on the 9th, three or four; probably all juveniles (D.S.). On August 19th off Boulmer, one seen amongst other terns. Its different habit of feeding was very noticeable, dipping to the water in typical marsh-tern fashion. In mixed flocks of terns this character should be looked for by other observers (F.J.N.). On August 28th and September 16th single birds were seen passing south off Monks' House and on September 20th, two (E.A.R.E.). From August 31st to September 2nd at Hurworth Burn Reservoir, D., two. (P.L.H.). On September 10th at Teesmouth, one hawking insects over the water behind the sea-wall (J.C.C. & E.W.).

467. Sandwich Tern.—The colony on the Brownsman, Farne Islands, was very large indeed and had a most successful breeding season. Attempts to breed on other islands failed (see *F.I.O.R.*, 1951). A bird ringed as a nestling on the Farnes on July 14th, 1947, was found dead at Budle Bay four years later, on July 7th, 1951. Four ringed birds were recovered on the West African coast (*F.I.O.R.*).

469. Common Tern.—At Teesmouth, on the old site, two pairs attempted to breed, probably unsuccessfully; on a new site however, *c.* 25 pairs nested, where on July 5th most of them had chicks (A.B.). On the Farnes numbers have increased and a fair-sized colony was established on the Brownsman (*F.I.O.R.*).

470. Arctic Tern.—On June 2nd, at the usual Northumbrian mainland colony, a dozen nests were found and many empty scrapes—11 nests with one egg each and one with two (F.B.). As usual large numbers bred on the Farnes; but the number of young successfully reared was considerably smaller than in normal years (*F.I.O.R.*).

471. Little Tern.—On June 2nd, at the usual Northumbrian colony, at least two dozen pairs were present; several nests were found with one or two eggs each (F.B.). At Teesmouth on July 5th six pairs had eggs. This site was not visited later; but tides usually frustrate any breeding here (A.B.).

477. Little Gull.—On September 28th on the south beach, South Shields, a flock of three, one adult and two juveniles. The immature birds were present on the following day and were approached to within 3 yds. (J.C.C.). A few seen off the Farnes during the week ending October 23rd (W.T.L.). On November 11th on the beach near Monks' House, one (E.A.R.E.).

*Note.*—Large numbers were present on the Firth of Forth this autumn.

482. Herring Gull.—More abundant than ever on the Farnes—out-numbering Lesser Black-backed (*F.I.O.R.*). On Marsden Rock, D., on January 21st, 108 birds were counted gradually increasing to 189 by April 29th when some were already sitting on nests. Every available space on the top of the Rock was occupied. Many birds haunted the top of the mainland cliffs and were even defending territories there, but the sites were too accessible to the public and no nesting took place. During the war years, when the area was protected by barbed wire, breeding on the mainland cliffs was successful (J.C.C.). (See *O.R.*, 1945.) Well over 100 young were reared on the Rock (F.G.G.).

(*Correction.*—In *O.R.*, 1950, it was stated that ' Four broods were reared on the Rock '; this should have read—' *By June 7th,* four broods were already hatched out.' The colony was far larger than this, almost every site on the top of the Rock being occupied (G.W.T.) ).

485. British Lesser Black-backed Gull.—A pair again nested upon Marsden Rock, D., and reared two young (F.G.G. & J.C.C.).

487. Glaucous Gull.—The sub-adult bird that wintered in Seahouses Harbour was seen as late as April 4th (R.S.). Had this been the same bird that has wintered here regularly since 1948-49 it should have been in adult plumage in the winter of 1951; but though two birds of this species turned up and haunted the Harbour in 1951-52 one was sub-adult and the other juvenile (E.A.R.E.).

On April 23rd a single bird was seen on the beach at South Shields (J.C.C.). On October 28th three were seen off the Longstone (W.T.L.). On December 30th one on the beach north of Whitley Bay, feeding on a dead fish (B.L.). On January 5th 1952, an adult, probably the same bird was seen on three occasions near the same spot (L.G.H.).

[488. Iceland Gull.—On April 13th a gull, almost certainly of this species, was seen with Herring Gulls on a ploughed field near Whitburn, D. From its all-white appearance it was judged to have been within a year of maturity (H.M.S.B.)]

489. Kittiwake.—For particulars of the North Shields colony see above. On January 21st at Marsden already four birds present; by February 11th about a quarter of the breeding strength present; on April 23rd first seen carrying nesting material (J.C.C.). In late August, after all the young had left the ledges, adult birds were still present on the nests. In August, sample counts of Kittiwakes present along the coast between Marsden and Shields piers, showed only an average of 8·5% of young birds (maximum count 11%). The majority of young birds must leave the district as soon as they are fledged and before the adults (J.C.C.).

Adult birds have been reported as far up the Tyne as the bridges at Newcastle and on the Wear at Durham City (H.R.O. & R.M.P.).

491. Great Skua.—On September 11th at Whitburn, D., one chasing a Common Gull over the cliff top fields (T.S.D.). On the 13th off Monks' House, one chasing Herring Gulls (E.A.R.E.). On the 25th one in a flock of diving Gannets two miles off Coquet (A.E.G.). On October 24th at Whitburn, D., one (J.W.). On October 28th off the Longstone, Farnes, one (W.J.L.).

501. Black Guillemot.—On November 16th off the North Wamses, Farne Islands, one in full winter plumage (E.A.R.E.). The only record for the year.

502. Little Auk.—In February and March two or three oiled birds were found along the coast (F.B. & F.J.N.).

504. Corncrake.—Since 1946 there has been a very gradual increase in the number reported each summer, but in the summer of 1951 a most unexpected increase occurred. More have been recorded than in any year since these *Reports* were first issued in 1933. In recent years breeding was chiefly recorded from high ground lying in the upper river valleys to the west, where crops are usually cut late; but this summer birds have occurred also on many lowland farms in the eastern parts of the two Counties, where they had not been heard for years past. In some areas many were heard together. The Shaftoe Trust School Nature Club, Haydon Bridge, recorded hearing birds calling in 18 different places in the Tyne Valley in the section lying between Hexham and Haltwhistle (per W.J.).

Definite records of breeding were established. In a Jarrow School playground a nest was found when grass was being cut (Miss Proudlock). On June 29th at Swarland, near Alnwick, a nest was found containing eight eggs from which young had been hatched (Mr. Scott, per S.E.C.). A nest of broken egg-shells was found near Hunwick, D., where a bird had been calling all the summer (C.G. & D.B.).

513. Black Grouse.—' Still holding their own in the Wolsingham, D., area where a nice lot can again be seen ' (R.M.). Numbers have again slightly increased on the moors west of Wark, North Tyne (H.M.S.B.). On May 7th near Wingates, N., eight birds seen ' lekking ' (R.C.).

514. Red Grouse. ' Grouse fared badly during the long cold winter and many dead birds were found in the spring. Nesting was at least three weeks late and a spell of cold wet weather at hatching time destroyed young birds ' (G.A.). ' Did not do well in the Wolsingham area this season; a lot of disease about and many dead birds picked up ' (R.M.).

517. PHEASANT.—At Blagdon, N., a nest was found containing 32 eggs! One bird hatched eight eggs in a nest in the fork of a yew tree eight ft. above ground-level (M.W.R.).

KEY TO THE INITIALS OCCURRING IN THE ABOVE REPORT:

G. Aikenhead, J. R. Ainsley, J. Alder, R. Allison, S. Ash, J. S. Ash, A. & R.= J. S. Ash and M. W. Ridley, A. Baldridge, K. Baldridge, A. H. Banks, G. R. Barnby, D. Bell (Miss), C. Bennet (Lady), R. V. H. Benson, H. M. S. Blair (Dr.), J. H. R. Boswall, A. Bowers, F. Brady, W. M. Brady (Miss), V. Brown, H. O. Bull (Dr.), J. E. Caffyn, H. Church, F. Clark, A. J. Clissold, R. Clissold, R. Cook, S. E. Cook, G. A. Cowen, J. C. Coulson, M. Cowley, J. M. Craster, W. S. Craster, C. E. Crawhall, D. M. R. Crombie, T. S. Dillon, M. Dixon, V. Dobson (Miss), G. R. Elliott, E. A. R. Ennion (Dr.), N. Fletcher, A. D. Forster, C. J. Gent, D. Graham, K. N. Green, C. Greenwell (Miss), A. E. Gregory, F. Gregory, F. G. Grey, R. G. Grey, R. T. Grey (Miss), R. Henderson, L. P. Hird, T. F. Hird (Dr.), P. L. Hogg, L. G. Holloway, A. R. Huntley, C. Hutchinson, K. Ilderton (Rev.), W. Johnson, J. M. Keegan, H. W. Kerridge, L. Kinlen, E. Laidler, A. Lamb. W. J. Lewis, E. M. Lobley (Miss), W. R. Lofthouse, C. H. Longstaff, K. Longstaff, R. F. Lyndon, A. MacRae, J. A. McGeoch, R. Martinson, E. Miller, F. J. Nattrass (Prof.), H. R. Oliver, W. E. Oliver (Mrs.), R. M. Palmer, M. Philipson, D. A. Ratcliffe, B. C. E. Richardson (Dr.), M. W. Ridley, M. G. Robinson, N. A. Robinson, J. E. Ruxton, W. D. Ryder, B. Sadler, F. Scott, D. Seaward, D. R. Shannon, H. S. Short, P. J. Stead, G. W. Temperley, E. G. Tyer, D. Watson, H. Watson, G. Watt (Miss), J. Whillis (Miss), B. Whitaker (Miss), E. White, D. Wright, W. A. Wright.

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# In Memoriam

## ROBERT C. FOWLER JONES
(1865-1952)

ROBERT C. FOWLER JONES collected fungi for the excellent reason that he liked the look of them—their form, colour and intriguing diversity. He liked the mycologists also, and formed warm friendships with a wide variety of them through several generations. All his activities endeared him to members of the Union, and gave him a unique place in an organisation noted for its liberal welcome to all kinds of naturalists.

His contribution was that of a tidy and methodical mind turned to mycology. Perhaps this arose from his professional work as an architect. No one can have enjoyed Union meetings and fungus forays more than he, and it was his quiet persistence which brought many species from the collecting basket to the pages of records. His aim was always to make the collections from an area as complete as possible, and he, perhaps more than anyone else, strove to present a modern picture of the Yorkshire fungus flora. It was his insight and persistence, first with the late F. A. Mason, and later with the writer, which brought about the publication of the records as *A Catalogue of Yorkshire Fungi* (1937). He bore the whole cost of publication and distribution to members, and the work is his memorial.

Those who knew him will, however, have another kind of memorial—that of his warm humanity. He came from a strict Victorian home in which his brother, returning as a grown man after many years' absence abroad had still to go to the stable loft to smoke his pipe. Yet his tolerance was as wide as any we know, and his courtesy as real as the existence of his favourite *Laccaria laccata* var. *amethystina*. He shone among his dour, sometimes ponderous, technical colleagues with an impregnable geniality which began the tradition of fungus forays as social gatherings as well as mycological meetings.

We have not enjoyed his presence at Union meetings for some years, but his death at Ilkley on April 19th in his 87th year seems to mark an epoch. Young members who knew him not will enter the Union, and, finding a welcome, may now perhaps remember the earlier personalities of which it is compounded. The Union owes him much, both for his unobtrusive generosity, and for his less tangible contributions which make it what it is.

J.G.

# THE AUTUMN FUNGUS FORAY AT RIPON
## September 21st-25th, 1951

W. G. BRAMLEY

THROUGH the kindness of the West Riding County Council the Committee was able to enjoy the use of Grantley Hall as headquarters for the 1951 Autumn Foray. Some dozen members only were able to enjoy the excellent accommodation.

The weather was variable, but only on one half-day were we forced to stay indoors. On the Saturday the woods and fields in the immediate vicinity of the Hall were searched and in the absence of workers in the micro-section the larger fungi were the chief objects of attention. Specimens were not especially numerous either in species or genera. Sunday morning was wet and spent in examining the previous day's collection. After lunch the weather moderated and a small conifer plantation near the Hall was looked over and later a couple of hours was spent in Spa Gill woods.

Monday started out fair and warm and members made their way to Fountains Abbey. Here, conditions were more favourable, and soon three species of *Helvella* were found in a few yards radius, *H. lacunosa* being fairly plentiful. The close-clipped lawns, especially in the more shaded parts, had a fair sprinkling of various species. *Clavaria ligula* was a pleasing sight and new to all of us. In 1950 Dr. Sledge had found *Geoglossum glabrum* in quantity, but on this occasion only one small clump of some half a dozen individuals could be found. To make amends two groups of what proved to be *Microglossum viride* were found. Several species of *Hygrophorus* were also found on the lawns, including nice specimens of the exceedingly sticky *H. unguinosus*. After a picnic lunch, higher wooded ground was explored with, as expected, a different complex of species, chiefly *Russula*, *Lactarius* and a species of *Tricholoma* about which much discussion arose. Microscopic examination shewed it to be *T. triste*. About 3-0 p.m. rain started, but fortunately we were able to find partial shelter until the thunderstorm passed over. Collecting was abandoned and a return made to headquarters.

The results of the meeting were rather varied, chiefly because most attention was paid to the Basidiomycetes, with the other groups a poor second. Messrs. Broadbent and Collinge devoted their attention to the Myxomycetes. The larger Discomycetes seemed to be more frequent than usual and a number of species are listed which although recorded for most Vice-Counties only seem to appear or are found at long intervals. Although a good list of agarics was made, due to a number of reasons several interesting species were not identified.

The following list comprises the most interesting or those rarely recorded in recent years, and a full record of all those recorded is being kept by the writer.

* Not in Mason & Grainger's *Catalogue*.
† Not in Mason & Grainger's *Catalogue* for V.C. 64.
F.=Fountains Abbey. G.=Grantley.

### BASIDIOMYCETES

†*Amanita citrina* (Schaeff.) Roques G.
*Amanitopsis inaurata* (Secr.) Boud. G. (=*strangulata*).
**Boletus variegatus* (Swartz) Fr. F.
†*Clitocybe gigantea* (Sow.) Fr. F., G.
*Inocybe rhodiola* Bres. F., G.
†*Russula claroflava* Grove F.
*R. delica* Fr. G.
†*Tricholoma triste* (Scop.) Fr. F.
*Volvaria speciosa* Fr. G.
*Polyporus nummularis* (Bull.) Quel.
**Clavaria botrytis* (Pers.) Fr. F.
**C. ligula* (Schaeff.) Fr. F.

### DISCOMYCETES

*Dermatea cerasi* (Pers.) de Not., *stat. con.* on *Prunus padus*. F.
*Geoglossum glabrum* Pers. F.
**Microglossum viride* (Pers.) Gill. F.

### PYRENOMYCETES

**Valsa leucostoma* (Pers. ex Fr.) Fr., on *P. padus*. F. (=*V. persoonii*).
**Xylaria longipes* Nits., on *Acer*. G.

### HYPHOMYCETES

*Bactridium flavum* Kunze F.

## THE ENTOMOLOGY OF SPURN PENINSULA

(*continued from* 1951, *page* 190)

It is obvious that these two moths must prevent the spread of the *Dipsacus*, which, if its many seeds were to germinate, might become rampant on Spurn Peninsula. An experiment with two infested seed heads sowed in a box filled with sand and fine soil produced one strong and two weak seedlings, the remaining seeds failed to germinate.

*Pammene regiana* Zell. K.W. June 1951.

### TINAEOIDEA

GELECHIIDAE

*Bryotropha terrella* Hubn. K.W. Two sp. Food : grass stems. In silken gallery at base.

*Phthorimaea acuminatella* Sircom. K.W. Two, August 1949.

OECOPHORIDAE

*Esperia sulphurella* Fabr. K.W. Near cottage. Food : dead wood.

*Endrosis lactella* Schiff. K.W. Abundant in cottage and huts. Food : dry vegetable matter, fur, etc.

GLYPHIPTERIGIDAE

*Glyphipteryx fuscoviridella* Haw. K.W. and W.B.B.D. Four sp. Food : in stems of *Luzula*.

*Glyphipterix fischeriella* Zell. K.W. Abundant. Food : seeds of *Dactylis glomerata*.

ELACHISTIDAE

*Elachista luticomella* Zell. M.M. Four sp. Food : stems of *Dactylis glomerata*.

HYPONOMEUTIDAE

*Swammerdamia pyrella* de Vill. K.W. and M.M. Among Hawthorn.

COLEOPHORIDAE

*Coleophora alcyonipennella* Koll. K.W. A long search of the leaves of *Centaurea* produced two larval cases.

*C. troglodytella* Dup. K.W. Five larval cases from *Carduus*.

TINAEIDAE

*Tinea ganomella* Treits. K.W. Three sp. in bird trap. Feeds in birds nests.

*Monopis imella* Hubn. K.W. Among refuse in army huts. Food : fur, wool, etc.

### HOMONEURA

HEPIALIDAE

*Hepialus lupulinus* Linn. K.W. Omitted from previous list.

*H. humuli* Linn. K.W. and M.M.

## VII. COLEOPTERA, EXCLUDING CARABIDAE AND STAPHYLINIDAE

W. D. HINCKS

Spurn Peninsula cannot be regarded as good ground for Coleoptera according to usual standards, because of its relatively uniform nature and lack of trees. Nevertheless the careful work of a number of members of our expeditions has produced an astonishingly extensive list of species. In addition to records for 1947-50 the present part incorporates material collected from June 15th to 25th, 1951, and the following names of members joining the party for the first time should be added to the list on p. 75 (*The Naturalist*, 1950): J. H. Flint, O. Gilbert, and H. M. Russell.

A total of nearly 570 species of Coleoptera have been discovered in the few hundred square yards which constitute the area studied. This is nearly one sixth of the total Coleoptera of the British Isles. The proportion would be higher if we were to delete from the British total those families and species which are associated with wooded country, such as Cucujidae, Erotylidae, Colydiidae, Ciidae, Anobiidae, Cerambycidae, Scolytidae, etc., and which cannot be expected to occur at Spurn. Half of the total is represented by two families, the ground-beetles (Carabidae)

and cocktails (Staphylinidae). So important are these two predaceous families in the Spurn fauna that they are treated in separate sections of this report by Messrs. S. Shaw and W. O. Steel respectively. It will suffice to say here that the Carabidae are so plentiful at Spurn that nearly a hundred species have been collected, representing over 25 per cent. of the total British species. The total of nearly 200 species of Staphylinids collected represents over 20 per cent. of the known British fauna. The abundance of these two families was unexpected and is one of the interesting results of our survey. It is a striking point that both these families are predators and that they far outnumber all the phytophagous species of the peninsula in species and individuals.

A few peculiarities of the Spurn beetle fauna may be briefly mentioned. Not a single specimen of the usually ubiquitous Sexton-beetles (*Necrophorus*) has yet been found and only two species of the lesser Sextons or Silphas. Chrysomelids are few in species and with one or two exceptions, also few in individuals. Only a single specimen of the usually common genus *Anaspis* has yet been taken. Of the phytophagous species the Curculionidae were the most numerous, about fifty species being collected. There are no Cicindelinae, Dryopidae, and Heteroceridae and several families, such as the Elateridae, Cantharidae, and Coccinellidae, are very poorly represented.

Our experience suggests that the marram dunes were the most productive for arenicolous beetles early in the year and that July is perhaps the best month for most of the other special Spurn habitats. The most interesting of the latter are the Dyke for water-beetles, paludicoles and detriticoles; the Warren for lapidicoles and herbicoles, and the Phragmites Area for detriticoles. The Salt Marsh produced a few special species and the Humber shore provided several interesting beetles, especially cadavericoles. The other dykes, ponds and craters were also examined for aquatic species; Long Bank Dyke at Kilnsea and the Saltings north of the village were both relatively rich in Coleoptera.

The whole area which at first sight might appear to support a very small beetle fauna has proved to be unexpectedly rich as the figures already given indicate. It seems clear that along specialised lines Spurn provides good habitats for beetles. The results achieved also reflect great credit on the work of the coleopterists of the party, admittedly by far the largest section.

## AQUATIC COLEOPTERA

The water-beetles of the peninsula as a whole have been insufficiently collected and offer an interesting field for future work. A knowledge of their distribution in relation to the salinity and oxygen content of the various habitats at Spurn would be of considerable interest. The fauna of the dyke alone would provide valuable data in regard to the seasonal fluctuations of aquatic coleoptera.

### HALIPLIDAE

Haliplids are probably largely vegetarian feeders and are most plentiful in waters containing an abundance of aquatic plants. They appear to be rare in waters of high saline content and only a single species was taken in the dyke. They have not been sufficiently collected at Spurn. Father E. J. Pearce has been good enough to determine specimens of each of the six species recorded below. It is probable that several other species may occur at Spurn.

*Haliplus confinis* Stephens P.M.M., 14/6/47, 1♀.

*H. obliquus* (Fabricius) P.M.M., 14/6/47!; Pond near Humber shore, 21/7/48; crater pond in M.M., 22/7/48, 8/6/50, 6/51!; D., 25/7/48, 1 spn.

*H. lineatocollis* (Marsham) P.P.A., 3/5/50, 5/6/50.

*H. ruficollis* (Degeer) P.M.M., 14/6/47!; crater in M.M., 8/6/50; P.P.A., 3/5/50.

*H. immaculatus* Gerhardt P.M.M., 14/6/47.

*H. fulvus* (Fabricius) P.P.A., 3/5/50!!, 5/6/50!!

### HYGROBIIDAE

*Hygrobia hermanni* (Fabricius) P.P.A., 3/5/50; crater in M.M., 8/6/50!, 22/6/51. The 'squeaker,' an interesting species known only in Yorkshire from a few East Riding localities.

### DYTISCIDAE

The carnivorous water-beetles are not very abundant in species on the peninsula, 16 only being noted below. Sometimes however, individuals are numerous, especially

in the spring and in waters where the oxygen content is not too reduced by decaying vegetation and where the salinity is not too high. In adverse conditions their place seems to be taken by the plant-feeding Hydrophilidae. At least one species, *Agabus conspersus* (Marsham), prefers brackish water and was not found in the ponds where the water is nearly fresh. Some of the earlier specimens were kindly identified by Professor F. Balfour-Browne.

[*Noterus capricornis* (Herbst.) L.B.D., 18/6/51 (S.S.)] (*Ent. mon. Mag.* in press).
[*Laccophilus minutus* (Linnaeus) L.B.D., 18/6/51].
*L. variegatus* (Germar) P.M.M., 21/8/49; crater in M.M., 8/6/50.
*Hygrotus inaequalis* (Fabricius) P.M.M., 14/6/47!!; crater in M.M., 8/6/50.
[*H. confluens* (Fabricius) L.B.D., 18/5/51].
*H. parallelogrammus* (Ahrens) D., 22, 25/7/48; P.P.A., 20/8/49; 3, 5/6/50!!; crater in M.M., 8/6/50.
*Hydroporus pictus* (Fabricius) P.M.M., 14/6/47.
*H. lepidus* (Olivier) P.M.M., 14/6/47, 21/8/49.
*H. palustris* (Linnaeus) P.M.M., 14/6/47, 21/8/49.
*H. erythrocephalus* (Linnaeus) P.M.M., 14/6/47!!; D., 19/6/47.
*H. discretus* Fairmaire, P.M.M., 14/6/47, 1 spn. (det. F.B.B.).
*H. pubescens* (Gyllenhal) P.P.A., 3/5/50!
*H. planus* (Fabricius) W., static water tank, 14/6/47; P.M.M., 14/6/47; D., 21, 25/7/48; P.P.A., 5/6/50.
*H. tessellatus* Drapiez D., 25/7/48, 1 spn.
*Agabus conspersus* (Marsham) D., !! in 6 and 7, rare 8; Boundary dyke, 21/8/49; pond near Humber shore, 21/7/48.
*A. bipustulatus* (Linnaeus) W., static water tank, 14/6/47; D., 18, 25/7/48; crater in M.M., 8/6/50.
[*Ilybius fuliginosus* (Fabricius) L.B.D., 21/6/47].
*Colymbetes fuscus* (Linnaeus) D., 22/7/48; pond near Humber shore, 22/7/48.
*Dytiscus circumflexus* Fabricius D., 18/7/48 1♀, larvae fairly plentiful; crater pond in M.M., 6/51; pond near Humber shore, 21/6/51 [L.B.D., 21/8/49, 1♂].
*Acilius sulcatus* (Linnaeus) Crater in M.M., 6/51 (J.H.F.).

GYRINIDAE

*Gyrinus natator* (Linnaeus) W., static water tank, 14/6/47; P.M.M., 21/8/49.
*G. caspius* Ménétriés crater in M.M., 6/51, 1 spn. (J.H.F.).

HYDROPHILIDAE

The aquatic members of this family are represented by few species but individuals are often abundant; *Enochrus bicolor* (Msh.) for instance occurs in the utmost profusion in the dyke. Most of the species appear to replace the Dytiscids in conditions where the oxygen content is low and *Enochrus bicolor* and *Ochthebius* spp. occur only where the water is brackish. The Sphaeridiinae are found on land, in dung, vegetable refuse and particularly in decaying seaweed on the Humber foreshore. A total of 28 species are noted below.

*Ochthebius dilatatus* Stephens D., 17/6/47, 17/8/49!; PH., 18/7/48; P.P.A., 4/6/50; W., on flrs. of *Lotus corniculatus*, 11/6/50 (W.J.S.); [Saltings, 20/6/51].
*O. marinus* (Paykull) D., 14/8/49!, 3/5/50; [Saltings, 20/6/51].
*Helophorus aquaticus* (Linnaeus) D., 25/7/48.
*H. brevipalpis* Bedel Boundary Dyke, 14/6/47; PH., 18/7/48; pond near Humber shore, 21, 22/7/48; M.H., 23/7/48.
*H. minutus* Fabricius P.M.M., 14/6/47; M.M., sweeping, 17/6/47; D., 21/7/48!; PH., 20/7/48.
*H. flavipes* Fabricius Pond near Humber shore, 21, 22/7/48!!; P.P.A., 3/5/50, 5/6/50; D., 25/7/48, 3/5/50.
*H. dorsalis* (Marsham) D., 4/6/50, at roots of grass.
*Sphaeridium bipustulatum* Fabricius M.M., 22/7/48, cow dung; 4/6/50, horse dung.
*S. scarabaeoides* (Linnaeus) PH., 21/6/51; M.M., 4/6/50, 22/6/51.
*S. lunatum* Fabricius M.M., 22/7/48, 22/6/51, cow dung.
*Cercyon litoralis* (Gyllenhal) F, S.M., on seaweed!! 6, 7, and 8; Spurn Point on porpoise, 6/6/50.
*C. depressus* Stephens F., on seaweed and carcases!! 6, 7, and 8.
*C. ustulatus* (Preyssler) P.M.M., 10/6/50 (S.S.).
*C. atomarius* (Fabricius) M.M., 22/7/48, 22/6/51, cow dung; PH., 21/6/51.

*Cercyon haemorrhoidalis* (Fabricius) M.M., 22/7/48, cow dung; S., dead porpoise, 24/7/48; PH., 21/6/51.
*C. melanocephalus* (Linnaeus) M.M., 4/6/50, horse dung; PH., 21/6/51.
*C. lateralis* (Marsham) M.M., 4/6/50, horse dung; 22/6/51, cow dung; PH., 4/6/50, horse dung.
*C. pygmaeus* (Illiger) PH., 4/6/50, in horse dung; 21/6/51.
*C. unipunctatus* (Linnaeus) M.M., 9/6/50, in straw refuse.
*C. quisquilius* (Linnaeus) M.M., 22/7/48, cow dung.
*C. analis* (Paykull) PH., 9/6/50 (S.S.).
*Megasternum obscurum* (Marsham) M.R., rabbit droppings, 20/7/48; M.H., 23/7/48; M.M., 9/6/50, in straw refuse; D., 21/6/51; M.R., 23/6/51.
*Cryptopleurum minutum* (Fabricius) M.M., 4/6/50, horse dung!; W., 7/6/50; PH., 9/6/50.
*Hydrobius fuscipes* (Linnaeus) D., 22/7/48; PH., 23/7/48, in moss; P.M.M., 21/8/49; P.P.A., 3/5/50.
*Anacaena globulus* (Paykull) P.M.M., 10/6/50 (S.S.).
*A. limbata* (Fabricius) PH., 18, 23/7/48 (J.S.); *v. nitida* (Heer) PH., 18/7/48 (J.S.).
*Laccobius sinuatus* Motschulsky D., 21/8/49, 1 spn.; Spurn (no data), 7/6/50 (T.B.K.).
*Enochrus bicolor* (Fabricius) D., 6, 7, and 8!!; pond near Humber shore, 21/7/48; P.M.M., 14/6/47.

SILPHIDAE

Only two species of Burying-beetles have been taken so far. One (*T. rugosus*) is very abundant in carcases of all kinds. Not a single specimen belonging to the ubiquitous genus *Necrophorus* has been observed at Spurn. The breaking-up of carcases at Spurn appears to be mainly carried out by *Thanatophilus rugosus* and several species of Diptera. Several species of Histerids, probably feeding on the abundant fly larvae, swarm on carcases at Spurn.
*Thanatophilus rugosus* (Linnaeus) F., W., M.R., 6, 7, 8,!! on carcases.
*T. sinuatus* (Fabricus) W., 12/6/50.
*Nargus velox* (Spence) M.M., 4/6/50, in grass near runs of mice (J.S.).
*Choleva angustata* (Fabricius) M.M., 4/6/50, in grass near mouse runs; W., 6/6/50, on wing (J.S.).
*C. jeanneli* Britten W., 23/6/51.
*Catops fuscus* (Panzer) W., 8/6/50, in nest of *Bombus agrorum* and at grass roots (J.S.).
*C. nigricans* (Spence) W., 18/7/48, in vole's nest; 16/6/51; W., M.M., S.M., 6/50; M.H., 3/6/50; M.R., 24/6/51!
*C. fuliginosus* Erichson M.M., 4/6/50, in grass near mouse runs (J.S.).
*C. coracinus* Kellner W., 18/7/48, vole's nest (J.S.).
*C. morio* (Fabricius) W., 19/7/48, vole's nest and droppings; 10/6/50.
*C. chrysomeloides* (Panzer) M.R., 8/6/50, entrance to fox earth (J.S.).

LEIODIDAE

*Leiodes furva* (Erichson) Spurn Point, 19/8/49, 1 spn. (A.E. Winter).
*L. dubia* (Kugelann) W., 4, 7/6/50.
*Agathidium laevigatum* Erichson W., 4/6/50; sea cliffs near PH., 9/6/50.

SCYDMAENIDAE

*Stenichnus scutellaris* (Mueller) D., 6, 7!!, 8; F., 18/6/51.

ORTHOPERIDAE

*Corylophus sublaevipennis* du Val D., 4/6/50.
*Orthoperus brunnipes* (Gyllenhal) W., 10/6/50; F., 18/6/51 [L.B.D., 6/6/50].

PTILIIDAE

A single female specimen of a very distinct new species of *Ptilium* was taken in the Dyke. We have not discovered further specimens and the species has not yet been described. Ptiliids are plentiful in vegetable debris at Spurn but have not been much collected.
*Ptenidium fuscicorne* Erichson D., 21/7/48; PH., 21/6/51!! at damp grass roots.

PSELAPHIDAE

*Brachygluta helferi* (Schmidt-Goebel) D., 6, 7!!, a few 8; F., 5/6/50 [L.B.D., 6/6/50] [Saltings, 7/6/50].
*Reichenbachia juncorum* (Leach) M.M., 21/7/48.
*Tychus niger* (Paykull) M.M., 21/7/48; PH., 23/7/48.

HISTERIDAE

*Saprinus semistriatus* (Scriba) abundant in carcases, 6, 7, 8; M.M., 21/7/48, in dung.
*S. aeneus* (Fabricius) F., 4/6/50; W., 6/51.
*Pachylophus maritimus* (Stephens) F., 17/7/48, 7/6/50, in dead cod; Spurn Point, 6/6/50!! in porpoise.
*Hister unicolor* Linnaeus M.M., 21, 22/7/48, cow dung; W., 6/51.
*H. cadaverinus* Hoffmann W., 4/6/50, 6/51; PH., 17/6/51.
*H. purpurascens* Herbst W., 6/51; M.M., 6/51 (J.H.F.).
*H. bimaculatus* Linnaeus M.M., 9/6/50, cow dung (J.S.).
*H. duodecimstriatus* Schrank M.M., 4/6/50; horse dung (J.S.).

CANTHARIDAE

This family is very poorly represented in the area, both in species and individuals.
*Cantharis nigricans* (Mueller) S.M., 16/6/47.
*C. darwiniana* (Sharp) D., 19/6/47; W., 10/6/50 [Common at Welwick].
*C. fulvicollis* Fabricius D., 18, 21/7/48.
*C. thoracica* (Olivier) Spurn, 22/7/48 (T.B.K.).
*C. paludosa* Fallén D., 18/7/48.
*C. lateralis* Linnaeus PH., 21/6/51 [Saltings, 7/6/50].
*Rhagonycha fulva* (Scopoli) W., 20/7/48.
[*R. limbata* Thomson Saltings, 7/6/50].
*Malthodes pumilus* (Brébisson) M.M., 17/6/47.

CLERIDAE

*Necrobia violacea* (Linnaeus) F., 17/7/48, 4/6/50, in carcases; 5, 7/6/50, in dead cod.
*N. rufipes* (Degeer) F., 5/6/50, in dead cod (J.S.).

ELATERIDAE

This large family is very badly represented at Spurn, only four species having been noted within the area.
*Adelocera murina* (Linnaeus) S.M., 6, 7, 8! F., 6/47, under seaweed, 3/6/50; W., 4/6/50; M.R., 5/6/50.
*Agriotes sputator* (Linnaeus) W., 4/6/50 [L.B.D., 5/6/50].
*A. lineatus* (Linnaeus) D., 22/7/48; W., 12/6/50; M.M., 4/6/50, in dry horse dung [Saltings, 7/6/50].
*A. obscurus* (Linnaeus) S.M., 18/6/47; M.M., 3/6/50; W., 9, 10/6/50.

HELODIDAE

*Microcara testacea* (Linnaeus) PH., 21, 23/7/48.
*Cyphon variabilis* (Thunberg) PH., 9/6/50, 21/6/51; W., 24/6/51.
*C. paykulli* Guérin-Méneville M.M., 17/6/47.

HETEROCERIDAE

No specimens of this salt-marsh frequenting family have yet been found within the area but at least one species should occur there. A little north of Kilnsea village two species were discovered and two also occurred at Welwick.
[*Heterocerus marginatus* (Fabricius) Welwick, 20/6/47! Saltings, 7/6/50].
[*H. fenestratus* (Thunberg) Saltings, 7/6/50].
[*H. sericans* Kiesenwetter Welwick, 20/6/47].

DERMESTIDAE

*Dermestes maculatus* Degeer S., on porpoise, 20/7/48 (J.S.).

BYRRHIDAE

*Simplocaria semistriata* (Fabricius) S.M., 19/7/48, 6/50!!; W., 16/8/49, 6/50!! under stones; M.R., 5, 8/6/50.
*Byrrhus pilula* Linnaeus W., 20/7/48, 5/6/50.
*Syncalypta setigera* (Illiger) S.M., 19/7/48, at grass roots, 6/50! under stones.

NITIDULIDAE

*Brachypterus glaber* (Stephens) M.M., 23/7/48, in straw refuse, 20/6/51; W., 7/6/50.
[*B. urticae* (Fabricius) L.B.D., 6/6/50].
*Laria dulcamarae* Scopoli near S.M., 18/6/47; M.R., 3/6/50! on *Solanum dulcamara* L.
*Meligethes aeneus* (Fabricius) common throughout area, 6, 7, and 8, on flrs. of hawthorn, *Hypochaeris radicata* L., *Leontodon hispidus* L., *Crepis capillaris* (L.) Wallr., *Senecio jacobaeae* L., *Matricaria, Symphytum, Cardaria draba* (L.) Desv., and *Heracleum spondylium* L.

*Meligethes fulvipes* Brisout S.M., 18/6/47.
*M. erythropus* (Gyllenhal) M.R., flrs. of *Potentilla reptans* L., 20/7/48 (J.S.); near S.M., 11/6/50, on *Lotus corniculatus* L. (W.J.S.).
*Nitidula bipunctata* (Linnaeus) S., on porpoise, 24/7/48.
*Omosita discoidea* (Fabricius) F., 17/7/48.
*O. colon* (Linnaeus) S., on porpoise, 20/7/48; F., 7/6/50, dead herring gull, 8/6/50.
*Epuraea aestiva* (Linnaeus) W., 5, 7/6/50; M.M., 3. 4, 7/6/50, hawthorn flrs.; W., 11/6/50, 19/6/51, on flrs. *Symphytum officinale* L.
*E. melina* Sturm M.M., 6/6/50.
*E. florea* Erichson M.M., 17/6/47; W., 8/6/50, in nest of *Bombus agrorum* (F.) (J.S.); W., 11/6/50, on *Symphytum officinale* L. [L.B.D., 6/6/50].

CRYPTOPHAGIDAE

The sub-family *Atomariinae* is well represented at Spurn and several species of *Atomaria* are abundant in decaying vegetable debris.
*Micrambe villosa* (Heer) D., 17/8/49; W., 15/8/49, 11/6/50; PH., 18/7/48.
*Cryptophagus hirtulus* Kraatz M.M., 9/6/50, in straw refuse, (J.S.).
*C. umbratus* Erichson W., in vole droppings, 19/7/48, 1 spn. (J.S.).
*C. badius* Sturm Spurn, in grass tufts, 6/6/50 (J.S.).
*C. acutangulus* Gyllenhal D., 18/6/51.
*C. punctipennis* Brisout M.M., 9/6/50, in straw refuse (J.S.).
*C. setulosus* Sturm W., 8/6/50, 5 spns. in nest of *Bombus agrorum* (F.) (J.S.).
*Antherophagus pallens* (Fabricius) W., 19/6/51. A queen *Bombus distinguendus* Morawitz, was seen hanging by its hind claws from a flower spike of comfrey, vigorously trying to clean its proboscis with the front pair of legs. The bee was captured and the beetle *A. pallens*, was found to be firmly attached by its mandibles to the proboscis, near to the apex. Although kept in a box for some hours the bee was unable to remove the beetle which only relinquished its hold in the killing-bottle. This bees-nest beetle is often carried in this way as are other insects and mites by bees and other hosts. This well-known phenomenon is called phoresy (see Donisthorpe, 1920, The Phoresy of Antherophagus *Ent. Record*, **32**: 181-187; Scott, 1920, Notes on the biology of some inquilines and parasites in a nest of *Bombus derhamellus* Kirby *Trans. Ent. Soc. Lond.*, **1920:** 99-127).
*Atomaria mesomela* (Herbst) PH., 6/6/50 (S.S.).
*A. fuscata* (Schoenherr) D., 17/6/47.
*A. atra* (Herbst) M.M., 22/7/48, damp log (J.S.).
*A. nitidula* Heer M.R., 22/7/48, rabbit burrow (J.S.).
*A. atricapilla* Stephens M.H., 13/6/47!; M.M., 18/7/48!, 3, 4/6/50!; W., 10/6/50.
*A. fuscipes* (Gyllenhal) D., 18/7/48; M.M., 3/6/50.
*A. apicalis* Erichson M.M., 9/6/50, straw refuse (J.S.).
*A. ruficornis* (Marsham) W., 7/6/50; PH., 9/6/50; M.M., 9/6/50, straw refuse.
*A. pusilla* (Paykull) PH., 13/8/49 (W.D.H.).
*A. linearis* Stephens M.R., 22/7/48; W., 5/6/50; F., 5/6/50; [L.B.D., 18/6/51].
*Ootypus globulus* (Waltl) M.M., 9/6/50, in cow dung (J.S.).
*Ephistemus globulus* (Paykull) M.M., 9/6/50; PH. 6/6/50, 21/6/51.

PHALACRIDAE

*Phalacrus coruscus* (Panzer) M.M., M.H., W., PH., 6, 7, 8!
*Olibrus aeneus* (Fabricius) M.H., 6/47! on *Matricaria*.
*O. liquidus* Erichson W., 16/6/51.
*Stilbus testaceus* (Panzer) M.M., 20/6/51; M.H., 23/6/51.

LATHRIDIIDAE

*Lathridius lardarius* (Degeer) D., 17/8/49, 18/6/51; W., 7/6/50.
*L. nodifer* Westwood W., 19/6/47, sweeping, 20/7/48, in shed.
*Enicmus histrio* Joy D., 4/6/50; M.M., 3/6/50, 4/6/50, in grass near mouse runs [Saltings, 7/6/50].
*Cartodere ruficollis* (Marsham) PH., 8/6/50, in stable refuse.
*Corticaria crenulata* (Gyllenhal) D., 17/6/47, 21/7/48, 18/6/51; F., 20/7/48, 3/6/50 : S.M., 5/6/50, in tidal refuse [L.B.D., 6/6/50].
*C. impressa* (Olivier) M.M., 4/6/50, in grass near mouse runs (J.S.).
*C. elongata* (Gyllenhal) S.M., 18/6/47; W., 19/8/49.

*Corticarina gibbosa* (Herbst) M.R., 13/8/49, on flrs. of *Senecio*, 6/6/50 in rabbit burrows; W., 11/6/50, near S.M., 6/50, in hawthorn flrs. [L.B.D., 6/6/50; Saltings, 7/6/50].
*C. fuscula* (Gyllenhal) D., F., W., M.H., PH., 6, 7, 8!; M.R., 22/7/48, in rabbit burrow.
*Melanophthalma transversalis* (Gyllenhal) M.M., 18/7/48 (W.D.H.).

MYCETOPHAGIDAE

*Typhaea stercorea* (Linnaeus) M.M., 22/7/48, straw refuse (J.S.).

COLYDIIDAE

*Cerylon histeroides* (Fabricius) Spurn, 4/6/50 (T.B.K.).

ENDOMYCHIDAE

*Mycetaea hirta* (Marsham) W., 9/6/50, two spns. in decayed sycamore in cottage garden (S.S.); F., 17/6/51, in clay banks.

COCCINELLIDAE

With the exception of *Coccidula* and *Rhyzobius* both individuals and species of this family are very scarce at Spurn. Most ladybirds are predaceous on aphids which are by no means plentiful on the peninsula. The low aphid population also accounts for the small numbers of aphid parasites, *Aphidiidae* and *Charipinae* (see Hymenoptera report).
[*Subcoccinella 24-punctata* (Linnaeus) Welwick, 18/8/49!].
*Coccidula rufa* (Herbst) abundant at all times in marram grass areas, etc., throughout the peninsula.
*Rhyzobius litura* (Fabricius) abundant throughout the area; very variable in colour, sometimes nearly black.
*Scymnus frontalis* (Fabricius) S.M., 19/7/48.
*S. redtenbacheri* Mulsant W., M.M., F., PH., D., 6, 7!
*Adalia 10-punctata* (Linnaeus) 6, 7, 8 fairly common.
*A. bipunctata* (Linnaeus) W., 7/6/50.
*Coccinella 7-punctata* Linnaeus M.R., 6/6/50; S.M., 10/6/50; W., 19/8/49, a var. with median row of spots much reduced in size.
*C. 11-punctata* Linnaeus S.M., 19/7/48, 5/6/50, 16/6/51.
*Psyllobora 22-punctata* (Linnaeus) Spurn Point, 6/6/50.
*Propylea 14-punctata* (Linnaeus) W., 19/8/49; M.M., 3/6/50.

ANOBIIDAE

*Ernobius mollis* (Linnaeus) Cottage, 18/6/47, 1 spn.
*Anobium punctatum* (Degeer) W., 22/7/48, in wood shed; many dead spns. in sycamore in cottage garden, 6/50.

OEDEMERIDAE

*Nacerdes melanura* (Linnaeus) abundant in 6 and 7, scarce in 8; on wing, crawling on sand, on or near railway sleepers; larvae in sleepers and groynes.

PYTHIDAE

*Vincenzellus viridipennis* (Latreille) M.M., 22/7/48, straw refuse, 1 spn. (J.S.).

PYROCHROIDAE

*Pyrochroa serraticornis* (Scopoli) F., 6/50, emerging from old ash trunk which had been washed up; not seen in 6/51 although trunk was still there.

ANTHICIDAE

*Notoxus monoceros* (Linnaeus) abundant in 6 and 7, less common but still plentiful in 8, in marram areas both in M.H. and M.S.
*Anthicus floralis* (Linnaeus) W., 8/49! on *Matricaria* and *Senecio* flrs.; PH., 9/6/50; M.M., 9/6/50, in straw refuse.
*A. antherinus* (Linnaeus) M.H., 23/7/48, 1 spn. (J.S.).

MORDELLIDAE

*Anaspis maculata* Geoffroy W., 22/6/51.

LAGRIIDAE

*Lagria hirta* (Linnaeus) W., a few larvae in 6, adults abundant in 7, scarcer in 8; came to light in 8.

TENEBRIONIDAE

*Phylan gibbus* (Fabricius) M.H., M.S., W., S.M., few in 6, 7!!, 8!
*Phaleria cadaverina* (Fabricius) F., 7/48! in tidal refuse and carcases, 3/6/50.
*Crypticus quisquillius* (Linnaeus) M.H., M.S., S.M., F., W., 6!!, 7!, scarce in 8; M.R., in rabbit burrow, 7/48.
*Scaphidema metallicum* (Fabricius) W., 5/6/50; M.R., 6/51.
*Tribolium castaneum* (Herbst) F., 3, 5/6/50! under driftwood.
*Cylindronotus pallidus* (Curtis) S.M., 8/49.

SCARABAEIDAE

*Geotrupes stercorarius* (Linnaeus) PH., 11/6/50; Spurn Point, 5/6/50, on dead porpoise.
*Aphodius erraticus* (Linnaeus) M.M., 4/6/50, horse dung; PH. 22/6/51, horse dung.
*A. subterraneus* (Linnaeus) Marram, near railway lines, 1 dead spn., 13/8/49; PH., 8/6/50.
*A. fossor* (Linnaeus) F., 19/7/48; M.M., 22/7/48, cow dung, 9/6/50; PH., 6/51.
*A. rufipes* (Linnaeus) M.M., cow dung, 22/7/48, 4/6/50; PH., M.M., 6/51.
*A. sphacelatus* (Panzer) M.M., 4/6/50, horse dung.
*A. merdarius* (Fabricius) S.M., 16/6/47.
*A. fimetarius* (Linnaeus) M.M., 22/7/48, cow dung.
*A. aestivalis* Stephens M.M., 22/7/48, straw refuse (J.S.).
*A. scybalarius* (Fabricius) PH., 6/51; S.M., 19/6/51!; M.M., 22/6/51, cow dung.
*A. ater* (Degeer) M.M., 22/6/51, cow dung.
*A. sordidus* (Fabricius) M.M., 22/7/48, cow dung.
[*A. plagiatus* (Linnaeus) Saltings, 7/6/50, 20/6/51!].
*Aegialia arenaria* (Fabricius) M.H., M.S., 6!!, scarce 7, rare 8; F., under seaweed.
*Euchlora* (*Anomala*) *dubia v. aenea* (Degeer) M.H., larvae 6/47; M.S., 6!!, 7; S.M., 6, 7. Absent in 8.

CERAMBYCIDAE

No longhorn beetles were found, the area being entirely unsuitable because of the absence of trees. In June 1950 a dead specimen of *Clytus arietis* (Linnaeus) was found near the cottage.

CHRYSOMELIDAE

Considering the relative wealth of the Spurn flora this family has proved to be rather poorly represented in the area.

[*Macroplea mutica* (Fabricius) L.B.D., 2/5/50!!, a few 6/51. Only captured by vigorous use of water-net when beetles were disclosed clinging closely to water-plants].
*Lema melanopa* (Linnaeus) S.M., 19/7/48.
*Chrysolina staphylaea* (Linnaeus) F., 14/7/47, under seaweed; M.M., 6/6/50; W., 16/6/51.
*Gastrophysa polygoni* (Linnaeus) F., 6, 7 in large numbers, dead, in tidal refuse; M.M., 3/6/50 [L.B.D., 6/6/50].
*Phaedon cochleariae* (Fabricius) M.M., 17/6/47; W., 20/7/48.
[*P. regnianum* Tottenham has been reported from Welwick (*The Naturalist*, 1946: 159) and further spns. occurred on 18/8/49 on *Cochlearia anglica* L. The status of this form is doubtful].
*Timarcha goettingensis* (Linnaeus) S.M., 16/6/47; W., 16/6/51.
*Sermylassa halensis* (Linnaeus) M.H., W., S.M., larvae, 6, on *Galium*, adults 7, and 8!!
*Phyllotreta undulata* Kutschera S.M., W., D., M.M., 6, 7!!
*P. atra* (Fabricius) W., 20/7/48.
*Aphthona venustula* Kutschera PH., 15/8/49, 1 spn. (W.D.H.).
*A. euphorbiae* (Schrank) S.M., D., M.R., M.M., PH. [L.B.D., Saltings], a few in 6, abundant in 7 and 8, but never on the normal food-plant *Euphorbia* spp. A number of plants of a large *Euphorbia* were carefully examined but found to be entirely free from attack.
*Longitarsus ochroleucus* (Marsham) S.M., 18/6/47.
*L. jacobaeae* Waterhouse M.R., 13/8/49!! on *Senecio*; PH., 15/8/49.
*L. succineus* Foudras W., 20/7/48; PH., 15/8/49!
*L. melanocephalus* (Degeer) PH., 15/8/49.

(*To be continued*)

## BOOK REVIEWS

**British Mammals,** by **L. Harrison Matthews.** Pp. 409, with 16 coloured plates, 68 photographs and 92 figures. *New Naturalist Series*, No. 21. Collins, 25/-.

The aim of the author as outlined in the Preface is to gather together and present to the reader the results of much valuable research work carried out in various places during the past twenty-five years rather than to repeat what has already been described and is readily available. A reference to the bibliography, which includes 234 items, will indicate how widely the author has cast his net.

Such a book is, in fact, overdue, and in reading it one is surprised by the amount of new information made available even though workers in this important field are comparatively few. Dr. Harrison Matthews occupies, as Scientific Director of the Zoological Society of London, a unique position from which to study our British mammals and their near relations on the continent of Europe.

In the introductory chapter the author refers to the fact that only about fifty species of land mammals are found in Britain and that this number is increased to about eighty if the seals and whales, which have visited these shores, are included. He also explains that for half a century the study of Zoology has turned away from systematics and natural history to problems of genetics and that much new knowledge gained in the laboratory is now being applied to animals in the field with most beneficial results. He has also something to say regarding the ' splitters ' and the ' lumpers ' while himself steering a rational course somewhere in between.

The chapter on Structure and Function is clearly written and introduces the student to the mammalian structure and to the processes of reproduction. We then move on to the four species of shrew, the mole and the hedgehog, and the reader must be alert as the author skips from one to another, though he will learn much in the process; that, for instance, the life of a shrew is 14 to 16 months and that its bite is indeed poisonous.

The chapter on ' Bat Biology ' explains to the student the peculiar adaptation to the mammalian form necessary for the achievement of flight and gives a very clear description of the remarkable discoveries made by Griffin and Galambos who shewed that the bat had anticipated the discoveries of ' radar ' and was thus able to avoid obstacles in flight and perhaps also to find its prey without the aid of sight. Some reference might have been made to the recorded movements of ringed bats which have been made in the Cheddar caves and the Pennines.

The following chapter opens with a useful key to the identification of the British bats and proceeds to describe each species. Here distribution maps would have been useful to supplement the rather vague statements. For instance the Barbastelle bat, which is described as infrequent north of the Wash, is not at all uncommon in parts of Yorkshire.

Rabbits, hares and rodents next claim our attention and we learn that the habit of ' refection ' is practiced by the rabbit as well as the hare. This is not carried out, as in the ruminants, by returning the food to the mouth from the stomach but by passing practically all the food twice through the intestines. The surprising statement is also made that among rabbits at least 60 per cent. of all the litters conceived are never born, the young dying and being absorbed in the uterus.

The small rodents receive adequate attention and much will be learnt regarding vole plagues. It is also of interest to learn that the house mouse of St. Kilda failed to re-adapt itself to a feral life after the evacuation of the human population, presumably because all the territory had been previously occupied by *M. apodemus*.

Turning now to the beasts of prey one is surprised at the statement that the weasel in Britain never assumes the white coat in winter. In the family Mustelidae is found the phenomen known as ' delayed implantation ' where the fertilised egg remains dormant for a variable period in the early stage known as the ' blastocyst.' In this manner the apparent length of the period of gestation can be increased by several months. The stoat and probably the marten also possess this power which appears to be governed by psychological factors. It is stated that the Carnivores do not hibernate and this of course includes the badger. They are the only British mammals which educate their young and are also the only ones that regularly indulge in play—perhaps a direct result of their more highly developed brains.

We have but two resident species of seals and specimens of five other kinds have visited our shores. Their structural adaptation to an amphibious life are well described and it is of interest to learn that the naso-lachrymal duct, which normally carries away the fluid from the eye is not developed and that this accounts for the copious tears that flow from their eyes when on dry land.

As the seals and the whales are both able to dive to great depths and to remain submerged for long periods, two questions arise. How in the first place do these mammals escape that scourge of the human diver known as the ' bends ' when nitrogen is dissolved in the blood, and secondly, how do they store sufficient oxygen to carry them through? These questions are dealt with at some length and provide much interesting reading.

The British deer are remarkable for the fact that the stags shed their antlers after the ' rut ' and without unduly straining their constitutions contrive to replace them annually. The habit of chewing and eating the cast antlers may be an attempt to conserve the calcium and phosphorus for the new growth. It is stated that the only species of deer native to Britain is the ' Roe ' (*Capreolus capreolus*) and that in this species also ' delayed implantation ' is known to occur.

The whales (*Cetacea*) are shown to be much more completely adapted to an aquatic life than are the seals. It is stated that an 80 foot blue whale is able to sustain a speed of 20 knots for ten minutes and one of 14 to 15 knots for two hours, and that a whale of this size weighs at least 120 tons and would probably need something like 500 h.p. to drive it through the water at the higher speed. A very plentiful supply of suitable food is available in the sea and whales grow at a most surprising rate; thus a blue whale calf is about 25 foot long at birth and may attain sexual maturity at a length of 70 foot, in two years. The period of gestation is about 12 months and the calf weighs 12-15 tons at birth!

The last chapter is entitled ' The Origin of the British Mammal Fauna ' and we are informed that the mammal became dominant early in the tertiary—that they reached their peak in numbers and diversity of form in the late miocene and early pliocene, since then they have been declining so that the present mammalain fauna is only an impoverished remnant of that which once roamed the British Isles. In this chapter the effects of the four glacial periods on the mammalian life of Britain are considered and the peculiarities of their distribution in Ireland and the islands are used as evidence of the time of their severance from the mainland.

Perhaps the final task of the reviewer should be to state if in his opinion the author has lived up to his aspiration as expressed in the Preface. The answer is that Dr. Harrison Matthews has suceeded admirably in his task. The book contains a great deal of information brought together for the first time and the writing is lucid and restrained. The illustrations are excellent and every difficulty that might have been experienced in finding particular information, in a book that sometimes skips from one species to another and back again, is overcome by reference to the well-prepared index.

E.W.T.

**Fleas, Flukes and Cuckoos.** A study of bird parasites by **Miriam Rothschild** and **Theresa Clay.** Pp. xiv + 304 with 40 plates of monochrome photographs, 4 maps and 22 drawings. *New Naturalist* Special Volume. Collins, 1952, 21/-.

The recent spate of books on birds must surely have satiated even the most ardent and indiscriminate ornithologist. Birds are perhaps the most intensively studied animals in the world, yet until now a fundamental aspect of their lives and ecology has been largely overlooked. In this masterly volume not only have the authors gone far to remedy a major omission in ornithological literature, but they have provided one of the most fascinating accounts to be found in a series which has already set a new standard in natural history writing. Throughout the book the evolutionary aspect has been stressed, and the general discussion of phoresy, commensalism, symbiosis and parasitism which comprises the first part of the volume concludes with the interesting suggestion that whereas in immature stages parasitism is a successful and progressive step, in adult animals it leads to dependence and loss of evolutionary potential. The second part of the book is devoted to feather-lice and bird fleas, two contrasting types of parasitic insect which clearly illustrate the intimate relationship that exists between host and parasite. Both shed light on the phylogeny and past geographical history of birds. The authors, who are among the world's greatest authorities on the two groups, present the important evidence for classifying flamingoes with the geese and ducks, and not with the storks and herons where they are usually placed: and they demonstrate a hitherto unexpected relationship between the ostrich and the rheas of South America. In the third part a survey is given of various other groups of parasites of the birds of Great Britain.

Throughout each part the themes of parallel evolution and convergence, of adaptation, host specificity and of discontinuous distribution are interwoven with fascinating comparisons, suggestions, implications and problems, and enlivened with classical quotations. For example, few fleas are found on the bodies of birds and it is assumed that they spend the greater part of their time hiding in the nest. The fleas of nocturnal mammals such as bats are eyeless, yet all bird fleas (even those of species which nest in burrows, such as martins and shearwaters) have retained their eyesight. Why does the hen flea bite over a hundred different species of bird whilst the crow flea is host specific ? Did martins acquire their bugs from man in the days when both shared the same cave-dwellings ? Digenetic trematodes are highly host specific; why have none remained parasitic on molluscs in the sexual phase ? To what extent do birds regard their nidicoles as food, if at all ? Why do cuckoos have an inherited liking for hairy caterpillars which other birds avoid, even though so many hairs become embedded in their gizzards that these appear to be lined with dense fur ? Does imprinting account for the presence of strains or ' gentes ' of cuckoo which parasitise only one species ?

Nestling birds must suffer torture from the grim hordes of hungry parasites which inhabit their nests, and bird-lovers who preserve these habitations from one year to another unwittingly preserve the hibernating louse-flies, fleas, mites and bugs which are responsible for pain, misery, disease and even death to the nestlings of the following spring.

Anthropomorphisms are introduced in a restrained and charming manner that delights the ear. Thus we read that numbers of temporary insect parasites are only parasitic in the female sex—' the males feeding romantically on dew and nectar '; that ducks eat leeches with ' extreme relish,' and that the larvae of tapeworms and flukes ' enjoy a few hours of careless freedom in the water and their eggs are washed about the world in the ebb and flow of urine and faeces.' Redshank are ' very fond of small fish ' and mosquitos ' very fussy ' about the conditions in which they will mate.

The book is remarkably free from slips and typographical errors although ' geotropism ' (p. 78) should read ' geotaxis ' and *Gasterosteus aculeatus* (p. 195) is not the ' miller's thumb.' Since its publication a number of cases of parasitism by *Ixodes passericola* and *I. frontalis* have been recorded from birds in Britain, and it has been shown that specimens of the latter have been erroneously assigned to a North American species, *I. brunneus*. A minor criticism regarding the absence of an index to the text figures applies also to some other books in the *New Naturalist* Series. It would be helpful, too, if the page numbers of plates, maps and text figures were given whenever these are referred to in the text, for they are worth consulting. A. L. E. Barron's microphotographs are particularly outstanding, and A. Smith's drawings exceptionally clear and artistic. This is one of the most enjoyable and interesting books I have read.

J. L. Cloudsley-Thompson.

**King Soloman's Ring:** New Light on Animal Ways, by **Konrad Z. Lorenz.** Illustrated by the author and with a Foreword by Julian Huxley. Pp. xxii + 202. Methuen & Co., 1952, 15/-.

Amongst the continual stream of books on natural history there appears, from time to time, one of quite exceptional interest and merit. There is no doubt at all that *King Soloman's Ring* is one of these infrequent and outstanding books. It towers high above the general run of books about bird and animal watching.

Konrad Lorenz is a distinguished naturalist. His life has been largely devoted to a study of animal behaviour, to an understanding of certain aspects of which he has, as Dr. Julian Huxley says in his Foreword, contributed more than any other man. For such study complete freedom for bird and beast is essential. He has, therefore, contrived to live on terms of mutual trust and friendship with a wide variety of creatures, including mongooses, lemurs, monkeys, ravens, jackdaws, cockatoos, greylag geese and mallards. Where others might rush to close a window to prevent the escape of a captive bird or animal, he was more likely to do so to prevent them from getting in at inconvenient times. So, at a time when several potentially dangerous animals had the run of the house and garden, it was his infant son who had to be put in a cage !

Most of the experiences and observations recorded in this book relate to fishes, water shrews and birds. The facts he recounts are always interesting, often

amusing, and never commonplace. Some are new and of fundamental importance to a proper understanding of animal behaviour. His long chapter on jackdaws is surely one of the most illuminating and brilliantly written accounts of animal behaviour in natural history literature. But however faithful observations of animal reactions may be, interpretation is a more difficult and precarious task for which a combination of scientific knowledge and psychological insight are required in order to avoid the reefs and shoals of anthropomorphic and mechanomorphic explanations. It is the skilful way in which Lorenz handles his facts even more than the engaging way in which he recounts them, that will appeal to well-informed and critical readers.

Every naturalist should read this delightful book, for Konrad Lorenz writes with great charm and distinction as well as understanding. It will more than hold the attention of readers without previous knowledge of the matters discussed, and it will equally certainly justify its sub-title by providing, even for those with special interest in the subject, new light on animal ways.

W.A.S.

**The Concealed Coalfield of Yorkshire and Nottinghamshire.** Third Edition, by **W. Edwards.** Pp. 274. *Mem. Geol. Survey England and Wales.* H.M. Stationery Office, 1951, 22/6.

The importance of this region as the most important coal-producing area in Great Britain warrants careful and detailed geological study and in the volume under review, Mr. Edwards has produced a comprehensive account which will be of the utmost value to geologists and mining engineers. Although described as a third edition, it is completely re-written for the extensive exploration carried out in the Concealed Coalfield by colliery companies, by the National Coal Board and by the oil exploration companies in the last two decades has rendered the subject matter of the earlier editions unreliable.

The complete Coal Measure succession from the Kilburn or Better Bed Coal to the Red Measures at the top is described in detail and illustrated by some thirty isopachyte maps, mainly of the worked coal seams. The most significant palaeontological discovery is the recognition of some eleven ' marker ' horizons in the Productive Measures, nine of which contain marine fossils and two with the crustacean ' *Estheria.*' Plate III showing the range in time of the various species of non-marine lamellibranchs is especially valuable.

The speculations concerning the boundaries of the Concealed Coalfield which found a place in the earlier editions are absent but it is shown that at least in the east coal has been found beyond the limits formerly visualised and there is no evidence to show where the eastern boundary of the Coalfield lies. Structurally the area is dominated by shallow anticlines often with large flanking faults; many of the folds can be traced into the exposed coalfield while the important Spital-Askern fold belt is continuous with the Morley-Campsall disturbance which is so important in the West Yorkshire Coalfield.

The Permo-Trias covering rocks are described with special reference to those details of lithology and variation which are likely to be significant in exploration for the underlying Coal Measures. The memoir concludes with records of nearly a hundred shafts and boreholes in great detail and of 27 oil-exploration bores in summary form. Mr. Edwards is to be congratulated for producing what should be an invaluable work of reference for a long time.

H.C.V.

**Geology of the Appleby District,** by **H. C. Versey.** Pp. 40, with 4 plates and 7 text figures and maps. Whitehead & Son, Appleby. Paper covers, 3/6.

The issue of a third edition of this guide to the geology of the Appleby district—first published in 1941—is sufficient evidence of its continued popularity and of the measure of success which it has achieved in meeting demands for an account of the structure and geological history of the area. Descriptions of the series of rocks represented in the area, from Ordovician to Tertiary, are followed by short directions for a series of field excursions with instructions as to route and the principle features of geological interest to be observed.

**The Living Tide,** by **Dr. N. J. Berrill.** Pp. 255, with 21 photographs. Victor Gollancz, 1952, 16/6.

This is a most absorbing book, written by a scientist for non-scientific people.

Dr. Berrill writes fervently about important problems of marine life without ever finding it necessary to become technical. His command of words is such that he can create in his reader brilliant mental images of American shores and coastal waters, scenes which one could visit only by the expenditure of much trouble and treasure. Not often is the armchair a satisfactory substitute for such a visit in the flesh.

Beginning amongst the Keys of Florida the author considers the problems of the turtle, the Palolo worms of the reefs, jellyfish, crabs and sponges. Travelling North, he next deals with Limulus, the breeding of the catfish, the farming of oysters. The squid, especially the young squid, is described and discussed in entertaining terms; ' it is almost all eyes, covered with tiny patches of colour . . . flashing large and small, a scintillating jewel of tiny life.' Finally, off the banks of Newfoundland he brings the herring, cod and dogfish to entertain us.

Few books instruct and educate whilst imparting so much pleasure, and no one interested in marine life, even no one interested in a seaside holiday should miss this opportunity for pleasure.

H.H.

**River Pollution,** The Buckland Lectures, by **H. D. Turing.** Pp. 93. Edward Arnold. 7/6.

A very useful little book which gives precisely the information which every citizen needs if he wishes to understand the problem of river pollution. The subjects dealt with include manner of pollution, recovery from pollution and possible methods of preventing pollution. The most ridiculous aspect of the whole question is well brought out, viz., the expenditure of vast sums in creating upland reservoirs and long pipe lines whilst leaving the rivers to become mere open sewers, when the river itself could so easily be reservoir and pipe line. The law in relation to river pollution is simply explained and amendments which would render it more effective are discussed. This book will well repay close study by all naturalists and anglers, as well as all whose living amenities would be greatly improved by clean rivers and streams.

H.H.

**The Technique of Fresh Water Fishing,** by **W. E. Davies.** Pp. 189, with 16 photographs and 20 line drawings. A. G. Elliott, *Right Way* Books, Glade House, Kingswood, Surrey. 6/-.

This is one of the best fishing books of its type that has come to hand for a long time. It is packed with information, is never dull and positively radiates the spirit of the angler's art. To be a successful angler is to be a master craftsman and obviously Mr. Davies is just that. His book contains a wealth of solid information as distinct from mere hints and tips. There are chapters on choosing rods and lines, on making nets and floats, on baits, on roach, perch and other coarse fish. Then there is a section on salmon and trout fishing, with an introduction to fly dressing which is most helpful and practical. In short, this book will enthral the novice and yet be of interest and value to the experienced fisherman. H.H.

**The Sounds We Hear,** by **F. R. Elwell.** *Life and Science Books.* Pp. 74, with numerous drawings. Methuen & Co. Ltd., 1952. Paper boards, 4/6; Cloth boards, 6/-.

The lively and imaginative manner of presentation of each subject is an outstanding feature of this series of books designed especially for modern school pupils of eleven and over. The good opinions which we have formed of previous volumes are fully sustained in this one. Mr. Elwell deals with the physics of sound in a refreshingly original manner, better calculated to arouse the pupils' interest, and above all the attitude of independent enquiry through the many simple experiments suggested, than the conventional text-book approach to the subject. The book is enlivened by the many simple but admirably executed and often amusing illustrations.

**Nestboxes,** by **Edwin Cohen and Bruce Campbell.** Pp. 32. 2/6. *B.T.O. Field Guide, No.* 3. 1952.

The whole question of the use of nesting boxes for birds in gardens, fields, copses, and private and Forestry Commission woodlands, is considered; including design (illustrated), construction, siting, density, etc. The provision of artificial nesting-sites for other than hole-breeding species is not forgotten. Time was when provision

for such was hardly considered to be a scientific matter, not so to-day; even a bibliography is provided. The considerable experience of Mr. N. Tracy could surely have contributed usefully to this symposium.

The Ministry of Agriculture and Fisheries Bulletin No. 76 ' Herbs,' has recently been re-issued (Pp. 46 with 4 plates, 1/9). With expansion of the title to **Culinary and Medicinal Herbs,** more information might have been expected, but the scope of the work is the same. One misses the valuable text-figures of varieties of mint. The plates too, are reduced from eight to four pages, half of which are worthless photographs of horseradish. The excellent drawings of John Hutchinson on the other pages make amends.

Choice of material for inclusion appears to be somewhat arbitrary, sorrel and tarragon appearing among the more important culinary herbs. In the Medicinal Herbs section, squirting cucumber and angelica are included though both have long been obsolete in medicine. The use of the word *inorganic* in connection with chemistry in the Foreword was at first reading accepted as a misprint for *organic* but its recurrance (p. 19, 1, 12) shows it to have the meaning ' not derived from living matter.' Such use cannot be too strongly condemned.

It would be interesting to know for whom the Bulletin is produced; too sketchy to be of real value to established growers, it cannot but discourage would-be aspirants to herb cultivation by its fairness in pointing out the high initial outlay required and the hazards involved. The re-issue is not of the standard of the original Bulletin —at nearly twice the price!

G.A.N.

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## CORRESPONDENCE

*The Editor,*
*' The Naturalist.'*

SIR,

Your reviewer (No. 841, p. 92) of my *Bird Recognition II,* warns readers that some wrong impressions may come to those who read its maps, compiled by W. B. Alexander ; and he quotes what he alleges to be examples.

It seems likely from the review that the reviewer has probably overlooked the quite clear statement in Vol. 1, p. 7, on ' How to read the maps,' which explains, amongst other things, that they are based on *published* records.

The reviewer also states that ' more matter is included extraneous than relevant to recognition ' in the book. He should read again my rather wide, but perfectly clear, definition of what I mean by recognition on Vol. 1, p. 5, and Vol. 2, p. 5. Surely I must be allowed my own definition of ' recognition ' !

Your reviewer comments ' at least one species noted in Yorkshire twice in 1952 is omitted.' So what ? It is made perfectly clear on Vol. 1, p. 5, and Vol. 2, p. 178, that birds recorded less than a hundred times in Britain do not get a full treatment in the book. And how he can expect me to have noticed 1952 Yorkshire records before they occurred I do not know !

Your reviewer might have read my *Bird Recognition* a little more carefully, I think, before criticising these alleged errors. He ends by mentioning the need for a book which *Bird Recognition* was never intended to be; this I should have said was irrelevant.

Authors who put many years of research and reading into a general book of this sort expect that reviewers might at least try to discover the book's aims, and the rules under which it is written, and direct their criticism to questions such as : What is it for ? Does it *do* what it is for ?—and so forth. Nothing is more frustrating than to be criticised for doing something one clearly set out to do, or not doing something one never intended to do. I wish Mr. Chislett had said what he thought of my book, in his review, instead of warning against imaginary pitfalls in his rather limited space.

Yours faithfully,
JAMES FISHER.

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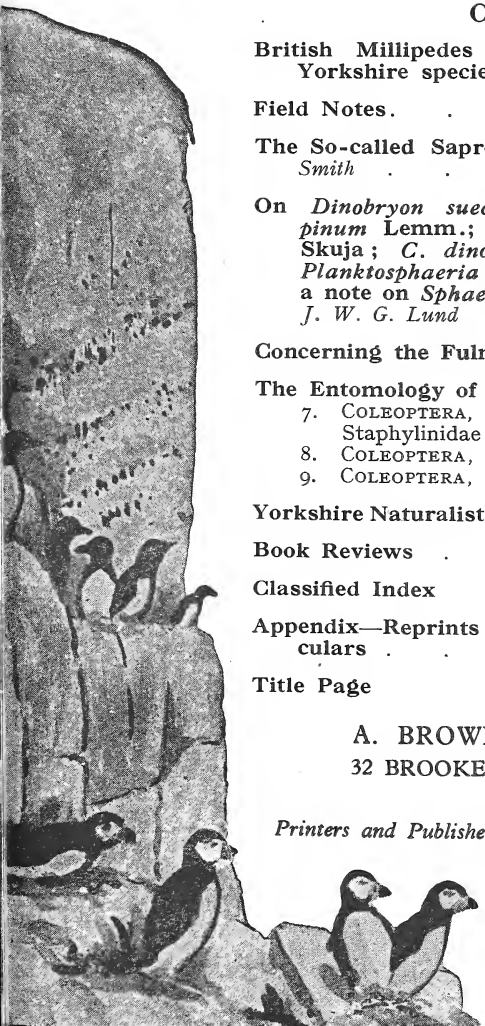

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# BRITISH MILLIPEDES WITH SPECIAL REFERENCE TO YORKSHIRE SPECIES

GORDON BLOWER,
*Department of Zoology, University of Manchester*

## 1. Introduction.

This paper is intended to summarise our knowledge of the Yorkshire millipede (Diplopod) fauna up to the present date. There are very few records for Yorkshire but the adjacent counties in the North have been well worked in the past by such people as Jackson, Bagnall and Brade-Birks, all of them well known for their work on this group of animals. In this paper the scanty past records are included with my own and are placed against the background of the whole British millipede fauna with notes concerning the distribution in the well-worked adjacent counties of species not yet recorded from Yorkshire. These records are preceeded by notes on diagnosis and a key to the British species designed primarily for non-specialist workers in the field.

## 2. The Animals and their Diagnostic Features

The Latin name, Diplopoda, refers to the fact that the body segments of these animals each bear two pairs of legs. These segments are themselves, in reality, double, being developed from two embryonic segments and only later adopting the superficial appearance of a single segment. The first three body segments are truly single, the first apodous the second and third each with a pair of legs. The first double segment (the fourth apparent segment) usually bears but a single pair of legs (the posterior pair). Thus the first four segments have three pairs of legs between them, the remainder, two pairs each excepting a few posterior segments which may be apodous. The term ' segment ' in the literature and in this paper refers to the apparent segment whether double or single.

As in all arthropods, the typical body segment consists essentially of four plates or sclerites, a dorsal tergite, a ventral sternite and lateral pleurites. In many millipedes (*e.g.* Iulids and Polydesmids) all the sclerites are joined together to form what is, in effect, a single cylindrical sclerite. Each segmental ' cylinder ' consists of an anterior, more narrow *prozonite*, usually smooth and a posterior, wider *metazonite* which is often grooved longitudinally or sometimes produced into lateral expansions (tergal keels). The prozonite telescopes into the metazonite when the animal is extended. When disturbed, millipedes may ' freeze ' motionless, coil up into a close spiral or sphere (*Glomeris*) or execute rapid extension and flexion of the body.

Opening laterally on most of the segments are the stink glands, the contents of which are sometimes apparent (where the general body colour is light) as two rows of dark spots. The stink, which is believed to be a quinonoid substance, is sometimes discharged on handling or fixation. In this latter case the discharged secretion may stain the whole animal and thus be misleading where colour is in any way diagnostic.

The head may or may not bear ocelli, sometimes of diagnostic value, and a pair of short antennae which vary little in form. Mouthparts consist of mandibles and a ventral plate similar to the labium of insects, the gnathochilarium, which is probably homologous with both first and second maxillary segments of insects. This is used in the classification of the larger groups.

The paired genital openings are on the third segment just behind (or on) the second pair of legs. In the female the orifice is surrounded by two sclerotised pieces, one forming the bursa, arranged like the two shells of a mussel with the hinge directed posteriorly and the second, the operculum, covering the gape of the two valves of the bursa, the whole ensemble being designated the vulva. These are of diagnostic value and can be dissected off with the second pair of legs entire. The vulvae of only a few British diplopoda have been figured and described and so it is to the male that reference has to be made in most cases for specific diagnosis.

The male openings may or may not be developed into paired (or single) penes. Most important however, are the accessory genitalia of the male. These consist of one or both of the appendages of the seventh segment (8th and 9th appendages) which are modified to form intromittent organs called gonopods (except *Glomeris*

q.v.). These organs, as yet, are the only criteria of accurate diagnosis and are quite easy to dissect off. In some species they are retracted within the cavity of the seventh segment.

Prior to copulation, the male, by flexing his anterior segments, ' charges ' his gonopods from the opening on the third segment. In the Iulids and Blaniulids the anterior gonopods (peltogonopods) shield and protect the seminal fluid carried by the gonopods proper of the posterior pair. Copulation takes place mainly in the Spring months and it is at this time that collecting is most fruitful since most catches include a number of adult males which are necessary to the beginner for successful diagnosis. At this time it is also quite usual to find pairs in coitus. Even in captivity copulation takes place readily. The female in some cases constructs an elaborate nest for her eggs. This is best developed in the Polydesmidae. The newly-hatched millipede has three pairs of legs and then proceeds to add on double leg-bearing segments from behind, moult by moult, until the adult stage is reached. The number of segments and/or legs may help diagnosis but in some species (Iulids) may vary within limits. Millipedes are mainly vegetable scavengers but will sometimes eat fresh growth. The subject of their feeding habits and economic importance generally is discussed by Brade-Birks (1930).

## 3. Diagnosis

The key which follows is based entirely on the external characters of the *adult*. It is essentially a field key and operates with characters which may be seen with a decent hand lens. In several cases it will be noticed however, external characters alone do not permit of complete diagnosis. and indeed it cannot be too strongly emphasised that in no case can a diagnosis be definite until the gonopods of the male have been compared with reliable figures. Brade-Birks (1939) gives the sources of description and figures for all British species and it is to this work and the others to which it refers that resort must eventually be made.

It is regrettable that the available literature on the diagnosis and description of British forms is so scattered with so little of it published in English. More unfortunate however, is the paucity of adequate descriptions of the females. The author is hoping to publish, in the near future, an illustrated account of the various groups but in the meantime he will be glad to receive any material, preparations of gonopods, vulvae, etc., for diagnosis.

In compiling the present key I have made use of three keys to individual groups published by other workers. It incorporates keys to the Iulids and Blaniulids published by Brade-Birks (1930) and Turk (1947) respectively, with modifications and a key to the genus *Polydesmus* from Turk (1945). To these authors I am greatly indebted, especially to Dr. Turk who kindly supplied me with reprints of his papers. I have felt that a synthesis of all existing keys into one including those British species not previously dealt with is justified by present needs.

When using the key, external characters should be noted *in the field* on the living animal, particularly the colour and markings. Reference should also be made to the note contained in the section on individual species for such confirmatory detail as they may supply. An attempt to explain differences of vulval structure without diagrams is only attempted in one instance and this in the case of two millipedes likely to be encountered quite often and which are likely to be confused.

## 4. Outline Key to Adult Diplopoda so far Recorded from Britain

*Polyzonium germanicum* (see page 157) is not included in this key.

| | | | |
|---|---|---|---|
| 1 | (2) | With 13 prs. of legs. Body covered with curiously shaped bristles. | *Polyxenus lagurus* (Linné) p. 150. |
| 2 | (1) | More than 13 prs. of legs. | 3. |
| 3 | (4) | Body short and broad, rolling up into a ball, 17 prs. of legs. | *Glomeris marginata* (Villers). *G. marginata* var. *perplexa* Latzel, p. 150. |
| 4 | (3) | Body not as above, elongate, with more than 17 prs. of legs. | 5. |

| | | | |
|---|---|---|---|
| 5 | (46) | Body cylindrical or sub-cylindrical in section without any trace of lateral expansions on the terga. Body segments either 28 or more than 30 (never 30). | 6. |
| 6 | (7) | Body slightly compressed laterally, small pale forms less than 10 mm., with 28 body segments. | *Microchordeuma* (*Chordeumella*) *scutellare* var. *brölemanni* (Brade-Birks) var. *bagnalli* (Brade-Birks), p. 152. |
| 7 | (6) | Body circular in section with more than 30 body segments (Opisthospermophora). | 8. |
| 8 | (9) | Body with a diameter over 1 mm., with an irregular patch of many ocelli (Iulidae.) | 10. |
| 9 | (8) | Body with a diameter of usually much less than 1 mm. (no stouter than a thick steel pin). Either without ocelli, with one or two distinct *rows* of ocelli, or, if with ocelli in an irregular black patch (*Isobates*) less than 0·5 mm. in diameter. Legs equal in length to the diameter of the body, much more apparent than in the Iulids. (Blaniulidae). | 32. |
| 10 | (27) | Last segment with a caudal projection. | 11. |
| 11 | (16) | With a clubbed caudal projection. | 12. |
| 12 | (13) | Adult black, large, up to 48 mm. | *Cylindroiulus londinensis* (Leach), p. 156. |
| 13 | (12) | Adult not black, light brown in colour with contents of stink glands quite apparent. | 14. |
| 14 | (15) | Adult smaller, 1·2-2·1 mm. broad, 13-28 mm. long. | *C. punctatus* (Leach), p. 156. |
| 15 | (14) | Adult larger, 1·5-3·3 mm. broad, 20-40 mm. long. | *C. luridus* (C. L. Koch), p. 157. |
| 16 | (11) | Tail not clubbed, weakly developed and rounded or strongly developed and pointed. | 17. |
| 17 | (18) | Caudal projection feeble, rounded, adult black. | *C. londinensis* var. *finitimus* Ribaut., p. 156. |
| 18 | (17) | Caudal projection pointed and strongly developed. | 19. |
| 19 | (22) | Adult black or brown-black, contents of stink glands not apparent, without longitudinal bands of a lighter colour. | 20. |
| 20 | (21) | With transverse striae (fine chasings) on the prozonites. | *Tachypodoiulus niger* (Leach), p. 155. |
| 21 | (20) | With quite smooth prozonites. | *Iulus* (*Micropodoiulus*) *scandinavius* (Latzel), p. 154. *Ophyiulus pilosus* (Newport), p. 155. |
| 22 | (19) | Adult not black or brown-black, either lighter in colour with contents of stink glands quite apparent or with a longitudinal band or bands of a lighter colour. | 23. |
| 23 | (24) | Adult uniformly brown with contents of stink glands quite apparent. | *Cylindroiulus* (*Leucoiulus*) *nitidus* (Verhoeff), p. 157. |

| | | | |
|---|---|---|---|
| 24 | (23) | Adult darker with a longitudinal band or bands of lighter colour. | 25. |
| 25 | (26) | Adult with two dorso-lateral orange bands. | *Schizophyllum sabulosum* (Linné), p. 155. |
| 26 | (25) | Adult with one dorso-median stripe. | *Leptoiulus* (*Acrovelatus*) *belgicus* (Latzel), p. 154. |
| 27 | (10) | Last segment without a caudal projection. | 28. |
| 28 | (29) | Larger form, body quite black, contents of stink glands not apparent. | *Cylindroiulus londinensis* var. *caeruleocinctus* (Wood), p. 156. |
| 29 | (28) | Smaller forms lighter in colour with contents of stink glands quite ap parent or with dorso-lateral bands of a lighter colour. | 30. |
| 30 | (31) | Without dorso-lateral bands of a lighter colour. | *C. britannicus* (Verhoeff), p. 156.<br>*C. oweni* (Bollman) p. 156.<br>*C. latistriatus* (Curtis).<br>*C. parisiorum* (Brölemann et Verhoeff), p. 155. |
| 31 | (30) | With two dorso-lateral bands (like a small *Schizophyllum sabulosum*) | *Brachyiulus* (*Microbrachyiulus*) *pusillus* (Leach) p. 155. |
| 32 | (33) | With ocelli. | 34. |
| 33 | (32) | Without ocelli. | 42. |
| 34 | (37) | Ocelli 12-30 in an irregular black patch. | 35. |
| 35 | (36) | Terminal claw of leg roughly equal to half the length of the tarsus. Length of animal 6-10 mm. | *Isobates varicornis* (C. L. Koch), p. 153. |
| 36 | (35) | Terminal claw roughly equal in length to that of the tarsus. Length of animal 9-20 mm. | *I.* (*Thalassisobates*) *littoralis* Silvestri, p. 153. |
| 37 | (34) | Ocelli arranged in a single row or in two rows converging posteriorly. | 38. |
| 38 | (41) | Ocelli 6-8 in a single row. | 39. |
| 39 | (40) | Dorsal bristles of body long, greater than half the width of the tergite. | *Choneiulus palmatus* (Němec), p. 153. |
| 40 | (39) | Dorsal bristles short, less than half the width of the tergite. | *Nopoiulus minutus* (Brandt), p. 154. |
| 41 | (38) | Ocelli in two rows converging together posteriorly. | *Proteroiulus fuscus* (Am Stein), p. 154. |
| 42 | (43) | 0·4-0·7 mm. broad, 9-18 mm. long. | 44. |
| 43 | (42) | 0·30-0·4 mm. broad, 6-11 mm. long. | *Boreoiulus tenuis* (Bigler), p. 154. |
| 44 | (45) | Contents of stink glands blood red and very apparent. | *Blaniulus guttulatus* (Bosc.), p. 153. |
| 45 | (44) | Contents of stink glands more orange and not nearly so apparent. | *Archiboreoiulus pallidus* (S.G. Brade-Birks), p. 153. |
| 46 | (5) | Flat or square-backed millipedes with lateral projections from the terga (tergal keels) ; with either 19, 20 or 30 segments. | 47. |
| 47 | (54) | With 30 segments. | 48. |
| 48 | (49) | Larger forms (above 10 mm.) darker in colour and with many ocelli. (Craspedosomidae.) | 52. |
| 49 | (48) | Smaller forms (less than 10 mm.) pallid and with few (3-6) ocelli. (Brachychaeteumidae.) | 50. |
| 50 | (51) | With three weakly pigmented ocelli sometimes little apparent. | *Brachychaeteuma bagnalli* (Verhoeff), p. 152.<br>*B. bradeae* (Brölemann et Brade-Birks), p. 152.<br>*B. quartum* Brade-Birks, p. 152. |

| | | | |
|---|---|---|---|
| 51 | (50) | With 4-6 more heavily pigmented ocelli. | *B. melanops* Brade-Birks, p. 152. |
| 52 | (53) | Brown-light brown with well-developed tergal keels giving a Polydesmid-like appearance. | *Polymicrodon polydesmoides* (Leach), p. 153. |
| 53 | (52) | Darker and more richly coloured with tergal keels not so well developed and less Polydesmid-like. | *Craspedosoma rawlinsi* var. *rhenanum* (Verhoeff).<br>*C. rawlinsi* var. *bagnalli* (Verhoeff).<br>*C. rawlinsi* var. *balticum* (Verhoeff), p. 152. |
| 54 | (47) | With 19 or 20 body segments. (Proterospermophora.) | 55. |
| 55 | (68) | With toothed lateral margin to tergal keel (Polydesmidae+*M. palicola*). | 56. |
| 56 | (59) | With 19 segments, small pallid forms. | 57. |
| 57 | (58) | 3·5-4·0 mm. long, very small. | *Macrosternodesmus palicola* Brölemann, p. 151. |
| 58 | (57) | Larger, 8-10 mm. long. | *Brachydesmus superus* Latzel, p. 151. |
| 59 | (56) | With 20 segments, larger forms. (Polydesmidae except *Brachydesmus*) | 60. |
| 60 | (61) | Lateral edge of ninth tergite with numerous small, well-marked tubercular teeth, 10-16 mm. long. | *Polydesmus denticulatus* C. L. Koch, p. 151. |
| 61 | (60) | Lateral margin of ninth tergite with not more than 5 teeth, generally pointed. | 62. |
| 62 | (63) | Smaller, usually less than 13 mm. long, first tergite kidney-shaped. | *Polydesmus coriaceus* Porath, p. 151. |
| 63 | (62) | Usually larger than 14 mm., first tergite elliptical or rectangular. | 64. |
| 64 | (65) | Sculpturing of surface of tergites not so deep, 14-17 mm. long. | *P. testaceus* C. L. Koch, p. 151. |
| 65 | (64) | Sculpturing of surface of tergites deeper and well marked, usually longer than 17 mm. | 66. |
| 66 | (67) | 1·7-3·0 mm. broad. | *P. gallicus* (Latzel), p. 151. |
| 67 | (66) | 2·8-5·0 mm. broad | *P. angustus* (Latzel), p. 151. |
| 68 | (55) | Lateral edge of tergal keel quite smooth. (Strongylosomidae except *M. palicola* and Eumastigonodesmidae. | 69. |
| 69 | (70) | With 20 segments. | 71. |
| 70 | (69) | With 19 segments. | *Eumastigonodesmus bonci* (Brölemann), p. 151. |
| 71 | (72) | About 5 mm. long. | *Ophiodesmus albonanus* (Latzel), p. 152. |
| 72 | (71) | More than 10 mm. long. | *Paradesmus gracilis* (C. L. Koch), p. 152.<br>*P. coarctus* (Saussure), p. 152.<br>*Strongylosoma italicum* Latzel, p. 152. |

## 5. Detailed Records and Check List of British Species

The following is a complete list of British species recorded to date. The list is taken from Brade-Birks (1939) but one or two later additions (and possible subtractions) are included.

The specific names of the species collected in Yorkshire by myself or other workers are followed by ecological notes of possible interest, where available, and detailed

records under their appropriate Watsonian Vice-County number. Authorities and sources of records, other than my own are quoted after the records. Material kindly collected for me by Dr. Butler and Miss Sewell of this Department is included and the initials P.M.B. and M.T.S. respectively, follow these records. Doubtful earlier records are placed in brackets.

Species not, to my knowledge, recorded from the county have their specific names printed in parentheses and are followed by brief notes concerning their known habits and distribution elsewhere. A measure of the likelihood of a particular animal, not yet recorded, occurring in Yorkshire is thus given. It will be noticed that many of the common species, not to mention the rarities, have still to be recorded from most of the five vice-counties. These gaps in the records will no doubt be filled as naturalists in the area become interested in these animals.

CLASS DIPLOPODA

SUB-CLASS PSELAPHOGNATHA

FAMILY POLYXENIDAE

*Polyxenus lagurus* (Linné)

The ' Bristly Millipede,' the only British member of the sub-class.

V.C. 61. Brantingham Dale, in debris beneath Larch trees 4/16. First County record (Stainforth, 1916).

SUB-CLASS CHILOGNATHA

ORDER ONISCOMORPHA

FAMILY GLOMERIDAE

*Glomeris marginata* (Villers)
*G. marginata* var. *perplexa* (Latzel)

This is the common pill millipede which rolls up into a ball on being disturbed. Very similar superficially to the woodlouse *Armadillidium* which is often found in similar habitats. Unlike the rest of the millipedes this species (and its congeners) has the hindermost pair of legs in the male modified as gonopods.

The type is usually of a uniform black colour. The variety is described as a smaller animal, brown in colour with yellow markings. The status of the type and variety is not very clear however, since some large forms are quite brown and the colour and markings of the so-called type are very variable. The type, variety and intermediate forms are often found together as indicated in the following records by the letters T, V and I respectively. Common in woodlands and also in hedge banks often in quite dry habitats.

V.C. 62. Rievaulx 4/8/50 1T ; 10/8/50, 2♀I ; Salmon's Wood, Sproxton, 10/8/50, 1V, 2I. Thornton-le-Dale, 9/50, several T (P.M.B.). Easingwold, hedge bank, 7/4/51, 1I. Farndale, under stones, 7/4/51, 1♀T, 1♀V, 1♂V (M.T.S.). Easingwold, 8/4/51, 1♀T. Crayke, woodland, 8/4/51, 2T, 1V. Duncombe Park, woodland, 9/4/51, many, all forms, both sexes. Rievaulx, woodland, 9/4/51, several, all forms.

V.C. 63. (Sheffield district, as *G. limbata*? rare in mouldering oak leaves (Evans, 1910)).

V.C. 64. Bolton Abbey (Thompson, 1921).

V.C. 65. By River Ure, near Wensley, 31/7/50, 1V, 2I.

ORDER PROTEROSPERMOPHORA

Flat-backed millipedes with 19 or 20 body segments. Only the eighth appendages are modified as gonopods, the ninth are ambulatory. They differ from the other flat-backed forms (Brachychaeteumidae) in having their sternites fused with the pleura and terga to form a complete cylindrical sclerite (*i.e.* the sterna are not displaceable with a dissecting needle). Dorso-lateral expansions (tergal keels) from the metazonites give the appearance of a flat back. The edges of the keels may be smooth or toothed and the presence or absence of these, and their form where present are of diagnostic value. There are three families the first of which includes the larger British forms.

Family Polydesmidae

*Brachydesmus superus* Latzel

Most records of this animal are referred to the sub-species *mosellanus* Verhoeff. Turk (1947) however, discusses the validity of this form and I am following this author's procedure in referring all my specimens to Latzel's type.

V.C. 61. Spurn, marshy ground, 6/50, 4♀ (P.M.B.).
V.C. 62. Wildon Grange, pasture land, under stone, 8/4/51, 1♀.
V.C. 63. Sheffield district, common (Evans, 1910).

*Polydesmus angustus* Latzel

The commonest species of the genus in Britain (often refered to in older records as *P. complanatus* which is not a British form and is not a synonym). It is the largest species, 18-25 mm.

V.C. 62. Salmon's wood, Sproxton, 10/8/50, several. Thornton-le-Dale, 9/50, 1♀ (P.M.B.). Farndale, 7/4/51, 1♂ (M.T.S.). Hutton-le-Hole, 7/4/51, 1♂ (M.T.S.). Thornton Hill, 7/4/51, 1♀. Easingwold, North Moors, 7/4/51, 2♀. Wildon Grange, pasture land, 8/4/51, 1♀. Duncombe Park, woodland, 9/4/51, 1♂, 1♀, cornfield, under stones, 1♂, 1♀.
V.C. 63. (Sheffield district—Evans (1910) records this animal as conspicuously rare in mouldering oak leaves—see note under *Polymicrodon polydesmoides*).
V.C. 64. Manor farm, Garforth (Thompson, 1921). Bolton Bridge, 31/7/50, 1♀.
V.C. 65. By River Ure, near Wensley, 31/7/50, 1♂.

(*P. edentulus* C. L. Koch)

There is only a single record of this species from Ireland, Schubart, quoted by Turk (1947) suggests that this animal might have been imported with alpine plants since its distribution makes it hardly likely that it is indigenous in these islands.

(*P. testaceus* C. L. Koch)

Only recorded from the south, being quite common locally in Kent (Rolfe, 1935); elsewhere it is not common. An active animal.

*P. coriaceus*, Porat.

Widely distributed but nowhere common.

V.C. 62. Ampleforth, under stone near pasture and woodland, 4/8/50, 1♂. Salmon's Wood, Sproxton, 10/8/50, 1♀. Thornton Hill, 7/4/51, 3♀.
V.C. 64. Ilkley (Jackson, 1916).

(*P. gallicus* Latzel)

Brade-Birks (1930) regards this animal as a Fen-lover. It is a rare animal in Britain not unlike *P. angustus* but markedly narrower. The most northerly record known to me is from Cheshire.

Turk (1947) adds the variety *tolosana* Brölemann tentatively to the British list, a single ♀ being found in a cave in Somerset.

(*P. denticulatus* C. L. Koch)

A rare animal recorded from the adjacent counties of Lancashire, Derbyshire and Durham.

The following members of the Proterospermophora are either small forms and pallid in colour or, if larger, are often found in hothouses, being introduced species and not truly indigenous.

Family Mastigonodesmidae

(*Eumastigonodesmus bonci* (Brölemann))

This species stands as British by virtue of a single ♀ from Gibside, Co. Durham with *M. palicola* (Bagnall, 1922).

Family Strongylosomidae

(*Macrosternodesmus palicola* Brölemann)

Probably the smallest British diplopod, the *Titanosoma jurassicum* of older records. It is most often found in gardens and is recorded from such localities in Northumberland, Durham, Cheshire, Lancashire and Westmorland. It has also been taken ' wild ' in Durham, Lancashire and Westmorland.

*Ophiodesmus albonanus* (Latzel)

Often found with the previous species (particularly in gardens) and rather like a stout edition of the previous species.

V.C. 65, Moulton, near Richmond (Bagnall, 1922).
Actually Bagnall writes ' Malton, Yorks. (Nr. Richmond) ; and I have presumed that ' Moulton ' was meant since the only Malton in Yorks. is far from Richmond.

The following three species are larger introduced forms and occur in hothouses Only the first is widely distributed and likely to occur in Yorkshire.

(*Paradesmus gracilis* (C. L. Koch))

This form is probably to be found in greenhouses all over the country. It has been recorded as a common form from greenhouses in Durham, Lancashire and Cheshire.

(*P. coarctus* (Saussure))
(*Strongylosoma italicum* Latzel)

Both of these species have only been recorded from the south.

Order Ascospermophora

The members of this order have 28 or 30 segments. The sternites are free from the dorsal and lateral elements of the segments. In this last feature they contrast with all other Chilognaths except *Glomeris* and its relatives.

The first two families of the order are regarded by Brade-Birks (1930) as garden and park forms. They are all small and pale forms. They are sometimes taken wild as indeed was the first record of the family Brachychaeteumidae to the country and my only specimen referable to this section of the order q.v. The order is dealt with by Brölemann (1935) who includes figures and keys to all forms.

Family Chordeumidae

With 28 segments and sub-cylindrical in cross section.

*Microchordeuma* (*Chordeumella*) *scutellare brölemanni* Brade-Birks
*M.* (*Chordeumella*) *scutellare bagnalli* Brade-Birks

The first sub-species (*brölemanni*) has been taken ' wild ' on one occasion (Lancashire) and a form intermediate in some respects between the two sub-species is recorded ' wild ' from Lancashire. The sub-species *bagnalli* was first described from a garden in Derbyshire but has not been recorded since its first description as far as my present knowledge goes. *Brölemanni* is common in certain gardens in Lancashire.

V.C. 62. Rievaulx, woodland, under stone, a single ♀ probably referable to this species. Males are required for sub-specific diagnosis. 9/4/51.

Family Brachychaeteumidae

With 30 segments and tergal keels like the *Polydesmidae*.

(*Brachychaeteuma bagnalli* Verhoeff)

This was the first member of this family to be described, from woodland in Durham.

(*B. bradeae* (Brölemann et Brade-Birks))

Recorded in the North only from Lancashire, on the surface of soil in gardens, under leaves and in rockeries.

(*B. melanops* Brade-Birks)

Recorded only from Dorsetshire in mixed deciduous and coniferous litter.

(*B. quartum* Brade-Birks)

This species was founded on a single female from Derbyshire. Brade-Birks (1920) has since reported that females from Norfolk found with males which were undoubted examples of *B. bradeae* were apparently identical with the described female of *B. quartum*. This doubt cast on the validity of *B. quartum* still remains as far as I know.

Family Craspedosomidae

The two British species of this family have 30 segments and are quite large animals the first being uncommon the second is, locally, very common.

*Craspedosoma rawlinsi* Leach var.

This is a rare form. It is rather richly coloured and is hardly likely to be confused with any other diplopod. It has lateral tergal expansions but not so

marked and ' Polydesmid-like ' as those of the next species. Three varieties described by Verhoeff are included in Brade-Birks list.
V.C. 63. Sheffield district, not common (Evans, 1910).
Also from Lancashire, Cheshire and Durham.

*Polymicrodon polydesmoides* Leach

In Yorkshire it is practically confined to the leafy floor of woodland, in deciduous litter and in the soil beneath, where the animal is very common. It is occasionally found elsewhere, under stones, etc., but never far from woodland. I have found quite active specimens under two feet of snow in frozen decicuous litter.

V.C. 62. Rievaulx, woodland, 4/8/50, 10/8/50, many, both sexes and immature forms. Ampleforth, under stones near wood, 4/8/50, 1♀. Thornton-le-Dale, 9/50, several (P.M.B.). Rievaulx, woodland, 1/1/51, 4♀. Rievaulx, 9/4/51, many—more pale immature specimens than in June. Duncombe park, woodland, 9/4/51, many.

V.C. 63. (Sheffield district, commonest millipede in district and occurs everywhere near dwellings, Evans, 1910).
This record is very curious in view of the usual habitat of this animal. From the fact that *P. angustus* is recorded from Sheffield as rare it seems possible that these two were confused.

Order Opisthospermophora

Cylindrical millipedes with more than 30 segments. With the sternites fused to the dorsal and lateral elements as in the Proterospermophora and with both eigth and ninth appendages modified as gonopods. If we exclude from consideration a single exotic species found at Kew, *Trigoniulus lumbricinus*, there are but two British families to be considered.

Family Blaniulidae

These are of small diameter and usually of a pale colour quite distinct from individuals of the next family, even when young, which are of a larger diameter. The posterior gonopods are of simple form as compared with the Iulids. The gonopods are not retracted into the body as in Iulidae. The arrangement if present, of ocelli help in field diagnosis.

(*Isobates* (*Thalassisobates*) *littoralis* Silvestri)
(*I. varicornis* C. L. Koch)

Both these species have been recorded from Lancashire and the latter from Durham. *I. littoralis* is found below high-water mark on the coast. Neither species is common in the North.

(*Choneiulus palmatus* (Němec.))

It is most often recorded from southern localities and is considered to be a greenhouse form in the North. It is recorded from Lancashire as such and no doubt will occur in Yorkshire in similar situations.

An immature ♀ referable to this or *N. minutus* was collected by Dr. Butler from Thornton-le-Dale, 9/50.

*Blaniulus guttulatus* (Bosc.)

This and the following two species are without ocelli. This species has a row of rich red spots along the sides of the body (the contents of the stink glands). On fixation the contents are often discharged and stain the whole animal. Normally the animal is quite white in general colour. This animal, the ' spotted snake millipede ' is a noted pest of agriculture.

V.C. 61. Spurn, under trees near cottage, 6/51, 2♀, 1 immature ♂ (P.M.B.).
V.C. 62. Ampleforth, near field, under stone, 10/8/50, 1♂. Helmsley, cornfield, under stone in clay earth, 9/4/51, 1♀.
V.C. 63. Sheffield, Rivelin Gardens (Evans, 1910).
(V.C. 64. Wheat, Manor Farm, Garforth (Thompson, 1931) as *B. pulchellus*).

*Archiboreoiulus pallidus* (Brade-Birks)

A very pallid form like *Blaniulus* but can be distinguished from this last by the fact that the contents of the stink glands are not nearly so striking in colour and indeed may be overlooked altogether in the field.

V.C. 62. Rievaulx, woodland, 4/8/50, 10/8/50, several, both sexes. Thornton-le-dale, 9/50, 1♀ (P.M.B.). Helmsley, cornfield, 9/4/51, 1♂ in clay soil beneath stone.
V.C. 64. Bolton Bridge, woodland, 31/7/50, 1♂, several ♀♀.

*Boreoiulus tenuis* (Bigler)

Often found together with the last species. The smallest Blaniulid.

V.C. 64. Leeds, both sexes, 6/10/17 (Bagnall, 1918). This might have come from V.C. 63, no locality in Leeds is given. Bolton Bridge, woodland, 31/7/50, several ♀♀ ♂♂.

*Proteroiulus fuscus* (Am Stein)

Darker in general body colour than the two previous species.

It is a common Blanuilid found beneath the bark of rotting logs, particularly pine stumps and often associated with *C. punctatus* q.v. Males of this species are very rare. I have but a single male in my collection from Lancashire.

V.C. 62. Gilamoor, 23/9/50, several ♀♀ in bark of tree stump (M.T.S.). Easingwold, 7/4/51, several ♀♀ beneath piece of wood in hedge bank. Crayke, woodland, 8/4/51, several ♀♀ under bark of fallen log.

(*Nopoiulus minutus* (Brandt.))

With ocelli arranged as in *Choneiulus*. Only distinguishable from this last in the form of the gonopods and in having shorter dorsal bristles (much less than half the width of the tergite). It is a rare British species. The nearest record to Yorkshire is from Gibside, Co. Durham.

Family Iulidae

Larger and thicker animals than the Blaniulids with more complex posterior gonopods. The presence or absence of a dorsal caudal projection from the last tergum and its form, together with the colour and general appearance help towards a grouping of the species of this family.

*Iulus* (*Micropodoiulus*) *scandinavius* (Latzel)

A large brown-black form with a pointed caudal process. The two animals this is likely to be confused with are *T. niger* and *O. pilosus*. *T. niger* is quite distinct. Males of *I. scandinavius* have a characteristic expansion from the coxae of the second pair of legs which are absent in *O. pilosus* which has sickle-shaped first legs. Furthermore, *O. pilosus* is usually black. Females of the two species are difficult to tell apart. Generally speaking, *O. pilosus* has a smaller breadth/length ratio than *I. scandinavius* particularly in the male (males of *O. pilosus* are nearly as thin as a Blaniulid). The vulvae of the female are quite distinct and can be separated with a little practice, those of *O. pilosus* being developed in length perpendicular to the body more so than those of *I. scandinavius* the latter being more globular and not so strongly sclerotised. The operculum in *O. pilosus* is strongly indentate distally and projects beyond the bursa. In *I. scandinavius* it is not so strongly indentate and does not project far beyond the bursa.

This form is very common in the litter and soil of the woodland floor. Like *Polymicrodon* it is found elsewhere but not often far from woods. It is certainly pre-eminently a woodland form in Yorkshire at least. Curiously enough, Brade-Birks (1930) does not include either *Polymicrodon* or this species in his list of woodland forms.

V.C. 62. Rievaulx, woodland, 4/8/50, 10/8/50, many, both sexes and immature forms. Salmon's wood, Sproxton, 10/8/50, many. Crayke, woodland, 7/4/51, several. Easingwold, North Moors, 7/4/51, 1♂ under stone. Rievaulx, woodland, 9/4/51, many. Duncombe Park, woodland, 9/4/51, several, both sexes.

(V.C. 63. '*I. terrestris*' recorded by Evans (1910) in Sheffield district as not common. This record may be referable to any of the three similar species discussed above.)

(V.C. 64. Bolton Abbey and Manor Farm, Garforth (Thompson, 1921) as *I. terrestris*. The synonomy of this form is obscure, see above notes. The true *terrestris* is not British.)

(*Leptoiulus* (*Acrovelatus*) *belgicus* (Latzel))

With a single dorsal median light stripe and a pointed caudal process. It is a

moderately large animal. As far as I am aware it has only been recorded from Devon and Cornwall.

*Ophyiulus pilosus* (Newport)

See the remarks under *I. scandinavius* concerning diagnosis.

Like *I. scandinavius* this is mainly a woodland form though not nearly so common

V.C. 62. Rievaulx, woodland, 4/8/50, 10/8/50, several ♀♀. Salmon's wood, Sproxton, 10/8/50, ♀♀. Rievaulx, woodland, 9/4/51, 4♂. Duncombe Park, woodland, 9/4/51, 2♂, 1♀. Easingwold, North Moors, 12/4/51, 1♂.

V.C. 65. Aysgarth, 31/7/50, 1♀.

*Brachyiulus* (*Microbrachyiulus*) *pusillus* (Leach)

A small form with two dorso-lateral light stripes and no caudal projection. This species is most often found on the coast but has been recorded inland (see note appended to notes on *T. niger*.).

V.C. 61. Spurn, 6/50, 2♀ (P.M.B.).

(V.C. 63. Sheffield district, not common (Evans, 1910).)

*Schizophyllum sabulosum* (Linné)

A large stout handsome species with two orange-yellow dorso-lateral stripes down the whole length of the body ; it cannot be mistaken for any other form. Its colouring resembles that of the much smaller *B. pusillus*. It is usually found on sandy soils particularly in coastal regions. My Yorkshire records however, are all from inland regions but in other counties I have found it quite common in coastal districts.

V.C. 62. Rievaulx, woodland, 10/8/50, 1♀. Ampleforth, 10/8/50, 2♀. Easingwold, North Moors, 1♀ under stone in sandy soil.

*Tachypodoiulus niger* (Leach)

This is probably the commonest and most widely spread Iulid being found in a host of different habitats. A synonomic trivial name *transversulcatus* describes its most characteristic feature—very fine transverse striae or chasings on the prozonites (usually quite smooth in other forms). Also of note are the long white legs which contrast strikingly with the jet black body. It is an active form (the generic name means literally, ' swift-footed Iulus.')

Although Brade-Birks (1930) includes this animal as a typical woodland form, it is not so common, in Yorkshire woodland, as *I. scandinavius*, which as has had been mentioned, is not included. In woodland, in contrast with the last named species, it is found on the *under surfaces* of stones, beneath the bark of logs and on the under surface of logs and not very often in the actual litter or in the soil. In agricultural regions it is also very common, but again, on the under surface of stones, etc. In this latter habitat it contrasts with *C. londinensis* var. *caeruleocinctus* q.v. which, like *I. scandinavius* in woods, is essentially a soil form. It is also classed by Silvestri amongst what he calls ' indifferent halophiles ' (in contrast to true halophiles like *I. littoralis*) being often found on the shore and generally well distributed in coastal districts.

(During March many immature forms, probably referable to this species are to be found co-existing with adults of both sexes and are characterised by longitudinal stripes rather similar to those of the adult *B. pusillus*. It seems possible to me that these immature forms may have been confused, at times, with the last-mentioned species. In France *B. pusillus* and *C. oweni* q.v. occur as garden forms. In England both of these seem to be typical coastal forms. It would be interesting to have confirmation of *inland* records of these animals in Britain.)

V.C. 62. Rievaulx, 4/8/50, 10/8/50. Thornton-le-Dale, 9/50 (P.M.B.). Crayke, 7/4/51. Easingwold, 7/4/51, 8/4/51, under stones, etc. Crayke, woodland, 8/4/51, several. Duncombe Park, woodland, under stones, 9/4/51. Helmsley, cornfield, common on under surfaces of stones, 9/4/51. Rievaulx, under stones, 9/4/51. Farndale, 7/4/51 (M.T.S.).

V.C. 61. Spurn, 6/50, 6/51, common in Marsh Meadow area (P.M.B.).

(*Cylindroiulus parisiorum* (Brölemann et Verhoeff))

A smaller form indistinguishable externally from *C. oweni* and *C. britannicus* q.v. There is only one record of this animal in Britain—from Worcestershire.

I have recently (7/51) had examples of this species from Wiltshire where they were kindly collected for me by Mr. Halliday, of Marlborough School.

*C. punctatus* (Leach)

A large light-brown Iulid with a very characteristic clubbed caudal process ; this, together with its colour and habitat, is quite diagnostic. It may be confused with *C. luridus* which is a much larger animal and has only been recorded from Ireland. (Note that *C. londinensis londinensis* has a clubbed caudal horn but is *black*.)

A common form beneath the bark of decaying logs and also within decaying wood which appears to constitute a large part of its diet. Naturally common in woodland, it also occurs wherever decaying pieces of wood of any description are found.

V.C. 62. Salmon's Wood, Sproxton, 10/8/50, 5♀. Rievaulx, woodland, 4/8/50, 10/8/50, 1♂, 2♀♀. Crayke, hedge bank in piece of wood, 7/4/51, 2♂, 1♀. Easingwold, 7/4/51, in wood in hedge banks. Crayke, woodland, 8/4/51, very common. Rievaulx, woodland, 9/4/51, common Duncombe Park, woodland, 9/4/51.

(V.C. 64. Manor Farm, Garforth—as *J. nemoralis*—perhaps referable to this species, Thompson, 1921).

(*Cylindroiulus londinensis* Leach)

(*C. londinensis* var. *finitimus* Ribaut.)

*C. londinensis* var. *caeruleocinctus* (Wood)

This species is a black Iulid, the type is the largest form up to 48 mm. the two varieties are somewhat smaller, about 35 mm. The type is almost twice the diameter of the varieties. The commonest variety, *caeruleocinctus*, is easily separated from other black Iulids by the absence of a caudal projection. The variety *finitimus* has a weakly projecting process and the type has a clubbed process ; all forms are thus readily distinguished from other black forms.

The typical form has been recorded from Lancashire (the record being the first since Leach's original description from the south). In Lancashire it was found together with the variety *caeruleocinctus*. The variety *finitimus* is recorded from Kent and Norfolk together with the type and other variety. The gonopods of all three forms are identical. Only the tailless variety *caeruleocinctus* is recorded from Yorkshire.

Brade-Birks (1930) has indicated the importance of this animal to agriculture. Although included as a typical woodland form it is not nearly so common in Yorkshire woodland as in and around arable land. It is essentially a soil form, the counterpart so to speak, in arable regions of *I. scandinavius* in woodland.

V.C. 62. Rievaulx, woodland, 10/8/50, 1♂. Duncombe park, under stones in litter adjacent to ploughed field, 9/4/51, 3♂, 3♀. Helmsley, cornfield, under stones in clay earth bordering field, 9/4/51, both sexes very numerous. Rievaulx, woodland, 9/4/51, 1♀, 1♂, under stones in litter, Farndale, 7/4/51, 1♂ (M.T.S.). Hutton-le-Hole, 7/4/51, 1♀ (M.T.S.).

*C. britannicus* (Verhoeff)

This and the following two species, as *C. parisiorum*, are small light brown forms without caudal projections. Only dissection of the male and examination of the gonopods can enable one to distinghish between these four tailless species. *C. britannicus* is the most well-known of the inland forms but even so is not very common.

Brade-Birks (1930) regards this animal as a garden form and greenhouse form in the North. The following record from open woodland is therefore noteworthy.

V.C. 62. Duncombe Park, woodland, under bark of felled tree, 9/4/51, 2♂, 1♀.

*C. oweni* (Bollman)

In Britain this species appears mainly in coastal regions where it is very common in sandy soils. Like *T. niger* it can be termed an indifferent halophile although it is much more characteristic of coastal regions than this latter. In France it occurs as a garden form inland.

V.C. 61. Spurn Head, 6/50, 2♂, 2♀ (P.M.B.). Spurn Head, 6/51, under debris near beach, Marsh meadow, many. Old dunes near warren and in cracks in clay cliff (P.M.B.).

(*C. latistriatus* (Curtis))

This animal, identical externally with the last-named species, has not been recorded in England since the forms on which Curtis based his original description (on externals only). Brade-Birks (1928) dissected one male from the British Museum (Curtis's material) and figured the gonopods. The figure compares with some of my preparations of *C. oweni* mounted in a particular way. I hope to examine the specimens myself in the near future to clear this matter up. The only specimens were collected at Nantwich in Cheshire where Curtis described the animal as being very common !

(*C. luridus* (C. L. Koch))

A large light brown form with a clubbed tail like *C. punctatus* but larger than this latter. Only recorded from one locality in Ireland.

(*C.* (*Leucoiulus*) *nitidus* (Verhoeff))

This is the only light coloured Iulid in Britain which has a pointed tail. It was first described from Staffordshire where it has a restricted local distribution. It has also been found in Lincolnshire and Cornwall. It is a rare animal.

Sub-Class Colobgnatha

(*Polyzonium germanicum* (Brandt.))

A bizarre form with semi-suctorial mouthparts recorded only from Kent in litter in a Juniper wood. It is convex dorsally and *concave* ventrally ; this will serve to identify this animal.

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In addition to the references quoted in the text the following will be found useful since it gives figures of the gonopods of most of the species found in Britain :


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## FIELD NOTES

***Claytonia alsinoides* Sims—Annual or Perennial ?**—The new *Flora of the British Isles* (Clapham, Tutin and Warburg, 1952) describes this plant as an annual. This status is also given in *Loudon's Encyclopedia of Plants* (1841) and probably copied by many later books. It is an annual only in the gardener's use of the term, which is often incorrect botanically; that is it will flower the same year the seeds are sown. The status A. or P. in Hayward's *Botanist's Pocket Book* (1909) is more correct if the letters are transposed. This species has had considerable success in the Halifax area, and in all its naturalised positions—stream sides, damp woodland, and even roadside gutters—it is a leafy perennial, that is, the aerial parts persist as well as the roots through the winter. In this state it is very resistant to frost, and by stream sides on shale exposures down which water trickles I have seen cushions of the plants encased in ice for long periods, and on thawing appear as fresh and green as after a shower of rain. It is essentially a moisture-loving plant, but if growing in dry positions, when it is a much smaller plant, it may die down after seeding.—H. WALSH.

**The Medicinal Leech (*Hirudo medicinalis* L.) in Yorkshire—another record.**—A reference to the collecting of the Medicinal Leech at Randy Mere, near Goathland was made in *The Naturalist*, 1949, p. 20.

I am indebted to Mr. D. C. Drummond of Bishopthorpe, York, who sent me a specimen of the Medicinal Leech which he had taken in a pond on Strensall Common, near York. In his letter he says: ' I first found it there in 1947. The enclosed specimen was taken in April last year (1951) and was found feeding on a toad. Toads spawn in the pond in large numbers in the spring and presumably this is the only time the leeches get a sizeable meal.' He kindly added the National Grid reference 651598 on sheet 97 of the O.S. map 97, one inch popular edition. This pond is about the centre of the Common, one mile S.E. of Strensall Station.

The leech measures 100 mm. in length and 15 mm. across at the widest part. This is an average size and the markings are very similar to those of a specimen taken in the New Forest in 1911.

It would be of interest to know if any pharmaceutical chemist of York remembers Medicinal Leeches being collected locally at the close of the nineteenth century. —H. WHITEHEAD.

**Further occurrence of *Luronium* [*Alisma*] *natans* (L.) Raf. at Slaithwaite.** —As reported in *The Naturalist*, 1950, p. 160, *Luronium* [*Alisma*] *natans* was discovered at Hill Top Reservoir, Slaithwaite, near Huddersfield, in July, 1950. In spite of fluctuations in water level the plant seems to be well established at the reservoir, and at the time of writing (July) a very fine display of flowers is to be seen; and this in spite of the fact that a month previously a rise in the water level completely inundated all the flowers then present. It is pleasing to be able to record a second station for this species, namely in the canal at Slaithwaite, where, at one point, two well-established clumps have been seen in flower, and scattered over a distance of about a quarter of a mile, a considerable number of smaller plantlets, which have not yet borne flowers, have been found. There can be little doubt that these new finds originate from the plants at Hill Top Reservoir, for the latter is used to supply water for maintaining the level of the canal.

A factor which has doubtless facilitated the establishment of the plants in the canal is the lowering of its water level (as reported in the annual report of the Freshwater Biology section of the Y.N.U. for 1950), which has exposed a thin marginal bank of mud in places, to which seeds can easily become attached and take root. As the canal is no longer used for navigational purposes, and as the water level remains fairly constant, conditions are such as should prove favourable to such a plant as *L. natans* and there seems to be no reason why the species should not spread.

In Clapham, Tutin and Warburg's recently published *Flora* it is stated that *L. natans* is ' very local but apparantly increasing,' and that it is now to be found in canals in several counties ' where it is of recent introduction.' The finds here reported may be perhaps regarded as a manifestation of a fairly general spread in such habitats.—G. FRYER.

# THE SO-CALLED SAPROPHYTIC ORCHIDS

A. MALINS SMITH

It is well known that the orchids all contain a living fungus in their underground parts. The association of fungus and orchid is known as mycorrhiza. Used accurately, the term mycorrhiza implies that the fungus is only in the roots. (Greek *rhiza*=root.) As, however, in many orchids the fungus exists in underground parts which are not roots, e.g. in rhizomes, the term mycorrhiza is not exact and the association is more accurately described by calling the orchid mycotrophic, implying that the orchid feeds on or through the fungus. Setting aside for the present the relationship between the fungus and the green orchids, I want to direct attention to the orchids which are devoid, or almost devoid, of chlorophyll. It has been common to call these—the best known example of which is the bird's-nest orchid *Neottia nidus-avis*—'saprophytic' orchids, implying that these orchids absorbed dead organic matter.

The publication of two books in the authoritative 'New Naturalist Series' *Wild Orchids of Britain* by V. S. Summerhayes (4), and *British Plant Life* by W. B. Turrill (5), in which the term saprophytic is applied unquestioningly to non-green orchids, has prompted me to raise the question of the accuracy of the description of these orchids as saprophytic. *Neottia* is, perhaps, the clearest example for the purpose. Of this plant Skene (2) states that it possesses some chlorophyll, yet, in fact, the amount is so small that no one who is familiar with the growing plant is likely to deny that its photosynthetic activity, especially in the deep shade in which it commonly grows, is negligible. It is, therefore, a basic fact in this discussion that the organic food of *Neottia* does not come from the plant itself, as it does in normal green plants.

The facts as to the position and appearance of the fungus in *Neottia* are summarised by Skene (2) as follows:

> 'The fungus is sharply limited to the three or four external cortical layers of the root. It is found only sparingly in the epidermal layer (two to three cells thick). It is also found in the rhizome and here as many as six cortical layers are infected. The fungus reaches a short distance into the flowering axis. Infection of new roots takes place at a very early stage from the rhizome. The mycorrhizal cells are sharply separated into two distinct classes, (1) an outer and an inner layer of "digestive" cells, and between these (2) a layer of "host" cells.'

These two types of cells are also found in a great many mycotrophic plants beside *Neottia*. In the 'host' cells the fungus threads (hyphae) stand out clearly and are easily distinguished from each other. Moreover, they fill the whole cell vacuole. In the 'digestive' cells the threads are lumped together in an irregular mass in the centres of the cells. It is generally agreed that in the digestive cells the fungus is in various stages of absorption by the orchid, while in the host cells it is living and holding its own.

There is a difference of testimony as to the connection of the internal fungus with the outside soil. Skene (2) states that very few hyphae find their way outwards into the soil. Summerhayes (4), on the other hand, writes: 'Mycorrhiza in the saprophytic orchids is both ectotrophic and endotrophic, the first forming quite a felt-like covering to the roots in *Neottia*.' My own examination of sections of the roots of a *Neottia*, which had been dug in the early fruiting stage, showed scanty connections with the outside soil. The apparently differing statements of Skene and Summerhayes can be reconciled by supposing that they refer to different stages of the orchid's life.

Actually, the matter is not very important, as it is not in doubt that the organic food of the orchid all comes from the soil *via* the fungus, as Summerhayes states, and therefore if a stage is reached when the hyphal connections are scanty, this is simply a sign that the absorptive stage of the orchid's life is over, at any rate for a period.

Now, if we consider the fungus as a whole, in relation to the orchid as a whole, the fundamental question to be answered is 'What advantage is derived from the association by one or both partners to it?' If both derive benefit the association ought to be called symbiosis, as it is in the two well-known symbiotic associations: (1) of leguminous plant and nodule bacteria in leguminous roots, and (2) of fungus

and alga in the lichens. If only one of the partners derives advantage then that one is a parasite on the other. Now there is broadly considered no obvious way in which the fungus can derive any advantage from the association, since the orchid has no chlorophyll and must therefore get all its organic food from the fungus. Since, according to Summerhayes, there is abundant mycelium round the orchid's roots, at any rate in the earlier years of development, it is practically certain that inorganic salts are also absorbed through the fungus, as they are in our forest trees. It thus seems that we cannot escape the conclusion that the orchid is parasitic on the fungus.

This description of the orchid-fungus relationship—in my view the correct one—is not new, but has been recognised for a considerable time. For example, Skene (2) in 1924 stated:

> ' It is not certain that any flowering-plant saprophytes really draw organic food directly from the soil. The fungus may in all cases act as an intermediary. The word " saprophyte " would thus be a misnomer and these plants would properly be regarded as the end of a series, exhibiting the extreme results of the mycorrhizal habit, having become parasitic on their fungi. It is, however, convenient at present to distinguish some humus plants which have reduced leaves and chlorophyll as a separate class.'

Thus the reason given for continuing a term which it is admitted may be a misnomer is ' convenience.' I cannot agree that an erroneous term should be continued for this reason.

Skene (2) in a statement whose emphasis is almost contradictory of his former statement, wrote ' the saprophytes are sometimes spoken of as being parasitic on their endophytic fungi, a description which scarcely helps us to an understanding of the relation.' As to this it seems to me clear that a term used accurately and consistently to describe the relationship is more likely to help us to understand it than is an inaccurate term.

The work of Ziegenspeck (6) may appear to provide some support for those who call the non-green orchids saprophytic. This author states that *Neottia* depends on manufactured food which is obtained by digestion of the fungus after this is dead, i.e. *Neottia* is saprophytic on the dead fungus. Two interpretations of this statement are possible: (1) that *Neottia* does not get any food from the fungus until the whole internal mycelium is dead, or (2) that in the particular cell where digestion takes place—the ' digestive ' cell—the fungus is always dead before absorption. With regard to (1) I know of no evidence for this. As previously noted, sections of the roots of a plant at an advanced stage of flowering show the typical ' host ' cells in which the fungus threads are thick-walled and turgid and were evidently alive when the plant was dug up. According to Summerhayes such a plant is produced nine to eleven years after the germination of the seed. If it has been produced from a root-bud this period may be only four to six years. In either case there is clear evidence that the mycelium was living in the plant for a period varying from four to eleven years. Even if the mycelium is killed out and the roots become free from fungus later the status of the fungus during this long period must be considered and accurately described, and as there is no doubt that the fungus is living during that period and that it is the source of the organic food of the orchid, the relationship must be one of parasitism of the orchid on the fungus.

As to the second interpretation of Ziegenspeck's statement outlined above it may well be that the piece of mycelium in any digestive cell is dead before absorption, but it appears to me illogical to think of the fungus piecemeal in this way. Whatever may happen in a particular cell, there can be no doubt that the internal mycelium remains alive in the ' host ' cells for several years and during this living period the orchid is parasitic, whatever may occur in particular cells of its tissue.

Besides putting forward the above hypothesis of saprophytism, Ziegenspeck makes a suggestion implying that *Neottia* may get organic food from the humus without the aid of the fungus. Now, although orchids themselves as well as other plants have been shown by experiment to be able to absorb soluble sugars from an artificial medium containing them, there is no evidence that the soil humus can be so absorbed. Skene, summing up the experiments of Robbins, Brannon and others, states ' the fact is established that humus compounds are not available for higher plants and this makes it all the more likely that the " saprophytes " draw on the soil only through their symbiotic fungi.' Though this sentence, in my view, contains

two terms which are inaccurately used, viz. ' saprophytes ' and ' symbiotic,' yet substituting the correct terms ' non-green orchids ' for ' saprophytes ' and ' internal ' for ' symbiotic ' fungi, the statement is a clear and correct one as to the possibility of absorption of humus compounds by the orchid and rules out the hypothesis of Ziegenspeck. Thus we are left with the position that the orchid absorbs food from a fungus mycelium which, as a *whole organism*, is living, i.e. the orchid is parasitic on the fungus.

Summerhayes, in his excellent book on the British Orchids, uses the term saprophytic for the non-green orchids. Possibly because he feels that the term is firmly established by usage, he uses it without attempting to justify its application. His description of the relationship in *Neottia* is ' the fungus threads extract food by ferments from the humus and pass it to the internal parts of the fungus, which are, in due course, digested by the orchid.' An implication of this statement is that the internal fungus threads are living, for, if dead, they could not conduct organic food to the internal ' digestive ' cells where absorption takes place. This being so, the orchid is evidently absorbing food from certain parts of a living fungus and this is not saprophytism but parasitism.

That a non-green orchid may be a parasite is admitted even by those who call the majority of such orchids saprophytes. Thus, Summerhayes describes the non-green Japanese orchids of the genus *Gastrodia* as secondary parasites when they get their food from a parasitic fungus *Armillaria mellea*. It follows logically from this that they are parasites when they get their food, as they sometimes do, from a saprophytic fungus. In these conditions their case is parallel to that of *Neottia*.

We may now consider still more closely the fungus-orchid relationship in *Neottia* by enquiring whether the orchid might contribute something to the invading fungus which could make the inside of the orchid an advantageous environment for the nutrition of the fungus. Since, in the absence of chlorophyll, the orchid can contribute no organic food, it seems as if any such advantage must be sought among the enzyme apparatus of the orchid. Enzymes in the orchid might be different from those possessed by the fungus and their activity might result in breakdown products favourable to the growth of the fungus. Any such breakdown products, however, must come from food solely produced by the fungus and this would involve a situation in which the orchid enzymes broke down food formed by the fungus in order to feed that same fungus with these special breakdown products. This complex exchange would seem to be inherently unlikely and to require some special proof from those who suppose that such an exchange occurs. A similar view is expressed by Skene when he says: ' The fungus is presumed to benefit by obtaining food from the orchid, but the case of the saprophyte (i.e. the non-green orchid) is difficult to understand, if we are to assume that in the first place the fungus supplies the plant with all its food and in the second place withdraws some from it.'

If this purely hypothetical supply of food to the fungus from the orchid does not occur, then there remains the simple situation that *Neottia* feeds on a living fungus and gives no advantage in return, i.e. *Neottia* is a parasite on the fungus.

## The Status of the Green Orchids

When we realise that *Neottia* gets all its carbohydrate food—and probably all its food of any sort—from the fungus, it becomes probable that green orchids also get a good deal of their carbohydrate food from the fungus and that this renders them less dependent on the success of their own photosynthesis. Probably there are many gradations of dependence on the fungus, for orchids vary very much in the length of time during which they retain the fungus. Summerhayes gives a valuable review of the facts. From this it appears that from germination—for success in which all wild orchids depend on the fungus—and throughout the life of the juvenile rhizome (mycorrhizome) the plant is dependent on the fungus. When the mycorrhizome has developed into the adult rhizome or into the tuber, some orchids become much less dependent, for example, the spherical tubers of *Orchis* and *Ophrys* are never infected. There are, however, several examples of complete dependence on the fungus, e.g. Summerhayes states that ' in *Listera cordata* root-buds are frequent and can flower by the third year. They are heavily infected and depend on the fungus and can grow and increase without any food from green leaves.' He says, further, that ' the Red Helleborine can persist underground by the fungus nutrition alone and without any aerial parts for over twenty years.

*Goodyera repens* is similar and depends on fungus nutrition when the wood is thick and shady and no doubt partly in the lighter parts also.'

In my own observations (3) on the Butterfly Orchid, *Platanthera chlorantha*, I stated: ' Owing to various accidents the total life of these plants above ground was short. In some years they had entirely disappeared seven weeks after their first appearance, while in other years they lasted for thirteen weeks. The length of their life above ground in any year had no correlation with the abundance or vigour of their occurrence in the following summer.' This seems to point to their being at least partly independent of the food made by their own photosynthesis. It is as though they had an alternative source of supply when the life of their green organs was short. The only alternative source which can be suggested is the fungus. Summerhayes says of this species: ' It persists for a long time in quite deep shade, merely producing the two large leaves. In doing this it is undoubtedly much indebted to the activities of the fungus in the heavily infected roots.'

All this evidence suggests that there is no rigid line to be drawn between the green and the non-green orchids and as the latter are parasitic on their fungi, the former are partly parasitic in varying degrees and thus are not all in the full sense symbiotic.

Summerhayes discusses the origin of the orchid-fungus partnership in evolution and states the theory that the association started as parasitism of the fungus on the orchid and that the orchid developed a power of retaliation, which enabled it to check the hostile attack of the fungus and to keep it within circumscribed limits. He describes the association as one of mutual hostility delicately balanced. Now this may be a true account of the evolution of the mutual relationship. The evolutionary approach, however, does not absolve us from determining the nature of the relationship which exists at present and which undoubtedly has existed for innumerable generations. In the present relationship the fungus feeds the orchid and there can be no doubt that it itself receives in those cells of a green orchid in which it flourishes, the ' host cells,' food from the orchid. It seems clear, therefore, that however the relationship arose, it is now one of mutual benefit and not of mutual hostility. I cannot, therefore, follow Summerhayes when he writes of the presence of the fungus as ' this apparently undesirable feature,' and indeed he himself goes on at once to say that it may be of advantage to the orchid. Why should any feature which is of acknowledged advantage in numerous species be called even ' apparently undesirable ' ? However it has originated, I maintain that the present relationship is advantageous to both partners in the green orchids, but only to the orchid in the non-green species.

The use of the term ' saprophytic ' has perhaps arisen through a minimising of the importance of the fungus in the partnership. Thus, of the very similar partnership which exists in the plants *Sarcodes* and *Monotropa*, Bower (1) writes: ' The only visible source of nutrition of these plants is from the abundant decaying vegetable matter, humus, of the woodland soils in which they live, presumably through the intermediary of the fungus. *These higher plants would thus appear to be saprophytes at second hand.*' This statement seems to ignore completely the nature of the intermediary agent through which the food comes. If it were some non-living indifferent material the higher plants would certainly be saprophytes, but as it is a living plant (a fungus) the question must be considered as to what is the physiological state of a flowering plant which is thus getting all its food from a living partner and giving nothing in return. That the flowering plant is giving nothing is plain from its lack of chlorophyll, the source of the organic food of ordinary green plants. We can clearly no longer be satisfied with the term saprophytic, which may have been first applied before the existence of the fungal partner was known. After careful consideration I do not know how we can escape the conclusion that the flowering plant is a parasite on the fungus.

In summing up the flowering-plant-fungus relationship in *Neottia* and similar plants, including *Monotropa*, it appears to me that the benefit to the flowering-plant is large, clear, and easily proved, and that the benefit to the fungus is so far entirely hypothetical and unproven.

Finally, it is to my mind a fair conclusion from the present state of our knowledge that there are no such organisms as saprophytic flowering-plants. In the normal flowering plant with a root-system whose ultimate branches are covered near their tips with a zone of root-hairs the function of the root system—apart from its action as a holdfast—is to absorb (1) water and (2) inorganic salts from the soil. The

structure of such a root system is not in the least fitted for the breakdown of humus by the action of enzymes. The fungus hypha, however, is an admirable instrument for this purpose, as is shown by the existence of enormous numbers of saprophytic fungi, which occur wherever there are reserves of organic food to be tapped.

It is the use of this significant organ—the hypha—by flowering-plant partners which enables the enormous reserves of organic food (humus) in many soils to be used by flowering-plants. Such plants, if they retain their chlorophyll, are not notably different in external appearance from independent green plants. If, however, they lose their chlorophyll they form that small group of non-green flowering-plants to which the term 'complete saprophytes' has been so often applied. It has been the object of this paper to show that the application of this term is erroneous and that such plants are really parasitic on a saprophytic fungus.

## References

Only a few references are given since there is little, if any dispute about the facts. The discussion in this paper is chiefly concerned with the interpretation of the facts. From this point of view I have thought it unnecessary to refer to several important researches such as those of Bernard, Knudson, Rayner and others.

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## ON *DINOBRYON SUECICUM* LEMM. var. *LONGISPINUM* LEMM; *CHLAMYDOMONAS GLOEOPHILA* SKUJA; *C. DINOBRYONI* G. M. SMITH and *PLANKTOSPHAERIA GELATINOSA* G. M. SMITH WITH A NOTE ON *SPHAEROCYSTIS SCHROETERI* CHODAT.

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The first three algae are, so far as I am aware, new records for Great Britain.

*Dinobryon suecicum* Lemm. var. *longispinum* Lemm. (fig. 1, A-E). The anterior portion of the delicate envelope is vase-shaped and constricted below the often more or less obliquely set apex; posteriorly it narrows into a long very fine stalk 10-15$\mu$ long, the whole varying from 32-43$\mu$ long and 4-5$\mu$ broad at the widest point. A fine spiral band runs six to eight times round the apical half of the case so that, in optical section, it appears serrate. The ovoid to oval protoplast is located in the central portion of the case and has a single parietal chromatophore and a very small anterior stigma (fig. 1A). The shorter of the two flagella is straight, lies within the envelope and is about a third to a quarter the length of the undulate longer flagellum which usually projects beyond the apex of the envelope. It seems that the cells commonly contract somewhat on killing since fixed individuals often have both flagella within the envelope and Skuja (1948 p. 286) points out that the delicate thread affixing the protoplast to the envelope is contractile. Oil and leucosin are stored.

The species differs (Lemmermann 1903-04 p. 126) in the lack of a long stalk. The number of turns made by the spiral thickening of the envelope varies. Lemmermann (1903-04 p. 126) states there are six to seven turns in the species and eight in var. *longispinum*, while Skuja (1938 p. 86) gives seven to thirteen for specimens showing basal stalks intermediate in length between those of the species and var. *longispinum*.

In small numbers in the plankton of Tarn Hows near Coniston Water, Lancashire in April 1951.

*Chlamydomonas gloeophila* Skuja (fig. 1, F-H). The cells (6·5-10$\mu$ long; 2·5-3$\mu$ broad) are elongate, ovoid or ellipsoid, often with one side plane and the other convex in one longitudinal plane and both convex in the other. There is a delicate

wall and prominent rounded conical papilla. The flagella are as long as or somewhat shorter than the cell. The laterally situated parietal chromatophore contains a pyrenoid lying about half way down the cell. There is a minute anterior stigma and two contractile vacuoles.

Though only flagellate cells have been observed there can be no doubt about the identity of this characteristic little species (see Skuja 1948, Taf. IX, fig. 1). According to Skuja (1948 pp. 86-87) the cells are predominantly found in the mucilage of the colonial rotifer *Conochilus hippocrepis* Schrank. and there undergo a characteristic series of developmental phases. It has not been observed in the *Conochilus* spp.* occurring in Windermere though it is common in the mucilage surrounding *Coelosphaerium naegelianum* Unger. and sometimes that of other algae. Skuja (1948) states that cells like those described above occur in the outer portions of the rotifer colony and many swim inwards through the mucilage to the central regions, during which time they become shorter and rounded ovoid. Those in the central regions of the rotifer colony lose their flagella, becoming spherical and forming cysts with thick, smooth or finely punctate walls. Another remarkable feature described by Skuja (1948) is the production of leucosin, a reserve product normally only found in the Chrysophyta (Xanthophyceae, Chrysophyceae and Bacillariophyceae).

*Chlamydomonas dinobryoni* G. M. Smith (1920 p. 91) fig. 1, I-L. The cells (2-5$\mu$ long; 3$\mu$ broad) are ellipsoid or ovoid with a thin wall and no papilla. The flagella are about cell length. There is a discoid stigma. The parietal chromatophore is basal or more or less lateral with a pyrenoid similarly situated. This species, which is widespread in the plankton of lakes and tarns in the English Lake District, is imperfectly known. A stigma has not been previously recorded nor have the number of contractile vacuoles yet been determined. Division of the cells has not been described and the method of perennation is unknown. It is usually observed in the envelopes of *Dinobryon* spp. which themselves show a very marked seasonal periodicity, a part of the life-cycle being passed in the form of free-living cysts. There would appear then to be a considerable period of the year when there are no envelopes to colonise.

This species has been recorded as an inhabitant of empty envelopes of *Dinobryon* and it does not seem to have been realised previously that cells may also occur in envelopes harbouring live protoplasts, a remarkable fact brought to my notice by Dr. H. M. Canter (Mrs. J. W. G. Lund). In such cases the *Chlamydomonas* cells may force their way between the envelope and *Dinobryon* protoplast causing a marked deformation of the latter (fig. 1, I). Sometimes, so many *Chlamydomonas* cells are present that little space is left for the *Dinobryon* protoplast and it is quite possible that they may even cause it to leave its envelope.

*Planktosphaeria gelatinosa* G. M. Smith (1918 p. 627; 1920 p. 103) fig. 1, M-Q. The solitary cells are spherical with a moderately thick wall and are surrounded by a firm unstratified mucilage envelope which is clearly visible without staining or mounting in Indian ink (fig. 1, M-O). The cells vary from 5-46$\mu$ diameter without the mucilage envelope which may reach 30$\mu$ in breadth before autospore formation occurs. There is a parietal chromatophore which, in the young cell, may not cover the whole wall (fig. 1, M-P) but be more or less cup-shaped. At first it contains one pyrenoid but as the cell enlarges the chromatophore becomes more massive, covers the whole wall and finally divides into 8, 16 or 32 segments each containing a pyrenoid (fig. 1, O). These segments round off to form the autospores (fig. 1, P) which are liberated into the mucilage envelope by rupture of the mother-cell wall which persists though it may crumple or break into a few irregular pieces. The autospores disperse in the now much widened mucilage envelope (to 250$\mu$ diameter) of the mother-cell (fig. 1, Q). This is so diffluent that its full extent may only be ascertained by mounting in Indian ink while the cells may be caused to move within it by vibrations or convection currents. They usually lie in one plane so that this temporary colonial stage has the form of a flat or curved plate forming a very characteristic feature of the species. The process of deliquescence of the mucilage continues until the envelope is lost and the autospores disperse; they may be seen to have formed their own mucilage envelopes before liberation from the mucilage envelope of the mother-cell.

I place this alga here despite certain differences both from the original description (Smith 1918, p. 627) and that of Flint (1950 p. 236). Smith (1918, 1920) states that

* Determined by Mr. A. L. Galliford as *C. hippocrepis* and *C. unicornis* Rouss.

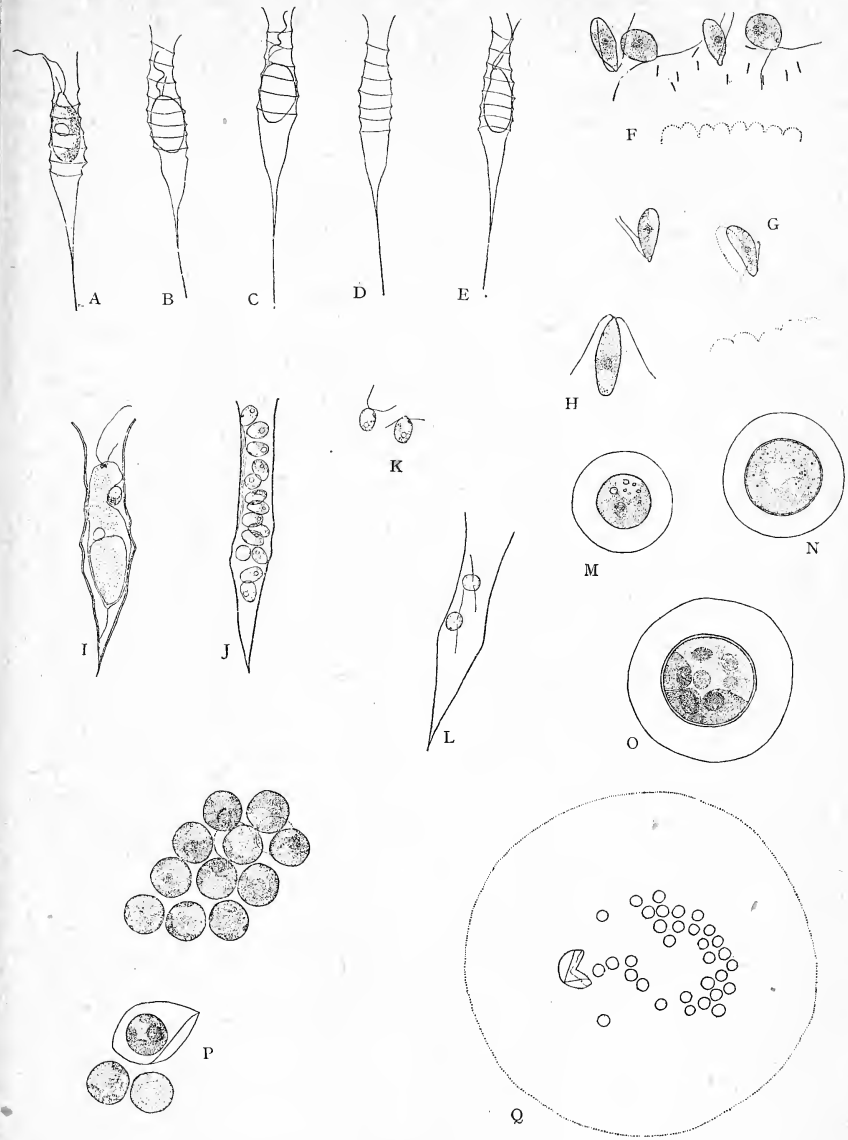


Figure 1. **A-E,** *Dinobryon suecicum* var *longispinum* Lemm.; **F-H,** *Chlamydomonas gloeophila* Skuja; **F, G,** cells in mucilage of *Coelosphaerium naegelianum* Ung.; **H,** free-swimming cell, in **F**, the ovoid cells belong to *Chlamydomonas epiphytica* G. M. Smith and the small rod-shaped bodies are bacteria; **I-L,** *Chlamydomonas dinobryoni* G. M. Smith **I, J, L** in envelopes of *Dinobryon divergens* Imhof **K,** free swimming; **M-Q,** *Planktosphaeria gelatinosa* G. M. Smith, **P, Q** formation of 16 and 32 autospores respectively. **A-H** ×1050; **I-L** ×680; **M-P** ×600; **Q** ×190.

the alga is colonial though the cells are at first solitary while Flint (1950) says that it normally occurs as solitary cells. It will be seen from the above that the ' colonial ' condition is temporary owing to the fact that, in reproduction, the dehiscence of the mother-cell occurs before its mucilage envelope has been lost. Thus the alga is not strictly colonial. Further, Smith depicts the cells in the ' colonial ' stage arranged botryoidally, a state which I have only observed rarely at the time of dehiscence of the mother-cell, after which the cells are at once dispersed in the mucilage envelope. Flint (1950) states that the young cells contain a few chromatophores while Smith (1918, 1920) depicts them with one as I have observed them. However, the difference may be related to the rate of reproduction of the population for, if this be fast, the chromatophore of the recently liberated autospores soon begins the segmentation leading to further autospore formation. This alga merits further study.

Owing to the vegetative state consisting of single cells and colony formation being a part of the reproductive process, collections of plankton by means of a net normally only contain the latter. This alga has almost certainly frequently been determined as *Sphaerocystis Schroeteri* Chod. (*Gloeococcus Schroeteri* (Chod.) Lemm.), which is, in my view, an aggregate species. This is in part due to Chodat's (1897 pp. 119, 292) original description. His figure 11b depicts a colony with each daughter cell surrounded by a narrow mucilage envelope and arranged in one plane within the colonial envelope, while the crumpled remains of the mother-cell persist. This part of the generic description should be placed in *Planktosphaeria gelatinosa*. Consideration of other parts of Chodat's original description which probably refer to yet other algae cannot be considered here. The cause of his uniting several algae in one species was probably his well-known belief in polymorphism among green algae (*e.g.* Chodat 1909) and dependence on net collections of plankton.

The only previous record of *P. gelatinosa* for Great Britain is that of Flint (1950). I have, however, observed it in so many lakes in diverse parts of Great Britain and Eire that there can be no doubt that it is one of the most widespread of our plankton algae, though the only lake in which I have observed it in abundance is Ullswater.

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W.J.S.

## CONCERNING THE FULMAR

RALPH CHISLETT

THE Fulmar (*Fulmarus glacialis*) ' is more likely to be met with in the middle of the northern oceans than any other ' bird. ' Those that we see round the shores of Britain, Faeroe, Iceland, Jan Mayen, and West Greenland are light-coloured birds ' giving a gull-like impression at a casual glance; but ' no novice need confuse them with gulls for long.' The Fulmar's mode of flight is sufficient to distinguish it, that flight by which it reaches ' the middle of each ocean because it has become a sailing vessel, a sail-plane.' The quotations and those that follow are from Mr. James Fisher's new book, *The Fulmar*.*

All successful ornithological monographers must needs be obsessed by their subject matter, usually with increasing intensity until their self-imposed tasks have been achieved. They need a capacity for single-minded perseverance that few people possess. As their knowledge grows, as material accumulates and is arranged, they must ask themselves from time to time ' am I ready? ' Like Nethersole-Thompson with his monograph *The Greenshank*, Mr. Fisher has not fallen into the error of premature publication.

Mr. Fisher tells us ' this book is the result of an obsession ' that has lasted for some twenty years. During those years the Fulmar must have been always with him, like a disembodied spirit ever present, whatever form his multifarious activities might take at any time. What devoted hours he must have expended, rapid worker as he is, systematically searching literature of all types that possibly had references to this species, probing records, assimilating and arranging material, corresponding with people in many countries, studying the world atlas and local maps. He has visited innumerable cliffs colonised by Fulmars from Spitzbergen and Iceland southward. It is plain he has felt he must see things for himself as far as possible and has loved doing so. Time limits the activities of all, and its devotion to a single species limits that available for others, and entails sacrifices to be cheerfully made. Mr. Fisher has his reward. He has produced a book that will live, that every ornithologist will desire for his shelves, and every important library make available for students of this and future generations. The production of such a book is a reward in itself, and a lasting source of satisfaction to its author. It was not written ' because I have thought it " useful " to do so, but because I like Fulmars and everything to do with them.' Many others however will find the book useful; and will be no less grateful for its eminently readable qualities.

Antarctic Fulmar, Pacific Fulmar, Atlantic Fulmar are all studied in their different breeding and feeding ranges; after which Mr. Fisher concentrates on the spread of *F. glacialis glacialis* southward to various parts of Britain. The spread continues somewhat irregularly. From its beginning Mr. Fisher associates the spread, not with climate, nor with nesting-sites available for overspill populations, but with food supply. ' All the sea birds that benefit from fishing have increased.' ' The Fulmar's spread began when whaling increased the population of dead whales in the Fulmar's area.' ' When whaling petered out ' (in the northern hemisphere) ' off-shore trawling kept up a special food supply ' of fish offal. Photographs show crowds of Fulmars fighting for fat at the side of a ship whale-flensing in Spitzbergen; and waiting for gutting and fighting for guts by the side of a trawler off Iceland. The opinion is argued with much cited evidence. Formerly, although such free meals were eaten eagerly when available, plankton, also the food of whales, was the main food-supply; and no doubt is so still to a large extent. The history of Atlantic-Arctic whaling, although not easy to reduce to potted dimensions, is briefly traced. If Mr. Fisher is right, as I have no doubt he is, presumably the cessation of trawling, or of casting offal into the sea, would cause some breeding cliffs to be abandoned, if they owed their colonisation to more convenient proximity to this new source of food. After mentioning the recent introduction of trawlers fitted with plant for conversion of fish waste into cattle food he asks: ' How long will it be before the Fulmars have no more free meals ? '

The Fulmar's spread did not begin with its arrival on the cliffs of Foula. The spread and increase in Shetland repeated the performance of the species in the Faeroes during the forty or more years since Fulmars came there from Iceland, ' probably between 1816 and 1839.' St. Kilda has been commonly surmised to

* **The Fulmar** by **James Fisher.** Pp. 496 with a painting by Peter Scott, 4 photographs in colour and 78 in monochrome. *New Naturalist Monographs*e Series; Collins, 35/-.

be the source whence birds came to Britain, and was the only proved British breeding station before 1878, and recorded as such in 1697. Mr. Fisher finds ' much reason for presuming that the spread to Britain came from Faeroe.' Whether he has sufficient reason for connecting some local colonisations with the nearest established colony I am not quite sure; but more than once when reading I queried if ' possibly ' might not have been a more suitable word than ' probably.' It seems to me not improbable, with such a continuous movement, that some of the birds of the new colonies may have come more directly from the same source as the earlier colonisations.

Birds, and people, have their peculiarities. The Fulmar presents special interests and problems, yet it has never interested me more than many other species, although I have lived through much of the period of its spread in Britain. A few weeks, sometimes repeated in another year and place, have been as long as I have felt able to spare for one bird, so many others are there with which to reach terms of familiarity. Nevertheless I had fairly early experience of the Fulmar in Shetland in 1921 and 1922, when I spent most of my time in and around North Yell. Mr. Fisher mentions Outsta Ness, on the north coast of Yell, for the species at a much earlier date. A colony of North Yell in which at least one young bird was seen in 1921 is apparently connected with ' the nine miles of cliff between Outsta Ness and Whale Firth.' I saw no breeding Fulmars along those Atlantic cliffs in either of my years, but did not explore their whole length. Under date June 2nd, 1921, my notebook says: ' three Fulmars with eggs along the cliffs towards Cullivoe ' from Gutcher. They were on Gutcher Head on the eastern coast of North Yell, and on the western side of the southern end of Blue Mull Sound. That chick-containing colony of 1921 of which the locality is broadly designated as ' North Yell,' may have been on Gutcher Head. On the cliffs of Blue Mull ' Fulmars were first seen nesting in 1922,' but were probably there earlier. The Fulmar population of Hascosay for 1947 had apparently approximately trebled since 1922.

Mr. Fisher asks for recent information of the Yorkshire colonies, ' especially about the fate of some of the colonies where breeding has not yet been proved.' Breeding is not easy to prove on such as Boulby Cliffs, which overhang so that sites cannot be inspected from above; but it is now known to occur yearly on most of the loftier cliffs on the Yorkshire coast. It would be interesting to check in 1953 if any of the prospected sites, which cover practically the whole coastline from Hunt Cliff near Saltburn to the neighbourhood of Bridlington, are not now occupied by breeding birds.

Every phase of the Fulmar's history, evolution, ecology, distribution, behaviour, breeding biology, colour phases, voice and display, parasites, enemies and rivals, the yearly cycle, is discussed with a wealth of detailed data. ' How often does the Fulmar breed ? ' is asked in a final chapter. Appendices cover legend, measurements, weights, ringing recoveries, and even palatability. Such avian biological problems as that of the contribution of colonial living to breeding success are illuminated.

The book is exhaustive, geographically and biologically, yet written admirably, with an avoidance of unnecessary technicalities, so as to make interesting reading matter. Mr. Fisher is to be congratulated and thanked.

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**The Observer's Book of The Larger British Moths,** by **R. L. E. Ford.** Pp. 224, with 117 coloured plates and 82 figures. Frederick Warne & Co., 5/-.

The coloured plates are those used in South's *Butterflies and Moths of the British Isles* and illustrate moths of 113 species—a nice selection of the 800-odd so-called 'macros.' The egg, caterpillar or pupal stages of over 80 of these are figured in black and white. In all cases the earlier stages are described and food plants given, along with collecting and rearing hints. The illustrations are good and Ford's contribution irreproachable. Excellent value for money. Only two minor errors were noted, ' indusial melanism ' on page 120 should read ' industrial melanism ' and a superfluous ' s ' appears on page 215.

In lighter vein the reviewer fears that if Ford's suggestion is adopted—that the easiest way to secure a certain migratory species on the south coast is to look along the eaves of bathing machines during the day time—moth-hunting may yet be listed amongst the more dangerous pastimes !

F.H.

## THE ENTOMOLOGY OF SPURN PENINSULA

(*Continued from page* 138)

*Longitarsus pratensis* (Panzer) PH., 15/8/49!
[*L. atricillus* (Linnaeus) Skefling, 18/8/49; L.B.D., 21/8/49].
*L. suturellus* (Duftschmidt) M.H., W., M.M., F. clay banks, [Saltings], 6, 7!; some specimens very dark in colour.
*L. luridus* (Scopoli) PH., 15/8/49.
*L. parvulus* (Paykull) PH., W., D., F. clay banks, 6, 7, 8· [Welwick, 18/8/48; Saltings, 20/6/51].
*Crepidodera transversa* (Marsham) W., 20/7/48, 17/8/49; D., 14/8/49.
*C. ferruginea* (Scopoli) M.H., 6/47!; S.M., 18/6/47; M.M., 20/6/51.
*Mantura rustica* (Linnaeus) M.M., 3/6/50.
*Chaetocnema concinna* (Marsham) S.M., 19/7/48; F. clay banks, 17/6/51.
*C. hortensis* (Geoffroy) M.M., 3/6/50.
*Sphaeroderma testaceum* (Fabricius) W., 18/7/48; M.R., 20, 22/7/48, on *Cirsium vulgare* (Savi) Ten.
*Psylliodes marcida* (Illiger) M.H., 15/6/47, 1 dead spn.; near S.M., W., F., adults in sand below plants of *Cakile maritima* Scop., a few in 6, 7!, rare 8. Larvae mine leaves of host-plant.
*P. cuprea* (Koch) PH., 15/8/49 [Skefling, 18/8/49].
*Cassida flaveola* Thunberg, M.H., 15/6/47.
*C. rubiginosa* Mueller, M.H., 15/6/47; S.M., 16/6, 8/6/47, on thistles; W., 4/6/50, on wing, [Saltings, 7/6/50].

BRUCHIDAE

[*Bruchus rufimanus* Boheman Welwick, 20/6/47, 18/8/49; L.B.D., 6/6/50].

CURCULIONIDAE

The weevils are the best represented family of phytophagous beetles on the peninsula. Several species are present, in their season, in considerable numbers.

*Caenorhinus germanicus* (Herbst) W. 7/6/60. [Saltings, 7/6/50.]
*Apion hydrolapathi* (Marsham) M. H., 13/6/47.
*A. curtirostre* Germar, W., 7/6/50, 17/6/51; PH, 21/6/51. [L.B.D., 6/6/50, 18/6/51.]
*A. miniatum* Germar, M.H., 6/47!; on *Rumex*. S.M., 18/6/47, 16/6/51; M.M., 3/6/50.
*A. onopordi* Kirby, P.H., 15/8/49; M.M., 3/6/50 [L.B.D., 6/6/50.]
*A. carduorum* Kirby, M.M., 17/6/47, 3/6/50. W., 5/6/50, 10/6/50, on *Carduus nutans* L. [Saltings, 7/6/50.]
*A. hookeri* Kirby, M.M., 3/6/50.
*A. loti* Kirby, W., 11/6/50, on *Lotus corniculatus* L. [Saltings, 7/6/50.]
*A. pisi* Fabricius, PH., 15/8/49, 9/6/50. W., 7/6/50. [L.B.D., 6/6/50, 18/6/51; Saltings, 7/6/50.]
[*A. vorax* Herbst, Saltings, 20/6/51.]
*A. ononis* Kirby, S.M., M.M., PH., W., D., 6, 7, 8! [Saltings, 7/6/50.]
*A. ervi* Kirby, M.M., 17/6/47, 3/6/50; PH., 13/8/49, 9/6/50; W., 7/6/50, 10/6/50, on *Carduus nutans* L., *Trifolium repens* L. [Saltings, 7/6/50.]
*A. dichroum* Bedel, M.M., 3/6/50. W., 10/6/50, on *Trifolium repens* L. [L.B.D., 6/6/50; Saltings, 7/6/50.]
*A. nigritarse* Kirby, W., 7/6/50. [Saltings, 7/6/50.]
*A. apricans* Herbst, M.M., 17/6/47; PH, 13/8/49; W., 10, 11/6/50 on *Trifolium dubium* Sibth. [Saltings, 7/6/50.]
*A. ononicola* Bach, S.M., 11/6/50, on *Ononis repens* L. (W.J.S.).
*Otiorrhynchus singularis* (Linnaeus) W., 7/6/50.
*O. ovatus* (Linnaeus) M.H., W.!, 6, 7, grass roots, 10/6/50; D., 19/6/47; tidal refuse, 17/7/48.
*Phyllobius parvulus* (Olivier) W., 5, 7/6/50. M.M., 4, 10/6/50. [Saltings, 7.6/50.]
*P. virideaeris* (Laicharting) M.M., 17/6/47, 3/6/50; W., 7/6/50, 6/51 ! on sycamore, etc.
*P. pyri* (Linnaeus) M.H., 15/6/47; M.R., 5/6/50. This was the dominant plant-feeding species throughout the peninsula during June 1950.
*P. calcaratus* (Fabricius) W., 11/6/50, on *Lotus corniculatus* L. (W.J.S.).
[*Sciaphilus asperatus* (Bonsdorff) Saltings, 7/6/50.]
*Philopedon plagiatus* (Schaller) M.H., M.S., S.M., 6, 7 !! absent 8.

*Barynotus obscurus* (Fabricius) D., 19/6/47.
*Sitona lineatus* (Linnaeus) PH., 13/8/49; M.H., 16/8/49; M.M. 3/6/50; W., 16/6/51.
*S. sulcifrons* (Thunberg) PH, 15/8/49; W., 7/6/50. [Saltings, 7/6/50.]
*S. punctticollis* Stephens, D., 19/6/47; M.H., 16/8/49; W., 14/8/49, 11/6/50 on *Symphytum officinale* L.
*S. lepidus* Gyllenhal, PH., 15/8/49.
*S. hispidulus* (Fabricius) PH., 15/8/49; W., 7/6/50.
*Cleonus piger* (Scopoli) M.S.!, M.H., W., M.R., on spear thistle, 17/7/48; 6, 7, absent 8.
*Phloeophagia spadix* (Herbst). Common in groynes on seaside and especially on Humber shore. Also under stones, wood, etc., F., 6, 7, 8 !! [Welwick, 20/6/47.]
*Miccotrogus picirostris* (Fabricius) M.M., 3/6/50. W., 10/6/50, on *Trifolium repens* L. (W.J.S.). [Kilnsea, 10/6/50, on *Vicia sativa* L., Saltings, 7/6/50.]
*Anthonomus rubi* (Herbst) M.M., PH., W.,! on *Symphytum officinale* L., *Senecio jacobaea* L., *Potentilla anserina* L.
[*A. pedicularius* (Linnaeus) Skefling, 18/8/49.]
*Phytonomus austriacus* (Schrank) S., 16/8/49.
*P. rumicis* (Linnaeus) W., 6/51.
*P. nigrirostris* (Fabricius) near S.M., 16/6/47.
*P. posticus* (Gyllenhal) W., 16/8/49.
*Gronops lunatus* (Fabricius) M.H., 20/7/48; S.M., 19/7/48, a number of specimens at roots of grass.
*Ceuthorhynchidius troglodytes* (Fabricius) M.M., W., S.M., M.R., PH, 6 ! [Saltings, 7/6/50.]
*Ceuthorhynchus floralis* (Paykull) W., 11/6/50, on *Matricaria*.
*C. viduatus* (Gyllenhal) W., 16/8/49 (T.B.K.).
*C. litura* (Fabricius) W., 6/51 (H.M.R.).
*C. rugulosus* (Herbst) M.H., 6; M.S., 8; W.; on *Matricaria*, etc.
*C. pleurostigma* (Marsham) PH. !!, 8; S., 8; W., 7/6/50 !!, 8.
*C. assimilis* (Paykull) W., 15/8/49, 7/6/50.
*C. quadridens* (Panzer) M.M., 14/8/49.
*C. contractus* (Marsham) M.H., D., M.M., W., 6, 7, 8.
*Rhinoncus pericarpius* (Linnaeus) W., 5/6/50; L.B.D., 6/6/50.
*Mecinus pyrraster* (Herbst) M.M., 17/6/47.
*Rhamphus pulicarius* (Herbst) M.M., 3/6/50.

## VIII. COLEOPTERA, CARABIDAE

S. SHAW

The result of five years assiduous collecting on Spurn Peninsula has produced a list of 94 species of *Carabidae*, over a quarter of the species on the British list. Records have been gathered from all the Coleopterists who visited Spurn.

After the 1950 visit, when the list totalled 81 species, it seemed that the Carabid fauna had been worked out. But the 1951 visit in June resulted in 13 more species being added to the list, some of which are common species elsewhere, such as *Loricera pilicornis* (F.) and *Elaphrus cupreus* Duft., which turned up singly within the area. An old record for *Nebria livida* (L.) referred to in W. C. Hey's list as occurring at Spurn (W. E. Clarke, *Trans. Y.N.U.*, 1885, (*D*): 3) started a thorough search of both the clay sea cliffs and the banks of the Humber, ending without success. In 1950, four specimens of *Panagaeus bipustulatus* (F.) were taken on the Warren, establishing an old record from Spurn. During the last visit (1951) this beetle was found to be widespread, although by no means common, along the Main Ridge of the peninsula.

The debris strewn over the Warren provides ideal shelter for ground-beetles, and this small area has yielded a total of 44 species, the commonest being *Harpalus aeneus* (F.), *H. ardosiacus* Luts. and *Amara familiaris* (Duft.). *Calathus mollis* (Msh.) is common throughout the Warren and Main Ridge.

A single specimen of *Agonum gracilipes* (Duft.) was taken at the south end of the Warren by Mr. J. H. Flint, and, although the area was diligently searched on the successive days of the visit, no further specimens of this rare beetle were taken.

The dry dunes of the Main Ridge provided relatively poor collecting. Grubbing at the roots of marram produced a few species in abundance, notably, *Trechus obtusus* Erich., *Badister bipustulatus* (F.), *Risophilus atricapillus* (L.) and *Dromius*

*notatus* Steph. Along the Humber shore certain species were common; *Broscus cephalotes* (L.) and *Dicheirotrichus gustavii* Crotch were numerous under seaweed, debris and stones.

The genus *Bembidion* was well represented in the marshy areas and the banks of the Dyke. The 18 species recorded were taken mainly in these areas, the commonest species, *B. varium* (Ol.), *B. assimile* Gyll. and B. *minimum* (F.), swarmed over the mud in great numbers. Species of the genus *Dyschirius* are found in similar habitats associated with their Staphylinid hosts *Bledius*.

An unusually heavily mite-infested specimen of *Feronia strenua* (Pz.) was taken whilst searching a heap of vegetable debris, near the Phragmites area. The mites covered the elytra of the beetle, several deep, extending to the thorax, with only one or two clinging to the underside of the abdomen (figs. 1, 2). The mites, which

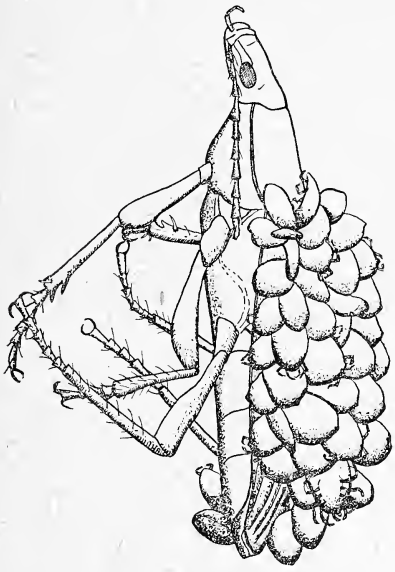

FIG. 1—Lateral View.

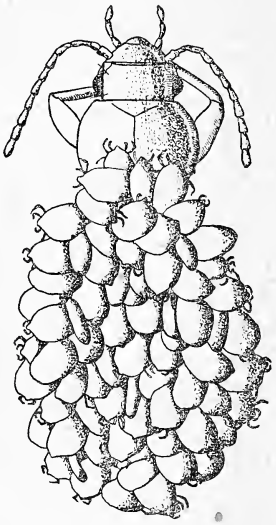

FIG. 2—Dorsal View.

*Feronia strenua* (Pz.) with mites attached.

have been identified by Mr. H. Britten, M.Sc., F.L.S., F.R.E.S., were *Urodinychus sartor* Hull, and *Macrocheles tridentinus* Can. This kind of phoresy, in a lesser degree, was noted to be very common amongst the insect population of the haystack refuse in this area.

A parasitic fungus, *Laboulbenia vulgaris* Teyritsch (identified by Miss E. M. Rosser, B.Sc. of the Manchester Museum), was found attached to the legs of *Bembidion aeneum* Germ., taken at Walker Butts Bank Dyke, 6/6/50. These small fungi, which are rarely seen by mycologists, are apparently common at Spurn. As far as is known *Laboulbeniales* are superficial in their attachment and are not fatal to their hosts. It is hoped that some further observations may be made on these interesting members of the Spurn flora.

*Carabus nemoralis* Mueller W., 9/6/50, 6/51!
*C. problematicus* s. *gallicus* Gehin W., 7/48.
*C. violaceus* v. *sollicitans* Hartert M.M., 21/7/48; W., 10/6/50.
*Leistus fulvibarbis* Dejean W., 23/6/51 (S.S.).
*L. terminatus* (Hellwig) W., 20/6/47, at light; Sea-cliff near W., 6/50.
*L. ferrugineus* (Linnaeus) W., 3 specimens at grass roots, no date (J.S.); common on Main Ridge, grass roots, 6/50 (J.H.F.).
*Notiophilus aquaticus* (Linnaeus) S.M., 10/6/50, on mossy bank (J.S.), 16/6/51 (W.D.H.).

*Notiophilus palustris* (Duftschmid) 1 spn. on road to Saltings, 20/6/51 (S.S.).
*N. biguttatus* (Fabricius) W., 19/6/47, 7/6/50; cliff face by sea, 9/6/50.
*Elaphrus cupreus* Duftschmid D., 1 spn., 22/6/51.
*Loricera pilicornis* (Fabricius) D., 6/51 [Saltings, 20/6/51].
*Clivina fossor* (Linnaeus) W., railway, 7/6/50.
*Dyschirius arenosus* Stephens S.M., 1 spn., 16/6/47; D., 18/7/48. [Saltings, 7/6/50].
[*D. nitidus* (Dejean), Saltings, 7/6/50.]
*D. salinus* Schaum D., 6/47, 6/51; M.M., 4/6/50. [Saltings, 7/6/50, 3 spns. in old cow dung.]
*D. aeneus* Dejean PH., 4/6/50, 6/51. [L.B.D., 6/6/50.]
*D. globosus* (Herbst) D., 18/7/48, 6/6/50 [Saltings, 6/51].
*Broscus cephalotes* (Linnaeus) F. Common during all the visits to Spurn, although to a less extent on the seashore. It usually occurs in ones and twos under debris.
*Asaphidion flavipes* (Linnaeus) F., clay banks, 17/6/51, 1 spn. (dead) (S.S.).
*Bembidion lampros* (Herbst) W., 7/6/50, 6/51; M.M., 3/6/50; sea-cliff, 9/6/50.
*B. lampros* s. *properans* Stephens, W., 12/8/49, 1 spn.; F., clay cliffs, 17/6/51.
*B. varium* (Ol.) D., PH., !!, 7/48, 6/50, 6/51; M.H., 13/8/49; M.M., 4/6/50. [Saltings !! 7/48, 7/6/50.]
*B. stephensii* Crotch, Sea-cliff, 6/51 (J.H.F.).
*B. genei* v. *illigeri* Netolitzky, P.M.M., ! 6/51 (J.H.F.).
*B. fumigatum* (Duftschmid) PH., 18/7/48, 13/8/49, 6/6/50; W., in Phragmites debris, 9/6/50.
*B. assimile* Gyllenhal D., !! 22/7/48; PH., 23/7/48, 6/6/50; P.M.M., 6/50. [L.B.D., 6/6/50.]
*B. normannum* Dejean D., 6/6/50, 6/51; M.M., 4/6/50 [Welwick, 18/8/49].
*B. minimum* (Fabricius) D., ! 14/8/49, 6/6/50, 6/51; S.M., 19/7/48; W., 15/8/49; M.M., 4/6/50; F., Clay cliff, 7/6/51 [L.B.D., 7/6/50].
*B. quadrimaculatum* (Linnaeus) D., 15/8/49; W., 6/51.
*B. articulatum* (Panzer) PH., 6/51 (J.H.F.).
*B. quadriguttatum* (Fabricius) PH., 4/6/50.
*B. obtusum* Serville W., 22/6/51 (S.S.).
*B. biguttatum* (Fabricius) D., 19/6/47; 6/6/50. [L.B.D., Saltings, 6, 7/6/50.]
*B. aeneum* (Germar) D., 6/6/50, 6/51; M.H., 4/6/50.
*B. guttula* (Fabricius) PH., 20/8/48 (J.S.).
*B. lunulatum* (Geoffroy) M.M., 4/6/50 (J.S).
*B. iricolor* Bedel D., 21/7/48, 19/6/47,; M.M., 4/6/50; D., 6/51. [LB.D., 6/6/50; Saltings, 20/6/51.]
*Trechus quadristriatus* (Schrank) W., 19/6/47, 19/8/49, 24/6/51; M.R., 6/51; S.M., 13/8/49, tidal refuse.
*T. obtusus* Erichson M.H., 13/8/49; F., 18/8/49; PH., 21/6/51; W., 10/8/49, 6/51; M.R. !!, 26/6/51.
*Pogonus chalceus* (Marsham) *Atriplex*, on S.M. 6/50, 19/7/48, 13/9/49, tidal refuse; D., 14/8/49. The specimen from the Dyke was bright blue in colour, different in colouration to all the other specimens taken.
*Panagaeus bipustulatus* (Fabricius) W., 8/6/50, 4 spns. taken under stones and at grass roots; M.R., 8 spns., 6/51.
*Chlaenius ruficornis* (Fabricius) S.M., 19/7/48, 1 spn. under stone (J.R.D.).
*Badister bipustulatus* (Fabricius) W., 17/6/47, 6/6/50; S.M., 19/7/48; M.R. !!, grass roots, 6/51.
*Harpalus aenus* (Fabricius) W., common throughout the three months under stones, etc. [Saltings, 7/6/50.]
*H. attenuatus* Stephens W., 7/6/50, 2 spns. (S.S.).
*H. tardus* Panzer W., F., M.H., S.M., PH., fairly common on all visits.
*H. ardosiacus* Lutschnik W. !!, 19/8/49, 6/6/50, 6/51.
*H. angusticollis* Mueller, M.H., W., F. !, all three months.
*H. rufipes* (Degeer) W., 17/7/48, under stone, 8/6/50.
*Acupalpis dorsalis* (Fabricius) PH., 20/8/49; [Saltings, 7/6/50.]
*Stenolophus mixtus* (Herbst) W., 6/6/50, at grass roots, several spns., 6/51.
[*Bradycellus ruficollis* (Stephens), Welwick, 18/7/48.]
*B. verbasci* (Duftschmid) W., 15/8/49, grass tufts (J.S.), 22/6/51.
*B. harpalinus* (Serville) W., 17, 18/8/49, under stones (J.R.D.), 22/6/51.
*Trichocellus placidus* (Gyllenhal) W., 5/6/50, 2 spns. (J.S.).

*Dicheirotrichus gustavi* Crotch S.M., *Atriplex*, 6/50. Abundant in all three months, under seaweed, stones and debris, etc., on F.
*Amara plebeja* (Gyllenhal) M.M., 3/6/50; W., M.R., 8/6/50.
*A. similata* (Gyllenhal) W., 11/6/50, 6/51, !; S.M., 16/6/51.
*A. ovata* (Fabricius) M.R., 6/51, 1 spn. (J.H.F.); W., 6/51. 1 spn. near cottage (O.G.).
*A. communis* (Panzer) W., 6/51, 1 spn. (J.H.F.).
*A. aenea* (Degeer) W., 6/6/50; S.M., 10/6/50, 6/51 !!, 1 green form (J.H.F.); M.R., 6/51 !!
*A. familiaris* (Duftschmid) W., F., M.R., S.M., common during all visits, under stones and in grass tufts.
*A. tibialis* (Paykull) S.M., 16/6/47, 19/7/48, 16/6/51 !; M., 19/7/48; in rabbit warren on railway, 6/51.
*A. bifrons* (Gyllenhal) F., 17/7/48, tidal refuse.
*A. apricaria* (Paykull) D., 17/6/47; W., 19/8/49.
*A. fulva* (Degeer) W., 17/8/49.
*A. aulica* (Panzer) F., 5/6/50; W., 7/48, 8/49, on flowers of *Senecio* at night.
*A. convexiusculus* (Marsham) F., 17/7/48, tidal refuse; W., 19/8/49, under a stone.
*Feronia cuprea* (Linnaeus) W., 15/8/49, grass tufts, 6/6/50; F., 3/6/50, 17/6/51.
*F. longicollis* (Duftschmid) F., 17/7/48, tidal refuse (J.S.), 6/51; W., 6/51; Seacliff, 6/51 (J.H.F.).
*F. macra* (Marsham) D., 14/8/49; W., 1948/9 !; M.M., 9/6/50.
*F. nigra* (Schaller) W., railway, 8/6/50.
*F. melanaria* (Illiger) D., 18/7/48; W., 22/7/48, under stone.
*F. nigrita* (Fabricius) PH., 20/8/49.
*F. strenua* (Panzer). Vegetable debris in cultivated field near PH., 9/6/50.
*F. diligens* Sturm D., 18/7/48.
*F. madida* (Fabricius) W., 18/7/48, under stone.
*Calathus fuscipes* (Goeze) W., 17/7/48, under stone, 8/6/50.
*C. ambiguus* (Paykull) S.M., 6/51 !! (O.G., J.H.F.).
*C. melanocephalus* (Linnaeus) F., 17/7/48, under stones; W., 8/6/50, at grass roots.
*C. mollis* (Marsham) M.R., W., abundant in the more sandy places, under stones, etc., during all the visits.
*Agonum gracilipes* (Duftschmid) W., 1 spn. under a stone 22/6/51 (J.H.F.).
[*A. marginatum* (Linnaeus) Saltings, 7/6/50, on mud of dried up pond.]
*A. viduum* v. *moestum* (Duftschmid) P.M.M., 10/6/50; PH. 21/6/51.
*A. ruficorne* (Goeze) P.M.M., 10/6/50.
*A. dorsale* (Pontoppidan) F., 11/6/50. 1 dead spn.; W., 15/8/49, 5/6/50.
*A. fuliginosum* (Panzer) D., 8/7/48; PH., 23/7/48.
*A. thoreyi* Dejean, PH., 18/7/48 1 spn. (J.S.); 24/6/51 1 spn. (W.D.H.).
*Risophilus monostigma* (Samouelle) M.H., 15/6/47; M.R., 20/6/51.
*R. atricapillus* (Linnaeus) W., D., M.H. !! All visits.
*Dromius linearis* (Olivier) M.H.! All visits; S.M., 13/8/49, tidal refuse; M.M., M.M., 4/6/50; W., 3/6/50, 6/51.
*D. melanocephalus* Dejean W., 6/6/50, 24/7/48, in nest of Field Vole; M.H., 6/7/48, in rabbit burrow on railway; D., 10/6/50 !!
*D. notatus* Stephens W., 16/8/48, 6/6/50; M.H., 18/8/48, 15/6/47 !!; F., !, 6/51.
*Metabletus foveatus* (Geoffroy) W., 17/7/48, 6/6/50, under stones; F., 17/7/48, tidal refuse.
*Microlestes maurus* (Sturm) W.! all visits; PH., 8/6/50; Humber banks, 3/5/50; D., 14/8/49.

## IX. COLEOPTERA, STAPHYLINIDAE

W. O. STEEL

In the introduction to the Coleoptera report, Mr. W. D. Hincks (*antea*, p. 132) notes that nearly 200 species of *Staphylinidae* have been taken during the Y.N.U. Entomological Section's visits to Spurn. Including the 1952 material, the total is 199, plus one further species (*Achenium depressum* (Gr.)) taken at Kilnsea Saltings. This figure certainly includes casual immigrants, but the majority of the species recorded are breeding there.

At first glance, this total appears abnormally large for an area such as the Spurn Peninsula which seems wholly unsuitable for a beetle population of any size. However

if one takes into consideration the feeding habits of the *Staphylinidae* (these are discussed below under the sub-family headings) and the fact that most of them live in situations which are to a large extent protected from the weather, i.e., have relatively stable microclimates, it can more easily be understood. It must, nevertheless, be noted that the weather, particularly the rainfall, can have a marked effect on the abundance of many species. For example, in July, 1948, there was plenty of water in the Phragmites area of Kilnsea Warren and many Staphylinids, notably *Atheta fallax* (Kr.), were very common. On the other hand, in July, 1952, this area was very dry (as was most of the peninsula) and, though the same species were present, they were there in much smaller numbers, one, *A. luteipes* (Er.), being apparently absent. The rainfall for the months April-June, 1948, was some 130 per cent. of average, that for the same period in 1952 was only 70-80 per cent. of average.

As full details of the habitats, etc., of the species encountered are given in the accompanying list, no discussion of them is necessary here. It is, however, worth drawing attention to the following species which are normally regarded as rare. All of them, with the exception of the *Lamprinodes*, occur on the peninsula in numbers *Carpelimus foveolatus* (Sahl.), *Bledius tricornis* (Hbst.), *B. occidentalis* Bondr., *Quedius obliteratus* Er., *Lamprinodes saginatus* (Gr.) and *Atheta fallax* (Kr.).

My best thanks are due to the various members of the Spurn party who have helped by passing on specimens or records.

MICROPEPLINAE

This group which contains five British species is here treated as a sub-family of the *Staphylinidae*, though it probably represents a separate family. The British species appear to feed solely on moulds.

*Micropeplus porcatus* (Fabricius) S.M., 18/6/47, by sweeping, 2 exx.; W., 6/50, by sweeping, 1 ex.; wet place on sea cliffs, 13/7/52, 1 ex.

*M. fulvus* Erichson PH., 17/6/51, in straw refuse, 1 ex.

PROTEININAE

*Proteinus* and *Megarthrus* are apparently saprophagous* or phytophagous and are usually found in dung or decaying vegetable matter. *Metopsia*, however, appears to have very different habits from these. Several attempts have been made to find the larva of this last genus, so far without success.

*Metopsia gallica* (Koch) M.H., W., D., S.M., common at roots of vegetation.

*Proteinus ovalis* Stephens D., 18/6/51, on mud, 1 ex.

*Megarthrus depressus* (Paykull) PH., 6/51, a few exx. in horse dung.

OMALIINAE

These insects are at least partially saprophagous or phytophagous, as has been proved by an examination of the gut contents of various species. It seems likely, whoever, that some may also be predaceous—examination of the gut contents will not help here, as no chitin is ingested by predaceous species and what is eaten is apparently wholly liquid.

*Hapalaraea floralis* (Paykull) F., 18/6/47, in decaying seaweed, 1 ex.

*Omalium rivulare* (Paykull) F., in decaying seaweed, not common.

*O. riparium* Thomson F., in decaying seaweed and in carrion.

*O. caesum* Gravenhorst W., 5/6/50, on window of cottage, 2 exx.; D., 6/51, on mud, a few exx. [Welwick, 20/6/47, at roots of vegetation in salt marsh].

*O. excavatum* Stephens W., 19/8/49, in grass tufts, 2 exx.; M.M., 6/51, not uncommon [Welwick, 28/6/47, at roots of vegetation in salt marsh].

*Lesteva heeri* Fauvel PH., common in reed debris; D., sometimes common at roots of vegetation [L.B.D., in reed debris and at roots of vegetation].

*L. longo-elytrata* (Goeze) wet place on sea cliff, 21/6/51, 1 ex.

OXYTELINAE

Mainly phytophagous or saprophagous insects. As far as the Spurn species are concerned, *Bledius* lives solely on diatoms or algae, several *Oxytelus* spp. and *Platystethus arenarius* (Fourc.) feed mainly on dung and the *Carpelimus* spp. and *P. cornutus* (Gr.) are probably, to some extent, algal feeders. Some species of *Oxytelus* and *Carpelimus* have been recorded as seriously damaging seedlings of various plants.

* Saprophagous is used to denote feeding on dead material of either animal or vegetable origin.

*Carpelimus bilineatus* Stephens PH., common; F., occasionally in tidal refuse.
*C. pusillus* (Gravenhorst) PH., 6/50, a few in stable refuse (Kilnsea saltings, 7/52, not uncommon on mud).
*C. foveolatus* (Sahlberg) D., adults and larvae very common; S.M., occasional specimens. The larvae of this species, together with those of *Ochthebius* spp. and *Bledius germanus* undoubtedly form a great part of the food of the *Carabidae* living in Walker Butts Bank Dyke.
*C. corticinus* (Gravenhorst) PH., P.P.A., common on mud.
*Oxytelus sculptus* Gravenhorst F., 6/47, in decaying seaweed; PH., 9/6/50; occasional specimens elsewhere, not common.
*O. laqueatus* (Marsham) PH., 6/50, a few exx. together with *Oxytelus* larvae in horse dung.
*O. sculpturatus* Gravenhorst common in dung and carrion throughout the area, often taken on the wing; sometimes common in tidal refuse.
*O. inustus* Gravenhorst as *sculpturatus*.
*O. nitidulus* Gravenhorst not uncommon in dung, carrion and tidal refuse throughout the area, also taken on the wing and on the seashore (also at Kilnsea saltings).
*O. tetracarinatus* (Block) M.M., in cow dung; S.M., D., occasionally elsewhere, apparently not common.
*O. rugosus* (Fabricius) not uncommon in dung and tidal refuse; PH., 7/48, a few exx. in reed debris; occasional specimens elsewhere.
*Platystethus arenarius* (Fourcroy) wet places on sea cliffs, 7/52, a few exx.
*P. cornutus* (Gravenhorst) wet place on sea cliff, 7/52, 1 ex. [Kilnsea saltings, 7/52, very common on and in burrows in mud. This species was not present, or only present in very small numbers, in this area in 6/50 and 6/51. It certainly could not have been overlooked if present in anything like the numbers found in 1952].
*Bledius tricornis* (Herbst) S.M., a large colony. In dry weather, the mud in this area is very cracked, the top inch or so being completely dried out and very hard (the hard crust can easily be lifted off the damper mud below). This, however, does not appear to affect the beetle. Young larvae are often found in this top hard portion, whereas older larvae, pupae and adults prefer the damper parts lower down. The eggs appear to be generally laid about a quarter of an inch below the hard crust. A number of pupal cells contained empty cocoons of a parasitic Hymenopteron very similar to those of a species of *Leptopygus* (Ichneumonidae-Thersilochini) which parasitises *Bledius germanus* Wagner, in Anglesey. From experiences at Spurn, the males appear to be very difficult to obtain, only one having been taken in the six visits. This may be generally the case as Joy had apparently never seen a male when he stated (*A Practical Handbook of British Beetles*, London, 1932:140) ' male with thorax simple ' i.e., without a horn in front.
*B. germanus* Wagner (=*limicola* Tottenham) D., common; P.P.A., a small colony was found on the bank of this pond in 6/50 but this now appears to have died out. (Common at Kilnsea saltings; scattered small colonies on the salt marsh at Welwick.)
*B. occidentalis* Bondroit P.P.A., a small colony in the clay banks of this pond. In 7/52, the water in the pond was very low and the small area of the banks where the beetle occurs had been badly kicked by horses which use the water for drinking Also, there appeared to be a marked increase in the vegetation. It may be, therefore, that conditions in a few years' time will not be suitable for the survival of this species. As the pond is in a bomb crater and therefore not more than 12 years old, an intensive search was made of the area to find out if the insect was breeding elsewhere, but no colonies were found. So far as I have been able to ascertain, it has not been recorded from Lincolnshire or Yorkshire.
*B. opacus* (Block) S.M., 6/47, a very small colony which has not been found since and appears to have died out.

STENINAE

Very little is known regarding the habits of the *Steninae*, but the general opinion is that they are predaceous. *Stenus* larvae are very difficult to find and only one or two have been recorded in the literature. One larva (species unknown) was, however, taken on the bank of the crater pond in the Phragmites area in 6/51, in company with large numbers of *Ochthebius* larvae.

*Stenus bimaculatus* Gyllenhal PH., 6/51, a few specimens on mud amongst the reeds.
*S. juno* (Paykull) PH., common; occasional specimens taken elsewhere, mainly by sweeping.
*S. clavicornis* (Scopoli) M.H., M.S., W., M.R., not uncommon at roots of vegetation, also taken by sweeping.
*S. pusillus* Stephens P.P.A., not uncommon on banks of pond.
*S. crassus* Stephens PH., 9/6/50, 2 exx.
*S. nigritulus* Gyllenhal wet place on sea cliff, 21/6/51, 1 ex.
*S. brunnipes* Stephens M.H., M.S., D., PH., common at roots of vegetation; W., common in grass tufts.
*S. nitidiusculus* Stephens M.H., 8/49, 1 ex.
*S. impressus* Germar as *brunnipes*.
*S. ossium* Stephens M.H., occasional specimens; S.M., 15/6/47, at roots of vegetation, 1 ex.
*S. similis* (Herbst) W., M.M., occasional specimens at roots of vegetation.
*S. fulvicornis* Stephens M.M., 20/7/48, 4 exx. at roots of vegetation in company with *brunnipes*.

PAEDERINAE

This sub-family is very poorly represented at Spurn, further species of *Lathrobium* and at least one *Paederus* sp. might well be expected to occur there, but this is not the case. The adults and larvae of all the species are predaceous.
*Astenus longelytratus* Palm PH., D., not uncommon in vegetable debris; M.M., in straw heap.
*A. pulchellus* (Heer) S.M., F., in debris, not common.
*Rugilus orbiculatus* (Paykull) S.M., M.M., W., in debris, only occasional specimens seen.
*Sunius propinquus* (Brisout) W., 8/6/50, in nest of mouse, 1 ex.
*Lithocharis ochraceus* (Gravenhorst) PH., 6/50, in stable refuse, a few exx.
*Lathrobium fulvipenne* (Gravenhorst) W., D., PH., not common. The var. *letzneri* Gerhardt has also been taken.
*L. punctatum* (Fourcroy) (=*brunnipes* (Fabricius)) PH., occasional specimens in reed debris.
*L. longulum* Gravenhorst P.P.A., 8/49, 6/50, 6/51, a few exx. on the bank of the pond; P.M.M., 10/6/50, on bank of pond, 1 ex.
[*Achenium depressum* (Gravenhorst) Kilnsea saltings, 7/6/50, 1 ex.].
*A. humile* Nicolai on sea cliff, 17/6/51, 1 ex.

STAPHYLININAE

These are all predaceous and some of the species appear to show food preferences. The dung-frequenting *Philonthi*, for instance, feed almost entirely on Dipterous larvae which they search out and seem to have no interest in the other insects present.
*Xantholinus semirufus* Reitter (=*meridionalis* auctt.) W., PH., inlets in sea cliffs, mainly under stones, not uncommon at times.
*X. linearis* (Olivier) occurs under stones, at roots of vegetation and in debris over most of the area.
*X. longiventris* Heer W., D., PH., not uncommon.
*X. glabratus* (Gravenhorst) W., F., under stones; M.M., in cow dung; occasional specimens only.
*X. fracticornis* Müller F., in tidal refuse; M.M., PH., in straw heaps; not uncommon.
*X. angustatus* (Stephens) W., under stones; F., in tidal refuse; occasional specimens only.
*Gyrohypnus laeviusculus* (Stephens) W., under stones; S.M., in moss; not uncommon.
*G. angustus* Stephens (=*melanocephalus* (Gravenhorst)) W., 8/49, a few exx. in grass tufts.
*G. myrmecophilus* (Kiesenwetter) S.M., 10/6/50, in moss, 1 ex.
*Philonthus splendens* (Fabricius) PH., M.M., common at times in dung; F., in tidal refuse, occasional specimens.
*P. tenuicornis* Mulsant and Rey (=*carbonarius* (Gyllenhal)) M.M., 6/50, a few exx. in straw refuse.
*P. succicola* Thomson W., under stones, a few exx.; F., S., at times common in carrion.

(*To be continued*)

## YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1952

### LOFTUS, V.C. 62, May 30th—June 2nd

**Mammals** (R. Chislett): Many more stoats than weasels appeared on the keeper's 'gibbet.' R. M. Garnett identified otter's footprints by the Lockwood Reservoir, and J. P. Utley came across a badger's sett.

**Ornithology** (R. Chislett): The ornithologists were highly satisfied with a headquarters surrounded by lawns, flowering shrubs, conifers and ponds, with the twin becks of Grinkle and Roxby within strolling distance, and further woods and extensive moorlands quite near, and with Boulby Cliffs less than three miles away. The achievement of identifying eighty species in three days appears to be a new record for a Y.N.U. meeting. Much of our success was due to Mr. Slater's local knowledge, but the facts testify to the possibilities of the area which we far from exhausted. Numerous woods and attractive places were not explored.

It became apparent on the Friday evening that the twin ghylls (Grinkle and Roxby) were rich in small bird life, which also proved to be so in the Loftus woods.

Along the Boulby Cliffs, Herring Gulls, House Martins, Jackdaws and Fulmars seemed a strange combination to be breeding together in numbers. Kittiwakes and Cormorants had their own quarters. Doves flew around in small parties, most of them showing affinities with escaped homing pigeons. Linnets were numerous on the cliff-top. A few Rock-Pipits occurred, and one male Wheatear.

The Lockwood Reservoir showed little of interest beyond a pair of Sandpipers, and some Lesser Redpolls about the pines, but on the surrounding moors, Curlews and Golden Plovers had young, and a Merlin demonstrated.

As the whole area has been so little worked except by K. Maclean and R. Slater the species noted are listed in full: Carrion Crow, Rook, Jackdaw, Magpie, Jay, Starling, Greenfinch, Goldfinch, Lesser Redpoll (in several places), Linnet, Bullfinch, Chaffinch, House and Tree Sparrow, Yellow and Reed Bunting, Skylark, Tree and Meadow-Pipit, Rock-Pipit, Grey (one) and Pied Wagtail, Great and Blue, Coal and Marsh Tit, Goldcrest, Spotted Flycatcher, Chiffchaff, Willow Warbler, Wood Warbler, Sedge-Warbler, Garden Warbler, Blackcap, Whitethroat, Lesser Whitethroat (nest found), Mistle-Thrush, Song-Thrush, Blackbird, Wheatear (one), Whinchat, Redstart (nest found), Robin, Hedge-Sparrow, Wren, Dipper (three nests found), Swallow, House-Martin (numerous on the cliffs), Sand-Martin (one), Swift, Nightjar (eggs found), Green and Great-Spotted Woodpecker (nest found), Cuckoo, Tawny Owl, Merlin (one), Kestrel, Sparrow-hawk, Mute Swan, Mallard (brood seen), Cormorant (*c.* 25 nests), Fulmar, Wood-pigeon, Stock Dove, Rock Dove, Turtle Dove, Golden Plover, Lapwing, Oystercatcher (party of ten), Common Sandpiper (one pair), Curlew (several pairs), Snipe, Herring Gull, Kittiwake (*c.* 200 nests), Guillemot (one oiled bird), Moorhen, Grouse, Common Partridge, Pheasant. The Corn-Bunting was noted commonly near to Saltburn. Among the species we failed to note although known to occur were the Long-tailed Tit, Tree-Creeper, and Teal.

**Flowering Plants and Ferns** (Miss C. M. Rob and R. Lewis): As in the case of the 1905 visit of the Union to Loftus, botanists were once again in the minority. The first of the two writers could only attend on the last day, and the second on the last two days.

On the first day Lockwood Reservoir and the adjacent moorland and woods were explored. The only plant of special note was *Trientalis europaea* L. On the second day the second of the writers joined the party who explored the coastal area between Hummersea and Staithes. The only plants of interest noted were *Dryopteris Borreri* Newm., the dominant fern in the disused Alum Quarries near Street Houses, and *Brassica oleracea* L. which is still plentiful on the cliffs at Staithes. On the last day both writers jointly explored the densely wooded valleys on either side of Ridge Lane, and examined some of the streams and boggy ground on Roxby High and Low Moors. Among the plants seen during the day were *Vicia sylvatica* L., *Coeloglossum viride* (L.) Hartm., *Carex pendula* L., *C. dioica* L., *C. pulicaris* L., and *Botrychium Lunaria* (L.) Sw. In addition to the above the second of the writers visited the woods in the area of the Liverton Mines, near Loftus, on the evening of

the second day. In this area *Vicia sylvatica* L. and *Carex pendula* L. were both noted in quantity.

The following is a list of the more local plants noted during the weekend:
*Ranunculus peltatus* Schrank Roxby Beck.
*R. hederaceus* L. Pond, Roxby Low Moor.
*Cardamine amara* L. Roxby Beck Woods.
*Brassica oleracea* L. Cliffs at Staithes.
*Vicia sylvatica* L. Woods, Roxby Beck and Liverton Mines.
*Geum intermedium* Ehrh. Easington Beck Woods.
*Alchemilla glabra* Neyg. Open places, Easington Beck Woods.
*Galium mollugo* L. Grassland, Easington Beck.
*Asperula odorata* L. Easington Beck Woods.
*Crepis paludosa* (L.) Moench. Roxby Beck Woods.
*Campanula latifolia* L. Roxby Beck Woods.
*Trientalis europaea* L. Wood in Lockwood Reservoir area.
*Myosotis secunda* A. Murr. Roxby Low Moor.
*M. sylvatica* (Ehrh.) Hoffm. Roxby and Easington Beck Woods.
*Veronica montana* L. Easington Beck Woods.
*Pinguicula vulgaris* L. Roxby Low Moor.
*Carex dioica* L. Roxby Low Moor.
*C. pulicaris* L. Roxby Low Moor.
*C. pendula* L. In woods, Easington and Roxby Becks, and at the Liverton Mines.
*C. rostrata* Stokes Roxby Low Moor.
*Botrychium Lunaria* (L.) Sw. Grassland, Easington Beck.
*Dryopteris Borreri* Newm. The dominant fern in the disused Alum Quarries at Street Houses, near Loftus.
*Equisetum telmateia* Ehrh. Easington Beck Woods.
*E. sylvaticum* L. In a boggy field Roxby Low Moor.
*Chara delicatula* Ag. Roxby Beck.

In the preparation of this report we have adopted the nomenclature of Clapham, A. R., ' Check-List of British Vascular Plants,' *Journ. Ecol.*, **33** No. 2 (1946), 308-47, with the exception of the *Chara* for which Allen, G. O., ' British Stoneworts ' (1950) has been adopted.

## LITTON, V.C. 64, June 14th

Despite the difficulty of transit to Litton due to the restricted bus service, some thirty members were present on this excursion, and 14 societies responded to the roll-call. The botanical report made it evident that this area is full of interest, and a visit at some other time of the year would be of value.

**Ornithology** (R. Chislett): The birds expected were duly seen. With undergrowth very wet some woods were not explored, or the list of 37 species identified might have been extended. Chaffinches, Willow-Warblers and Redstarts were scarce. All three species of Wagtails were numerous, especially the Yellow, some of which were feeding young up to an altitude of *c.* 1,200 feet. Ring-ousels had young in nests on the gill-sides, four being duly ringed. Wheatears were conspicuous, many of them with broods already on the wing. A Merlin appeared. Oystercatchers were noted and were known to be breeding. A fortnight-old Curlew was ringed. Golden Plovers and Lapwings obviously had young. Two Dunlins fed by Birks Tarn.

**Flowering Plants** (W. A. Sledge): Heseltine Gill is a good example of a high limestone gill. The stream is fringed by trees—principally Ash—for part of its course and is partly open and treeless. In no part is it so heavily wooded as Ling Gill. The slopes are steep and though the rock faces are nowhere more than a few yards high they afford protection from grazing animals and carry a varied flora. The London Pride (*Saxifraga umbrosa* L.) for which this locality has so long been famous, was seen in two parts of the gill nearly half a mile apart. *Actaea spicata* L. was seen in three or four different parts of the gill and *Draba muralis* L. occurs in

the tributary gill above the main colony of London Pride. Other plants seen were mostly species characteristic of the Craven limestone gills. These included:

*Selaginella selaginoides* (L.) Link.
*Asplenium viride* Huds.
*Polystichum aculeatum* (L.) Roth.
*Cystopteris fragilis* (L.) Bernh.
*Thalictrum minus* L. ssp. *montanum* (Wallr.) Clapham
*Helianthemum chamaecistus* Mill.
*Geranium sylvaticum* L.
*Alchemilla glabra* Neyg.
*Prunus Padus* L.
*Saxifraga hypnoides* L.
*Parnassia palustris* L.
*Galium pumilum* Murr.
*Scabiosa Columbaria* L.
*Hieracium* spp.
*Primula farinosa* L.
*Myosotis sylvatica* Ehrh.
*Pinguicula vulgaris* L.
*Salix phylicifolia* L.
*Poa nemoralis* L.
*Helictotrichon pubescens* (Huds.) Pilger.

The best find of the day was made by Miss R. Kilby, who discovered *Arenaria gothica* Fr. It was growing on wet stony ground above the gill, associated, as at Selside and Sulber with *Sedum villosum* L. and corresponding exactly with the conditions which it favours in its Ribblesdale stations. The new locality is about five miles from its nearest station in Ribblesdale and at a slightly higher altitude than the highest station there.

Mr. Utley collected Cloudberry (*Rubus chamaemorus* L.) from the moors near Birk Tarn, and *Botrychium Lunaria* (L.) Sw. were also seen in the course of the day.

**Mosses and Liverworts** (J. Appleyard): Heseltine Gill has been well worked by bryologists in the past so that a new record by Miss Mattinson, namely, *Moerckia flotowiana* (Nees) Schiffn. was all the more pleasing. Well towards the head of the gill *Orthothecium rufescens* (Brid.) B.&S. was seen growing in great beauty and profusion, falling in masses of a rich reddish colour down a vertical face of limestone rock.

The rare moss *Zygodon gracilis* Wils. was plentiful on a wall near Giant's Grave but the material was rather poor. A little was also seen lower down the gill. *Plagiopus oederi* (Brid.) Limpr. was common, conspicuous by reason of its fruit and *Tortella tortuosa* (Hedw.) Limpr., a characteristic moss of the mountain limestone in Yorkshire, grew in large bosses among the boulders. In a small tributary gill *Dichodontium pellucidum* (Hedw.) Schp. var. *flavescens* (Turn.) C. Jens, was collected.

*Eucladium verticillatum* (With.) B. & S. and *Gymnostomum recurvirostrum* Hedw. were seen but neither was fruiting. Also observed were *Trichostomum brachydontium* Bruch. var. *cophocarpum* (Schp.) Richards & Wallace and *Mnium longirostrum* Brid.

On and among wet rocks where a rivulet runs down to join the main stream were *Aplozia cordifolia* (Hook.) Dum., *A. sphaerocarpa* (Hook.) Dum. and *A. riparia* (Tayl.) Dum. *Preissia quadrata* (Scop.) Nees, *Lophozia incisa* (Schrad.) Dum., and *Scapania aspera* Dernet were among the other hepatics noted.

## TOPCLIFFE and LECKBY CARR, V.C. 65, June 28th

**Ornithology** (J. P. Utley): The area covered by this excursion formed almost as big a contrast to that examined on the 14th June as could be found in Yorkshire. Most of the ground explored on this occasion was in the neighbourhood of 70 feet above sea-level, whilst in Littondale altitudes exceeding 2,000 feet were attained.

A number of aspects were provided such as: the River Swale, cutting deep through alluvial deposits; the 'liable to flood' lands adjoining; Leckby Carr, with its lowland peat, birch wood, bracken and rhododendron; Rush Wood, which is literally a wood growing out of water; the Rookery, being mainly a mature hardwood plantation with bramble undergrowth; low lying open fields with considerable *Juncus*; cultivated land and the garden areas around Asenby village. Taken as a whole this was a location from which a number of species could be expected and this anticipation was verified by the reports.

A total of 60 species were noted as follows: Carrion Crow, Rook, Jackdaw, Magpie, Jay, Starling, Greenfinch, Lesser Redpoll, Linnet, Chaffinch, Yellow Bunting, Reed Bunting, House Sparrow, Tree Sparrow, Skylark, Tree Pipit, Meadow Pipit, Pied Wagtail (very few) Tree Creeper, Great Tit, Blue Tit, Marsh Tit, Long-Tailed Tit, Spotted Flycatcher, Willow-Warbler, Grasshopper Warbler, Sedge-Warbler, Garden-Warbler, Blackcap, Whitethroat, Mistle Thrush, Song Thrush,

Blackbird, Whinchat, Redstart, Robin, Hedge Sparrow, Wren, Swallow, House Martin, Sand Martin (most numerous bird), Swift, Nightjar, Kingfisher, Cuckoo (seen, but not heard), Little Owl, Mallard (with young), Teal (with young), Little Grebe, Wood Pigeon, Stock Dove, Turtle Dove, Curlew, Snipe, Lapwing, Black-headed Gull, Moorhen, Coot, Pheasant and Partridge. There were very few game birds.

Of the birds mentioned in the circular those not seen were Goldfinch, which was almost sure to be in the locality, and Heron, whose absence was probably due to the presence of human fishermen ! I have seen the bird in the area on several occasions.

Bullfinch and Corn Bunting have been seen in the district at other times, and there was evidence of Woodpeckers having been about quite recently though none were recorded.

**Flowering Plants** (Miss C. M. Rob): The Union's visit to this once famous botanical area was favoured by the weather, the temperature being rather too high for comfort. In spite of the poorness of the Carr itself, the area covered was very interesting. Unfortunately the attendance was poor, which was disappointing in view of the central situation of the meeting and quite good transport facilities. Only half those present did the whole round, those who did were rewarded by refreshments generously provided by R. Blair, Esq., one of the many landowners who gave permission to cross their land.

The ground covered consisted of grass and arable land, waste ground by the River Swale, several boggy fields, the Carr proper and the wood across the Helperby road. The variety of habitats provided a rich flora, but only one of the many rare plants that once flourished in Leckby Carr, now survives. This can no longer be considered carr, except for a very small area at the south end which is rapidly becoming ordinary birch wood. Most of the ground is now dry woodland which was felled in the first World War and has now gone derelict. In the lower parts a few small patches of *Sphagnum* still persist but the ditches are for the most part quite dry. One small pond remains in the north-west corner but it was possible to cross most of this without any difficulty and it appears to be getting overgrown with *Juncus* and *Molinia*. Here grows the last of the rare plants *Lysimachia thyrsiflora*, which was flowering sparsely. The plant is very much less abundant than in 1936.

In contrast to the drying up of the Carr, the wood across the Helperby road is now very wet. This extreme wetness if of recent occurrence and so far has had little effect on the trees, mostly Poplars, but it seems likely that another winter will show a marked change in the area, unless some drainage takes place. The land between Leckby and Asenby by way of Aram Grange is very wet in the lower parts and it seems unlikely that any extensive drainage will be attempted owing to the contour of the ground.

The flora of the district was very interesting, though rare plants were not noted. The River Swale and its banks had a large number of common plants; *Ranunculus fluitans* Lam. was plentiful in the shallower parts, *Sagittaria sagittifolia* L. and *Butomus umbellatus* L. were in small quantity, also *Potamogeton pectinatus* L., *P. perfoliatus* L., *Saponaria officinalis* L. and *Schoenoplectus lacustris* (L.) Palla. In a damp spot in one field near Asenby, a few plants of *Crepis paludosa* (L.) Moench. and *Carex disticha* Huds., were seen. The former is a rare plant in the lower part of the Swale drainage area. No plants of *Trollius* which formerly occurred in this spot, were found. *Malva moschata* L. and *Carex Pairaei* F. Schultz were by the road near the Carr, the latter also occurred in the lane opposite.

The Carr to-day is dry wood with *Dryopteris austriaca* (Jacq.) Woynar, *Pteridium aquilinum* (L.) Kuhn and *Chamaenerion angustifolium* (L.) Scop. Isolated patches of *Sphagnum* remain, with a few areas of bare peat. The shrubs comprise *Rhododendron ponticum* L. some of which was dying off, *Frangula Alnus* Mill. now confined to one corner and there looking very unhappy, *Betula pubescens* Ehrh. and a few Oaks. In the only remaining bit of wet ground, *Carex curta* Good. and *Eriophorum vaginatum* L. were still to be found but in small amounts. The area was very well worked but no signs of any of the rare plants of former visits were seen.

In the wet wood across the Helperby road, the plants seen included *Salix pentandra* L., *Ribes rubrum* agg., *R. nigrum* L. and *Solanum dulcamara* L.

In contrast to the very wet ground of this wood a field on the left of the track to Aram Grange had a typical dry ground flora, with *Thymus serpyllum* L., *Hieracium*

*Pilosella* L., *Galium hercynicum* Weigel., *Hypericum pulchrum* L. and *Veronica officinalis* L.

Arable fields in this part of the district were very weed-free and the only noteworthy plants were *Galeopsis speciosa* Mill. and *Geranium dissectum* L. In the swampy fields near Aram Grange the following were noted: *Salix repens* L., *Valeriana dioica* L., *Carex hostiana* DC., *C. pulicaris* L. and *C. lepidocarpa* Tausch. *Thalictrum flavum* L., *Senecio sylvaticus* L., *Geranium pusillum* Burm. and *Lamium amplexicaule* L. were other plants of interest noted on the excursion.

**Mosses and Liverworts** (J. Appleyard): Although the Topcliffe area is not rich in species, especially hepatics, owing to the different types of habitat visited e.g., crumbling lias rocks, peaty ground and marshy ground, the ecological variation was quite interesting. On the lias by Asenby stream there was a good deal of *Barbula tophacea* Brid. (Mitt.) in fruit, also *Cratoneuron filicinum* (Hedw.) Roth., *Dicranella varia* (Hedw.) Schp., *Funaria hygrometrica* Hedw. and *Conocephalum conicum* (L.) Dum. The *Funaria* looked out of place on the wet rock.

On stones down by the stream there was *Hygroamblystegium fluviatile* (Hedw.) Loeske and *Amblystegium juratzkanum* Schp. The dried up ground of Leckby Carr was unable to sustain any of the moisture-loving species other than a few miserable patches of *Sphagnum*. *Orthodontium liniare* Schwaegr. was established on tree roots in the Carr. *Tetraphis pellucida* Hedw. and *Aulacomnium androgynum* (Hedw.) Schwaegr. were common. Other bryophytes seen in the Carr were *Campylopus fragilis* (Turn.) B.&S., *C. piriformis* (Schultz) Brid., *Plagiothecium undulatum* (Hedw.) B.&S., *Marchantia polymorpha* L., *Lophocolea heterophylla* (Schrad.) Dum., *L. bidentata* (L.) Dum. and *Calypogeia trichomanes* (L.) Corda.

In the marshy meadowland and on boggy ground there were very few bryophytes. A small amount of *Acrocladium stramineum* (Brid.) Richards and Wallace was collected in which the leaves all the way up the stem had bundles of rhizoids growing from them. The one important find of the day was from wet ground in a meadow. This was *Amblystegium kochii* B.&S., new to V.C. 65.

## HATFIELD, V.C. 63, July 12th

Our visit soon found evidence that the Moor was far drier than in 1887, when the Union was last there. Many plants such as Bog Myrtle, Cross-leaved Heath, Purple Moor grass and Cotton Grass were evidence of a wetter period and what little water now remains will soon have gone through the activities of the British Moss Litter Company.

About half a dozen car loads of members and friends representing seven Societies dispersed widely over the Moor once we had succeeded in finding our way to Lindholme. Botany was well represented but the most interesting plants seen were not on the Moor itself which yielded nothing of moment. The general opinion expressed by all sections at the meeting later in the day was one of disappointment. Future visitors to the area are advised to keep to the outskirts of the Moor.

**Flowering Plants** (W. A. Sledge): Hatfield Moor is now much too dry to afford suitable conditions for marsh or bog species and for variety of species the dike sides round the margin of the moor are undoubtedly the best collecting grounds though these were not visited on this occasion. The first part of the day was spent in walking across the Moor from Lindholme to the southern border. The principal plants in this area are Bracken, *Molinia, Calluna, Eriophorum vaginatum, Agrostis canina* and, less frequently, *Erica Tetralix*. Birch is abundant over much of this part but frequent fires prevent the development of tall woodland. Oak (*Q. Robur*), Willow (*S. atrocinerea*), Sweet Gale (*Myrica*) and Alder Buckthorn (*Frangula Alnus*), are also present. *Calamagrostis canescens* (Weber) Roth is plentiful by dikes on the southern fringes of the Moor and doubtless occurs elsewhere where sufficient ground water is available.

After returning to Lindholme the remainder of the afternoon was spent in examining the dry sandy ground about the farm and the arable fields and moorland to the east and north. On the sandy ground near the farm *Ornithopus perpusillus* L. and *Plantago coronopus* L. were noted and an abundance of *Galeopsis speciosa* Mill. was a feature of the weed flora of the cornfields which also yielded *Vicia tetrasperma* (L.) Moench and *Centaurea cyanus* L. *Geranium pusillum* L. and *Sagina ciliata* Fr.

were also seen on dry ground by the peat railway track to the north, and *Conium maculatum* L. was an abundant plant by ditches and field borders. Mrs. Hoyle who succeeded in locating the large pond to the east of Lindholme which eluded most of us, recorded *Oenanthe aquatica* (L.) Poir., *Sagittaria* and *Typha angustifolia* L. from there and also found *Stellaria nemorum* (L.) Vill. Since the meeting I have received specimens of *Ranunculus Lingua* L. and *Rumex maritimus* L. sent from the borders of the Moor by Mr. W. Bunting.

**Mosses and Liverworts** (Mrs. J. Appleyard): Whatever it may have been in the past, the part of Hatfield Moor visited during this meeting is now of no interest to the bryologist. The chief moss is *Polytrichum commune* Hedw. There is a little *P. piliferum* Hedw. on the dry heath and *Cephalozia connivens* (Dicks.) Lindb. was seen on damp peat. *Drepanocladus fluitans* (Hedw.) Warnst. was present sparingly in a dried up ditch, and *Marchantia polymorpha* L. was abundant in one place, with both male and female inflorescence. No other species were observed.

**Ornithology** (F. C. Griffith): Owing to the time of year very few birds were seen, which was more or less as expected.

Three pairs of Woodlark (feeding young) were the most unexpected find. On the pond east of Lindholme farm a pair of Great Crested Grebe with four youngsters were noted, also Coot and Moorhen. Other birds recorded: Kestrel, Sparrow Hawk, Tawny Owl, Little Owl, Sedge Warbler, Swallow, Sand and House Martins, Swift, Willow Tit, Blue Tit, Great Tit, Chaffinch, Greenfinch, Carrion Crow, Green Woodpecker, Wood Pigeon. Altogether rather a poor day.

**Entomology** (C. A. Cheetham and A. C. Hoyle): A fresh breeze kept down most of the insects and there was little to record at the end of the day, though better conditions combined with better entomological representation would no doubt have resulted in a different story. Caterpillars of Cinnabar Moth were very numerous on Ragwort and Meadow Brown, Small Heath, Ringlet and Large Skipper Butterflies were noted, also Forester Moths (*Procris statices*).

A few Tipulid flies were seen on the sides of the deep peat cuttings, the odd ones caught being *Tipula lateralis* Mg., a usual insect on damp stream sides, and *Prionocera turcica* Fab., a daddy with saw-like antennae. The only other species noted were the Limnobid *L. meigeni* and *Dolichopus longicornis* Stann. The latter, which also occurs on Thorne Waste, was taken in a wet dyke with stream.

**Freshwater Biology** (H. Whitehead): The only water seen was at the bottom of the deep drains cut in the peat. A sample taken with *Sphagnum* in it yielded only a few Ostracods. Test papers gave about *p*H 5.

Mr. Cheetham took one caddis—*Limnephilus luridus* Curt. No other aquatic insect was seen.

## LEVEN, V.C. 61, July 26th

**Ornithology** (G. H. Ainsworth): The ornithological party probably made up by experience a little of what it lacked numerically and spent a most enjoyable day along the quiet water of this disused canal.

Few birds could be identified by sight owing to the thick growth of sedges, grasses, nettles and leafy bushes, but as we slowly made our way along the unfrequented bank on this warm, sunlit day, stopping now and again to admire the beauty of the blue dragonflies hovering above the white water lilies, or to delight in the glory of the purple loostrife we were able to identify many of the birds by their calls.

Surely on few of the Y.N.U. excursions has lunch been taken to the accompaniment of the ' wet-my-lips,' ' wet-my-lips ' of the Quail, but that was our experience. Our chairman heard the call and immediately identified the bird—he had known it well in Switzerland—and as we sat the bird or birds came nearer to us.

Reed Warblers were there and as numerous as they appear to be in all parts of the East Riding, where phragmites grow thickly. Now and again we disturbed young Sedge Warblers not long from out of their nests.

Corn Buntings in nervous agitation on the look-out post on the top of some bush gave us reason to believe that their nests or fledged young were near at hand.

Excited Moorhens called their young from off the water plant leaves to the shelter of the reed beds as we approached, whilst Sand Martins, House Martins, and Swallows skimmed the water and Swifts flew high overhead.

Although the heat of the day and the difficulty of walking through the dense growth necessitated our shortening the planned route, over 30 species of birds were identified and included, in addition to those already mentioned, Carrion Crow, Rook, Jackdaw, Starling, Greenfinch, Lesser Redpoll, Linnet, Yellow Bunting, Reed Bunting, Skylark, Spotted Flycatcher, Willow Warbler, Whitethroat, Blackbird, Hedge Sparrow, Kestrel, Sparrow-hawk, Little Owl, Wood Pigeon, Turtle Dove, Lapwing, Black-headed Gull, Common Gull and Common Partridge.

**Flowering Plants** (Miss E. Crackles): A most interesting and profitable day was spent studying the flora of the northern bank of Leven Canal and adjacent fields for some two miles from the Leven end.

*Galinsoga parviflora* Cav. was seen to have become established as a troublesome weed in the garden of the Canal House. Other species of interest found as casuals near the buildings at the head of the canal were: *Sisymbrium officinale* (L.) Scop. var. *leiocarpum* DC., *Papaver dubium* L., *Scandix pecten-veneris* L., *Matricaria chamomilla* L., *Chrysanthemum segetum* L. and *Alopecurus myosuroides* Huds.

At the edge of the canal the most important species were *Scirpus lacustris* L., which forms large beds, *Sparganium ramosum* Huds., *Carex Otrubae* Podp., on the edge of the bank, *C. elata* All., *C. rostrata* Stokes, and *Glyceria maxima* (Hartm.) Holmb. Other species noted in this zone include: *Oenanthe fistulosa* L., *Sium latifolium* L., *Polygonum amphibium* L. and *Carex vesicaria* L.

Of aquatic plants the White and Yellow Water Lilies made a fine show as, did Arrowhead (*Sagittaria sagittifolia* L.) and the Water Plantain (*Alisma plantago-aquatica* L.). One or two flowering spikes of *Butomus umbellatus* L. were noted a week earlier but not on the day of the meeting.

Species found on the wetter parts of the canal bank included: *Hypericum tetrapterum* Fr., *Sagina nodosa* L., *Lotus uliginosus* Schkuhr., *Lythrum salicaria* L., *Angelica sylvestris* L., *Lysimachia nummularia* L., *Lysimachia vulgaris* L., *Lycopus europaeus* L., *Scutellaria galericulata* L., *Inula dysenterica* L. and *Achillea ptarmica* L. *Thalictrum flavum* L. was noted in a nearby dyke.

From Leven to just beyond Sandholme, the bank had been subject to a certain amount of grazing. Beyond this point *Calamagrostis canescens* (Weber) Roth., and *Phragmites communis* Trin. dominate the scene. Here *Calamagrostis neglecta* (Ehrh.) Gaertn. *et al.*, was seen flourishing in its recently discovered station; also a patch of plants believed to be the hybrid *C. canescens* × *neglecta*.

The marshy edge of a field just beyond the Swing Bridge yielded some species uncommon in Holderness: *Isolepis setacea* (L.) R.Br., *Carex echinata* Murr., *C. ovalis* Good and *Catabrosa aquatica* L. Other species found here include: *Triglochin palustris* L., *Stellaria uliginosa* Murr., and *Juncus bufonius* L., with *Alopecurus geniculatus* L. and *Glyceria fluitans* L. dominating the vegetation of the wetter parts. *Hydrocotyle vulgaris* L. was present in another marshy area.

For a short period at the end of the day some of the party investigated the vegetation of the canal by means of a boat. The following species were recorded: *Ceratophyllum demersum* L., *Myriophyllum spicatum* L. (in flower), *Hippuris vulgaris* L., *Potamogeton natans* L., *P. lucens* L., *P. Friesii* Rupr., *P. crispus* L., *Lemna trisulca* L., *L. minor* L., and *Elodea canadensis* Michx. A subsequent boating trip revealed the presence of a large bed of *Myriophyllum verticillatum* L., also *Apium inundatum* (L.) Rchb. and *Hottonia palustris* L. were noted.

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**Respiration in Plants,** by **Walter Stiles** and **William Leach.** Third Edition. Pp. viii+172 with ten diagrams. Methuen's Monographs. Methuen & Co., Ltd., 10/6.

As the last edition of this useful work appeared in 1936 considerable changes have been necessitated; for in no branch of plant physiology have recent advances in knowledge been more rapid than in plant respiration. The chapter on the mechanism of respiration—which now occupies nearly half the book—has been largely rewritten and brought up to date in the light of recent work on the subject and the changed outlook which these developments have produced. Several important alterations and additions have been made to other parts of the book which has been thoroughly revised throughout.

## BOOK REVIEWS

**Downs and Dunes: Their Plant Life and its Environment** by **Sir Edward Salisbury.** Pp. xiv + 328 with 74 photographs, 93 line drawings and diagrams, and 54 distribution maps. G. Bell & Sons, Ltd., 1952, 45/-.

Downland and duneland habitats have certain features in common which make it appropriate that their plant ecology should be discussed in one volume. Both are characterised by their porous, well aerated soils and both are normally basic in reaction. Thus despite wide dissimilarities in other respects, the two habitats are alike in physical and chemical characteristics of great ecological importance. In this book Sir Edward Salisbury describes the plant life of open downs and beech-woods, of chalk scrub and limestone pasture, and of young and old sand dunes and dune slacks, relating the structure of the plant communities to the soil and other conditions of the environment.

One of the problems raised by the porous nature of the substratum in chalky and sandy soils is that of water supply and especially the ability of plants to survive the drought conditions liable to be experienced during the summer months. The treatment of this problem is one of the best features of the book. In both habitats the plants present are either shallow rooted species, mostly annuals, or deep rooted perennials. The former complete their period of activity before midsummer and thus evade drought conditions. The latter rarely if ever evince signs of water deficiency and this is related to the fact that at depths of twenty inches in chalk pasture the supply of water is relatively constant even in summer droughts, while internal dew formation in dunes accounts for a constant, if moderate, supply of moisture at two to three feet even in prolonged summer droughts. A large number of determinations and careful drawings of the extent and depth of penetration of the underground parts show clearly how well adapted to their requirement are the root systems of the perennial species. Rest Harrow and Sea Holly may, for example, draw upon soil moisture from five to six feet below ground level.

Many other aspects of the vegetation in relation to its environmental conditions are discussed and the operation of significant ecological factors is explained by means of numerous field observations and quantitative data. The succession in time of the flora of sand dunes and the process of formation, fixation and stabilisation of dunes is traced from the pioneers of the youngest dunes to the complete carpet of plants which clothes the oldest. These changes are related to changes in the soil due to the accumulation of organic matter and consequent increase of water-retaining capacity followed later by the leaching away of carbonates and progressive change in soil reaction. The account of each distinctive type of vegetation is supplemented by notes on the morphology, biology and geographical distribution of the more abundant or characteristic species.

Most of the descriptions of calcareous grasslands and woods refer to those developed on chalk soils. In the chapter on limestone vegetation a short account is given of the carboniferous limestone flora of Northern England. This is evidently much less familiar to the author as several errors occur in this chapter. Rock Rose is stated to be ' very rare ' on the Yorkshire limestones—a complete reversal of the truth. *Polygala amara* is not confined to Teesdale, nor is Teesdale situated in Northumberland! Wayfaring Tree and Old Man's Beard are not constituents of the limestone scrub in Yorkshire and *Carex digitata* is not an Upper Teesdale species though *C. ericetorum,* which is elsewhere stated to be confined to the eastern counties, is.

The distribution maps also contain errors and omissions besides greatly exaggerating areas of distribution in many cases through blacking-in entire vice-counties on the strength of the occurrence within them of isolated stations of small extent. *Trifolium suffocatum* and Lizard Orchid have both been found in Yorkshire, but the inclusion of *Aceras* in the same county merely perpetuates an old error and the Pasque Flower has been extinct in this county for over 70 years. (A map showing correctly its distribution was available in one of the works quoted in the bibliography.) It is unfortunate that the author did not take the precaution of submitting these distribution maps for comment to some one well versed in topographical botany.

Nearly all the information in this book is already available to students in published papers, many of them due to the author's own research or that of his former students. Its value lies in the manner in which this information has been assembled and presented in terms which are readily understandable by any ordinary reader and which in combination with the admirable photographs and drawings will add understanding to appreciation of the types of country described. W.A.S.

**An Angler's Entomology,** by **J. R. Harris.** *New Naturalist Series,* No. 23. Pp. 268, with 32 plates in colour and 16 in black and white. Collins, 1952, 25/-.

This book is well worthy of its place in the *New Naturalist* series and will doubtless become one of the most popular of the entomological volumes. It makes a strong appeal to all fly-fishermen and will be found very useful and attractive to many entomologists who are not anglers. As its title indicates however, it is intended to be entomology for anglers and the author never loses sight of this, his main purpose.

The subject is treated in serious scientific vein. Most books dealing with flies and fishermen are concerned with angling in relation to insects and not insects in relation to angling. As a result they are usually merely expressions of opinion, or dogmatic assertions; they do not seriously search for truth, nor systematise it as does Mr. Harris. The fly-fisherman will be interested in this book even if he is not prepared to make the serious effort of study which alone can bring the deepest satisfactions. However, the angler who is prepared to make such effort will become a very considerable authority on his subject. He will be confident of the reality of his knowledge and unafraid to express himself even to the most experienced of his club friends. Furthermore he will be able to assess the real value of much that now ranks as uncritical angler's lore, and to discriminate between the valuable and the useless in the mass of ' rule of thumb ' learning acquired by years of experience.

The first two chapters are in the nature of a general introduction to entomology. The reviewer found these a trifle dull and the average angler may find them difficult and unrewarding. If others should find them dull or difficult they should on no account allow themselves to be deflected from pursuing the remainder of the book. Chapters 3 to 9 deal with the natural history of the mayflies, those which inhabit weeds, those in the stones, and those in the mud. Their structure, habits, and ways of life are dealt with in fascinating style and the angler who would know something of his drakes and duns and spinners will find all he could wish for. Chapters 10 and 11, together with Appendix B, are concerned with the collecting and naming of specimens and will enable an intelligent angler with some patience and application to become truly expert in the identification of natural flies. Chapters 12 to 14 deal with other kinds of flies of some interest to anglers. These include the caddis flies or sedges, the stone flies and certain gnats and midges. These are dealt with as effectively and interestingly as the mayflies.

The third part of the book, Chapters 15 to 19, is a more direct application of entomological studies to fish and fishing. A list of anglers' flies correlated with the scientific names of their natural counterparts is a courageous undertaking. Its value to anglers is self-evident since it enables them to know, when discussing flies, whether they are really talking about the same thing. As an expansion of this list there are detailed descriptions of the natural flies arranged in order of their normal times of appearance on the water. Finally, with an appendix giving a list of fly dressings, the fly-fisherman is in a position to tie flies as correct imitations or to purchase flies with discrimination and a real knowledge of what he wants.

This is truly a fly-fisherman's book, one that cannot fail to be of absorbing interest, a worthy companion to the evening pipe after a hard day on the river.

The colour plates, as well as the plates in black and white, are well up to the standard of the *New Naturalist* series and will materially assist in identifying specimens.

H.H.

**The Origin and History of the British Fauna,** by **Bryan P. Beirne.** Pp. x+164, with 60 maps. Methuen & Co. 1952, 18/-.

The fauna of the British Isles has been investigated more thoroughly than that of any other area of equivalent size, and in no other comparable geographic unit is found such a remarkable assemblage of species of diverse habits and ecological requirements. This book provides a competent outline of the probable origin and development of this fauna with especial reference to the Lepidoptera, birds and mammals. Although some species may have survived continuously from early Pleistocene or even Pliocene times, there have been so many glacial phases since then that it is impossible to reconstruct with confidence the history of any existing species before the beginning of the last glaciation. The present populations of an ice-age survivor may be the descendents of two or more glacial phases. In addition many species have changed their habits with changes in the food plants available.

Most British species have reached these islands from the continent of Europe,

many by aerial migration, others by human transport; a few were originally marine. The majority however, have come by overland migration during the periods when the British Isles formed part of the European mainland. Once forest covered the land except for the mountain-tops, fens and marshes; now less than five per cent. is tree-covered, and only a small proportion of this comprises natural woodland. The native fauna is consequently predominantly sylvan, and artificial preservation of woodlands as game reserves has enabled many species to survive locally. It is cheering therefore to read that it seems improbable that any significant number of animal species will be exterminated for a long time to come.

The book is lavishly illustrated with useful maps, but some are almost unnecessary as they record distributions which could be conveyed adequately in a few words. In their place, illustrations of some of the species discussed would have added to the interest of the work. Well-written, although in text-book style, the subject matter of this volume holds considerable intrinsic biological interest. Its chief drawback may prove to be that it presents almost too much detail for the school-teachers and ecologists for the needs of whom, according to the publishers, it will serve, and at the same time fails to provide enough data for the specialist on one particular group. Nevertheless, however dry their presentation, the graphic events of the ebb and flow of the Pleistocene ice-sheets and their effect upon the fauna of our country should not fail to hold the reader's interest.

J. L. Cloudsley-Thompson.

**Animal Ecology,** by **W. H. Dowdeswell.** Pp. 207, with 16 plates and 45 text figures. Methuen & Co., 12/6.

Ecology has been styled scientific natural history but in bringing discipline and method to the enthusiasm of the naturalist a fascinating hobby becomes an exacting but absorbing study and an ardent collector acquiring masses of field data is converted into a skilled and trained observer, appreciative of the significance of his observations and using his details to establish and elaborate scientific principles. It is not enough to collect, identify and classify, for information regarding the environment is needed before real knowledge and understanding of living organisms can be attained. Adaptations as well as affinities must be studied, habits and habitats must be known, associations and distributions must be investigated, and the individual in relation to its physical and living environment must be examined in a most intimate manner. All these cover a wide biological field and as the basis of ecological study provide a measure of appreciation of the dynamic relationships involved and even of the processes of evolution itself.

It is both desirable and advantageous therefore to encourage and stimulate those with an interest in natural history to become students of ecology at an early stage and the publication of this book is both timely and valuable from this point of view. It is intended for school sixth forms and first year University students, and although it gives a useful general introduction to the subject some advanced reading will be needed to appreciate with advantage all the topics presented and the examples given. Simpler arrangement would have aided clearer presentation and more familiar examples could have been chosen with profit. After an explanation of the scope of the subject the influence of ecological factors upon the distribution of animals is considered. A general outline of the features of animal communities follows, and attention is given to special associations such as parasitism and symbiosis, and characteristics of particular environments and their fauna such as the shore and fresh water. Some guidance is given with regard to practical work, but it is unfortunate that, in spite of many virtues, more emphasis upon fundamentals has not been introduced at the expense of the wide variety of topics touched upon with inadequate explanation and co-ordination. A useful list of books and references is given.

E.A.S.

**Furred Animals of Australia,** by **Ellis Troughton.** Pp. xxxii+376, with 25 plates, 4th (revised) edition. Angus & Robertson, Sydney & London, 1952, 30/-.

A few additions have been made to the 'Introduction,' but otherwise the composition is similar to that of the previous edition. For those who wish to have an idea of the variety, distribution and habits of the interesting mammalian fauna of Australia and adjacent islands, this is a valuable book. The illustrations are quite satisfactory for their purpose and are numerous. Mention is made of the effects of

various introductions of European mammals, particularly of carnivores, on the native mammals; and Troughton is among those who are vitally concerned about the chances of survival of many of the more vulnerable natives. Those who have no knowledge of the book and who wish to make acquaintance with an introductory manual to the mammals of Australia will be interested to know of the range—Monotremes, Marsupials, Dingo, Whales, Dugong, Seals, Rodents, Bats.

E.P.

**Curiosities of Animal Life,** by **Maurice Burton,** illustrated by **L. F. Savage.** Pp. 224, with 40 line drawings. Ward, Lock & Co. 17/6.

It must not be supposed that the author of this book has sought out only the bizarre and unusual to justify his title. The curiosities described are those which are familiar and regularly encountered by biologists but which nevertheless provide intriguing topics for discussion of wide interest to laymen as well as biologists. Structure, methods of feeding, migration, hibernation, etc., are all dealt with in a manner which can readily be followed. There is however a tendency to ascribe a less complete knowledge of some of these occurrences to the workers concerned than is actually the case, and one feels that the range of topics has been so wide that justice cannot be done to the facts which have been gathered about some of the problems. Some of the incidental botanical information is much over-simplified and the description of photosyntheses on page 24 gives a picture which portrays no hint of the great complexity of this process; and again the inference that the pollen is identical with the sperm (on page 189) is one that could easily have been avoided. The reader will nevertheless find much to fascinate and perhaps stimulate since many of the subjects can be studied by comparatively inexperienced observers. The book is very pleasantly written and there are few typographical errors—the principle exception noted being on page 158 on which ' 30° C. ' must read ' 10° C.' if the remaining statements are to make sense.

J.H.E.

**Caddis.** A short account of the biology of British Caddis flies with special reference to the immature stages, by **Norman E. Hickin.** Pp. x+50, with 4 plates in colour and 75 line drawings. 1952, *Field Study Books,* Methuen & Co., 9/6.

**The British Amphibia and Reptiles,** by **L. Harrison Matthews.** Pp. x+54 with 4 coloured plates and 33 text figures. *Field Study Books,* Methuen & Co., 9/6.

**Oaks and Oak Woods,** by **A. G. Tansley.** Pp. viii+50, with 4 coloured plates and 20 text figures. *Field Study Books,* No. 7. Methuen & Co., 9/6.

The aim of these *Field Study Books* published under the auspices of the Council for the Promotion of Field Studies, is to make the study of various aspects of natural history both instructive and interesting to non-experts without descending to superficiality. The high standing in their respective fields of each of the authors of these works is alone a guarantee of the soundness and reliability of the books.

Dr. Hickin's accurate and detailed work on the structure of larvae and pupae of British Trichoptera is well known to entomologists. This little book is a simplified epitome of the author's published papers on Caddis flies and is illustrated by some of the excellent line drawings taken from these. Features essential for the recognition of larvae and pupae are described in simple terms and shown in keyed drawings. Keys are given for the identification of families of larvae and pupae. In view of the fact that about only one-fifth of the immature stages of British Caddises have been described it is impossible to go into further details. There are useful notes on collecting, rearing and preserving specimens, and a short chapter is devoted to suggestions for further research. Some of the problems outlined could be undertaken by a careful and painstaking naturalist with a reasonable hope of success. The short title ' Caddis ' is perhaps a trifle misleading as the book deals almost entirely with immature stages. Reference to winged insects is limited to three and a half pages which include Mosely's key to families. As a clear, accurate and interesting account of caddis larvae and pupae this book can be recommended to the field naturalist and to the fisherman.

Dr. Matthews' book bears virtually the same title as the *New Naturalist* monograph recently reviewed in this magazine but is by no means the same in its content. The two books might indeed be said to be complementary since the major portion of

the work under review is devoted to considering the physiology and morphology of these little-known, if common, creatures in a manner which differs markedly from Dr. Smith's treatment of the subject. The information imparted in this section of the book is concise and precise, serving as a useful introduction to the subject. The second section deals with the natural history of the British species in systematic order and is on the whole a satisfactory account though perhaps owing to the need for brevity, Dr. Matthew's indulges in some unduly positive statements. Thus he says that the Natterjack pairs enter the water to lay eggs only at night which may be generally true but not the case in Lancashire colonies. He repeats the common but misleading statement that the Grass Snake ' never ' bites whereas ' seldom ' would be a better word, and his supposition that the Sand Lizard may have been introduced into its Lancashire haunts shows that he is unaware of the extent of the animal's distribution in this area during the last century. The nuptial display of the adder is inadequately treated. In a brief note of the many problems still awaiting solution, Dr. Matthews reiterates how little is known of commonplace events especially in the lives of the amphibians.

Sir A. G. Tansley's reputation in the field of plant ecology is a sufficient guarantee of the competence of his account of oaks and oakwoods. His survey covers the structure, quality and uses of the timber, parasites on the oak, the distribution of the two species, the types of oakwood and the soils they grow in. A few doubtful or inaccurate statements occur, e.g. ' Sandy soils may even consist almost entirely of lime ' and the text figures 5 and 6 represent damaged twigs whose terminal has suffered injury. Some of the terms used may not be familiar to all readers and a glossary of these and a list of sources of futher information would have been useful. In this and Dr. Matthews' book the coloured illustrations doubtfully justify their expense if they contribute substantially to the rather high price of these works.

**Collins' Pocket Guide to British Birds,** by **R. S. R. Fitter** and **R. A. Richardson,** with Foreword by Peter Scott. Pp. 240, with over 1,000 illustrations, 600 in colour. Collins, 21/-.

The plan of this book is highly original. Whilst it will fit into a jacket pocket, the emphasis is on ' Guide,' especially for those without knowledge of bird classification. Birds are divided according to habitat, and ' land birds,' ' water-side birds,' and ' water birds ' are ordered according to length, beginning with ' very short ' and passing through ' short ' ' medium short,' ' medium,' ' medium long,' ' long,' ' very long,' to ' huge.' There are also similarly graded groups for ' wing-lengths,' ' wing-ratios,' ' tail-ratios,' ' neck-ratios,' ' leg-ratios,' and ' bill-ratios.' Abbreviations indicate the group of each species under the heading of structure. Each species is also dealt with in respect of salient features of plumage, movement, voice, field-marks, flocking, habitat, and range and status. At the end are 44 pages of ' key ' with instructions how to use it. The system is that of finding the common denominator.

Considerable ingenuity has been used, and extends to Mr. Richardson's excellent illustrations in colour (64 pages) and monochrome (48 pages). Each colour-plate includes a number of species, often of both sexes and juveniles, that have similarities of colour, marking, or size, and on each appears a silhouette to scale of the House Sparrow. The monochrome plates principally show birds in flight, and species whose plumage is mainly black and white.

The scope is comprehensive and includes all British species known to have occurred more than 50 times. Occasional rarities (128) are listed. Migration is summarised in a table covering the year. A vast amount of information has been admirably selected and skilfully compressed. This product of Mr. Fitter's learning and industry, and of Mr. Richardson's very considerable artistic ability, can be recommended to anyone. To learn how to use the key will not be difficult, and even those with knowledge of genera occasionally need a book with which ' you just flick over the pages until you get the appearance of the bird in question.' The half-dozen lines concerning each species labelled ' Field Marks ' are very apt, and to many will be the most useful part of the book, used in conjunction with the illustrations.

The plan used has the effect of separating related species if they differ in habitat or size, but there is an index which also covers the illustration pages. The book is undeniably a good ' guide,' and I know of no book so well and completely illustrated at the price. Even after a field student has found the need for a book arranged system-

atically that includes the rarities, and is studying at isolated places where such occur most frequently as passage migrants, he will probably still find this book useful.

R.C.

**Stories from a Bird Watcher's Log,** by **W. W. Nicholas.** Second Edition. Pp. 262, with 53 photographs by the author. Clegg & Son, Ltd., Bradford, 1952, 12/6.

Although the second edition does not appear to differ materially from the first (published 1945, and not 1942 as stated), yet the re-issue of this non-technical book about watching birds must be welcomed. While at times Mr. Nicholas must have encountered considerable trouble in getting his photographs, his writing indicates that he loves watching birds chiefly because of the interest and pleasure given by the occupation.

Mr. Nicholas not only makes it clear that patient and consistent watching is essential in obtaining the true ' home life ' of birds but that the results justify the time spent. Observing the Chough at close quarters is delightfully recorded.

In the ' Stories ' there are no assertions on debatable points and they do not send the reader off on side tracks. The notes about the differences of sex in those species usually classed ' sexes alike ' are interesting; though the author admits being unable to separate male and female Coots. The title of the first chapter, ' The Charm of Birds ' is maintained to the end of the book.

The photographs are good and well reproduced while the type used is easy to read.

J.P.U.

**Transformations of Butterflies and Moths,** by **L. Hugh Newman.** Pp. 256, with 8 colour plates and 146 photographs. Ward, Lock & Co., 30/-.

This is primarily a picture book; but what pictures ! The cult of bird photography has been so assiduously and expertly pursued in recent years that one has grown accustomed to the very high combination of artistic and ornithological standards which have been achieved. In this book the same high standards are applied to butterflies and moths and their caterpillars. Thirty species of butterfly and forty-three species of moths are depicted showing, on opposite pages, close-up photographs of the caterpillar and adult insect. These are reproduced to a size which brings out clearly those features, either of physical characteristics or habitat, which specifically identify the caterpillar or imago. There are in addition eight very fine colour plates by Anthony Moore based on the work of the eighteenth century Dutch artist Jan Christiaan Sepp, portraying twenty-eight species. The descriptive matter gives concise information on the feeding season, size, colouring and habits, and food plants of the caterpillar, and general remarks on the adult insect. Though there is little which will be new in this to the experienced lepidopterist, no one interested in butterflies or moths will be able to turn the pages of this handsomely produced and beautifully illustrated book without coveting a copy.

**British Pyralid and Plume Moths,** by **Bryan P. Beirne.** *Wayside and Woodland Series.* Pp. 208, with 405 figures, of which 216 are reproductions of direct colour photography. Frederick Warne & Co., 1952, 21/-.

The *Wayside and Woodland* series of nature books published by Messrs. Frederick Warne, are familiar to most naturalists, and the *Butterflies and Moths of the British Isles* by Richard South first published in 1906 and 1907-08 respectively, have proved invaluable to both the beginner and experienced lepidopterist alike. But these volumes, which have run through several editions and many impressions, only deal with the so called ' macrolepidoptera,' and the need for a similar work on the much-neglected smaller moths has been long felt. Indeed the absence of any comprehensive and up-to-date book on the subject has no doubt contributed to this neglect.

Dr. Bryan Beirne has tackled this problem of the smaller British lepidoptera by compiling a work on the pyralid and plume moths, which is now published as a companion volume to those by Richard South. Nothing but the highest praise can be bestowed on Dr. Beirne's work in which he covers all that is known concerning the life history, ecology and distribution of each species. He also gives most useful keys, and figures of wing pattern, and wing neuration in order to assist in identification, together with very ingenious and instructive sketches showing the typical habitats and food plants of the larvae. The book closes with a useful bibliography including local lists, glossary and a comprehensive index.

To the beginner particularly, coloured illustrations are invaluable for identification and undoubtedly much of the success of the *Wayside and Woodland* series is due to their excellent plates. In the book under review, however, a critical examination of the plates gives rise to a feeling of disappointment, as here and there the specimens are either out of register or have a washed-out appearance rendering identification difficult. It is to be hoped that these defects will be rectified in any future editions.

To sum up, Dr. Beirne and his publishers are to be congratulated on placing in the hands of the lepidopterist an invaluable text-book on the British pyralids and plume moths that is certain to stimulate the study of the smaller moths which as Dr. Beirne has estimated, has lagged about sixty years behind that of the macrolepidoptera.

ARTHUR A. LISNEY.

**The Spider's Web,** by **Theodore H. Savory.** Pp. 154, with 27 plates. F. Warne & Co. 12/6.

This is one of the well-known *Wayside and Woodland* series of works on natural history, and a companion to the same author's *The Spiders and Allied Orders of the British Isles*. It will appeal however to a wider circle than to systematists, and will delight many who have never so much as dreamed of studying spiders as such. Here are no vague generalities, no flights of imagination; the interest and, we may say, the admiration are gained and held from the first page to the last, by the treatment of the subject, which is as well-ordered as a book of Euclid. The author rigorously sticks to his text, 'the spider's web,' although it is obvious that he has resisted many temptations to digress.

Comparative analyses of the chemical constituents of the spider's thread and silk showing how they differ and where they agree, their relative strength and elasticity, are given and various deductions are drawn therefrom. The various kinds of web from the simple to the more elaborate are described and there follows a discussion of the reason or reasons why these forms have been adopted. The different theories which have been put forward from time to time are examined with commendable fairness, and while discounting speculation, the author leaves the reader to assess their validity, giving his opinion that 'none of the problems can really be said to be finally and satisfactorily solved.'

Hints on the preservation of webs, the use of photography, and obtaining webs from captive spiders bring this fine work to an abrupt end, except for a well-chosen bibliography and a necessary glossary.

The lepidopterist may demur to a statement made on page one which, however, is modified and partially corrected on page 27. The plates are extremely good, as are also the text figures, although some difficulty will be found in following the explanation of figs. 27 and 28.

The publishers deserve to be congratulated on the production of this book, arrangement, proof-reading, indeed, every part of its get-up: all are excellent.

E.G.B.

**Systematics of Flowering Plants:** an Introduction, by **Patricia Mann.** Pp. xii+307, with 182 text figures. Methuen & Co., 18/-.

The greater part of this book is devoted to accounts of the floral morphology and systematic characters of twelve families of Angiosperms being those listed in the syllabus for the General Certificate of Education Examination. The characteristics common to each family are first enumerated followed by a "discursive account' dealing with the systematic position, chemistry, vegetative propagation, economic value, variation and classification of the family, and concluding with an account of pollination mechanisms. Vegetative and floral characters, including floral diagrams of the principle genera are fully illustrated by numerous clear accurate line drawings. Morphological terms used are fully explained and illustrated in a separate section and there is a useful chapter giving practical instruction on the construction of floral diagrams. The introductory section on the principles of classification outlines the history of systematics, the problems inherent in phylogenetic schemes and the taxonomic significance of cytology, polyploidy and genotypic variation.

The book is intended for top forms at schools and elementary classes at universities and colleges and as such can be unreservedly recommended. Despite the

numerous text-books on botany there was still room for a work wholly devoted to systematics on this level. The concise treatment of the families described and admirably executed drawings should materially help teachers as well as pupils to achieve a better understanding and higher standard in this field of botanical study.

W.A.S.

**A Hand List of the Plants of the London Area, Parts I and II,** compiled by **D. H. Kent** and **J. E. Lousley.** Part I, pp. xii+40, with a map and 2 plates: Part II, pp. 41-112, with 2 plates. *London Naturalist,* Reprints No. 70 and 73. Copies obtainable from H. A. Toombs, c/o British Museum (Natural History), Cromwell Road, S.W.7, or from D. H. Kent, 75 Adelaide Road, London, W.13. 2/6 per part.

The first two parts of this list of London plants include the families Ranunculaceae to Rosaceae inclusive. The London area as here defined covers a circle of twenty mile radius centered on St. Paul's Cathedral, and thus includes all of Middlesex and parts of Kent, Surrey, Essex, Hertfordshire and Buckinghamshire. In spite of the alarming rate at which the country has been overrun by buildings during the present century, a large and interesting flora is still to be found in the widely diverse habitats within the area. Though the authors of this work do not claim that it is more than a compilation of records accruing from the activities of past and present members of the London Natural History Society, it is in effect a Flora, for the habitat, frequency and status are given for each species as well as recorded stations inclusive of herbarium citations. As might be expected a large number of aliens figure in the work. The records are very condensed and if space considerations precluded records for each vice-county starting on a fresh line, then ease of reference would have been considerably increased by appropriate typographical discrimination of vice-county numbers without the needless repetition of 'V.C.' prior to each The competence both of the editing and the general taxonomic standard of the work is what one would expect of two such able and experienced systematic botanists.

**Mem. Geol. Survey; Special Reports on the Mineral Resources of Great Britain.** Vol. IV, **Fluorspar** (Fourth Edition) by **K. C. Dunham.** Pp. 143. H.M. Stationery Office, 1952, 17/6.

Britain produces about 65,000 tons of fluorspar annually, mainly for the metallurgical industry with the principal mines in Durham and Derbyshire. In this volume, the occurrence of the mineral in nearly 200 mines in Great Britain is described although for the majority of them, the interest is purely historical. It is, however, suggested that in some cases, the dumps left from early lead mining may repay re-working. Yorkshire readers will find interest in the descriptions of old mines in Swaledale, Wensleydale and Wharfedale with a useful Plate showing their areal distribution, but they may not recognise Trollers Gill under the name 'Trotter's Gill.'

The general conclusion reached is that British reserves of fluorspar are very limited and it may be doubted whether the publication of such an extensive volume at the enhanced price is justified merely to give negative results.

H.C.V.

**The Bay,** by **Gilbert C. Klingel.** Pp. x+278. Victor Gollancz, 12/6.

The bay about which Mr. Klingel writes in this book is Chesapeake Bay, between Maryland and Virginia. This great area of water with its innumerable estuaries and creeks, bays, points, coves and indentations, he knows intimately from twenty years of sailing its waters and wandering among its fringing marshes, beaches and woods. He knows it below water as well as above for he has spent many hours on the floor of the bay in diving equipment patiently watching its underwater life.

Much of the book is devoted to the creatures of this region, their manner of life and personal observations on their habits and behaviour. He writes with equal knowledge and familiarity about jelly fishes, tunicates and barnacles, fiddler crabs, marine worms and fishes, or about the birds, and especially the swans, bald eagles, great blue herons and ospreys which frequent some parts of the shores. Many observations were made beneath the surface in diving helmet and from his 'bentharium,' a steel cylinder in which he was able to sit and watch the varied stream of creatures which passed in front of the window and observe remarkable phosporescence effects.

Mr. Klingel is a trained zoologist with considerable literary ability. His writing reflects his intense love of the bay as well as his intimate knowledge of its topography and fauna. Time and scientific training have not dulled his fervour or aesthetic appreciation. He writes sensitively and with sincerity and though occasional passages tend too plainly to strain after effect he succeeds in his object of portraying vividly the character of the region he describes as well as the fascinating animal life which inhabits it.

W.A.S.

**The White Lady,** by **Leonard Dubkin.** Pp. 136. Macmillan & Co. 8/6.

This is not an easy book to review in the columns of a scientific journal. It is not an imaginary story of the life of a bat nor is it a scientific book such as might have been written by an experienced field naturalist. It is in fact a curious mixture of sentiment and observation, centering around a very unusual experience that befell the author.

The scene is laid near the shore of Lake Michigan when a solitary locust tree threw out branches to form a sort of tent or grotto. Penetration was difficult but once inside the author became aware of a musty smell and the presence of a colony of bats of the species *Myotis lucifugus*. The colony consisted of about 250 females, mostly with young and was in August augmented by the arrival of the males. Pairing took place in mid-September and the colony moved to undiscovered winter quarters on October 17th. Early in May of the following spring the females returned to the grotto and on May 28th the author witnessed the birth of an albino—The White Lady.

It would not be fair to the author to carry on the story in any detail but a close study was made of this individual and of its homing instincts, until mid-October, when the bats again left the grotto for their winter quarters. During the winter the locust tree was cut down as part of a clearance scheme and there the story ends.

The reader may wish, as did the reviewer, that the author had made even more of this rare opportunity but the book is recommended to all interested in the winged mammals.

E. W. Taylor.

**Filmstrip: Our Birds.** Notes by **Sydney Rogerson,** Illustrations by **Charles Tunnicliffe.** Distributed by Educational Productions, Ltd., East Ardsley, Yorkshire, 25/-.

Here are 32 half-size frames in 'Dufay-Chrome' of three groups of selected British birds. The pictures are from the original, mainly excellent, coloured engravings of Charles Tunnicliffe. Most of these will probably be more useful than direct black and white photographs to a careful teacher, and they are certainly good enough to be used in rapid identification tests in the class room.

It would be difficult, perhaps, to find any educational use for the notes which are issued with the film-strip. The man who knows his birds will surely throw the pamphlet away, and the beginner will learn little, though he will be puzzled by the slip-shod phraseology. He will read that the mistle-thrush 'usually likes to sing in the teeth of a gale of wind or rain,' 'the song-thrush lines its nest with a smooth coating of mud or dung so that it holds water,' 'the nightingale is a bird 'with a lovely song, a thrilling gurgle at night,' and so on.

The accepted method of writing the names of birds has been changed for the worse in some cases, and with no apparent reason. We read of Red Start, Green Finch, Bull Finch, Red Shank, etc., up to a total of ten, but Jackdaw, Kingfisher, Lapwing and others have been left unchanged. It would perhaps be safer to issue such useful film-strips with a list of names of species only, and leave the getting-up of appropriate notes to the individual.

W.R.G.

**Filmstrip: Summer Moths (1).** Photography and Notes by **G. E. Hyde.** Educational Productions Ltd., East Ardsley, Yorkshire, 15/-.

This filmstrip of 28 frames depicts 15 species of moths in larval or adult condition or both, and includes one frame of moths on a 'sugar' patch and one showing the wood-boring capabilities of Wood Leopard caterpillars. The photographs are good and the notes on habits, habitats and distribution are clear and accurate, and should be adequate for teachers wishing to describe some of the moths which may be found during summer by their entomologically-minded pupils.

# CONTRIBUTORS

# CLASSIFIED INDEX

COMPILED BY W. E. L. WATTAM.

Circular No. 521

# Yorkshire Naturalists' Union.

**President:**
Prof. E. A. SPAUL, D.Sc., Ph.D.Lond., F.Z.S., Leeds University.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

## The Seventh Spring Foray

WILL BE HELD AT

# THORNTON-LE-DALE

## FROM APRIL 17TH TO 21ST, 1952

*Chairman:* Professor C. G. C. Chesters.
*Recorders:* Dr. J. Grainger, West of Scotland Agric. College, Ayr.
Mr. W. G. Bramley, Pallathorpe, Bolton Percy, York.
*Secretary:* Miss J. Grainger, Wilshaw, Meltham, Huddersfield.

**ACCOMMODATION** at Miss Maidment's, The Cafe, Thornton-le-Dale, Nr. Pickering. Terms: 14/6 per day.

Members should write direct to Miss Maidment for reservations.

**WORKROOM.**—An excellent room is available. Members should bring microscopes and books.

**MAPS.**—The area to be chiefly worked is Forge Valley. This is covered in Sheet 23, old series. Map 22 shows Thornton-le-Dale area.

A short meeting will be held on April 19th.

Circular No. 522

# Yorkshire Naturalists' Union.

## President:

Prof. E. A. SPAUL, D.Sc., Ph.D.Lond., F.Z.S., Leeds University.

## General Secretary:

CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

## Assistant Secretary:

K. G. PAYNE, B.Sc., A.R.C.S., York.

## Hon. Treasurer:

J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

## Local Secretary:

R. SLATER, Esq., Brockenhurst, Loftus, Yorks.

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# The 522nd Meeting

WILL BE HELD AT

# LOFTUS

# From MAY 31st to JUNE 2nd, 1952

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**HEADQUARTERS.**—The Grinkle Park Hotel, Loftus. The terms are 30/- per day. Members are asked to book as early as possible, stating that they are members of the Y.N.U. The hotel stands in good country about four miles inland from Staithes.

Members up to a number of four can be accommodated at the Angel Inn, Loftus, at a charge of 21/- per day.

**TRAVEL.—**

**Private Car.**—From the Leeds-York area the route is by Thirsk, Stokesley, Guisborough and along the Guisborough-Whitby road, turning left at Waupley Farm after ten miles, where the hotel is signposted.

**Bus.**—The United bus service from Middlesborough to Loftus is half-hourly, and it is a one hour's run.

**Train.**—Main line King's Cross to Darlington and then Darlington to Saltburn. There is a half-hourly bus service, Saltburn to Loftus.

The Hotel motor will meet visitors at Loftus Market Place and convey them to Headquarters.

**PROGRAMME.**—Assemble at Headquarters each day at 10 a.m.

SATURDAY, MAY 30TH.—Lockwood Reservoir and the adjacent moorland, Swindale and upper reaches of Kilton Wood.

SUNDAY, JUNE 1ST.—Sea cliffs, banks, quarries and beaches from Hummersea, via Boulby to Staithes. High water on this date is 10-45 a.m. This will make it advisable to work southwards from Hummersea to Staithes. About 2 p.m. the tide will have fallen sufficiently to allow an exploration of the foot of the cliffs, rocks and beaches between Staithes and Boultby.

MONDAY, JUNE 2ND.—The Grinkle Park area, Loftus Wood, Grinkle Wood and Ridge Lane. The moorland area in the vicinity can be visited, if desired, or the coastal areas near Staithes again.

**THE DISTRICT.**—The area is a varied one from a sea coast with cliffs at Rockcliff, Boulby, 660 ft. high, the highest on the east coast, to deep-wooded valleys with inland cliffs running up to the moors. From the nature of the country it follows that there are fast-flowing streams in rocky beds with rapids and falls. The area falls within the newly-designated North Yorkshire Moorland National Park.

**PERMISSIONS.**—We are indebted to the following for allowing us to visit their lands:—

The Cleveland Water Company, for Lockwood Reservoir and the enclosure.

Mrs. Ringrose-Wharton of Skelton Castle, for the moorlands and woodlands adjacent to the reservoir and for the upper reaches of Kilton Wood.

The Grinkle Park Hotel Ltd., for Grinkle Park and the adjacent woodlands.

Zetland Estates Ltd., for Loftus Woods.

Major R. H. Turton, M.P., for the woodlands on the Roxby Estate.

**FLOWERING PLANTS.**—Miss C. M. Rob writes: The 1905 visit of the Union was not rich in botanical records, but this was due to a shortage of botanists rather than of plants. Whitsun is always early for the botanical section, few plants being in good condition, but the sheltered valleys of this area should show a fairly rich flora. *Carex pendula* L. is a feature of all the gills from Saltburn southwards. The cliffs are not rich in species, the surface being generally unstable. *Crambe maritima* L. has been recorded for Huntcliffe and Whitby but lacks recent confirmation, *Brassica oleracea* L. was plentiful at Staithes in 1881, and has been found from Saltburn to Whitby, *Sedum album* L. has been found on walls at Loftus and *Parnassia palustris* L. and *Campanula latifolia* L. are at Runswick and other places in the district. *Samolus valerandi* L. occurs in Saltburn Gill in very precarious conditions—three plants in 1951—further records of this plant would be welcome.

**MOSSES.**—A list of mosses is given in the Report on the Staithes meeting (*Naturalist*, 1898, p. 108). Numerous records for the area are given by R. Barnes in lists of mosses of North Yorkshire and South Durham (*Naturalist*, 1890, p. 211) and a supplementary list (*Naturalist*, 1897, p. 179). The writer is indebted to Mr. H. Walsh for these references. The following are included in the lists: *Barbula sinuosa* Braith., *Brachyodus trichodes* Fuenr., *Bryum lacustre* Brid., *B. calophyllum* R.Br., *Campylostelium saxicola* B. & S., *Dicranella secunda* Lindb., *Fissidens crassipes* Wils., *F. decipiens* de Not., *Eurhynchium Teesdalei* Schp., *Orthotrichum stramineum* Hornsch., *O. rivulare* Turn., *O. leiocarpum* B. & S., *Plagiothecium depressum* Dixon, *P. latebricola* B. & S., *Ptychomitrium polyphyllum* B. & S., *Seligeria recurvata* B. & S., *Tetraphis Browniana* Grev., *Ulota crispa* Brid. var. *crispula* Hamm., *Weisia microstoma* C.M., *W. mucronata* B. & S., *W. tenuis* C.M. and *Zygoden Stirtoni* Schp.

**ORNITHOLOGY.**—Mr. R. Slater writes: In 1905, although the moors were not specifically visited during the Union's meeting at Loftus, 70 species were recorded. Some of those then noted have been little in evidence recently—Yellow Wagtail, Ring-Ousel, Stonechat, Corncrake and Tree-Sparrow. To-day's list should be at least equal in numbers and should include some not met with in 1905. Most of the moorland species should be noted, including both Long and Short-eared Owls. The

Boulby cliffs should prove interesting, with breeding Fulmars, Herring Gulls and Kittiwakes, Cormorant, Kestrel and Rock-Pipit. House Martins nest on the cliffs and Stock Doves and Carrion Crows are suspected. The woodlands harbour Green and Great Spotted Woodpeckers, Tawny Owls, Woodcocks and Redstarts with Dippers and Grey Wagtails by the becks. Goldfinch, Grasshopper Warbler, Corn Bunting, Lesser Redpoll, Pied Flycatcher and Sedge Warbler are rather scarce. Warblers should occur in variety and the Nightjar, Turtle Dove and Little Grebe may be heard near to Headquarters. Species noted intermittently in the area, in recent years, include Hawfinch, Quail, Montagu's Harrier, Peregrine Falcon and Lesser Black-backed Gull. The date will not be too late for some northward east-coast passage migration possibly to be witnessed, of Scandinavian breeding species.

**MAMMALS.**—Most of the common mammals may be seen, including both Grey and Red Squirrels, the native Red much the scarcer. Adders, Grass Snakes, Slow Worms and Common Lizards occur.

**FRESHWATER BIOLOGY.**—Mr. H. Whitehead writes: There appears to be no information available regarding the aquatic fauna of the district. J. M. Brown worked the Robin Hood's Bay area thoroughly but his records do not extend north of Whitby. The excursions include visits to a variety of habitats and, given good weather, it is likely that interesting species of Ephemeroptera, Plecoptera and Trichoptera in addition to other groups may be taken. The sheltered valleys are worth special attention.

Water oozing from cracks in the rocks of the cliffs and sides of the valleys often have growths of algae . The consistency of porridge in which live larvae of Diptera—*Thaumalea* (*Orphnephila*), *Pericoma*, *Dicranomyia* and *Oxycera*—which present some unusual structural and physiological features. The water film must be thin as the under surface of the larva lies in water and gaseous air is taken through spiracles on the dorsal surface. Thienemann gave the name ' fauna hygropetrica ' to the animal life found only in thin films of water flowing over rocks. A study of the fauna (which includes other groups in addition to Diptera) of such patches of wet rock is well worthwhile as it is an unworked field in Britain.

**MARINE BIOLOGY.**—Prof. Spaul writes : The coast near Loftus is especially interesting to the Geologist, but its formation has many unique characters which provide conditions on the shore that will be of interest to the Marine Biologist.

The ironstone and alum shale are features of the district and the burnt refuse from the old alum workings was thrown over the cliffs in the past, to be distributed over the shingle below. There are deposits of Boulder Clay, and erosion has occurred, giving many indentations, and sandy stretches occur therefore, but as the tide recedes rocky beds are exposed. The foot of the cliffs is protected in parts from the full force and action of the waves by big blocks of rock and large boulders, but some of them have been worn into strange shapes and slabs. Hence, with shingle, sand, rock pool exposed and sheltered rock surface, there is a variety of habitat and a wide range of shore life to be examined.

Records of the flora and fauna from this shore appear to be few and scattered, and more complete information is needed not merely from collections but upon ecology and zonation, for comparison with records from other parts of the Yorkshire coast.

**ENTOMOLOGY.**—From the nature of the area it can be taken that the insect fauna is rich, but it appears that it has been little or not at all worked. It may be noted that the seashore has a limited but very interesting insect population. There are very few records of the Diptera of these littoral habitats for any part of the Yorkshire coast.

**TEAS and MONDAY MEETING.**—On Saturday tea can be obtained, if desired, at the cottage of the reservoir keeper where there is a small café. On Sunday there will be a choice of a number of cafés and tea-rooms in the village of Staithes. On Monday tea will be at Headquarters at 5 p.m., 2/6 for those not staying at the Hotel, followed by a meeting for presentation of sectional reports and for the election of new members.

CIRCULAR No. 523

# Yorkshire Naturalists' Union.

**President:**
Prof. E. A. SPAUL, D.Sc., Ph.D.Lond., F.Z.S., Leeds University.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Assistant Secretary:**
K. G. PAYNE, Esq., B.Sc., A.R.C.S., York.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Linton Avenue, Boston Spa, York.

## The 523rd Meeting

WILL BE HELD AT

# LITTON

V.C. 64

## On Saturday, JUNE 14th, 1952

**HEADQUARTERS.**—The Queens Arms, Litton, P.A., via Skipton, proprietor R. G. Jolleys. Cups of tea are available to those wishing to eat their lunch indoors. A plain tea will be served at 5 p.m. to all who want it, at 3/-. A Meat Tea can be had at 6/-, but this must be ordered beforehand.

**TRAVEL.**—This will mean private car or private bus as at present (April) the only bus from Skipton to Litton starts at 7 a.m. There is a return bus from Litton at 5-45 p.m. A party will start from headquarters at 12 noon for Hesleden and return for 5 p.m. tea.

**THE DISTRICT.**—This upper portion of Littondale has been too far to explore, when the Union has had meetings at Arncliffe. The stream running from the Giants Grave, on Pen-y-ghent Fell down what is called in part Pen-y-ghent Gill and then Hesleden Gill will prove most interesting to the general body of Naturalists and we are indebted to Mr. W. Ingleby of Nether Hesleden for permission to visit it. Behind the inn at Litton there is a limestone gill with a stream the Crystal Beck this can be followed to the Out Moor and on to Birks Tarn, 2,000 ft. O.D., here the writer (C.A.C.) once saw a large expanse of the Cloudberry, with flowers double, that is, carrying extra petals in place of stamens. Across the valley from Litton there is Scosca Cave, easy to explore and on the vertical walls a moth *Scotosia dubitata* hibernates in quantity (see *The Naturalist*, 1911, p. 149). With it are several hibernating Diptera species, notably *Speolepta* (*Polylepta*) *leptogaster*.

**ORNITHOLOGY.**—Mr. R. Chislett writes: From Kilnsea Crag at the bottom, with its Dippers, Grey Wagtails and Sandpipers by the stream and possibly Kingfishers, and House Martins nesting on the face of the crag and Swifts in the crevices above, Littondale has plenty of interest. Across the wider parts to an altitude of perhaps 1,000 feet, or even more, Yellow Wagtails breed; although such a habitat is not mentioned in *The Handbook*. Higher up, Wheatears and probably Ring-Ousels should be seen, with the other typical moorland species, including the Dunlin. The tarn on Darnbrook Fell is worth a visit. Several gills are wooded, and it would be interesting to list the species noted in each; included should be Woodpecker, Wood-Warbler, Redstart, and probably Pied Flycatcher. Raven and Merlin should be looked for; and Owls. The Twite ought to be on the higher ground but there is no recent record of it.

**FRESHWATER BIOLOGY.**—Mr. Whitehead points out that there is little published work on this area. Mr. D. S. Kimmins visited Littondale and he gives a list of insects in *The Naturalist*, 1943, p. 115.

**FLOWERING PLANTS.**—In *The Naturalist*, 1891, there is a list of flowering plants and ferns of Littondale by the Rev. W. A. Shuffrey. This of course includes the Arncliffe area. Possibly the most interesting plant to be seen is the London Pride, *Saxifraga umbrosa* L. in Hesleden Gill, this was noted in 1792 and it is certainly well established and has the same appearance as the native plant in West Ireland but the situation is in the streamlet leading down from Upper Hesleden farm where there is a garden only a short distance away, and it is nowhere else in the main gill, its nativity is questionable but it should be seen by all botanists in the party. Jacobs Ladder, Solomon's Seal, Baneberry, Horse Shoe Vetch, Northern Bedstraw, Hairy Sedum, Viviparous Bistort, Wall Draba. These should all be looked for carefully.

The most interesting mosses are found at the head of the gill, this might be called the headquarters for Nowell's moss, *Zygodon gracilis* Wils. (*Nowellii* Schp.), a little further down is a fine display of the reddish Leskea, *Orthothecium rufescens* B. & S. The pink lower stems and silvery upper parts of *Plagiobryum Zierii* Lindb. and the large bosses of Oeder's Apple Moss, *Bartramia Oederi* Schp. are typical of our limestone gills and the loose limestone blocks should be examined to see which species of Thuidium are present.

**MEETING.**—Tea will be had at headquarters at 5 p.m. and will be followed by a meeting for the election of new members and for the presentation of reports on the excursion by the various sections.

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**Next meeting.**—Topcliffe, for Leckby Carr, June 28th.

CIRCULAR No. 524

# Yorkshire Naturalists' Union.

**President:**
Prof. E. A. SPAUL, D.Sc., Ph.D.Lond., F.Z.S., Leeds University.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Assistant Secretary:**
K. G. PAYNE, Esq., B.Sc., A.R.C.S., York.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

**Divisional Secretary:**
CATHERINE M. ROB, F.L.S., Catton Hall, Thirsk.

## The 524th Meeting

WILL BE HELD AT

# TOPCLIFFE

For LECKBY CARR, V.C. 65

## On Saturday, JUNE 28th, 1952

**HEADQUARTERS.**—The Angel Hotel, Topcliffe (Miss Sigsworth). Plain Tea 1/9; High Tea 4/-.

**TRAVEL ARRANGEMENTS.**—Topcliffe Village is 2¾ miles from the railway station of the same name and the train service is quite useless for this excursion. There is an early bus from Ripon arriving about 9 a.m. (Scarborough Route) otherwise the 119 service Ripon-Thirsk is the only transport available.

| | | | | | |
|---|---|---|---|---|---|
| Ripon | 10-10 a.m. | 11-45 a.m. | Topcliffe | 5-57 p.m. | 6-57 p.m. |
| Topcliffe | 10-37 a.m. | 12-12 p.m. | Ripon | 6-29 p.m. | 7-29 p.m. |
| Thirsk | 11-5 a.m. | 12-40 p.m. | Topcliffe | 5-55 p.m. | 6-12 p.m. |
| Topcliffe | 11-27 a.m. | 1-2 p.m. | Thirsk | 6-17 p.m. | 6-34 p.m. |

These times should be verified when the Summer time-table is published.

**MAPS.**—Sheet 21 Ordnance Survey (Ripon/Northallerton).

**PERMITS.**—Permission to visit the Carr and surrounding farmlands has kindly been given by Messrs. Blair, Clayton, Gill, Kidson, Kitching, Macdonald, Sweirs, Wood and Mrs. Watson. Care must be taken to avoid any damage to growing crops, to see all gates are shut. *No dogs are permitted on any of the farms.*

**ROUTE.**—Topcliffe Village is in V.C. 62, the river being the boundary. Meet headquarters 11 a.m. Cross the river to V.C. 65, follow the road to Asenby stream then the river to the Gravel Pits, here the party may either follow the river for a short distance and then strike up through the fields to the Carr Wood or follow the road from Poplar Hill. After examining the Carr the party will go by the cart track to Aram Grange and Asenby Village, cross the main road to Poulters Bog, and by the river to Topcliffe.

This is rather a long walk, but cars may be taken direct to the Carr where the party can join up.

Leckby Carr was last visited by the Union on May 18th, 1891, but even then it was a shadow of what it had been, through drainage and a general drying out of the surrounding country.

The Circular for that meeting has no Entomological information, there is a full account of the Geology by the late Dr. T. Carter Mitchell of Topcliffe. The botanical notes are by the late Wm. Foggitt, these note the fact that the first British record of *Scheuchzeria palustris* L. was from Leckby, where it was discovered by the Rev. James Dalton in 1787. In 1840 it was still plentiful but on the occasion of the Y.N.U's visit no trace was seen. Mr. Foggitt listed a number of rare plants which were still to be found in 1891, and it will be interesting to see which, if any, still persist. *Lysamachia thyrsiflora* L. and *Oxycoccus quadripetalus* Gilib. were still to be found in 1935, but since then there has been a considerable amount of drying out, *Carex curta* Good. is still here but not much else has been seen recently. Botanists will be able to see how drainage can alter a habitat but cannot hope for many of the recorded plants.

There is still some very wet ground between Aram Grange and the main road which may be of interest, as will Poulters Bog, where a few plants of *Polemonium caeruleum* L. Hott. are still to be seen, also *Thalictrum flavum* L. and *Hottonia palustris* L.

The 1891 Circular also gives a short list of birds, including the Nightjar, Heron, Goldfinch and Grasshopper Warbler, the area should be good and Ornithologists can find a variety of habitats which may produce an interesting list of birds, mammals noted in the area include Foxes, Badgers, Stoats, Weasles, and Hedgehogs.

Topcliffe is a noted fishing centre, Trout, Grayling, Barbel, Roach, Dace, Perch, Gudgeon, Chub, and Eels being the chief catches, some big Pike including one of 22 lbs. have been taken at Topcliffe Mill, also Trout up to 4 lbs.

The 1891 meeting was early in the year and the night before was a very hard frost which had a disastrous effect on the vegetation, the later date fixed for this meeting should be more favourable for all branches of Natural History.

Meet at Headquarters 11 a.m., passengers on the bus from Thirsk can alight at Asenby and join the party by the river at Asenby stream. Tea will be at 5 p.m. followed by a meeting to present reports and elect new members.

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**Next Meeting.**—Hatfield, V.C. 63, July 12th, 1952.

CIRCULAR No. 525

# Yorkshire Naturalists' Union.

**President:**
Prof. E. A. SPAUL, D.Sc., Ph.D.Lond., F.Z.S., Leeds University.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Assistant Secretary:**
K. G. PAYNE, Esq., B.Sc., A.R.C.S., York.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

**Divisional Secretary:**
Miss J. GRAINGER, Wilshaw, Meltham.

## The 525th Meeting

WILL BE HELD AT

# HATFIELD

V.C. 63

## On Saturday, JULY 12th, 1952

**HEADQUARTERS.**—The Ingram Arms, High Street, Hatfield. Meat Tea (ham and salad) 5/6; Plain Tea 2/6, at 4-30 p.m. A postcard ordering tea should be sent to the Proprietor, Ingram Arms, by July 5th.

A Meeting for election of new members and presentation of reports on the meeting will be held after the tea.

**TRAVEL.**—Buses leave Christ Church, Doncaster, on the hour and at 15 minute intervals. Alight at Hatfield Woodhouse.

The party collect at the Post Office, Hatfield Woodhouse, at 11 a.m.

*N.B.*—Hatfield Woodhouse is beyond Hatfield.

The district to be worked is Hatfield Moor or sometimes known as Hatfield Chase and permission is given to visit the area by The Secretary, British Moss Litter Co. Ltd. **No smoking is allowed.**

**HATFIELD CHASE.**—Mr. Ralph C. Chislett: Most of the old Royal Chase is now cultivated, but some semi-wild corners are left, and there are miles of ' chains,' and Lindholme Moor. July is rather late for breeding birds and most of them will have young. Typical breeding birds for the area include Mallard and Teal; Curlew, Redshank, and Snipe, Sedge-Warblers, numerously, Goldfinch, Corn-Bunting, Nightjar, Green and Great-Spotted Woodpeckers, and Tree-Sparrow. The Grasshopper Warbler will probably be heard, and I have known five species of Owl there (Little, Long-eared, Short-eared, Tawny and Barn). Small birds are mainly about the few wooded parts, and where trees grow alongside the dykes, where also the Willow-Tit should be noted.

**FLOWERING PLANTS.**—W. A. Sledge: Amongst the plants referred to Dr. Lees in the Circular relating to the Y.N.U. visit to Hatfield Chase in 1887 were *Andromeda, Utricularia* spp., *Gentiana Pneumonanthe, Hydrocharis, Rhynchospora alba* and *Thelypteris palustris,* whilst *Peucedanum palustre* and *Cladium Mariscus* were cited as growing in or by the Torne and Idle Rivers near Tunnelpits on the Wroot side of the moor. This excursion was ruined by bad weather however and no confirmations or additions to the list were made. I have botanised on Hatfield Chase on two or three occasions and during the war years the late Dr. J. M. Taylor, of Thorne, made a thorough survey of the rich Pondweed flora of the numerous dykes surrounding the Moor. In the North Idle Drain may be found *Potamogeton gramineus, Zizii, nitens, praelongus, lucens* and *perfoliatus,* whilst *crispus Friesii* and *alpinus* also occur in neighbouring drains, and the very rare *P. perlfoliatus* × *praelongus* grows just over the Lincolnshire boundary. Other aquatics in these drains include *Apium inundatum, Scirpus fluitans* and *Tolypella glomerata.* The Moor itself is much cut up for peat but *Andromeda* is still plentiful in parts and *Calamagrostis canescens* and Alder Buckthorn I have seen in quantity on the southern side. Dr. Taylor recorded *Butomus umbellatus* from Tunnelpits.

CIRCULAR No. 526

# Yorkshire Naturalists' Union.

**President:**
Prof. E. A. SPAUL, D.Sc., Ph.D.Lond., F.Z.S., Leeds University.

**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Assistant Secretary:**
K. G. PAYNE, Esq., B.Sc., A.R.C.S., York.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

**Divisional Secretary:**
Miss F. E. CRACKLES, B.Sc., Hull.

## The 526th Meeting
WILL BE HELD AT

# LEVEN

V.C. 61

## On Saturday, JULY 26th, 1952

**HEADQUARTERS.**—Orchard Café, Leven (Mrs. Speight). Meat and salad tea 3/6. A fortnight's notice is requested. Will members requiring tea please advise the Divisional Secretary by July 10th (143 Holmgarth Drive, Bellfield Avenue, Hull).

**ACCOMMODATION.**—The New Inn, Leven. Proprietor: Mr. J. C. West. Bed and breakfast 12/6. Write as soon as possible. Non-hotel accommodation may be obtained in the village. Write to the Divisional Secretary.

**TRANSPORT.**—Leven lies along Hull-Hornsea, Hull-Bridlington and Hessle-Beverley 'bus routes, but 'buses are not frequent.

| | Hornsea 'bus. | | Bridlington 'bus. | | |
|---|---|---|---|---|---|
| Hull | 8-45 a.m. | 10-15 a.m. | 9-15 a.m. | Hessle | 9-30 a.m. |
| Leven | 9-30 a.m. | 11-00 a.m. | 10-0 a.m. | Beverley | 10-10 a.m. |
| | | | | Leven | 10-29 a.m. |

| | Bridlington 'bus. | Hornsea 'bus. | |
|---|---|---|---|
| Leven | 5-34 p.m. | 7-30 p.m. | Leven 7-30 p.m. |
| Hull | 6-19 p.m. | 8-15 p.m. | Beverley 7-50 p.m. |

Leven to Hull 'buses will be returning from the coast. It is advisable to notify the Traffic Controller of the number of members wishing to travel on the 7-30 p.m. 'bus from Leven; an approximate number being required by July 10th and an exact number on the day of the Excursion.

**MEETING PLACE.**—Canal House, Leven, 11-0 a.m.

**MAP.**—One-inch Ordnance Survey. New Popular Edition. Sheet 99.

**PERMISSION** to investigate the banks of the Canal has kindly been given by Mr. R. Carter. Mr. Carter has most generously offered the use of a boat for workers desirable of investigating aquatic communities. Write Divisional Secretary.

**ROUTE.**—It is suggested that members should concentrate on studying the flora and fauna of Leven Canal and its banks.

Ornithologists under the leadership of Mr. Ainsworth will cover more ground. The following route is suggested: Take the south bank from the Swing bridge to Waterloo bridge and the north bank from here to the lock. Proceed northwards along the bank of the river Hull to Baswick landing and return via Low Baswick and Little Leven.

**THE DISTRICT.**—The land adjacent to Leven Canal is low-lying; it consists of glacial drift, mainly boulder clay with some gravel. Disused pits are present in the vicinity.

The Canal was opened in 1802 and is $3\frac{1}{4}$ miles in length. It has been closed since 1934.

**FLOWERING PLANTS.**—The canal and its banks do not appear to have been well worked. In late July fine displays of White and Yellow Water lilies, also of Arrowhead (*Sagittaria sagittifolia* L.) are to be expected. Plants growing along the banks of the canal include: *Lythrum salicaria* L., *Lysimachia vulgaris* L., *Lycopus europaecus* L., *Stachys palustris* L., *Galeopsis speciosa* Mill and *Achillea ptarmica* L.

A search for *Carices* in 1951 yielded the following species: *C. rostrata* Stokes, *C. vesicaria* L., *C. riparia* Curt, *C. hirta* L., *C. paniculata* L., *C. elata* All., *C. disticha* Huds., and *C. panicea* L. *C. paradoxa* Willd. was recorded here by J. F. Robinson in 1904.

Of the grasses, *Phragmites communis* Trin., and *Calamagrostis canescens* Roth. grow in abundance and in 1951 *C. neglecta* Gaertn. was found growing in some quantity along the north side of the bank.

**ENTOMOLOGY.**—Coleoptera: The late T. Stainforth, B.A., B.Sc., made some good discoveries here while carrying out research on Donacian Beetles. See *The Naturalist*, 1944, pp. 81 to 91 and 127 to 139.

Donacian Beetles recorded for the canal are as follows: *D. claripes* on Phragmites, *D. versicolorea* (once only), *D. semicuprea* on Glyceria maxima (cocoons also found on Sparganium ramosum, *D. sparganii*, beetles found on Yellow Water Lilies, *D. impressa* found at Leven end of canal on Scirpus lacustria *D. simplex* and *Macroplea appendiculata* (cocoons found on Carex sp. near Canal Head.

Lepidoptera.—Mr. D. Wade of Hull, gives the following list of species which may be seen. Butterflies: Large White, Small White, Green veined White, Wall Brown, Meadow Brown, Small Heath, Large Skipper, Ringlet, Common Blue, Small Copper and Orange Tip. Moths: Oak eggar, Drinker, Five and Six spotted Burnets; all these species having been found in the adjacent countryside.

**MOLLUSCA.**—The following species were found in the canal by J. D. Butterell. (See *Journal of Conchology*, vol. 3, pp. 289-296 and *The Naturalist*, vol. IV, 1878-79.)

*Succinea elegans* Risso, *Planorbis carinatus* (Müll), *Planorbis albus* (Linn.), *Limnaea peregra* (Müll.), *L. amicularia* (Linn.), *Velletia lacustris* (Linn.), *Bythinia tentaculata* (L.), *Valuata piscinalis* (Müll), *V. eristata* (Müll), *Unio pictorum* (Linn.), *Anodonta cygnea* (Linn), *Pisidium amnicum* (Müll), *P. fontinale* (Drap), *P. henslowanum* (Shepp.), *P. pusillum* (Gmelin.), [*P nitidum* Jenyns and *Bythinia leachii* (Shapp)] are recorded for ditches parallel to the canal.

**VERTEBRATES.**—Mr. M. M. Foster gives the following list of fishes which occur in the canal: Pike, Perch, Roach, Rudd, Carp-bream, Silver Bream, Tench, Eel and Three Spined Stickleback.

**ORNITHOLOGY.**—Mr. G. H. Ainsworth writes: Late July is certainly not the ideal time of the year to visit the locality for bird study. Rank vegetation, tall reeds and the close foliage of bushes will not make observation easy. However, about fifty species should be seen which could include Carrion Crow, Magpie, Jay, Goldfinch, Lesser Redpoll, Bullfinch, Corn-Bunting, Reed Bunting, Tree Sparrow, Marsh Tit, Spotted Flycatcher, Reed Warbler, Sedge Warbler, Lesser Whitethroat, Whinchat, Kingfisher, Little Owl, Heron, Teal, Little Grebe, Turtle Dove and Common Snipe.

The Grasshopper Warbler has been heard here and it may interest some of our members to visit the gravel pits in the vicinity, with the hope of seeing Little Ringed Plover!

**MEETING.**—A meeting to elect new members and to receive reports from various sections will follow tea at 5-30 p.m. at the Orchard Café.

CIRCULAR No. 527

# Yorkshire Naturalists' Union.

**President:**
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**General Secretary:**
CHRIS. A. CHEETHAM, Esq., F.R.E.S., Austwick, via Lancaster.

**Hon. Treasurer:**
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

## The Autumn Fungus Foray

WILL BE HELD AT

# CLOUGHTON
## (SCARBOROUGH)
## SEPTEMBER 18th to 23rd, 1952

*Chairman:* Professor C. G. C. CHESTERS.
*Recorders:* Mr. W. G. BRAMLEY, Pickering.
Dr. J. GRAINGER, Auchincruive, by Ayr.
*Secretary:* Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield.

**HEADQUARTERS.**—Cober Hill, Cloughton, Scarborough. Terms 16/6 a day. Will members please write direct to Mr. C. Butler enclosing a booking fee of 10/-. Cober Hill is in a very advantageous position with sea view and the manager has quoted the special terms as above. Members please note that we start the meeting a day earlier than usual as Professor Chesters will have to leave on the Monday. An excursion will be arranged on Monday. There will be ample room at Cober Hill for the setting out of specimens and the use of microscopes. The house is on the bus route from Scarborough.

The area to be visited includes Hackness and Silpho Moor and there are other wooded areas near Scalby and Hayburn Wyke.

**THE CHAIRMAN'S ADDRESS.**—" New Fungi for Old ' (with apologies to Alladin), will precede the Annual Meeting.

The **ANNUAL MEETING** will take place at approximately 8-30 p.m. on Saturday, September 20th.

**MAPS.**—No. 93 New Series National Grid, one-inch. No. 23 and 22 old series one-inch.

CIRCULAR No. 528

# Yorkshire Naturalists' Union.



# Sectional Meetings, 1952

**to consider the Annual Reports and nominate Officers for the Sections and their Committees.**

*All members and associates of the Union are eligible to attend.*

OCTOBER 4th.—Leeds Church Institute, Committee Room. The **Geological Section** meet at 2-0 p.m. The **Freshwater Biological Section** at 3-0 p.m. The **Conchological Section** meet at the Geological Department, Leeds University, on October 11th, at 2-30 p.m.

OCTOBER 11th.—**The Botanical Section** will meet in the Botanical Department, Leeds University, at 2-30 p.m. Entrance *via* Baines door, University Road.

After tea there will be an exhibition of specimens to which members are invited to contribute.

OCTOBER 18th.—**Vertebrate Section.** Meetings will be held in the **Belgrave Rooms, New Briggate, Leeds 1,** on SATURDAY, 18th OCTOBER, 1952, at 3-0 p.m. and 6-0 p.m.

Members and associates are cordially invited to attend the above

meetings. Will officials of affiliated societies kindly notify their members.

There will be a break for tea from about 4-45 to about 5-45 p.m. at which time the evening session will commence. Arrangements will be made to provide tea for those members who care to bring sandwiches.

October 25th.—**Entomological Section.** The Annual Meeting of the section will be held in the **Leeds City Museum, Park Row,** where a room has been made available by courtesy of the Leeds Literary and Philosophical Society. *Please note this change of meeting place.* Meet 2-0 p.m. Tea will be available at a small charge. Please bring own food.

*Business.*—Exhibits, Recorders' Reports, Nomination of Officers, Excursions, Spring Meeting, Any Other Business.

Please Bring Exhibits.

W. A. Hincks

(*Hon. Sect. Secretary*).

November 1st.—An **Executive Meeting** will be held at 3-0 p.m. in the Committee Room on the first floor of the Parkinson Building. The entrance is *via* the main entry to the University in Woodhouse Lane.

December 6th.—**The Annual Meeting** will be held in York by the kind invitation of the Yorkshire Philosophical Society, who have offered the use of the Yorkshire Museum on this occasion.

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October 1st, 1952