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LONDON NATURAL HISTORY SOCIETY



A HAND LIST OF THE PLANTS  
OF THE LONDON AREA

*Compiled by*

DOUGLAS H. KENT and J. EDWARD LOUSLEY

1951-57

*Supplement to London Naturalist, 30-36*

*Printed for the Society by*

T. BUNCLE & Co. Ltd., Market Place, Arbroath, Angus

## ERRATA

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- p. 16, line 19 : *For* AUBRETIA *read* AUBRIETA.  
p. 17, line 4 up: *For* Gilib. *read* Usteri.  
p. 24, line 7 up: *After* Alien *add* Europe, including parts of  
Britain.  
p. 51, line 1 : *Delete* O. FLORIBUNDA Lehm.  
p. 69, line 20 : *For* PURPURASCENS *read* SUBPURPURASCENS.  
p. 71, line 17 : *After* Green Street Green *add* near Farnborough:  
*H.M.P.*  
p. 134, line 18 up: *Before* Bombed sites *add* V.-c. 21.  
p. 153, line 6 : *For* 21 *read* 20.  
line 7 : *Before* Hackney *add* V.-c. 21.  
p. 179, line 12 up: *Delete* casual.  
p. 206, line 1 up: *After* at *add* Hone; F. R. Mount's Wood, Swans-  
combe, 1952: *H.M.P.*  
p. 207, line 1 : *Before* little *add* V.-c. 17.  
p. 208 : *Delete* line 1.  
p. 259, line 10 up: *For* CILODENDRON *read* CALODENDRON.  
p. 265, line 8 : *For* A.P.S. *read* A.E.E.  
p. 290, line 20 up: *For* S. CARICIS *read* SCIRPUS CARICIS.  
p. 303, line 7 : *For* Esher *read* Ewell.  
line 13 up: *For* C. E. Hubbard *read* F. T. Hubbard.  
p. 313, line 1 up: *For* L.H.B. *read* L.B.H.

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## DATES OF PUBLICATION

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- Part 1, pp. 1- 40, December 1951  
2, pp. 41-112, June 1952  
3, pp. 113-168, June 1953  
4, pp. 169-228, June 1954  
5, pp. 229-276, June 1955  
6, pp. 277-316, June 1956  
7, pp. 317-368, June 1957

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In this work there are represented 130 families, 651 genera, 1835 species (including 260 microspecies of *Capsella*, *Viola*, *Rubus* and *Hieracium*), 19 subspecies, 268 varieties, 33 forms and 113 hybrids. The records and determinations have been contributed by 392 helpers.

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*The*  
**LONDON  
NATURALIST**

*The Journal of*  
**THE LONDON NATURAL  
HISTORY SOCIETY**

FOR THE YEAR  
1956

*No. 36*

PRICE 10s, OR COMPLETE WITH  
THE LONDON BIRD REPORT, 15s.

PUBLISHED BY THE  
LONDON NATURAL HISTORY SOCIETY.

DATE OF PUBLICATION,  
JUNE 1957.

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Founded 1858.

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# THE LONDON NATURALIST

No. 36 for the year 1956



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Supplement: A Hand List of the Plants of the London Area.



## Council's Report for 1956

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FOR two successive years the Society's funds showed a deficit, arising partly from the cost of moving the Library and Collections to Eccleston Square and partly from the increased cost of our publications. Faced with the possibility of another loss, Council decided to start a campaign for increased membership and to make economies in the *London Naturalist* and the Programme. Publicity leaflets and posters were sent to a great number of libraries, colleges and schools, and we hope that the full results of this drive have yet to be seen. In the meantime an appeal to existing members to find new candidates for membership has met with a welcome response and, in spite of a long list of deletions, the membership figure rose to 1,400 by the 31st October. There has thus been a net increase of over 100, although we have been more drastic than usual in removing from the roll members whose subscriptions were more than a year in arrears. Economies effected by a re-arrangement of the Programme, the printing of the outer pages for both issues at one time and an extensive cut in the *L.N.* have enabled us to achieve a surplus on this year's work of about £123 compared with a deficit of about the same amount in 1955. This has been very encouraging, but it means that we have still virtually no balance to carry forward, nor have we yet been able to return to reserve the £50 withdrawn in 1954. At least another 100 members are urgently needed.

An unfortunate result of the reduction in size of the *L.N.* was that a disproportionate amount of the space was concerned with systematic material, of great value to those interested in the subjects concerned but inevitably of slight interest to other members. The value of the work done, however, is witnessed by a contribution of £49 from the Royal Society's grants-in-aid to scientific publications towards the cost of publishing the papers by J. L. Harrison and Dr. Beven on mammals and birds respectively at Bookham Common and the "Key to Carices of the London Area" by E. Nelmes in the "Hand List". The editor is always glad to receive offers of papers, especially ones of more general interest, and it was hoped that it might be possible to restore in the following issue some of the cut in the size of the *L.N.* The *London Bird Report* did not share in the cut as it had already been reduced in size in the previous year, and the issue for 1955 contains the valuable results of the survey of the birds of Beddington sewage farm.

Meetings in general have been well attended and included a notable lecture on "The Colours of Animals" by our Honorary President, Professor Munro Fox, to whom we are indebted for an instructive and interesting evening. The course arranged jointly with London University on "How Birds Live" was fully booked well before the opening date, and considerable interest was also shown in the two courses planned for the

spring of 1957. Dr. Carthy agreed to give South-West Middlesex Group a course on Animal Behaviour, and this also was well booked.

During the year the old-established Chingford branch was wound up owing to the lack of support for indoor meetings, and its place has been taken by an Epping Forest Field Section, which has had a successful beginning with good attendances at its excursions. It is very gratifying that the Society's long association with this part of London should be maintained in this way.

The study of mammals, previously rather neglected except by an occasional meeting of the Ecology section, has been encouraged by the formation of a Mammal Study Group as a sub-committee of that section. With a nucleus of enthusiastic officers, indoor and field meetings are being planned, and it is hoped that this extension of the Society's activities will receive good support.

Although the books in the Library are not used by members as much as we had hoped, more and more informal meetings are being held at Eccleston Square by the sections for discussions and the study of specimens. It also provides a useful meeting place for the many committees, and has saved the Society a great deal of expense in the hiring of special rooms for this purpose. After nine years R. W. Hale has resigned as librarian; although wishing to resign many years ago, he has remained in office in spite of many other commitments and it is no formal tribute to say that the library is very much richer for the many bargains which his intimate knowledge of books has enabled him to acquire. He is being succeeded by J. B. Foster, a former President of the Society, who has our best thanks for taking on this post.

In the current year both the botanists and the ornithologists are seeing the final results of their works on the flora and avifauna of our Area respectively. As a result of the printing dispute in the early part of the year, the publication of "The Birds of the London area since 1900" was delayed until March, 1957. The Society contracted to buy 400 copies for sale to members at a reduced price. Publication of the "Handlist of the Plants of the London Area", which commenced in the *L.N.* for 1950, is completed in this issue. The finished work will be a valuable source of reference not only for botanists, but also for others requiring information about the distribution of plants in our Area, and complete sets will be put on sale at an inclusive price as soon as possible.

There has as usual been close co-operation with national bodies in the same field, and in particular the Botany section has continued to give valuable assistance to the Botanical Society of the British Isles in the five-year national scheme for mapping plant distribution. We were represented by Mr. Benson at the Tenth International Entomological Conference and by Miss Longfield at the meeting in Edinburgh of the International Union for the Preservation of Nature.

During the year two past Presidents, Miss C. E. Longfield and Mr. C. L. Collenette, accepted the invitation of Council to become Honorary Vice-Presidents. Miss Longfield is leaving us next year to live in Ireland

and Mr. Collenette shortly enters his fiftieth year of membership. To both the Society owes a great debt for their many years of active service on its various committees.

The unavoidable resignation at the same time of Miss Longfield as Chairman and of C. P. Castell as Secretary has left the Nature Conservation Committee without officers, and it would have been hard to find a substitute for their energy and enthusiasm. It has been arranged, therefore, that the Ecology section shall take over the work on Nature Conservation problems, and they are appointing a special sub-committee for the purpose.

In connection with the drive for new members and the need to augment our income, a new prospectus has been produced and advantage has been taken of the move to Eccleston Square to take stock of the considerable store of the Society's publications which have accumulated over the years. With the double object of helping members to become better acquainted with the past work of the Society and of adding to our funds, earlier *London Naturalists* and *London Bird Reports* have been made up into sets at much reduced prices. Single copies and reprints have also been reduced in price and members are urged to take advantage of this opportunity to complete their own sets or to buy them for friends.

The publicity drive, the stocktaking of publications and the revision of the prospectus and the exchange list have involved considerable extra work for the Secretary and other officials, and we should like to record our thanks to all the members who have assisted them, and in particular to Mrs. Waller who has helped the Secretary in many ways during the course of the year.

We have lost during the year an old and valued Honorary Vice-President in H. J. Burkill, who had taken an active part in the Society for over forty years. He held many offices during this time and was still recorder for plant galls at the time of his death. [An obituary notice appears on page 104.] Through the generosity of his sister, Miss Burkill, part of his library has been given to the Society, including many runs of journals which have helped to complete those in our Library.

The death has also occurred of Dr. E. A. Cockayne, who was President of our Society from 1915 to 1919. [An obituary notice appears on page 106.]

We have also to record with regret the deaths of the following members:—Miss M. Curtis, J. Forrester, Miss G. A. Hains, Mrs E. MacAlister, F. O. Whitaker (an honorary member), and Capt. R. F. L. White. From Mr. MacAlister we received a generous gift in memory of his wife, who had been a member since 1929.

# The Distribution of the Grey Squirrel in the London Area (1953-1956)

By GEOFFREY BEVEN, F.Z.S.

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**I**N 1953, the Ecology Section of the London Natural History Society set up a sub-committee to investigate the distribution of the Grey Squirrel (*Sciurus carolinensis* Gmelin) in the London Area. At that time, the Government commenced special control measures against these squirrels and began offering rewards for tails. The London Natural History Society thought this an opportune moment to obtain as much information as possible on the status of this mammal and also to note if there were any changes in status as a result of the control measures. An appeal was, therefore, made for records of Grey Squirrels and this report is based on information referring to the period 1953-1956. Observers were asked to send data on (i) locality, (ii) date, (iii) numbers of squirrels observed, (iv) the presence of dreys, and (v) nature of habitat. The names of localities from which squirrels were thought to be absent, were also requested.

*History.* Grey Squirrels from North America were set free in about half-a-dozen places within 20 miles of St. Paul's Cathedral between 1889 and 1916. Details of these introductions are given by Middleton (1930) and Fitter (1939). The largest numbers were 100 released at Richmond, Surrey, in 1902 and 91 at Regent's Park between 1905 and 1907. The subsequent increase and spread of the squirrels are discussed by Fitter (1939) for the whole area and by Johnston (1938) for Epping Forest. In 1931 an epidemic of coccidiosis reduced the numbers in England, but this was only temporary (Shorten, 1954). Fitter states that by 1938 this mammal had become a common resident over the greater part of the London area. Only in Essex outside Epping Forest, and a strip of south Middlesex westwards of Hounslow and Feltham, along the Thames Estuary in Kent, and in parts of the eastern and southern suburbs was it still unknown. To combat this remarkable increase a national campaign was instituted, and shooting was commenced in the Royal Parks and some L.C.C. open spaces in 1930-1931. As a result, in 1938 only one squirrel was seen in Kensington Gardens, and Fitter concluded that by then the Grey Squirrel had definitely been exterminated from the central parks, and it was still absent from them at the end of the War, 1945 (Fitter, 1945; Shorten, 1954). It seems likely, however, that it had increased somewhat in the outer parts of the area.

*Present Position and Distribution (1953-1956).* During the period of the present survey only one record was received of a squirrel being even seen, much less shot, in central London. This one, which was being chased by a black Labrador dog in Kensington, may have been an escaped pet!







In the suburbs, however, they are still abundant and penetrate far into the densely built-up areas of London. Some idea of the numbers occurring in the larger open spaces can be obtained from a study of the quantities of those shot in the last few years. It seems likely that before the start of the scheme of rewards for tails, the number of squirrels shot was often an estimate, and there is more than a suggestion that they may sometimes have been inflated by keepers anxious to prove their worth! Comparison from year to year may not, therefore, always be justifiable. However, perusal of these figures remains of some interest. For instance, between 1932 and 1937 a total of 2,100 were shot in Richmond Park; in 1953 alone, 1,036 were shot, in 1954, 647, and in 1955, 622. In Epping Forest between 1930 and 1942, "over 300" squirrels were killed, whereas in 1950 alone, 1,803 were shot, in 1951—1,952, in 1952—2,141, in 1953—886, in 1954—666, and in 1955—427. A similar trend is perhaps detectable at Selsdon Wood, Surrey. The numbers shot there in 1951 were 400, in 1952—352, in 1953—255, in 1954—261 and in 1955—242. There is thus little doubt of their present abundance in these three localities.

The method of showing distribution on the map is similar to that used by Shorten (1946), except that "one kilometer" squares (National Grid) are marked instead of "ten km." squares. On this map are indicated squares from which records of squirrels have been received during the survey, and also areas in which observers have rarely or never seen a squirrel even after prolonged observation during this period. These "nil" records are not mapped unless they are known to be the result of many visits. Unmarked squares indicate areas from which no information has been received.

From this map the distribution of the squirrel in the London area may be seen. Although there are many localities in which the status is unknown, it appears that in the outer more rural suburbs squirrels occur more or less wherever there are trees. However, they penetrate far into central London, reaching the following points:—

(1) In the north, to the southern end of Hampstead Heath, within 3-4 miles of St. Paul's. It is remarkable that, although they still roam within about a mile of Regent's Park, no squirrels have been seen there in the last four years. Presumably they are unable to penetrate the "built-up" zone between the two open spaces, although they were able to do so when they spread outwards from Regent's Park to Hampstead Heath in the early days. Probably then the intermediate area had more gardens and less flats.

(2) In the south-west they reach as far as Barnes and Putney, through Richmond Park and Wimbledon Common, i.e. 6-7 miles from St. Paul's.

(3) In the south the Dulwich open spaces and Lambeth are populated, probably via the Crystal Palace Grounds and Beckenham (3-4 miles from St. Paul's).

(4) In the south-east they occasionally reach Greenwich, presumably via Shooter's Hill (5 miles from St. Paul's)

(5) In the north-east Wanstead and Valentine's Park (7-8 miles from St. Paul's) are reached. There is, however, much less information from this area.

It seems probable, therefore, that it is the distribution of the open spaces which allows the squirrels to penetrate nearer to the centre of London from the north and south, than from the east and west.

*Habitats.* There was a relatively small response to the request for descriptions of the habitats in which the squirrels were seen. However, the material is perhaps worth placing on record. Squirrels were noted in a wide variety of habitats. Several were seen crossing roads, one on the top of a flag-pole in a garden, and one on a railway level-crossing gate.

TABLE I. HABITAT PREFERENCES.

	Woods.	Parks.	Gardens.	Farmland.	Total.
North of the Thames ...	28	18	22	3	71
South of the Thames ...	38	46	28	5	117
Total ... ..	66	64	50	8	188

Key: Woods are broad-leaved woods except for one pine wood.

Parks include ornamental parks, playing fields, school grounds, commons, heaths and golf-courses.

Gardens include churchyards and cemeteries.

In Table I are given the numbers of records from the more important habitats. Each habitat locality is only counted once in this table. These figures are unlikely to give a true picture of the relative use of various habitats, as no allowance can be made for the possibility that "apparently suitable" habitats may be visited by more observers, nor is any indication made of the numbers of squirrels seen in each habitat. It is unlikely, therefore, that a true sample of habitats was watched. Nevertheless, certain points of interest are emphasized. For example, it can be seen how important are trees in the habitat preference. Nearly 70% of the records were from woods and parks. However, the garden habitat also figures largely, i.e. 26%. The presence of large trees in these gardens was often mentioned and they were frequently not far from a small wood, common or 'open space'. Gardens quite clearly permit squirrels to travel from one small wood to another and thus spread far into the built-up areas of London. These animals feed frequently in gardens and are seldom shot or trapped there. In fact gardens must often become sanctuaries and breeding grounds for them, and are perhaps partly responsible for the repopulation of places such as Richmond Park, where so many are killed. The Forestry Commission are, therefore, keen to encourage the trapping of squirrels in gardens.

*Changes in Status.* Information on recent changes in status of the Grey Squirrel has been scanty. Few observers would even make an estimate, and as has already been mentioned figures for squirrels shot may, in some cases, only be accurate since 1953. However, the estimates

given in Table II do suggest that in a large proportion (70%) of this small sample of localities, the numbers of squirrels have decreased recently, and it does seem probable that there has been a diminution in population since the Government control measures were intensified in 1953. In most cases it is not known on what these estimates are based and whether counts were made over a period of years, or at different times of the year. They must be regarded as approximations only.

TABLE II. CHANGES IN STATUS.

				Estimated changes in status since 1945 or more recently.			
				Increase.	Static.	Decrease.	Total.
North of the Thames	...	...	...	2	1	9	12
South of the Thames	...	...	...	5	3	19	27
Total	...	...	...	7	4	28	39

It is, however, debatable whether this decrease in squirrels was wholly due to shooting. Monica Shorten (1957) is of the opinion that decreases in 1955 were due to a combination of shortage of food, a fairly hard winter previously, and a drought in the summer. Another reason suggested is increased pressure from predators, especially the stoat, owing to myxomatosis removing their natural prey. Such views would perhaps explain observations from certain areas in Middlesex and Essex where squirrels decreased in 1955-56, although there was no increase of shooting.

The infestation by squirrels in Hertfordshire in 1955 was described by the Ministry of Agriculture (1955) as heavy and as not having decreased since 1954. Nevertheless in the country as a whole the population reached a low level in 1955. There has, however, been some recovery in 1956 (Shorten, 1957) and in most areas round London the Grey Squirrel is still common and widely distributed, except in the central parks.

#### *Summary.*

(1) A summary is given of the distribution of the Grey Squirrel in the London area.

(2) Squirrels are absent from the central parks, but are still common in the more rural suburbs and extend well into the densely built-up parts to within three miles of St. Paul's Cathedral.

(3) Of the records of localities in which the habitats were stated, nearly 70% were woods and parks and 26% were gardens. Gardens are probably an important factor in allowing squirrels to penetrate well into the built-up areas of London. They also no doubt act as sanctuaries where squirrels can remain relatively free from persecution.

(4) Estimates from a small sample number of localities suggest that in a large proportion (70%) there has been a decrease in the number of squirrels within the last ten years or so.

## ACKNOWLEDGMENTS.

This report would not have been possible without the help of many people who have sent in interesting material, much of which cannot be published owing to lack of space. The assistance of all these is gratefully acknowledged. Mention should be made of the members of the special Sub-committee of the Ecology Section, S. Cramp, P. W. E. Currie and W. G. Teagle, and also of C. P. Castell and R. S. R. Fitter. The map has been kindly drawn by Rosemary Teagle. The Ministries of Works and of Agriculture, Fisheries and Food have given much advice and help.

Among those who have also given information are the following 131 observers:—Miss C. Acland, Mrs. M. Ainsley, Dr. H. Alexander, F. Allen, Miss N. Allen, A. H. G. Alston, C. B. Ashby, B. P. Austin, Miss R. Baines, L. Baker, Mrs. D. Baldwin, E. B. Bangerter, A. C. Barker, Miss M. Barrett, W. M. Barrett, T. L. Bartlett, D. W. Bayliss, C. H. Bentham, R. F. Birchenough, Mrs. W. J. Brewer, H. Britten, Miss E. P. Brown, Miss P. Brown, K. W. Buckie, W. C. Bullett, F. R. Cann, L. Cashman, R. Cashmore, G. Cathcart, S. H. Chalke, S. Chave, Miss G. Chave, F. J. Chinery, B. H. Clark, Miss E. Coldman, B. W. Coleman, Miss M. M. Constable, Mrs. D. Cooper, Miss J. Cornell, E. R. Denyer, D. Edwards, R. B. Fairs, J. Farrand, R. G. Finnis, F. B. Ford, R. Forty, A. E. Fox, W. Franklin, Miss H. Franks, J. Freeman, E. Glide-well, P. Greenfield, Miss R. Griffiths, A. E. Le Gros, M. Grundy, R. W. Hale, Miss E. M. Hillman, R. C. Homes, J. Hooper, L. A. Huddart, Miss L. J. Johns, A. W. Jones, W. Kelly, Miss R. Kendall, Miss M. E. Kennedy, Miss B. A. Kneller, J. R. Laundon, G. F. Lawrence, Miss N. I. Lawrence, P. B. Lowe, K. Macdonald, W. MacDonald, H. J. Martin, R. Martin, Miss I. Mason, Miss M. Matthews, Dr. W. M. McPhail, H. P. Medhurst, A. Mellenfield, B. S. Milne, T. A. Moore, P. A. Moxey, Miss D. Nicholson, Miss G. E. Palmer, R. V. Palmer, W. D. Park, A. C. Parker, F. Pask, G. H. Pattinson, H. W. Payton, G. C. Phillips, B. P. Pickess, E. B. Pinniger, M. Pullen, A. Quist, F. W. P. Radford, B. A. Richards, Dr. (Mrs.) N. O. Richards, B. G. Rigden, Miss M. E. Robins, Miss D. A. Rook, H. W. Rudd, Miss V. Ruffles, A. J. Sales, B. L. Sage, Miss M. Scholey, D. C. Seel, P. Shaw, Dr. S. R. Sims, Mrs. L. M. P. Small, A. M. Smith, Mrs. K. A. Solomon, D. M. Stairs, F. H. Stallworthy, Miss I. Stromberg, D. J. Summers, G. Taylor, Mrs. S. G. Thomas, Miss A. M. Thomas, H. V. Thompson, A. Turner, E. E. Turtle, Mrs. M. Vizoso, B. Wade, Mrs. M. Waller, G. Warburg, Prof. E. H. Warmington, R. B. Warren, N. J. Wood, G. Woodward, H. Woodward.

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## Botanical Records for 1956

Compiled by J. EDWARD LOUSLEY.

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THE weather of 1956 was unfavourable almost throughout the season. Cold east winds and lack of showers, with frosts at night, held back spring flowers. On the morning of April 20th there was ice a quarter of an inch thick on a pool in my garden, and at that date *Viola hirta* was still flowering freely at Botley Hill, while primroses were not yet at their best. May was fairly warm and sunny but dry, and early in June cold and wet weather set in which continued more or less throughout the summer. As some slight compensation, autumn botanizing was possible until a later date than usual—the first severe frost was on October 25th—while flowers were still rather plentiful until a month later.

With such unpleasant conditions to contend with it is a tribute to the enthusiasm of the Society's botanists that they were able to contribute more records than in any other year since this series of reports commenced in 1943. Some of the most interesting records were made in the course of work for the B.S.B.I. Distribution-Maps Scheme to which the Society is making a valuable organised contribution.

During 1956 important progress has been made in listing plants in places not open to the public. By gracious permission of Her Majesty The Queen the grounds of Buckingham Palace were visited on June 5th and September 4th by Lt.-Col. J. Codrington, D. H. Kent, J. E. Lousley and D. McClintock and about 175 species listed. On June 19th I visited Bromley-by-Bow gasworks by the River Lea with B. T. Ward and Richard Ward, and this produced nearly 100 species. Mrs. L. M. P. Small, having observed from public roads several interesting plants in the Grand Surrey Canal, Rotherhithe, approached the Port of London Authority for permission for a small party to have access to the banks. On July 14th, T. G. Collett, D. H. Kent, J. E. Lousley and Mrs. Small visited four stretches of the canal under very wet conditions, and useful lists were made. The volume of records contributed this year is such that only a small proportion can be mentioned in this report.

### V.-c. 16, WEST KENT.

For the second time in three years, a rare orchid has been added to our records from the part of Kent falling within our Area. In October

K. E. Bull drew attention to a large colony of *Epipactis* in a beech plantation south of Eynsford, to which he had been directed by another botanist whose name he has forgotten. This colony was visited by Dr. F. Rose, D. McClintock, Mr. and Mrs. P. C. Hall and myself, and a specimen sent to Dr. D. P. Young. It proved to be *E. phyllanthes* G. E. Sm., growing, as elsewhere, associated with ivy under very shaded conditions. Even at the late date at which it was found, many of the flowers were still sufficiently fresh to show their structure. On the same day that we visited this orchid, Mr. and Mrs. Hall, D. McClintock and I saw *Artemisia verlotorum* in great abundance in gravel pits  $1\frac{1}{2}$  miles south of Otford.

Mrs. A. G. Side reports *Spartina townsendii* H. & J. Groves from mud flats above Littlebrook Power Station, Dartford; the only previous record of this maritime grass from our Area is from West Thurrock, Essex. She also found *Tetragonolobus maritimus* (L.) Roth established in rough grassland by the Old Rectory, Longfield and *Centaurea solstitialis* L. in a lucerne field at Stone. The records contributed by Miss A. E. S. Mills include *Euphorbia cyparissias* L., named by D. McClintock, from chalk grassland and *Galinsoga ciliata* (Ran.) Blake as a garden weed; both from Elmstead Woods. The last mentioned species has also been found at Farnborough as a nursery weed by Mrs. L. Ackerman, whose material was named by E. B. Bangerter. These are our first records from the vice-county.

#### V.-c. 17, SURREY.

The Surrey records contributed by Mrs. B. Welch include several very interesting additions. She found *Polygonum mite* Schrank in Chertsey Mead, and also on the river wall near Barnes Bridge, *Typha angustifolia* L. by the Thames opposite Hurst Park racecourse, *Ceratophyllum demersum* L. in a pond at Parkside, Wimbledon and in the Upper Stew Pond, Epsom Common, and *Elodea callitrichoides* (Planch.) Caspary in great abundance choking the ditch in the Old Deer Park, Richmond. The last species was first recorded for Britain from the Longford River where it was probably introduced by aquarists, and its extension to the Richmond ditch which is flooded by the Thames at high water, and to the Thames lower down at Strand-on-the-Green (*Lond. Nat.*, 35, 5) is consistent with natural distribution by water carriage, though this cannot yet be regarded as proved. Mrs. Welch has known *Lepidium smithii* Hook. on grass slopes near the Temperate House in Kew Gardens since 1945, and draws attention to its inclusion in Nicholson's *Flora of Kew Gardens*, 1906. She points out that *Bromus carinatus* Hook. & Arn. has greatly extended its range in recent years, and now extends along the Thames from Richmond to Hammersmith, and is also on Barnes Common.

Of the plants recorded from the Grand Surrey Canal by Mrs. Small and those who joined her on the later visit (see above), perhaps the most interesting was *Nymphoides peltata* (S. G. Gmel.) Kuntze. When Edward Newman published a note on this in 1852 (*Phytologist*, 4, 479) he said it was abundant in the canal by the gas-works in Old Kent Road



and in other places. The place where we saw it, in great abundance, was about half a mile west of the Old Kent Road bridge, and it was particularly pleasing to see it in a canal where Salmon in his *Flora of Surrey*, 1931, regarded it as extinct. With it grew *Acorus calamus* L. and various aquatics. Mrs. Small also found an excellent station for *Rumex palustris* L. by a pond on the west side of Beddington Sewage Farm. It was accompanied by hybrids with *R. obtusifolius* and *R. conglomeratus*, and nearby grew *Zygophyllum fabago* L., to which Dr. D. P. Young directed me. This plant of the Syrian Bean-caper was only about 200 yards from the one on Mitcham Common which was detected by J. B. Evans in 1955. *Rumex palustris* has also been found this year near Sunbury Weir by Mrs. Welch, and by me in an old gravel-pit in Beddington Lane.

*Cyperus longus* L. has been found by Mrs. J. E. Smith on Arbrook Common, where nearly a dozen small plants grew by a stream: it may have been an outcast from some aquatic garden. On Wimbledon Common some dumped rubble near an area where horse-jumping takes place produced uncommon aliens—Dr. D. P. Young had found *Panicum laevifolium* Hack. here in 1955, and in 1956 W. Mackintosh added *Descurainia sophia* (L.) Pursh. and *Conringia orientalis* (L.) Dum. In the old gravel-pit in Beddington Lane I found *Foeniculum vulgare* Mill., and there, on Beddington Sewage Farm and on Mitcham Common, *Artemisia verlotorum* Lam. in great abundance. On the towing path between Kew and Richmond I collected *Artemisia annua* L., while D. McClintock sent me *Polygonatum odoratum* (Mill.) Druce from amongst bushes on a chalky roadside above Caterham round-about. Two records from just outside our Area should be noted as likely to have significance in interpreting occurrences within it—R. B. Ullman found a young plant of *Osmunda regalis* L. on the shore of Boldermere (this seems to be on the increase in Surrey), and, while in 1955 W. H. Spreadbury noticed *Azolla filiculoides* as abundant for two miles in the Basingstoke Canal near Sheerwater, it seems that this fern is now extending eastwards.

Much as the dumping of rubbish on Mitcham Common is to be deplored as destroying one of the finest haunts of naturalists near London, it has produced temporary compensations during the year. A few of the more interesting aliens which appeared on the newest tip are:—*Vicia lutea* L., *V. pannonica* Crantz, *Lathyrus aphaca* L., *L. hirsutus* L., all first noted by Dr. D. P. Young, and *Vaccaria pyramidata* Medik., *Cephalaria syriaca* (L.) Roem. & Schult., *Guizotia abyssinica* Cass., *Silybum marianum* (L.) Gaertn., *Centaurea diluta* Ait., *Nicandra physaloides* Gaertn., *Datura ferox* L., *D. stramonium* L., *Salvia reflexa* Hornem., *Amaranthus caudatus* L. and *A. chlorostachys* (Willd.) Thell. (both det. J. P. M. Brenan), *Chenopodium hybridum* L. and *Lolium temulentum* L.

*Lagarosiphon major* (Ridley) Moss has been found in abundance in a pond in Cannon Hill Park, Raynes Park by R. C. Wingfield, who handed a specimen to Dr. D. P. Young which has been confirmed by D. H. Kent.

## V.-c. 18, SOUTH ESSEX.

Our introduction to ground of exceptional interest was again due to Mrs. Small. From the promontory by the Thames marked on the one-inch maps as Great Coldharbour, south of Rainham, she sent me specimens of *Rumex cristatus* DC. and *Senecio* × *londinensis* Lousley, and mentioned that there were salt-marsh plants growing nearby. A subsequent visit by D. McClintock, B. T. Ward and myself added *Amaranthus albus* L. (det. J. P. M. Brenan) and *Salsola pestifer* Nelson from waste ground at the promontory, and the following maritime species from salt-marshes a little to the north:—*Cochlearia anglica* L., *Spergularia salina* J. & C. Presl, *Aster tripolium* L., *Glaux maritima* L., *Salicornia ramosissima* Woods (det. D. H. Dalby), *Juncus gerardi* Lois., *Triglochin maritima* L., *Scirpus maritimus* L., *Puccinellia distans* (L.) Parl., *P. maritima* (Huds.) Parl. and *P. fasciculata* (Torr.) Bickn. Further investigation earlier in the year may well add to the list for these salt-marshes so near London. On the way we visited a refuse tip on Ripple Level and the plants found included:—*Vaccaria pyramidata* Medik., *Descurainia sophia* (L.) Prantl., *Melandrium noctiflorum* (L.) Fr., *Bupleurum lancifolium* Hornem., *Chenopodium glaucum* L. and *Setaria glauca* (L.) Beauv.

In Epping Forest R. M. Payne has found a few plants of *Dryopteris oreopteris* (Ehrh.) Maxon in three separate localities. He also reports *Glyceria declinata* Breb. and *Epipactis helleborine* (L.) Crantz from Ongar Park Wood. H. C. Holme found *Anthemis tinctoria* L. (conf. D. H. Kent) in a hayfield at Abridge. In September I was invited to join a meeting of the Essex Field Club which included a visit to Stubbers, North Ockendon, which was the home of William Coys (1560-1627) whose lists of some of the interesting plants he grew are still extant. We saw *Cymbalaria muralis* Gaertn. Mey. & Scherb. still on the old walls from which it is believed to have been spread to its present wide distribution in Britain. Like *Chrysanthemum parthenium* (L.) Bernh., which grows with it, it appears in Coy's garden list of 1616-1617 (Gunther, R. T., *Early British Botanists*, 1922, pp. 317-8). By the fish-pond at Stubbers I noticed *Rumex maritimus* L. and its hybrid with *R. conglomeratus* Murr., and, on the other side of the house, *Artemisia verlotorum* Lam.

In June, I joined B. T. and Richard Ward in a visit to Bromley-by-Bow gasworks. They had made a list in the autumn of 1955 of some of the plants found there including *Angelica archangelica* L. in abundance on the banks of the Lea. Amongst those we added were *Poa palustris* L. and *Cardaminopsis arenosa* (L.) Hayek growing by heaps of bog-ore brought from Denmark, and *Bunias orientalis* L. near the railway. In November, B. T. Ward handed me specimens of a plant which C. Bignell Pratt had found choking a small pond at Greenstead Church near Chipping Ongar. This is *Tillaea recurva* Hook. f. which is a native of Tasmania and southern Australia. It has also been found by Mrs. Welch near Southampton in an artificial pond. At Greensted it was found independently earlier in the year

by E. B. Bangerter, P. Hall and Mrs. J. Hall. It was probably planted but is noted here in case it appears elsewhere.

#### V.-c. 19, NORTH ESSEX.

As in previous years, records from this vice-county are few. The only one received of general interest is that of *Sorbus torminalis* (L.) Crantz found by R. M. Payne at Galley Hill.

#### V.-c. 20, HERTS.

Our most recent record for *Campanula latifolia* L., the handsome bell-flower which formerly occurred in several places about North Mimms, was 1910. Last autumn R. F. Turney showed me plants growing on an estate at Chorley Wood, which I did not report at the time as the habitat was unsatisfactory and a little outside our Area. This year F. M. Day has restored it to our list with a record from a wood in Tolpits Lane, Rickmansworth. R. M. Payne reports *Catabrosa aquatica* (L.) Beauv. and *Glyceria plicata* Fr. from Cheshunt; J. G. Dony, *Scutellaria minor* Huds. from Bishop's Wood near Harefield; and R. A. Graham, *Chenopodium succicum* Murr. (det. J. P. M. Brenan) which he found in 1950 on a refuse tip at Bushey.

#### V.-c. 21, MIDDLESEX.

The two visits to the grounds of Buckingham Palace by the members mentioned earlier provided records which fill an important gap in our knowledge of the distribution of plants in central London. The flora of the margin of the lake proved particularly interesting and the species seen there included *Acorus calamus* L., *Caltha palustris* L., *Carex acuta* L., *C. acutiformis* Ehrh., *Glyceria maxima* (Hartm.) Holmb., *Hydrocotyle vulgaris* L., *Lythrum salicaria* L., *Oenanthe crocata* L., *Phragmites communis* Trin., *Rumex hydrolapathum* Huds. and *Scirpus maritimus* L., but no doubt some of these had been planted for ornamental purposes at some time in the past. *Chaerophyllum aureum* L. is abundant under trees in the north-west part of the garden and it was interesting to find both species of *Galinsoga*.

All the localities for *Stellaria dilleniana* Moench. previously known to us are from near the Thames in Surrey and Middlesex. In 1956 T. G. Collett, B. P. Pickess and D. H. Kent found it plentiful over a very small area on Harefield Moor. They also reported *Carex vesicaria* L. from a pond at Knightscode Farm, Harefield. J. Codrington sent me a specimen of *Chenopodium murale* L. from a derelict garden at Pimlico and R. A. Graham reports that he collected *Polygonum orientale* L. var. *glabratum* Hook. (det. J. P. M. Brenan) from Hill End tip, Harefield. H. C. Holme has continued his useful observations in Regent's Park, and found *Sisymbrium irio* L. (conf. E. B. Bangerter and Mrs. B. Welch) in a hedge bordering the Zoological Gardens, and *Potentilla recta* L. (conf. D. H. Kent) on waste ground in the Park for the second year running. From the River Colne north of Harefield, C. A. Milner sent specimens of *Potamogeton obtusifolius* Mert. & Koch to D. H. Kent, who also confirmed for him *Smyrniium perfoliatum* Mill. from a rubbish

tip at Eastcote collected in 1954. Mrs. L. M. P. Small gathered *Scorzonera hispanica* var. *latifolia* C. Koch (det. A. Melderis) from a roadside verge at Twickenham, and Dion Murray, *Glaucium corniculatum* (L.) Rudolph (det. Kew) from the railway yard at Kew Bridge Station.

V.-c. 24, BUCKS.

No records have been contributed from this vice-county.

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Publication of *A Hand List of the Plants of the London Area* is completed in the current issue of the *London Naturalist*. This part includes a supplement covering the more important additions made while the work was in course of publication, but limitations of space have compelled us to omit a very large number of records. The Committee of the Botanical Section has now reviewed the arrangements for the collection and publication of records, and their relation to the work being done by the Society in connection with the Distribution Maps Scheme of the Botanical Society of the British Isles, which was initiated after publication of the *Hand List* had commenced. To ensure that their records can be used to full advantage in the system which will be adopted, members are asked in future to give National Grid references (as fully as possible, but at least to 10 km. Grid Squares) in addition to the vice-county, for all records contributed.

We are grateful to the following for their contributions during the year:—Mrs. L. Ackerman, E. B. Bangerter, J. P. M. Brenan, K. E. Bull, Lt.-Col. J. Codrington, C. L. Collenette, T. G. Collett, D. H. Dalby, F. M. Day, E. R. Denyer, Dr. J. G. Dony, A. E. Ellis, J. B. Evans, R. A. Graham, Mrs. P. C. Hall, P. C. Hall, H. C. Holme, H. Inglis, Miss L. J. Johns, D. H. Kent, D. McClintock, W. Mackintosh, Miss A. E. S. Mills, C. A. Milner, Dion Murray, R. M. Payne, B. P. Pickess, Dr. F. Rose, Mrs. A. G. Side, Mrs. L. M. P. Small, Mrs. J. E. Smith, W. H. Spreadbury, R. F. Turney, R. B. Ullman, B. T. Ward, Richard Ward, Mrs. B. Welch, R. C. Wingfield and Dr. D. P. Young.

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## Bees and Wasps in Bushy Park and at Hampton Hill, Middlesex

By P. F. YEO.

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**T**HIS is an account of my collecting in this area, which took place from August 1948 to May 1953, though mainly in 1949-1951. Most of it was done in Bushy Park and the garden of 43 Park Road, Hampton Hill, but a few records are from Carlisle Park, Hampton. Bushy Park is two miles long and one mile wide, though tapering to a point at the Hampton Wick end. It is bordered on the North and West by built-up areas, including Hampton and Hampton Hill on the West.

The South border is formed partly by the River Thames and partly by Hampton Court Park. On this side it is connected by more or less open country to the Surrey Commons around Esher. No. 43 Park Road is about  $\frac{1}{4}$  mile from Bushy Park and about 150 yards from Fulwell golf course.

The soil of the area is gravelly, but areas of fairly pure fine sand occur in Bushy Park. In the Park there are a number of firm sandy paths which form the principal habitat for certain fossorial species. There was an area near Hampton Wick which yielded more species than other areas; it was traversed by paths, and had some bare patches, and a shallow depression with vertical banks a foot or so high. There are a number of Oak woods; some of these are enclosed and have a shrub layer of Rhododendrons. Others are open and have no undergrowth. There are also numerous solitary Oaks and Hawthorns, which are old and more or less rotten, and there was also a group of rotten Alders, since removed. These trees provide nesting sites, in the form of beetle holes, for some species. The best trees were some old Oaks forming a boundary row by the wall near Hampton Hill.

Flowers are not numerous in the park. Heath Bedstraw (*Galium hercynicum*) and Tormentil (*Potentilla erecta*) are the commonest flowers, but no insects were taken at them. In Spring there is some Gorse (*Ulex europaeus*), Dandelion (*Taraxacum officinale*), and some Coltsfoot (*Tussilago farfara*). Later in the year, Ragwort (*Senecio jacobea*), Smooth Hawk's Beard (*Crepis capillaris*) and Harebell (*Campanula rotundifolia*) are in flower. All these plants are attractive to Aculeates, but all are local in distribution in the Park, with the possible exception of the *Campanula*. Hawthorn is somewhat more widespread and must form an important source of food for the Andrenas.

In the garden at Hampton Hill wasps were usually taken on foliage, that of a Peach tree (which has foliar nectaries) in a warm corner being particularly attractive. Plum, Golden Rod (*Solidago*), and Michaelmas Daisy (*Aster*) were the most attractive flowers, the second attracting wasps as well as bees.

The limitations to my collecting must now be stated. First, as will be seen from the list, I largely ignored the social species. Secondly, collecting was almost confined to school and university vacations. This means that practically no collecting was done from the third week in April until the second week in June. This is responsible for the small list of Andrenas and for the almost complete absence of *Nomada* from my records. Thirdly, in Bushy Park I did more collecting from the ground than from timber, and though one of the enclosed woods is open to the public I never tried collecting in it.

I have searched most of the *Entomologist's monthly Magazine* for the present century without finding any records for this part of Middlesex. Saunders (1896) gives two records, *Megachile ligniseca* from Hampton Court, and *Chelostoma campanularum* from Hampton Wick. There is, however, very full information on Hampstead Heath, made available by Yarrow and Guichard (1948) and Yarrow (1954). In order to make some comparisons between Bushy Park and Hampstead Heath I have

supplied after the general list a list of species from my area not recorded for Hampstead Heath. In addition a list of species found in the garden at Hampton Hill is given. This makes possible comparison between the Hampton Hill garden and those at Hampstead, as well as between Bushy Park and the garden nearby.

### RECORDS OF SPECIES

In the list that follows records (including negative ones) without locality are from Bushy Park; H refers to the garden of 43 Park Road, Hampton Hill. Unless otherwise stated, all captures were made and determined by me and are in my collection.

#### CHRYSIDIDAE

1. *Omalus auratus* (L.) 25/6/51 1, H. 20/8/51 2 (1 ♀) on Peach foliage, H. 27/8/51 1 on Peach foliage, H.
2. *O. aeneus* (F.) 1951 a bottle-green Chrysid, probably this sp., seen on Peach foliage at a time when *O. auratus* was in evidence, i.e. probably late August.
3. *Hedychridium coriaceum* Dahlb. 30/6/51 ♀. 23/8/51 ♀.
4. *H. ardens* (Latr. in Coq.) 30/6/51 ♀, taken in net with a ♀ *Ablepharipus podagricus*, probably fortuitously; its host, *Tachysphex pompiliformis*, was taken nearby on the same date. 23/8/51 ♀.
5. *Chrysis cyanea* (L.) 22/6/51 1 at rotten Oak. 25/6/51 ♀ at rotten Alders. 23/8/53 ♀ at rotten Oak.
6. *C. ignita* (L.) 8/6/49 one found disabled, H. 3/6/50 ♀ newly dead in window, H. 11/6/50 1, presumably this sp., seen, H. —/9/50 presumably this sp. seen several times on house, H, last on 18/9/50.

#### SAPYGIDAE

7. *Sapyga clavicornis* (L.) 22/6/51 2 ♀ ♀ at rotten Oaks, 1 caught in net with *Chelostoma florissomne*.

#### MYRMOSIDAE

8. *Myrmosa atra* Panz. 1/9/50 ♀. 5/9/50 ♀; ♀ ♀ seen commonly. 12/9/50 ♀ ♀ common. 5/10/50 none; a fine day on which several spp. caught. 19/8/51 ♀ seen.

#### POMPILIDAE

9. *Priocnemis schiodtei* Haupt (see also next sp.) 10/6/50 ♂. 1/9/50 2 ♀ ♀. 12/9/50 ♀ (coll. M. C. F. Proctor, and in his collection). 25/6/51 ♀. 19/8/51 ♀.
10. *P. gracilis* Haupt 19/8/49 ♀. 31/8/49 ♀. 1/9/50, 5/9/50, and 18/9/50 ♀, each date. 19/8/51 ♀. This species and the last are in many cases difficult to distinguish in the ♀ sex, as they seem to grade into one another. Some of the determinations are therefore tentative, but it does appear that I have taken ♀ ♀ of both spp. in Bushy Park, the more extreme forms being less difficult to determine.
11. *P. pusillus* Schiodte 12/9/50 ♀ (coll. M. C. F. Proctor, and in his collection). 18/9/50 ♀.
12. *P. minor* Zett. 10/6/50 ♀. 1/9/50 3 ♀ ♀. 22/6/51 and 30/6/51 ♀, each date. 19/8/51 2 ♂ ♂, 2 ♀ ♀.
13. *Pompilus cinctellus* Spin. 22/6/51 2 ♂ ♂. 1 ♀, on wall; were quite numerous on this wall and nearby Oak stumps.
14. *P. unguicularis* Thoms. (see also next sp.) 5/10/50 2 ♀ ♀ (det. I. H. H. Yarrow, as probably this sp.). (One of these probably *P. trivialis* P.F.Y.)
15. *P. trivialis* Dahlb. 18/9/50 2 ♀ ♀ (Det. I. H. H. Yarrow, as probably this sp.). 5/10/50 ♂, probably ♀ (see preceding sp.). 19/8/51 ♀. This and the preceding sp. are not satisfactorily distinguishable in the ♀ sex).

16. *P. crassicornis* Shuck. 5/9/50 ♀.
17. *Anoplius infuscatus* Schiodte 1/9/50 3 ♀♀. 5/9/50 ♀.
18. *A. fuscus* (L.) 18/9/50 ♀, at burrow.
19. *A. nigerrimus* (Scop.) 19/8/51 ♀.

## VESPIDAE

20. *Ancistrocerus callosus* (Thoms.) 18/8/49 ♂ at *Solidago*, H.
21. *A. gazella* (Panz.) 18/8/49 ♂, at *Solidago*, H. 19/8/49 ♀ at *Solidago*, H. (Both det. I. H. H. Yarrow).
22. *Symmorphus sinuatissimus* Rich. 8/7/51 ♀ resting on Peach foliage, H.
23. *Microdynerus exilis* (H.-S.) 22/6/51 ♀ at rotten Oak, another seen entering a hole here. 30/6/51 ♀ at rotten Oak. (One or both these det. I. H. H. Yarrow).
24. *Vespa crabro* (L.) 25/6/51 1 seen.

## SPHECIDAE

25. *Astata pinguis* Dahlb. (*A. stigma* Klug in Panz.) 5/9/50 ♀. 30/6/51 ♂.
26. *Tachysphex pompiliformis* (Panz.) 18/9/50 ♀. 30/6/51 ♀.
27. *Trypoxylon figulus* (L.) 22/6/51 ♂ at rotten Oak, ♀ on bare sand.
28. *T. clavicerum* Lep. 10/6/51 1, H. 18/6/51 1, H. 22/6/51 ♂ at rotten Oak.
29. *Ammophila sabulosa* (L.) 22/8/49 ♂, about *Solidago*, H. 5/9/50 ♀, and several seen; numerous also in Carlisle Park, Hampton. 5/10/50 still some about. 16/9/51 ♀ at *Solidago*, H.
30. *Spilomena troglodytes* (V. d. L.) 20/8/51 and 31/8/51 ♀ each date. at Peach foliage, H.
31. *Cemonus shuckardi* (Moraw.) —/9/48 ♀, H. 25/6/51 2 ♂♂, H.
32. *C. lethifer* Shuck. 6/6/50 2 ♂♂ on Raspberry leaves, ♀ on post, H. 23/8/50 ♀ on *Geum* leaves, H. 18/6/51 ♂, H. 27/8/51 ♀ at Peach foliage, H.
33. *Diodontus minutus* (Fab.) 5/9/50 ♀, running down to base of stem of *Senecio vulgaris* plant, Carlisle Park, Hampton.
34. *D. insidiosus* Spooner 30/6/51 2 ♀♀.
35. *Passaloecus corniger* Shuck. 27/6/50 ♀, in window, H. 22/6/51 2 ♀♀. at rotten Oaks. 25/6/51 ♂, at rotten Oak. 23/8/51 ♀, on Peach foliage, H.
36. *P. insignis* (V. d. L.) 8/7/51 ♀ on Peach foliage, H.
37. *P. gracilis* (Curt.) 1/7/51 ♂, H. 8/7/51 ♀ at Peach foliage, H.
38. *Mimesa bruxellensis* Bondroit 12/9/50 ♀ in burrow, in colony of *M. equestris* (det. I. H. H. Yarrow)
39. *M. equestris* (Fab.) 1/9/50 2 ♀♀, where *M. bruxellensis* caught (confirmed I. H. H. Yarrow). 19/8/51 3 ♀♀, in another colony about a mile from that where earlier specimens caught.
40. *M. dahlbomi* Wesm. 10/6/51 ♂, H. 25/6/51 ♀, H.
41. *Psenulus atratus* (Fab.) 8/7/51 ♀, H.
42. *Oxybelus uniglumis* (L.) 9/7/50 2 ♀♀, one at burrow with Dipteran prey, *Chironia parvicornis* Zett. (det. van Emden), attached to sting. The sp. appeared to be common in Bushy Park in July 1950. 5/9/50 ♀, digging. 22/6/50 ♂, H. 30/6/51 ♂.
43. *Crabro cribrarius* (L.) 19/8/51 ♀.
44. *C. peltarius* (Schreb.) 25/6/51 ♀.
45. *Coelocrabro ambiguus* Dahlb. 7/9/50 ♀ on post, H. 18/9/50 ♀ trying to enter hole in wood of fallen tree. (The preceding two confirmed by I. H. H. Yarrow). 8/7/51 2 ♂♂, H. 10/7/51 ♂, H.
46. *Ablepharipus podagricus* V. d. L. (*Crossocerus podagricus*) 30/6/51 ♀ taken in net with *Hedychridium ardens*, probably fortuitously.
47. *Crossocerus varus* Lep. et Brullé 5/10/50 ♀ at burrow in vertical bank (det. I. H. H. Yarrow). 30/6/51 ♀ on sandy path. 8/7/51 ♀, H.
48. *C. ovalis* Lep. et Brullé (*C. anxius* (Wesm.)) 10/6/50 ♀ (confirmed by I. H. H. Yarrow). 22/6/51 ♀, sandy path. 25/6/51 6 ♀♀.

49. *C. elongatulus* (V. d. L.) 26/8/49 ♀, H. 10/6/50 ♂, H. 10/6/51 ♂, H. 18/6/51 2 ♂♂, 1 ♀, H. 22/6/51 ♂, ♀, on wall. 8/7/51 6 ♂♂ round Peach tree, H. 20/8/51 2 ♂♂, at Peach tree, H. 25/5/52 ♂, at Peach foliage, H.
50. *Hoplocrabro quadrimaculatus* (Fab.) (*Crossocerus quadrimaculatus*) 18/9/50 ♂, ♀, at uprooted tree stump with sand between roots; this provided vertical surfaces which this species is restricted to, but which are rare in Bushy Park. 5/10/50 ♀ at burrow in vertical bank.
51. *Solenius continuus* (Fab.) (*Ectemnius continuus*) 19/8/49 ♂, ♀, at *Solidago*, H. 25/6/51 ♂ at rotten Alders.
52. *Rhopalum clavipes* (L.) 8/7/51 1, at Peach tree, H.
53. *Lindenius panzeri* (V. d. L.) 8/7/50 ♂, ♀. 1/9/50 2 ♂♂, 7 ♀♀ (2 carrying Dipteran prey, one *Chlorops pumilionis* Bjeck., one queried the same (det. H. Oldroyd and D. J. Clark)) on a path, where very common. 5/9/50 2 ♂♂. 12/9/50 ♂; species still common on the path referred to, emerging from holes as soon as sun shone, a few remaining about when it was dull. 5/10/50 several seen at spot where previously most abundant. 19/8/51 2 ♂♂, 2 ♀♀ (1 pair *in cop.*); the species formed the great majority of all Aculeates seen on this visit to the park.
54. *L. albilabris* (Fab.) 10/6/50 ♀, on path. 30/6/51 3 ♀♀. A fairly common species in firm paths.
55. *Entomognathus brevis* (V. d. L.) 19/8/51 ♀.
56. *Nysson trimaculatus* (Rossi) 20/8/50 ♀, on Lettuce leaf, H.
57. *Hoplisus bicinctus* (Rossi) 3/6/49 ♀, on window (det. O. W. Richards, specimen in Brit. Mus. (Nat. Hist.)). (Yarrow (1943) gives *H. quadrifasciatus* as the host of *Nysson trimaculatus*, but since this species and *H. bicinctus* are the only representatives of their genera that I have taken in the district, it has occurred to me that *H. bicinctus* may be an alternative host of the *Nysson*. In support of this suggestion it may be mentioned that I have taken the *Nysson* at the undercliff at Highcliffe, Hants., not more than  $\frac{1}{3}$  mile from where Dr. M. C. F. Proctor took an *H. bicinctus* in his garden, the respective dates being 6/9/51 and 1 or 2/9/50. Again, these are, I believe, the only two specimens of their genera taken at Highcliffe by either of us).
58. *Cerceris rybyensis* (L.) This species is quite common in Bushy Park, though not so numerous as *C. arenaria*. It burrows in firm sandy paths. 19/8/49 2 ♀♀, 1 with prey (*Halictus calceatus*, ♂). 8/7/50 1 ♂, 2 ♀♀. 9/7/50 ♀. 5/9/50 1 or 2 seen (presumably this sp.) in Carlisle Park, Hampton. 5/10/50 none seen in Bushy Park. 20/8/51 ♀ (presumably this sp.) at *Solidago*, caught and released, H.
59. *C. arenaria* (L.) 17/8/49 and 18/8/49 ♀ each date, at *Solidago*, H. 31/8/49 ♀. 8/7/50 very common; 2 ♂♂, 1 ♀, including a pair *in cop.*; ♂ of this pair seen to beat with his antennae those of the ♀, several times in rapid succession, first on one side, then on the other; this took place in a specimen tube and on the ground, at a place where several copulating pairs were seen. Probably the season's activities had only just started. Here an additional ♂ and a ♀ were taken, found moribund on the ground. 12/9/50 1 (coll. M. C. F. Proctor, and in his collection). 5/10/50 none seen. 19/8/51 several seen.

#### APIDAE

60. *Prosopis communis* Nyl. Common, H. —/8/48 ♀ in window after visiting *Thymus* on window-sill. 7/7/50 ♀, H. 22/8/50 1 ♂, 1 ♀, at *Solidago*, 1 ♂, 1 ♀, in spider's web. ♂ newly caught, ♀ dead and wrapped in a "cocoon" of spider's web, H. In 1950 last seen a few days after this; disappeared a little earlier than *P. hyalinata*. 22/6/51 and 25/6/51 ♂ each date, H. 8/7/51 1 ♂, 1 ♀, H.



61. *P. hyalinata* (Smith) Common, H. 19/6/49 ♂, H. 17/8/49 ♀, H. 10/6/50 ♂, H. 7/7/50 1 ♂, 1 ♀, H. 23/8/50 ♀, at *Solidago*, H.; both sexes active until about beginning of September. 22/6/51 ♀, H.
62. *Halictus leucozonius* (Schrank) —/8/48 ♀, at *Aster*, H. 4/9/50 ♂, at *Aster*, H. 12/9/50 ♀ at yellow Composite. ♂ in burrow (coll. M. C. F. Proctor, and in his collection). 5/10/50 ♀. 20/9/51 ♂. at *Solidago*, H.
63. *H. lativentris* (Schenck) 5/10/50 ♀, (confirmed I. H. H. Yarrow).
64. *H. calceatus* (Scop.) —/8/48 and —/9/48, ♂ each month, H. 19/8/49 ♂, prey of *Cerceris rybyensis*. 26/8/49 2 ♂♂, H. 9/7/50 ♀, prey of *Cerceris rybyensis*. 10/9/50 ♀, at *Scabiosa*, H (this and the two preceding det. I. H. H. Yarrow). 20/8/51 ♀, at *Oenothera*, H. 17/9/51 ♀, seen at *Solidago*, H. presumably this sp.
65. *H. malachurus* (Kirby) 19/8/49 ♀. 5/10/50 ♀. 9/4/52 2 ♀♀, at *Ulex europaeus*.
66. *H. villosulus* (Kirby) 5/10/49 ♀. 20/8/50 ♂, at *Solidago*, H. 5/10/50 2 ♀♀.
67. *H. punctatissimus* (Schenck) 9/4/52 3 ♀♀, 1 at *Taraxacum*, 1 at *Ulex europaeus*, 1 on ground.
68. *H. minutissimus* (Kirby) 5/10/50 2 ♀♀. 22/6/51 ♀. 17/4/52 ♀, on ground: others seen at *Taraxacum*.
69. *H. nitidusculus* (Kirby) 5/10/50 ♀.
70. *H. tumulorum* (L.) or *H. perkinsi* Blüthgen 5/10/50 ♀, at *Senecio jacobea*. 30/6/51 ♀, at burrow in path.
71. *H. smeatmanellus* (Kirby) —/8/48 ♂, H. 10/9/50 ♀, at *Solidago*, H. 18/6/51 ♀, H.
72. *H. morio* (Fab.) —/8/48 ♀, H. 17/8/49 ♂, H. 18/8/49 ♀, H. 26/8/49 ♂, H. 29/8/50 ♂, at *Solidago*, H. 5/9/50 ♀, on leaf, H. 10/9/50 ♀, H; about 5 other ♀♀ of this sp. caught and released, H.
73. *H. leucopus* (Kirby) 5/10/50 ♀. —/9/51 the sp. coll. and det. by M. C. F. Proctor, and in his collection.
74. *Sphecodes gibbus* (L.) 19/8/49 ♂, H (confirmed by I. H. H. Yarrow).
75. *S. reticulatus* Thoms. —/9/48 ♀, H. 9/7/50 ♀. 7/9/50 ♂, H. (All confirmed by I. H. H. Yarrow).
76. *S. monilicornis* (Kirby) 9/7/50 ♂, ♀. 22/8/50 ♀, H.
77. *S. puncticeps* Thoms. —/8/48 ♀, H. 17/9/50 ♂. 5/10/50 ♂, 2 ♀♀.
78. *Andrena haemorrhoea* (Fab.) 13/4/52 ♂. 2 ♀♀. at Plum Blossom, H. Others seen on succeeding days.
79. *A. tibialis* (Kirby) 17/4/52 ♀.
80. *A. flavipes* Panz. 22/8/50 ♀, at *Solidago*. H. 5/4/51 ♂, at burrow, near where a number seen on the bank of a depression. 11/4/51 ♂, at spot where seen on 5/4/51. 9/4/52 2 ♂♂, at spot where seen in 1951, where rather numerous. 13/4/52 ♂, at Plum blossom, H. 16/4/52 2 ♀♀, and several others seen, ♂♂ numerous, at same spot as on 9/4/52, etc.
81. *A. florea* Fab. 30/6/51 ♀, at burrow in path.
82. *A. pubescens* Oliv. 13/4/52 ♂, ♀, at Plum blossom, H. ♀ seen subsequently on same day and on several succeeding days. 16/4/52 ♂, at Plum blossom, H.
83. *A. nigroaenea* (Kirby) 5/4/51 ♀, stylopized, at rest on *Ulex europaeus* bush. 15/4/52 ♂, at Plum blossom, H.
84. *A. bicolor* (Fab.) 10/7/51 ♀, H.
85. *A. jacobae* Perk. 15/4/52 ♀, at Plum blossom, H.
86. *A. varians* (Rossi) 11/4/51 ♀, at burrow in side of small crater-like pit. 13/4/52 ♂, at Plum blossom, H.
87. *A. armata* (Gmel.) 11/4/52 ♀, H. 13/4/52 ♀, at Plum blossom, H; ♀, and probably ♂, seen later same day, and ♀ a few times on subsequent days.
88. *A. humilis* Imhoff 10/6/50 ♀.
89. *A. subopaca* Nyl. 9/4/52 ♀, at *Taraxacum*.

90. *A. ovatula* (Kirby) 8/7/50 ♀, H. 17/4/52 2 ♀♀, at *Ulex europaeus*; ♀♀ numerous, and perhaps ♂♂ present, round a single large bush of *Ulex*; ♂, on ground in the *A. flavipes* colony.
91. *Panurgus calcaratus* (Scop.) 8/7/50 ♀. 19/8/51 ♀, at the *P. banksianus* colony, which was inactive at the time.
92. *P. banksianus* (Kirby) 30/6/51 two active colonies, close together, were found; 2 ♂♂, dead, and a ♀, were taken. 19/8/51 no activity at these colonies.
93. *Anthophora retusa* (L.) 17/4/52 ♂, at *Aubrietia*, H; flies about flower beds and does not visit Plum blossom. 18/4/52 2 ♂♂ seen, H; this sex seemed to be present continuously in the garden at this time. 9/5/53 ♂, on ground, ♀, at *Cheiranthus cheiri*; ♂♂ frequent, ♀♀ less so.
94. *A. quadrimaculata* (Panz.) 25/6/51 ♂, H; this or other individuals seen about this time, frequenting Catmint (*Nepeta × faassenii*).
95. *Nomada goodeniana* (Kirby) 17/4/52 ♂, at *Taraxacum*.
96. *Megachile willughbiella* (Kirby) 21/8/51 ♀, at *Campanula glomerata*, H.
97. *Osmia rufa* (L.) —/4/49, H. 13/4/52 2 ♂♂, at Plum blossom, H. Between this date and 20/4/52 other ♂♂ were caught and released, but no ♀♀ seen.
98. *O. coerulescens* (L.) 10/6/51 ♀, at *Myosotis*, H. 1951 nest made in hollow stick provided, believed completed in July, H. It was opened in November 1952, no insects having emerged; they were found dead, 4 ♂♂ above, and 2 ♀♀ below; the first and third ♂♂ were facing downwards.
99. *Chelostoma florissomne* (L.) 22/6/51 ♀, at rotten Oak, caught in net with ♀ *Sapyga clavicornis*.
100. *C. campanularum* (Kirby) 7/7/50 2 ♀♀, from post in which there was a colony occupying beetle holes, H. The first hole was being sealed on 1/7/50. A bee was seen finishing the plug; it worked round the hole, working at the edge with its mouth-parts. After this the plug was the same colour as the post and slightly concave, and quite inconspicuous; the bee then covered it with sand grains which made it conspicuous. The bees were collecting pollen from *Centaurea cyanea* about this time. The colony was active in 1951 but no records were made. 22/6/51 3 ♂♂, at Oak stumps. On one or two visits at this time one of the Oak stumps was swarming with small Aculeates, the majority being this species; others present in numbers, but much less numerous, were *Trypoxylon* spp. and *Passaloecus corniger*.
101. *Bombus agrorum* (Fab.) 16/4/52 ♀, at Black Currant flowers, H.
102. *Apis mellifera* L.

LIST OF SPECIES IN THE ABOVE LIST NOT RECORDED FOR  
HAMPSTEAD HEATH

An asterisk indicates species found in the garden at Hampton Hill only.

* <i>Omalus ? aeneus</i>	<i>Microdynerus exilis</i>
<i>Hedychridium coriaceum</i>	<i>Astata pinguis</i>
<i>Chrysis cyanea</i>	<i>Ammophila sabulosa</i>
<i>Sapyga clavicornis</i>	<i>Mimesa bruxellensis</i>
<i>Priocnemis schiodtei</i>	<i>Crabro cribrarius</i>
<i>P. gracilis</i>	<i>Ablepharipus podagricus</i>
<i>P. pusillus</i>	* <i>Nysson trimaculatus</i>
<i>Pompilus cinctellus</i>	* <i>Hoplisis bicinctus</i>
<i>P. unguicularis</i>	<i>Halictus lativentris</i>
<i>Anoplius infuscatus</i>	<i>H. minutissimus</i>
<i>A. fuscus</i>	<i>Sphecodes reticulatus</i>
<i>A. nigerrimus</i>	<i>S. puncticeps</i>
* <i>Ancistrocerus callosus</i>	<i>Andrena denticulata</i>
* <i>Symmorphus sinuatissimus</i>	<i>Chelostoma florissomne</i>

Total 28 \*5

LIST OF SPECIES FOUND IN THE GARDEN AT HAMPTON HILL

An asterisk indicates species recorded for Bushy Park also.

<i>Omalus auratus</i>	<i>Prosopis communis</i>
<i>O. ? aeneus</i>	<i>P. hyalinata</i>
<i>Chrysis ignita</i>	* <i>Halictus leucozonius</i>
<i>Ancistrocerus callosus</i>	* <i>H. calceatus</i>
<i>A. gazella</i>	* <i>H. villosulus</i>
<i>Symmorphus sinuatissimus</i>	<i>H. smeathmanellus</i>
<i>Vespula vulgaris</i>	<i>H. morio</i>
* <i>Trypoxylon clavicerum</i>	<i>Sphecodes gibbus</i>
* <i>Ammophila sabulosa</i>	* <i>S. reticulatus</i>
<i>Spilomena troglodytes</i>	* <i>S. monilicornis</i>
<i>Cemonus shuckardi</i>	* <i>S. puncticeps</i>
<i>C. lethifer</i>	<i>Andrena haemorrhoea</i>
* <i>Passaloecus corniger</i>	* <i>A. flavipes</i>
<i>P. insignis</i>	<i>A. pubescens</i>
<i>P. gracilis</i>	* <i>A. nigroaenea</i>
<i>Mimesa dahlbomi</i>	<i>A. bicolor</i>
<i>Psenulus atratus</i>	<i>A. jacobi</i>
* <i>Oxybelus uniglumis</i>	* <i>A. varians</i>
* <i>Coelocrabro ambiguus</i>	<i>A. armata</i>
* <i>Crossocerus varus</i>	<i>A. denticulata</i>
* <i>C. elongatulus</i>	<i>Anthophora retusa</i>
* <i>Solenius continuus</i>	<i>A. quadrimaculata</i>
<i>Rhopalum clavipes</i>	<i>Megachile willughbiella</i>
<i>Nysson trimaculatus</i>	<i>Osmia rufa</i>
<i>Hoplisis bicinctus</i>	<i>O. coerulescens</i>
* <i>Cerceris rybyensis</i>	* <i>Chelostoma campanularum</i>
* <i>C. arenaria</i>	<i>Bombus agrorum</i>
	* <i>Apis mellifera</i>

Total 55 \*21

COMPARISON WITH HAMPSTEAD HEATH AND DISTRICT

The area of Hampstead Heath is about the same as that of Bushy Park, but the lists of Yarrow and Guichard already mentioned include records from six private gardens. These lists also draw on records made over about 130 years. The difference in the periods drawn on for records and the exclusion of part of the season from my collecting could well account for the differences in the totals in the following table, in which figures for Formicidae from Hampstead have been left out.

	Bushy Park and District	Hampstead Heath and District (total)	Hampstead Heath and District (present century only)
Wasps	58	79	63
Bees	44	122	101
Total	102	201	164

When Hampstead totals for the present century are considered the numbers of wasps are comparable, and this suggests that a similarly rich bee fauna may exist. However, it seems quite possible that Hampstead Heath is still a genuinely richer area than Bushy Park even though it is nearer the centre of London, for it seems that its habitats are more varied. My only visit to Hampstead Heath was at the end of June 1955. The day was dull and I only explored the Vale of Health and

Parliament Hill Fields. It appeared that suitable ground for fossorial species is much more extensive than in Bushy Park. There is also a contrast between the flatness of Bushy Park and the hilliness of the Heath which, combined with erosion there, produces some steep banks. There is, however, less human interference in Bushy Park.

To turn from total numbers of species to the differences between the Aculeate faunas, there is a conspicuous difference between the two places in respect of Pompilidae. These are well-represented in Bushy Park, but very poorly represented at Hampstead. Yarrow and Guichard discuss this but cannot offer an explanation. The number of species of all groups in my list not recorded for Hampstead is 28. Of these the great majority are sabulicolous fossorial species, all of which might be expected to occur at Hampstead. There are numerous species at Hampstead which might be expected to occur at Bushy Park, and which might be discovered by more collecting. As already indicated, this applies especially to the bees.

Several of the species which have apparently disappeared from Hampstead occur in Bushy Park and district; these are *Pompilus crassicornis*, *Mimesa equestris*, *Andrena flavipes*, *A. florea*, *A. humilis* and *Anthophora retusa*.

#### COMPARISON OF GARDEN AND PARK RECORDS

Out of the total of 102 species, 55 were recorded in the garden; of these, 21 were also found in the Park. There is a greater proportion of non-fossorial species in the garden, including some not found in the Park. Though the garden makes a substantial contribution to my total list it only provides five species out of the 28 that were not recorded from Hampstead.

To sum up, Bushy Park is somewhat similar to Hampstead Heath in ecology and in its suburban situation, and represents a favourable locality for Aculeate Hymenoptera in the London area and provides a habitat in Middlesex for a number of species not known at Hampstead.

#### ACKNOWLEDGMENTS

I am very grateful to Dr. I. H. H. Yarrow for his numerous determinations. Mr. P. W. E. Currie kindly gave me guidance in identification in the early stages of my collecting. I am also indebted to Prof. O. W. Richards for a determination.

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# A Foraminiferal Assemblage from the London Clay of Oxshott, Surrey.

By J. S. HAMPTON.

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During 1954 Mr. D. Curry (Brown & Castell, 1955, p. 48) collected a sample of London Clay from Oxshott, Surrey, at approximately 5 feet above the working floor of the pit, where there was a drift of shell fragments around a piece of fossil wood, and prepared it, for the separation of the microfauna, in the following manner: the sample, which weighed about 1-3 lbs., was broken into smallish pieces by hand and allowed to dry thoroughly. The dry clay was placed in water for a few hours, in order to break it down completely. The clay fraction was decanted off by many careful washings with water and the resulting residue dried at a moderate temperature.

## SEPARATION OF THE MICROFAUNA.

To facilitate the removal of the microfossils from the residue the remaining heavy clay fraction was separated from the shell fraction by flotation in bromoform (Sp. Gr. 2.86). The shell fraction was then collected on a filter paper and washed in acetone to remove all traces of the heavier solution. After being left to dry, the foraminifera, ostracoda and some macrofossil fragments were removed from the shell fraction with the aid of a binocular microscope and a moistened, 00 grade, sable hair brush. Specimens were then selected and mounted on slides for examination.

## MICROFAUNA OTHER THAN FORAMINIFERA.

During the removal of the foraminifera, other micro-organisms were observed and collected, including:—

(i). MACROFOSSIL FRAGMENTS. Apart from foraminifera and ostracoda the final residue consisted entirely of minute macrofossil fragments belonging to the porifera, echinoidea, holothuroidea, lamelli-branchiata, gastropoda and pisces, all of which proved generically indeterminate.

(ii). ARTHROPODA; OSTRACODA. In addition to a few indeterminate fragments, an assemblage of 15 well-preserved and complete ostracod valves was obtained and identified by reference to Jones (1856), Jones & Sherborn (1887), and Bowen (1953). The species obtained include:

*Cytheridea* (*Cytheridea*) *mülleri* (Münster). 47% of the assemblage.

*Trachyleberis scabropapulosa* (Jones). 40%.

?*Cativella* sp. 13%

In the London Clay, the Ostracoda are rare and although 7 genera and 13 species have been described from the formation (Bowen, 1953),

assemblages generally consist of only a few genera and species. Bowen (1953) does not record either *Trachyleberis scabropapulosa* or *Cativella* from the deposit, and *Cytheridea mülleri* is a common, long range form. The specimens are in the collection of H.M. Geological Survey and Museum, registration number Mik (T) 153.

#### FORAMINIFERAL ASSEMBLAGE.

The residue contained many hundreds of individual foraminifera, but only a few genera and species. Specimens were identified by reference to Sherborn & Chapman (1886 and 1889), Ellis & Messina (1940), and Bowen (1954), and the classification of Cushman (1948), with the modifications of Bowen (1954, p. 131) has been followed. In the list the symbols VR, R, C and A denote:

Very rare .....	1- 5 specimens
Rare .....	5-10 specimens
Common .....	10-15 specimens
Abundant .....	15 or more specimens

Numbers preceded by the symbol P indicate registration numbers in the collection of the Protozoa Section, British Museum (Natural History). History).

#### THE ASSEMBLAGE INCLUDES:—

##### FORAMINIFERA:

###### AMMODISCIDAE.

*Ammodiscus incertus* (d'Orbigny). VR. P43334.

###### TEXTULARIIDAE.

*Bolivinopsis expansa* (Plummer). Recorded Bowen (1954, p. 171). A. P43339.

*Textularia* sp. cf. *lontensis* Lalicker. VR. P43336.

*T.* aff. *porrecta* Brady. VR. P43337.

###### MILIOLIDAE.

*Quinqueloculina akneriana* d'Orbigny. VR. P43330.

###### LAGENIDAE.

*Lagena striata* (d'Orbigny). VR. P43343.

*Dentalina bradyensis* (Dervieux). VR. P43346.

*D. communis* d'Orbigny. VR. P43347.

*D.* sp. cf. *inornata* d'Orbigny. VR. P43345.

*Lenticulina articulata* (Reuss). Recorded Bowen (1954, p. 171). VR. P43341-2.

*L.* sp. cf. *flexuosa* (Sherborn & Chapman). VR. P43340.

cf. *Nodosaria consobrina* (d'Orbigny). VR. P43344.

###### POLYMORPHINIDAE.

*Globulina gibba* d'Orbigny. VR. P43329.

## NONIONIDAE.

- cf. *Nonion applini* Howe & Wallace. VR. P43352.  
*Nonionella auris* (d'Orbigny). C. P43353.

## BULIMINIDAE.

- Uvigerina aculeata* d'Orbigny var. *asperula* Czjzek. A. P43348.  
*U. canariensis* d'Orbigny. A. P43349.  
 ?*Bolivina punctata* d'Orbigny. VR. P43338.

## ROTALIIDAE.

- Eponides umbonata* (Reuss). A. P43350-1.

## GLOBIGERINIDAE.

- Globigerina bulloides* d'Orbigny. VR. P43331.  
*G.* spp. Two types, R. P43332-3.  
 ?*G.* sp. VR. P43335.

## ANOMALINIDAE.

- Cibicidella variabilis* (d'Orbigny). VR. P43359.  
*Cibicides lobatulus* (Walker & Jacob). A. P43355.  
 cf. *C. praecursorius* (Schwager). C. P43356.  
*C. pygmeus* (Hantken) var. *almaensis* Samoilova. A. P43354  
 and 57.  
*C.* sp. Pathogenic. VR. P43358.

## NOTES ON THE ASSEMBLAGE.

In 1954, Bowen (p. 171) recorded 5 species of foraminifera from the London Clay of Oxshott, two of which have been observed in the present assemblage which includes 10 families, 17 genera and 28 species.

The Lagenidae constitute one-quarter of the total number of species recorded, but these are very rare and species of *Cibicides*, *Uvigerina*, *Nonionella*, *Eponides* and *Bolivinopsis* are the abundant forms. Both *Uvigerina aculeata* d'Orbigny var. *asperula* Czjzek and *U. canariensis* d'Orbigny are long range cosmopolitan species. The former was first recorded from the Miocene of Austria and ranges throughout the Upper Tertiary. Brady (1884, p. 579) shows it to have a wide distribution in Recent seas, recording it from the Atlantic and Pacific at depths between 120 and 2600 fathoms. Having a similar range, *U. canariensis* was first described from the Canaries and occurs at depths between 40 and 1900 fathoms (Brady, 1884, p. 574). It has also been noted from the coasts of Britain. The record of these species in the present assemblage, and from the London Clay of Enborne (Bowen, 1954, p. 137), extends their range into the Ypresian (Lower Eocene).

The majority of foraminifera are of benthonic type and the occurrence of *Cibicides*, *Quinqueloculina*, *Nonion* and *Textularia* suggests that at Oxshott the London Clay sea was warm and shallow, with a depth not exceeding 200 fms.

The London Clay of Oxshott belongs to Wrigley's (1924, p. 252) Division 5 of the deposit (Brown & Castell, 1954, p. 62), and Davis (1928, p. 347) states that, at this level, foraminifera are decidedly rarer than in the lower divisions. *Dentalina* and *Nodosaria*, which are common and widespread forms in Divisions 2 and 3 of the deposit (Davis, 1928, p. 348), appear to be very rare in the upper levels of Sheppey and the Isle of Wight (Bowen, 1954, p. 171-2), and were absent at Cannon Street (Sherborn & Burrows, 1891, p. 4). This apparent distribution of the two genera and their rarity in the assemblage, listed above, suggest that it may be considered characteristic of the Upper London Clay. Bowen (1954, p. 172), however, finds foraminifera to be of no stratigraphical value in the zonation of the deposit.

#### ACKNOWLEDGMENTS.

I am indebted to Mr. D. Curry for allowing me to examine the residue he prepared so laboriously; to Mr. A. G. Davis of the Protozoa Section, British Museum (Natural History), for confirming my determinations of the foraminifera; to Dr. F. W. Anderson of the Geological Survey and Museum for correcting my determinations of the ostracoda; and to Dr. R. N. C. Bowen of Exeter University for reading the manuscript.

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# Vegetation History and Environmental Factors in the London Area

By FRANCIS ROSE, B.Sc., Ph.D., F.L.S.

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IN this paper I wish to consider the plant ecology of the London Area in the real sense: namely, the relation between the vegetation and the factors of the environment, as far as one can assess them. In the neighbourhood of this vast city the environmental factors are perhaps uniquely complex, both by reason of the very varied topography and soils and of the immense, but also very varied, effects of man's interference. In a short paper it is only possible to consider certain aspects of such a vast subject in any detail, so I shall confine my observations to two main subjects:

(1) The historical factors of changing climate and increasing human influence that have modified the flora and vegetation of the London Area since the last glaciation; and

(2) The factors of soil, topography and human interference that appear to regulate the present-day semi-natural vegetation of the area. In both cases the results of these factors—the vegetation—will be discussed.

The nomenclature for vascular plants is that of Clapham, Tutin & Warburg's *Flora of the British Isles*, and for bryophytes that of the *Census Catalogue of British Hepatics* and the *Annotated List of British Mosses*, published by the British Bryological Society. A list of English names of the plants mentioned is given below.

The first question that comes to mind is: what was the vegetation and flora of our Area like before man began to have an important influence? To answer this question properly, we must consider conditions during the Glacial Period.

In the late Pliocene, and again in the Interglacial periods, the climate and flora of south-east England had much in common with that of the present day: Matthews (1955) gives data which make this clear. During the phases of glaciation, however, the temperate flora would appear to have been largely destroyed and replaced by one of Arctic-alpine type, such as is now found in the Scottish Highlands. Most is known about the flora of the last period of glaciation: Godwin (1953 and 1956) has collected much information together on this period, and in particular the data of C. and E. M. Reid, M. E. J. Chandler and J. Allison are of interest to us, having been obtained from the London Area. These records are based upon sub-fossil remains found in Full-Glacial gravels of the Lea Valley at Broxbourne, Ponders End, etc. They give us some idea of the flora of the London Area at a time when the ice sheets were not nearer than 100 miles away, and probably much further, so in earlier and more severe glacial phases the flora can hardly have been more temperate in character.

This Lea Valley flora includes the following plants:

<i>Arctostaphylos uva-ursi</i>	<i>Polygonum viviparum</i>
<i>Betula nana</i>	<i>Potamogeton filiformis</i>
<i>Arenaria gothica</i>	<i>Potentilla crantzii</i>
<i>Carex aquatilis</i>	<i>P. nivea*</i>
<i>C. atrata</i>	<i>P. nivalis*</i>
<i>C. bigelowii</i>	<i>Pedicularis hirsuta*</i>
<i>C. capitata*</i>	<i>Ranunculus hyperboreus*</i>
<i>C. lachenalii</i>	<i>R. nemorosus*</i>
<i>C. maritima</i>	<i>Salix herbacea</i>
<i>Chamaepericlymenium suecicum</i>	<i>S. lapponum</i>
<i>Cirsium heterophyllum</i>	<i>S. reticulata</i>
<i>Draba incana</i>	<i>Scheuchzeria palustris</i>
<i>Dryas octopetala</i>	<i>Silene maritima</i>
<i>Oxyria digyna</i>	<i>Thalictrum alpinum</i>

Those species marked \* are high alpiners not now known as natives of Britain; the others, except *Scheuchzeria*, are all typical northern or highland plants; except for *Silene maritima*, which is also of course a common coastal species, none of them are found to-day nearer to London than the Pennines, and most are Scottish.

However, the Lea Valley Full-Glacial gravels also produced the following species:

<i>Carex pulicaris</i>	<i>P. praelongus</i>
<i>Damasonium alisma</i>	<i>Potentilla palustris</i>
<i>Eriophorum angustifolium</i>	<i>Vicia sylvatica</i>
<i>Menyanthes trifoliata</i>	<i>Salix repens</i>
<i>Potamogeton obtusifolius</i>	

These species are all found in the London Area to-day, but are all very rare and far more characteristic of north Britain at the present time, except for *Damasonium*.

The picture that emerges, then, from this fossil record is of a markedly arctic-alpine type of flora in the London Area in the last Glacial phase, about 10,000 B.C. The vegetation appears to have been of a tundra type, with dwarf scrub, and of very open character. Our present native flora in the London Area is very different in character, though we can see that a few species may be survivors from that time.

As conditions became gradually warmer in Post-Glacial time, the subfossil record shows us that more temperate species of open base-rich habitats spread widely (see Pigott and Walters, 1954), including many of our common weeds of the present day; but gradually forest, at first of birch and pine, then later mixed oak forest, established itself, except in the marshy river valleys where peat formed from swamp and fen plants. The open habitat species became very restricted, and in our Area possibly only some few survived; even for aquatics there was little natural open water, apart from streams.

The forest must have been very dense on the heavy soils developed over the London Clay, and dominated by oaks with some lime and elm, with alders in the wetter valleys; it was probably less dense, with smaller oaks and some birch, on the lighter soils over sands and gravels. By the Neolithic Period, beech was probably present in the London Area as a component of the forest on the lighter soils including the dip slopes of the North Downs (though there is as yet no certain *local* evidence).

By the Neolithic Period, human influence was beginning to be an appreciable factor affecting our vegetation, and this became more important still in the later Bronze Age. These early human inhabitants, however, seem to have avoided the densest forest on the heavier soils: but sites on the Bagshot Beds, as at the present Hampstead and Oxshott Heaths, and on the coarser Plateau and Valley Gravels, as at Hounslow Heath and Wimbledon Common, would have been easier to clear, and easier to cultivate with primitive implements, than the denser forest on the clays and in the river valleys. Most evidences of early man in S.E. England are on such soils, or on the chalk (though in the London region there is little evidence on the whole of early chalkland colonisation). Later on, as it became possible to clear the dense forest from the richer, heavier soils of the clays and loams of the valleys, the old sites of occupation would have become deserted, and as the light soils became leached, podsolisation and the establishment of heath vegetation would have taken place. Until recent historical times, far more heathland occurred around London than survives to-day; for example, Hounslow Heath once covered much of south Middlesex, until late 18th and early 19th century enclosures reduced it to its present small area.

The Iron Age brought further changes to the London Area: London seems to have come into existence as a settlement for the first time, at the lowest point on the river where firm banks gave a good natural crossing point. Iron axes enabled denser forest to be cleared, and the pollen-analysis record indicates that at about this time hornbeam began for the first time to become abundant in the forests of east and south-east England. The opening up of the oak forests, it has been suggested, gave the hornbeam its chance to spread into partly or wholly felled areas. The present remarkable abundance of hornbeam north and north-east of London in old woodlands probably had its origin in part at least in Iron Age fellings which gave this species its first "big chance" in this country.

Right through the Dark Ages after the Romans left, and on up to the late Middle Ages, much forest is known to have survived in Essex, Herts and Middlesex, and even to-day there are appreciable areas of forest of fairly natural character at Epping, though much interference in the way of pollarding and sporadic felling has occurred even there in the past. Smaller areas of natural-looking woodland, which may represent little-modified relics of the old forest, occur at Wormley Wood in Herts, and at Ken Wood in Middlesex; at the last, as at Epping, beech is very prominent and fine.

## THE PRESENT VEGETATION AND FACTORS AFFECTING IT.

Ecologists recognise three main groups of factors affecting vegetation: climatic, edaphic, and biotic factors. I propose to consider selected factors affecting the vegetation of the London Area under each of these three headings. I shall also suggest possible lines for future study.

**CLIMATIC FACTORS.** The climate is the paramount factor controlling the vegetation of any area, as we have already seen in the historical discussion. Generally speaking, that of the London Area is fairly uniform on the whole and like that of the rest of S.E. England; the rainfall varies from about 20 ins. per annum along the valley of the Thames below London to nearly 30 ins. per annum on the North Downs in the S.W. part of the Area. Microclimatic variations are of much greater importance and interest. Good examples of microclimatic effects are to be seen on slopes of different aspects on the North Downs, particularly at Boxhill. The bryophytes are particularly affected by aspect of slope; Wallace (1954) gives a very full account of the bryophyte flora of Boxhill. In the valley behind the Burford Bridge Hotel, a steep N.E.-facing slope has thirty-two species of mosses and eight species of liverworts—forty bryophytes, of which sixteen are very abundant. On the opposite S.E.-facing slope, however, only eighteen species of mosses and one liverwort occur—nineteen bryophytes, of which only nine are even locally abundant. Only two grassland bryophytes on Boxhill are found *only* on S. or S.W.-facing slopes—the “Mediterranean” moss *Pleurochaete squarrosa*, and *Thuidium hystricosum*. These differences in bryophyte vegetation are apparently due to the very different atmospheric humidities of slopes of different aspects. On N. or N.E. slopes, the sun’s rays only reach the ground for a part of the day, and as they fall even then at an acute angle, the intensity of insolation is low; consequently the total amount of heat reaching a unit area on a N.E. slope is very low compared with a unit area on a S. (or still more, a S.W.) slope. Thus evaporation is much less, and temperature remains low. Hence species intolerant of desiccation can survive in a region where the general climate is too dry for them. Such are the moss *Tortella tortuosa* and the liverwort *Scapania aspera*. These species are common on calcareous substrata in the wetter parts of Britain, but on the North Downs are confined to N. and N.E. slopes on Boxhill. Culture of these species shows their intolerance of too prolonged desiccation.

Microclimatic phenomena appear also to be responsible for the richer flora of bryophyte epiphytes on trees in sheltered valleys near streams, and on elders in sheltered chalkpits, as compared with the flora on the same species of trees in exposed places. Effects of this kind can be seen in several places along the North Downs, and in valleys in woods on the N.W., W. and S.W. sides of the metropolis, as at Bishop’s Wood, Herts. It must have been much more marked before atmospheric pollution became so severe.

EDAPHIC FACTORS. Differences in soil, both physical and chemical, are the main factors responsible for gross differentiation in the semi-natural vegetation types in the London Area. As stated above, there is much soil diversity in the region, due largely to the varied geology, so I shall only consider a few examples of edaphic factors.

SOIL REACTION. The problem of "calcicoles" and "calcifuges" has long interested ecologists. Recent work at Oxford, by Whitehead and Rorison, suggests that it is the alkalinity of calcareous soils, rather than the calcium ions as such, that is the important factor. Calcicoles appear to suffer from aluminium toxicity on very acid heath soils and are unable to take up potassium, iron, and phosphate ions; while calcifuges are prevented by alkaline conditions from getting enough iron, potassium and manganese. But competition comes into the problem; calcicoles will in many cases grow better in a garden bed without competition of more "aggressive" species than they do on a dry chalk down in nature. It appears to be the seedlings, and not the mature plants, which are most sensitive; so that in nature it is initial establishment which is the crux of the matter.

Habitats for calcicoles are well developed in the southern part of the London Area, on the chalk downs of Kent and Surrey formed by clearance of former forest on the chalk slopes and subsequent sheep-grazing. The virtual cessation of such grazing, and the (perhaps temporary?) reduction in rabbit populations, has resulted in extremely rapid spread of scrub, and the old chalk grassland vegetation that remains is gravely threatened by this. The richest chalk grassland vegetation is found on steep dry slopes where shallow immature rendzina soils are found; these contain little humus and are alkaline and  $\text{CaCO}_3$ -rich throughout. The best remaining examples of old chalk grassland of this type are to be found at Boxhill, Walton and Epsom Downs, Banstead Downs, Colley Hill, Quarry Hangers, Riddlesdown, South Hawke, and Farthing Downs in Surrey, and at Darwins Bank near Downe, Chevening Park, Polhill, and at Juniper Hill and Preston Hill near Shoreham in Kent. At such places *Festuca ovina* and *Bromus erectus* (the latter particularly where slopes are less steep or there is little grazing or trampling pressure) are the dominant grasses, with such associated herbs and dwarf shrubs as *Hippocrepis comosa*, *Polygala calcarea*, *Helianthemum*, *Poterium sanguisorba*, *Gentianella axillaris*; *Phyteuma tenerum*, *Campanula glomerata* and *Thesium humifusum* in Surrey only; and many orchids (there are 21 chalk orchids in the Area). There are of course many other more local species, but those named seemed particularly characteristic "exclusive" species of London Area old chalk grasslands, together with *Carex flacca* and the grasses *Briza media*, *Koeleria gracilis* and the two *Helictotrichon* species (*H. pubescens* and *H. pratense*). *Helianthemum vulgare* occurs also on the calcareous Thanet Sands on dry hedgebanks with *Viola hirta*, another typical calcicole. On a few of the oldest sites, Juniper survives but shows little sign of regeneration; but old records indicate that it was once very common and widespread on the downs south and south-east

of London. The reasons for its diminution are not clear, except in certain spots where succession has led to its invasion and replacement by beech or yew wood, as in Juniper Valley, Boxhill.

Beech forest is well developed in several places on the chalk in Surrey and Kent, and such typical associates of the beech on calcareous soils as *Daphne laureola* and *Cephalanthera damasonium* are exceptionally common; *Helleborus foetidus* is however rare, and the grass *Hordelymus europaeus* extremely rare compared with the Chiltern beech forests; the reasons for this are not clear. *Hypericum montanum* is a local species which is almost invariably found, in my experience, at the junction of the chalk and Thanet Sand in this part of England, usually at wood borders.

Calcareous Boulder Clay occupies a very small part of the London Area, and most of what there is of it, in Herts and Essex, is cultivated; but a few woods about Ware show the effect of the chalk in this soil by having calcicoles in their flora. Perhaps the most interesting place on the Chalky Boulder Clay near London is a small marsh where calcareous seepage occurs, near Wormley Wood. Here are found several species of wet open calcareous habitats, two of which (*Gymnadenia conopsea* ssp. *densiflora* and *Eleocharis quinqueflora*) are not known elsewhere in the Area, while others (e.g. *Epipactis palustris* and *Carex distans*) are excessively rare elsewhere. This habitat, indeed, gives us a faint idea of what the vegetation of wet open areas in the present London Area may have been like in the early Post-Glacial (see above).

In contrast to the regions of calcareous soils are those where the ill-drained, nutrient-poor London Clay occurs at the surface.

The soils developed over this substratum tend to be surface water gleys, i.e., tend to waterlog with surface drainage water due to their lack of porosity and impeded drainage. They crack badly in summer, since as the clay colloids lose water they shrink; what water is left is tightly bound and not available to plants, and roots are liable to injury. In winter the supply of oxygen to the roots is poor owing to severe waterlogging. Although the clay itself is neutral in reaction, it lacks alkaline carbonates, and the accumulation of organic matter under bad drainage conditions soon leads to acidity, as there is nothing to neutralise the organic acids accumulated. Under natural conditions, dense oak forest occurs, with some hornbeam. *Crataegus oxyacanthoides*, *Corylus*, and both birches are common, with alder by streams. The herb layer is generally poor, and characteristic species are *Deschampsia caespitosa* (very abundant), *Angelica*, *Ajuga reptans*, *Carex pendula*, *Filipendula ulmaria*, *Cardamine pratensis*, *Ranunculus ficaria* and *Primula vulgaris* in the damper parts, while where drainage is better, *Pteridium*, *Lonicera*, *Holcus lanatus*, *Viola riviniana*, *Anemone nemorosa* and *Endymion nonscriptus* are common. Many woodland species of the better loams and of sandy soils are scarce or absent, owing apparently to lack of nutrients rather than periodic waterlogging; such are *Mercurialis perennis*, *Glechoma hederacea*, *Circaea*, *Euphorbia amygdaloides* and *Sanicula europaea*. The occurrence of such species on the London Clay is largely confined to small areas of alluvial downwash

by streamlets or to patches of lighter superficial deposits. In more open parts of the woods, *Prunus spinosa* often forms dense scrub in drier parts and *Salix atrocinerea* in wetter parts. Most of this woodland has been converted into coppice-with-standards.

Where the London Clay is covered with superficial Glacial or Plateau Gravels, a much richer flora is found; conditions are often fairly acid (pH 5.0 to 5.5) but drainage is better and the soil more aerated. Hornbeam is often even more plentiful, as in the Hertfordshire woods of this type described by Salisbury in his classical studies (1916, 1918), and *Luzula sylvatica* is often plentiful as at Wormley Wood. *Ilex aquifolium* and *Sorbus torminalis* are local but characteristic species of these drier oakwoods.

To the S.E. of London, oakwood is developed on the Lower London Tertiaries of Kent. On the loamy Woolwich Beds, the soils are damp and base-rich and the vegetation is of the "damp oakwood" type, though with a richer ground flora than on the London Clay. On the Thanet Sands drainage is very free, but this rock is slightly calcareous and a special type of sandy oakwood with Ash and a very rich ground flora is developed. *Polygonatum multiflorum*, *Ruscus*, *Luzula sylvatica*, *Iris foetidissima*, *Mercurialis perennis*, *Daphne laureola*, *Campanula trachelium* and *Viola reichenbachiana* are characteristic, and the shrub layer contains not only *Corylus* but even more base-demanding shrubs such as *Cornus*, *Clematis*, *Ligustrum*, *Euonymus* and *Viburnum lantana*; in more open parts the vegetation is reminiscent of chalk scrub. In most of these Kentish woods, Thanet and Woolwich Beds crop out on the sloping margins while the central plateaux are covered with Blackheath Pebble Beds. This formation, derived from ancient shingle beach, produces some of the most free-draining soils to be found in the London Area. Its natural climax appears to be open oakwood with much birch, and a heathy ground layer in the more open parts; characteristic species in the closed woodland include *Ruscus*, *Luzula sylvatica*, *Convallaria* (often very plentiful), *Lonicera*, *Polygonatum multiflorum* and *Anemone nemorosa*. Much of the oak on the Blackheath Beds is coppiced, however, and a community described by Marriott (1925) as "oak-birch heath", in which pine may be present subspontaneously, is developed. Complete clearance of the forest has led to development of true heath, as at Keston Common; this, however, either reverts to woodland (of Scots pine or of oak) in time if left undisturbed, or if frequently burned, tends to become dominated by *Pteridium*. It will be seen that the oakwoods on the Lower London Tertiaries in N.W. Kent are very varied and of much ecological interest; Marriott (1925) carried out an interesting study at Abbey Wood, which is of this type, and the Kent Field Club is commencing an intensive study of Farningham Wood at the present time. (Any L.N.H.S. members who would like to take part should get in touch with me.) Other woods of this type are Joyden's Wood (once the best, now devastated by clear felling), Darenth Wood, Pett's Wood, Hockendell and Bourne Woods near St. Mary Cray, and Rams Wood, W. of Sutton-at-Hone.

Which species of oak dominates the oakwoods I have mentioned? This is not as simple a question as might once have seemed. Ecologists used to think that *Quercus robur* was the normal dominant of the wetter, heavier soils, and *Q. petraea* of the drier, lighter, more acid soils; but it is not as simple as that. There are even grounds for suspecting that *Q. robur* may nearly always be planted. One can say, however, that in the London Area *Q. robur* is the principal species on heavier clay soils and where conditions are more base-rich, while *Q. petraea* dominates the gravels and sands. Culture experiments (see Tansley, 1939, p. 303) show that both species make better height growth as first-year seedlings on more acid soils, and there is no significant difference between them in this respect.

One other type of woodland controlled by edaphic factors should be discussed; this is the alderwood of swampy valleys, well flushed by springs. Such woods are still locally frequent in parts of the London Area, though many of them must have been destroyed by drainage and building. They occur in Herts and Essex at the spring lines at the junction of the previous superficial gravels and the impervious London Clay, and in Kent at the spring lines between the Blackheath Beds and the underlying impervious Woolwich Beds. These little woods are very interesting because, although the alder is usually coppiced, there is usually little other sign of human interference, and they provide examples, all too rare, of virtually natural woodland ground vegetation. *Chrysosplenium oppositifolium* is especially characteristic of such woods; *Equisetum telmateia* often forms great stands, several ferns occur, and there is often a very rich bryophyte flora. *Carex strigosa* occurs in at least five such woods in the Area, and *Paris* in at least three. Such spring line alderwoods deserve more study than they have so far received in the Area; humidity in them is exceptionally high, and their bryophytes need more study. The pH of the drainage water is often far more alkaline than might have been expected.

I have referred above to the formation of our lowland heaths. There are now few really good examples of true *Calluna*-heath left in the area, owing to "improvements" and to the excessive trampling and burning of those that have not been deliberately cleared and resown. Good examples remain, however, at Keston, Wimbledon and Oxshott, though *Pinus sylvestris* is tending to invade them rather heavily. At these three places, on Reigate Heath, and near the "Wake Arms" in Epping Forest, are situated the few remaining open *Sphagnum* bogs of the Area: it is quite remarkable how most of the species of these bogs survive, e.g. *Drosera*, though in reduced abundance; trampling by visitors is the main danger at the best of these bogs (Keston). These small valley bogs occur where valleys cut down through the sandy or gravelly strata (which bear heath on their podsolised surfaces) to impervious beds below, so that the acid base-poor drainage water from the heathland comes out at a seepage line, providing suitable conditions for *Sphagnum* growth. It is probable that in earlier prehistoric times most of these valleys bore alderwood of the type mentioned above; the existing valley bogs occur in valleys corresponding topographically and



geologically with others, which contain alderwoods; in the latter cases, however, the plateaux are covered with deciduous woodland or pasture, and not with heath. Clearance of forest and subsequent neglect, leading to the formation of heath as described above, may well have led to the formation of *Sphagnum* bog on the death of the alders from too acid drainage water. There is stratigraphical proof of this change in the New Forest valley bogs, but not yet in the London Area.

Space does not permit the discussion of further edaphically controlled plant communities, though fresh- and tidal-water habitats present further fascinating problems.

#### BIOTIC FACTORS.

In few areas of Britain are the biotic factors so diverse and complex. I shall discuss only a few that have interested me personally.

**THE BOMBED SITES.** Much work has been devoted to the bombed sites by the ecologists of the Society, so I shall not say much about this subject. It is worth noting, however, that the flora of the bombed areas at first had much in common in general character with the open vegetation of base-rich soils of the very early Post-Glacial period. There is a certain parallel between the two events, the glaciation and the bombing. In one case, the ancient closed forest climax had been destroyed by Arctic cold, in the other by man's activities of clearance and subsequent building; in each case, both after the climate had ameliorated and after the built-up areas had been destroyed by bombing, large open areas of unweathered, base-rich material, capable of forming soil under the action of weather and plants were exposed; and in both cases, plant succession, tending to produce a closed community, took place. At the present time, on those bombed sites that have not yet been cleared for rebuilding, closed vegetation of grasses, with patches of either bracken or *Salix caprea* scrub, has become characteristic, and the flora is far poorer in species than in the early, open stages.

**DRAINAGE.** It is often suggested that the vast absorption of water by pumping from wells in the chalk in the London Area has seriously affected the water table. This may well be so, but there is little evidence in my experience of any marked effect on the position of the chalk springlines. With "perched" water-tables, however, such as those in the Tertiaries, the vastly increased surface drainage into sewers and out to sea, rather than into the soil, has had a marked effect on the strength of springs and consequently on the extent and wetness of boggy ground. Even so, in areas not built up the springs appear to maintain themselves fairly well at or near their old sites. The bog on Keston Common has shrunk considerably in the last hundred years, but much of this effect appears to be due to tree growth; it is notable that in a wet year like 1954 the extent of actual bog increased appreciably, and *Narthecium* was detected in flower in a place where it had not been noticed for many years, though it had probably been present in a vegetative state. More systematic records of the positions of springs,

the extent of bogs, and the performance of plants are, however, needed. Deliberate surface drainage is a much more obviously serious threat to bog and marsh communities, and a great many bogs have disappeared from this cause, such as those on Hampstead Heath. Alluvial meadows near rivers have in many cases become much drier, not only through deeper ditching but through the digging of vast gravel pits; these not only destroy much meadowland but cause what remains to dry out. We can see this effect in the Colne, Thames, and Darent valleys.

Embanking of riverside marshland has been an increasingly serious threat to many plants. By the tidal Thames, *Sonchus palustris*, *Leucojum aestivum*, *Schoenoplectus triqueter*, *S. × arunensis*, and *Althaea officinalis* have almost certainly gone from this cause; although suitable habitats appear to remain, the plants do not appear to exist now; with species with a poor dispersal power, spread to other suitable habitats when the original ones become unsuitable does not always occur.

Another factor which may be serious for riverside species is the severe pollution of the Thames. This needs more study; but it is worth recording here that in J. S. Mill's time (before 1863) *Limonium vulgare* extended up the Thames to Plumstead; Hanbury and Marshall (1899) recorded it up to Northfleet; I knew it in 1943 up to one mile below Gravesend, while to-day it appears to extend no higher than Higham. This may not be due to pollution, but it needs investigation: the salt-marshes have not all been destroyed.

**ATMOSPHERIC POLLUTION.** This is the last biotic factor due to man's influence that I shall consider. Except in the most heavily industrialised areas, the effect of pollution on vascular plants does not appear to be severe enough to limit their occurrence, though their foliage may be damaged; but it is otherwise with the bryophytes and lichens. These plants seem very sensitive to air pollution, and the abundance, and even the occurrence, of many species appears to be affected by this factor far beyond the suburban area out into Essex. I would recommend this subject as one to which members might devote careful study; far more work is needed on it before any final conclusions can be drawn. There are, however, certain observations which may be made already. Firstly, as might have been expected, pollution appears to be far worse generally to the east and north-east of the Metropolis than to the south and west of it; the prevailing south-west winds blow most of London's smoke out over Essex, Herts, and the Thames estuary. Species of mosses which grow on trees are by far the worst affected; for example, *Dicranoweissia cirrata*, a cushion-forming moss of tree trunks, palings, etc., is found S. and S.W. of London as far into the suburban area as Wimbledon Common, Keston, and Bexley; N. and N.E. of London it is much scarcer, and rare even at Wormley and Epping. The corticolous bryophytes, *Lejeunea cavifolia* and *Cryphaea heteromalla*, found at Boxhill and between Shoreham and Chevening on the south side of London, well within the 20-mile limit, are not known anywhere to the N. or N.E. of London within 40-50 miles and may be absent even further

away. This may, of course, be due in part to the lower rainfall N. and N.E. of London. It is difficult to disentangle the two factors without careful measurements of actual pollution and experimental work in the laboratory.

Abbey Wood, near Woolwich, shows in its changed bryophyte flora what appears to be the effect of increased air pollution. In the seven years preceding 1925, Marriott (1925) recorded 99 species and varieties of mosses, including many interesting epiphytes of stumps and logs. This was before the huge modern industrial development of the Dagenham area just across the river. In 1948, I found it difficult to find ten mosses and the chestnut stumps were almost bare of bryophytes, being covered with a black deposit of tarry soot. Even the common *Dicranum scoparium* and *Dicranoweissia cirrata* appeared to have disappeared or at least to have become very rare. *Dicranum montanum* and *D. flagellare* were apparently extinct; but it is worth noting that these last two mosses, and *D. strictum*, appear to have become much commoner than formerly in areas of apparently moderate pollution in Herts. They seem to be fairly resistant compared with other species that grow on trees.

I would like to conclude this very sketchy and inadequate survey of past and present conditions by drawing attention again to the fact that there is so much still to be done by way of *real* ecological work around London; we know so little for certain of real causal factors, and careful experimental work, both in the field and in the laboratory, is still much needed. As far as field work is concerned, there is a vast amount that members can do.

#### LIST OF ENGLISH NAMES OF PLANTS REFERRED TO IN THE TEXT.

- |  |   |
|--|---|
| <i>Ajuga reptans</i> —Bugle                                | <i>C. strigosa</i> —Thin-spiked Wood Sedge                  |
| <i>Althaea officinalis</i> —Marsh Mallow                   | <i>Cephalanthera damasonium</i> —Large<br>White Helleborine |
| <i>Angelica sylvestris</i> —Wild Angelica                  | <i>Chamaepericlymenium suecicum</i> —<br>Dwarf Cornel       |
| <i>Anemone nemorosa</i> —Wood Anemone                      | <i>Chrysosplenium oppositifolium</i> —<br>Golden Saxifrage  |
| <i>Arenaria gothica</i> —Yorkshire Sandwort                | <i>Circaea lutetiana</i> —Enchanter's Night-<br>shade       |
| <i>Arctostaphylos uva-ursi</i> —Bearberry                  | <i>Cirsium heterophyllum</i> —Melancholy<br>Thistle         |
| <i>Betula nana</i> —Dwarf Birch                            | <i>Clematis vitalba</i> —Traveller's Joy                    |
| <i>Briza media</i> —Common Quaking-grass                   | <i>Convallaria majalis</i> —Lily-of-the-Valley              |
| <i>Bromus erectus</i> —Upright Brome-grass                 | <i>Cornus sanguinea</i> —Dogwood                            |
| <i>Calluna vulgaris</i> —Ling, Common<br>Heather           | <i>Corylus avellana</i> —Hazel                              |
| <i>Campanula glomerata</i> —Clustered<br>Bellflower        | <i>Crataegus oxyacanthoides</i> —Woodland<br>Hawthorn       |
| <i>C. trachelium</i> —Nettle-leaved Bellflower             | <i>Damasonium alisma</i> —Star Fruit                        |
| <i>Cardamine pratensis</i> —Cuckoo-flower,<br>Lady's Smock | <i>Daphne laureola</i> —Spurge Laurel                       |
| <i>Carex aquatilis</i> —Straight-leaved Sedge              | <i>Deschampsia caespitosa</i> —Tufted Hair-<br>grass        |
| <i>C. atrata</i> —Jet Sedge                                | <i>Draba incana</i> —Twisted Whitlow-grass                  |
| <i>C. bigelowii</i> —Stiff Sedge                           | <i>Drosera rotundifolia</i> —Round-leaved<br>Sundew         |
| <i>C. distans</i> —Distant-spiked Sedge                    |   |
| <i>C. flacca</i> —Glaucous Sedge                           |   |
| <i>C. maritima</i> —Curved Sedge                           |   |
| <i>C. pendula</i> —Great Drooping Sedge                    |   |
| <i>C. pulicaris</i> —Flea Sedge                            |   |

- Dryas octopetala*—Mountain Avens  
*Eleocharis quinqueflora*—Few-flowered  
 Spike-rush  
*Endymion nonscriptus*—Bluebell  
*Epipactis palustris*—Marsh Helleborine  
*Equisetum telmateia*—Great Horsetail  
*Eriophorum angustifolium*—Common  
 Cotton-grass  
*Euonymus europaeus*—Spindle  
*Euphorbia amygdaloides*—Wood  
 Spurge  
*Festuca ovina*—Sheep's Fescue-grass  
*Filipendula ulmaria*—Meadow Sweet  
*Gentianella axillaris*—Felwort  
*Glechoma hederacea*—Ground Ivy  
*Gymnadenia conopsea* ssp. *densiflora*—  
 Dense-spiked Fragrant Orchid  
*Helianthemum chamaecistus*—Rock-  
 Rose  
*Helictotrichon pratense*—Meadow Oat  
*H. pubescens*—Downy Oat  
*Helleborus foetidus*—Stinking Helle-  
 bore  
*Hippocrepis comosa*—Horse-shoe Vetch  
*Holcus lanatus*—Yorkshire Fog.  
*Hordelymus europaeus*—Wood Barley  
*Hypericum montanum*—Pale St. John's  
 Wort  
*Ilex aquifolium*—Holly  
*Iris foetidissima*—Gladdon, Stinking  
 Iris  
*Koeleria gracilis*—Crested Hair-grass  
*Leucojum aestivum*—Summer Snowflake  
*Ligustrum vulgare*—Wild Privet  
*Limonium vulgare*—Common Sea  
 Lavender  
*Lonicera periclymenum*—Common  
 Honeysuckle  
*Luzula sylvatica*—Great Woodrush  
*Menyanthes trifoliata*—Bog Bean  
*Mercurialis perennis*—Dog's Mercury  
*Narthecium ossifragum*—Bog Asphodel  
*Oxyria digyna*—Mountain Sorrel  
*Paris quadrifolia*—Herb Paris  
*Phyteuma tenerum*—Round-headed  
 Rampion  
*Pinus sylvestris*—Scots Pine  
*Polygala calcarea*—Chalk Milkwort  
*Polygonatum multiflorum*—Solomon's  
 Seal  
*Polygonum viviparum*—Alpine Bistort  
*Potamogeton obtusifolius*—Blunt-leaved  
 Pondweed  
*P. filiformis*—Slender-leaved Pondweed  
*P. praelongus*—Long-stalked Pondweed  
*Potentilla crantzii*—Alpine Cinquefoil  
*P. palustris*—Marsh Cinquefoil  
*Poterium sanguisorba*—Salad Burnet  
*Primula vulgaris*—Primrose  
*Prunus spinosa*—Blackthorn  
*Pteridium aquilinum*—Bracken  
*Quercus petraea*—Durmast Oak  
*Q. robur*—Common Oak  
*Ranunculus ficaria*—Lesser Celandine  
*Ruscus aculeatus*—Butcher's Broom  
*Salix atrocinerea*—Grey Sallow  
*S. caprea*—Common Sallow  
*S. herbacea*—Least Willow  
*S. lapponum*—Downy Willow  
*S. reticulata*—Netted Willow  
*S. repens*—Creeping Willow  
*Sanicula europaea*—Wood Sanicle  
*Schoenoplectus* × *arunensis*—Hybrid  
 of Triangular & Greyish Bulrushes  
*S. triqueter*—Triangular Bulrush  
*Silene maritima*—Sea Campion  
*Sonchus palustris*—Marsh Sowthistle  
*Sorbus torminalis*—Wild Service Tree  
*Thalictrum alpinum*—Alpine Meadow-  
 rue  
*Thesium humifusum*—Bastard Toadflax  
*Viburnum lantana*—Wayfaring Tree  
*Vicia sylvatica*—Wood Vetch  
*Viola hirta*—Hairy Violet  
*V. reichenbachiana*—Pale Wood-Violet  
*V. riviniana*—Common Dog-Violet

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# The Arachnida of London

By T. H. SAVORY, M.A., F.Z.S., and A. E. LE GROS.

**T**HE compilation of the accompanying List of the Arachnida of London was foreshadowed in the Journal of the Quekett Microscopical Club in 1953. One of us had come from Worcestershire to live in London and had found that the number of recorded London spiders was very small; we therefore agreed to collaborate in the production of this wider survey, which now includes the names of 130 species of spiders, 9 harvestmen and 6 false-scorpions, a total of 145. We have not concerned ourselves with mites.

The limits of our area are those of the London postal district. With regard to the localities mentioned, the following may be noted:—

1. *Buckingham Palace*. Collection made in Palace grounds by W. S. Bristowe in 1929 (Bristowe, 1939).
2. *Catford*. Collections made by A.E.LeG. in his own house and garden.
3. *Cricklewood*. Collections made in the school field by boys of the Haberdashers Askes Hampstead School. The captors are usually mentioned.
4. *Cripplegate*. Collections made by A.E.LeG. on bombed sites (Le Gros, 1949).
5. *Greenwich*. Collections made by A.E.LeG.
6. *Hampstead*. Collections made by T.H.S. on Hampstead Heath and in his own house and garden.
7. *Lewisham*. Collections made by A.E.LeG.
8. *New Eltham*. Collections made by G. Freeman.
9. *Wimbledon*. Collections of W. E. Dick (Dick, 1937).
10. *Woolwich*. Collections made by A.E.LeG. and G. Freeman (includes Bostall Woods).

Other localities will also be found to be mentioned below, though less frequently; and the name of the collector to whom the record is due has been added.

## I. SYSTEMATIC LIST.

### ORDER ARANEAE.

*Atypus affinis* Eichw.

Recorded by F. Enock (1885) on Hampstead Heath and by J. E. S. Dallas (1938).

*Ciniflo fenestralis* (Stroem).

Cricklewood, Cripplegate, Lewisham, Mountsfield Park (A.E.LeG.), Woolwich.

*C. similis* Bl.

To be found everywhere throughout the area.

*C. ferox* (Walck).

Cricklewood, Woolwich.

*Dictyna arundinacea* (L.).

New Eltham, Richmond Park (A.E.LeG.). Temple Fortune (R. G. Pawsey), Woolwich.

*Oonops pulcher* Templ.

Buckingham Palace, Catford, Cripplegate, Deptford (A.E.LeG.), New Eltham.  
Usually said to be adult in spring but in London adults occur all the year round.

*O. domesticus* de Dalmas.

Catford, Hampstead, New Cross (A.E.LeG.).  
Probably to be found in most houses.

*Dysdera erythrina* (Walck).

Cricklewood (R. H. Martin), Finchley (A. S. Goldstein).

*D. crocata* C.L.K.

Catford, Lee (K. Bobe), Lewisham.

Often in warm buildings, rubbish heaps warm with putrefaction, etc., yet also found near the coast.

*Harpactea hombergi* (Scop.).

Hither Green (A.E.LeG.), Lewisham, Mill Hill (J. K. Sholl), Temple Fortune (R. G. Pawsey).

*Segestria senoculata* (L.).

Woolwich.

*S. florentina* (Ross).

Westminster School (Bristowe, 1939).

*Scytodes thoracica* Latr.

Forest Hill (H. K. A. Shaw, 1952), Catford.

*Pholcus phalangioides* Fuess.

Recorded by Bristowe (1939).

*Physocyclus simoni* Berland.

Recorded by Bristowe (1939).

*Drassodes lapidosus* (Walck).

Catford, Cricklewood, Cripplegate, Greenwich, New Eltham, Woolwich.

*D. lapidosus* var. *cupreus* (Bl.).

Catford.

*D. signifer* (C.L.K.).

Greenwich Park.

*Herpyllus blackwalli* (Thor).

Bermondsey (A.E.LeG.), Cricklewood, Hampstead, New Cross (A.E.LeG.), Streatham (T.H.S.), Temple Fortune (R. G. Pawsey), Woolwich Arsenal.

*Micaria pulicaria* (Sund).

Blackheath (J. L. Cloudsley-Thompson, 1954), Cripplegate (P. W. E. Currie), New Eltham.

*Clubiona corticalis* (Walck).

Buckingham Palace, Catford, Greenwich Park, Mountsfield Park (A.E.LeG.), Woolwich.

*C. reclusa* Cb.

Hither Green (A.E.LeG.), New Eltham.

*C. diversa* Cb.

Cricklewood (C. I. Carter).

*C. terrestris* Westr.

Buckingham Palace, Cricklewood, Hampstead, Lewisham.

*C. lutescens* Westr.

Cricklewood (T. Stout).

*C. compta* C.L.K.

Hampstead, Hendon (S. Ovis), Woolwich.

*C. trivialis* C.L.K.

Cripplegate (L. Parmenter).

*Agroeca brunnea* (Blackwall).

Recorded by F. P. Smith (Bristowe, 1939).

*Zora spinimana* (Sund).

New Eltham.

*Phrurolithus festivus* (C.L.K.).

Cricklewood (M. M. Freeman).

*Anyphoena accentuata* (Walck).

Woolwich.

- Micrommata virescens* (Clerck).  
Recorded in Ken Wood by E. Albin in 1736.
- Diaea dorsata* (Fabr.).  
Recorded in Ken Wood by E. Albin in 1736.
- Xysticus cristatus* (Clerck).  
Blackheath (A.E.LeG.), Catford, Cripplegate, Dulwich (A.E.LeG.), Highgate (W. S. Bristowe), Lewisham, Mountsfield Park (A.E.LeG.), New Eltham, Regents Park (A.E.LeG.), Woolwich.
- X. erraticus* (Bl.).  
Greenwich, Victoria Park Embankment (A.E.LeG.).
- Oxyptila praticola* (C.L.K.).  
Recorded by F. P. Smith (Bristowe, 1939).
- Philodromus aureolus* (Clerck).  
Cricklewood (M. Layland), New Eltham.
- Tibellus oblongus* (Walck).  
Cricklewood (T. Stout).
- Salticus scenicus* (Clerck).  
Cricklewood (J. O. Herzog), Hampstead, Streatham (T.H.S.), Cripplegate, Catford, etc., etc.
- Marpissa muscosa* (Clerck).  
Wood Green (C. N. Colyer).
- Euophrys frontalis* (Walck).  
Cricklewood, Charlton (A.E.LeG.), Lewisham, New Eltham, Streatham (A.E.LeG.).
- E. aequipes* (Cb.).  
Cripplegate.
- E. lanigera* (Simon).  
Recorded by Locket and Millidge (1951).
- Sitticus pubescens* (Fabr.).  
Blackheath (A.E.LeG.), Cripplegate, Lewisham, New Eltham, Tottenham Court Road (J. L. Cloudsley-Thompson, 1954).  
The dark colour of the typical form is no doubt a protection over much of the London area where the speckly grey variety has not been found.
- Evarcha falcata* (Clerck).  
Recorded by F. P. Smith (Bristowe, 1939).
- Hasarius adansoni* (Aud).  
Well established in hothouses throughout Britain.
- Lycosa monticola* (Clerck).  
Charlton (A.E.LeG.).
- L. tarsalis* Thorell.  
Cricklewood (T. Stout).
- L. pullata* (Clerck).  
Hither Green (A.E.LeG.), New Eltham.
- L. amentata* (Clerck).  
Cricklewood (J. K. Sholl), Hampstead, Hither Green (A.E.LeG.), Streatham (T.H.S.).
- Tarentula pulverulenta* (Clerck).  
Campden Hill (G. H. Locket).
- T. barbipes* (Sund).  
Charlton (A.E.LeG.).
- Trochosa ruricola* (De Geer).  
Mill Hill (J. K. Sholl), Woolwich.
- T. terricola* Thor.  
Recorded by Bristowe (1939).
- Pirata piraticus* (Clerck).  
Buckingham Palace, Mill Hill (C. I. Carter).
- Pisaura mirabilis* (Clerck).  
Cricklewood (C. I. Carter), Hampstead.
- Argyroneta aquatica* (Clerck).  
Wimbledon Common (J. L. Harrison).
- Ageiema labyrinthica* (Clerck).  
Hampstead, New Eltham, Wimbledon.

- Tegcnaria atrica* C.L.K.  
Buckingham Palace, Cricklewood, Cripplegate, Hampstead, Lewisham, Streatham (T.H.S.), Woolwich.
- T. parietina* (Fourc.).  
Brixton (T.H.S.), Camberwell (A.E.LeG.), Minories (A.E.LeG.), Tower of London (A.E.LeG.).  
More often found in large buildings such as warehouses than in smaller dwellings.
- T. domestica* (Clerck).  
In almost every house.
- T. silvestris* L.K.  
Cricklewood (Fitzgerald).
- Cicurina cicur* (Fabr.).  
Cricklewood (I. K. Dallison).
- Steatoda bipunctata* (L.).  
Everywhere; very seldom away from buildings.
- Teutana grossa* (C.L.K.).  
Dockland (Bristowe, 1939).
- Theridion sisypium* (Clerck).  
Blackheath (A.E.LeG.), Finchley (A. S. Goldstein), Forest Hill (A.E.LeG.), Hampstead.  
With a preference for plants with spines or prickly leaves.
- T. varians* Hahn.  
Buckingham Palace, Catford, Cricklewood (D. Alford), Paddington (A.E.LeG.).
- T. denticulatum* (Walck).  
Common in gardens all over the area.
- T. tinctum* (Walck).  
Catford.
- T. ovatum* (Clerck).  
Catford, Cricklewood (M. Layland), Cripplegate.
- T. pallens* Bl.  
Woolwich.
- T. tepidariorum* C.L.K.  
Buckingham Palace, Cricklewood (T.H.S.), and probably in every hothouse in the area.
- T. bimaculatum* (L.).  
Hampstead.
- Nesticus cellulanus* (Clerck).  
Recorded by Bristowe (1939).
- Pachygnatha degeeri* Sund.  
Buckingham Palace, Hampstead, Ladywell Recreation Ground (A.E.LeG.), Mountsfield Park (A.E.LeG.), Woolwich.
- P. clercki* Sund.  
Buckingham Palace, Cricklewood (J. K. Sholl).
- Meta segmentata* (Clerck).  
Abundant all over the area.
- M. mengei* (Bl.).  
Woolwich.  
The opinion is now generally accepted that this is to be regarded as a separate species from *M. segmentata*.
- M. merianae* (Scop.).  
Hither Green (A.E.LeG.).
- Araneus diadematus* Clerck.  
Abundant all over the area.
- A. pyramidatus* Clerck.  
Recorded in Ken Wood by E. Albin in 1736.
- A. sclopetarius* Clerck.  
Buckingham Palace, Woolwich Dockyard (A.E.LeG.).  
Sometimes known as the Bridge Spider since many of the early records were from bridges. A.E.LeG. has noted its preference is for brickwork or fences on river banks.



- A. umbraticus* Clerck.  
Catford, Cricklewood.
- A. cucurbitinus* Clerck.  
Buckingham Palace, Chiswick (T. Stout), Cricklewood, Forest Hill (A.E.LeG.),  
Temple Fortune (R. G. Pawsey).
- Zygiella x-notata* (Clerck).  
Abundant all over the area.
- Z. atrica* (C.L.K.).  
Cricklewood (J. K. Sholl), Hampstead, New Eltham.
- Walckenaera acuminata* Bl.  
Recorded by Bristowe (1939).
- Wideria antica* (Wider).  
Catford, Cricklewood (I. K. Dallison), Cripplegate.
- Dicymbium nigrum* (Bl.).  
Catford, Forest Hill (A.E.LeG.), Hampstead (W. S. Bristowe), Woolwich.
- Gnathonarium dentatum* (Wider).  
Buckingham Palace, Charlton (A.E.LeG.).
- Pocadicnemis pumila* (Bl.).  
Cricklewood (J. K. Sholl).
- Oedothorax fuscus* (Bl.).  
Catford, Hither Green (A.E.LeG.).
- O. retrusus* (Westr.).  
Buckingham Palace, Woolwich Arsenal (A.E.LeG.).
- O. apicatus* (Bl.).  
Catford.
- Tiso vagans* (Bl.).  
Cricklewood (J. K. Sholl).
- Thyreosthenius parasiticus* (Westr.).  
Recorded by Bristowe (1939) as *T. becki* Cb.
- Erigonella hiemalis* (Bl.).  
Hyde Park (A.E.LeG.).
- Savignia frontata* Bl.  
Catford, Lewisham, New Eltham.
- Diplocephalus cristatus* (Bl.).  
Buckingham Palace, Blackheath (A.E.LeG.), Catford, Cricklewood, Ladywell  
Recreation Ground (A.E.LeG.).
- D. latifrons* (Cb.).  
Buckingham Palace, Cricklewood.
- Araeoncus humilis* (Bl.).  
New Eltham and in a No. 36 bus (A.E.LeG.).
- Erigone dentipalpis* (Wider).  
Baker St. (G. H. Locket), Catford, Cricklewood (J. K. Sholl), Cripplegate,  
Hampstead (W. S. Bristowe).
- E. atra* (Bl.).  
Buckingham Palace, Catford, Cricklewood, Cripplegate, Hampstead, Lords  
(G. H. Locket).
- E. arctica* (White).  
Woolwich Dockyard (A.E.LeG.).
- E. vagans* Audouin.  
Finchley (Locket and Millidge, 1953).
- Meioneta rurestris* (C.L.K.).  
Catford, Cricklewood (J. K. Sholl), Cripplegate, Highgate (W. S. Bristowe),  
Piccadilly (G. H. Locket).
- M. beata* (Cb.).  
Buckingham Palace.
- M. mollis* (Cb.).  
Cricklewood (J. K. Sholl).
- Microneta viaria* (Bl.).  
Blackheath (A.E.LeG.), Camberwell Green (A.E.LeG.), Hampstead, Lewisham.
- Bathyphantes concolor* (Wider).  
Buckingham Palace, Cricklewood (J. K. Sholl), Mountsfield Park (A.E.LeG.).

- B. gracilis* (Bl.).  
Catford, Cricklewood, Cripplegate, Hampstead, Highgate (W. S. Bristowe),  
New Eltham.
- Poeciloneta globosa* (Wider).  
Recorded by Bristowe (1939).
- Tapinopa longidens* (Wider).  
Woolwich.
- Floronia bucculenta* (Clerck).  
Recorded by F. P. Smith (Bristowe, 1939).
- Labulla thoracica* (Wider).  
Catford, Cripplegate, Forest Hill (A.E.LeG.), Hampstead (C. I. Carter).
- Stemonyphantes lineatus* (L.).  
Catford, Cricklewood (T. Stout), Cripplegate, Lee (A.E.LeG.), Temple For-  
tune (R. G. Pawsey).
- Lepthyphantes nebulosus* (Sund.).  
Catford, Cricklewood (T. Stout), Hampstead, New Eltham, Woolwich Dock-  
yard (A.E.LeG.).
- L. leprosus* (Ohlert).  
Catford, Chelsea (A.E.LeG), Lewisham, Mill Hill (K. Sholl).
- L. minutus* (Bl.).  
Catford, Hyde Park (A.E.LeG.), New Eltham; Temple Fortune (R. G. Pawsey).
- L. tenuis* Bl.  
Catford, Hampstead (W. S. Bristowe).
- L. alacris* (Bl.).  
Temple Fortune (R. G. Pawsey).
- L. zimmermanni* Bertk.  
Hither Green, The Minories (A.E.LeG.), New Eltham.
- Linyphia triangularis* (Clerck).  
Blackheath (A.E.LeG.), Catford, Hampstead (C. I. Carter), Streatham (T.H.S.),  
Woolwich.
- L. pusilla* Sund.  
Hampstead (C. I. Cater), New Eltham.
- L. clathrata* Sund.  
Hampstead.
- L. hortensis* Sund.  
Cricklewood, Hampstead.
- L. montana* (Clerck).  
Cricklewood (J. K. Sholl).
- Centromerita bicolor* (Bl.).  
Cricklewood (J. K. Sholl).
- Entelecara erythropus* (Westr.).  
Buckingham Palace

## ORDER OPILIONES.

- Nemastoma lugubre* (Müller).  
Hampstead, New Eltham.
- Leiobunum rotundum* (Latr.).  
Cricklewood, Cripplegate, Hampstead, Woolwich.
- Oligolophus agrestis* (Meade).  
New Eltham.
- O. tridens* (C.L.K.).  
Hampstead.
- Odiellus spinosus* (Bosc.).  
Catford, Cricklewood, Hampstead.  
In nearly all gardens in the area.
- Lacinius ephippiatus* (C.L.K.).  
Catford.
- Mitopus morio* (Fabr.).  
Cricklewood, Hampstead.

*Phalangium opilio* L.

Common all over the area.

*Opilio parietinus* (De Geer).

Cricklewood, Hampstead, Willesden (M. M. Freeman).

#### ORDER PSEUDOSCORPIONES.

*Chthonius orthodactylus* (Leach).

Cripplegate, Regent's Park (T.H.S.).

*Neobisium muscorum* (Leach).

Hampstead.

*Chelifer cancroides* (L.).

Catford.

*Pselapochernes scorpioides* (Herm.).

Catford.

*Roncus lubricus* (L.K.).

Kensington (E. Browning).

## II. NOTES ON THE FOREGOING LIST.

By T. H. SAVORY.

The first comment that would arise in the mind of an arachnologist as he read the above list would be that these are the spiders that can be easily found by everyone everywhere. Comparison with the remarks on distribution given by Locket and Millidge in their recent Ray Society volumes show that the words 'common', 'frequent', 'widespread' or their equivalents have been used in reference to 114 of the species listed here.

Of the remaining sixteen, *Araneus pyramidatus* is an 18th century record only, and four, *Atypus affinis*, *Clubiona subtilis*, *Euophrys lanigera* and *Meioneta mollis* are widespread in the south of England. This leaves eleven species which are regarded as rare, or at least uncommon anywhere in Britain. They are

*Segestria florentina*

*Teutana grossa*

*Scytodes thoracica*

*Araneus sclopetarius*

*Xysticus erraticus*

*Erigone vagans*

*Marpissa muscosa*

*Microneta beata*

*Euophrys aequipes*

*Entelecara erythropus*

*Cicurina cicur*

These facts suggest two questions, of which the first asks what characteristic, common to about a hundred species, has enabled them to colonise such a wide area and even to survive the disadvantages of city life. The second and complementary question is how the others, which presumably find it more difficult to reach a satisfactory environment, should survive here at all.

A partial answer to the second question is suggested by the species\* that have occurred in the field behind the Haberdashers' School in Cricklewood. This is a field of about four acres, the centre occupied

\*The identifications of the *Erigonine* species were confirmed by M. Jacques Denis of Var, France, to whom my thanks are due.

by a rugby pitch, while the edges support a belt of poplars and elders. The immediate surroundings are the reverse of rural. Yet from the leaf litter and other places the boys have brought me fifty different species, including *Cicurina cicur*, a great surprise.

This may be compared with Bristowe's twenty-six species caught in one afternoon at Buckingham Palace and including *Microneta beata* and *Entelecara erythropus*.

The probable truth is that both these spaces, different as they are in almost every respect, prove on examination to be harbouring a relict population of invertebrates, which have found them to be refuges from the surrounding tide of civilization. This is one of the most interesting results of our attempts to catch spiders in London. It is probable that a similar conclusion would emerge from an equally close study of most of the parks and residual green areas within the metropolis, and that other groups of small animals would also show that here and there remnants of the old fauna are surviving.

The outstanding London spider is undoubtedly *Erigone vagans*, a species which has been found in Yorkshire, Staffordshire and on the sewage filter beds in Finchley.

### III. BIOLOGICAL NOTES.

By A. E. LE GROS.

London habitats have for spiders the disadvantage of a smoke-polluted atmosphere, but those spiders that are less sensitive to smoke than others are able to persist in these habitats and find compensation in more favourable climatic conditions and comparative freedom from parasites.

*Smoke Pollution.* Bristowe (1939) suggests that the absence or rarity of so many common species from Central London is due to heavy soot deposits. This would also apply to the vast "deserts" of buildings in South London. Fitter (1945) estimated 30,000 tons of soot deposited annually on London and a more recent figure from Battersea is 600 tons per square mile per month. This reduces sunshine, affects plant growth, and sours the soil; and hence influences the insect population and its predators.

*Climate.* Tall buildings act as windbreaks and heat from chimneys raises the temperature of London above that of the surrounding country. Houses provide a stable temperature and enable house-spiders to extend their breeding and adult periods. Adults of *Tegenaria atrica* have been found in every month of the year not only in houses but also under rubble on bombed sites. In contrast, one may note that a colony of this species, found under the debris of a rock fall at 1400 ft. on the Longmynd Hills, Shropshire and kept under observation for eighteen months, was found to have, in that exposed situation, a strictly limited adult life and breeding period, adults appearing only in early July and few being seen after the first frosts of October or November.

*Enemies.* There are very few records of vertebrate enemies, apart from birds. Among invertebrate enemies, wasps are conspicuous.

Wasps of the family Trypoxylonidae are far more common in London than is generally believed. I have found *Trypoxylon figulus* in a number of parks and gardens and consider that, pending more observations on the role of beetles as predators of spiders, we must regard these wasps as the most important enemies of London spiders.

In two batches of *figulus* cells constructed in old beetle borings in a garden fence I found specimens of *Araneus diadematus* (11), *Zygiella x-notata* (7), *Theridion denticulatum* (2), *Lepthyphantes* sp. (5), *Oedothorax fuscus* (1) and *Erigonine* spp. (16), all immature except the *Oedothorax*. Some of these paralysed spiders I kept alive for several weeks. A twitching of the tarsi when the abdomen was stroked by a small brush was the only indication that the spider was still alive.

Pompillid wasps are to be met with on the fringes of our area, but I do not think they are as important here as elsewhere.

M. J. Davies (1953) has shown that spiders are caught in numbers by Carabid beetles. Mr. A. A. Allen tells me that two of Davies' species, *Nebria brevicollis* and *Abax parallelopipedus* are to be found generally throughout our area. The *Nebria* he has found abundant at Blackheath and Davies has said of this species that spiders form a significant fraction of its normal food.

*Parasites.* Insects collected in London have as heavy an infestation of hymenopterous and dipterous parasites as those in the country (Owen, 1954) but London spiders seem remarkably free. Mr. J. F. Perkins (B.Mus.N.H.) told me "I have had a look to see if we have any spider parasites from the London area, but have found no bred specimens, and in fact the only examples that I have noted are of *Clistopyga incitator* F., Selford Park, 4.vi.1928".

My friend, Mr. L. Parmenter, said that in the V.C.H. of Surrey there are two records of Cyrtid flies from Wimbledon Common for the 19th century but he knows of no modern record from a place nearer our area than Epping Forest and Edgware.

*Melanism.* There is very little evidence of melanic forms superseding light forms in London. I certainly have not found the melanic variety of *Salticus scenicus* more common in London than elsewhere. On the other hand, *Sitticus pubescens*, a dark, active, diurnal spider, flourishes exceedingly in London. It may possibly be darker here than elsewhere, but I have not noticed much difference between specimens collected in London and those collected in Shropshire away from a town.

Melanism in British spiders is, I believe, nearly always correlated with high humidity (Hull, 1931).

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## The Survey of Bookham Common

FIFTEENTH YEAR.

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### Progress Report

The rather rapid drop during the last few years in the average attendance at the monthly meetings appears to have been halted, as the figure of 12 was only one less than last year, in spite of very bad weather on two days. There has been a small increase in the number of botanical workers but more ornithologists would be welcomed by the present very small team. (C.P.C.)

VEGETATION. (Report by C. P. Castell and A. W. Jones.)

Notes were again made on plants colonising disturbed soil and dumps. S.W. Ditch, a new ditch dug due west of the junction of I.O.W. and S. Ditches, was examined as were numerous piles of materials for making tracks, old deturfed areas, waste places and a cleared woodland area north of I.O.W. Pond and Marsh. Observations were made on the gun-pits, some hedgerow and woodland vegetation and on Station Copse.

A series of quadrats in both long and short grass areas in Central Plain were re-surveyed after a lapse of four years. Mapping showed a great increase in scrub and marked changes in the percentage cover of herbaceous plants, especially grasses, apparently associated with the reduction of rabbit grazing. There had been a remarkable increase of *Arrhenatherum elatius* at the expense of *Agrostis*, *Festuca* and *Holcus*.

The site of the water-main trench in W. Plain, west of Common Road, has been conspicuously marked by a pure stand of luxurious flowering *Deschampsia caespitosa*.

Mr. J. R. Laundon is preparing a paper on the lichen flora of the Common.

BIRDS. (Report by G. Beven.)

Census work was continued throughout the year on Chesmore and Kelsey's Farms and on Western and Isle of Wight Plains. From a study of the census figures, Miss E. M. Hillman has demonstrated some

interesting changes in the bird population of the plains. For instance, three groups of birds were studied:—(i) Those feeding mainly on vegetable matter, i.e. Chaffinch, Reed Bunting and Yellow Bunting; (ii) Insectivorous birds feeding mainly on herbs and foliage, i.e. Willow Warbler, Whitethroat and Wren, and (iii) Insectivorous birds feeding mainly on the ground, i.e. Robin, Tree Pipit and Hedge Sparrow. The total number of spring territories in each group were compared. Between 1949-50 and 1956 there was a gradual decrease in all groups, but this decrease was much more marked in the "insectivorous birds on ground" group than it was in the "vegetable feeders", where the decrease was very slight. This may be partly due to footpaths becoming overgrown, especially by encroachment of *Deschampsia caespitosa* tufts and of Bracken. Some decrease also occurred in the "insectivorous on foliage" group and this is perhaps unexpected in view of the increase in herb and scrub. However, it was the Wren population which decreased most, especially in 1956; Wrens also became fewer in Eastern Wood in the same period, and in 1956 were there drastically reduced almost to half the 1955 population. Thus the changes in Wren numbers may have been due to more general causes.

Following the cold spell in February 1956 an extra census was made in the spring in Eastern Wood, but this did not reveal any decrease in the bird population as a whole. The only exception was in the case of Wrens mentioned above.

Work is proceeding on the feeding niches of woodland birds.

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## The Gall Midges (Cecidomyiidae) of Bookham Common

By M. NIBLETT, F.R.E.S.

The following list of Gall Midges has been compiled from records made by me during visits to Bookham Common since 1929, though during the earlier years these visits were infrequent, and no great attention was paid to midge galls. Since 1942, from 5 to 17 visits a year have been made, and more attention given to these galls. I have made no attempt to give localities; many of the host-plants are scarce or very widely scattered, while some have changed their location over a period of years, and the frequency of their occurrence has varied greatly from year to year.

I have given the names of the host-plants, the part of the plant upon which the galls are formed, colour of the larvae, date found, and as many of the midges were bred emergence times have been included. Roman numerals denote the year, and ordinary numerals the months.

*Anabremia viciae* Kieff. : Orange larvae in swollen flowers of *Vicia cracca*, 7, 8, pupate in soil, emerge I 8, 9, II 6, 7.

*Anisostephus betulinum* Kieff. : White to sulphur-yellow larvae in pustules on leaves of *Betula verrucosa* 6, 7, 8, pupate in soil, emerge I 8, II 4, 5.

*Atrichosema aceris* Kieff. : White larvae in swollen petioles of *Acer campestre* 6, 7, pupate in soil, emerge II.

*Contarinia anthobia* F. Lw. : Light yellow jumping larvae in swollen flowers of *Crataegus monogyna* 4, 5, pupate in soil, emerge II 4.

*C. corylina* F. Lw. : White jumping larvae in swollen catkins of *Corylus avellana* 8 to 10, pupate in soil, emerge II 7.

*C. hypochoeridis* Rüb. : Yellow jumping larvae in flowers of *Hypochaeris radicata* 6, 7, pupate in soil, emerge I 7, 8, II 6.

*C. jacobaeae* H. Lw. : Yellowish jumping larvae in swollen flowers of *Senecio erucifolius* and *S. jacobaea* 7, 8, pupate in soil, emerge II 6, 7.

*C. lonicerarum* F. Lw. : Yellow jumping larvae in swollen flowers of *Viburnum opulus* 5, 6, pupate in soil, emerge II 4.

*C. loti* Deg. : Yellow jumping larvae in swollen flowers of *Lotus corniculatus* and *L. uliginosus* 7, 8, pupate in soil, emerge I 7, 8, II 5, 6.

*C. pilosellae* Kieff. : Yellow jumping larvae in flowers of *Hieracium pilosella* 6, 7, pupate in soil, emerge II 5, 6.

*C. schlechtendali* Rüb. : Deep yellow jumping larvae in flowers of *Sonchus arvensis* and *S. oleraceus* 7, 8, pupate in soil, emerge I 8, II 7.

*C. solani* Rüb. : White jumping larvae in swollen flowers of *Solanum dulcamara* 7, 8, pupate in soil, emerge I 7, 8, 9, II 5, 6.

*C. steini* Karsch. : Yellow jumping larvae in flowers of *Melandrium album* 6, 7, 8, pupate in soil, emerge I 7, 8, 9; II 5, 6.

*C. tragoponis* Kieff. : Yellow jumping larvae in flowers of *Tragopogon minus* and *T. pratense* 6, 7, 8, pupate in soil, emerge I 7, 8.

*C. tremulae* Kieff. : White jumping larvae in rolled leaf-edges of *Populus tremula* 6, 7, pupate in soil.

*Cystiphora sonchi* F. Lw. : White larvae in reddish to purple pustules on leaves of *Sonchus arvensis* 7, 8, 9, pupate in gall or soil, emerge I 7, II 5.

*Dasyneura affinis* Kieff. : White to orange larvae in rolled leaves of *Viola* spp. 7, 8, 9, pupate in gall, emerge II 5, 6d.

*D. aparines* Kieff. : Orange-yellow larvae in flowers of *Galium aparine* 6, 7, pupate in soil, emerge I 9.

*D. bryoniae* Bché. : White larvae among terminal leaves of *Bryonia dioica* 7, 8, pupate in soil, emerge I 8, 9, II 5.

*D. crataegi* Winn. : Reddish larvae in leaf rosettes on *Crataegus monogyna* 6, 7, 8, pupate in soil, emerge I 6, 7, II 5, 6.

*D. epilobii* F. Lw. : Yellowish larvae in swollen flowers of *Chamaenerion angustifolium* 6, 7, 8, 9, pupate in soil, emerge I 7, II 5, 6, 8.

*D. filicina* Kieff. : Orange larvae in folded pinules of *Pteridium aquilinum* 6, 7, pupate in soil, emerge I 10, II 5 6.

*D. fraxini* Kieff. : Orange larvae in folded leaves of *Fraxinus excelsior* 6, 7, 8, pupate in soil, emerge II 5, 6.

*D. fusca* Rüb. : Orange-yellow larvae in swollen flowers of *Crataegus monogyna* 5, pupate in soil, emerge II 4.

*D. loewiana* Rüb. : Pale-red larvae in folded leaflets of *Vicia tetrasperma* 7, 6, pupate in soil, emerge I 8, 9, II 4, 5.

*D. oxyacanthae* Rub. : Red larvae in swollen flowers of *Crataegus monogyna* 5, 6, pupate in soil, emerge I 6, II 4.

*D. plicatrix* H. Lw. : White larvae in folded and crinkled leaves of *Rubus* spp. 6, 7, 8, pupate in soil, emerge I 7.

*D. populeti* Rüb. : White larvae in rolled leaf-edges of *Populus tremula* 7, 8, pupate in soil.

*D. pteridicola* Kieff. : White larvae in folded pinules of *Pteridium aquilinum* 7, pupate in soil.

*D. pustulans* Rüb. : Whitish larvae in pustules on leaves of *Filipendula ulmaria* 7, 8, pupate in soil, emerge I 8, 9, II 6.

*D. sisymbrii* Schrnk. : Yellow larvae in flowers and leaf-buds of *Barbarea vulgaris* 5, 6, pupate in gall, emerge I 5, 6.

*D. spadicea* Rüb. : Yellow larvae in folded leaflets of *Vicia cracca* 6, 7, 8, 9, pupate in soil, emerge I 7, 8, 9, II 5.

*D. trifolii* F. Lw. : Reddish-yellow larvae in folded leaflets of *Trifolium pratense* and *T. repens* 6, 7, 8, 9, pupate in gall or soil, emerge I 6, 7, 8, 9.

*D. ulmariae* Bremi. : Yellowish larvae in small rounded swellings on leaves of *Filipendula ulmaria* 6, 7, 8, 9, pupate in soil, emerge I 7, 8, 9, II 5, 6.



- D. urticae* Perris. : White larvae in swellings on leaves of *Urtica dioica* 7, 8, 9, 10, pupate in soil, emerge I 7, 8, 9, II 4, 5, 6, 7.
- D. viciae* Kieff. : White larvae in folded leaflets of *Vicia cracca* and *V. tetrasperma* 7, 8, 9, 10, pupate in soil, emerge I 9, II 4, 5.
- Diodaulus linariae* Winn. : Whitish larvae in terminal tufts of leaflets of *Linaria vulgaris* 7, 8, 9, pupate in soil, emerge I 8, II 5.
- Geocrypta galii* H. Lw. : Yellow to orange larvae in galls on stems *Galium palustre* and *G. verum* 7, 8, 9, pupate in soil, emerge II 5, 6.
- Harmandia globuli* Rüb. : Reddish-yellow larvae in small globular galls on leaves of *Populus tremula* 6, 7, 8, pupate in soil, emerge II 5, 6.
- H. loewi* Rüb. : Orange larvae in globular galls on leaves of *Populus tremula* 7, 8, 9, pupate in soil, emerge II 4, 5, 6
- H. populi* Rüb. : Yellowish-red larvae in globular galls on underside of leaves of *Populus tremula* 6, 7, pupate in soil, emerge II 4.
- Hartigiola annulipes* Htg. : White larvae in hairy cylindrical galls on leaves of *Fagus sylvatica* 7, 8, 9, pupate in gall, emerge II 4.
- Helicomyia saliciperda* Duf. : Yellowish-orange larvae in swollen branches of *Salix fragilis* 8 to 4, pupate in gall, emerge II 4, 5, 6, 7.
- Iteomyia capreae* Winn. : White to orange larvae in pustular galls on leaves of *Salix atrocinerea* and *S. caprea* 6, 7, 8, 9, pupate in soil, emerge II 5, 6.
- I. major* Kieff. : Red larvae in swellings on leaves of *Salix atrocinerea* and *S. caprea* 6, 7, 8, 9, pupate in soil, emerge II 5, 6.
- Jaapiella dittrichi* Rüb. : Yellow to reddish larvae on crinkled leaves of *Silaum silaus* 8, pupate in soil, emerge I 8.
- J. loticola* Rüb. : Red larvae in terminal leaves of *Lotus uliginosus* 8, pupate in soil, emerge I 9.
- J. schmidti* Rüb. : Orange-red larvae in flower-heads of *Plantago lanceolata* 6, 7, pupate in soil.
- J. veronicae* Val. : Orange-red larvae in terminal leaf-tufts of *Veronica chamaedrys* 6, 7, 8, pupate in gall, emerge I 6, 7, 8, 9, II 4, 5, 6.
- Kiefferiana pimpinellae* F. Lw. : Orange-red larvae in swollen seeds of *Angelica sylvestris*, *Pastinaca sativa*, and *Silaum silaus* 8, 9, pupate in soil, emerge I 9, II 6, 7, 8.
- Lasioptera carophila* F. Lw. : Orange-yellow larvae in swollen umbel bases of *Angelica sylvestris*, and *Silaum silaus* 8, 9, pupate in gall, emerge II 7, 8.
- L. populnea* Wachtl. : White larvae in pustular galls on leaves of *Populus tremula* 6, 7, 8, pupate in soil, emerge II 5.
- L. rubi* Heeg. : Orange larvae in swellings on stems of *Rubus* spp. 8 onwards, pupate in gall, emerge II 4, 5, 6.
- Macrodiplosis dryobia* F. Lw. : White larvae in downward folds of leaves of *Quercus robur* 5, 6, pupate in soil, emerge II 5.
- M. volvens* Kieff. : Orange larvae in upward folds of leaves of *Quercus robur* 5, 6, pupate in soil, emerge II 4, 5.
- Macrolabis cirsii* Rüb. : Red larvae in flowers of *Cirsium arvense* 7, 8, pupate in soil, emerge I 8.
- M. corrugans* F. Lw. : White larvae in folded leaves of *Heracleum sphondylium* 7, 8, pupate in soil, emerge II 4.
- Massalongia rubra* Kieff. : White to red larvae in swollen leaf-veins of *Betula verrucosa* 6, 7, 8, pupate in soil, emerge II 4.
- Placochela nigripes* F. Lw. : Orange-yellow larvae in swollen flowers of *Sambucus nigra* 6, 7, pupate in soil, emerge II 4, 5, 6.
- Plemeliella betulicola* Rüb. : White larvae in young terminal leaves of *Betula verrucosa* 6, 7, pupate in soil, emerge II 5.
- Putoniella marsupialis* F. Lw. : Orange-yellow larvae in folded leaves of *Prunus spinosa* 5, 6, pupate in soil, emerge II 4, 5.
- Rhabdophaga rosaria* H. Lw. : Reddish larvae in leaf rosettes on *Salix atrocinerea* and *S. caprea* 8 onwards, pupate in gall, emerge II 4, 5.
- R. salicis* Schrnk. : White to red larvae in swellings on twigs of *Salix atrocinerea* and *S. caprea* 8 onwards, pupate in gall, emerge II 4, 5, 6.
- R. terminalis* H. Lw. : Reddish larvae in folded terminal leaves of *Salix fragilis* 6, 7, 8, pupate in soil, emerge I 6, 7, 8, II 5.

*Rhopalomyia ptarmicae* Val. : White larvae in swollen flowers of *Achillea ptarmica* 7, 8, pupate in gall, emerge I 8, 10.

*Rondaniella bursaria* Bremi. : White larvae in cylindrical galls on leaves of *Glechoma hederacea* 6, 7, 8, 9, pupate in gall, emerge I 9, 10, II 5, 6.

*Syndiplosis petioli* Kieff. : Orange larvae in swellings on petioles of leaves of *Populus tremula* 5, 6, 7, pupate in soil, emerge II 4, 5.

*Taxomyia taxi* Inch. : Red larvae in clustered leaflets of *Taxus baccata* 8 to 4, pupate in gall, emerge II 5.

*Wachtliella rosarum* Hardy. : Orange larvae in folded leaflets of *Rosa* spp. 6, 7, 8, pupate in soil, emerge I 8, 10, II 5.

*W. stachydis* B.-W. : Orange larvae in rolled leaves of *Stachys sylvatica* 6, 7, 8, pupate in soil, emerge I 7, 8, II 4, 5, 6.

*Zygiobia carpini* F. Lw. : White larvae in swellings along leaf-veins of *Carpinus betulus* 6, 7, 8, pupate in soil.

This is not claimed to be a complete list of all the Gall Midges that occur on the Common; there are no doubt a number of others to be found. Several other species have been recorded at various times, but I have not seen any of these and believe some were wrongly identified.

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## Bookham Common Before 1914 and After

By W. H. SPREADBURY.

My first visit to Bookham Common was at least as early as the Spring of 1905.

Most of my visits in those days were made in the Spring and early Summer as my interests then were chiefly in birds and lepidoptera. In those days few visited the Common, and as there were only two trains from Waterloo on a Sunday and hiking had not then become popular it is no wonder that we were often the only people to alight from the Sunday morning train.

In trying to assess the changes over the last 50 years one is tempted to say that the Common is not what it was, until one realises the obvious retort. For all naturalists know that change is continuous apart from man's interference, though unless one keeps careful notes and records one can easily overlook the changes year by year until a flash of memory pictures the area as one first knew it.

Looking back over the years it seems to me that much of the woodland was very dense, especially Eastern Wood, parts of Central Wood and Sheepbell Wood, though the northern woods and those bordering the chain of ponds and hollows were comparatively free of dense undergrowth.

There were fewer footpaths and, with few exceptions, these were really footpaths and not wide cart-tracks as now. They were little used except by the few local farm-workers and the gipsies who frequently camped on the Common.

The Central Plain and those areas along the western side of the Common where cattle frequently grazed were less wet, and the grass was mostly short though hawthorn bushes were not infrequent especially in Isle of Wight and Western Plains. Skylarks commonly nested on the plains and most of the hawthorns held a Chaffinch's nest. There was little blackthorn and of course grazing checked the growth of scrub. The

slopes immediately along the western edge of South East Wood were thickly covered with Dwarf Gorse with little if any bracken, and it seems to me that the wood has encroached on to the plain since my early visits.

Eastern Plain was almost entirely covered with Dwarf Gorse and Heather and was without trees except for a few saplings by Hollow Wood. Here the Stonechat always greeted one and there were nests of Tree Pipit and Yellow Bunting to be found. Here again the woodland has encroached considerably and frequent fires in recent years have brought about great changes. Station Copse did not exist. There was a more or less grassy area with a few bramble and other bushes surrounded by Elm trees and suckers. We always referred to this area as the 'Station yard' and could spend half an hour or so in it when waiting for our return train.

Perhaps the greatest and most conspicuous changes have taken place in the ponds.

Both I.o.W. and U.E. Ponds were clear stretches of water. There was little if any sallow at the edges and as far as I can recall no Reed Mace in the I.o.W. Pond, though there was some Sparganium at the eastern end. Indeed this open sheet of water was covered with Potamogeton and one could walk freely round its borders.

The water extended right up to the bank of Western Hollow.

Upper Eastern Pond was a dark stretch of water rather over-shadowed by the fine old oaks of the surrounding woods. Here we sometimes saw a Kingfisher which, at least once, tried to nest in the raised bank between the ponds. There was very little silting at the eastern end.

Eastern Hollow was a clear grassy area which has now become almost overgrown with scrub.

Sheepbell Pond was in a dense wood and not always easy to find. Here on several occasions we caught some fine Tench.

## CHANGES SINCE 1914

### 1. *Topography*

There was much tree-felling during the First World War and no doubt the clearing of the trees made cart-tracks of footpaths and created many new ones. Grazing ceased soon after the war and scrub rapidly spread on the plains. Many areas, especially the plains, became much wetter, perhaps in consequence of diversion of drainage when neighbouring land was developed for building.

Increasing visitors raided the primroses which had prospered in the cleared woodlands.

Bracken spread tremendously, helped no doubt by the all too frequent fires, particularly on Eastern Plain.

### 2. *Bird-life*

Jays were very numerous before 1914 and it was quite usual to find a dozen or so nests any year. The usual sites were the tangled clumps of honeysuckle hanging in the oaks, and the dense old hawthorns that were common in the woods.

Wood Pigeons nested commonly, especially in the taller Hawthorns and Hollies.

Small birds were much more numerous, particularly Blackbirds, Thrushes and Chaffinches, and nests were numerous and easy to find. Warblers abounded, particularly along the edges of woods and in the immediate neighbourhood of the ponds and hollows. Skylarks and Tree Pipits nested commonly on the plains, where there was generally at least one pair of Whinchats. Stonechats were always to be found nesting on Eastern Plain. Several pairs of Yellow Buntings nested along the gorse-covered slope of Central and Western Plain. The Red-backed Shrike occurred but there were rarely more than a pair or two. The Wryneck was present every year in the I.o.W. orchard.

Curiously enough, Green Woodpeckers, Goldcrests, Tits, Tree Creepers and Bullfinches seem to have changed little in numbers. Until a few years ago I was always puzzled to know where the Goldcrests in Bookham Woods nested. The finding of a nest in the ivy clump crowning an aged and decrepit hawthorn stump solved the problem. A note on this type of nesting site appears in the "Handbook".

Coot and Dabchick nested in the I.o.W. Pond. Snipe were sometimes flushed from the pond edges and could often be seen "drumming" over Western Plain. I believe they nested in the fields west of the Common and possibly just after the 1914 war on the Plain itself.

I have no recollection of the Nightjar before 1914 but have since seen the nest (or rather the eggs) in a cleared part of Eastern Wood.

The Grasshopper Warbler was not known to us as a regular visitor to the Common before 1914 and the chance finding of a nest in 1911 just across Bank's Stream was a great surprise. This area then was dry and gorse-covered (as was Bank's Common) and a frequent camping ground for gipsies.

### 3. *Plant-life*

The great decrease in primroses is most marked though other woodland flowers seem to be holding their own except where bracken is smothering the ground. There were fairly open areas particularly north and west of the ponds and hollows where primroses carpeted the ground every Spring.

Sallow, Birch and Aspen have increased enormously, especially in the plains and the pond and hollow areas. Bracken has invaded the woods and is spreading over the plains.

### 4. *Insect-life*

On the whole the lepidoptera seem to have maintained their numbers well. Indeed the war-time clearing of the woods probably benefited the Fritillaries by encouraging the growth of their food-plant.

The White Admiral is an interesting gain not, however, peculiar to Bookham Common, for of late years this butterfly has become a common inhabitant of all suitable woods around London. The Purple Hairstreak is as abundant as ever most years. With the increase of Reed-Mace and Sparganium the Bullrush Moth has become very abundant. The dis-

covery of larvae of Webb's Wainscot in 1935 was exciting but it appears to have been only an accidental occurrence and two years later was not to be found. There is, I believe, an old record of this coastal species having occurred on a Surrey Common.

#### SUMMARY OF CHANGES WITH SUGGESTED POSSIBLE CAUSES

1. The silting of the ponds and the spread of scrub on to the plains in the absence of grazing is natural, though the silting has been hastened by neglect of maintenance of the banks and wanton damage to the I.o.W. pond bank particularly.

2. Decrease in bird-life is undoubtedly due to man. Increase in the number of visitors to the Common is a disturbing factor, particularly to ground-nesting birds. It is significant that the birds that have lost most in numbers are species which nest early and whose nests are easily noticed.

3. Numerous trippers and local residents have taken toll of the primroses.

4. Too frequent fires have destroyed much, and burnt areas have often become covered with bracken.

5. The felling of trees during war years and subsequent clearing have had great effect in opening up areas difficult of access, though the woods, especially Eastern Wood, are once again becoming dense.

6. It is possible that diversion of ditches and drainage operations on building sites in the neighbourhood have increased the water content of some areas.

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### Material used in a Long-tailed Tit's Nest on Bookham Common, Surrey

By E. W. GROVES.

Whilst visiting the Common on 20th June 1955 I came upon a long-tailed tit's nest which had been robbed and destroyed, probably that same day. The remains lay on the ground near the sloe thicket by Bookham Stream on Western Plain (Square 458). Although it was impossible to gather up all the feathers that had been scattered about by the breeze, I collected as many as I could along with the outer part of the nest which was reasonably complete. The total weight of all the material I brought home was 13.4 grams. In view of the long term ecological studies made by the Society at Bookham (ornithological, botanical, etc.) I feel it may be worth while recording the constituents of the nest.

The nest lining included many small feathers of domestic fowl (the nearest chicken runs being 300-400 ft. from the nesting site), breast feathers of hen pheasant and primaries of cock pheasant, body feathers of fieldfare and blackbird, breast feathers of song thrush and of *Corvus* sp., and small feathers of pigeon. The nest proper consisted of mosses, lichens, bits of grass, tiny dead leaves, many egg cocoon cases of various

spiders, small pieces of twig, more feathers (of the same bird species as mentioned above) and a piece of soft grey paper similar to that used in the manufacture of egg cartons.

With regard to the mosses (kindly identified by Mr. A. H. Norkett), the majority of the pieces present were of *Eurynchium praelongum* (Hedw.) Hobk. with *Brachythecium rutabulum* (Hedw.) Bruch as the species next in abundance. *Hypnum cupressiforme* Hedw. and *Camptothecium sericeum* (Hedw.) Kindb. had also been gathered by the birds though to a lesser extent. The first three species occur mainly on the ground while the latter, although at times on trees, is perhaps more frequent on walls.

Of the lichens, *Parmelia physodes* (L.) Ach. was the species used most, though there were many fragments of *Parmelia sulcata* Tayl. and small pieces of bark and twig bearing *Lecanora conizaeoides* Nyl. ex Cromb. Mr. J. R. Laundon who named them provided me with the following note: "It appears likely that the lichens were collected by the birds at least 800 ft. from where the nest was built, since the *Parmelia* spp. are common only on the woodland oaks. It is probable that they were taken from the branches and not from the trunks since the lichen *Evernia prunastri* (L.) Ach. was not present in the nest and this species is often the most abundant macrolichen on the boles but does not occur on the branches. Moreover the two species of *Parmelia* used in the nest construction are the only common foliose lichens which occur on the lichen branches, although of course both are common on the tree bole as well."

# The Moths of London and its Surroundings.

By C. G. M. DE WORMS, M.A., Ph.D., F.R.I.C., F.R.E.S.

(Continued from p. 76 of the *London Naturalist*, 35, 1956)

THE next Super-Family to be dealt with comprises the Geometridae, a large group of Moths embodying both day and night fliers. Their chief distinguishing feature for classification is the structure of their larvae, all of which have the four pairs of false legs absent which has earned for them the popular name of looper caterpillars. The Family occurs in all parts of the world and is well represented in the arctic regions. To date (1956) 245 species of the Geometers have been recorded for the London Area out of a total of 294 valid species for the whole of Great Britain; that is some 83% of species of our Geometers are to be found within the specified limits of the range covered in this survey.

The first two species to be reviewed are usually treated among the Geometers, though they have certain affinities with the Noctuae.

\**Brephos parthenias* Linn. M.21, H.20, E2.18, K.16, S.17.

This most attractive species, the Orange Underwing, is a real harbinger of spring. It usually appears during the first warm days of March and is abundant among birch all over the south of England and right up to the Highlands where a larger and brighter form occurs. The late afternoon is as a rule the best time to attempt to take it on the wing. It is of doubtful occurrence in Ireland. The 1898 list only gives Croydon and Wimbledon Common as localities within the 10-mile radius. Other records include

MIDDLESEX. Lea Bridge (*Entom.*, 1877, 10: 162); Scratch Wood, common (Lorimer); Harrow Weald (Fletcher); Uxbridge, Ruislip and Northolt (J. Ward).

HERTS. Watford, common (Penrose); Bricket Wood, Haileybury, Hertford, Hoddesdon, Broxbourne (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Edelsten); Warley (Heath: Hope Dept. Collection, Oxford).

KENT. Lessness Wood, 1950 (Showler); Hayes Common, 1948 (Hyatt); Pett's Wood (A. Swain); Addington Hills (Birchenough); Dartford Heath (Owen); West Wickham (Wheeler).

SURREY. Cheam (Menzies); Banstead, 1949 (Wheeler); Arbrook Common (Keywood); Oxshott Common, 1947 (C. de W.); Bookham Common (Wheeler).

*Brephos notha* Hübn. M.21, H.20, E2.18, K.16, S.17.

The Light Orange Underwing is much more local than the preceding species. It appears several weeks later, usually in the first part of April and is often still on the wing in early May. It is always associated with aspens, its larval foodplant, round which it flies freely

in the sunshine and from which it may be shaken at dusk. It is found in most of the southern counties up to the Midlands and has been reported from Moray in the Highlands. It is not included in the 1898 list.

MIDDLESEX. Ruislip district (Minnion).

HERTS. Hoddesdon Woods (Eagles); Broxbourne Woods, plentiful (Bull); Watford, common (Penrose); Bricket Wood, 1932 (Fryer).

ESSEX. Ongar Park Wood, 1933, plentiful (C. de W.); Brentwood (Edelsten).

KENT. Pett's Wood (A. Swain); Shooter's Hill (West, *Ent. Rec.*, 1906).

SURREY. Bookham Common and Oxshott Woods (Finnigan); Limpsfield (Cockayne); Epsom Downs, late March 1945 (Canon Edwards).

*Aplasta ononaria* Fuessl. (K.16).

This small ochreous-coloured insect, the Rest Harrow, until recently was among our rarest species. It was found for a few years in the Warren at Folkestone from 1866 onwards. Its foothold there was short-lived and it was not seen again in the British Isles till 1932 when it reappeared in Kent. In 1937 a flourishing colony was again discovered in the Folkestone Warren by Mr. A. M. Morley (vide *Entom.*, 1938, 71: 145). Since that year it has continued to exist in that area among its foodplant *Ononis* and also near Sandwich. Its only claim to be included in the London Area was a specimen taken at light near Westerham in July 1947 by Mr. Clifford Edwards.

The next group of species belongs to the Family known as the Hemithiinae. This comprises the large number of green moths known as the Emeralds of which ten have been recognised as occurring in the British Isles and six in the London Area.

\**Pseudoterpna pruinata* Hufn. M.21, H.20, E2.18, [E1.19], K.16, S.17.

This very attractive species, the Grass Emerald, when freshly emerged is of a delicate, but most fugitive blue-green which fades rapidly, often within a few hours. It is widespread mainly on heathland over the whole of the British Isles up to the Highlands, appearing in late June and sometimes in September. Gorse and broom are the chief foodplants of its larva. In the 1898 list it is reported from Wanstead, Woodford, Bromley and Shirley in Kent, Tooting, Barnes and Wimbledon Common, also from Hampstead Heath. Other records include

MIDDLESEX. Ruislip and Northolt (J. Ward); Whitton and Harefield (Cockerell, *Lep. Middx.*, 1891).

ESSEX. Epping Forest (Edelsten).

HERTS. Totteridge, one (Lorimer); St. Albans, Broxbourne, Haileybury, Bushey, Watford (Foster, *Lep. Herts.*, 1937).

KENT. Dartford and Hayes (Owen); Pett's Wood (A. Swain); Abbey Wood (Showler); West Wickham (Birchenough).



SURREY. Brixton (Farmer); Wimbledon Common, 1930, and East Sheen, 1928 (D. King); Barnes (Gardner); Worcester Park (Kaye); Fairmile Common, 1953 (Greenhill); Banstead (Wheeler); Weybridge (Messenger); Addington (Keywood); Putney, two in 1951 (H. Swain).

\**Hipparchus papilionaria* Linn. I.L., M.21, H.20, E2.18, K.16, S.17, B.24.

The Large Emerald is in many ways the most handsome of this group of moths. It appears in the middle of the summer and may be found all over the British Isles, except the most northerly points. Its thick-set larva is readily obtained from birch in the spring. In the 1898 list it has been noted from Woodford, Eltham, Croydon, Shirley, Coombe Wood and Wimbledon Common, also from Highgate and Hampstead Heath.

INNER LONDON. The Zoo, Regent's Park in 1951 (Bushby).

MIDDLESEX. Ruislip and Northolt (J. Ward); Haverstock Hill, 1848, Whitton and Harefield (Cockerell, *Lep. Middx.*, 1891); Stanmore, 1938 (Fletcher); Enfield (Edelsten).

HERTS. Totteridge, common, Lorimer; Bushey, Haileybury, Watford, Cheshunt, Bricket Wood, Broxbourne (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Clark).

KENT. Pett's Wood (A. Swain); Joyden's Wood (Hyatt); Hayes Common (D. Owen); Orpington (Siggs); Darenth Wood (West, *Ent. Rec.*, 1906); Eltham, Bexley and Greenhithe (V.C.H., 1908); West Wickham (Birchenough).

SURREY. Esher and Arbrook Common, 1936 (Keywood); Burgh Heath (Wheeler); Sheen Common, 1933 (D. King); Chipstead, 1946 (Johnson); Weybridge (Messenger).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

\**Hemistola immaculata* Thunb. (= *chrysoprasaria* Esp.) M.21, H.20, E2.18, K.16, S.17.

This delicately coloured species, the Small Emerald, is virtually confined to the areas where its foodplant, the Traveller's Joy, flourishes which is chiefly on chalk soils, though its larva may also feed on cultivated Clematis in gardens. It is found over most of the southern counties, but only very rarely in Ireland and Scotland. The 1898 list gives it from Eltham, Croydon, Richmond, Coombe Wood, Worcester Park and Harrow. Other records include

MIDDLESEX. Stanmore, common (Lorimer), Whitton (Cockerell, *Lep. Middx.*, 1891), Ruislip district, rare (Minnion).

HERTS. St. Albans, Haileybury, Hoddesdon (Foster, *Lep. Herts.*, 1937).

ESSEX. Tilbury (Edelsten).

KENT. Abbey Wood, 1951 (Showler); Chelsfield (A. Swain); Orpington, 1954 (Siggs); Plumstead, 1877 (West, *Ent. Rec.*, 1906); Foot's Cray, 1892 (Sellon: Hope Dept. Collection, Oxford).

SURREY. East Sheen, 1933 (D. King); Coulsdon and Tadworth (Wheeler); Addington (Birchenough); Chipstead, five in 1946 (Johnson); Weybridge, rare (Messenger); Box Hill, 1936 (C. de W.); Wimbledon Common, one on a fence on 20 July 1936 (Hawkins); Putney, several in 1948 and 1951 (H. Swain).

\**Comibaena pustulata* Hufn. I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Blotched Emerald is fairly prevalent among oaks in late June. Its range seems to be all over southern England up to the Midlands. From the 1898 list it has been recorded from Ladbroke Square in Central London, also from Brondesbury as well as from Highgate, Hale End, Hounslow, Southall, Epping Forest, Hendon, Dulwich and Wimbledon.

MIDDLESEX. Mill Hill, July 1955 (Goater); Stanmore, 1936 (Fletcher); Elstree (Lorimer); Hampstead (*Ent. Annual*, 1869); Ruislip (Minnion).

HERTS. Northaw, 1953 (Rutherford); Haileybury, Aldenham, Bushey Heath, Broxbourne (Foster, *Lep. Herts.*, 1937).

KENT. Abbey Wood, 1951 (Showler); Bexley, Erith, Chislehurst and Pett's Wood (A. Swain); Hayes and Downe (Birchenough); West Wickham and Shooter's Hill (West, *Ent. Rec.*, 1906).

SURREY. Wimbledon Common, 1953 (Sutton); Putney, 1930 (D. King); Selsdon (Barnett); Tadworth (Wheeler); Chipstead, 1946 (Johnson); Weybridge (Messenger); Oxshott and Worcester Park (V.C.H., 1902).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

\**Iodis lactearia* Linn. M.21, H.20, E2.18, E1.19, K.16, S.17.

This small moth, the Little Emerald, is yet another of this group which has a very delicate and fugitive colour. It appears in late May and can often be seen in numbers flying at dusk along hedgerows all over the British Isles, including Scotland and Ireland. The 1898 list enumerates it from many localities, including Highgate, Woodford, Epping Forest, Willesden, Southgate, Dulwich and Wimbledon Common. Other records are

MIDDLESEX. Hounslow, 1955 (Pierce); Stanmore (Fletcher); Mill Hill, 1955 (Goater); Uxbridge, Ruislip, Northolt (J. Ward); Enfield (Edelsten); Harrow, Whitton and Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Watford, rare (Penrose); Totteridge (Lorimer); Bricket Wood, Haileybury, East Barnet, Cheshunt, Northaw, Broxbourne (Foster, *Lep. Herts.*, 1937).

KENT. Joyden's Wood, 1947 (Hyatt); Shooter's Hill, 1947 (Burton); Hayes (D. Owen); Lee, Lewisham, Greenwich (West, *Ent. Rec.*, 1906).

SURREY. Oxshott, 1930, and Putney, 1932 (D. King); Weybridge (Messenger).

\**Hemithea aestivaria* Hübn. (= *strigata* Müll.) M.21, H.20, E2.18, E1.19, K.16, S.17.

The Common Emerald is a familiar flier where oaks are prevalent all over England to the Northern Counties and in most of Ireland. It is recorded in the 1898 list from nearly all the region, including Chiswick, Highgate, Hounslow, Woodford, Chingford, Dulwich and Wimbledon Common as well as from almost every part of the outlying quarters of the London Area.

The next group of the Geometers belongs to the Family of the Sterrhinae which comprises small insects known as the Waves.

*Sterrrha muricata* Hufn. (= *auroraria* Borkh.) S.17.

This tiny insect, the Purple-bordered Gold, is chiefly to be found in damp places on moors and in fen districts over most of the south of England, but it is always very local, especially in the Lake District and in the west of Ireland. It often flies freely at dusk and dawn in July. The only records for the London area are that it used to be found in the Croydon area (Barrett, vii, 332) and one example from Merton Park (Nott). Noted as rare near Croydon in 1906.

\**Sterrrha rusticata* Fabr. (M.21), K.16.

The Least Carpet is one of our most local species, being found mainly in Kent on the outskirts of London. In these haunts it is often easy to spot at rest on the surface of leaves in late June. It has also been reported from the coast in Sussex, Suffolk, Dorset and Devon and very doubtfully from the Island of St Kilda. The 1898 list only gives a record from Hampstead Heath in 1890. Other records include

MIDDLESEX. Harefield, one in 1890 (Cockerell, *Lep. Middx.*, 1891).

KENT. Abbey Wood and Belvedere, 1953 (Showler); Grove Park, 1948 (Hyatt); Pett's Wood and Chelsfield, 1951 (A. Swain); Pinden (Hare); Dartford (C. Johnson: Hope Dept. Collection, Oxford); Erith, common in 1936 (C. de W.); Greenhithe (V.C.H., 1908).

\**Sterrrha inquinata* Scop. (= *herbariata* Fabr.) (I.L.)

Central London seems to have been the headquarters of this little insect, the Rusty Wave, which has appeared spasmodically in the vicinity of herbalists' shops, since the larvae feed on withered plants. The 1898 list gives a single record of a specimen taken in Southampton Row on 21 July 1898 by the late Selwyn Image (*Entom.*, 1898, 31: 220). Earlier records reported in South (ii, 112) are an example taken in Bloomsbury Street in 1856, the first time this species was noted in this country. In June 1868 several were found in a herbalist's shop in Holborn, then one in Oxford Street in 1873, while another was found in a shop in Cannon Street in the City on 21 July 1879. There is also a record of a specimen in 1910 from Stroud in Gloucestershire.

\**Sterrha seriata* Schrank. (= *virgularia* Hübn.) I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Small Dusty Wave is one of the most prevalent of this group of moths, being found in midsummer freely all over England and up to the Highlands, though only of doubtful occurrence in Ireland. It may often have been found at rest by day and in this state it is to be seen commonly all over the London Area whence it has been noted in the 1898 list from Ladbroke Square and also from South Kensington (C. de W.) for the Inner London region.

\**Sterrha silvestraria* Hübn. (= *straminata* Treits.) M.21, H.20, K.16, S.17.

This is another very local species, the Dotted Border Wave, which occurs at midsummer usually on heaths over a wide area in the south of England and up to the moorlands of Yorkshire and Lancashire where occasionally a form is met with with ringed markings known as *ab. circellata*. The 1898 list mentions it from Highgate, Shirley and Bromley in Kent. Elsewhere from

HERTS. Haileybury (Foster, *Lep. Herts.*, 1937).

KENT. Chislehurst (V.C.H., 1908).

SURREY. Wandsworth (*Ent. Rec.*, 1935, 47: 25); Croydon (*Ent. Annual*, 1869); Oxshott Heath, 1907 (Kaye), also there (H. Williams, *Ent. Rec.*, 1931, 43: 42).

\**Sterrha fuscovenosa* Goeze (= *interjectaria* Boisd.) M.21, H.20, E2.18, K.16, S.17, B.24.

The Dwarf Cream Wave is very common in late June in most parts of southern England, though it is reported from the northern counties and Scotland up to the Clyde. But it is not known in Ireland. It is given in the 1898 list from Hale End, Clapton Marshes, Forest Hill, Dulwich, Hammersmith, Chiswick, Southall and Highgate.

MIDDLESEX. Ruislip (Minnion); Mill Hill, 1955 (Goater); Greenford and Southall (J. Ward); Stanmore (Fletcher); Enfield (Edelsten).

HERTS. Watford, rare (Penrose); St. Albans, Haileybury, Chess-hunt, Broxbourne Woods (Foster, *Lep. Herts.*, 1937).

KENT. Pett's Wood, 1949 (A. Swain); West Wickham, 1950 (Trundell); Orpington, 1953 (Siggs).

SURREY. Wimbledon Common (van Emden); Oxshott Common, 1928 and Putney, 1930 (D. King); Barnes and Banstead (Gardner); Weybridge, 1956 (Messenger).

\**Sterrha subsericeata* Haworth M.21, H.20, E2.18, K.16, S.17.

The Satin Wave is fairly common in most parts of the country in early July when it is a regular dusk flier. It ranges up to Scotland and is widespread in Ireland. The 1898 list only reports it from Shirley and Highgate. Elsewhere from

MIDDLESEX. Ruislip district, rare (Minnion).

HERTS. Haileybury and East Barnet (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Meldola: Hope Dept. Collection, Oxford).

KENT. Orpington, 1954 (Siggs); West Wickham, rare (Birchenough); Eltham and Dartford (V.C.H., 1908).

SURREY. Coulsdon, 1946 (Wheeler); Oxshott, 1907 (Kaye); Chipstead, 1946 (Johnson); Weybridge, one in June 1953 (Messenger).

\**Sterrha inornata* Haworth M.21, H.20, E2.18, K.16, S.17.

The Plain Wave is very similar in appearance and behaviour to the next species. It can be distinguished by the less wavy cross-lines and less distinct pattern. It is much scarcer, often affecting fir woods over England to the Highlands where a brighter form occurs. It has been reported from Ireland. The 1898 list gives it from Hale End, Highgate, Richmond and Wimbledon Common. Other records include

MIDDLESEX. Ruislip and district, scarce (Minnion); Enfield (Edelsten).

HERTS. Aldenham, 1933 (H. King).

KENT. Westerham (C. Edwards); Abbey Wood (Showler); Orpington, 1948 (Siggs); Hayes and Downe (Birchenough); Lee, Eltham, Chislehurst and Bexley (V.C.H., 1908); Darenth, 1870 (Meldola: Hope Dept. Collection, Oxford).

SURREY. Limpsfield (Cockayne); Oxshott, July 1928 (D. King); Reigate (V.C.H., 1902).

\**Sterrha aversata* Linn. I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Riband Wave is one of the commonest and most widespread species in this group. It is to be found all over the British Isles up to the Caledonian Canal and is most variable, often producing a form with a heavy cross-band on the wings. It has been noted from almost every part of the London Area including Islington, Ladbroke Square, Brixton (Farmer) and Wimbledon Common.

\**Sterrha biselata* Hufn. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Small Fan-footed Wave is another very prevalent moth in late June, occurring in most parts of these Islands up to Moray. In the 1898 list it is noted from Highgate, Finchley, Hampstead, Chingford, Hale End, Barnes, Dulwich and Wimbledon Common, also from

MIDDLESEX. Oxhey (Fletcher); Hounslow (Pierce); Uxbridge, Ruislip and Northolt (J. Ward); Mill Hill, Whitton and Chiswick (Cockerell, *Lep. Middx.*, 1891).

HERTS. Totteridge, two (Lorimer); Watford, Hoddesdon, Cheshunt, Bushey, St. Albans, Broxbourne (Foster, *Lep. Herts.*, 1937).

KENT. Orpington, 1949 (Siggs); Hayes and Downe (Birchenough); West Wickham (Trundell); Pett's Wood (A. Swain).

SURREY. Box Hill (van Emden); Epsom, 1933 (D. King); Tadworth, 1951 (Wheeler); Richmond Park, 1931 (D. King); Weybridge (Messenger).

\**Sterrha dimidiata* Hufn. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Single-dotted Wave is a very common little insect in almost every part of the British Isles in early July, ranging right up to the Highlands. It is quite plentiful in Ireland and is recorded from nearly every quarter of the London Area, except the centre of the Metropolis. The 1898 list notes it from Highgate, Hampstead, Chiswick, Epping Forest, Clapton, Woodford, Bromley and Wimbledon Common.

\**Sterrha trigeminata* Haworth M.21, H.20, E1.19, K.16, S.17, B.24.

The Treble Brown-spot Wave is much more local, to be found often at rest on the upper sides of leaves in late June in most of the English counties up to the Lowlands. In the London Area the 1898 list mentions it only from Eltham, Forest Hill, Bromley and Dulwich, also from Epping Forest. Elsewhere from

MIDDLESEX. Hounslow, 1954 (Pierce); Stanmore, one (Fletcher); Greenford and Southall (J. Ward); Ruislip, rare (Minnion).

HERTS. Haileybury, East Barnet and Hoddesdon (Foster, *Lep. Herts.*, 1937).

KENT. Pett's Wood (A. Swain); Orpington, 1948 (Siggs); Abbey Wood, 1953 (Showler); Darenth Wood, Joyden's Wood, 1948 (Hyatt); Hayes (Birchenough); West Wickham (Trundell); Lee, Dartford, Greenhithe (V.C.H., 1908).

SURREY. Surbiton, 1927 (Kaye); Claygate (Cockayne); West Ewell (Gardner); Oxshott, 1930, Putney, 1946 (D. King); Headley, 1952 (Wheeler); Box Hill, 1954 (C. de W.); Weybridge (Messenger).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

(*Sterrha serpentata* Hufn. (*perochraria* F.R.)). (S.17).

There appears to be only two authentic records of this very rare ochreous insect, sometimes known as the Ochraceous Wave. Both these examples were taken just within the Area, one in 1865 by Mr. Sidney Webb at Leigh near Reigate, and the other almost in the same locality in 1869 by a Mr Weston (Barrett, vii, 11). It might easily be confused with *Sterrha ochrata* which occurs in Kent and Suffolk.

\**Sterrha emarginata* Linn. M.21, H.20, E2.18, E1.19, K.16, S.17.

The Small Scallop is an inhabitant of marshy ground, as a rule in most parts of the south of England ranging up to the Midlands and into Wales, but not known elsewhere. It is reported in the 1898 list from Hale End, Hampstead, Highgate, Hendon, Southall, Plumstead, Ham Common and Wimbledon Common, also from

MIDDLESEX. Hounslow, three in 1955 (Pierce); Uxbridge and Ruislip (J. Ward); Mill Hill, Whitton and Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Haileybury (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Meldola: Hope Dept. Collection, Oxford).

KENT. West Wickham and Hayes (Birchenough); Orpington, 1950 (Siggs); Pett's Wood (A. Swain); Lee, Eltham, Bexley (V.C.H., 1908).

SURREY. Wimbledon Common (van Emden); Shirley Hills (Wild); Oxshott (Woodward, *Ent. Rec.*, 1924); Weybridge (Messenger); Putney, one in July 1951 (H. Swain).

\**Scopula ornata* Scop. H.20, K.16, S.17.

This very pretty insect, the Lace Border, is essentially a denizen of chalk downs where it is often locally abundant flying over the thyme, its foodplant. It appears in June and again in August, but seems to be confined to England, ranging up to Oxford and the Eastern Counties. There is one record in the Suppt. to the 1898 list, from Norwood in August 1901. Others include,

HERTS. Waltham Common (Foster, *Lep. Herts.*, 1937).

KENT. Shoreham, 1951 (Wheeler); Magpie Bottom and Eynsford, 1948 (Hyatt); West Wickham (Trundell); Pinden (Hare); Otford (Proc. South London Soc., 1902); Greenhithe and Dartford (V.C.H., 1908).

SURREY. Box Hill (Rumsey); Addington, 1952 (Barnett); Chipstead, 1945, and Mickleham, 1948 (Johnson); Caterham (West, *Ent. Rec.*, 1906); Betchworth (V.C.H., 1902).

\**Scopula floslactata* Haworth (= *remutaria* Hübn.). M.21, H.20, E2.18, K.16, S.17.

The Cream Wave is very common in early June in wooded areas all over the British Isles up to the Caledonian Canal where a very well-marked form occurs. It is prevalent in most parts of the London Area, being reported in the 1898 list from Hale End, Highgate, Finchley, Mill Hill, Southgate, Harrow, Dulwich and Wimbledon Common.

MIDDLESEX. Hounslow, 1955 (Pierce); Uxbridge and Northolt (J. Ward); Ruislip, fairly common (Minnion); Hampstead and Pinner (Cockerell, *Lep. Middx.*, 1891).

HERTS. Bricket Wood, Haileybury, Watford, Broxbourne (Foster, *Lep. Herts.*, 1937).

ESSEX. Brentwood (Edelsten).

KENT. West Wickham, 1906 (Keywood); Hayes and Downe (Birch-enough); Pett's Wood, 1949 (A. Swain); Lee, Darenth and Shooter's Hill (West, *Ent. Rec.*, 1906).

SURREY. Merton Park (Nott); Oxshott, 1934 (D. King); Epsom (Sidgwick: Hope Dept. Collection, Oxford); Weybridge (Messenger).

*Scopula immutata* Linn. M.21, K.16, S.17.

The Lesser Cream Wave, unlike the preceding species, is an inhabitant of marshy places in most parts of England and Ireland, but there is only a single record from Scotland. The insect is distinctly local and is not noted in the 1898 list. Those records for the London Area are

MIDDLESEX. Ruislip area, rare (Minnion); Enfield (Cockerell, *Lep. Middx.*, 1891).

KENT. Dartford Marshes, June 1952 (Hyatt); Eltham, Dartford and West Wickham (V.C.H., 1908).

SURREY. Oxshott, 1907 (Kaye); Weybridge, one in July 1952 (Messenger).

\**Scopula marginepunctata* Goeze M.21, H.20, K.16, S.17.

The Mullein Wave is one of the most variable of this group. It is mainly a coastal species which has distinct forms in special areas. It occurs over most of England and Ireland and up to the south of Scotland. The 1898 list mentions it from Eltham and Westcombe Park.

MIDDLESEX. Greenford, 1949 (J. Ward); once at Chiswick (Cockerell, *Lep. Middx.*, 1891).

HERTS. St. Albans and Bushey Heath (Foster, *Lep. Herts.*, 1937).

KENT. Abbey Wood and Blackheath, 1953 (Showler); Pinden, common (Hare).

SURREY. Wandsworth, two in 1952 (Sutton); East Sheen, August 1924 (D. King); Weybridge, Sept. 1953, and one in 1956 (Messenger); Putney, one, July 1951 (H. Swain).

(*Scopula nigropunctata* Hufn. (= *strigilaria* Hübn.)). (K.16), (S.17).

The Sub-angled Wave has always been one of our rarest species. The Warren at Folkestone was its only regular locality till the start of this century when it apparently died out there and was thought to be extinct. But two examples have been taken in recent years, one at Folkestone in 1946 and another in West Kent in 1952. There are some early records for the Area from Darenth about 1831 (South, ii, 128). There is also a specimen taken by Sidney Webb at Gatton near Reigate (V.C.H., 1902). The larva feeds on Traveller's Joy (*Clematis*).

*Scopula emutaria* Hübn. H.20, K.16.

The Rosy Wave is a very local insect always inhabiting marshy ground. It is mainly confined to the south-eastern counties where it flies freely at dusk in early July in its restricted haunts. It is not included in the 1898 list, but has been reported from

HERTS. St. Albans and Bricket Wood.

KENT. Lee Marshes (Burton); Dartford Marshes (V.C.H., 1908); Pinden, one on 11 July 1954 (Hare).

\**Scopula imitaria* Hübn. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Small Blood-vein is fairly plentiful in most parts of southern England and is fairly common in the south of Ireland, but it is rare in the northern counties and not recorded from Scotland. The 1898 list gives it from Hale End, Chingford, Woodford, Hampstead, Highgate and Hanwell, Crouch End, and Wimbledon Common. Elsewhere from

MIDDLESEX. Bedfont, 1952 (Kindred); Ruislip, common (Minnion); Whitton (Cockerell, *Lep. Middx.*, 1891); Enfield (Edelsten).

HERTS. Bushey, Haileybury, East Barnet, Cheshunt, St. Albans, Broxbourne (Foster, *Lep. Herts.*, 1937).



KENT. Orpington, 1948 (Siggs); Pett's Wood, 1951 (A. Swain); West Wickham, 1952 (Birchenough); Lee, Bexley and Eltham (V.C.H., 1908).

SURREY. Merton Park (Nott); Tadworth, 1952 (Wheeler); Weybridge (Messenger); Worcester Park, Surbiton and Godstone (V.C.H., 1902).

*Scopula rubiginata* Hufn. (H.20).

The Tawny Wave is an extremely local species, being virtually confined to the Breck Sand district of Suffolk and Norfolk, though it has occurred in some of the southern counties as well as in Yorkshire. There is one record for the Area from Watford in 1890 (Foster, *Lep. Herts.*, 1937).

\**Calothysanis amata* Linn. I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Blood-vein is one of the commonest of the geometers, producing often three generations in the year and occurring over the British Isles up to Northern Scotland, though it is less frequent in Ireland. It has been noted from every part of the London Area, from the Zoo in Regent's Park (Bushby) and has been reported in the 1898 list from Woodford, Epping Forest, Forest Hill, Petersham, Highgate, Finchley, Willesden, Ealing, Hendon and Wimbledon Common.

The next seven species belong to the genus *Cosymbia*, known popularly as the Mocha moths. Their chief peculiarity is that, unlike our other geometers, they pupate on a leaf forming an elongated chrysalis attached by a belt round the centre after the fashion of the Pieridae.

\**Cosymbia porata* Fabr. M.21, H.20, E2.18, E1.19, K.16, S.17.

The False Mocha is to be found fairly freely in oak woods in late May and again in August in most areas of southern England. In the north it is distinctly rare, though there are a few scattered records for Scotland. The 1898 list and Suppt. mention it from Hale End, Ealing, Dulwich, Mitcham and Wimbledon Common.

MIDDLESEX. Hampstead and Mill Hill (Cockerell, *Lep. Middx.*, 1891).

HERTS. St. Albans, Haileybury, Bricket Wood, and Hoddesdon (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Buxton, 1890).

KENT. Pett's Wood, 1951 (A. Swain); Westerham (C. Edwards); Dartford, Bexley and West Wickham (V.C.H., 1908).

SURREY. Streatham, 1912 (*Ent. Rec.*, 1935, 47: 116); Oxshott (Cockayne); Weybridge (Messenger).

\**Cosymbia punctaria* Linn. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Maiden's Blush can be readily distinguished from the preceding species by the absence of the small circles in the centre of each wing. It inhabits the same type of terrain, but is more widespread, being found in Scotland and parts of Ireland. It is noted in the 1898

list from Epping Forest, Hale End, Woodford, Grove Park, Dulwich, Richmond Park, and Wimbledon Common.

MIDDLESEX. Hounslow, 1956 (Pierce); Uxbridge, Northolt and Ruislip, 1950 (J. Ward); Hampstead and Whitton (Cockerell, *Lep. Middx.*, 1891).

HERTS. Bricket Wood, Watford, Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937); Totteridge, very common (Lorimer).

KENT. Pett's Wood, 1946 (A. Swain); Hayes, Downe (Birchenough); West Wickham (Trundell); Darenth Wood (D. Owen); Dartford and Bexley (V.C.H., 1908).

SURREY. Streatham (*Ent. Rec.*, 1935, **47**: 116); Tadworth, 1952 (Wheeler); Box Hill (van Emden); Weybridge (Messenger).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

*Cosymbia puppillaria* Hübn. (K.16).

This species is very similar to *Cosymbia porata*, but has a smoother appearance and is much less speckled. It has become known as Blair's Mocha after its discoverer. It was first observed in October 1946, when a female was taken at Freshwater. A series was bred from this specimen on myrtle, its chief foodplant in its normal habitat, the South of France. Since then two old specimens have come to light, emanating from the Scilly Islands where it was again taken in 1956 when no less than seven examples were recorded in the South of England. Previous to this five others had been noted since its discovery, including one for the Area, from Otford, taken at m.v. light on August 18, 1955, by Lt. Col. W. B. Manley (*vide Entom.*, 1956, **89**: 121).

\**Cosymbia linearia* Hübn. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Clay Triple-lines is essentially an inhabitant of beech woods over most of England up to the northern counties. There are a few records from Ireland. It is double-brooded appearing in May and August. The 1898 list only reports it from Ealing. Elsewhere it is noted from

MIDDLESEX. Hounslow, one in 1954 and two in 1955 (Pierce).

HERTS. St. Albans, East Barnet, Broxbourne, Hoddesdon (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (V.C.H., 1903).

KENT. Biggin Hill, June 1947 (Hyatt); Shoreham, 1949 (Siggs); Orpington, 1954 (Siggs); Pett's Wood, 1951 (A. Swain); West Wickham (V.C.H., 1908).

SURREY. Bookham, 1951 (Wheeler); Box Hill (van Emden); Weybridge, one on 16 June 1951 (Messenger).

BUCKS. Black Park, Fulmer (V.C.H., 1905); Chalfont St. Peter (Ansorge).

\**Cosymbia annulata* Schulze H.20, K.16, S.17.

The Mocha is another mainly downland species living on maples. It occurs in this type of environment over most of southern England up to the north Midlands appearing in late May and again in August. It is only recorded from Croydon in the 1898 list, also from

HERTS. Haileybury (Foster (*Lep. Herts.*, 1937).

KENT. Westerham (C. Edwards); Bexley and Dartford (V.C.H., 1908); Darenth Wood (West, *Ent. Rec.*, 1906).

SURREY. Oxshott (Woodward, *Ent. Rec.*, 1924, 4); Weybridge, three in 1952 (Messenger).

\**Cosymbia orbicularia* Hübn. H.20, K.16, S.17.

The Dinky Mocha is extremely local, occurring in a few counties of the South of England, mainly Sussex, Dorset and Hampshire. It appears in May and August, while its larvae may be readily beaten from stunted sallows in late September. The 1898 list gives it from Croydon only. It has also been noted from

HERTS. Bricket Wood (Foster, *Lep. Herts.*, 1937).

KENT. West Wickham and once at Blackheath (V.C.H., 1908).

SURREY. Redstone near Reigate (V.C.H., 1902).

\**Cosymbia albipunctata* Hufn. (= *pendularia*). M.21, H.20, K.16, S.17, B.24.

The Birch Mocha is by far the commonest of this genus, since it is to be found wherever birch grows all over the British Isles. In Scotland the form is more rosy than that found in the south which is usually dull grey in ground colour. The 1898 list reports it from Ealing, Croydon and Wimbledon Common.

MIDDLESEX. Mill Hill, August 1955 (Goater).

HERTS. Broxbourne Wood (Foster, 1942).

KENT. Darenth Wood, June 1949 (Hyatt); Pett's Wood, 1951 (A. Swain); West Wickham and Addington (Birchenough); Joyden's Wood (D. Owen); Plumstead (West, *Ent. Rec.*, 1906).

SURREY. Box Hill (van Emden); Bookham Common, 1952 (Wheeler); Oxshott, 1931 (D. King); Esher (Gardner); Putney Heath (H. Swain); Weybridge (Messenger).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

The next group of these moths belongs to the large Family of the Larentiinae which comprises those that are known under the name of Carpets and Highflyers.

\**Anaitis plagiata* Linn. M.21, H.20, K.16, S.17.

The Treble-bar is a very familiar insect, especially on downland in early June and again in August where it flies readily by day among its foodplant, St. John's Wort (*Hypericum*). It is found in such terrain over almost the whole of the British Isles. In Scotland, in the Highlands, and in Ireland the local form is more blue-grey than in England. The 1898 list gives it from Highgate, Crouch End, Southall, Croydon, Dulwich and Bromley.

MIDDLESEX. Bedfont (Kindred); Mill Hill, 1955 (Goater); Ruislip (Minnion); Enfield (Edelsten); Hounslow, two in 1955 (Pierce); Highgate (Andrewes); Whitton, Harefield and Hampstead (Cockerell, *Lep. Middx.*, 1891).

HERTS. St. Albans, Haileybury, Bushey, Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937); Totteridge, common (Lorimer); Watford, common (Penrose).

KENT. Orpington, 1948 (A. Swain); Belvedere (Showler); Joyden's Wood and Shoreham (Hyatt); West Wickham (Trundell); Downe (Siggs).

SURREY. Putney, 1927 and Epsom, 1931 (D. King); Tadworth, August 1954 (Wheeler); Coulsdon, 1946 (Wheeler); Chipstead, 1946 (Johnson); Merton Park (Nott); Weybridge (Messenger).

*Anaitis efformata* Guenée M.21, H.20, K.16, S.17.

The Lesser Treble-bar was only finally separated from the preceding species in 1923 by Dr. Karl Jordan. It is readily distinguished by the shorter and less pointed body in both sexes and by the more angular cross-line at the base of the forewing. It usually flies with *A. plagiata*, but seems to be confined to the southern portion of England, where its present range is being discovered since the earlier writers confused it with *A. plagiata*. Authentic examples have been recorded for the Area from

MIDDLESEX. Ruislip, fairly common (Minnion).

HERTS. Watford, rare (Penrose); St. Albans (Foster, *Lep. Herts.*, 1937).

SURREY. Dulwich (Gardner); Weybridge (Messenger); Egham, one on 13 October 1947 with cross-lines obscured, ab. *fibriata* (C. de W.).

\**Chesias legatella* Schiff. (= *spartiata* Fuessl.). M.21, H.20, E2.18, E1.19, K.16, S.17.

The Streak is one of the most prevalent species during the autumn months, occurring almost anywhere where there is broom from which its larvae may be beaten in numbers in May. It is quite common in Scotland and Ireland and is reported for the Area in the 1898 list and Suppt. from Walthamstow, Snaresbrook, Forest Gate, Eltham, Shirley, Hampstead Heath, Muswell Hill and Wimbledon Common.

MIDDLESEX. Ruislip, rare (Minnion); Highgate (Andrewes); Havestock Hill and Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Haileybury, Bushey Heath, Broxbourne (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Edelsten); Warley Common (Heath: Hope Dept. Collection, Oxford).

KENT. Abbey Wood (Showler); Joyden's Wood, bred 1947 (Hyatt); Hayes, Downe (Birchenough); Pett's Wood, 1950 (A. Swain); West Wickham (Trundell); Shooter's Hill (D. Owen); Dartford (West, *Ent. Rec.*, 1906).

SURREY. Tadworth, 1949 (Wheeler); Weybridge (Messenger); Putney, two examples in 1950 and 1951 (H. Swain).

\**Chesias rufata* Fabr. E2.18, K.16, S.17.

The Broom-tip, as its name implies, is another *Genista* feeder, but far more local than the preceding species. It comes out all through the summer from May till August and is widespread in England and

quite common in the Highlands, which produce a very bright form. The 1898 list mentions it from Snaresbrook, Forest Gate and Barnes.

ESSEX. Wanstead Flats (Carrington, *Entom.*, 1879, 12: 162); Epping Forest (Clark).

KENT. Near Pinden (Hare); Bexley, 1892 (Sillon: Hope Dept. Collection, Oxford).

SURREY. Barnes Common (Gardner); Weybridge (Messenger); Shirley (West, *Ent. Rec.*, 1906).

\**Odezia atrata* Linn. M.21, H.20, E2.18, K.16, S.17.

The Chimney Sweep is a very remarkable little moth which is extremely local, but abundant in places where the pig nut (*conopodium*) flourishes in England. It is on the whole much more prevalent in Scotland and Ireland, where the form is larger. It is reported in the 1898 list from many localities, notably from Woodford, Stamford Hill, Southall, Willesden, Edgware, Finchley, Mill Hill, Highgate, Hampstead, Southgate, Edmonton, Harrow, Richmond and Wimbledon Common.

MIDDLESEX. Hendon (Hare); Highgate (Andrewes); Mill Hill (Cockayne); Enfield (Edelsten).

HERTS. Totteridge (Lorimer); Haileybury, East Barnet and Oxhey (Foster, *Lep. Herts.*, 1937).

ESSEX. Loughton (West, *Ent. Rec.*, 1906).

KENT. Plumstead and West Wickham (V.C.H., 1908).

\**Nothopteryx polycommata* Hübn. E1.19, K.16, S.17.

The Barred Tooth-striped is extremely local, occurring in the south of England chiefly on downs where low privet bushes surround clumps of large trees. In its restricted haunts in the Lake District it affects woods where there are plenty of ash saplings. The form in this region is larger and brighter than that in the south. The moth appears in early April and is wont to hang after dark on the tips of privet or ash twigs. It is only mentioned from Croydon in the 1898 list.

ESSEX. Epping Forest (Doubleday: V.C.H., 1903).

KENT. Formerly at Greenhithe (V.C.H., 1908).

SURREY. Box Hill, 1946 (Johnson); Mickleham Down in 1938 and again in 1956 (C. de W.).

\**Nothopteryx carpinata* Borkh. M.21, H.20, K.16, S.17.

The Early Tooth-striped is another spring species very prevalent in April in most parts of England. In the Highlands it is often abundant with a large proportion of the specimens having the bars on the forewings very pronounced. Only given from Eltham and Shirley in the 1898 list.

MIDDLESEX. Harrow (Cockerell, *Lep. Middx.*, 1891).

HERTS. Oxhey Woods (Classey).

KENT. Sidcup (V.C.H., 1908); Darenth, West Wickham and Shooter's Hill (West, *Ent. Rec.*, 1906).

SURREY. Esher and Oxshott (V.C.H., 1902), also there in 1913 (D. King); Weybridge (Messenger).

\**Acasis viretata* Hübn. M.21, H.20, E2.18, K.16, S.17.

This little insect, the Yellow-barred Brindle, is fairly common in May and again in August in most parts of England and Ireland, but it is only known from the south in Scotland. In the autumn the stumpy larvae may be readily beaten from ivy buds. The 1898 list mentions it from Chiswick, Petersham and Eltham.

MIDDLESEX. Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Haileybury, Watford, Hoddesdon (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Buxton, 1890); Walthamstow (V.C.H., 1903).

KENT. Pett's Wood (A. Swain); West Wickham, May 1952 (Birch-enough); Lee (West, *Ent. Rec.*, 1906).

SURREY. Tadworth, 1953 (Wheeler); Banstead (Gardner); East Sheen, June 1932 (D. King); Wimbledon Common (van Emden); Weybridge (Messenger).

\**Lobophora halterata* Hufn. M.21, H.20, K.16, S.17.

The Seraphim is sometimes a very abundant insect in aspen groves at the end of May in many parts of England, Scotland and occasionally in Ireland. It is reported in the 1898 list from Hounslow, Harrow, Shirley, Bromley and Eltham, also from

MIDDLESEX. Ruislip and Uxbridge (J. Ward); Stanmore Common (Fletcher); Whitton (Cockerell, *Lep. Middx.*, 1891).

HERTS. Aldenham, May 1939 (Fletcher); Watford, one (Penrose); Haileybury, Hoddesdon, Bricket Wood (Foster, *Lep. Herts.*, 1937).

KENT. West Wickham, 1920 (Keywood); Pett's Wood, 1953 (A. Swain); Orpington, 1953 (Siggs); Bexley, Eltham (V.C.H., 1908).

SURREY. Barnes (Gardner); Wimbledon Common (Kidner); New Haw, 1928 (C. de W.); Weybridge, May 1954 (Messenger).

\**Mysticoptera sexalisata* Hübn. M.21, K.16, S.17.

The Small Seraphim is seldom common, though it ranges over most of England to the Lowlands and it occurs occasionally in Ireland. It appears twice a year, in June and August, feeding on willow. The 1898 list only mentions it from Eltham.

MIDDLESEX. Ruislip area, scarce (Minnion).

KENT. Orpington, 1948 (Siggs); Sidcup (V.C.H., 1908).

SURREY. Weybridge, rare (Messenger); Claygate (V.C.H., 1902).

\**Triplosa dubitata* Linn. I.L., M.21, H.20, E2.18, E1.19, K.16, S.17.

The Tissue is much more often seen in the larval state on its food-plant, the buckthorn, than as the imago which appears in the late summer and hibernates. It is often noted in the spring. Its range is over England and Ireland to the Scottish Lowlands. It has been noted on many occasions in the London Area, even from the Centre of the Metropolis. The 1898 list reports it from Clapton, Woodford, Hackney, Stratford, Southall, Paddington, Harrow, Hammersmith, Barnes, Shirley, Streatham, Dulwich, Bromley and Eltham, also from

INNER LONDON. The City, two in Sept. 1954 (Craske).

MIDDLESEX. Stanmore (Lorimer); Highgate, 1925 (Andrewes); Ruislip, rare (Minnion).

HERTS. Watford, one (Penrose); Totteridge, common (Lorimer).

ESSEX. Epping Forest (V.C.H., 1903).

KENT. West Wickham (Trundell); Keston (Birchenough); Beckenham (Keywood); Blackheath (West, *Ent. Rec.*, 1906); Chislehurst, Lee, Eltham (V.C.H., 1908).

SURREY. Mickleham (Cockayne); Wimbledon Common, April 1935 (Hawkins); Weybridge, formerly (Messenger).

\**Calocalpe cervinalis* Scop. (= *certata* Hübn.). I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Scarce Tissue somewhat belies its name as it is often commoner than the previous species, though it only occurs in England up to the northern counties. It is to be found in May almost wherever berberis is grown, especially in gardens. Its large larvae may often be beaten from the bushes. It is reported in the 1898 list from most parts of the Area, notably from Finsbury Park, Tottenham, Chiswick, Stratford, Eltham, Croydon and Wimbledon.

INNER LONDON. Regent's Park (Cockerell, *Lep. Middx.*, 1891).

MIDDLESEX. Ruislip area, rare (Minnion); Hampton, May 1933 (Keywood); Highgate, 1925 (Andrewes); Mill Hill, Hampstead, Ealing. (Cockerell, *Lep. Middx.*, 1891); Willesden (Heath: Hope Dept. Collection, Oxford).

HERTS. Watford, one (Penrose); St. Albans, Watford, Haileybury, Cheshunt, Hoddesdon, Broxbourne (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (V.C.H., 1903).

KENT. Orpington, 1949, and Chelsfield, 1948 (A. Swain); Swanscombe, 1952 (Siggs); Westerham (C. Edwards); Blackheath, Lee (V.C.H., 1908).

SURREY. East Sheen, 1930 (D. King); Weybridge (Messenger); Worcester Park (V.C.H., 1902).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

\**Calocalpe undulata* Linn. (I.L.), M.21, H.20, E2.18, K.16, S.17,

The Brown Scallop is a comparatively rare insect, occurring in marshy ground in most parts of southern and central England, also occasionally in southern Scotland and more plentifully in Ireland. Its thick-set larva may often be beaten from spun tips of willow shoots, though it will also feed on bilberry. Only reported in 1898 list and Suppt. from Hamilton Terrace (*Entom.*, 1899, **32**: 237), also from Eltham and Wimbledon.

MIDDLESEX. Ruislip district, rare (Minnion); Hampstead and Harefield, two in 1887 (Cockerell, *Lep. Middx.*, 1891).

HERTS. Chorley Wood (Foster, *Lep. Herts.*, 1937).

KENT. Westerham (C. Edwards); Dartford (V.C.H., 1908).

SURREY. Oxshott and Limpsfield Chart (Cockayne); Weybridge, one on 19 July 1931, one in August 1954 and a remarkable variety with heavy central band in July 1956 (Messenger).

\**Philereme vetulata* Schiff. (I.L.), M.21, E2.18, E1.19, K.16, S.17, B.24.

The Brown Scallop is another species which is seldom seen on the wing, but which is more often met with as a larva in the spun tip of buckthorn shoots in May. It is found chiefly in the south-east of England, in the Eastern Counties and in the north up to Westmorland. From the London Area the 1898 list gives it from Hampstead, Croydon, Chislehurst, and Wimbledon Common.

INNER LONDON. Stephens records it at Fulham in 1831 (South ii., 161).

MIDDLESEX. Ruislip, rare (Minnion); Mill Hill, Kingsbury and Harefield (Cockerell, *Lep. Middx.*, 1891).

ESSEX. Chingford, 1903 (Kaye); Epping Forest (V.C.H., 1903).

KENT. Westerham (C. Edwards); Dartford (West, *Ent. Rec.*, 1906); Lewisham and Chislehurst (V.C.H., 1908).

SURREY. Headley, July 1954 (Wheeler); Weybridge, two in 1952 and one in 1956 (Messenger).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

\**Philereme transversata* Hufn. (= *rhamnata* Schiff.). M.21, H.20, E2.18, E1.19, K.16, S.17.

The Dark Scallop is another buckthorn feeder. Its bright-green larva with a blue anal stripe is readily beaten in late May. The insect appears in July in many parts of the south of England ranging to South Wales and some of the northern counties. The 1898 list notes it from Harrow, Ilford and the south-east area of London.

MIDDLESEX. Ruislip, rare (Minnion); Mill Hill (Cockerell, *Lep. Middx.*, 1891).

HERTS. Watford, rare (Penrose); Hertford, St. Albans, Oxhey, Watford (Foster, *Lep. Herts.*, 1937).

ESSEX. Chingford, 1903 (Kaye); Epping Forest (V.C.H., 1903).

KENT. Orpington, 1949 (Siggs); Chelsfield, 1951 (A. Swain); Westerham (C. Edwards); Dartford (V.C.H., 1908); Otford (Manley); Pinden (Hare).

SURREY. Croydon (*Ent. Annual*, 1865); Tadworth, 1954 (Wheeler); Epsom, 1933 (D. King); Banstead (Gardner); Addington, Selsdon, Woldingham (Birchenough); Wimbledon Common (Cockayne); Chipstead, 1946 (Johnson); Sutton, 1905 (Meldola: Hope Dept. Collection, Oxford); Weybridge, rare (Messenger).

\**Ecliptopera silaceata* Schiff. M.21, H.20, E1.19, K.16, S.17.

The Small Phoenix is sometimes very prevalent both in May and in August all over the British Isles up to the Caledonian Canal. It is quite widespread in Ireland. It chiefly affects woods where the rose-bay willowherb abounds. It also feeds on balsams. The 1898 list gives it from Chiswick, Bromley, Eltham and Croydon.

MIDDLESEX. Ruislip, common (Minnion); Uxbridge and Northolt (J. Ward); Stanmore, common (Lorimer).



HERTS. Watford, one (Penrose); Aldenham, May 1939 (Fletcher); Haileybury, Oxhey, Bushey Heath, Broxbourne, Watford (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (V.C.H., 1903).

KENT. Joyden's Wood, 1952 (Hyatt); Darenth Wood, 1950 (Hyatt); Hayes and Downe (Birchenough); Pett's Wood, 1950 (A. Swain); Dartford and West Wickham (*West Ent. Rec.*, 1906).

SURREY. Brixton (Farmer); Esher (Gardner); Tadworth, 1952 (Wheeler); Weybridge (Messenger).

\**Lygris prunata* Linn. M.21, E2.18, H.20, K.16, S.17.

The Phoenix, though widespread over almost the whole of the British Isles, seldom appears in numbers anywhere. It is mainly a garden species feeding on gooseberry and currant. Its only mention in the 1898 list is from Harrow. It seems to have got much scarcer in recent years everywhere.

MIDDLESEX. Ruislip and Northolt (J. Ward).

HERTS. Totteridge, rare (Lorimer); St. Albans, Hertford, Haileybury, East Barnet, Hoddesdon (Foster, *Lep. Herts.*, 1937).

ESSEX. Woodford Green, August 1923 (Collenette); Epping Forest (V.C.H., 1903).

KENT. Blackheath, 1952 (Hyatt).

SURREY. Weybridge, one in 1926 (Messenger); also there in 1905 (Robertson: Hope Dept. Collection, Oxford).

\**Lygris testata* Linn. M.21, H.20, E2.18, K.16, S.17.

The Chevron is a very common and widespread insect, ranging all over the British Isles right to the Shetlands. In the Sheffield area a very dusky form occurs, while in the Highlands it is more purple than in the south. In the London Area the insect seems less common than in former times, since it was recorded in 1898 list from Tottenham, Hale End, Woodford, Hampstead, Harrow, Chiswick, Tooting, Bromley and Wimbledon Common.

MIDDLESEX. Ruislip and Northolt (J. Ward); Stanmore, 1938 (Fletcher); Bedford Park and Harefield (Cockerell, *Lep. Middx.*, 1891); Sudbury, 1904 (Shelley: Hope Dept. Collection, Oxford).

HERTS. Totteridge, common (Lorimer).

KENT. Pett's Wood, 1946 (A. Swain); Lee (West, *Ent. Rec.*, 1906).

SURREY. Esher (Gardner); Oxshott, 1951 (Wheeler).

\**Lygris mellinata* Fabr. (= *associata* Borkh.). M.21, H.20, E2.18, E1.19, K.16, S.17.

The Spinach is a very common visitor to light in July. It is another currant feeder and is found freely in gardens over the whole of England to southern Scotland and in South Ireland. It has been noted from nearly every part of the Area, though not the Centre. The 1898 list gives it from many localities, including Shepherd's Bush, Hammer-smith, Chiswick, Highgate, Tottenham, Walthamstow and Wimbledon Common.

\**Lygris pyraliata* Schiff. M.21, H.20, E2.18, E1.19, K.16, S.17.

The Barred Straw is a fairly common moth in July all over England up to the Highlands. It is quite prevalent in Ireland. It is widely recorded from the London Area, in the 1898 list from Chingford, Hale End, Hanwell, Ealing, Finchley, Willesden, Highgate, Harrow, Croydon, Dulwich and Sydenham, also from

MIDDLESEX. Uxbridge (J. Ward); Ruislip, numerous (Minnion); Mill Hill, Hampstead, Harefield and Bedford Park (Cockerell, *Lep. Middx.*, 1891).

HERTS. Watford, common (Penrose); Oxhey, 1936 (Fletcher); St. Albans, Hertford, East Barnet, Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937).

KENT. West Wickham (Trundell); generally distributed (V.C.H., 1908).

SURREY. Oxshott (F. M. Carr, *Entom.*, 1899, 32: 260); Epsom, July 1933 (D. King); Tadworth, 1954 (Wheeler); Chipstead, 1946 (Johnson); Egham, common (C. d e W.); Weybridge (Messenger); Upper Tooting, 1913 (Hawkins).

\**Lygris fulvata* Forst. M.21, H.20, E2.18, K.16, S.17, B.24.

This very attractive little insect, the Barred Yellow, is another prevalent species in July and August all over the British Isles up to the Orkneys. In Ireland the form is larger and brighter than that in England. It is noted in the 1898 list from Hale End, Chingford, Hendon, Southall, Chiswick, Dulwich, Croydon, Tooting and Wimbledon Common.

MIDDLESEX. Uxbridge (J. Ward); Ruislip area, common (Minnion); Highgate (Andrewes); Enfield (Edelsten); Mill Hill, Hampstead and Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Totteridge, common (Lorimer); Haileybury, St. Albans, East Barnet, Oxhey, Cheshunt, Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937).

KENT. Orpington, 1948 (Siggs); Chelsfield, 1950 (A. Swain); generally distributed (V.C.H., 1908); Kidbrook and Lee (West, *Ent. Rec.*, 1906); Selsdon (Birchenough).

SURREY. Oxshott (Kaye); Ham Common, 1928 (D. King); Chipstead, a few (Johnson); Sutton, 1902 (Meldola: Hope Dept. Collection, Oxford).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

\**Electrophaës corylata* Thunb. M.21, H.20, E2.18, K.16, S.17.

The Broken-barred Carpet is a fairly common insect, chiefly where birch grows. It occurs in most parts of the British Isles up to the northern Highlands where a form with suffused markings (f. *albocrenata*) is not uncommon. In Ireland, too, it is widely distributed. It is noted in the 1898 list from Hale End, the Isle of Dogs, Mill Hill, Highgate, Shooter's Hill, Croydon and Shirley.

MIDDLESEX. Ruislip, scarce (Minnion); Hampstead, Pinner and Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Bricket Wood, St. Albans, Haileybury, Watford, Hoddesdon (Foster, *Lep. Herts.*, 1937).

KENT. Beckenham, 1920 (Keywood); Pett's Wood (A. Swain); Hayes and Downe (Birchenough); West Wickham (Trundell); Dartford (West, *Ent. Rec.*, 1906).

SURREY. Bookham Common (Gardner); Oxshott, 1928 (D. King); Weybridge, one in 1952 (Messenger).

\**Dysstroma truncata* Hufn. I.L., M.21, H.20, E2.18, [E1.19], K.16, S.17, B.24.

The Common Marbled Carpet is one of the most widespread and the most variable of our geometers. It appears in May and seems continuously brooded throughout the summer, occurring in every part of these Islands, except the Shetlands and also all over the London Area, including the Zoo in Regent's Park where it was taken in 1954 (Bushby). Also noted from Hampstead, Highgate, Harrow, Hagger Lane, Woodford and Dulwich.

\**Dysstroma citrata* Linn. (= *immanata* Haworth). M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Dark Marbled Carpet is much more of a northern species, though it is widely distributed in the south. It is, if anything, more variable than the preceding one from which it may be distinguished by the elbowed line on the underside of the hindwing. It is found all over the British Isles up to the Shetlands and in many parts of the Area. The 1898 list mentions it from Ponder's End, Hampstead, Harrow, Dulwich, Shirley.

MIDDLESEX. Ruislip, Uxbridge and Northolt (J. Ward).

HERTS. Watford, one (Penrose); generally distributed (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Edelsten).

KENT. Generally distributed (V.C.H., 1908); Shooter's Hill (West, *Ent. Rec.*, 1906).

SURREY. Tadworth, August 1954 (Wheeler); Box Hill, 1911 (Water: Hope Dept. Collection, Oxford).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

\**Chloroclysta siterata* Hufn. M.21, (S.17).

The Red-green Carpet, though distributed over most of the British Islands up to Moray, is always a scarce insect to come by. In some areas it seems entirely absent. It only appears in October and the females alone hibernate. It is only mentioned in the 1898 list from Muswell Hill and for SURREY from Tooting (*Ent. Annual.*, 1865).

\**Chloroclysta miata* Linn. M.21, H.20, K.16, S.17.

The Autumn Green Carpet is much more often seen than the last species. Its range extends to the Shetlands. The females also hibernate and are frequently met with in the spring, especially in the Highlands. The 1898 list gives it from Hampstead, Chiswick, Harrow, Crouch End and Eltham. Other records include

MIDDLESEX. Enfield (Edelsten); Mill Hill and Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Watford, one (Penrose); St. Albans, Bricket Wood, Cheshunt, Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937).

KENT. Lee and West Wickham (V.C.H., 1908).

SURREY. Worcester Park, 1893 (Kaye); Redhill (Webb: Hope Dept. Collection, Oxford).

*Thera variata* Schiff. S.17.

This species, now known as the Grey Spruce Carpet, was for many years confused with the next one until it was separated by the late Mr. Prout in 1911 (*Entom.* 1912, 45: 141). It is generally greyer than *T. obeliscata* and has more pronounced white edging to the cross-bar of the forewings. Its larva seems to feed exclusively on spruce in most parts of the British Isles. It appears often three times a year in May, September and even in November. All the older records for the Area are treated as *Thera obeliscata*. Authentic records for *T. variata* have so far only been for SURREY. Chipstead, October 1946 (Johnson); Weybridge, one in May 1952 (Messenger); Putney, numerous (H. Swain).

\**Thera obeliscata* Hübn. I.L., M.21, H.20, E2.18, K.16, S.17, B.24.

The Grey Pine Carpet is by far the commonest species of this group, since it seems to occur all over England, Ireland and Scotland wherever Scots pine grows. It is exceedingly variable with an ever increasing tendency to melanism. In the Highland form the cross-bar is bright red. The 1898 list reports *T. variata*, which probably implied this species, which was observed at Clapton, Stamford Hill, Hale End, Hampstead, Chiswick, Hanwell, Highgate, Harrow and Finchley.

INNER LONDON. The Zoo, Regent's Park in 1952 (Bushby).

MIDDLESEX. Hounslow, one in 1955 (Pierce); Mill Hill, a few (Goater); Kenton, 1938 (Fletcher); Enfield (Edelsten).

HERTS. Watford, common (Penrose); St. Albans, Haileybury, East Barnet, Watford, Bushey Heath and Hoddesdon (Foster, *Lep. Herts.*, 1937).

KENT. Greenwich Park, 1947 (Hyatt); Hayes and Downe (Birch-enough); West Wickham (Trundell).

SURREY. Putney, 1930, East Sheen, 1934, Oxshott, 1928 (D. King); Tadworth, 1953 (Wheeler); Wimbledon Common (van Emden); Weybridge (Messenger); Shirley (West, *Ent. Rec.*, 1906).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

\**Thera firmata* Hübn K.16, S.17, B.24.

The Pine Carpet is much more seldom seen than the previous species, though it affects pine woods all over the British Isles. Its larvae are readily beaten from *Pinus silvestris* in the spring in the Highlands where the moth appears in the late summer and chiefly in September in southern England. Unlike *T. obeliscata*, the males have pectinated antennae. The 1898 list reports it as "scarce" in the south-east area.

KENT. West Wickham (West, *Ent. Rec.*, 1906).

SURREY. Oxshott, 1906 (Kaye), also there (Cockayne).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

\**Thera juniperata* Linn. M.21, K.16, S.17.

The Juniper Carpet is the latest of these species to appear, as it is on the wing chiefly in late October and November. It is very local and except in the Highlands where a small form occurs, it is not found in all places where the juniper grows. Tooting is the only locality given in the 1898 list.

MIDDLESEX. Whitton (Cockerell, *Lep. Middx.*, 1891).

KENT. West Wickham, 1895 (Pogson Smith: Hope Dept. Collection, Oxford).

SURREY. Croydon (Birchenough); Riddlesdown, near Purley, common in 1952 (Wild); Epsom Downs (*Ent. Rec.*, 1910); Box Hill, October 1946 (Johnson); Betchworth, 1956 (Jackson); Mickleham Down (Webb: Hope Dept. Collection, Oxford); Oxshott and Caterham (V.C.H., 1902).

\**Lampropteryx suffumata* Schiff. M.21, H.20, E2.18, E1.19, K.16, B.24.

The Water Carpet is widespread over most of the British Isles, though it is always very local. It appears in late April and flies freely at dusk. In the Highlands a melanic form f. *piceata* is fairly prevalent. It is recorded in the 1898 list from Highgate Wood, Hendon and Harrow, but is reported to be extinct in the south-eastern quarter where it was formerly common. Elsewhere from

HERTS. St. Albans. East Barnet, Oxhey Woods, Watford, Bushey Heath and Hertford (Foster, *Lep. Herts.*, 1937). Whippendell Wood, common, 1956 (Saunders).

ESSEX. Loughton (West, *Ent. Rec.*, 1906); Epping Forest (V.C.H., 1903).

KENT. Abbey Wood (Showler); Orpington, 1953 (Siggs); Lee and Eltham (V.C.H., 1908).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

\**Xanthorhoë quadrifasciaria* Clerck M.21, H.20, K.16, S.17, B.24.

The Large Twin-spot Carpet is the most handsome of this genus, but is by no means common. Its range only seems to be over the east and south-east of England up to the Midlands. It appears at the end of July. It is only noted in the 1898 list from Richmond Park and as uncommon in the south-east quarter.

MIDDLESEX. Whitton (Cockerell, *Lep. Middx.*, 1891); Ruislip, rare (Minnion).

HERTS. Chorley Wood (South, *Entom.*, 1893, 26: 25); St. Albans, Hertford and Watford (Foster, *Lep. Herts.*, 1937).

KENT. Bexley (F. M. B. Carr, *Entom.*, 1900, 33: 130); Erith, Dartford and West Wickham (V.C.H., 1908).

SURREY. Chertsey (*Ent. Annual*, 1865); Oxshott, 1910 (Kaye).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

\**Xanthorhoë ferrugata* Clerck M.21, H.20, E2.18, E1.19, K.16, S.17.  
B.24.

In recent years there has been a good deal of confusion between this and the next species as to their correct nomenclature. The new designa-

tion is that this insect is known as the Dark-barred Twin-spot Carpet which occurs all over England and Ireland, though rare in the Highlands. It appears at least twice a year and seems to be found in every part of the London Area, except Central London. The 1898 list mentions Highgate, Finchley, Ealing, Ilford, Sydenham, Streatham and Wimbledon Common.

\**Xanthorhoë spadicearia* Schiff. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

This insect now known as the Red Twin-spot Carpet has very much the same range and habits as the last species, though it seems to extend further north in Scotland. In the London Area, too, it has been reported from almost every district including from the 1898 list from Harrow, Highgate, Hammersmith, Barnes and Wimbledon Common.

\**Xanthorhoë designata* Rott. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Flame Carpet is another common insect, ranging over nearly every part of the British Isles right up to the Orkneys. It is quite common in Ireland. It appears in May, August and sometimes has a third autumn emergence. It is also recorded from most parts of the Area, in the 1898 list from Hale End, Woodford, Highgate, Finchley, Bromley, Barnes, Streatham and Wimbledon Common.

MIDDLESEX. Stanmore (Lorimer); Highgate, 1925 (Andrewes); Chiswick, Harefield and Ealing (Cockerell, *Lep. Middx.*, 1891); Ruislip (Minnion).

HERTS. Radlett, Bricket Wood, Haileybury, Bushey, Broxbourne and Hoddesdon (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Clark).

KENT. Beckenham, 1920 (Keywood); Erith and Eltham (V.C.H., 1908).

SURREY. Box Hill (Gardner); East Sheen, 1930 (D. King); Epsom Downs, 1952 (Wheeler); Chipstead, 1946 (Johnson); Weybridge, 1954 (Messenger).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

\**Xanthorhoë montanata* Borkh. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Silver-ground Carpet is a further extremely prevalent and often abundant species to be found over the whole extent of the British Isles as far as the Shetlands, where a smaller and duskier form occurs. It has been noted from nearly every quarter of the London Area, though apparently not from Central London. Localities mentioned in the 1898 list include Stratford, Hale End, Finchley, Harrow, Hounslow, Dulwich, Sydenham, Croydon and Wimbledon Common.

*Xanthorhoë fluctuata* Linn. I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

Like the last species, the Garden Carpet is again very widespread, inhabiting apparently every part of these Islands and also equally common in the London Area where a somewhat melanic form is not infrequent. It was taken at the Zoo, Regent's Park in 1951 (Bushby) and also noted from Hounslow, Tottenham, Islington, Isleworth, Forest Gate, Dulwich, Barnes and Wimbledon Common.

*Colostygia olivata* Borkh. K.16.

The Beech-green Carpet is a very local insect, appearing at the end of July largely in beech woods, though it affects coastal areas and seems much more prevalent in Scotland and Ireland. It is not in the 1898 list and has only been recorded for the Area from

KENT. West Wickham and Shooter's Hill (West, *Ent. Rec.*, 1906); Darenth (V.C.H., 1908).

\**Colostygia pectinataria* Knoch (= *viridaria* Fabr.). M.21, H.20, E2.18, K.18, S.17, B.24.

The Green Carpet is very familiar at dusk in late May and again in August. It is widespread in almost every part of the United Kingdom and in most of the Area, including for the 1898 list from Hale End, Highgate Woods, Harrow, Hammersmith, Dulwich and Shirley.

MIDDLESEX. Ruislip, common (Minnion); Whitton and Harefield (Cockerell, *Lep. Middx.*, 1891); Stanmore (Lorimer).

HERTS. Totteridge (Lorimer); Oxhey, common (Fletcher); St. Albans, Haileybury, Bricket Wood, Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Edelsten).

KENT. West Wickham (Trundell); Hayes and Downe (Birch-enough).

SURREY. Tadworth, 1952, and Woldingham (Wheeler); Epsom, 1933, and Oxshott, 1930 (D. King); Weybridge, one in May 1952 (Messenger).

BUCKS. Chalfont St. Peter (Ansorge).

\**Colostygia multistrigaria* Haworth M.21, H.20, E2.18, K.16, S.17.

The Mottled Grey is one of the earliest of the season's geometers, since it is on the wing in late March. It is on the whole local in the southern areas of England, though much more prevalent on the moors of the North, of the Highlands and of Ireland. The 1898 list gives it from Hampstead Heath, Tooting, Shirley, Richmond Park, Wimbledon Common and the south-eastern suburbs.

MIDDLESEX. Mill Hill and Hampstead (Cockerell, *Lep. Middx.*, 1891).

HERTS. St. Albans, Watford and Broxbourne (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Edelsten).

KENT. Dartford (V.C.H., 1908).

SURREY. Box Hill (Gardner); Mickleham, March 1956 (C. de W.); Reigate (V.C.H., 1902).

\**Colostygia didymata* Linn. M.21, H.20, E.18, [E1.19], K.16, S.17.

The Twin-spot Carpet, though very widespread in most areas of the British Isles, seems to be distinctly more often seen in the north, especially on the Scottish moors, where it sometimes swarms in July and August. Of recent years it has apparently become far less frequent in the south and east. The 1898 list reports it from Woodford, Hackney Marshes, Hale End, Highgate, Hampstead, Finchley, Tooting and Croydon.

MIDDLESEX. Ruislip, rare (Minnion); Highgate, 1925 (Andrewes); Hampstead, Harefield, Whitton, Dalston, and Mill Hill (Cockerell, *Lep. Middx.*, 1891).

HERTS. Totteridge, rare (Lorimer); Oxhey, July 1937 (Fletcher); generally distributed (Foster, *Lep. Herts.*, 1937).

KENT. West Wickham, 1950 (Trundell); Dartford (V.C.H., 1908).

SURREY. Sutton, 1902 (Meldola: Hope Dept. Collection, Oxford); Weybridge, one in July 1954 (Messenger).

*Rhometra sacraria* Linn. I.L., M.21, H.20. [E2.18], K.16, S.17.

This small species, the Vestal, is one of the most remarkable migrants among our lepidoptera. It was first noted in this country in 1857. Since then there have been a number of visitations, but none to equal that of 1947 when, after a very dry summer, large numbers with many variations of colour appeared in the latter part of the season, mostly in September. In some stubble fields in the south that year it was possible to flush the moths by dozens. The species was recorded right up to the Highlands. In 1949 there were again a good many taken in the southern counties. The 1898 list does not note any from the London Area. Old and recent records include

INNER LONDON. South Kensington, 1947.

MIDDLESEX. Ruislip (Minnion); Bedfont, 31 August 1950 (Kindred); Highgate and Uxbridge in 1878 (Cockerell, *Lep. Middx.*, 1891).

HERTS. Radlett, two in 1947 (Foster);

ESSEX. Chingford, August, 1899 (South, ii, 141).

KENT. Plumstead (*Ent. Annual*, 1868); Westerham, 1948 (C. Edwards); Eynsford, two in Sept. and Oct. 1947 (Hyatt); Blackheath, two in Sept. 1947 (Hyatt); Pinden, one in Sept. 1940, several in 1947, a few in August 1953 (Hare).

SURREY. Clapham Common, 1859 (*Ent. Annual*, 1860); Banstead, 1863 (*Ent. Annual*, 1864); two in Nonsuch Park, Cheam in Sept. 1947 (Finnigan); South Croydon, 1947 (Wild); Dulwich (V.C.H., 1902); Weybridge, one on 31 July 1951 (Messenger).

\**Ortholitha bipunctaria* Schiff. M.21, H.20, E2.18, K.16, S.17.

The Chalk Carpet is locally abundant, mainly on downlands in August over most of the south of England up to North Wales. It is very variable locally, producing sometimes very dark grey or almost white forms. It is only mentioned in the 1898 list from Ealing and Dulwich.

HERTS. Hertford, Haileybury (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (V.C.H., 1903).



KENT. Magpie Bottom, Eynsford, 1948 (Hyatt); Orpington, 1953 (Siggs); Pett's Wood and Chelsfield, 1950 (A. Swain); Shoreham, 1950 (Wheeler); West Wickham (Trundell); Eltham, Grove Park (V.C.H., 1908).

SURREY. Box Hill (1952 (Wheeler)); Addington (Birchenough); Reigate and Banstead, 1904 (Meldola: Hope Dept. Collection, Oxford); Chipstead, very common, 1946 (Johnson).

\**Ortholitha mucronata* Scop. (= *plumbaria* Fabr.) M.21, H.20, E2.18, K.16, S.17.

The Lead Belle is usually very plentiful on heathland and moors in almost every region of Great Britain, appearing at the end of June and continuing sometimes well into August. In the London Area it has been noted in the 1898 list from Woodford, Hampstead, Harrow, Dulwich, Tooting and Wimbledon Common, elsewhere from

MIDDLESEX. Elstree, very common (Lorimer); Enfield (Edelsten).

HERTS. St. Albans, Haileybury, Hertford, Watford, and Bushey Heath (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Edelsten); Loughton (West, *Ent. Rec.*, 1906).

KENT. Shooter's Hill (West, *Ent. Rec.*, 1906); Shoreham and West Wickham (V.C.H., 1908).

SURREY. Ashted (Gardner); Wimbledon Common, 25 June 1928. (D. King); Bookham Common (Cockayne); Banstead, 1904 (Meldola: Hope Dept. Collection, Oxford).

*Ortholitha umbrifera* Prout E2.18.

This species, sometimes known as the Early Lead Belle, was confused with the preceding insect until 1925 when the German entomologist Heydemann pointed out certain differences in markings, genitalia structure and time of appearance, since this species is on the wing at the end of May and in early June. The cross-lines are more wavy than in *O. mucronata*, the discal mark is usually a dash instead of a dot, and the markings are more mottled. *Ortholitha scotica* Cockayne has been found to be synonymous with this species which ranges chiefly over the western portion of the country up to the Highlands and also occurs in Ireland. In the Selwyn Image collection in the Hope Dept., Oxford, there are two undoubted examples of this insect taken at Loughton in Essex on 27 May 1911. It is probable that Prout described this species from these specimens. The insect has also been taken recently in this area by Gardner.

\**Ortholitha chenopodiata* Linn. (= *limitata* Scop.). M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Shaded Broad-bar is one of the commonest moths in grassy places in July and August in nearly every quarter of the British Isles. In the Highlands melanic forms are numerous. It has been noted from almost every part of the London Area, including Hampstead, Highgate, Finchley, Bromley, Brixton, Tooting, Richmond Park and Wimbledon Common.

\**Larentia clavaria* Haworth M.21, H.20, E2.18, K.16, S.17.

The Mallow is fairly frequent wherever any form of mallow or hollyhock occurs throughout Great Britain, though not in the far north. It is on the wing only in the autumn, appearing in late September. The 1898 list and Suppt. give it from Chiswick, Bedford Park, Harrow, Highgate, Southgate, Bromley, Croydon, Barnes and Wimbledon Common.

MIDDLESEX. Greenford in 1948 (J. Ward); Mill Hill, 1949 (Collyer); Hampton, 1931 (Keywood); Hampton Court (Kaye); Harefield (Cockerell, *Lep. Middx.*, 1891); Enfield (Edelsten).

HERTS. St. Albans, Bushey, Haileybury, Cheshunt, Hoddesdon and Chorley Wood (Foster, *Lep. Herts.*, 1937).

ESSEX. Leyton (Meldola: Hope Dept. Collection, Oxford).

KENT. West Wickham, 1950 (Trundell); Lee, Eltham (V.C.H., 1908).

SURREY. Tadworth, 1949 (Wheeler); Chipstead, October 1946 (Johnson); Weybridge (Messenger).

\**Orthonama lignata* Hübn. (= *vittata* Borkh.). M.21, H.20, K.16, S.17.

The Oblique Carpet is essentially an inhabitant of marshy areas over most of the country, except the extreme north. It appears in late July and has been recorded in the Area in the 1898 list from Clapton, Hanwell and Highgate, also from

MIDDLESEX. Mill Hill (Cockerell, *Lep. Middx.*, 1891).

HERTS. Haileybury, Cheshunt, Watford (Foster, *Lep. Herts.*, 1937).

KENT. Lee, Eltham and Dartford (V.C.H., 1908).

SURREY. Egham, a few in 1933 (C. de W.); Weybridge, rare (Messenger).

\**Oporinia dilutata* Schiff. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The November Moth is one of the most familiar geometers of the autumn, since it is often seen in the daytime in late October at rest or flying in woods in practically all parts of the British Isles up to Moray. It has been noted according to the 1898 list in all parts of London, except the Centre, including Forest Gate, Chiswick, Highgate, Hampstead, Shooter's Hill, Dulwich, Barnes, and Wimbledon Common. Melanic forms are not infrequent.

*Oporinia christyi* Prout K.16, S.17.

Christy's Autumnal Carpet was only separated from the previous species early this century (Vide *Ent. Rec.*, 1911, 23: 79) when Prout pointed out the main features of distinction which consist in the superficial markings of the minute discal spot of the forewing with its central band more angled near the costa. The insect seems to prefer beech woods and wych elms. It has been found to be widespread in the south, also occurring in Scotland and Ireland, where the speci-

mens are nearly white. It is on the wing by mid-October and has been and still is confused with *O. dilutata*. Authentic examples have been noted for

KENT. Farnborough, October, 1938 (D. Marsh); West Wickham (Trundell).

SURREY. Selsdon Wood (Birchenough); Box Hill area (C. de W.).

*Oporinia autumnata* Borkh. H.20, K.16, S.17.

The Autumnal Carpet is also fairly generally distributed over England and Scotland to the Highlands and has been taken in Ireland. It seems to affect birch in the south and also bilberry in the north. Its larva can be readily distinguished from the previous two species by the yellow stripes along the back, while the insect itself always has a glossy surface and is grey or whitish in ground colour, never having a brownish or greenish tinge. It also has a very small discal spot and even more angled central band. It is not in the 1898 list, but has been noted with authentic examples from

HERTS. Watford, common (Penrose); fairly general (Foster, *Lep. Herts.*, 1937).

KENT. Orpington, 1949 (Siggs).

SURREY. Selsdon Wood (Birchenough); Weybridge (Messenger); Egham, numerous (C. de W.).

*Minoa murinata* Scop. K.16, S.17.

The Drab Looper is rather a small and easily overlooked insect which affects woods and hillsides where the wood spurge grows. It is on the wing in June and seems to be confined to the southern counties of England up to Worcester, though it is more in the east and not reported from the south-west. For the London Area it has been recorded from

KENT. Abbey Wood, Dartford, and West Wickham (V.C.H., 1908).

SURREY. Wimbledon Common (V.C.H., 1902).

\**Asthena albulata* Hufn. (= *candidata* Schiff.). M.21, H.20, E2.18. K.16, S.17.

This tiny geometer, the Small White Wave, is sometimes very abundant at the end of May and again in August in woodlands. It seems to occur in most parts of the British Isles up to the Highlands and in Ireland. It has also been noted from nearly all over the London Area, including, according to the 1898 list, Lea Bridge Road, Epping Forest, Hale End, Highgate Woods, Southgate, Dulwich and Wimbledon Common.

*Discoloxia blomeri* Curt. H.20, E2.18, B.24.

Blomer's Rivulet is very local, occurring in a few of the Midland counties, chiefly Bucks, Oxford and Lincs, and also sporadically up to Lancashire and Yorkshire. It is out at the end of June and seems to like sitting on trunks of beech and elm. It is not given in the 1898 list and has only been recorded for the Area from

HERTS. Chorley Wood (South, *Entom.*, 1893, 16: 251).

ESSEX. Wanstead (Rev. Burrows, V.C.H., 1903).

BUCKS. Rickmansworth area (V.C.H., 1905); Chalfont St. Peter (Ansorge).

\**Hydrelia testacea* Don. H.20, K.16, S.17.

The Waved Carpet is an even more local insect which is found in a few of the southern and midland counties and also in the west of Ireland. It appears in July and affects woods. Croydon is the only locality given in the 1898 list. Also noted from

HERTS. Rickmansworth, one in 1935 (Classey).

KENT. Eltham and Greenhithe (V.C.H., 1908).

SURREY. Box Hill and Redstone (V.C.H., 1902).

\**Hydrelia flammeolaria* Hufn. (= *luteata* Schiff.). M.21, H.20, E2.18, K.16, S.17, B.24.

The Small Yellow Wave is mainly a denizen of areas where maple is plentiful. It appears to range over most of England and Wales up to the edge of the Highlands and is on the wing from May to July. In the London Area it has been reported in the 1898 list from Hale End, Chingford, Hendon, Mill Hill, Lee, and Croydon, also from

MIDDLESEX. Mill Hill, June 1955 (Goater); Kenton, August 1936 (Fletcher); Ruislip, scarce (Minnion); Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Totteridge, rare (Lorimer); Chorley Wood, St. Albans, Cheshunt, Hertford, and Watford (Foster, *Lep. Herts.*, 1937).

ESSEX. Theydon Bois, 1905 (Meldola: Hope Dept. Collection, Oxford).

KENT. Orpington, 1948 (Siggs); Hayes and Downe (Birchenough); Swanscombe and Darenth (West, *Ent. Rec.*, 1906); Sidcup, 1892 (Sellon: Hope Dept. Collection, Oxford); Bexley and Dartford (V.C.H., 1908).

SURREY. Oxshott, 1934 (D. King); Banstead (Gardner); Sutton, 1903 (Meldola: Hope Dept. Collection, Oxford); Weybridge (Messenger); Worcester Park, Redhill and Wimbledon Common (V.C.H., 1902).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

\**Euchoeca nebulata* Scop. (= *obliterata* Hufn.). M.21, K.16, S.17.

The Dingy Shell is often very plentiful in alder carrs in most parts of England and Wales up to Yorkshire. It appears in June and can be flushed from its haunts in numbers by beating the alder stems and foliage by day. The 1898 list gives it from Harrow and Eltham and says it is abundant in the south-east suburbs.

MIDDLESEX. Ruislip and Northolt, July 1953 (J. Ward); Stanmore, one (Lorimer).

KENT. West Wickham (Birchenough); Pett's Wood, 1948 (A. Swain); Eltham, Bexley, Chislehurst (V.C.H., 1908).

SURREY. Oxshott, 1934 (D. King); Wimbledon Common (van Emden); Weybridge (Messenger); Esher, Oxshott and Reigate (V.C.H., 1902).

\**Operophtera fagata* Scharf. (= *boreata* Hübn.). M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Northern Winter Moth belies its name since it is found all over the south of England wherever birch is plentiful. It appears in November, sometimes in great numbers. It occurs in the Highlands and also in Ireland. According to the 1898 list and Suppt. it has been recorded from Tottenham, Shirley, Brockley, Richmond Park and Wimbledon Common, also abundant in the south-eastern area and noted from

MIDDLESEX. Ruislip and Northolt (J. Ward); Mill Hill, November 1955 (Goater); Stanmore (Fletcher); Hampstead (Cockerell, *Lep. Middx.*, 1891); Enfield (Edelsten).

HERTS. Bushey Heath, St. Albans and Watford (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (V.C.H., 1903).

KENT. Chislehurst, 1947 (Hyatt); West Wickham (Trundell); Hayes and Downe (Birchenough); Orpington, 1949 (Siggs).

SURREY. Wimbledon Common, 1927 (D. King); Tadworth and Banstead (Wheeler); Weybridge in 1939 (Messenger).

BUCKS. Chalfont St. Peter (Ansorge).

\**Operophtera brumata* Linn. I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Winter Moth is among the most abundant of our lepidoptera and is also an official pest. It occurs in the winter months throughout the British Isles and has been noted from every quarter of the London Area, including Islington, Chiswick, Hampstead, Epping Forest, Dulwich, Barnes and Wimbledon Common.

\**Pelurga comitata* Linn. I.L., M.21, H.20, E2.18, K.16, S.17.

The Dark Spinach is another very prevalent species, especially round market gardens, though it seems to range over most of Great Britain, appearing in August. From the 1898 list it is mentioned from Highbury, Holloway, Canonbury, Highgate, Chingford, Hackney Marshes, Stamford Hill, Streatham, Dulwich, Chiswick and Wimbledon Common.

INNER LONDON. South Kensington, larvae common (C. de W.).

MIDDLESEX. Mill Hill, 1955 (Goater); Southall (J. Ward); Potters Bar (Rutherford); Stanmore (Fletcher); Enfield (Edelsten); Hammer-smith and Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. St. Albans, Hertford, East Barnet, Bushey and Watford (Foster, *Lep. Herts.*, 1937).

KENT. West Wickham, 1950 (Trundell); Abbey Wood (Showler); Elmer's End, 1907 (Keywood); Orpington, 1948 (Siggs); Pett's Wood, 1950 (A. Swain); Hayes and Downe (Birchenough); Lee and Greenwich (V.C.H., 1908).

SURREY. Box Hill (van Emden); East Sheen, 1934, and Putney, 1946 (D. King); Tadworth, 1952 (Wheeler); Weybridge (Messenger); Surbiton (V.C.H., 1902).

*Mesotype virgata* Rott. H.20.

The Oblique-striped is fairly numerous in suitable places, mainly on chalk and limestone. It ranges locally over most of the south of England, though it occurs more commonly in the west and in North Wales. It has been recorded from Northern Ireland. It appears twice a year, in May and August, but has only been noted from the north-western boundary of the Area, at Sandridge (Foster, *Lep. Herts.*, 1937).

\**Epirrhoë galiata* Hübn. M.21, H.20, K.16, S.17.

The Galium Carpet is chiefly an inhabitant of chalk downs on coastal regions round most of the south of England. It also occurs in the Clyde area and in the west of Ireland. Inland it is far less common and is only given for Croydon in the 1898 list, also from

MIDDLESEX. Enfield Chase (Cockerell, *Lep. Middx.*, 1891); also there (Edelsten); near Harrow (Rev. Hind, 1876).

HERTS. St. Albans and Wormley (Foster, *Lep. Herts.*, 1937).

KENT. Woolwich, 1939 (Rigden); Pinden (Hare); Kingsdown (Sellon: Hope Dept. Collection, Oxford); Dartford and Shooter's Hill (West, *Ent. Rec.*, 1906).

SURREY. Chipstead, 1946 (Johnson).

\**Epirrhoë rivata* Hübn. M.21, H.20, E2.18, K.16, S.17.

The Wood Carpet is fairly widespread and also found most commonly on chalk. It is on the wing in late June and has been noted from most of the English counties up to the north and occasionally in southern Scotland and in western Ireland. It is readily separated from the next species by its bluer ground colour and the broader white band across the wings. The 1898 list mentions it from Woodford, Hale End, Croydon, Chiswick, and Wimbledon Common.

MIDDLESEX. Ruislip, rare (Minnion); Hampstead, Harrow and Chiswick (Cockerell, *Lep. Middx.*, 1891).

HERTS. Totteridge, one (Lorimer); Oxhey, one on 25 June 1938 (Fletcher); Bricket Wood, St. Albans, Watford, Haileybury, Cheshunt. Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937).

KENT. West Wickham (Trundell); Orpington, 1956 (Siggs); Pinden (Hare); Kidbrooke, Lee and Lewisham (West, *Ent. Rec.*, 1906); generally distributed (V.C.H., 1908).

SURREY. Addington, bred from larvae (Birchenough); Banstead (Meldola: Hope Dept. Collection, Oxford).

\**Epirrhoë alternata* Müll. (= *sociata* Borkh.). M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Common Carpet, as its name implies, is a very common insect all over Great Britain, except in the Shetlands. In the Highlands, a very brown and small form occurs. It is on the wing in May and again in August and has been reported from nearly all parts of the London Area, including, according to the 1898 list, Highgate, Hampstead, Tottenham, Hale End, Woodford, Chiswick, Hounslow, Dulwich, Barnes and Wimbledon Common.

(\**Epirrhoë tristata* Linn.). (M.21), (S.17).

The Small Argent and Sable is essentially a moorland species which is found in Devon and Cornwall, through Wales to the north, then throughout the Highlands. In Ireland a very dark form is found. The insect which feeds on *Galium* spp. has seldom been recorded from anywhere in the east or south of England. There are two doubtful records for the London Area, one in the 1898 list for Croydon and the other for MIDDLESEX, at Graeme's Dyke, near Harrow (Cockerell, *Lep. Middx.* 1891).

\**Euphyia unangulata* Haworth M.21, K.16, S.17, B.24.

The Sharp-angled Carpet is very local, sometimes being abundant in one small locality and non-existent in the vicinity. It appears in July and has been found sporadically over most of England, Wales and the northern counties. It is fairly widespread in the south of Ireland. The 1898 list mentions it from Bromley, Croydon, Ham Common, Richmond Park, and Wimbledon Common. Other records include

MIDDLESEX. Bishop's Wood at Hampstead (Cockerell, *Lep. Middx.*, 1891); Bedfont, 1952 (Kindred).

SURREY. Weybridge, rare (Messenger); Epsom, 1895 (Sidgwick: Hope Dept. Collection, Oxford); Tooting, 1904 (Thornewell: Id); Oxshott (V.C.H., 1902).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

*Euphyia luctuata* Schiff. (= *lugubrata* Staud.). K.16.

This virtual newcomer to the British list, the White-banded Carpet, was only first recognised in 1924 with a single specimen in North Kent. It did not reappear till 1950 when it was discovered in Sussex and in the following year was found fairly commonly in East Kent. Since then it has spread rapidly in that area where it seems to be continuously brooded. Its chief foodplant is the rosebay willowherb (*Chamaenerion angustifolium*) from which the larvae can be readily obtained. This very attractive moth can be flushed from these surroundings in the daytime. It has already found its way into the Area with a single example taken at Westerham in 1955 by Mr. Clifford Edwards.

\**Euphyia picata* Hübn. H.20, E2.18, K.16, S.17, B.24.

The Cloaked Carpet is an exceedingly elusive insect, though it is to be found in most of the southern counties, especially in the west. It is met with in late June or July, usually only in single examples, at light or at dusk flying along hedgerows. It is only mentioned from Croydon in the 1898 list, also from

HERTS. St. Albans, Bricket Wood, Cheshunt, Watford, and Haileybury (Foster, *Lep. Herts.*, 1937); Carpender's Park, several in 1938 (Classey).

ESSEX. Loughton (West, *Ent. Rec.*, 1906).

KENT. Abbey Wood and Shooter's Hill (West, *Ent. Rec.*, 1906).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

\**Euphyia bilineata* Linn. I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Yellow Shell is one of the commonest of moths in the middle of the summer, to be found in almost every hedgerow all over the British Isles. In the Shetlands a very small form occurs, while a nearly black race is known from the Blasket Islands off Kerry. The species has been recorded from every part of the London Area including Kilburn, Islington, Highgate, Hampstead, Hammersmith, Woodford, Dulwich, Richmond Park and Wimbledon Common.

*Euphyia cuculata* Hufn. M.21, H.20, E2.18, K.16, S.17, B.24.

The Royal Mantle is very local, mainly affecting chalky districts in the southern part of England where the yellow bedstraw, its larval food-plant, flourishes. It sometimes occurs some distance from such areas as in the Breck Sand of Suffolk. It has recently been found fairly freely in eastern Scotland and also on the limestone of Clare and Galway in Ireland. It is not in the 1898 list and has been noted for the Area from

MIDDLESEX. Bedfont, 13 July 1951 (Kindred).

HERTS. St. Albans (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest, one in 1896 (Waters, V.C.H., 1903).

KENT. Otford, 1955 (Manley).

SURREY. Tadworth, 1952 (Wheeler); Chipstead, three in 1946 (Johnson); Putney, one on 14 July 1955 (H. Swain); Mickleham Down and Box Hill, 1938 (Johnson); Reigate (Geldart: Hope Dept. Collection, Oxford); Weybridge, a few (Messenger).

BUCKS. Chalfont St. Peter, one (Ansorge).

*Euphyia rubidata* Fabr. M.21, H.20, E2.18, K.16, S.17.

The Flame is another very local species which is found in July over the southern half of England, chiefly on chalk. It has been recorded as far north as Yorkshire and even in Arran. It is not in the 1898 list, but has been reported from

MIDDLESEX. Mill Hill, 1875 and Whitton (Cockerell, *Lep. Middx.*, 1891).

HERTS. Haileybury, East Barnet and Bushey (Foster, *Lep. Herts.*, 1937).

ESSEX. Romford, 1894 (Meldola; Hope Dept. Collection, Oxford).

KENT. Lewisham (*Ent. Annual.*, 1865); Otford, June 1902 (Proc. South London Soc., 1902); Lee and Eltham (V.C.H., 1908); Kidbrooke (West, *Ent. Rec.*, 1906).

SURREY. Chipstead, one in 1946 (Johnson); Box Hill, one in 1954 (Bretherton).

(*Euphyia polygrammata* Borkh.). (K.16).

The Many-lined used to be found in the Fens, near Cambridge and Ely, but has long since been extinct from our list, probably since 1879 (*vide* Bretherton: *Ent. Gazette*, 1951, 2: 215). There is a single record for Dartford, one in 1874 (Webb, V.C.H., 1908), but this species has often been confused with *Orthonama lignata*.



\**Eulype hastata* Linn. M.21, H.20, E2.18, K.16, S.17.

The very handsome Argent and Sable is a familiar sight careering about among birch in the June sunshine. It is very widespread in England, scarce in Ireland and found over most of Scotland and the Highlands where it feeds chiefly on bog-myrtle. This form was at one time considered to be *E. subhastata*, a separate species. For the London Area it is only recorded in the 1898 list from Shooter's Hill.

MIDDLESEX. Ruislip, scarce (Minnion).

HERTS. Hoddesdon in 1948 (Rutherford); Northaw Great Wood, 1920 (Bull); Bricket Wood, 1929 (Fryer).

ESSEX. Brentwood (V.C.H., 1903).

KENT. Dartford (V.C.H., 1908).

SURREY. Esher (Gardner); Oxshott, 1933 (Kaye); also there in 1950 (C. de W.).

\**Mesoleuca albicillata* Linn. M.21, H.20, E2.18, K.16, S.17, B.24.

This very pretty moth, the Beautiful Carpet, is chiefly a woodland insect occurring up to southern Scotland and fairly freely in Ireland. It is on the wing in July and has been observed in the Area according to the 1898 list from Hale End, Woodford, Southall, Bromley, Eltham, Croydon and Wimbledon Common.

MIDDLESEX. Highgate, 1938 (Andrewes); Ruislip and Northolt (J. Ward); Pinner (Cockerell, *Lep. Middx.*, 1891).

HERTS. St. Albans, Waltham Cross, East Barnet, Broxbourne and Hoddesdon (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Edelsten).

KENT. Abbey Wood, 1952 (Showler); Joyden's Wood, 1947 (Hyatt); also there (D. Owen); West Wickham (Trundell); Eltham and Bexley (V.C.H., 1908); Darenth (West, *Ent. Rec.*, 1906).

SURREY. Addington (Birchenough); Putney, 1925, and Oxshott, 1929 (D. King); Tadworth, 1954 (Wheeler); Weybridge, before 1947 (Messenger).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

\**Lyncometra ocellata* Linn. M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Purple-bar is very widespread and found in late May and again in August in most parts of the British Isles up to the Highlands. It is also well distributed over Ireland. It has been reported for the Area in the 1898 list from Hale End, Woodford, Walthamstow, Tottenham, Stratford, Epping Forest, Hampstead, Streatham, Bromley, Richmond and Wimbledon Common, also from

MIDDLESEX. Ruislip (Minnion); Stanmore and Elstree (Lorimer); Enfield (Edelsten); Mill Hill, Harrow and Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Bricket Wood, Haileybury, Hertford, Cheshunt, Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937).

KENT. Pett's Wood, 1950 (A. Swain); Shoreham (D. Owen); West Wickham (Birchenough); Kidbrooke and Lee (West, *Ent. Rec.*, 1906).

SURREY. Putney, 1930, Ham Common, 1928, Richmond Park (D. King); Chipstead, 1946 (Johnson); Tadworth, 1951 (Wheeler); Weybridge (Messenger).

BUCKS. Chalfont St. Peter (Ansorge).

\**Plemyria bicolorata* Hufn. M.21, H.20, E2.18, K.16, S.17, B.24.

The Blue-bordered Carpet is a very pretty little moth which is readily flushed from the vicinity of alders in almost all parts of Great Britain. In the north, especially in the Highlands, a very dark form is fairly predominant. From London it seems to have been noted from nearly every quarter and according to the 1898 list from Chingford, Hale End, Epping Forest, Stratford, Mill Hill, Finchley, Hendon, Harrow, Barnes, Hammersmith, Richmond, Hounslow, Putney and Wimbledon.

\**Melanthia procellata* Fabr. M.21, H.20, K.16, S.17, B.24.

The Pretty Chalk Carpet is a *Clematis* feeder and found only where the Traveller's Joy flourishes, chiefly on downs. It seems to be confined to the southern and south Midland counties where it is on the wing in July. It is only reported from the Area in the 1898 list and Suppt. from Croydon, Wimbledon Common, and the south-eastern area. Other records include

MIDDLESEX. Ruislip, rare (Minnion); Dartmouth Park, 1860 (Cockerell, *Lep. Middx.*, 1891).

HERTS. Haileybury, Hertford and Watford (Foster, *Lep. Herts.*, 1937).

KENT. Woolwich, 1939 (Rigden); Abbey Wood, 1953 (Showler); Orpington, 1948; West Wickham, 1950 (Trundell); Dartford (West, *Ent. Rec.*, 1906).

SURREY. Epsom, July 1933 (D. King); Addington and Selsdon (Birchenough); Headley, 1954 (Wheeler); Tadworth, 1951, and Box Hill (Wheeler); Sutton, 1903, and Banstead, 1904 (Meldola: Hope Dept. Collection, Oxford); Weybridge, one on 19 July 1932 (Messenger).

BUCKS. Black Park, Fulmer (V.C.H., 1905).

*Perizoma affinitata* Steph. M.21, H.20, K.16, S.17, B.24.

This little moth, the Large Rivulet, is an inhabitant of places where the red campion grows plentifully. Here it may be readily taken at dusk at the end of May in most areas of the country up to Moray and in Ireland. It is not mentioned for London in the 1898 list.

MIDDLESEX. Ruislip, numerous (Minnion); Hampstead, Finchley, and Harefield in 1889 (Cockerell, *Lep. Middx.*, 1891).

HERTS. Haileybury, Hertford, Watford, Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937); Totteridge, common (Lorimer).

KENT. Abbey Wood (V.C.H., 1908); Darentli (Meldola: Hope Dept. Collection, Oxford).

SURREY. Coulsdon, 1952 (Wheeler), Reigate and Wimbledon Common (V.C.H., 1902).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

\**Perizoma alchemillata* Linn. M.21, H.20, K.16, S.17, B.24.

The Small Rivulet is a fairly local species to be found at the end of June among its foodplant, the hemp nettle (*Galeopsis tetrahit*), in most regions of the British Isles right to the Hebrides. In the 1898 list it is only noted from Eltham. Hampstead Heath and Highgate, also recorded from

MIDDLESEX. Uxbridge, July 1949 (J. Ward); Ruislip, common (Minion); Mill Hill, numerous (Goater); Stanmore, a few (Lorimer).

HERTS. Hertford, Bushey Heath, St. Albans, Haileybury, Hoddesdon, Watford and Aldenham (Foster, *Lep. Herts.*, 1937); Watford, rare (Penrose); Totteridge, scarce (Lorimer).

KENT. Orpington, 1949 (Siggs); Dartford, West Wickham (V.C.H., 1908).

SURREY. Coulsdon, 1952 (Wheeler); Reigate and Wimbledon Common (V.C.H., 1902).

BUCKS. Chalfont St. Peter (Ansorge).

\**Perizoma flavofasciata* Thunb. (= *decolorata* Hübn.). I.L., M.21, H.20, E2.18, [E1.19], K.16, S.17, B.24.

The Sandy Carpet is another insect associated with the red campion amongst which it may readily be flushed in late May and at the end of July. It has been noted from most of England and Wales, also up to the Clyde and in Northern Ireland. It has been recorded from nearly every part of the London Area, including Conduit St. in Central London in June 1931 (D. King). Other localities mentioned in the 1898 list include Hale End, Chingford, Hackney Marshes, Ilford, Woodford, Ealing, Hendon, Finchley, Hampstead and Eltham, also from

MIDDLESEX. Hounslow, six in 1955 (Pierce); Mill Hill, July 1955 (Goater); Kenton, 1951 (Fletcher); Uxbridge, 1950 (J. Ward).

HERTS. St. Albans, Haileybury, East Barnet, Hertford, Oxhey, Watford and Broxbourne (Foster, *Lep. Herts.*, 1937).

KENT. West Wickham (Trundell); Abbey Wood, 1953 (Showler); Joyden's Wood, 1948 (Hyatt); Orpington, 1955 (Siggs); Farnborough (Marsh); Lewisham (D. Owen); Foots Cray (Burton); Hayes, Downe (Birchenough); Erith and Dartford (V.C.H., 1908).

SURREY. Barnes, 1937 (D. King); Coulsdon, 1946 (Wheeler); Tadworth and Bookham, 1954 (Wheeler); Ewell (Gardner); Weybridge (Messenger).

BUCKS. Chalfont St. Peter (Ansorge).

\**Perizoma albulata* Schiff. M.21, H.20, E2.18, K.16, S.17.

The Grass Rivulet is a very familiar little moth, found often in great numbers almost anywhere that the yellow rattle (*Rhinanthus*) grows all over the British Isles up to the Shetlands, where a special dusky form occurs. The 1898 list mentions it from Highgate, Mill Hill, Finchley, Willesden, Grove Park, Epping Forest and locally common in the south-eastern district.

MIDDLESEX. Ruislip and Northolt, 1951 (J. Ward); Mill Hill, 1955 (Goater); Ealing and Harefield, 1889 (Cockerell, *Lep. Middx.*, 1891); Enfield (Edelsten).

HERTS. Watford, common (Penrose); Totteridge, one (Lorimer).

KENT. Joyden's Wood, 1948, and Eynsford, 1952 (Hyatt); West Wickham (Trundell); Farningham (Wheeler); Pett's Wood (A. Swain); Bexley and Lee (V.C.H., 1908).

SURREY. Weybridge (Messenger); Coombe Wood, 1905 (W. J. Cox).

\**Perizoma bifaciata* Haworth K.16, S.17.

The Barred Rivulet is very local, found only where its foodplant, the red bartsia, grows. The insect which is occasionally seen in early August occurs in England, Wales, southern Scotland and parts of Ireland. The species can be readily bred from the larvae obtained in the plant seed pods in October. The 1898 list gives it from West Norwood, Eltham and Croydon, also from

KENT. Orpington, 1954 (Siggs); Keston, 1928 (Cope).

SURREY. Cheam (*Ent. Annual*, 1869); Riddlesdown (Cockayne); Chipstead, common, August 1946 (Johnson); Dulwich, Croydon and Reigate (V.C.H., 1902).

\**Hydriomena furcata* Thunb. (= *sordidata* Fabr.). M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The July Highflyer is one of the commonest of our moths which in its almost innumerable forms is found all over Great Britain, except the Shetlands. On the moors of the north a small form occurs which feeds on bilberry whereas most of the larvae in the south are to be found in the shoots of willow. The species has been recorded from every quarter of the London Area, except the Centre, notably in the 1898 list from Chingford, Woodford, Epping Forest, Ealing, Highgate, Finchley, Chiswick, Brockley, Dulwich and Wimbledon Common.

\**Hydriomena coerulea* Fabr. (= *impluviata* Hübn.). M.21, H.20, E2.18, K.16, S.17.

The May Highflyer is very widespread, occurring among alder all over the British Isles. Like the last species, it is very variable, though in the north it is often generally deep grey in colour. It is readily flushed from trunks and foliage of alder, while the pupae can be found in the rotten bark. The 1898 list gives Hale End, Wanstead, Harrow, Eltham, Brockley and Croydon.

MIDDLESEX. Hounslow, one each year 1954-56 (Pierce); Highgate, 1925 (Andrewes); Ruislip, scarce (Minnion).

HERTS. Haileybury and Watford (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Edelsten).

KENT. West Wickham (Trundell); Pett's Wood, 1946 (A. Swain); Orpington, 1954 (Siggs); Hayes and Downe (Birchenough); Sidcup and Bexley (V.C.H., 1908); Blackheath and Catford (West, *Ent. Rec.*, 1906).

SURREY. Arbrook Common (Cockayne); Wimbledon Common (van Emden); Weybridge (Messenger); Reigate, Redhill (V.C.H., 1902).

\**Hydriomena ruberata* Freyer H.20, K.16, S.17.

The Ruddy Highflyer is decidedly rare in the south of England, whereas in the Highlands it is very plentiful in June right up to Orkney.

Its larvae may often be obtained in hundreds from the sewn-up tips of stunted willow bushes on the moors in September. It is also very variable, but is much redder than the last species. The 1898 list gives it from Wimbledon Common (Clark). The only other records are from

HERTS. Watford, one in 1953 (Penrose).

KENT. Dartford (V.C.H., 1908).

\**Earophila badiata* Hübn. I.L., M.21, H.20, E2.18, E1.19, K.16, S.17, B.24.

The Shoulder-stripe is one of the familiar spring geometers, usually appearing at the end of March. It feeds on wild rose and is found in almost every region of the British Isles, except the north of Scotland. The London Area can also claim it in nearly every quarter, even in Green Park in May 1898, also from Chingford, Epping Forest, Lea Bridge Road, Southall, Forest Hill, Dulwich and Wimbledon Common.

*Coenotephria berberata* Schiff. (E2.18).

The Barberry Carpet is now one of our rarest moths, since its food-plant, the wild barberry, has been systematically eradicated as a winter host of a cereal disease. The species was formerly to be found in many of the southern as well as the eastern counties, but it seems now to be confined to a few localities in the latter area where it is on the wing in May and again in August. There is a record of its former occurrence in Epping Forest in ESSEX (V.C.H., 1903).

\**Coenotephria derivata* Schiff. (= *nigrofasciaria* Goeze). M.21, H.20, E2.18, K.16, S.17, B.24.

The Streamer is another early spring species appearing in April. It also feeds on wild rose and is found in most parts of Great Britain and in Ireland. The 1898 list gives it from Highgate, Hendon, Mill Hill, Harrow, Eltham and Barnes. Other records include

MIDDLESEX. Stanmore, April 1938 (Fletcher), Ruislip, scarce (Minion); Mill Hill, Pinner, Harefield, Acton (Cockerell, *Lep. Middx.*, 1891).

HERTS. Watford, one (Penrose); St. Albans, Bushey, East Barnet, Watford, Hoddesdon and Broxbourne (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest (Edelsten); Loughton (West, *Ent. Rec.*, 1906).

KENT. West Wickham (Birchenough); Plumstead (West, *Ent. Rec.*, 1906); Lee, Eltham, Bromley and Dartford (V.C.H., 1908).

SURREY. Claygate, 1934 (Keywood); Oxshott (Newman: Hope Dept. Collection, Oxford).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

\**Nycterosia obstipata* Fabr. (= *fluviata* Hübn.). M.21, H.20, E2.18, K.16, S.17.

The Gem is a most remarkable little insect, since it is one of the leading migrant species in the world. It is probable that all our specimens have originated from abroad in the spring and bred over here,

since it has been recorded from April till December. It was first noted in the London Area in the early part of the 19th century (*vide* Introduction). The species has been seen up to the northern counties. The sexes are very divergent, the male being ochreous and the female deep brown. The 1898 list and Suppt. record it for Woodford, Highgate and Wimbledon, also from

MIDDLESEX. Hampstead (*Ent. Annual*, 1868); Stanmore, one on 7 Nov. 1937 (Classey, *Entom.*, 1937, **70**: 286); Greenford, one on 27 July 1950 (J. Ward); Highgate (*Ent. Rec.*, 1912, **24**: 306).

HERTS. Waltham Cross, 1904 (Foster, *Lep. Herts.*, 1937).

KENT. Westerham in 1942 and 1947 (C. Edwards); Orpington, 1948 (A. Swain); Greenhithe, Lee, Eltham, Charlton, and West Wickham (V.C.H., 1908); Blackheath (West, *Ent. Rec.*, 1906).

SURREY. Tadworth, on 1 August 1951 (Wheeler); Chertsey Meads, 2 October 1948 (Bretherton); Weybridge in 1952, 1953 and 1956 (Messenger).

\**Horisme vitalbata* Hübn. M.21, H.20, E2.18, E1.19, K.16, S.17.

The Small Waved Umber is a species chiefly of the chalk, since its foodplant is the wild clematis, but it is known to feed on garden species. Its range is over most of southern England, though it has been recorded from Lancashire. It appears in June and August and has been noted in the 1898 list from Woodford, Highgate, Harrow, Eltham and Croydon.

MIDDLESEX. Hounslow, 1955 (Pierce); Finchley (Cross, *Entom.*, 1946, **79**: 208); Chiswick, July 1955 (Uffen); Highgate, 1925 (Andrewes); Mill Hill (Cockerell, *Lep. Middx.*, 1891).

HERTS. East Barnet, Haileybury, St. Albans, Watford, Cheshunt and Hoddesdon (Foster, *Lep. Herts.*, 1937).

ESSEX. Epping Forest, 1905 (Kaye).

KENT. West Wickham (Trundell); Orpington, 1949 (Siggs); Chelsfield, 1949 (A. Swain); Darenth Wood, 1951 (Burton); Hayes and Downe (Birchenough); Dartford and Plumstead (West, *Ent. Rec.*, 1906).

SURREY. Brixton (Farmer); Box Hill (Gardner); Coulsdon, 1938, and Tadworth, 1949 (Wheeler); Chipstead, numerous in 1946 (Johnson); Weybridge (Messenger).

\**Horisme tersata* Hübn. I.L., M.21, K.16, S.17, B.24.

The Fern is another clematis feeder which often finds its way into suburban areas, since it feeds readily on the garden varieties. It is also found over most of southern England up to Lancaster and has been recorded in the 1898 list from Hackney, Ealing, Lee, Eltham, Croydon and Westcombe Park, elsewhere from

INNER LONDON. The Zoo, Regent's Park, 1954 (Bushby); South Kensington, one on 11 July 1945 (C. de W.).

MIDDLESEX. Finchley (Cross, *Entom.*, 1946, **79**: 208); Mill Hill, 1955 (Goater); Hounslow, two in 1956 (Pierce); Highgate, 1925 (Andrewes); Greenford, one in July 1952 (J. Ward); Ruislip, rare (Minion); Harrow and Harefield (Cockerell, *Lep. Middx.*, 1891).

HERTS. Chorley Wood, Haileybury, Hertford, Watford (Foster, *Lep. Herts.*, 1937).

KENT. Abbey Wood, 1952 (Showler); Orpington, 1951 (Siggs); Hayes and Downe (Birchenough); Dartford and Plumstead (West, *Ent. Rec.*, 1906).

SURREY. Wimbledon Common (van Emden); Barnes (Gardner); Coulsdon, 1948, and Tadworth, 1944 (Wheeler); Chipstead, a few in 1946 (Johnson); Weybridge, rare (Messenger); Sutton, 1902 (Meldola: Hope Dept. Collection, Oxford); Putney Common (H. Swain).

BUCKS. Chalfont St. Peter (V.C.H., 1905).

*(To be continued.)*

# Nature Conservation in the London Region

## Report on the Activities of the Nature Conservancy, 1956

By O. E. BALME and W. A. MACFADYEN.

WINDSOR FOREST, BERKS. M.R. 41/936740.

The Crown Estates Commissioners have agreed to set aside a small area (45 acres) of the typical ancient woodland as a "Wilderness Area" which will be managed as a Forest Nature Reserve in the interests of nature conservation and ecological research. This area, known as High Standing Hill, consists mainly of beech and oak with a good variety of other species scattered in the canopy and shrub layer. The most remarkable feature of the area is the profuse natural regeneration of beech and, to a lesser extent, of oak; the main subject for research will be the progress of natural regeneration under different conditions of light intensity, ground cover, etc. High Standing Hill is in a part of the Estate not open to the public, and only a limited number of permits will be issued to scientists working on approved research projects or survey work.

### KENT.

SWANSCOMBE SKULL SITE NATIONAL GEOLOGICAL RESERVE. M.R. 51/598743.

Mr. and Mrs. B. O. Wymer and Mr. John Wymer have continued their excavations in the Upper Middle Gravel throughout the year. Some 76 cubic yards of material was meticulously examined and removed. Many fragments of mammalian bones, nearly all in bad condition, and teeth, were recovered, and have been provisionally identified at the British Museum (Nat. Hist.) as Elephant, Rhinoceros, Bovids, Horse, Red Deer, Lion, Dog, and Goose. These are definitely recorded from the Upper Middle Gravel, it is believed, for the first time.

No further human remains were found, but specks of charcoal continued to occur. Acheulian artifacts were again prolific, 29 hand axes being recovered and some 1770 worked flints, mainly flakes.

The Wymers propose to continue their excavations.

JOYDEN'S WOOD. M.R. 51/5071.

The value of this area as a site of scientific interest has been considerably reduced by the numerous incursions for residential development. Part has been acquired by the Forestry Commission and will therefore remain under some kind of woodland. It is questionable whether this site should remain on our schedule and its possible deletion must be considered during the coming year, when the Kent schedule should be revised.

OLDBURY AND SEAL CHART. M.R. 51/5755.

The part of this site lying between Stone Street and A25 has been subject to a Tree Preservation Order by the County Council.

GREENHILL WOOD. M.R. 51/5360.

A Tree Preservation Order has been proposed for this wood.



## SURREY.

During the year attention has been drawn to the geological interest of two Sites of Special Scientific Interest already notified for their botanical and ornithological interests.

## FETCHAM MILL POND, LEATHERHEAD. M.R. 51/158562.

Of hydrogeological interest and unique in south-east England, eight spring-pits are found as large crater-like vents in the bottom of the artificial mill pond. The largest is 16 feet deep and 10 feet across the top. In the bottom of each, sand is kept in suspension by the strongly upwelling water, giving the illusion of a miniature smoking volcano. Each is fed from its own separate fissure. They have been known to dry up, but when strongly flowing they yield a total of over  $3\frac{1}{2}$  million gallons daily of excellent Chalk water of a beautiful pale blue colour, some of which is used for watercress beds. They are mentioned in Domesday Book, and have been described by F. H. Edmunds in this journal (1944, for 1943, pp. 2-7, figs. 1-3).

## NORBURY PARK AND FOXBURY, MICKLEHAM. M.R. 51/1653.

Some ten out of 21 famous swallow holes known in the Chalk Rock bed of the River Mole between Dorking and Mickleham are included on the borders of this Site of Special Scientific Interest. In dry seasons they take the whole of the flow, and this stretch of the river dries out at the surface, the water reappearing between Mickleham and Leatherhead. They appear to be responsible for the gorge-like form unusual in Chalk valleys. The stream bed has not been lowered, and both meandering and widening of the valley have been thus prevented. Some of the fissures must be enormous, for in 1940 a fully grown oak tree disappeared into a hole about 30 feet in diameter within a few minutes, and later the top-most twigs were seen in the hole about 15 feet below the ground surface. A larger collapse nearby, of unknown date, has left a depression nearly 200 feet across.

This phenomenon was referred to by Spencer in his "Faerie Queen" published in the last decade of the 16th century, and is shown by Speed in his map of 1610. It is described by F. H. Edmunds (1944, *loc. cit.*).

## MIDDLESEX.

## RUISLIP RESERVOIR MARSH. M.R. 41/0890.

Progress has been made towards the establishment of a local Nature Reserve under Section 21 of the National Parks Act. The local natural history society has asked the Conservancy's advice on management and a discussion of the problems was to take place in January 1957.

No other developments of importance have occurred in the past year. It is hoped that the appointment of a Regional Officer for the South East will lead to closer liaison with local naturalists, local authorities and others interested or involved in the difficult task of nature conservation in the London area.

## Books

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*A Revised Key to the British Water Bugs (Hemiptera—Heteroptera)*  
by T. T. Macan, pp. 74, many black and white line drawings.  
Freshwater Biological Association (Scientific Publication No. 16),  
1956. Price to non-members, 4/-.

The two Freshwater Biological Association handbooks dealing with the British aquatic Heteroptera (published in 1939 and 1941 respectively) have been out of print for some time, and all students of freshwater insects will now be pleased that Dr. Macan has prepared a new edition, combining in one volume all the matter dealt with in the previous two booklets. At the same time he has taken the opportunity for redrawing some of the text figures and re-arranging them to fit the altered text, making some nomenclatural changes, extending the bibliography, and for correcting some minor mistakes that occurred in the earlier editions.

After commencing with a brief note on killing, preserving and examination, there follows a key to the aquatic families of Heteroptera. The main body of the work consists of various keys to the species. These are often well detailed, particularly as in the case of the genus *Velia* (Water Crickets) where both macropterous and brachypterous forms of either sex may be met with. Useful also are the clear line drawings of the male parameres in the difficult genus *Corixa* (Water Boatmen) when often only microscopic examination can make certain the correct identification. Following these keys are eight pages of ecological notes, and although the distributional data refer mainly to the Lake District the habitat preferences given may be equally applied elsewhere in this country. Finally, there are three pages of references listing the more important taxonomic papers by British and Continental authors that have been published in the last 50-60 years.

This publication will continue to be the standard reference for identification of our water-bugs, and is invaluable not only to hemipterists, but to all those who interest themselves in freshwater biology. The Association is to be highly praised for producing their keys to freshwater insects and for continuing to make them available to members of the public at such a nominal charge.

E. W. G.

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*Animal Navigation* by J. D. Carthy, pp. 151, 64 figs., 18 pls., Allen and Unwin, 1956, 18/-.

Dr. Carthy, who is Secretary of the Association for the Study of Animal Behaviour, provides us with a most attractively written outline of modern investigations of the almost intractable but fascinating problem of how animals find their way about. The author explains how insects and other arthropods are able with their compound eyes to recognise and analyse polarised light, and how ants, bees and wasps can recognise their surroundings. Our knowledge of the methods of insect navigation has a much more satisfactory experimental basis than

that of those employed by birds, mammals and fishes. Dr. Carthy reviews the remarkable, if well known, features of bird migration, the immense journeys of breeding fishes, the ability of dogs, horses and even mice to find their way home again when removed long distances. He discusses modern experimental work and theories and it is evident that no satisfactory explanation to most of these problems is yet forthcoming and that much more remains to be discovered.

The book should be in all public libraries and it is to be hoped that a cheaper edition will soon be available for the individual naturalist's bookshelf.

C. P. C.

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*The Observer's Book of Garden Flowers*, compiled by Arthur King, pp. 240, 200 coloured and black and white illustrations. Frederick Warne & Co., Ltd., 1957, 5/-.

With so many garden flowers now common in cultivation any selection for a book of small size must inevitably be a personal one. In the case of this latest addition to the Observer's book series the compiler has chosen for description 200 of the more popular annuals, biennials and perennials illustrated in G. A. R. Phillips' larger volume, *The Book of Garden Flowers* (Revised edition 1953), also published by Warne.

Every alternate two pages are produced in colour but where more than one species is described on a page it is not possible to tell which is the one figured. The publishers would do well to add Latin names below each flower in any revised edition of this little book they may issue. Apart from this there is a wealth of information in a compact form and and in the present time of ever-increasing production costs no one can grumble at its price.

Keen gardeners in the L.N.H.S. will find it a handy-sized book to have nearby when next making a selection from their seedsman's list.

E. W. G.

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The following books have also been added to the Library during 1956:

- R. E. Coker, *Streams, Lakes and Ponds*.
- W. Gaunt, *Chelsea*.
- R. Gathorne Hardy, *Wild Flowers in Britain*.
- A. Irvine, *The London Flora*.
- J. J. Keiffer, *Diptera—Chironomidae Ceratopogoninae*.
- M. Knight, *Some of my animals*.
- F. Howard Lancum, *Badger's Year*.
- Linton and Woodward, *Geology*.
- Bryan Little, *James Gibbs*.
- T. T. Macan & E. B. Worthington, *Life in Lakes and Rivers*.
- D. Melin, *Swedish Asilids*.
- E. Morris, *Towers and Bells of Britain*.
- L. C. O. Parent, *Diptera—Dolichopodidae*.
- C. Pierre, *Diptera—Tipulidae*.

- M. W. F. Tweedie & J. Harrison, *Malayan Animal Life*.  
 Constantin Weyer, *The Private Life of Fishes*.  
 W. Whitaker, *Memoirs of the Geological Survey of England and Wales*,  
 1889.  
 W. Whitaker, *Geology of London*, Vols. 1 and 2.  
 W. Whitaker, *Geology of London Basin*, Vol. IV, Pt. 1, 1872.  
 W. Prudhomme Van Reine, *Plants and Animals of the Sea Shore*.  
*The Entomologist*, Vol. 56 (1923), 66-67 (1933-34), 82-84 (1949-51), Vol.  
 86 (1953).  
*The Entomologist's Record*, Vols. 58-61 (1946-49).  
*Journal of Society for British Entomology*, Vol. 1 (1934-49).  
*Transactions of Society for British Entomology*, Vols. 1-7 (1934-41).  
*Handbook of British Birds*, Vol. IV.  
*International Committee for Preservation of Birds, Report 1954*.  
*British Birds*, Vols. 44-47 (1951-54).  
*The Entomologist's Gazette*, Vols. 3 and 4.  
*The Entomologist's Monthly Magazine*, Vols. 84-87 (1948-51).  
*Journal of Animal Ecology*, Vol. 6 (1937), Vols. 18-23 (1949-54).  
*The Naturalist*, 1906-46, 1950-55.  
*Proceedings of Geologist's Association*, Vol. 66, Parts 1 and 2.  
*Proceedings of XIth International Ornithological Congress*, 1954.  
*Bulletin of British Ornithology Club*, Vol. 75, No. 2; Vol. 76, No. 2.  
*Proceedings of South London Entomological & Natural History Society*  
 1948-51.  
*County of Surrey Development Plan*, 1953 Report.  
*British Museum, Instructions for Collectors. Birds and Eggs*.  
 And a number of County and Local Bird Reports.

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## Obituaries

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### Harold John Burkill (1871-1956)

Harold John Burkill was born at Chapel Allerton, Leeds, on 24th December 1871, the son of Isaac Henry Burkill of Cheltenham. He received his early education at Cheltenham College and was admitted to Gonville and Caius College, Cambridge, in October 1891. He obtained his B.A. degree in 1895 and proceeded to his M.A. in 1899.

On leaving Cambridge he became a medical student at St. Mary's Hospital, Paddington, but his health broke down and he was forced to abandon his medical career. He became a member of the London Stock Exchange where his industry, honesty, kindness and sociability were recognised, as was shown in the appreciative notices that appeared in the London newspapers on his retirement from stockbroking. His knowledge of natural history was well known and his advice sought by brokers and jobbers with similar interests.

A keen sportsman, especially as a hockey and tennis player, he was a member of several famous sporting clubs during his life. This energy

and love of the open air, with his friendly keenness to help others, had full vent in his services to our Society, preventing him from limiting himself to research.

He had a considerable knowledge of birds, plants and insects and recorded his observations and finds during his frequent long walks, in his diaries which he maintained day by day, year by year. By the time that his brother, I. H. Burkill, the well-known Kew botanist, left for India in January 1901, H. J. B. had acquired a knowledge of plant galls. This interest was fostered by the appearance of E. T. Connold's "British Vegetable Galls" in 1901. At the time Burkill found the volume disappointing and commented "little botany, practically no entomology"; moreover Oak galls were omitted. However, living then at Kew, he was able to further his studies in his walks over Barnes and Wimbledon Commons and Richmond Park and in Kew Gardens itself.

Holidays with friends and his family, in Yorkshire, Scotland, the Lake district, Sussex, etc., widened his knowledge of plants, and his correspondence with Connold, Swanton and others increased his keenness in plant galls.

Joining the Society in 1915, he was quickly appreciated by the prominent members. A few of the botanists of the Society were already mildly interested in galls. It will be remembered that Connold had followed his first book with "British Oak Galls" in 1908 and the following year with his handbook "Plant Galls of Great Britain". Also in France there had appeared the first volume of C. Houard's "Les Zoocécidies des Plantes d'Europe et du bassin de la Méditerranée". 1912 saw the publication of E. W. Swanton's "British Plant Galls". These well-illustrated books were welcomed by Burkill and others and encouraged them to form a Plant Galls Committee in 1916 which became, on the Society's reorganisation, a Section in 1917. This Section Burkill organised until its amalgamation with the Entomological Section in 1949.

Throughout the thirty-three years Burkill was the stimulus to the Section. He had a very wide knowledge of galls in the field, and spent much labour and time in the search for them. The opening paper of the 1916 volume of the *Entomologist* was Burkill's "Additions to the List of British Plant Galls" based on the discoveries of E. B. Bishop, L. J. Tremayne and himself. The same year he published "Plant Galls of Thorpe and District" in the *Derbyshire Archaeological and Natural History Society's Journal*. These were followed by a steady flow of papers and short notes: distribution lists, descriptions of 'new' galls, additions to the 'British List' often illustrated with beautiful pen and ink drawings. Among them, and especially remembered, are "British Gall Mites" in *London Naturalist* for 1929 and "An Introduction to the Study of Plant Galls" in *London Naturalist* for 1931. Breeding the insects and related research work was rarely undertaken, his interests were so diverse and his duties left him with little spare time. Already a Fellow of the Royal Geographical Society when he joined us, he continued to attend their lectures and was a constant user of their library. Indeed, during the London Blitz, when stockbroking was quiet, he

would walk from the City via the Parks to South Kensington to change his books before venturing to see whether the line was repaired and he was able to take his train to Leatherhead.

His wide reading, especially on plant galls, was placed at the disposal of his many friends and correspondents. His clues helped in solving many problems of identification though at times it must be admitted his zeal made him more optimistic than discreet. In his writings he endeavoured to stimulate further interest in the study of plant galls and constantly referred in these articles to the work of the members of our Society.

He became Minuting Secretary of the Society, continuing for 30 years until 1949. A regular attendant at meetings, he made frequent exhibitions of galls, etc., and with his wide interests and knowledge of men became a most useful Council member. He introduced many members to the Society. His annual reports on Plant Galls and those on British Butterflies were widely known and valued. When the Ecological Section commenced the Bookham Common survey, Burkill assisted right from the start and attended regularly. He also served as our representative on the local committee of the National Trust. Although he declined election to the Presidential chair, his energetic work for the Society for so many years was remembered on his appointment as a Vice-President in 1945. In Yorkshire, too, he was well-loved and honoured as a naturalist.

He did not marry and died on 17th March 1956, after living longer than many of his friends, but those who remain will always miss his cheerful company, his fund of stories, and his nature lore and be pleased that his memory will be sustained by the collections of galls, insects and books given to the Society by his sister, with whom he shared so many rambles and who had looked after him for so many years.

J. R., L. P.

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### Edward Alfred Cockayne

With the passing of Dr. Cockayne on November 28, 1956, at the age of 76, British entomology lost the most outstanding contemporary authority on its Macrolepidoptera. It was indeed distressing that one who had been so active all his life should have been struck down by grave ill-health during the last four years of it.

From his quite early days when he was at Oxford University Cockayne had shown a marked interest in the Lepidoptera, delving into the life histories, the habits and habitats of many uncommon species of which the first he treated was the Rannoch Beauty (*Nyssia lapponaria*). It is remarkable how he was able to combine with such brilliance the study of these insects with his profession of medicine in which sphere he also attained considerable eminence. His name appears in the literature as far back as 1900. Since then, though he never compiled a standard

work on any branch of entomology, his writings were prolific. He turned out just over 200 papers dealing with almost every aspect of the Lepidoptera of his country, in particular with their anatomy and genetics. Various types of abnormality also engaged his attention, such as teratology and gynandromorphism. In 1921 he contributed to the *London Naturalist* a monumental work of 60 pages on the "Structural abnormalities in the Lepidoptera". All his papers reveal a high degree of scholarship and an almost encyclopaedic knowledge of the literature.

It was during the First World War that he became associated with this Society on its amalgamation with the City of London Natural History Society of which he was an ardent member. He then became President of the London Natural History Society, an office he held from 1915 to 1919. In this capacity he gave two addresses, for one of which he took as his subject "Insects and Disease". He was a most careful and meticulous worker in the field as well as at home. A most interesting account of his collecting experiences appeared in these pages in 1923 after which there was a long gap until 1945 when he contributed "An appreciation of L. B. Prout and his work".

He had spent most of his life in this country, though he had been to the Far East in 1912 and had served in the Navy in Northern Russia in the 1914-18 War. It was when he retired in 1944 from the Medical Service after the Second World War that he was able to devote himself entirely to entomology. It was during this last ten years of his life, after he had settled at Tring, that he achieved his greatest work which is a lasting memorial to his industry. During this period he combined his own fine collection with that amassed by the late Lord Rothschild and that generously donated by Dr. H. B. D. Kettlewell. These three large collections of British Macrolepidoptera formed the basis of a general one in the Tring Museum, now comprising some 2000 drawers of the National collection. They contain a vast number of aberrational forms, many of which are unique. He produced many papers on these forms giving their full references, genetics and photographic reproduction. For his services in this field he was awarded the O.B.E. in 1954.

Besides holding the Presidency of this Society Cockayne held many other important offices, including that of President of the Royal Entomological Society in 1943 and 1944. He was twice President of the South London Entomological and Natural History Society, in 1927 and 1928 and again in 1940. In the world of medicine too he attained many high positions. He was Consulting Physician to the Middlesex and Great Ormond Street Hospitals. He was also a noted authority on the diseases of children.

He had a very forthright manner and could at times be very pungent. But beneath a somewhat shy exterior there lay a very kindly and cheerful nature. He was always ready to give help and information to the many who sought it and especially to the younger generation. Those who knew him intimately realise they have lost a very good friend and mentor.

C. G. M. DE W.

# Official Reports for 1956

## Curator's Report

The Botanical Collections have been examined and found free of insect pests, and a supply of mounting paper has been purchased with the intention of remounting some of the older specimens in the near future. A collection of about 100 plants, mostly from Bookham Common, has been presented by Mr. E. B. Bangerter.

There have been no additions to the Ecological Collections during the past year.

The Diptera, Coleoptera and Lepidoptera Collections are in process of being rearranged by the Entomological Curator, Mr. P. Le Masurier, and a team of four helpers. There are numerous drawers of unclassified material to be sorted. Unfortunately one of the Macro-Lepidoptera collections has suffered very severely from damp in the past and is gradually being scrapped, except in cases where there are no duplicates in better condition. It was hoped that by the end of the winter there would be one properly classified and tidy collection of Lepidoptera.

Additions to the Ornithological Collections comprise skins of Red-throated Diver, Red-breasted Merganser and Razorbill, and photographs of the Dartford Warbler and its habitat. A catalogue of the skin and egg collections has been prepared and copies are available to members.

It is hoped that since much work on rearranging the Collections has now been carried out, more members will in future make use of the extensive material the Society possesses. K. H. HYATT, *Curator*.

## Nature Conservation Committee's Report

This report is the last to be presented to the Society by the Nature Conservation Committee as a sub-committee of the Council. In future it will function as the Nature Conservation Committee of the Ecology Section. The Section has undertaken the responsibility of organising visits to the scheduled and recommended areas in order to draw up short reports on the vegetation and animal life. It is hoped that, by this means, more interest in the conservation of the areas will be aroused among members. A knowledge of the ecology of a habitat is, of course, an essential background to any scheme of management for ensuring the conservation of its flora and fauna.

The resignation of both the Chairman and Secretary has become an unavoidable necessity owing to the Chairman leaving London in the near future and to the Secretary's new commitments to the Society. There appears to be at present a phase of stability, if only temporary, in most of the conservation areas and at the same time a realisation at last within the Society that investigation of these areas must be undertaken and organised on ecological lines as one of the Society's field activities. The Chairman and Secretary retire therefore with the confident feeling that Nature Conservation will receive a new lease of life under the auspices of the Ecology Section.



Mrs. McMullen sounds an optimistic note in her report on Middlesex. The Middlesex Development Plan has now been published in its final form and it seems that a period of some stability may be anticipated for the county. The planners envisage an ultimate reduction in the population, and limits are to be set to gravel workings, so it may be assumed that existing agricultural land and other open spaces will be, for the most part, left alone.

The new road to be built on Staines Moor is generally agreed to be necessary, and although it may spoil some of the Moor for nesting birds, against this must be set the fact that the two reservoirs nearby provide a wonderful sanctuary for many kinds of birds. The proposed gravel workings on Hounslow Heath will, of course, destroy much of the existing fauna and flora, but, on the other hand, gravel pits, like the reservoirs, provide large stretches of water, which are soon colonized by aquatic plants and birds and cannot be regarded as completely detrimental to wild life.

The Royal Parks of Hampton Court and Bushy Park enjoy a privileged position, although not completely immune to disturbance, as the United States Air Force are still camped in the latter. Other parks, such as Osterley Park, are much valued by local residents and any proposed encroachments are likely to be rigorously opposed. At Osterley Park the War Department's huts have at last been removed and the ground levelled for agriculture; allotments and grazing land have also been ploughed. These fields should now attract species of birds, such as pipits and skylarks, which are very scarce in the district.

In general, it can be said that wild life in this largely built-up county cannot in the future be much altered and, in any case, development in the past has not always been as destructive as might have been supposed. In the case of the reservoirs and even of London Airport, where birds still nest, large areas have been kept open which otherwise would undoubtedly have been used for house building.

Prof. Warmington reports that in Hertfordshire there is no immediate threat to any particular place, but the county has three perennial sources of danger: first the chief towns. Here there seems to be little anxiety about the increase of Ware, Hertford and Welwyn on the borders of the Society's area or of Rickmansworth. But the growth of the county's largest town, Watford, remains a constant, if potential, source of danger. However, local woodlands and parklands have, on the whole, been respected during recent years. The second, and chief danger is to the Green Belt round London, which is very narrow in the area covered by Radlett and Watford. If all the schemes of both units were put in practice, the belt would be about 1000 yards wide at one point. Violation of the Green Belt is an insidious danger. Boreham Wood, a new town of a "pre-belt" scheme, is well on towards completion within the Belt, although it is being made with due respect to surrounding and nearby places of natural beauty. Thirdly; digging for gravel, which goes on widely in the county and, as in Middlesex, has for naturalists interesting features. The new reservoir of the Colne Valley Water Company at Hil-

field Park, near Elstree, is nearly finished and groups of trees have been planted at several places round the water. It is a place of much interest and, especially from higher land above, of some beauty.

Mr. Hall reports, for Kent, that parts of Stone Marshes must be spoilt by the Dartford-Purfleet tunnel. Plumstead and Abbey Wood Marshes have been ruined by the large L.C.C. building estate and Erith Marshes by the Littlebrook Power Station. However, the rich Swanscombe Marshes still remain. Complaints are still received of too free access to Keston Bog and of its overgrowth by encroaching conifers. Bromley Council have still to implement their promise to trim the trees and to take some steps to prevent the worst of the trampling (and even cycling) through the Bog. The threat to Joydens Wood by peripheral development still continues and it is gradually, if slowly, being consumed by the builder. Farningham Wood is being well looked after by Dartford R.D.C. and is now a subject of ecological study by the Kent Field Club. Notices have been erected recently forbidding motor-cycling which had been spoiling part of the area.

Mr. Payne reports that in Essex the Green Belt is being threatened and continuous building on the margins of Epping Forest threatens to ruin the Forest by the inevitable increase in trampling and disturbance.

Mr. Groves reports no threats to any of the areas in Surrey. However, we still have not heard what decision has been taken on where the new South Orbital Road is to lie. Mr. Groves is endeavouring to gain the co-operation of members of the South West Middlesex Group in a more detailed investigation of Chertsey Mead. This area was recommended by the Society as a Conservation Area on account of the rich flora characteristic of flooded meadows, a habitat unknown elsewhere near London.

Miss Longfield represented the Society at the Fifth General Assembly of the International Union for the Protection of Nature held in Edinburgh from June 20th to June 28th, 1956, and gave a full report to the Council on her return. A large file of papers on the subjects discussed, which are of interest to all conservationists, has been deposited in the Society's Library. No members of the I.U.P.N. took advantage of the programme of guided excursions offered to them by the Society.

CYNTHIA LONGFIELD, *Chairman*. C. P. CASTELL, *Secretary*.

The steady increase in the activities of the Nature Conservancy is reflected in the further increase in size (from 56 to 82 pages) of their report for 1956\*.

Details are given of the twelve new, and the additions to four existing, National Nature Reserves, with notes on four Local Reserves, one of which is new and others are approaching declaration stage.

The internal organisation has been overhauled to strengthen the work of the Conservation Branch, Dr. E. B. Worthington having been appointed Chief Conservation Officer and Deputy Director General (Scientific).

\*Report of the Nature Conservancy for the year ended 30th September 1956. pp. v, 82, 12 plates. H.M.S.O. 1956. 4/6.

The formation of Local Conservation Trusts is being encouraged by the Conservancy and it is to be hoped that S.E. England will not for long lag behind other regions in this respect. For two years the post of Regional Officer for S.E. England has had to be kept vacant as an economy measure and the transfer of Miss O. E. Balme, M.Sc., to Headquarters, to fill the post, is welcome news.

The Sections of the Report entitled Scientific Research and Scientific Advisory Services make interesting reading. Reprints of most of the thirty scientific publications of the staff listed were presented by the Conservancy to the Society.

Two pages are devoted to the Effects of Myxomatosis. There have been some signs of recovery but, "unfortunately, no scientifically acceptable method has yet been devised for sampling the numbers of wild Rabbit populations". "The Conservancy deplore waste of manpower involved in efforts to exterminate Buzzards, Stoats and other predators. These, if not frustrated by persecution, will assist in getting rid of the remains of the Rabbit population and, incidentally, of country-living Rats, whose position has also been made more vulnerable by the greater attention which they are receiving from predators. If efforts were concentrated on Rats and Rabbits, and potential allies were not destroyed but were protected, then a more optimistic view could be taken of the possibility that these two major pests will not recover from the most difficult situation which has faced them for many years".

"The Conservancy are maintaining their investigations into the repercussions on vegetation and animal life of the reduction of Rabbit numbers". The Buzzard has been hard hit, but there does not appear to have been any general increase in Hares and Voles.

"Profuse flowering of many uncommon plants such as the Pasque Flower and even the Soldier Orchid (which had been believed extinct in Britain) may not continue if coarse grasses and woody plants are not held down by some alternative form of grazing".

The Conservancy have submitted a Memorandum to the Royal Commission on Common Land, pointing out that common lands are now among the principal surviving reservoirs of the fauna and flora which formerly inhabited the surrounding reclaimed areas. Suggestions were made of a thorough survey of existing common lands, of research and management schemes and for consultation with the Conservancy.

Further research has been made into the chemical spraying of roadside verges and in the risks to wild life by the use of toxic chemicals in agriculture, and advice given to the appropriate Ministries. The Ministry of Agriculture has now issued a leaflet recommending precautions deemed essential during spraying or dusting for the protection of wild life.

In view of the public outcry at the burning of gorse land and scrub at Milton Hide, Sussex, in April 1956, to prevent its use as rabbit cover, it is of interest to note that the Conservancy are at present undertaking experiments designed to develop an effective alternative method of controlling unwanted woody vegetation with herbicides which will not cause indirect damage to other plant and animal life. The Conservancy intend to arrange regional meetings of all the authorities concerned.

In the Section devoted to the Management of Nature Reserves, a point, so often mentioned in the Society's reports, is strongly emphasised: the urgent need of information about the fauna and flora and of building up the fullest possible picture of the history, past trends and of the present situation. This is necessary to avoid undue risk and expense in experimenting in methods of management. Every Nature Reserve has its Reserve Record of the fauna and flora and of the past history, and assistance from the public in survey work is welcomed.

The Appendices include a list of the National and Local Nature Reserves, with acreage, access and restrictions, and address of warden. There is also a list of over seventy Research Grants, Contracts and Studentships, with names and subjects; this gives some idea of the large amount of ecological research which the Conservancy has been able to foster, in spite of severe restrictions through shortage of funds.

C. P. C.

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### Librarian's Report

The number of items borrowed was 194 as compared with 206 in the previous twelve months. These were borrowed by 143 members and the average attendance on library evenings was 8. It must be remembered, however, that now that we have warm and comfortable accommodation borrowers often stay quite a long time.

A great deal of binding has been carried out, especially of Entomological journals, where gaps in our runs have been filled, and the Journals of Ecology and of Animal Ecology. Efforts are being made to recover all those books and journals which have been out on loan for a long time. Sectional catalogues are now available for Botany, Ecology, Entomology, and Ornithology. There has been a good number of additions to the library through the Reading Circles, by gift and purchase and review copies.

The library is greatly indebted to a member, who wishes to remain anonymous, who presented a long series of "The Mariner's Mirror", which have been sold for £10, for the benefit of the Ornithological Section. Through the kindness of Miss Burkill the library has been given the bulk of the Plant Galls and Entomological books, journals and pamphlets left by the late Mr. H. J. Burkill. These include long runs of "The Vasculum" and "The Naturalist", and of several Entomological journals which, after gaps in our own series have been filled, can be sold for the benefit of the library.

It is a great pleasure to welcome as my successor Mr J. B. Foster, who has kindly offered to take over the librarianship. He has already worked with me for several months and his keenness will make a great difference to the running of the library. I shall give him all the help I can. In conclusion I should again like to express my grateful thanks to the Sectional Librarians and to the members of the library rota for their work in the library and attendance at the fortnightly library evenings.

R. W. HALE, *Librarian.*

## Report of the Epping Forest Field Section

This section, newly formed from the old Chingford Branch, has had a very successful year with greatly increased membership. Twenty-three field meetings were held, with an average attendance of 18 people. There was only one indoor meeting, the A.G.M., when an absorbing talk on the animals of Epping Forest was given by Mr. Fred Speakman, who has such an intimate knowledge of the Forest and its natural history. The lecturer, during his talk, showed a fine collection of slides including a number of photographs of badgers, and produced live specimens of reptiles for his enthusiastic audience to handle.

The scope of the field meetings covered the N.E. corner of the Society's area, giving the section a greater variety of habitats than just Epping Forest. A total of 100 species of birds, 18 species of Diptera, 49 species of Coleoptera, and over 200 plants were recorded in the area by members. The survey proposed by the section has been abandoned for the time being.

The officers and committee would like to extend a vote of thanks to the leaders of field meetings and to all who have helped to make our first year such a success, and especially to Mr. W. Vincent, who is resigning from the committee after many years of service to the Society, and to our chairman, Mr. F. Bancroft, whose resignation we must regretfully accept.

It must be emphasized that members of other sections, whether expert or otherwise, are always welcome.

J. JONES, *Secretary.*

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## South-West Middlesex Group Report

1955-56 membership has shown a marked increase this year. Our present total of 83 is made up by 69 Ordinary members, 12 Associates, and 2 Affiliated Societies.

Weather conditions have adversely affected attendance at field meetings this year—attendances have averaged 15; at indoor meetings the average was 14.

We regret to announce the resignation of our programme secretary, Mr. R. Parsons. He has worked conscientiously during the past three years to provide a wide range of interesting programmes. We are all very grateful to him and wish him every success on his new appointment with the Geological section.

All members are asked to give their support to the programme secretary by attending meetings and making suggestions for further meetings.

The second course of lectures arranged through the Department of Extra-Mural Studies, London University, is in progress at Bulstrode School, Hounslow; 17 students are attending this course. Suggestions for a further course of study next winter would be welcomed by the Secretary.

*Ornithology.* Our Chairman continues to maintain records of observations of birds in the area.

*Entomology.* Mr. C. W. Pierce, our group recorder, reports that in spite of bad weather the number of species recorded is higher than in the last two years. A total of 166 moths and 13 butterflies have been recorded, 37 species of moths not previously recorded since the group's formation.

*Botany.* We now have a group recorder for botany, Miss A. Davy, who will be pleased to receive plant records together with a few short notes on the plant's habitat.

*Nature Conservation.* Mrs. W. M. McMullen continues to represent the Society in this area, and would be glad of assistance from group members in covering areas by periodic visits.

Again this year we were fortunate to have a coach trip organised and led by Mrs. Small to Cuckmere Haven. This was a most enjoyable day with many rewarding observations. Outstanding were the Bee Orchid, Star Thistle, and Dwarf Ragwort.

Our appreciation and thanks are due to the Society's President; Lieut. Comdr. C. P. Staples, R.N., M.B.O.U.; J. Wymer, Esq., History Master, Wokingham School; W. C. Cunnington, A.L.A., Borough Librarian of Heston and Isleworth; P. F. Shenton, A.R.P.S., Vice-Chairman, Twickenham Photographic Society; D. England, Esq.; and to Society members: D. G. Hall, V. G. H. Howlett, and K. H. Hyatt, for their papers at indoor meetings, and to the following Society members for leading field meetings:—R. Cashmore, H. C. Grigg, H. J. Mackett, G. W. Moore, R. H. Ryall, C. A. White, Miss E. M. Goom, Mrs. B. Welch, F. E. Wrighton.

A. ANDERSON, *Chairman.* E. EVERITT, *Secretary.*

**STATEMENT OF ACCOUNTS YEAR ENDED 31st OCTOBER 1956**  
**GENERAL ACCOUNT**

STATEMENT OF ACCOUNTS,

1955		<i>Receipts.</i>		<i>Payments.</i>			
£995 4 3	Subscriptions—Current	...	£1117 15 3	£192 10 6	Rents	...	£188 13 4
33 1 6	Arrears	...	41 13 6	127 14 8	Programme	...	113 17 3
20 8 0	Advance	...	20 16 0	47 16 4	Printing and Stationery	...	59 14 9
18 7 6	Entrance Fees	...	31 7 6	36 12 5	Postages—Secretaries and Treasurer	...	42 13 10
£1067 1 3				2 18 6	Insurance	...	4 8 6
8 2 1	Interest on Post Office Account	...	...	3 0 0	Gratuities	...	3 0 0
—	Interest on Deposit Account	...	...	12 12 0	Subscriptions to other Societies	...	10 12 0
2 12 6	Interest on £75 War 3½% Stock	...	8 15 9	67 6 0	Sectional Expenses	...	60 11 6
5 8 0	Interest on £180 Savings 3% Stock 60/70	...	2 12 6	15 12 6	South West Middlesex Group Expenses	...	5 0 0
2 1 0	Hire of Rooms	...	5 8 0	11 14 1	“Birds of London Area” Expenses	...	28 18 2
4 0 0	Donations	...	...	109 16 3	Secretary's Honorarium and Expenses	...	136 12 7
120 4 7	Deficit at 31st October	...	...	53 14 11	Librarian and Curator's Expenses	...	—
				7 16 6	Sundry Expenses	...	4 3 10
£1209 9 5			£1255 9 10	517 5 4	Publications Account	...	474 8 9
				2 19 5	Deficit brought forward	...	120 4 7
				—	Balance at 31st October 1956	...	2 10 9
				£1209 9 5			£1255 9 10

PUBLICATIONS ACCOUNT		ACCOUNT			
£58 9 6	Sales of Publications	£489 8 5	London Naturalist—Printing and Postages	...	£382 9 5
32 15 3	Sales of Christmas Cards, 1955	182 8 3	London Bird Report—Grant	...	220 0 0
18 0 0	“	17 1 9	Christmas Cards, 1955—Printing and Postages	...	46 12 0
25 0 0	Grant—Royal Society—London Naturalist	—	1956—Reserve towards Printing	..	30 0 0
12 5 0	Advertisements—London Bird Report	85 8 7			
5 0 0	Donation—London Naturalist	49 0 0			
537 8 8	Balance from General Account	16 7 0			
		5 0 0			
		474 8 9			
£688 18 5		£679 1 5			

The Legacies, Life Composition and Reserve Accounts remain at £93 7s 6d, £350 and £75 respectively.

The Society has undertaken to pay £500 for 400 copies of *The Birds of the London Area*. At 31st October 1956 subscriptions for 272 copies had been received and £340 is held by the Society on a separate account. The remaining liability for 128 then unsold, of £160, is partly covered by personal guarantees of members.

Audited and found correct;

10th December 1956.

J. H. G. PETERKEN, *Hon. Auditor.*

A. W. JONES, *Hon. Auditor.*

L. PARMENTER, *Hon. Treasurer.*

## Sectional Reports

### Archaeological Section

THE usual number of meetings has been held during the year and attendances have been satisfactory.

In January we were shewn over Old Battersea House by the owner, Mrs. A. M. W. Stirling, whom we were glad to find as active as ever. In February we were shown round Westminster School by J. D. Carlton, Under Master and author of "Westminster School". Encouraged by the attendance of about 40 members, Mr. Carlton shewed us all round the school, including the Queen's Scholars Dining Hall built about 1370 by Henry Yeveley, of whom our member, J. Harvey, has written a biography. In March Captain Holden, Librarian, conducted a visit to Grays Inn. Captain Holden has now shewn a wide range of Societies over his Inn, and in spite of several efforts, including those of the writer, no-one was able to ask him a question which he was unable to answer. In April T. L. Bartlett conducted the Archaeological part of a joint visit with the Geological Section to Harefield, and a very interesting afternoon was spent. In May a very successful visit was paid to Somerset House, which has now entirely recovered from war damage. The original quarters of the Royal Academy, the Admiralty quarters occupied by Lord Nelson, and the 17c gravestones remaining from the original building were points of special interest. In June W. S. Palmer, M.B.E., gave us a very well attended talk, entitled "A Sketch Book of Vanished London" and Miss Darlington conducted an all day visit to St. Albans. Among other things we were given a very competent tour of the complicated excavations on the site of Verulamium, and spent a very interesting day. In July we visited Chelsea, inspecting Chelsea Church, Crosby Hall, and the Moravian burial ground. In the unavoidable absence of Miss Darlington the tour was competently conducted by Dr. Broom, ex-Warden of Crosby Hall.

In September G. F. Walsh gave us one of his topographical rambles in professional style. Starting from Tower Hill Stn. we first passed St. Katherine's Dock, where we were given a brief history of the London Docks. We then went along Wapping High Street, where we were shewn some of the interesting river-side sites. Crossing the river to Rotherhithe, we inspected interesting Rotherhithe Church and the neighbouring 18c houses. We then took the bus to the Russia Dock district, where we inspected the exterior of the Swedish Church and found more 18c houses.

In October we visited the Sir John Soane Museum, Lincolns Inn Fields, where we were shewn round by the Curator, John Summerson. In November a visit was paid to Old St. Pancras Church and St. Pancras Parish Church. In the unavoidable absence of the Chairman, Mr. Walsh very kindly took over the tour, and it was voted a very successful afternoon.



In December a tour of Roman London was made. By the courtesy of the Directors of the Bank of England we inspected the two tessellated pavements which were discovered during the re-building between the wars. A visit was then made to the section of the wall underneath the G.P.O. By the courtesy of the City Engineer we then inspected the north face of the section of the wall in London Wall, and then the excavation of the West Gate of the Roman Fort, where Mr. Grimes, Curator of the London Museum, kindly placed his diagrams and notes at our disposal.

Thanks are due to the committee, to Mrs. Regan for acting as secretary, to Miss E. Welford for acting as reading-circle secretary, and to Mr. Payton for acting as lanternist.

V. HOWLETT, *Chairman.*

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### Botanical Section

The section now has 378 members, an increase of 55 during the year.

*Indoor meetings.* One General and five Sectional meetings were arranged with an average attendance of 41, a gratifying increase over the 27 of last year. The general meeting 'Wild Flowers and Weeds' given by L. C. and S. T. Jermyn was of particular interest in that three-dimensional projection was used for the coloured slides. Eminent guest speakers at other meetings were Dr. E. V. Watson and Dr. J. G. Dony.

*Outdoor meetings.* 20 excursions were held with an average attendance of 15. The usual winter excursions for Fungi and Bryophytes were made, and an afternoon visit, under the guidance of E. B. Bangerter, to the Department of Botany, British Museum, Natural History, was very successful. Thanks are due to Miss P. I. Edwards and Mr. J. F. M. Cannon for demonstrating interesting exhibits. A special meeting in June for grasses, led by Dr. A. Melderis, enabled 57 species to be identified and demonstrated. Thanks to the efforts of our Programme Secretary a highly successful excursion to Pulborough and Amberley was held in July. This famous area, with its rich flora of aquatics, was reached at low cost by use of a Ramblers' Excursion train. Some other places visited and plants seen were as follows:—Chelsham and Warlingham, *Helleborus viridis*, *Veronica filiformis*; Swanscombe, fresh and salt marshes and chalk pits, *Ophioglossum vulgatum*, *Sorbus intermedia*; Brent Reservoir; Greenhithe to Green Street Green, *Silene italica*, *Genista tinctoria*; Putney Heath; Staines Moor; Highgate Woods, *Sorbus torminalis*, *Epipactis helleborine*; Ongar, where records were made for the B.S.B.I. Maps Scheme; Uxbridge, along the Colne for aquatics; North Cray, *Triglochin palustris* and other marsh species; Beckenham Place Park, weeds of arable land, *Acorus calamus*.

Work has continued on the B.S.B.I. Distribution Maps Scheme and it is felt that the squares for which the Society is responsible will be among the most thoroughly worked in the country. Thanks are due to the sub-committee that has been instrumental in this work.

The reading circle for the B.S.B.I. publications would welcome some new members.

It has been decided that records of the distribution of Bryophytes within the Society's area, along the lines of the current Plant Hand List, should be published in the near future. Our recorder, Mr. Peterken will be glad to hear from any members who can assist in this project. It may be possible later to consider Fungi in the same way.

A large quantity of herbarium mounting paper was bought early this year from the British Museum (Natural History) at an economical price. The work of remounting the Society's collection is now urgent, and steps are being taken to get the work started. Helpers with some knowledge of herbarium technique would be welcomed and suitable beginners would be accepted and given the necessary instruction. Work has begun on renovating and making dust-proof the cabinets housing the collection.

The undersigned wish to thank their colleagues on the committee for co-operation during the year, which has been responsible for increases in attendance at meetings and in membership.

E. B. BANGERTER, *Chairman*. F. E. WRIGHTON, *Secretary*.

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### Ecological Section

*Membership.* The membership has risen by 52 during the year, from 225 to 277, the highest number for the Section.

During the year the Section has arranged a full programme on ecological subjects.

*Indoor Meetings.* Two General Meetings were sponsored by the Section—Sir Edward J. Salisbury on "Downland Vegetation" and Dr. A. S. Thomas on "Changes in Vegetation since the advent of Myxomatosis". Dr. Francis Rose lectured to the Section on "Vegetation and Environmental Factors in the London Area" and a symposium on the "Changes in the Vegetation and Fauna of Bookham Common" was given by Messrs. W. H. Spreadbury, C. P. Castell and G. Beven. An informal meeting introducing the Bookham Common Survey to newcomers was also held.

*Field Meetings.* Monthly visits were made to Bookham Common and five summer visits to the City Bombed Sites for the carrying out of regular surveys. Mr. A. H. Norkett led a meeting to Effingham to compare woodland on clay and chalk, and Mr. C. P. Castell to Headley Heath to study the regeneration of the heathland. A visit to the Mole Gap was also arranged with the Geological Section.

In view of the extent of building on the City Bombed Sites it has been decided to discontinue this survey and in its place a survey of Devilsden Wood, Coulsdon and nearby chalk downs is to be commenced on the fourth Saturday in alternate months.

*Grey Squirrel Enquiry.* This enquiry is being closed at the end of 1956. In the last three years information has been submitted by 122 observers, most of whom are members of this Society. A distribution map and a report are being prepared (see page 6).

*Reading Circles.* After nine years Mr. A. H. Norkett has retired from the Reading Circle secretaryship and this task has been taken over by Miss E. M. Hillman, who reports that the circulation of 4 journals is: *Journal of Animal Behaviour*, 13; *Journal of Animal Ecology*, 29; *Journal of Ecology*, 24; *The Naturalist*, 16; the *North-Western Naturalist* has ceased publication. Several journals have now been bound through the Society's Librarian.

*Other Activities.* In addition to providing an ecological programme the Section has always endeavoured to arrange meetings for interests not catered for by other sections. Various meetings arranged for those interested in Mammals are mentioned below, but in addition a talk by Mr. G. L. Wilkins was given on "Wood- and Stone-boring Mollusca".

*Mammal Study Group.* It was mentioned in the previous report that there had been a greater interest in mammals, and during the current year the following meetings were held to cater for that interest: Mr. R. S. R. Fitter gave a talk entitled "Mammals in the London Area", and the second informal meeting was held of exhibits and short talks; Mr and Mrs J. D. Hooper led a visit to Godstone Caves to examine the bats there. During the year a Mammal Study Group was formed with a chairman, secretary and sub-committee, the objects of this group being "To encourage the study of mammals, reptiles and amphibians particularly in the London Area and to hold indoor and field meetings and to organise special surveys".

G. BEVEN, *Chairman.* A. W. JONES, *Secretary.*

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## Entomological Section

*Membership.* The addition of 53 new members has brought the Section's membership to its highest total of 235.

*Committee.* After many years on the Committee and eight years as Chairman, Miss C. E. Longfield has resigned from the Committee preparatory to her return to Ireland. The Section fared well under her leadership and extensive knowledge. She will be greatly missed. Our best wishes for many happy years of entomology in the future and our congratulations on her election as an Honorary Vice-President of the Society. We also add our congratulations to Mr. C. L. Collenette on his election as an Honorary Vice-President. Almost fifty years a member, President in 1937-38, he was secretary of the Section in 1935-36. He has an international reputation as a taxonomist, specialising in the Lymantrid moths.

During the year, with the death of H. J. Burkill, the Society lost an Honorary Vice-President who had served as the Society's Minuting Secretary for many years. He was best known in the entomological world for his work on Plant Galls, producing annual reports on these and on the British Lepidoptera. Our sympathy is tendered to his sister and others of his family on their great loss. Miss M. Burkill's generous gift of her brother's plant gall collections, notebooks and many books from his library will assist our younger students and act as a reminder to the many who were helped by him during his long life.

Mr. R. B. Benson, a past Chairman of the Section, relinquished his office of Representative to the Protection Committee of the Royal Entomological Society prior to his visit to Canada and Mr. E. W. Groves agreed to take over the duties. Both these gentlemen have had much experience in Nature Conservation problems and we are fortunate in being so well represented. Our thanks to Mr. Benson for his past work on our behalf.

*Indoor Meetings.* These have been well attended with an average of 41 at the formal meetings and 13 at the informal ones. At these meetings exhibits covered many orders and were shown by 43 members and friends. Once again we had a symposium on 'King's College (London) Ecology Club Expedition to the Spey Valley' when Messrs. B. Brooks, J. Burdin, G. Evans, P. Norman, M. A. Salmon, D. Saunders and G. Williamson spoke on the 1955 trip. The other lectures were 'Honeybees and Their Ways' by C. G. Butler, M.A., Ph.D., F.R.E.S.; 'Lepidoptera of the Chalk Downs' by L. W. Siggs; 'Beetles of Sandy Areas' by E. Lewis, F.R.E.S.; 'A Visit to Garth Field Study Centre and Glen Lyon, Perthshire' by P. C. Le Masurier and B. L. J. Byerley, F.R.E.S.; 'Mites' by K. H. Hyatt; 'Grasshoppers and Crickets in the London Area' by R. M. Payne; 'The Migration of Lepidoptera and Other Insects' by R. A. French, B.Sc., F.R.E.S., and 'Insects and Other Wild Life in the Tunisian Desert' by J. L. Cloudsley-Thompson, M.A., Ph.D., F.L.S., F.R.E.S. In addition Mr. D. G. Hall spoke to the South West Middlesex Group on 'Getting Acquainted with the Coleoptera' and lectures to both Ecological and Ramblers' sections included entomological matter.

The informal meetings included discussions on the following topics:— 'Our Collections—Society's and Personal', 'The Preparation of Short Notes and Articles', 'The Courtship of Insects', 'Collecting on Holidays', 'The Small Orders of Insects', 'Some Advantages of Breeding Insects' and 'On Exhibiting Insects'.

*Field Meetings.* The party of 32 that visited the Entomology Department of Rothamsted Experimental Station under the guidance of Dr. K. Mellanby, C.B.E., and Mr. R. A. French, on Saturday, 29th September, attended the most popular outing. The day's programme, very full and instructive, enabled members to meet correspondents with whom collaboration had been made in migration and aerial population studies.

The inclemency of the summer caused some meetings to be sparsely attended but in all, 133 members and friends joined in the Excursions with an average of 11 per meeting. The localities visited were:—All Hallows on Sea, Bookham Common, Coulsdon, Cripplegate, Dorking, Epping Forest, Horsell Common, Mickleham Downs, Otford, Oxshott, Rickmansworth, Staines Moor, Swanscombe, Tilgate and Worth Forests, Waltham Cross, Watford, Westerham and Wimbledon Common. Some of these were in co-operation with the Botanical, Ecological and Epping Forest Field Sections, South West Middlesex Group and the Amateur Entomologists' Society, thus continuing the introduction of the study of insects in our area to more naturalists.

*Library and Collections.* These continue to enlist support and interest from new helpers and students. Additions of Dermaptera, Plecoptera, Ephemeroptera, Odonata, Hemiptera, Megaloptera, Neuroptera, Mecoptera, Trichoptera, Lepidoptera, Coleoptera, Hymenoptera, Diptera, Plant Galls and Leaf Mines were presented by Miss M. Burkill, Messrs. P. W. E. Currie, A. Eve, D. G. Hall, P. C. Le Masurier, E. Lewis, A. A. Low, M. Niblett, L. Parmenter, W. Rutledge and K. C. Side. The library has received gifts of over 200 books and reprints from Miss M. Burkill, Drs. J. L. Cloudsley-Thompson, B. R. Laurence, K. Melanby, and Messrs. P. B. M. Allan, H. Britten, C. P. Castell, R. A. French, M. T. Hindson, E. Lewis, M. Niblett, L. Parmenter, M. A. Salmon, P. R. Salmon, G. B. Thompson, also from the British Museum (Nat. Hist.), Forestry Commission and Nature Conservancy. Our thanks are tendered to these donors, and to Mr. D. G. Hall our librarian, to Mr. P. C. Le Masurier and his team of specialists who have continued their work in rearranging and expanding our library and collections.

The Reading Circles have attracted new members and these have more than covered the resignations of those now subscribing direct to the periodicals. The complete annual volumes of the *Ent. mon. Mag.*, *Entomologist*, *Ent. Record*, *Ent. Gazette* have been added to the library which has also received many annual Transactions, etc., of other Societies by exchange and some entomological books purchased by the Society.

*Congress.* At the Tenth International Congress of Entomology held at Montreal, Canada, in August, our official representatives were the Baron de Worms and Mr. R. B. Benson.

C. G. M. DE WORMS, *Chairman*. L. PARMENTER, *Secretary*.

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### Geological Section

During the year the membership of the Section rose to 161, representing an increase of 33. Considerable publicity was received from a successful course of lectures, entitled "The Geology of London", held during the winter months, under the auspices of the Department

of Extra-Mural Studies of London University. The Section's chairman, Mr. C. P. Castell, took the Chair at all these meetings and was able to give the Society as a whole considerable publicity. The course of lectures, no doubt, played some part in the encouraging increase in membership over the year.

*Indoor Meetings.* One General Meeting was sponsored by the Section and was devoted to a lecture on "Glaciers" by Mr. P. Evans, who showed a remarkable collection of coloured slides which he had prepared from his own photographs taken in Norway and Central Europe. There were four sectional indoor meetings, including the annual general meeting. As in previous years, the lecture at the Sectional A.G.M. was given by the Chairman, and his subject this time was "Some Early Work and Workers on the London Clay". On January 31st Mr. G. A. Kellaway, of the Geological Survey, spoke on the "Geology of the Bristol and Gloucester District", to give members an introduction to the geology likely to be met on the Easter Field Meeting. The indoor meeting on May 15th was devoted to short talks by members and consisted of a paper on the Chalk of the Keston and Westerham district by Mr. J. S. Hampton, some very fine coloured slides of Mexico shown by Mr. K. Le Sueur, and a short illustrated account of the Eifel district by Mr. R. E. Butler. The lecture at the last Sectional meeting of the year, on September 28th, was given by Mrs. Mary Morgan and was entitled "The Interpretation of Landscape".

*Easter Field Meeting.* A successful field meeting was held during the Easter week-end in the Bath and Bristol districts, when members took the opportunity of seeing many types of rocks which are not exposed in the London Area. On the Friday, Mr. T. R. Fry of Bristol University led a coach tour to the Western Mendips, visiting some notable Carboniferous Limestone exposures at Burrington, Cheddar and Uphill. Sites of ancient Roman lead and zinc mines were seen, and some members collected quite a considerable quantity of Roman pottery. On the Saturday there was a coach tour of the Eastern Mendips, under the direction of Mr. F. R. Sterne and Mr. R. E. Butler. Among places and exposures visited were the Silurian volcanic andesites of Moons Hill, Holwell, the site of the discovery of the earliest known mammal remains in Britain, Vobster and Vallis Vale. On the Sunday morning, some members had a walk around Bath under the leadership of Miss Bradshaw, a local guide. In the afternoon the party went to Bristol to study the classic Avon Gorge section in the Carboniferous Limestone. The Monday morning was spent collecting from the classic Lower Lias section at Keynsham followed by a quick visit to the Roman remains at Bath. Monday afternoon was spent in the countryside south of Bath, where Mr. F. R. Sterne took the party to visit Midford to see the home of William Smith, who is often referred to as "the father of English Geology". A number of Jurassic exposures were also seen, and tea was appropriately taken at a café built into an old quarry.

The meeting concluded on the Tuesday with a whole day at Aust to see the classic river cliff section which provides fine exposures in the Keuper Marl and the Rhaetic Bone Bed.

*Other Field Meetings and Demonstrations.* The winter programme opened on November 5th with a visit to the Road Research Laboratory at Harmondsworth. In the following month, on December 3rd, a joint meeting with the Archaeological Section was held at the Institute of Archaeology, Regents Park, under the guidance of Professor Childs. Two visits were paid to the Natural History Museum, the first on January 7th, spent examining the meteoric collections under the guidance of Dr. M. H. Hey, the second, in March, when Mr. S. E. Ellis gave a demonstration on building-stones. On February 4th the Section combined with S.W. Middlesex Group to visit the Shell Training Centre at Teddington where, after seeing a film and some fine exhibition rooms, the party was entertained to tea by the Company. On February 25th a joint meeting with the Archaeological Section to see the marble at Westminster Cathedral attracted a very large party. The field meeting programme opened on March 18th with a successful coach tour of the Hertfordshire glacial deposits. Dr. G. H. Dury led the party, visiting Waterford, Codicote and Moor Mill. Of the short field meetings scheduled for April, the one to Oxshott under the leadership of Miss M. M. Brown was severely curtailed by very bad weather. The other, a visit to Harefield under the guidance of Mr. S. W. Hester, included the classic Tertiary/Chalk sections and was held jointly with the Archaeological Section. The annual coach trip in May was to Chislet Colliery. In spite of a last-minute cancellation of the visit to the underground workings, the party of 27 strong was able to collect a rich fossil plant flora from the tip-heaps and also to visit a number of quarries near Canterbury. On June 3rd, Mr. R. E. Butler led a party on a traverse of the South Downs from Goring-by-Sea to Storrington. The following Sunday was spent on the North Downs, when Mr. Ion Collins led a party to the Reigate district. June concluded with a visit to the Medway gravels exposed at Aylesford on the 24th and a visit to the Gault Clay at Westerham on the 30th. Mr. J. F. Wyley led the party to Aylesford, whilst Mr. J. S. Hampton was the leader at Westerham. Both the July field meetings were led by Geological Survey officers, that on the 15th to Maidstone under the leadership of Mr. B. C. Worssam to see Kentish Rag and cambering, and that on the 22nd to the Mole Gap, led by Mr. F. H. Edmunds, District Geologist for S.E. England. As an experiment a field meeting was held in August when, on the 18th, Mr. J. S. Hampton showed members some features of the Keston district. The turnout of a reasonable sized party for this meeting indicated that there is some demand for a field meeting during this month. On September 16th, Mr. A. W. Lane took a party to Walton-on-the-Naze to see exposures in the Red Crag, and on September 29th Dr. J. F. Kirkaldy took a party to South Mimms to see the classic swallow holes of the Mimms Hall Brook. The field meetings programme for the year was brought to a close with half-day visits on October 13th

to Worms Heath, under the direction of Mr. R. J. Jones, and on October 27th to Broxbourne, the latter being a joint meeting with the Epping Forest Field Section.

*Field Research and Special Investigations.* Miss Brown has continued her work on the London Clay pit at Oxshott but Mr. Wyley reports that the glacial gravel pit near Hatfield, which he had been collecting from, is now being filled in and offers no further scope for investigation.

The thanks of the Society are due to quarry owners and agents who have kindly permitted members access to their properties, and to leaders and members who have contributed to the activities of the Section.

C. P. CASTELL, *Chairman.* R. E. BUTLER, *Secretary.*

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### Ornithological Section

A marked increase in membership, from 897 to 993, reflects the efforts of Council and members to make the Society more widely known. With those awaiting election at 31st October 1956 a four-figure membership was in sight for the first time in the Section's history.

Indoor meetings provided a wide variety of subject and the average attendance rose from 116 in 1955 to 141 in 1956. The lectures were:—“The Social Behaviour of Geese” (with film), by Mr. Hugh Boyd; “Winter Migrants and Birds of Passage” (colour films), by Mr. R. P. Bagnall-Oakeley; “The Woodpigeon”, by Mr. S. Cramp, supported by Mr. W. G. Teagle's film “The Woodpigeon in Inner London”; “Birds of a West Highland Region”, by Dr. Bruce Campbell; “Bird Navigation”, by Dr. G. V. T. Matthews; “Impression of Fair Isle”, by Mr. H. A. Craw; and “Finch Courtship”, by Dr. Robert A. Hinde. The traditional joint meeting with the British Trust for Ornithology took place in January, with talks on “Bird Population Changes and Their Implications”, by Messrs. R. A. O. Hickling, P. A. D. Hollom, and James Fisher. Mr. Fisher most kindly provided a tape-recording before he left for a Congress in the U.S.S.R. Two General Meetings were also arranged by the Section—the R.S.P.B. film, “Birds of a Country Estate”, with commentary by Mr. George Edwards, and an illustrated lecture, “Three Visits to Iceland”, by Mr. G. K. Yeates.

Field meetings were equally varied and met with encouraging response despite one of the worst summers on record. On forty-three meetings, including five coach outings, 157 species were seen including several of our rarer visitors. An unheralded Little Egret added lustre to an already popular walk in Hertfordshire!



Informal meetings at Eccleston Square were again well attended; there is a very friendly atmosphere at these gatherings and members are able to get to know each other more easily than at the main meetings. Particularly popular was a skinning demonstration by Mr. Tony Tynan, then of the Maidstone Museum.

In the year ended 31st December 1955, the Section's bird-ringing scheme achieved the record total of 6050 birds, of 82 species. Future totals will, however, be very much smaller following the introduction of ringing permits by the B.T.O. Most of our ringers have taken out "A" permits and now make their returns direct to the Trust. A few "B" permit holders continue to ring in the name of the Society, but only within the Society's area. Having thus been relieved of much of the work of running the Section's ringing scheme, our Bird-ringing Secretary is turning his attention to the encouragement of co-operative ringing projects such as that at Beddington Sewage Farm, the first mention of which appeared in the *London Bird Report* for 1955. A bird-ringing sub-committee has been set up to initiate new ringing projects and encourage research into ringing results for the London area.

The Sectional Library has acquired, by gift or purchase, some half-dozen volumes, including the Proceedings of the X and XI International Ornithological Congress. Other additions include county bird reports and bound copies of six ornithological journals, the latter presented by the ever-flourishing reading circles. Steps were taken by Council to revise the exchange list and to acquire any local reports necessary to complete our sets. A Library catalogue is now on sale and this, with other improvements, should encourage greater use of the Library by members.

Gifts to the Collections comprised skins of Red-throated Diver, Red-breasted Merganser and Razorbill, and photographs of Dartford Warbler and its habitats. The Curator and his helpers compiled an up-to-date catalogue of skins and eggs. More use has been made of the Collections this year, particularly at the Section's informal meetings, when members have been pleased to find how comprehensive the Collections are.

Publication of the *London Bird Report* and the quarterly *Bulletin* continued as in previous years and there were encouraging advance orders for the Society's book, "The Birds of the London Area Since 1900", due to be published in March 1957. The Section again produced the Society's Christmas cards and the artists, members of the sub-committee and in particular Mrs. Small are to be congratulated on their success which far surpassed that of any previous year. Because interest in the Society's Christmas cards extends beyond the Ornithological Section, the sub-committee will now operate directly under Council.

As before, the Section was strongly represented on the committee of the Dungeness Bird Observatory, of which Mr. E. R. Parrinder continued as Chairman. L.N.H.S. members use the Observatory extensively and have derived much pleasure from it.

London University Extension Courses, arranged in conjunction with the Society, have proved very popular. During the session 1955-56 Dr.

J. D. Carthy lectured on "Zoology for Ornithologists" and for 1956-57 Mr. Bernard Stonehouse is conducting a series, "How Birds Live", embracing anatomy, physiology and behaviour. Although not originally sponsored by the Society, a course on "The Behaviour of Animals: a Review of Modern Work" was given strong support and many members attended the lectures by Dr. Carthy, Dr. Uli Weidmann, Dr. R. A. Hinde and Mr. B. M. Foss. Support was also given to Mr. Eric Simm's series, "The Language of Birds and Animals", at the Institute of Recorded Sound.

Mr. H. A. Craw continued as Chairman of the Section for a second year and took over the duties of Librarian when Miss Langham resigned during the summer. Thanks are due to Miss Langham for her work in the Library and especially for compiling the catalogue of books. Fortunately she was able to carry on with the sale of the Field Lists. All the other officers served for a further twelve months but there were Committee changes due to the retirement by rotation of Messrs. H. F. Greenfield and K. P. Keywood and the departure from London of Mr. P. W. E. Currie. The vacancies were filled by Messrs L. Baker, B. S. Milne and A. C. Parker. To complete the Committee Mr. R. E. Scott was co-opted in succession to Mr. B. P. Austin to represent the younger members of the Society.

H. A. CRAW, *Chairman*. A. V. PETTIT, *Secretary*.

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### Ramblers' Section

Membership of the section has now increased to 188, largely owing to the new forms which request new members to state their particular interests. It is with deep regret that we have to record the death of Captain R. F. L. White, one of our committee, who helped us in every way.

The section has been responsible for one general meeting, when coloured slides of "The French Alps" from the Dallas collection were shewn by Miss R. Davis. Sectional meetings held were:—"African Wild Life", a ciné-colour film shewn by Miss R. Davis for Miss C. Longfield; "London and London's Country", a series of sound films in colour and black and white presented by the London Transport Executive. At the annual sectional meeting a talk on "Heraldry—a pedigree of Royal Badges" was given, which was sponsored by the Archaeological Section. The attendance at the sectional meetings varied from 21 to 60.

Sixteen outdoor excursions have been held with an average attendance on Saturdays of 20, Sundays 9, mid-week 18, and short week-ends 6. Places visited were:—Waterman's Hall, E.C.3, The Metalwork Gallery of the Victoria and Albert Museum, Broxbourne, an Easter week-end in conjunction with the Geologists in the Bath and

Bristol districts, a Primrose ramble beginning from Knockholt, Lewes, by Ramblers' excursion train, and where the leader, Miss Frances Johns, conducted us over Plumpton Agricultural College, two short week-ends at Fernhurst in Surrey, Shaws Corner, a mid-week excursion by launch on the Thames for the "Swan Upping", Leatherhead District, Amersham to Great Missenden, Otford, Kemsing, Seal and North Downs, The Wellcome Historical Medical Museum, Lyons' Tea Factory, and the Apothecaries' Hall.

Two reading circles for "The Countryman" still continue.

L. JOHNS, *Secretary*. H. FRANKS, *Chairman*.



*F. TENUIFOLIA* Sibth., *F. OVINA* subsp. *TENUIFOLIA* (Sibth.) Tutin, *F. CAPILLATA* auct. *Fine-leaved Sheep's Fescue*. H., 107. Heaths, commons and open woodlands, often growing in company with *F. OVINA* with which it is sometimes confused. Locally abundant. V.-c. 16. Keston; W.W. Hayes Common; Chislehurst Common; Dartford Heath; *F.R.* 1½ miles S. of Eynsford railway station, on ant hills on chalk grassland, 1955. *J.E.L.*; *Hb.L.* V.-c. 17. Walton Heath, 1927; Mitcham Common, 1931; Headley Heath, 1932, *J.E.L.*; Queen's Cottage grounds, Kew Gardens, 1935, *C.E.H.*; *Hb.L.* Oxshott Heath, 1937; *P.H.C.* Richmond Park; Ham Common; Sheen Common; Wimbledon Common; Barnes Common; *B.W.* V.-c. 18. Near "Wake Arms", 1951; *L.N.H.S. Excursion*. V.-c. 19. Epping Lower Forest, 1951; *L.N.H.S. Excursion*. Epping Plain, 1954; *R.M.P.* V.-c. 21. Stanmore Common; Mimmshall Wood; Ruislip Common; Harrow Weald Common; Hounslow Heath; Hampstead Heath; Castle Bar, Ealing, 1944-55, *D.H.K.*; *Hb.K.* all det. *C.E.H.* Hampton Court, 1944; *B.W.* Syon Park, 1946; *B.W.* & *D.H.K.* Bombed site, Cripple-gate, 1949; *F.E.W.*

*F. GLAUCA* Lam. *Blue or Grey Fescue*. H., 111. Alien. Europe. V.-c. 16. Chislehurst Common; *W.W.* (We have not seen a specimen, *J.E.L.* & *D.H.K.*)

#### VULPIA C. C. Gmel.

*V. BROMOIDES* (L.) S. F. Gray, *FESTUCA BROMOIDES* L., *F. SCIUROIDES* Roth. *Squirrel-tail or Barren Fescue*. H., 135. Heaths, commons, roadsides, railway banks and dry grassy places. Very common throughout the Area, especially on sandy commons.

*V. MYUROS* (L.) C. C. Gmel., *FESTUCA MYUROS* L. *Rat's-tail Fescue*. H., 137. Heaths, banks and waste ground on light soils. Introduced on rubbish-tips and railway tracks. Local. V.-c. 16. Chislehurst Common; *W.W.* Sandy bank W. of Farningham Wood; *F.R.* Greenhithe, 1945, *J.E.L.*; *Hb.L.* Lullingstone Castle, 1950; *G.M.B.* Rubbish-tip, Sevenoaks, 1951, *D.McC.* V.-c. 17. Near Limpsfield, 1923; *R.W.R.* Hampton Court railway station, 1946; *B.W.* det. *C.E.H.* Reigate railway station yard, 1955; *B.M.C.M.* & *B.W.* det. *A.M.* V.-c. 18. Purfleet, 1910, *P.H.C.*; *Hb.L.N.H.S.* Rubbish-tip, Dagenham, 1939, *J.E.L.*; *Hb.L.* V.-c. 20. Hoddesdon, 1910, *P.H.C.*; *Hb.L.N.H.S.* Rubbish-tip, Cole Green; railway side, Garston, 1955; *J.G.D.* V.-c. 21. Stanmore; Canons Park, 1906; *C.S.N.* Hackney Marshes, 1914; Finchley, 1916; Yiewsley, 1916; *J.E.C.*; Harefield; Sunbury; Chiswick; railway sidings, Greenford, 1944-55; *D.H.K.* Gravel pit, Dawley, 1917, *J.E.C.*; *Hb.Mus.Brit.* det. *A.M.*

#### NARDURUS (Bluff, Nees & Schau.) Reichb.

*N. MARITIMUS* (L.) Fiori. Alien. Europe. Established on railway tracks. Very rare. V.-c. 21. Railway tracks between Denham and Uxbridge, 1951, *D.H.K.*; *Hb.K.* det. *C.E.H.*

## BROMUS L.

*B. DIANDRUS* Roth, *B. GUSSONII* Parl., *B. MAXIMUS* auct. angl., *ANISANTHA GUSSONII* (Parl.) Nevski. *Great Brome*. H., 49. Alien. Mediterranean region. V.-c. 16. Erith, 1926, *St.J.M.*; *Hb.L.* V.-c. 17. Sandy bank, Walton-on-Thames, 1955; *N.Y.S. & R.A.B.* det. *C.E.H.* V.-c. 18. Rubbish-tip, Dagenham, 1939, *J.E.L.*; *Hb.L.* Rubbish-tip, Barking, 1954; *R.M.P.* V.-c. 21. Muswell Hill, 1907, *J.E.C.*; *Hb.Mus.Brit.* det. *A.M.* Yiewsley, 1911, *J.E.C.*; *Hb.Kew.* Rubbish-tip, Greenford, 1953; *B.W.* det. *A.M.*

*B. RIGIDUS* Roth, *ANISANTHA RIGIDA* (Roth) Hyland. H., 49. Alien. Mediterranean region. V.-c. 18. Dagenham Dock, 1927, *J.E.C.*; *Hb.Mus.Brit.* det. *A.M.* V.-c. 21. Hackney Marshes, 1914; *J.E.C.* This species is much confused with *B. DIANDRUS* and the Middlesex record may belong to that species.

*B. STERILIS* L., *ANISANTHA STERILIS* (L.) Nevski. *Barren Brome*. H., 43. Roadsides, cultivated and waste land, hedgerows, etc. Abundant throughout the Area.

*B. TECTORUM* L., *ANISANTHA TECTORUM* (L.) Nevski. *Drooping Brome*. Alien. H., 45. Mediterranean region. V.-c. 21. Near Potters Bar, 1912; Hackney Marshes, 1912, *J.E.C.*; *Hb.Mus.Brit.* both conf. *A.M.*

*B. MADRITENSIS* L., *ANISANTHA MADRITENSIS* (L.) Nevski. *Compact Brome*. H., 47. Alien. Mediterranean region. V.-c. 17. Mortlake, 1922, *J.E.C.*; *Hb.Mus.Brit.* det. *A.M.* V.-c. 21. Yiewsley, 1922, *J.E.C.*; *Hb.Mus.Brit.* conf. *A.M.*

*B. RAMOSUS* Huds., *B. ASPER* Murr., *ZERNA RAMOSA* (Huds.) Lindm. *Hairy Brome*. Open woods, wood margins, hedgebanks and shady places. H., 51. Common in all the v.-cc.

*B. ERECTUS* Huds., *ZERNA ERECTA* (Huds.) S. F. Gray. *Upright Brome*. H., 53. Downs, pastures, roadbanks and verges. Locally plentiful, especially on the chalk. V.-c. 16. Abundant on the chalk. V.-c. 17. Frequent on calcareous soils. Bookham Common; *A.W.J.* V.-c. 20. Railway banks, Bushey; *L.B.H. & C.S.N.* Panshanger, in oakwood, 1952; *R.M.P.* Near Rickmansworth; *D.H.K.* V.-c. 21. Harefield, 1908; *J.E.C.*; 1922; *L.J.T.*; 1934-56; *D.H.K.* East Finchley, 1909; Sipson, 1910; Yiewsley, 1916; Hackney Marshes, 1914 & 1921; *J.E.C.* Springwell; between Hampton Court and Kingston Bridge; between Staines and Penton Hook, 1944-55; *D.H.K.*

*B. INERMIS* Leyss., *ZERNA INERMIS* (Leyss.) Lindm. *Hungarian Brome*. H., 53. Alien. Europe. V.-c. 18. Rubbish-tip, Dagenham, 1938, *N.Y.S.*; *Hb.Kew.*

*B. UNIOLOIDES* Kunth., *CERATOCHLOA UNIOLOIDES* (Willd.) Beauv. H., 51. Alien. America. V.-c. 16. Erith, 1926, *St.J.M.*; *Hb.L.* V.-c. 17. Wimbledon Common, 1937; *C.A.* Mizen's market garden, Ewell, 1939, *A.E.E.*; *Hb.E.C.M.* V.-c. 18. Purfleet, 1911; *C.S.N.* Dagenham Dock, 1927; *J.E.C.* Between Grays and Tilbury, 1927, *I.A.W.*; *Hb.L.* conf. *C.E.H.* V.-c. 21. East Finchley, 1906; Hackney Marshes, 1914, *J.E.C.*; *Hb.Mus.Brit.* conf. *A.M.* Yiewsley, 1916, *J.E.C.*; *Hb.Kew.* Finchley, 1908, 1910 & 1922; near Temple Fortune, 1915; North Finchley, 1916; Hackney Marshes, 1913-16, 1920 & 1921; *J.E.C.* Canal bank, Hanwell, 1925; rubbish-tip, Grove Park, 1927, *C.E.H.*; *Hb.Kew.*

*B. CARINATUS* Hook. & Arn., *B. MARGINATUS* auct., *CERATOCHLOA CARINATA* (Hook. & Arn.) Tutin. *Californian Brôme*. H., 51. Alien.

N. America. Naturalised by the Thames, and on waste ground and rubbish-tips. Locally abundant and spreading. V.-c. 17. In profusion by the Thames from Richmond to Hammersmith Bridge, having originally "escaped" from Kew Gardens. Rubbish-tip, Barnes Common, 1956; *B.W.* V.-c. 18. Dagenham Dock, 1928, *R.M.*; *Hb.Kew.* V.-c. 21. Thames bank, Brentford, 1948; Strand-on-the-Green, 1955, *D.H.K.*; *Hb.K.* Near the Thames, Chiswick, 1948; rubbish-tip, Hanwell, 1953; *B.W.* Bombed site, Ealing, 1951; *L.M.P.S.* det. *D.H.K.* Neglected garden, Gunnersbury, 1955; *C.E.H.* Rubbish-tip, Greenford, 1956; *D.H.K.*

*B. BRIZIFORMIS* Fisch. & Mey. *H.*, 55. Alien. Caucasus. V.-c. 21. Hackney Marshes, 1912, *J.E.C.*; *Hb.Mus.Brit.*; 1923; Yiewsley, 1913; Greenford, 1917; *J.E.C.* V.-c. 24. Near Iver, 1916; *J.E.C.* Langley, 1905, *L.B.H.*; *Hb.H.*

*B. SECALINUS* L. *Rye Brome.* *H.*, 67. Cornfields, cultivated and waste ground. Not common, and usually only casual. V.-c. 16. Stone, 1951; *H.M.P.* V.-c. 17. Weybridge, 1901, *L.B.H.*; *Hb.H.* Mortlake, 1917, 1920 & 1922; *J.E.C.* Cornfield, Limpsfield, 1922; *R.W.R.* Sanderstead, 1922; near Titsey Hill, 1927, *J.E.L.*; *Hb.L.* V.-c. 20. Near Oxhey Woods, 1900; *C.S.N.* V.-c. 21. Finchley, 1908; Hackney Marshes, 1909; Yiewsley, 1914; Temple Fortune, 1914, *J.E.C.*; *Hb.Mus.Brit.* Dawley; Harefield; *J.E.C.* Hendon, 1910; *P.H.C.* Denham; *D.H.K.* V.-c. 24. Colnbrook; near Iver; *J.E.C.* The var. *HIRTUS* (F. Schultz) Aschers. & Graebn. is reported from v.-c. 16. Lane S.E. of Eynsford, 1911, *W.H.Gr.*; *Hb.L.* det. *C.E.H.* V.-c. 17. Sandy cornfield, Esher, 1943, *J.E.L.*; *Hb.L.* Weedy fields  $\frac{1}{2}$  mile north of Upper Barn, Limpsfield, 1956; *D.P.Y.* V.-c. 18. Rubbish-tip, Dagenham, 1937, *J.P.M.B.* & *H.K.A.S.*; *Hb.Kew.* V.-c. 20. Field S. of Brookmans Park railway station, 1955; *J.G.D.* det. *C.E.H.* V.-c. 21. Hanwell, 1946; *B.W.* det. *C.E.H.* The var. *HIRTUS* (F. Schultz) Aschers. & Graebn. is recorded from v.-c. 17. Oatfield near Headley, 1931, *I.A.W.*; *Hb.L.* V.-c. 21. Uxbridge; *D.H.K.* The var. *GROSSUS* Koch is reported from v.-c. 17. Tot Hill, Headley, 1932, *J.E.L.*; *Hb.L.*

*B. COMMUTATUS* Schrad., *B. PRATENSIS* Ehrh. ex Hoffm., non Lam. *Meadow Brome.* *H.*, 65. Meadows, grassy places, cultivated and waste ground. Rather rare, but characteristic of wet hay-meadows. V.-c. 16. Bickley; *F.R.* V.-c. 17. Near Weybridge; *W.W.* Chertsey Mead, 1929; sainfoin field near Headley, 1931, *I.A.W.*; Tot Hill, Headley, 1932, *J.E.L.*; *Hb.L.* Mizen's market garden, Ewell, 1946, *A.E.E.*; *Hb.E.C.M.* Earlswood cinder-tip, 1952; *B.M.C.M.* det. *A.M.* V.-c. 18. Dagenham, 1928, *R.M.*; *Hb.L.* det. *C.E.H.* V.-c. 21. Hackney Marshes, 1909, *J.E.C.*; *Hb.Mus.Brit.* Ruislip; Denham; Harmondsworth; Shepperton; Hanwell, 1944-55; *D.H.K.* Hounslow Heath, 1948, *C.E.H.* & *D.H.K.*; *Hb.K.*

*B. RACEMOSUS* L. *Smooth Brome.* *H.* 63. Meadows, grassy places, cultivated and waste ground. Not common and confused with the previous species. V.-c. 16. Stone Marshes, 1945; *F.R.* V.-c. 17. Titsey

Hill, towards Oxted, 1927; Leatherhead Downs; Chertsey Mead, 1932, *J.E.L.*; *Hb.L.* Limpsfield, 1923; *R.W.R.* V.-c. 21. Rubbish-tip, Hanwell, 1946; *D.H.K.*

*B. MOLLIS* L. *Soft Brome* or *Lop Grass*. H., 57. Meadows, pastures, banks, roadsides, cultivated and waste ground. Abundant in all the v.-cc. The var. *LEIOSTACHYUS* Hartm. is reported from v.-c. 21. Harefield; West Heath, Hampstead; Chiswick; Hanwell, 1944-49; *D.H.K.* All det. *C.E.H.*

*B. LEPIDUS* Holmb., *B. BRITANNICUS* I. A. Williams. *Slender Brome*. H., 59. Cultivated and waste ground and roadsides. Perhaps frequent but distribution imperfectly known. V.-c. 16. Green Street Green, 1946; *F.R.* V.-c. 17. Woodcote Park, Epsom, 1926, *E.C.W.*; *Hb.L.* Ham, 1929, *C.E.H.*; *Hb.Kew.* Roadside, Sheen Common, 1948; *B.W.* det. *A.M.* Richmond Park, 1950; *D.H.K.* V.-c. 18. Loughton; Cooper-sale, 1955; *R.M.P.* V.-c. 19. Waltham Abbey, 1955; *R.M.P.* V.-c. 20. Panshanger, 1952; Bayford, 1953; *R.M.P.* V.-c. 21. Common.

*B. THOMINI* Hardouin, *B. HORDEACEUS* L. sec. Holmb. H., 57. In similar situations to the preceding species with which it is often confused. Perhaps common, but not well understood. V.-c. 17. Cornfield, Addington, 1942, *E.C.W.*; *Hb.L.* V.-c. 18. Loughton, 1955; *R.M.P.* det. *T.G.T.* V.-c. 19. Thornwood, 1955; *R.M.P.* det. *T.G.T.* Fishers Green, 1956; *R.M.P.* V.-c. 21. Hanwell; Chiswick; *D.H.K.* det. *C.E.H.* Bombed site, Upper Thames Street, E.C., 1945, *J.E.L.*; *Hb.L.*

*B. INTERRUPTUS* (Hack.) Druce. *Interrupted Brome*. H., 61. Arable land, usually associated with *Onobrychis viciifolia*. Very rare. V.-c. 17. Sainfoin field near Headley, 1931, *I.A.W.*; Tot Hill, Headley, 1932, *J.E.L.*; *Hb.L.* V.-c. 21. Yiewsley, 1912, *J.E.C.*; Uxbridge, 1907, *A.L.*; *Hb.Mus.Brit.* Both det. *A.M.*

*B. ARVENSIS* L. *Field Brome*. H., 55. Alien. Europe. V.-c. 21. Yiewsley, 1908; Hackney Marshes, 1912 & 1914, *J.E.C.*; *Hb.Mus.Brit.* East Finchley; Mill Hill; *J.E.C.* Acton, 1908, *C.B.G.*; *Hb.S.L.B.I.* Canons Park, 1918, *C.S.N.*; *Hb.L.N.H.S.* V.-c. 24. Uxbridge, 1910; *J.E.C.*

*B. SCOPARIUS* L. Alien. Europe. V.-c. 21. Waste ground, Ealing Common, 1905, *C.B.G.*; *Hb.S.L.B.I.*

*B. JAPONICUS* Thunb., *B. PATULUS* Mert. & Koch. Alien. Europe. V.-c. 18. Dagenham Dock, 1928, *R.M.*; *Hb.Kew.* V.-c. 21. West Drayton, 1928; Yiewsley, 1929, *R.M.*; *Hb.Kew.* V.-c. 24. Near Iver, 1928, *R.M.*; *Hb.Kew.*

### BRACHYPODIUM Beauv.

*B. SYLVATICUM* (Huds.) Beauv. *Slender* or *Wood False-Brome*. H., 69. Woods, copses, hedgebanks and other shady places. Very common in all the v.-cc.

*B. PINNATUM* (L.) Beauv. *Chalk False-Brome* or *Tor Grass*. H., 71. Downs and open grassy places almost entirely on the chalk. Locally



abundant. V.-c. 16. Common on the chalk. V.-c. 17. Common on the chalk. V.-c. 21. Copse Wood, Northwood, plentiful, 1945, *B.W.*; *Hb.K.* Above Harefield chalkpits, scarce, 1949; *D.H.K.* The var. *PUBESCENS* S. F. Gray is recorded from v.-c. 17. Banstead Downs, 1928, *J.E.L.*; *Hb.L.* and the var. *CORNICULATUM* (Lam.) Bréb. from v.-c. 17. Mickleham Downs, 1919; *C.L.W.*

### LOLIUM L.

*L. PERENNE* L. *Perennial Rye-grass*. H., 129. Meadows, pastures, roadsides and waste ground. A very variable species which is most plentiful throughout the Area.

*L. TEMULENTUM* L. *Darnel*. H., 133. Alien. Mediterranean region. V.-c. 16. Bexley; Wilmington; *G.M.B.* V.-c. 17. Weybridge, 1904, *L.B.H.*; *Hb.H.* Mortlake, 1916; *J.E.C.* Mitcham Common, 1956; *J.E.L.* V.-c. 18. Dagenham Dock, 1927; *J.E.C.*; 1934; rubbish-tip, Ripple Level, 1954; rubbish-tip, Barking, 1953, *J.E.L.*; *Hb.L.* V.-c. 20. Great Amwell, 1909, *P.H.C.*; *Hb.L.N.H.S.* Rubbish-tip, Watford, 1955; *D.B.* conf. *J.G.D.* V.-c. 21. East Finchley, 1906; Yiewsley, 1926, *J.E.C.*; *Hb.Mus Brit.* Finchley, 1908; Hackney Marshes, 1912-14, 1917, 1921-23; Hendon, 1915; *J.E.C.* Uxbridge, 1908, *A.L.*; near Hayes, 1916, *J.E.C.*; *Hb.Mus.Brit.* Golders Green, 1909, *P.H.C.*; *Hb.L.N.H.S.* South Harrow, 1944; rubbish-tip, Hanwell, 1948-55; *D.H.K.* Bombed site by Mark Lane, E.C., 1948, *J.E.L.*; *Hb.L.* Cripplegate; Highgate Village; *R.S.R.F.* Rubbish-tip, Greenford, 1954; *B.W.* Harrow-on-the-Hill, 1955; *P.M.N.* The var. *ARVENSE* Lilj. is recorded from v.-c. 17. Mitcham Common, 1956; *J.E.L.* V.-c. 21. Flower bed, Cheyne Walk, Chelsea, 1955, *D.McC.*; *Hb.L.* det. *C.E.H.*

*L. MULTIFLORUM* Lam. *Italian Rye-grass*. H., 131. Alien. Europe. Established on cultivated and waste ground, by roadsides, etc. Common in all the v.-cc.

*L. SICULUM* Parl. Alien. S. Europe. V.-c. 24. Near Iver; *J.E.C.*

### AGROPYRON Gaertn.

*A. JUNCEIFORME* (A. & D. Löve) A. & D. Löve, *A. JUNCEUM* auct., *ELYTRIGIA JUNCEIFORMIS* A. & D. Löve. *Sand Couch-grass*. H., 83. Salt marshes and grassy places by the tidal estuary. Local. V.-c. 16. Greenhithe, *F.J.H.*; *Fl. Kent*, 418. Cray estuary, 1955; *G.M.B.* V.-c. 18. West Thurrock Marshes; *C.S.N.*

× *REPENS*. V.-c. 18. West Thurrock Marshes, abundant; *C.S.N.*

*A. PUNGENS* (Pers.) Roem. & Schult., *ELYTRIGIA PUNGENS* (Pers.) Tutin. *Sea Couch-grass*. H., 79. Salt marshes and banks of the tidal Thames. Locally plentiful. V.-c. 16. Dartford Marshes, 1930; *P.H.C.* Erith; Crayford; Stone; Swanscombe; *F.R.* V.-c. 17. Thames bank near Putney, 1932, *J.E.L.*; *Hb.L.* det. *P.J.*; 1956; *B.W.*

*A. REPENS* (L.) Beauv., *ELYTRIGIA REPENS* (L.) Nevski. *Twitch* or *Couch-grass*. H., 77. Cultivated and waste ground, roadsides, etc. A very variable species which is a pernicious and abundant weed in all the v.cc.

A. CANINUM (L.) Beauv., ROEGNERIA CANINA (L.) Nevski. *Bearded Couch-grass*. H., 75. Woods, hedges and shady places. Local. V.-c. 16. Elmstead; S. of Downe; W.W. Hayes Old Rectory, 1938; D.McC. Darenth Meadows, 1944; F.R. det. A.J.W. N. of Biggin Hill, 1955; F.R. & G.M.B. Shooters Hill Woods, 1950; G.M.B. Lane near Stone Castle, 1952; H.M.P. V.-c. 17. Leatherhead, 1919, L.B.H.; Hb.H. Hedgebank, Walton Downs, 1927; Long Plantation, Chipstead, 1941, J.E.L.; Hb.L. Epsom Downs, 1930; P.H.C. Bookham Common; A.W.J. Littleworth Common, 1956; J.E.S. V.-c. 18. Copse, Upminster, 1955; L.N.H.S. *Excursion*. V.-c. 20. Napsbury, 1910, P.H.C.; Hb.L.N.H.S. V.-c. 21. Hackney Marshes, 1912; J.E.C. By the river Brent, Finchley, 1902; L.B.H.; 1927; J.E.C. Hendon, 1912, P.H.C.; Hb.L.N.H.S.; 1946; Harefield; Hanwell; near Horton, 1944-55; D.H.K. Gutter Lane, E.C., 1945, J.E.L.; Hb.L. det. C.E.H. Between Yiewsley and Iver; Brentford, 1945; B.W. V.-c. 24. Horton, 1955; D.H.K.

## SECALE L.

S. CEREALE L. *Rye*. Alien of cultivated origin. Common on rubbish-tips in all parts of the Area.

## TRITICUM L.

T. AESTIVUM L. *Bread Wheat*. This alien of cultivated origin is commonly met with on the metropolitan rubbish-tips.

## AEGILOPS L.

A. TRIUNCIALIS L. Alien. Europe. V.-c. 21. Hackney Marshes, 1912; J.E.C.

A. CYLINDRICA Host. Alien. Europe. V.-c. 21. Fortis Green, 1909, J.E.C.; Hb.Mus.Brit. Yiewsley, 1924; J.E.C.

## PARAPHOLIS C. E. Hubbard

P. STRIGOSA (Dumort.) C. E. Hubbard, LEPTURUS STRIGOSUS Dumort., L. FILIFORMIS auct., PHOLIURUS FILIFORMIS auct. *Sea Hard-grass*. H., 315. Salt marshes and waste places by the tidal Thames. Local. V.-c. 16. Dartford Marshes, 1930; P.H.C.; 1955; J.F.H. & P.U.H. Swanscombe Marshes, 1946; L.N.H.S. *Excursion*. Stone Marshes; F.R.

P. INCURVA (L.) C. E. Hubbard, LEPTURUS INCURVUS (L.) Druce, PHOLIURUS INCURVUS (L.) Schinz & Thell. *Curved Sea Hard-grass*. H., 317. Alien. Europe, including parts of Britain. V.-c. 21. Yiewsley, 1924; J.E.C.

## MONERMA Beauv.

M. CYLINDRICA (Willd.) Coss. & Dup. LEPTURUS CYLINDRICA (Willd.) Trin. Alien. Mediterranean region. V.-c. 17. Rubbish-tip, Earlswood, 1956; B.M.C.M. det. J.E.L.

## NARDUS L.

N. STRICTA L. *Mat-grass*. H., 319. Heaths, moors and commons. Locally abundant. V.-c. 16. Chislehurst Common, 1946; Keston Com-

mon; Dartford Heath; *F.R.* V.-c. 17. Richmond Park; *L.J.T.* Wimbledon Common; Shirley; Reigate Heath; Moorhouse, Limpsfield; *R.W.R.* Epsom Common; *P.H.C.* Sheen Common; Barnes Common, 1955; *B.W.* V.-c. 18. Chingford, *E.M.D.*; *Hb. L.N.H.S.* Cooks Folly Wood; Snaresbrook Heath; *R.W.R.* & *E.L.R.* High Beach, *P.H.C.*; *Hb.L.N.H.S.* Cuckoo Pits, Epping Forest; *J.H.G.P.* Curtis Mill Green, 1954; *B.T.W.* V.-c. 19. Epping Lower Forest, abundant, 1951; *L.N.H.S. Excursion.* V.-c. 20. Hadley Green, 1950; *D.H.K.* Hertford Heath, 1955; *J.G.D.* V.-c. 21. Whitechurch Common; Stanmore Common; *L.B.H.*; seen at both places, 1955; Ruislip Common; Harrow Weald Common; East and West Heaths, Hampstead, 1944-55; *D.H.K.* Syon Park; *B.W.* & *D.H.K.* Scratch Wood; *H.C.H.*

### HORDEUM L.

*H. SECALINUM* Schreb., *H. PRATENSE* Huds. p.p., *H. NODOSUM* auct. *Meadow Barley.* H., 93. Meadows and pastures. Common in all the v.-cc. The var. *BREVISUBULATUM* Thell. is recorded from v.-c. 21. Greenford, 1917; *J.E.C.*

*H. MURINUM* L. *Wall Barley.* H., 89. Waste ground, roadsides, etc. Abundant throughout the Area.

*H. CALIFORNICUM* Covas & Stebbins. Alien. N. America. V.-c. 17. Rubbish-tip, Hanwell, 1953; *D.H.K.* det. *A.M.*

*H. MARINUM* Huds., *H. MARITIMUM* Stokes. *Sea Barley, Squirrel-tail Grass.* H., 91. Margins of salt marshes and grassy places by the tidal estuary, rarely inland on waste ground as an adventive. Local. V.-c. 16. Stone Marshes; *W.W.* Dartford Marshes, 1930; *P.H.C.* 1955; *J.F.H.* & *P.C.H.* V.-c. 18. Grays; Rainham, 1908, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Hackney Marshes, 1921; *J.E.C.*

*H. JUBATUM* L. *Fox-tail Barley.* H., 93. Alien. N. America. V.-c. 18. Dagenham Dock; near Leyton; Rainham, 1927; *J.E.C.* V.-c. 20. Rubbish-tip, Cole Green, 1955; *J.G.D.* V.-c. 21. Hackney Marshes, 1909, 1910, 1923 & 1927; Temple Fortune, 1924; Finchley, 1926; *J.E.C.* Rubbish-tip, Lower Feltham, 1951; *R.W.D.* The var. *CAESPITOSUM* (Scribn.) Hitchc. is reported from v.-c. 20. Rubbish-tip. Cole Green, 1955; *J.G.D.* det. *C.E.H.*

*H. VULGARE* L. *Barley.* H., 93. This alien of cultivated origin is a common feature of rubbish-tips in the Area.

*H. DISTICHON* L. *Barley.* H., 93. An alien of cultivated origin which is frequently encountered on rubbish-tips.

### ELYMUS L.

*E. ARENARIUS* L. *Lyme-grass.* H., 85. Alien. Europe, including the coasts of Britain. V.-c. 16. Murray Avenue, Bromley, 1946, *G.W.C.\**; *Hb.L.*

*E. CANADENSIS* L. Alien. N. America. V.-c. 21. Waste ground, Yiewsley, 1948, *D.H.K.*; *Hb.K.* det. *C.E.H.*; 1951, *J.E.L.*, *D.McC.* & *D.H.K.*; *Hb.L.*

\*Coxhead, G. W.

## HORDELYMUS (Jessen) Harz

*H. EUROPAEUS* (L.) Harz, *HORDEUM EUROPAEUM* (L.) All., *H. SYLVATICUM* Huds., *ELYMUS EUROPAEUS* L. *Wood Barley*. H., 87. Woods and shady places, with a marked preference for calcareous soils. Rare. V.-c. 17. Long Plantation, Chipstead, 1941, *J.E.L.*; *Hb.L.*; 1955; *B.W.* Small wood between Kingswood Warren and Chipstead, 1940; *L.J.T.* Wimbledon Common, close to Putney Vale Cemetery, 1951; *L.M.P.S.* conf. *J.E.L.* V.-c. 21. Spontaneously in a garden at Northwood, 1951; *R.A.G.*

## CUPRESSACEAE

## JUNIPERUS L.

*J. COMMUNIS* L. *Juniper*. Chalk downs and heaths. Local. V.-c. 16. Crockham Hill, 1917; downs above Westerham and Brasted, 1929; Shoreham Downs, 1929; *R.W.R.*; E. of Shoreham railway station, locally abundant; Darwin's Bank, Downe, scarce, 1945; *F.R.* V.-c. 17. Banstead Downs; Chipstead; *W.W.* Walton Downs, S. of Tattenham Corner, 1942; Colley Hill; Buckland Hill, 1948; *B.W.* Fetcham Downs; Brockham Hill; Box Hill; Mickleham; downs above Limpsfield; *E.B.B.* Riddlesdown, plentiful; Limpsfield Common, rare, 1921; *R.W.R.*

## TAXACEAE

## TAXUS L.

*T. BACCATA* L. *Yew*. Woods and scrub, mainly on the chalk, but frequently planted in churchyards, plantations, copses, etc. Locally abundant. V.-c. 16. Frequent on the chalk. V.-c. 17. Common on the chalk. Near Weybridge; *L.J.T.* Wimbledon Common; Esher Common; *A.W.J.* V.-c. 20. Garrett Wood, Springwell; *D.H.K.* V.-c. 21. Harefield; Springwell; *D.H.K.* V.-c. 24. Denham; *L.J.T.*

## PINACEAE

## PINUS L.

*P. SYLVESTRIS* L. *Scots Pine*. Alien. Europe, including parts of Britain. Planted in woods and plantations and on heaths and commons where it sometimes reproduces from self-sown seed. Local. V.-c. 16. Eltham; *E.B.B.* Keston Common; *P.H.C.* Bromley; Farnborough; West Wickham; Hayes Common; Beckenham; N.E. of Otford; Westerham; Brasted; *L.J.T.* Shoreham; Crockham Hill Common; *R.W.R.* V.-c. 17. Weybridge; Oxshott Heath; Esher Common; Limpsfield Common; *E.B.B.* Springpark Wood, Addington; Redhill; Reigate; *L.J.T.* Norbury Park; Worm's Heath; Leatherhead; Mickleham; *P.H.C.* Wimbledon Common; Chipstead; *A.W.J.* V.-c. 21. Syon Park; Hendon; Ruislip; Hampstead Heath; *L.J.T.* Harrow Weald Common; Harefield; *D.H.K.* V.-c. 24. Black Park; *P.H.C.*

## EQUISETACEAE

## EQUISETUM L.

*E. TELMATEIA* Ehrh., *E. MAXIMUM* auct. *Great Horsetail*. Damp woods, heaths, banks and rough grassy places. Local. V.-c. 16. Chislehurst; *W.W.*; 1950; *G.M.B.*; Scadbury Park Wood; Petts Wood, 1954; *F.R.* Westerham Wood, 1952; *J.F.H. & P.C.H.* V.-c. 17. Paines Hill, 1921; *R.W.R.* White Hill, Caterham, 1923, *J.E.L.*; marshy field near Buckland, 1931, *E.C.W.*; *Hb.L.* Flower Lane, Godstone, on Gault Clay, 1954; *B.W.* Barrow Green, Oxted, scarce, 1917; *R.W.R.* Titsey, 1914; *E.B.B.* Wimbledon Common; *W.W.*; near Queensmere, 1950; *C.P.C.*; probably adventive; *B.W.* V.-c. 18. Passingford Bridge, 1907; *C.S.N.* High Beach, 1922; Weald Park; South Weald; *L.J.T.* Near "Wake Arms", abundant, 1951; *L.N.H.S. Excursion*. Warley Common, Shrub Hill, 1951; *F.R.* Loughton; Stapleford Tawney; Sewardstone; Epping; Mount End; Ongar; Navestock; Chigwell Row; *R.M.P.* V.-c. 19. Epping Forest, 1951; *R.M.P.* V.-c. 20. Near Wormley Wood, 1905, *J.A.S.*; *Hb.L.N.H.S.*; 1955; *J.E.L. & B.T.W.* New Barnet, 1910, *P.H.C.*; *Hb.L.N.H.S.* Railway N. of New Barnet station; Calais Wood; Cowheath Wood, near Cole Green, 1955; *J.G.D.* West Hyde, 1933; *P.H.C.* V.-c. 21. Ken Wood, 1926; *R.W.R.*; abundant, 1955; Stanmore Common; Ruislip Common; Bentley Priory; Harrow Weald Common, rare; railway side near Edgwarebury; near Teddington, 1932-55; *D.H.K.*

*E. ARVENSE* L. *Common Horsetail*. Fields, hedgebanks, waste ground and roadsides. Common throughout the Area. The var. *NEMOROSUM* Braun is recorded from v.-c. 16. Chislehurst Common; *W.W.* The var. *PSEUDOSILVATICUM* Milde, which appears to be an autumnal state, has been seen at v.-c. 21. Harefield; Denham; Staines; *D.H.K.*

× *FLUVIATILE* = *E. × LITORALE* Kühlew. V.-c. 17. Farm Ravine, Wimbledon Common, 1942, *J.E.L.*; *Hb.L.* conf. *A.H.G.A.*

*E. SYLVATICUM* L. *Wood Horsetail*. Damp woods, hedgebanks and ditches. Local. V.-c. 18. Childerditch, 1907; *P.H.C.*; 1938; *J.B.E.* Epping Forest, 1954; *R.M.P.* V.-c. 19. Epping Lower Forest, 1911, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 20. Hedgerows of Watling Street near Elstree; *C.S.N.* Bayford Wood, 1954; *R.M.P.* V.-c. 21. Bishop's Wood, 1866, *J.B.G.*; *Hb.L.N.H.S.*; 1950; *D.H.K.* Near Ken Wood, 1948; *H.C.H. & D.H.K.* Golders Hill, 1904; *L.B.H.* Harrow Weald Common, 1933-56; Stanmore Common, rare; *D.H.K.* The var. *CAPILLARE* Hoffm. is reported from v.-c. 18. Epping Forest, 1951; *R.M.P.* conf. *A.M.*

*E. FLUVIATILE* L., *E. LIMOSUM* L. *Water Horsetail*. In shallow water at the edge of lakes, ponds and ditches. Local. V.-c. 16. Chislehurst Common; Darrack Common, Orpington; *W.W.* Holwood Park; Bromley Common, 1954; Ravensbourne Estate, Keston, 1955; *F.R.* V.-c. 17. Weybridge, *L.B.H.*; *Hb.H.* Bookham Common; *E.B.B.*

Limpsfield; *R.W.R.* Epsom, *J.E.L.*; *Hb.L.* Wimbledon Common; *C.A.* Richmond Park, Leg of Mutton pond, 1945-50; Sheen Common; pond on West End Common, Esher; pond between Thorpe and Penton Hook, 1956; *B.W.* Bookham Common, 1954; *A.W.J.* V.-c. 18. Golding's Hill Pond, Loughton; *L.B.H.*; 1956; Warley, 1953; *R.M.P.* Woodford; *R.W.P.* Pond near "Wake Arms", *C.S.N.*; *Hb.L.N.H.S.* V.-c. 19. Epping Lower Forest, 1951; *L.N.H.S. Excursion.* V.-c. 20. Totteridge Ponds; *C.S.N.* Lea Navigation Canal, S. of Cheshunt, 1955; *J.E.L.* Colney Heath; Wormley Wood; *T.D.V.S.\** V.-c. 21. Whitchurch Common; *L.B.H.* & *C.S.N.* Ruislip Reservoir and Common; Stanmore Common; near Uxbridge; Shortwood Common, Staines; Finchley Common, 1939-55; *D.H.K.* Highgate Ponds; *R.S.R.F.* Hampton Court; *B.W.*

*E. PALUSTRE* L. *Marsh Horsetail.* Bogs, marshes, wet heaths, commons, stream, canal and pond sides. Local. V.-c. 16. Chislehurst; Darrack Wood, Orpington; *W.W.* Near Holwood, 1954; *F.R.* Otford; *G.M.B.* V.-c. 17. Oxted Mill; *R.W.R.* Mitcham Common, 1924, *J.E.L.*; *Hb.L.* Wimbledon Common, 1936; *C.A.* Glen Pond, Richmond Park, 1945-50; *B.W.* V.-c. 18. Little Warley; by lake, Thorndon Park, 1904; *C.S.N.* Bulphan; *P.H.C.* Loughton, 1956; *R.M.P.* V.-c. 20. Totteridge; North Mimms; *P.H.C.* Canal side, Rickmansworth; Cassio-bury Park; *C.S.N.* Wormley Wood, 1955; *J.G.D.* V.-c. 21. Frequent in the valley of the Colne. Near Chertsey Lock, 1905, *C.S.N.*; West Drayton, 1910, *P.H.C.*; *Hb.L.N.H.S.* Stanmore Common; *L.B.H.* & *C.S.N.*; 1955; Ruislip Reservoir; Poyle, 1939-55; *D.H.K.* West Heath, Hampstead; *C.S.N.*; 1955; *D.H.K.* Finchley Common, 1901; *C.S.N.*; plentiful, 1955; *D.H.K.* Syon Park, 1947; *L.G.P.* & *R.M.P.*; 1955; *D.H.K.* Ponders End, *P.H.C.*; *Hb.L.N.H.S.* Elstree Reservoir; *B.W.* V.-c. 24. Canal side, Denham; *D.H.K.* The var. *POLYSTACHYUM* Weig. is reported from v.-c. 17. Sheen Common, 1943; *B.W.*

## PTERIDOPHYTA

### POLYPODIACEAE

#### PTERIDIUM Scop.

*P. AQUILINUM* (L.) Kuhn, *PTERIS AQUILINA* L. *Bracken.* Heaths and commons, especially on acid or neutral soils. Common throughout the Area. Sporelings, looking very unlike the mature plants, occur on bombed sites, frequently on old walls and rubbish-tips, and occasionally in sand-pits and rabbit-holes.

#### BLECHNUM L.

*B. SPICANT* (L.) Roth, *LOMARIA SPICANT* (L.) Desv. *Hard Fern.* Woods and heaths, with a marked preference for acid soils. Local. V.-c. 16. Crockham Hill Common, 1917; *R.W.R.* Holwood, 1921; *W.W.*; Farn-

\*Swinscow, T. D. V.

ingham Wood; Joyden's Wood; Holwood Park; S. of Chelsfield, 1945; *F.R.* Ravensbourne Estate, Keston, 1954; *F.R.* V.-c. 17. Moorhouse, near Limpsfield, scarce, 1917; *R.W.R.* Oxshott Heath, 1923; *L.J.T.*; 1951; *F.R.* Addington, 1937; *J.E.S.D.* Black Pond, Esher, 1921. *J.E.L.*; *Hb.L.*; 1951; *F.R.* Sheerwater Bog, Byfleet, 1949, *J.E.L.*; *Hb.L.* V.-c. 18. Glade near Monks Wood, 1908, *R.W.R.*; *Hb.L.N.H.S.*; 5 plants, 1909; *C.L.C.* Epping Forest, a small colony, 1952; *J.W.Dy.*; 1956; *R.M.P.* V.-c. 20. Well Wood, Northaw, 1952; *R.M.P.* V.-c. 21. Ickenham Park, 1907, *C.B.G.*; *Hb.S.L.B.I.* East Heath, Hampstead, one plant, 1949; *H.C.H.*; *B.W.* & *D.H.K.*; grubbed up a few days after being found; *D.H.K.* V.-c. 24. Black Park, 1899, *A.U.B.*; plentiful, 1944-56; *D.H.K.*

### PHYLLITIS Hill

*P. SCOLOPENDRIUM* (L.) Newm., *SCOLOPENDRIUM VULGARE* Sm. *Hart's-tongue Fern.* Hedgebanks, walls and other brickwork and chalkpits. Not common. V.-c. 16. Near Kidbrooke Church, 1915; *L.J.T.* Eltham, 1937; *P.H.C.* Hayes Old Rectory and Churchyard, 1938; *D.McC.* Bromley Common Churchyard walls, 1954; *F.R.* & *G.M.B.* Clare Wood, Hayes; *A.W.J.* Farningham, 1954; *R.M.P.* Cudham, 1954; *L.N.H.S. Excursion.* Chislehurst; Shoreham; *G.M.B.* V.-c. 17. Numerous old records. Well, The Rookery, Streatham Common, 1951-1956; *J.E.L.* Wimbledon Common, 1950; *C.P.C.* Box Hill, abundant in an old chalkpit, 1942; *D.H.K.* Railway arch by Malden station, 1954; *W.H.S.* Godstone, 1951; *P.G.* Richmond Park, in old brick well, 1945; *C.L.C.* & *B.W.* Walls, Ham Common and Sandy Lane, Petersham, 1944-55; wall by Richmond railway station, 1944; wall of platform, Kew Gardens railway station, 1954; wall, Betchworth railway station, 1950; wall near Headley Lane, 1952; *B.W.* Beddington Churchyard, 1957; *D.P.Y.* V.-c. 18. Loughton Churchyard; High Beach Churchyard, 1951; Chigwell, 1954; *R.M.P.* V.-c. 20. Great Amwell, 1908, *P.H.C.*; *Hb.L.N.H.S.* Hertingfordbury Churchyard, 1920; *P.H.C.* Wall, Hertford Heath, 1955; *J.G.D.* Hoddesdon, 1953; Well Wood, Northaw, 1952; Bricken-den Green, 1956; *R.M.P.* V.-c. 21. Syon Park; Uxbridge; Hillingdon; Pinner; Harefield; Fulwell; Isleworth Churchyard; Wood End; Willesdon Green; Chiswick; North Finchley, 1933-56; *D.H.K.* Hampton Court, 1944; *B.W.* Hayes Churchyard; Hanwell; *C.B.G.* Highgrove House, Eastcote, 1949; *F.E.W.* Bombed site, Cripplegate, 1952; *A.W.J.*

### ASPLENIUM L.

*A. TRICHOMANES* L. *Maidenhair Spleenwort.* Walls and brick work, particularly in churchyards. Rare. V.-c. 16. Eynsford, 1925; *J.C.R.* Hayes Churchyard, 1938; *D.McC.* Shoreham Churchyard, 1938; *P.H.C.*; 1950; *G.M.B.* Near Sundridge, 1954; *P.G.* Bromley Common Churchyard, 1954; *F.R.* & *G.M.B.* Bexley Churchyard, 1954; *P.C.H.* Cudham, 1954; *L.N.H.S. Excursion.* V.-c. 17. Limpsfield Village, 1917; *R.W.R.* Downside, Cobham, 1938; *E.L.P.\** Richmond

\*Payne, E. L.

Park, 1938; *C.A.* Old wall, Richmond, a dozen small plants, 1948-49; *B.W.* Beddington Churchyard, 1957; *D.P.Y.* Banstead railway station, 1954; *R.M.P.* V.-c. 18. Wanstead, 1907, *J.O.B.*; *Hb. L.N.H.S.* High Beach, several plants, 1954; *R.M.P.* V.-c. 20. Wall near Moor Park, 1928; *B.T.W.* V.-c. 21. Hanger Hill, Ealing, 1903; Harefield Churchyard, 1905, *C.B.G.*; *Hb.S.L.B.I.* Ruislip Church, 1949; *F.E.W.* Syon Park, 1946; *B.W.* & *D.H.K.* Old walls, Uxbridge; Ickenham Churchyard, on tombs, 1950-56; *D.H.K.* V.-c. 24. Denham, 1913; *P.H.C.*

**A. ADIANTUM-NIGRUM L.** *Black Spleenwort.* Hedgebanks and walls. Rare. V.-c. 16. Wall near Cudham Church, 1935; *R.W.R.* Hayes Churchyard, 1938; *D.McC.* Chevening; *W.W.* Lessness Abbey walls, 1950; *G.M.B.*; 1951; *J.E.L.*, *B.W.* & *J.C.C.* Bromley Common Churchyard, 1954; *F.R.* & *G.M.B.* Old walls, Farningham, 1954; *R.M.P.* V.-c. 17. Headley Lane, Mickleham, 1917; *E.B.B.*; 1926; *L.J.T.* Richmond Cemetery, joint in an old marble tomb, 1952-56; *B.W.* Barrow Green, rare, 1921; *R.W.R.* Brick wall, Glebe House, Kemp's Farm, 1951; old walls, Carshalton, 1955; *P.G.* V.-c. 18. Wall at Eastbury Manor, Barking, 1920; *C.L.W.* Old wall, Loughton, 1954; Epping, plentiful on a railway bridge, 1956; *R.M.P.* V.-c. 20. Near Wormley, 1904; *L.B.H.*; 1910, *P.H.C.*; *Hb.L.N.H.S.* Broxbourne, 1924; *E.B.B.*; Cold Hall, Broxbourne; old wall, Hertford Heath, 1955; *J.G.D.* V.-c. 21. River wall, Hampton Court, 1902, *C.B.G.*; *Hb.S.L.B.I.*; old wall, 1949; *B.W.* Heston Churchyard, 1901; Walpole Park, Ealing, 1906, *C.B.G.*; *Hb.S.L.B.I.* Stanwell village, 1948, *D.H.K.*; *Hb.K.*

**A. RUTA-MURARIA L.** *Wall-Rue.* Old walls and brickwork. Common in all the v.cc. except 19, where it is so far unrecorded.

### ATHYRIUM Roth

**A. FILIX-FEMINA (L.) Roth, ASPLENIUM FILIX-FEMINA (L.) Bernh.** *Lady Fern.* Damp woods and hedgebanks. Not common. V.-c. 16. Joyden's Wood; Holwood Park, abundant; North Cray Brooks, on peat; 1945; Ravensbourne Estate, Keston, 1954; *F.R.* Westerham; *G.M.B.* V.-c. 17. Chart Wood, Limpsfield, a few plants, 1924; *R.W.R.* Near Oxshott, 1932; *L.G.P.* Alders Wood, Pains Hill, one fine plant, 1935; *R.W.R.* Sudbrook Park Golf Course, c. 200 plants, some very large, in a wood, 1946; Richmond Park, 1947; *C.L.C.* Ashurst Rough (near Box Hill), in wood on clay with flints, 1950; *F.R.* & *B.W.* Esher Common, *A.W.J.* V.-c. 18. Scattered about Epping Forest; *J.E.G.*; rare, 1951-56; Gernon Bushes, 1956; *R.M.P.* V.-c. 19. Epping Lower Forest, uncommon, 1956; Galley Hill Wood, 1956; *R.M.P.* V.-c. 20. Home Wood, Cuffley; Well Wood, Northaw; Balls Wood, 1952; *R.M.P.* Hoddesdon Park Wood, 1955; *J.G.D.* Bayford Wood, 1955; *T.D.V.S.* Wormley Wood, 1955; *F.R.* & *T.D.V.S.* V.-c. 21. Old Park Wood, Harefield, *C.B.G.*; *Hb.S.L.B.I.*; 1955; Chiswick House grounds; *D.H.K.* Osterley Park; *L.G.P.* Syon House grounds, 1927; *L.J.T.*; 1946; *B.W.* & *D.H.K.*; 1955; *D.H.K.* Bushy Park, *A.W.J.*



## POLYSTICHUM Roth

*P. SETIFERUM* (Forsk.) Woynar, *P. ANGULARE* (Willd.) C. Presl, *ASPIDIUM ANGULARE* Kit. ex Willd. *Soft Shield-Fern*. Woods and hedgebanks. Rare. V.-c. 16. Ravensbourne Estate, Keston, 1954; *F.R.* V.-c. 17. Hedgebank, Woodhurst Lane, Oxted, 1930; *R.W.R.* Wimbledon Common; *A.W.J.* V.-c. 20. Near Wormley West End; *J.E.G.* Bayford Wood, 1953; *R.M.P.* V.-c. 21. Harrow Weald Common, 2 clumps, 1955; *D.H.K.*

*P. ACULEATUM* (L.) Roth, *P. LOBATUM* (Huds.) Chevall., *ASPIDIUM ACULEATUM* (L.) Sw. *Hard Shield Fern*. Woods and hedgebanks. Very rare, and not recently seen. V.-c. 16. Above Otford; *W.W.* V.-c. 17. Mill Lane, Holland, Oxted, 1931; *J.C.R.* V.-c. 21. Hanwell, 1905, *C.B.G.*; *Hb.S.L.B.I.*; long extinct; *D.H.K.*

## DRYOPTERIS Adans.

*D. FILIX-MAS* (L.) Schott, *LASTREA FILIX-MAS* (L.) C. Presl, *ASPIDIUM FILIX-MAS* (L.) Sw., *NEPHRODIUM FILIX-MAS* (L.) Rich. *Male Fern*. Woods, thickets, hedgebanks, walls and other brickwork. Common in all the v.cc.

*D. BORRERI* Newm., *LASTREA FILIX-MAS* var. *PALEACEA* T. Moore p.p., *L. PSEUDOMAS* Wollaston. Woods. Rare. V.-c. 16. Scadbury Park, Chislehurst, 1954; *F.R.* V.-c. 18. Epping Forest, one plant, 1951-56; *R.M.P.* V.-c. 20. Balls Wood; Wormley Wood, 1953; *R.M.P.* Hertford Heath, 1955; *J.G.D.*

*D. SPINULOSA* Watt, *LASTREA SPINULOSA* G. Presl, *NEPHRODIUM SPINULOSUM* Desv., *ASPIDIUM SPINULOSUM* (O. F. Muell.) Sw. *Narrow Buckler Fern*. Damp woods, heaths and marshes. Local. V.-c. 16. Joyden's Wood; Holwood Park; North Cray Brooks; Ravensbourne Estate, Keston; *F.R.* V.-c. 17. Near Moorhouse; Limpsfield Common; *R.W.R.* Richmond Park; *C.L.C.* Sheerwater Bog, Byfleet, 1949, *J.E.L.*; *Hb.L.* Wimbledon Common, 1936; *C.A.*; 1950; Bookham Common; *A.W.J.* V.-c. 18. Epping Forest, 1927; rare, 1951-56; *R.M.P.*; High Beach, 1937; *R.W.R.* V.-c. 19. Epping Lower Forest, very rare, 1952; *R.M.P.* V.-c. 20. Bricket Wood, 1938; *R.W.R.* Derry's Wood, 1953; Panshanger; Wormley Wood, 1953; Balls Wood, 1953; *R.M.P.*; 1955, *J.E.L. & B.T.W.*; *Hb.L.* Bayfordbury, 1953; *T.D.V.S.* V.-c. 21. Old Park Wood, Harefield, *C.B.G.*; *Hb.S.L.B.I.*; 1955; *D.H.K.* Mad Bess Wood. Ruislip, 1946; *C.L.C.* Scratch Wood; *B.W. & D.H.K.* Ken Wood grounds, in trench, 1945; *R.S.R.F.* V.-c. 24. Rowley Wood, near Black Park, 1955; *R.A.B.*

*D. DILATATA* (Hoffm.) A. Gray, *D. AUSTRIACA* auct., *LASTREA DILATATA* (Hoffm.) C. Presl, *NEPHRODIUM DILATATUM* (Hoffm.) Desv., *ASPIDIUM DILATATUM* (Hoffm.) Sw., *DRYOPTERIS ARISTATA* Druce, non Kuntze. *Broad Buckler Fern*. Woods, hedgebanks, wet heaths, etc. Common throughout the Area.

## THELYPTERIS Schmidel

T. OREOPTERIS (Ehrh.) Slosson, DRYOPTERIS OREOPTERIS (Ehrh.) Maxon, LASTREA OREOPTERIS (Ehrh.) Bory, ASPIDIUM OREOPTERIS (Ehrh.) Sw., NEPHRODIUM OREOPTERIS (Ehrh.) Desv., LASTREA MONTANA T. Moore. *Mountain Buckler Fern*. Woods, glades and plantations. Rare. V.-c. 16. Joyden's Wood, 1945; Parson's "Marsh" (dry heath and oak wood), 1954; *F.R.* V.-c. 17. Sidmouth Plantation, Richmond Park, 1934; 16 plants, 1947; *C.L.C.* V.-c. 18. Near "King's Oak", Epping Forest, 1900; *R.W.R.* Glade near Monks Wood, 1908, *R.W.R.*; *Hb.L.N.H.S.*; several fine plants, 1909; *C.L.C.*; a few plants in three separate localities, 1956; *R.M.P.* Ongar Park Wood, 1909; *O.R.C.* V.-c. 20. Wormley Wood, one large plant, 1955; *F.R.*

T. PALUSTRIS Schott, DRYOPTERIS THELYPTERIS (L.) A. Gray, LASTREA THELYPTERIS (L.) Bory, ASPIDIUM THELYPTERIS (L.) Sw., NEPHRODIUM THELYPTERIS (L.) Stempel. *Marsh Buckler Fern*. Marshes. Very local. V.-c. 18. Coopersale Common, 1909; *O.R.C.*; in two stations, 200-300 yards apart, 1927; *R.W.R.*; 1952; *J.E.L. & B.T.W.*; 1956; *R.M.P.*

T. ROBERTIANA (Hoffm.) Slosson, GYMNOCARPIUM ROBERTIANUM (Hoffm.) Newm., PHEGOPTERIS ROBERTIANA (Hoffm.) A. Braun, POLYPODIUM ROBERTIANUM Hoffm., P. CALCAREUM Sm., DRYOPTERIS ROBERTIANA (Hoffm.) C. Chr. *Limestone Fern*. Alien. Europe, including parts of Britain. Established on brickwork. Very rare. V.-c. 17. Platform wall of Kew Gardens railway station, 1954; *J.P.M.B.*

## POLYPODIUM L.

P. VULGARE L. *Polypody*. Woods, banks, etc., and on trees and old walls. Not common. V.-c. 16. Mottingham; Holwood; *W.W.* Bromley, 1920; Hayes, 1931; *P.H.C.* Ravensbourne Estate, Keston, 1954; *F.R.* Lesness Abbey walls, 1954; *J.E.L., B.W. & J.C.C.* Bromley Common Churchyard walls, 1954; *F.R. & G.M.B.* Swanley, 1954; *F.R. & P.C.H.* V.-c. 17. Titsey Plantation, 1914; Esher Common, 1915; Headley Lane, Mickleham, 1917; *E.B.B.* Limpsfield Village and lane to Hook Wood, 1917; *R.W.R.* Wall, Godstone, 1948; *R.M.P.* Beddington Churchyard, 1957; *D.P.Y.* V.-c. 18. scattered about Epping Forest; *J.E.G.* Lane bank, Woodhatch, 1909; *P.H.C.* Coopersale Common, 1909; *O.R.C.* Wood on N. side of road from "Slades" to Kelvedon Hatch, 1928; *B.T.W.* Old wall, Loughton, several plants, 1951-56; *R.M.P.* V.-c. 19. Epping Lower Forest, on pollarded Hornbeams, 1952; *R.M.P.* V.-c. 20. Broxbourne, 1924; *E.B.B.*; 1955; *R.M.P.* V.-c. 21. Hayes Churchyard, *C.B.G.*; *Hb.S.L.B.I.* Laleham, 1946; *B.W.* Harefield Grove, 1945; *D.H.K.* Old wall, Osterley Park, 1955; *B.W. & D.H.K.* V.-c. 24. Fulmer, 1931; *J.C.R.*

## CETERACH Garsault

C. OFFICINARUM DC. *Rusty-back Fern*. Old walls, tombs, etc. Rare. V.-c. 16. Hayes Churchyard, 1938; *D.McC.*; 1952; *E.B.Ba.* Near

Farningham on road to Maplescombe; *G.M.B.* V.-c. 17. Headley Lane, Mickleham, one plant on a wall, 1913; *E.B.B.* Old wall, Richmond Park, 6 plants, 1946; *C.L.C.*; 1956; *S.F.H.* Wall by Woldingham railway station, 1947; *C.D.P.*; 1952; *K.E.B.*; 1955, *J.E.L.*; *Hb.L.* Limpsfield, 3 small plants, 1954; *P.G.* Beddington Churchyard, 1957; *D.P.Y.* V.-c. 18. Railway bridge near Epping, 1943; *J.H.G.P.*; 1951; *R.M.P.* V.-c. 20. Great Amwell, 1910, *P.H.C.*; *Hb.L.N.H.S.* V.-c. 21. Harmondsworth, 1910, *P.H.C.*; *Hb.L.N.H.S.*; many thriving plants, 1920; *L.J.T.* Perivale Churchyard, 1906, *S.A.*; *Hb.L.N.H.S.*; 1920; *L.J.T.*; 1932-56; *D.H.K.* Near Harefield, 1906; *C.S.N.* Stanwell Churchyard, 1904, *C.B.G.*; *Hb.S.L.B.I.*

### OSMUNDACEAE

#### OSMUNDA L.

*O. REGALIS* L. *Royal Fern.* Bogs, wet heaths and woods on peaty soil. Very rare, and almost always planted. V.-c. 16. Keston Bog, one plant, c. 1950; *J.D.L.* Ravensbourne Estate, Keston, very abundant, but probably originally planted, 1954; *F.R.* Holwood Park, planted; *E.B.Ba.* V.-c. 17. Near Oxshott Heath, several small plants, 1947; *H.B.* Limpsfield Chart Quarry, two young plants, 1936; *J.E.S.D.*; destroyed in the same year; *J.E.S.D.* Gatton Park, perhaps planted, 1955, *J.E.L.*, *B.M.C.M.*, *H.Br.* & *E.M.C.I.* V.-c. 21. Bushy Park, about 6 plants, known for many years, 1949; *F.P.D.B.*

### OPHIOGLOSSACEAE

#### OPHIOGLOSSUM L.

*O. VULGATUM* L. *Adder's Tongue.* Damp grassland, pastures, chalk-pits, etc. Local. V.-c. 16. Crofton; Holwood; Keston; *W.W.* Chalkpit, Greenhithe, 1946; *F.R.*; 1954; *G.M.B.* Springpark Wood, West Wickham, 1926, *J.E.L.*; *Hb.L.* Near Downe, 1945, *J.E.L.*; *Hb.L.* Waste land between Beckenham and Hayes, an extensive colony, 1950; *J.F.S.B.\** V.-c. 17. Numerous old records. Near Devil's-den Wood, Coulsdon, 1951-55; Selsdon Wood; field near Frith Wood, 1955; *H.Br.* Wood by Pebblecombe Hill, 1949; *B.M.C.M.* Bookham Common, 1949; *E.B.Ba.* Chertsey Mead, 1945; Richmond Park, in two areas, 1943-45; Sheen Common, 1942-50; Ham Common, 1945-55; *B.W.* Foot of Colley Hill, 1951; *L.N.H.S. Excursion.* V.-c. 18. Lea Bridge, 1845, *R.P.†*; *Hb.L.N.H.S.* Monks Wood, 1899; Woodhatch, 1908; *R.W.R.* Sewardstone; Baldwin's Hill; Chingford Plain, 1917; *J.R.* Chalkpit, Grays, 1949; *B.T.W.* Loughton, 1951-54; *R.M.P.* V.-c. 19. Meadow near Nazeing, 1915; *R.W.R.* V.-c. 20. Near Hatfield; *L.B.H.* Between Bayford and Essendon, 1953; *L.J.J.* V.-c. 21. Potters Bar, 1898; *L.B.H.* Near Northwood, 1902; *J.E.Wh.* Ickenham Park, 1912; Harefield, 1913; 1915; *J.E.C.*; Syon Park; *D.H.K.* Edgware, 1925; *J.E.C.*

\*Beesley, J. F. S.

†Pryor, R.

Near Botany Bay, Enfield, 1915; *R.W.R.* Meadows W. of Shepperton; *B.W.* Meadow adjoining Harrow Weald Common; *P.T.* Ken Wood grounds, 1949; *H.C.H.*

### MARSILEACEAE

#### PILULARIA L.

*P. GLOBULIFERA* L. *Pillwort*. Edges of ponds and lakes on acid soils. Very rare. V.-c. 17. Walton Heath, 1927, *J.E.L.*; *Hb.L.* Putney Heath, 1934; *C.A.*

### AZOLLACEAE

#### AZOLLA Lam.

*A. FILICULOIDES* Lam. *Water Fern*. Alien. N. & S. America. Naturalised in streams, canals and ditches. Local, and varying in quantity from year to year, sometimes in the greatest abundance, at others in very small quantity. V.-c. 17. Abundant for two miles in the Basingstoke Canal, near Sheerwater, just outside the Area, 1955; *W.H.S.*; 1956; *B.W.* V.-c. 18. Stapleford Abbots, 1950, *M.H.\** comm. *B.W.* Pond, Lambourne End, 1953; *B.T.W.* V.-c. 20. Hertford Heath, 1938; *D.McC.* V.-c. 21. Lea Navigation Canal, Enfield, 1920; *J.E.C.* Frays river near Uxbridge Common, 1945; *B.W.* Canal and river Colne, Uxbridge to Denham, abundant, 1946; Colne and adjoining streamlets, Stanwell and Staines Moors, 1948-55; *D.H.K.* Ditches near Whitton railway station, 1926; *H.B.*

### LYCOPODIACEAE

#### LYCOPODIUM L.

*L. CLAVATUM* L. *Common Clubmoss, Stag's-Horn Moss*. Heaths. Very rare. V.-c. 17. Banstead Heath, 1950; *J.P.P.†*; 1951, *J.E.L.*; *Hb.L.*

*L. INUNDATUM* L. *Marsh Clubmoss*. Wet heaths. Very rare. V.-c. 16. Keston Bog, c. 1930; *S.E.C.* comm. *J.D.L.* V.-c. 19. "Wake Arms" Bog, 1951, deliberately planted, teste *F.R.*

### CHARACEAE

We are indebted to Mr. G. O. Allen for naming some of the plants in *Hb. Kent* and *Hb. Lousley*.

#### NITELLA Ag.

*N. OPACA* Ag. Ponds. Very rare. V.-c. 17. Pen Pond, Richmond Park, 1954; *J.P.M.B.*

\*Higginson, Miss M.

†Pugh, Miss J. P.

*N. FLEXILIS* Ag. Ponds. Rare. V.-c. 17. Wimbledon Common, 1878, *H. Gr.\** & *J. Gr.\**; Mitcham Common, 1924, *J.E.L.* & *D.G.C.*; *Hb.L.*

*N. TRANSLUCENS* Ag. Canals. Very rare. V.-c. 17. Basingstoke Canal, Byfleet, 1931, *J.E.L.*; *Hb.L.* det. *G.O.I.*

#### TOLYPELLA Leonh.

*T. GLOMERATA* Leonh. Ditches. Very rare. V.-c. 16. Salt-marsh ditch, Plumstead, 1894, *H. Gr.* & *J. Gr.*; *Hb.L.*

#### CHARA L.

*C. VULGARIS* L. Ponds, lakes and ditches on sandy and gravelly soils. Local. V.-c. 17. Gravel pit, Tamworth Lane, Mitcham, 1930; Ham gravel pits; gravel pit, Chertsey, 1945, *J.E.L.*; *Hb.L.* All det. *G.O.A.* V.-c. 18. Near Grays, 1927, *I.A.W.*; *Hb.L.* det. *J. Gr.* V.-c. 20. Bog near Wormley Wood, 1955, *J.E.L.*; *Hb.L.* det. *G.O.A.* V.-c. 21. Staines Moor, 1947; *B.W.* & *D.H.K.*; 1955; Hampton Court Home Park; Bushy Park; gravel pit. W. of Hounslow Heath, 1947-55; *D.H.K.* All det. *G.O.A.* Shortwood Common, Staines, 1947; *B.W.* & *D.H.K.* det. *G.O.A.* The following vars. have been determined by *G.O.A.* Var. *LONGIBRACTEATA* Kütz. V.-c. 21. Staines Moor, 1949; *A.W.W.* Var. *PAPILLATA* Wallr. V.-c. 21. Staines Moor, 1947; *B.W.* & *D.H.K.* Var. *CRASSICAULIS* Kütz. V.-c. 21. Staines Moor, 1949; *A.W.W.*

*C. CONTRARIA* Kütz. Pools. Very rare. V.-c. 21. Long Water, Home Park, Hampton Court, 1949; *D.H.K.* det. *G.O.A.*

*C. GLOBULARIS* Thuill., *C. FRAGILIS* var. *HEDWIGII* Kütz. Pools, streams and ditches. Local. V.-c. 17. Tank near Kingston, 1881, *H.Gr.*; *Hb.L.* The var. *CAPILLACEA* (Thuill.) Zanev is reported from v.-c. 17. Pond near Bookham railway station, 1929, *J.E.L.*; *Hb.L.* conf. *J.Gr.* V.-c. 18. Walthamstow Ponds, 1923; *R.W.R.* V.-c. 21. Near river Lea, Clapton; *C.N.* Wyrardisbury River, Staines, very abundant, 1949, *D.H.K.*; *Hb.K.* det. *G.O.A.*

*C. DELICULATA* Ag. Pools and streams. Very rare. V.-c. 17. Near Byfleet; *L.B.H.*

**SUPPLEMENT TO A HAND-LIST OF THE PLANTS OF THE  
LONDON AREA**

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Publication of the successive parts of the *Hand List* has stimulated greatly increased interest in the contribution of records of the plants of the London Area, and, during the six years it has been in progress, a large amount of additional information has been added to the cards in the care of the Recorder. It is only possible to include a few of these records in this Supplement and the selection has therefore been restricted to the following:—

1. Additional species, and more important varieties and hybrids. These are prefixed with an asterisk.
2. Records for vice-counties not represented in the accounts already published.
3. Important new records for a few very rare species, even though these do not add new vice-counties to the distribution.

**Part 1.**

p. 1

CLEMATIS VITALBA L. V.-c. 19. North Weald, 1946; *L.J.T.* Latton Park; Mark Bushes; near Epping Upland Church, 1951; *B.T.W.*

p. 1

\**C. MONTANA* Buch.-Ham. ex DC. Alien. India. Garden escape. Very rare. V.-c. 17. Naturalised in the hedge of Purley Downs Golf Course adjoining Purley Downs Road, 1945 onwards; *H.Br.*

p. 1

THALICTRUM MINUS L. V.-c. 16. Dartford Heath, garden escape, 1950-51; *H.M.P.* V.-c. 18. Chigwell Lane, garden escape, 1939; *P.H.C.*

p. 2

ADONIS ANNUA L. V.-c. 16. Stone Marshes, 1951; *J.H.McC.* Swanley, 1883, *F.J.H.*; *Hb.Mus.Brit.* Cornfield by Mounts Road, Greenhithe, 1954; *D.McC. & F.R.* V.-c. 21. Rubbish-tip, New Years Green, one plant, 1954; *T.G.C. & M.C.*

p. 2

\**A. AESTIVALIS* L. Alien. S. Europe. V.-c. 17. Garden weed, Epsom College, 1945, *A.E.E.*; *Hb.E.C.M.*

p. 3

RANUNCULUS HETEROPHYLLUS Weber. V.-c. 18. Pond, Galley Hill, Epping, 1936; *J.B.E.*

p. 4

R. BAUDOTH Godr. V.-c. 16. Swanscombe Marshes, 1952; *H.M.P.*

p. 5

R. FLAMMULA \*var. ANGUSTIFOLIUS Wallr. V.-c. 17. Mitcham, 1937, *J.B.E.*; *Hb.Mus.Brit.*

p. 5

R. LINGUA L. V.-c. 18. Cook's Pond, Woodford Green, 1950; *D.J.B.*  
V.-c. 21. Pond, Potters Bar, 1955; *S.P.*

p. 6

R. PARVIFLORUS L. V.-c. 17. Box Hill, 1874, *F.J.H.*; *Hb.Mus.Brit.*  
Garden weed, Old Coulsdon, 1955; *H.Br.*

p. 6

R. ARVENSIS L. V.-c. 18. Epping Forest, between High Beach and  
Waltham, 1936; *J.B.E.* V.-c. 20. London Colney, 1941; *J.B.* Fields,  
Hertford Heath, 1951; *S.C.M.* Essendon, 1948; *L.J.T.*

p. 6

R. FICARIA var. BULBIFER Albert. V.-c. 17. The only form around  
Chipstead, Merstham and Reigate; *D.P.Y.*

p. 6

HELLEBORUS VIRIDIS var. OCCIDENTALIS (Reut.) Rouy & Fouc. V.-c.  
17. Titsey Woods, 1924; *E.B.B.* Copse between Walton Downs and  
Walton-on-the-Hill, 1942, *A.E.E.*; *Hb.E.C.M.* Fridley Copse, Mickle-  
ham, 1951; *J.E.S.D.*

p. 6

H. FOETIDUS L. V.-c. 16. Otford, 1955; *J.F.H.* & *P.C.H.* V.-c. 17.  
Warlingham, 1954; *R.C.* Old Coulsdon, 1939-49 and (a second locality),  
1955; *H.Br.*

p. 7

\*NIGELLA DAMASCENA L. *Love-in-a-Mist*. Alien. S. Europe. Garden outcast.  
V.-c. 17. Waste ground, Ham, 1953; *H.T.C.* Mitcham Common, 1956; *J.E.L.*

p. 7

DELPHINIUM AJACIS L. sec. Gay. V.-c. 18. Rubbish-tip near Ilford, 1951; *B.T.W.*

p. 7

D. ORIENTALE Gay. V.-c. 18. Gravel pit, South Ockenden, 1949; *L.M.P.S.* det.  
*D.H.K.*

p. 8

MAHONIA AQUIFOLIUM (Pursh) Nutt. V.-c. 16. Keston, 1953; *G.M.B.*  
Farningham, 1954; *L.N.H.S. Excursion.* V.-c. 20. Essendonbury;  
Rickmansworth, 1931; *L.J.T.* Panshanger, 1952; *R.M.P.*, *T.G.C.* &  
*D.H.K.*

p. 10

PAPAVER HYBRIDUM L. V.-c. 17. Appears annually at Epsom College; *A.E.E.*

p. 10

\*GLAUCIUM CORNICULATUM (L.) Rudolph. Alien. S. Europe. V.-c. 21. Railway yard, Kew Bridge, 1956; *D.M.* det. at *Kew.*

p. 10

## ARGEMONE L.

\*A. MEXICANA L. Alien. Mexico. V.-c. 18. Waste ground, Dagenham, *J.P.M.B.* & *N.Y.S.*, *B.E.C. 1939-40 Rep.*, 266.

p. 12

FUMARIA OFFICINALIS L. V.-c. 19. Little Parndon; *L.J.T.*

p. 12

F. PARVIFLORA Lam. V.-c. 17. Field, Epsom College, 1952, *A.E.E.*; *Hb.E.C.M.*

p. 12

\*F. AGRARIA Lag. Alien. S. Europe. V.-c. 18. Waste ground, Dagenham, *J.P.M.B.* & *N.Y.S.* conf. *H.W.P.*; *B.E.C. 1939-40 Rep.*, 267.

p. 12

\*MATTHIOLA BICORNIS (Sm.) DC. *Night-scented Stock.* Alien. S.E. Europe & Asia Minor. Garden outcast. V.-c. 21. Rubbish-tip, Hanwell, 1953; rubbish-tip, Greenford, 1954; *D.H.K.*

p. 13

NASTURTIUM MICROPHYLLUM (Boenn.) Rchb. V.-c. 18. Hainault Forest, 1950, *L.M.P.S.*; *Hb.Mus.Brit.* det. *E.B.Ba.* Epping Forest, 1952; *L.M.P.S.* det. *D.H.K.*

p. 14

RORIPPA AUSTRIACA (Crantz) Besser. V.-c. 17. Railway embankment, South Croydon, 1952; has persisted here for at least 15 years although mown down annually; *D.P.Y.*

p. 14

BARBAREA STRICTA Andrz. V.-c. 16. Abbey Wood Marshes, 1952; *L.N.H.S. Excursion* conf. *D.H.K.*

p. 14

B. INTERMEDIA Boreau. V.-c. 20. Arable land, Merlyn's Wood, near Watford, 1953; *L.N.H.S. Excursion* det. *F.B.Ba.*

p. 14

B. VERNA (Mill.) Aschers. V.-c. 24. Near Uxbridge, 1917; *L.J.T.*

p. 15

## CARDAMINOPSIS (C. A. Mey.) Hayek

\*C. ARENOSA (L.) Hayek, ARABIS ARENOSA Scop. Alien. Europe. V.-c. 18. Waste ground, Bromley-by-Bow Gasworks, 1956; *B.T.W.* & *J.E.L.*



p. 15

TURRITIS GLABRA L. V.-c. 16. Sandy bank near Catford Bridge. 1886, *F.J.H.*; *Hb.Mus.Brit.*

p. 16

DENTARIA BULBIFERA L. V.-c. 24. Ranston Covert, Denham, plentiful, 1955; *I.G.J.*

p. 16

LUNARIA ANNUA L. V.-c. 16. Sevenoaks, 1951; *L.J.T.*

p. 16

DRABA MURALIS L. V.-c. 20. Old wall in Hatfield House Park, 1955; *R.M.H.*

p. 19

SISYMBRIUM LOESELII L. V.-c. 16. A nearly glabrous form was found at Woolwich Common, 1954, *T.B.R.*; *Hb.Mus.Brit.* det. *N.Y.S.*, and also at Southwark Refuse-tip, Longfield (just outside the Area), 1956, *E.B.Ba.*, *J.F.H.*, *P.C.H.*, *J.E.L.* & *D.McC.*

p. 20

ERYSIMUM CHEIRANTHOIDES L. V.-c. 19. Latton Park; Mark Bushes, 1951; *B.T.W.*

p. 20

CAMELINA SATIVA (L.) Crantz. V.-c. 20. Rubbish-tip, Cole Green, 1955; *J.G.D.*

p. 21

BRASSICA OLERACEA L. V.-c. 16. Established behind river-walls at Stone and Swanscombe Marshes, 1955; *H.M.P.*

p. 21

*B. INTEGRIFOLIA* var. *CARINATA* (A. Braun) O. E. Schulz. V.-c. 21. Trinity Gardens. Tower Hill, 1951, *J.E.L.* & *E.M.C.I.*; *Hb.L.* Garden weed, Cricklewood, 1952; *J.Fa.* det. at *Kew.*

p. 22

SINAPIS ALBA L. V.-c. 18. Epping; *A.W.J.*

p. 22

ERUCASTRUM GALLICUM (Willd.) O. E. Schulz. V.-c. 18. Rubbish-tip, East Ham, 1951; *J.E.L.*, *B.W.*, *L.W.F.* & *J.Ru.* Ripple Level, Barking, 1956; *J.E.L.*, *B.T.W.* & *D.McC.*

p. 22

### HIRSCHFELDIA Moench

\**H. INCANA* (L.) Lagrèze-Fossat, *BRASSICA INCANA* (L.) Meigen, non Ten. Alien. Europe. Well established and spreading on waste ground. Locally abundant. V.-c. 18. Ripple Level, 1954; Creekmouth, 1951, *J.E.L.*; *Hb.L.* V.-c. 21. Waste ground, Hounslow Heath, in quantity, 1954; *B.W.*; increasing, 1956; *J.E.L.*, *T.G.C.* & *D.H.K.* Rubbish-tip, Hanwell, one large plant, 1954; *T.G.C.* & *G.W.C.*

p. 22

DIPLLOTAXIS TENUIFOLIA (L.) DC. V.-c. 20. Old walls, St Albans, 1919; *L.J.T.*; 1950; *S.C.M.* Rubbish-tip, Cole Green, 1955; *J.G.D.*

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CORONOPUS DIDYMUS (L.) Sm. V.-c. 18. Curtis Mill Green, 1954; *B.T.W.*

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LEPIDIUM GRAMINIFOLIUM L. V.-c. 21. Rubbish-tip, Greenford, 1955; *D.H.K.*

p. 24

*L. SMITHII* Hook. V.-c. 17. Garden weed, Old Coulsdon, 1955; *H.Br.* Kew Gardens, 1945 & 1956; *B.IV.*

p. 25

TEESDALIA NUDICAULIS (L.) R.Br. V.-c. 20. Radlett, 1942; *J.B.* V.-c. 21. Near Uxbridge, 1893, *F.J.H.*; *Hb.Mus.Brit.*

p. 25

VOGELIA PANICULATA (L.) Hornem. V.-c. 16. Rubbish-tip, Sevenoaks, 1948; *D.McC.*

p. 25

BUNIAS ORIENTALIS L. V.-c. 16. Abbey Wood Marshes, one plant, 1952; *L.N.H.S. Excursion.*

p. 25

RAPISTRUM PERENNE (L.) All. V.-c. 21. Bombed site, Hammersmith, 1952-55; *N.Y.S.*

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RAPHANUS RAPHANISTRUM \*var. AUREUS Wilmott. V.-c. 21. Bombed site, Shadwell, 1952, *A.H.*; *Hb.Mus.Brit.*

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RESEDA ALBA L. V.-c. 17. Gravel pits, Ham, 1954; *L.N.H.S. Excursion.*

p. 26

*R. LUTEA* \*var. PULCHELLA F. Muell. V.-c. 21. Bombed site, Hammersmith, 1952; *N.Y.S.*

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VIOLA ODORATA L. V.-c. 19. Epping Upland, 1936; *L.J.T.*

p. 27

*V. ODORATA* \*var. SULFUREA (Car.) Rouy & Fouc. V.-c. 17. Clearing in woods on chalk, Great Burgh, Epsom Downs, 1950, *D.P.Y.*; *B.S.B.I. 1951 Year Book*, 121.

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*V. PALUSTRIS* L. V.-c. 16. Boggy wood, Greatness, Sevenoaks, 1949; *F.R.*

p. 31

POLYGALA VULGARIS L. V.-c. 20. Panshanger, 1952; A.W.W.

p. 31

DIANTHUS DELTOIDES L. V.-c. 16. Abundant and apparently native in a disused quarry, S. of Chipstead, Sevenoaks, 1953; *F.S.E.F.*: 1954; *F.R.* V.-c. 17. Sandy field near Ham, 1871. *F.J.H.*; *Hb.Mus.Brit.*; 1885; *J.O.B.*

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D. ARMERIA L. V.-c. 17. Richmond Park, about 6 plants, 1952; *L.M.P.S.*

p. 33

SILENE ANGLICA L. V.-c. 17. Barnes Common, 1951; *L.N.H.S. Excursion.* V.-c. 18. Arable ground, Kelvedon, 1905, *P.H.C.*; *Hb.L.N.H.S.*

p. 33

S. NUTANS L. V.-c. 17. Norbury Park, 1955, *P.D.O.*; *Hb.L.*; 1956; *A.E.E.*

p. 33

\*S. CSEREH Baumg. Alien. S.E. Europe. V.-c. 18. Dagenham Dock, 1927, *J.E.C.*; *Hb.Mus.Brit.*

p. 33

S. DICHOTOMA Ehrh. V.-c. 17. Pebblecombe Hill, 1952, *P.D.O.*; *Hb.E.C.M.* In several fields, Chipstead Valley, 1954; *B.M.C.M.* & *B.W.* Horley, 1954; *B.M.C.M.* V.-c. 21. Penton Hook, 1953; *B.M.C.M.* det. *E.C.W.*

p. 34

MELANDRIUM ALBUM × DIOICUM. V.-c. 16. Blackheath, 1953; *G.M.B.* V.-c. 18. Bromley-by-Bow Gasworks, 1956, *B.T.W.*, *C.B.P.* & *R.W.*; *Essex Nat.*, 29, 340. V.-c. 20. Rickmansworth, 1882, *F.J.H.*; *Hb.Mus.Brit.*

p. 35

CERASTIUM SEMIDECANDRUM L. V.-c. 18. Chigwell, 1951; *B.T.W.*

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C. ARVENSE L. V.-c. 20. Near Radlett, 1951; *D.H.K.*

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C. TOMENTOSUM L. V.-c. 16. Eynsford, 1932; *L.J.T.* Rubbish-tip, Stone, 1951; roadside, Horn's Cross to Greenhithe, 1952; chalk bank, Greenhithe, 1955; *H.M.P.* Crossness, 1953-55; *J.F.H.* & *P.C.H.* Dartford; *G.M.B.*

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MOENCHIA ERECTA (L.) Gaertn., Mey. & Scherb. V.-c. 20. Hertford Heath, local, 1951; *S.C.M.*

p. 36

STELLARIA HOLOSTEA \*var. LACINIATA Bromf. V.-c. 17. Bookham Common, *W.H.S.*; *Lond. Nat.*, 30, 6.

p. 38

ARENARIA LEPTOCLADOS (Rchb.) Guss. V.-c. 19. Old wall, Netteswell, 1952; *R.M.P.* V.-c. 24. Old wall, Denham, 1954; *D.H.K.*

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SAGINA APETALA Ard. V.-c. 16. Chislehurst; Dartford Heath; Greenwich Park, 1953; *G.M.B.* Bexley Churchyard, 1954; Farningham Wood, 1955; *J.F.H.* & *P.C.H.* V.-c. 19. Latton Park; Mark Bushes, 1951; *B.T.W.*

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*S. CILIATA* Fries. V.-c. 20. Panshanger, 1952; *B.W.*

p. 39

*S. NODOSA* (L.) Fenzl. V.-c. 21. Isleworth, 1904; *C.B.G.*

p. 39

SPERGULA ARVENSIS L. V.-c. 19. Roydon, 1937; *L.J.T.*

p. 39

SPERGULARIA SALINA J. & C. Presl. V.-c. 16. Cray and Darent Estuary; *G.M.B.* Stone Marshes, 1955; *H.M.P.* V.-c. 18. Creekmouth, 1951; *J.E.L.* & *J.C.C.* Ripple Level, 1954; *J.E.L.* Rainham, 1956; *L.M.P.S.*

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\**PORTULACA GRANDIFLORA* Hook. Alien. S. America. Garden outcast. V.-c. 21. Rubbish-tip, Hanwell, 1955; *D.McC.*

p. 40

CLAYTONIA PERFOLIATA Willd. V.-c. 20. Meadow, Marden Park, N. of Panshanger, 1950, *S.C.M.*

p. 40

*MONTIA FONTANA* L. sens. lat. has been revised by S. M. Walters in *Watsonia*, 3, 1-6 (1953) and the following taxa have been recorded from the Area:—

*M. FONTANA* subsp. *CHONDROSPERMA* (Fenzl) Walters, *M. VERNA* auct. V.-c. 17. Wandsworth Common, 1871, *F.J.H.*; *Hb.Mus.Brit.* Bookham Common, 1940, *P.H.C.*; *Hb.L.N.H.S.* det. *D.H.K.*; 1951; *E.B.Ba.* Epsom Common, 1930, *J.E.L.*; *Hb.L.* V.-c. 18. Epping Forest, 1900, *C.S.N.*; High Beach, 1910. *P.H.C.*; *Hb.L.N.H.S.* both det. *D.H.K.* V.-c. 21. Staines Moor, 1947; Ruislip Common, 1951, *D.H.K.*; *Hb.K.*

Subsp. *INTERMEDIA* (Beeby) Walters, *M. LUSITANICA* Sampaio. V.-c. 17. Mitcham Common, 1930, *J.E.L.*; *Hb.L.*; Richmond Park, 1950; *N.Y.S.*

**Part 2.**

p. 42

HYPERICUM DUBIUM Leers. V.-c. 20. Whippendell Wood, 1954; *E.B.Ba.* & *E.W.G.*

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\*LAVATERA TRIMESTRIS L. Alien. S. Europe. V.-c. 18. Waste ground, Dagenham, *H.K.A.-S.*; *B.E.C. 1941-42 Rep.*, 484.

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MALVA PUSILLA Sm. V.-c. 18. Rubbish-tip, Barking, 1953, *J.E.L.* & *J.E.W.*; *Hb.L.*

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ABUTILON THEOPHRASTI Medic. V.-c. 18. Rubbish-tip, Barking, 1953; *B.W.*

p. 45

**ZYGOPHYLLACEAE**

**ZYGOPHYLLUM L.**

\*Z. FABAGO L. *Syrian Bean Caper*. Alien. N. Africa. Garden outcast. Established on waste ground. Very rare. V.-c. 17. Edge of Mitcham Common, 1955, *J.B.E.*; *Hb.Mus.Brit.* det. *A.W.E.* Beddington Sewage Farm, 1956, *D.P.Y.* & *J.E.J.*; *Hb.L.*

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TILIA PLATYPHYLLOS Scop. V.-c. 16. Avery Hill Park; Chislehurst. 1953; *G.M.B.* V.-c. 20. North Mimms, 1919; Wormley West End, 1915; *L.J.T.*

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LINUM BIENNE Mill. V.-c. 21. Field near Hounslow Heath. 1953; *B.W.*

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L. USITATISSIMUM L. Plants with pure white flowers were noted in v.-c. 17. Rubbish-tip, Mitcham Common, 1956, *J.E.L.*; *Hb.L.* V.-c. 18. Rubbish-tip, Ripple Level, Barking, 1956; *J.E.L.*, *B.T.W.* & *D.McC.* V.-c. 21. Rubbish-tip, Greenford, 1956; *D.H.K.*

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\*L. GRANDIFLORUM Desf. Alien. Algeria. Garden outcast. V.-c. 21. Bombed sites, Cripplegate; *A.W.J.*

p. 46

GERANIUM VERSICOLOR L. V.-c. 18. Under bushes near High Beach Church; *L.J.T.*

p. 46

G. PRATENSE L. V.-c. 20. Near Stocker's Lake, Springwell, in quantity, 1955; *B.P.P.*

p. 46

G. PHAEUM L. V.-c. 16. Footpath, Otford, 1955; *J.F.H.* & *P.C.H.*

p. 49

\**G. CAROLINIANUM* L. Alien. N. America. V.-c. 17. Near Mitcham, 1897, *C.E.B.*; *B.E.C. 1916 Rep.*, 406.

p. 50

*TROPAEOLUM MAIUS* L. V.-c. 17. Wimbledon and Bookham Commons; *A.W.J.* V.-c. 19. Nazeing, 1937; *L.J.T.*

p. 51

*IMPATIENS CAPENSIS* Meerburgh. V.-c. 18. Walthamstow Marshes, 1952; *J.J.*

p. 51

\**I. NOLI-TANGERE* L. Alien. Europe, including parts of Britain. Very rare. V.-c. 16. Ravensbourne Estate, Keston, 1955; *F.R.*, *P.C.H.* & *G.M.B.*

p. 54

*PARTHENOCISSUS QUINQUEFOLIA* (L.) Planch. V.-c. 16. Dartford Heath, growing over bushes, 1954; *H.M.P.*

p. 56

*SAROTHAMNUS SCOPARIUS* var. *ANDREANUS* (Puissart) Aschers. & Graebn. V.-c. 16. Rough ground near Sevenoaks, 1955; *K.E.B.*

p. 56

*ONONIS REPENS* L. V.-c. 18. Between Shenfield and Kelvedon Hatch, 1947; *L.J.T.* Chigwell; *A.W.J.* V.-c. 20. Panshanger, 1952; *T.G.C.* & *D.H.K.*

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*O. SPINOSA* L. V.-c. 19. Netteswell, 1933; *L.J.T.* Epping Lower Forest, 1933; *L.J.T.*

p. 57

*TRIGONELLA ORNITHOPODIOIDES* (L.) DC. V.-c. 17. Golf course, Wimbledon Common, 1953; *A.W.J.*

p. 57

*T. FOENUM-GRÆCUM* L. V.-c. 18. Rubbish-tip, Barking, 1952, *D.P.Y.*; *Hb.L.* V.-c. 21 Weed in flower bed, Chelsea Embankment Gardens, 1955, *D.P.Y.*; *Hb.L.*

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*T. HAMOSA* L. V.-c. 18. Rubbish-tip, Barking, 1953, *J.E.L.*, *R.A.G.* & *R.C.L.B.*; *Hb.L.*

p. 58

*MEDICAGO FALCATA* \*var. *PUBESCENS* (Rouy) Druce. V.-c. 18. Dagenham, *J.E.C.*; *B.E.C. 1927 Rep.*, 611.

p. 58

*M. × VARIA* Martyn. V.-c. 16. Roadside verge near Bexley, 1947; *J.M.B.* Dartford, 1954; *H.M.P.*

p. 58

\**M. MUREX* Willd. Alien. S. Europe. V.-c. 18. Rubbish-tip, Barking, 1953. *B.W. & J.E.L.; Hb.L.*

p. 58

*M. ARABICA* \*var. *LONGISPINA* Rouy. V.-c. 21. Acton, 1902, *A.L.; Hb.D.*

p. 60

\**MELILOTUS SULCATA* Desf. Alien. S. Europe. V.-c. 20. Rubbish-tip, Cole Green, 1955; *J.G.D.*

p. 60

*TRIFOLIUM MEDIUM* Huds. V.-c. 19. North Weald, 1946; *L.J.T.*

p. 61

*T. OCHROLEUCON* Huds. V.-c. 19. Between North Weald and Magdalen Laver, common in places, 1952; *L.J.T.*

p. 65

*TETRAGONOLOBUS MARITIMUS* (L.) Roth. V.-c. 16. Well established in rough grassland, Longfield. 1956; *A.G.S.*

p. 65

*LOTUS ULIGINOSUS* \*var. *GLABER* Bréb. V.-c. 17. Bookham Common, 1948; *E.B.Ba.*

p. 65

*L. ANGUSTISSIMUS* L. V.-c. 17. South west of Blackheath, *J.G.L.; B.E.C. 1930 Rep.*, 341.

p. 65

*GALEGA OFFICINALIS* L. V.-c. 18. Near Upminster; Chigwell; *A.W.J.*

p. 66

PSORALEA L.

\**P. AMERICANA* L. Alien. N. Africa. V.-c. 18. Rubbish-tip, Barking. 1953 *B.W.; Hb.Mus.Brit.* V.-c. 21 Rubbish-tip, Hanwell, 1952. *B.S.B.I. Excursion: Hb.Mus.Brit. & Hb.K.*

p. 66

*ROBINIA PSEUD-ACACIA* L. V.-c. 16. Chalkpit, Empire Paper Mills. Swanscombe, two trees, 1952; *H.M.P* V.-c. 18. Railway bank near Leytonstone, 1919; *L.J.T.*

p. 68

*VICIA SEPIUM* \*var. *OCHROLEUCA* Bast. V.-c. 17. Near Kemp's Farm, Buckland, 1954; *B.M.C.M.*

p. 68

*V. LUTEA* L. V.-c. 17. Rubbish-tip, Mitcham Common. 1956, *D.P.Y. & J.E.L.; Hb.L.* V.-c. 18. Rubbish-tip, Barking, 1953; *B.W.* V.-c. 21. Rubbish-tip, Hanwell. 1953; *D.H.K.*

p. 69

V. BENGHALENSIS L. V.-c. 18. Rubbish-tip, Barking, 1953; *B.T.W.*

p. 69

\*V. MONANTHA ssp. TRIFLORA (Ten.) Burt & Lewis. Alien. S. Europe. V.-c. 18. Rubbish-tip, Barking, 1954; *D.P.Y.*

p. 69

V. PANNONICA Crantz. V.-c. 17. Rubbish-tip, Mitcham Common, 1956; *D.P.Y.*  
V.-c. 21. Rubbish-tip, Hanwell, 1953; *D.H.K.*

V. PANNONICA var. SUBPURPURASCENS (DC.) Boiss. V.-c. 17. Derelict garden of empty house, Kew, 1953; *J.P.M.B.*

p. 70

LATHYRUS HIRSUTUS L. V.-c. 16. Rough field near Bromley, 1955; *J.Cu.* comm  
*D.P.Y.* V.-c. 17. Rubbish-tip, Mitcham Common, 1956, *D.P.Y.* & *J.E.L.*; *Hb.L.*

p. 72

\*PRUNUS LAUROCERASUS L. *Cherry-Laurel*. Alien. S.E. Europe and S.W. Asia. Planted in woods, copses and hedges. Not common. V.-c. 16. Sevenoaks, 1949; Knockholt, 1951; *L.J.T.* V.-c. 17. Epsom Downs, 1936; *L.J.T.* V.-c. 20. Hedgerow, Shenley, 1931; London Colney, 1949; North Mimms, 1951; *L.J.T.*

p. 72

P. PADUS L. Delete record for v.-c. 18, error for AMELANCHIER INTERMEDIA.

p. 72

P. DOMESTICA L. V.-c. 19. Waltham Abbey, 1946; *L.J.T.*

p. 73

\*P. PERSICA (L.) Batsch. *Peach*. Alien. China. Garden outcast established on waste ground. Rare. V.-c. 21. Rubbish-tip, Hanwell, a large sapling, 1953; waste ground, Yiewsley, 1953-56; *D.H.K.*

p. 73

\*P. AMYGDALUS Batsch. *Almond*. Alien. W. Asia. Garden outcast established on waste ground. Rare. V.-c. 21. Rubbish-tip, Hanwell, a single sapling, 1953; waste ground, Yiewsley, 1953-56; *D.H.K.*

p. 74

#### ARUNCUS Adans.

\*A. SYLVESTRIS Kostel, SPIRAEA ARUNCUS L. Alien. Europe, etc. Garden outcast. Established in a chalkpit. Rare. V.-c. 16. Chalkpit, Cotton Lane, Stone, 1950-52; *H.M.P.*

RUBUS. All additions and corrections to this genus are made on the authority of the late W. C. R. Watson.

p. 75

\*R. CAESIUS \*var. GRANDIS W. Wats. V.-c. 16. Turpington Lane, Bickley, 1952.



\*Var. *DENTICULATUS* W. Wats. V.-c. 17. Addington.

\*Var. *PINNENSIS* W. Wats. V.-c. 21. Near the Pinn Brook, near Swakeleys.

p. 77

*R. MERCICUS* Bagn. Delete record for v.-c. 17—error.

p. 77

*R. VULGARIS* W. & N. V.-c. 21. Hadley Wood.

p. 78

*R. OXYANCHUS* Sudre. V.-c. 16. Hayes Common.

p. 78

\**R. AMPHICHLORUS* P. J. Muell. V.-cc. 16 & 17. Springpark Wood.

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*R. ATROCAULIS* P. J. Muell. V.-c. 21. Hampstead Heath.

p. 79

\**R. LASIOTHYRSUS* Sudre. V.-cc. 16 & 17. Springpark Wood.

p. 79

For *R. CRYPTADENES* Sudre read *R. RUBRITINCTUS* W. Wats.

p. 82

For *R. MACROSTACHYS* P. J. Muell. read *R. ADENANTHUS* Boul. & Gill.

p. 82

\**R. SCUTULIFOLIUS* Sudre. V.-c. 17. Springpark Wood, towards Spout Hill; Gee Wood, Selsdon.

p. 82

*R. PODOPHYLLUS* P. J. Muell. V.-c. 16. Woodland site off Stanbourne Way, once forming part of Springpark Wood.

p. 83

Delete *R. MUCRONATOIDES* A. Ley—error.

p. 85

*R. DRYMOPHILUS* M. & L. V.-c. 18. Fairmead Bottom, Epping Forest.

p. 85

\**R. PUTNEIENSIS* W. Wats. V.-c. 17. Putney Heath.

p. 87

*R. FUSCIFORMIS* Sudre. Delete Surrey records—errors.

p. 87

\**R. FRONDICOMUS* Foerst. V.-c. 16. Hayes Common, in two places.

p. 88

R. ADORNATIFORMIS (Sudre) Bouv. V.-c. 20. Oxhey Wood.

p. 88

R. GRYPOACANTHUS M. &amp; L. V.-c. 21. Copse Wood.

p. 88

Delete R. SPRENGELIIFLORUS (Sudre) W. Wats.—error for R. OBSCURIFORMIS.

p. 88

R. HETEROBELUS Sudre. Delete S. Essex and Herts record—errors.

p. 89

R. INDUSIATUS Focke. V.-c. 18. Epping Forest, near High Beach, 1943.

p. 89

R. MOYLEI Bart. &amp; Ridd. V.-c. 21. Hampstead Heath.

p. 90

\*R. LAPEYROUSIANUS (Sudre) W. Wats. V.-c. 17. St. Ann's Hill.

p. 91

Delete R. EXASPERATUS L. &amp; M. and R. BAVARICUS (Focke) W. Wats.

p. 91

\*R. APRICUS var. SPARSIPILUS W. Wats. V.-c. 24. Tatling End Wood, Denham.

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R. CORONATUS var. CINERASCENS W. Wats. Delete Middx. record—error.

p. 92

\*R. ANALOGUS M. &amp; L. V.-c. 21. Bayhurst Wood.

p. 93

For R. RADULIFORMIS (A. Ley) W. Wats. read R. HALSTEADENSIS W. Wats.

\*R. PHOENICOLASIUS Maxim. *Japanese Wineberry*. Alien. Japan. Garden escape. Naturalised on a slope. Rare. V.-c. 17. Slope above river Mole, Norbury Park, 1951; *B.M.C.M.*; 1953; *W.H.S.*

p. 101

POTENTILLA REPTANS \*f. MICROPHYLLA Tratt. V.-c. 20. Broxbourne, 1924; *E.B.B.*

p. 103

ALCHEMILLA XANTHOCHLORA Rothm. V.-c. 24. Newland Park, Chorley Wood, 1955; *Miss Rooke*, conf. *S.M.W.*

p. 103

*A. VESTITA* (Buser) Raunk. V.-c. 20. Whippendell Wood, 1953; *L.N.H.S. Excursion*.

p. 104

*APHANES MICROCARPA* (Boiss. & Reut.) Rothm. V.-c. 18. Ongar Park Wood, 1956; *E.B.Ba.* V.-c. 20. Panshanger, 1952; *A.W.W.*

p. 104

*AGRIMONIA ODORATA* (Gouan) Mill. V.-c. 20. Highfield Wood, 1953; *R.M.P.*

p. 110

*ROSA TOMENTOSA* Sm. V.-c. 16. Wood on south side of river just north of Lullingstone Castle; *G.M.B.*

p. 112

*SORBUS TORMINALIS* (L.) Crantz. V.-c. 19. Galley Hill, 1956; *R.M.P.* V.-c. 20. Lane west of Cassiobury Park; *W.W.*

### Part 3.

p. 114

*PYRACANTHA COCCINEA* M. J. Roem. V.-c. 21. Disused chalkpit, Harefield, 1953; *T.G.C. & M.C.* det. *A.M.*

p. 114

*COTONEASTER SIMONSH* Baker. V.-c. 16. Eynsford village; *G.M.B.*

p. 114

\**C. MICROPHYLLUS* Wall. ex Lindl. Alien. Himalaya. Garden escape. Naturalised on banks and downs. Rare. V.-c. 17. Downs west of Betchworth Lime Works, no doubt bird-sown from a garden, 1953; *B.M.C.M.* Railway bank, Stuart Road, Warlingham, 1956; *D.McC.*

p. 114

*C. HORIZONTALIS* Decne. V.-c. 17. Abundant in a disused chalk quarry above North Park Farm, Caterham, 1955; *G.F.L.*

p. 116

### PELTIPHYLLUM Engler

\**P. PELTATUM* (Torr.) Engler. Alien. N. America. V.-c. 17. Persistent at Gatton Park; *E.M.C.I.*, *B.M.C.M.*, *H.Br.* & *J.E.L.*

### TILLAEA L.

p. 118

\**T. RECURVA* Hook. f. Alien. S. Australia and Tasmania. Established in a pond. Very rare. V.-c. 18. Choking a small pond near Greensted Church, near Chipping Ongar, 1956; *E.B.Ba.*, *J.F.H.* & *P.C.H.* This species was probably deliberately planted; *J.E.L.*

p. 118

SEDUM FORSTERIANUM Sm. V.-c. 16. Plentiful in a gravel pit near Green Street Green, Darenth, 1953; *H.M.P.*

p. 118

S. ALBUM L. V.-c. 16. Chalk bank, Dartford By-pass, Stone, 1953; *G.M.B.*; 1954; *H.M.P.*

p. 119

HIPPURIS VULGARIS L. V.-c. 18. Warren Pond, Chingford, 1952; *M.A.R.S.S.* V.-c. 21. Wet gravel pit, Harefield Moor, two colonies, 1956; *B.P.P.* V.-c. 24. In several places by the canal between Yiewsley and Iver, 1955; *D.H.K.*

p. 120

MYRIOPHYLLUM SPICATUM L. V.-c. 16. Ditch near Long Reach Tavern, Dartford Marshes, 1955; *L.N.H.S. Excursion.*

p. 120

M. ALTERNIFLORUM DC. V.-c. 16. Keston Ponds; *D.P.Y.*

p. 120

CALLITRICHE. This complex genus has recently been revised by Dr. H. D. Schotsman in *Acta Botanica Neerlandica*, 3, 313-384 (1954).

p. 120

\*C. PLATYCARPA Kütz. Specimens in Hb. Lousley from v.-c. 17. Epsom Downs, 1926, have been determined by Dr. Schotsman as probably this species, which is now much better understood following her revision of the genus. From the little at present known of its distribution it is likely to be found in the London Area.

p. 124

\*EPILOBIUM PEDUNCULARE Cunn. Alien. New Zealand. Garden escape. Established in damp grassy places. Very rare. V.-c. 21. Potters Bar Golf Course, c. 1945, *R.L.*; *Hb.L.*

p. 124

\*E. ALSINOIDES Cunn. Alien. New Zealand. Garden escape. V.-c. 16. Bickley; *F.R.B.*

p. 125

OENOTHERA ERYTHROSEPALA Borbás. V.-c. 16. Gravel pit near Green Street Green, Darenth, 1953; *H.M.P.* Blackheath, 1953; *G.M.B.*

p. 125

\*MENTZELIA LINDLEYI Torr. & Gray. Alien. California. Garden escape. V.-c. 16. Langton Way, Blackheath, 1953; *G.M.B.*

p. 126

ASTRANTIA MAJOR L. V.-c. 21. Waste ground, Regents Park, 1953-56; *H.C.Ho.* det. *D.H.K.*

p. 127

SMYRNIUM PERFOLIATUM Mill. V.-c. 21. Rubbish-tip, Eastcote, 1954; C.A.M. det. D.H.K. Harrow Park, 1954; R.M.H. det. D.H.K.

p. 127

BUPLEURUM LANCIFOLIUM Hornem. V.-c. 17. Near Chipstead railway station, 1954; B.W. & B.M.C.M.; J.E.L. & D.McC.; Hb.L. V.-c. 18 Rubbish-tip, Ripple Level, 1956; J.E.L., B.T.W. & D.McC. V.-c. 21. Garden weed, Hounslow, 1955; A.W.W. det. D.H.K.

p. 128

AMMI MAJUS L. V.-c. 21. Bombed site, Upper Thames Street, E.C.4, 1954; J.Ru.

p. 128

A. VISNAGA (L.) Lam. V.-c. 21. Border of field near Hounslow Heath, 1953; D.B.; gravel pit, Hounslow Heath, 1954; B.W.; well established in quantity, 1955, J.E.L., T.G.C. & D.H.K.; Hb.L.; destroyed by tipping operations, 1956; D.H.K.

p. 128

CARUM CARVI L. V.-c. 20. Rubbish-tip, Cole Green, 1955; J.G.D.

p. 129

PETROSELINUM CRISPUM (Mill.) Airy-Shaw. V.-c. 17. Wimbledon Common; A.W.J.

p. 130

PIMPINELLA MAJOR var. DISSECTA N.E.Br. V.-c. 21. Rough field, Springwell, 1954; T.G.C.

p. 130

\*P. ANISUM L. *Aniseed*. Alien. S. Europe. V.-c. 21. Rubbish-tip, Hanwell, 1953; D.H.K.

p. 131

\*CHAEROPHYLLUM AUREUM L. Alien. Europe. Naturalised in grassy and shady places. V.-c. 21. Very abundant in the grounds of Buckingham Palace, 1956; D.McC., J.C.C., J.E.L. & D.H.K.

p. 133

OENANTHE LACHENALII C. C. Gmel. V.-c. 21. Rubbish-tip, Hanwell, one plant, 1953; E.B.Ba.

p. 135

CORIANDRUM SATIVUM L. V.-c. 20. Rubbish-tip, Cole Green, 1955; J.G.D.

p. 135

BIFORA TESTICULATA (L.) Roth. V.-c. 17. Derelict garden near Kew, 1953; J.P.M.B.

p. 138

\*VIBURNUM TINUS L. *Laurustinus*. Alien. Mediterranean region. Planted in shrubberies. Rare. V.-c. 16. Mount's Road, Greenhithe; Horns Cross, Stone, both relics of shrubberies but persistent, 1955; H.M.P.

p. 138

LONICERA CAPRIFOLIUM L. V.-c. 19. In hedge, Shelley, 1941; *M.A.R.S.S.*

p. 138

\*L. NITIDA E. H. Wilson. Alien. China. Garden escape. Established in hedges and thickets. Very rare. V.-c. 17. Near North Park Farm, Caterham, 1955; *G.F.L.*

p. 138

## LEYCESTERIA Wall.

\*L. FORMOSA Wall. *Flowering Nutmeg*. Alien. Himalaya. Garden escape. Established in thickets and grassy places. Very rare. V.-c. 17. Three places near North Park Farm, Caterham, 1955; *G.F.L.*

p. 139

GALIUM PUMILUM Murr. V.-c. 16. Downs north of Pilgrim House, Westerham, 1955; scrubland north of Romney Street, 1952; *F.R.*

p. 140

G. PARISIENSE ssp. ANGLICUM (Huds.) Clapham. V.-c. 16. Old wall, Lessness Abbey, 1954; *N.L.K.*

p. 141

ASPERULA ODORATA L. V.-c. 24. Wood near Denham, 1954; *D.H.K.*

p. 143

VALERIANELLA DENTATA (L.) Poll. V.-c. 16. West of Eynsford, 1954; *F.R., J.F.H. & P.C.H.*

p. 143

DIPSACUS PILOSUS L. V.-c. 16. Near Cudham, 1918, *St.J.M.*; *Hb.St.J.M.*

p. 143

CEPHALARIA SYRIACA (L.) Roem. & Schult. V.-c. 17. Rubbish-tip, Mitcham Common, 1956, *J.E.L.*; *Hb.L.*

p. 147

\*ASTER ERICOIDES L. Alien. N. America. Garden escape. Established on waste ground. Rare, or overlooked. V.-c. 16. Rubbish-tip, Downe, 1956; *D.P.Y.*

p. 147

A. TRIPOLIUM L. V.-c. 17. River wall near Hammersmith Bridge, 1956; *B.W. det. A.M.*

p. 149

GNAPHALIUM SYLVATICUM L. V.-c. 20. Whippendell Wood, 1954; *A.W.E.*

p. 150

AMBROSIA ARTEMISIIFOLIA L. V.-c. 18. Rubbish-tip, Barking, 1953; *J.E.L.*, *R.A.G.* & *R.C.L.B.*; *Hb.L.* Rubbish-tip, Ripple Level, 1956; *J.E.L.*, *B.T.W.* & *D.McC.*

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XANTHIUM SPINOSUM L. V.-c. 18. Rubbish-tip, Barking, 1953; *B.W.*, *D.McC.* & *J.E.L.*; *Hb.L.* Ripple Level, 1954; *J.E.L.*

p. 151

HELIANTHUS ANNUUS L. V.-c. 16. Rubbish-tip, Chislehurst, 1953; *G.M.B.*

p. 151

\**H. PETIOLARIS* Nutt. Alien. N. America. V.-c. 18. Rubbish-tip, Barking, 1953; *J.E.L.*, *R.A.G.* & *R.C.L.B.* V.-c. 21 Waste ground, Yiewsley, 1956; *D.H.K.*

p. 151

GUIZOTIA ABYSSINICA (L. f.) Cass. V.-c. 17. Rubbish-tip, Mitcham Common, 1956, *J.E.L.*; *Hb.L.* V.-c. 18. Rubbish-tip, Barking, 1953; *J.E.L.* & *B.T.W.* V.-c. 21. Rubbish-tip, New Years Green, 1953-54; *J.E.L.*, *T.G.C.* & *D.H.K.*

p. 152

\**BIDENS VULGATA* Greene. Alien. N. America. V.-c. 17. Waste ground, Croydon, 1956; *D.P.Y.*

p. 152

GALINSOGA CILIATA (Rafn.) Blake. V.-c. 16. Weed in nursery, Farnborough, 1956; *L.A.* det. *E.B.Ba.* Garden weed, Elmstead Wood, 1956; *A.E.S.M.* Rubbish-tip, Longfield, just outside the Area, 1956; *J.F.H.*, *P.C.H.*, *J.E.L.* & *D.McC.* V.-c. 18. Rubbish-tip, Barking, 1953; *J.E.L.* & *J.E.W.* V.-c. 20. Rubbish-tip, Cole Green, 1955; *J.G.D.*

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## TAGETES L.

\**T. MINUTA* L. Alien. America. V.-c. 18. Rubbish-tip, Barking, 1953; *J.E.L.* V.-c. 21. Rubbish-tip, Hanwell, 1952; *J.G.D.*

p. 153

ANTHEMIS TINCTORIA L. V.-c. 18. Hay field, Abridge, 1956; *H.C.Ho.* conf. *D.H.K.*

p. 154

CHRYSANTHEMUM SEGETUM L. V.-c. 16. North Cray, a few plants, 1953; *G.M.B.* Field south of Brasted, 1955; *F.R.* V.-c. 18. Rubbish-tip, Barking, 1953; *J.E.L.* & *J.E.W.*

p. 156

ARTEMISIA ANNUA L. V.-c. 17. Towing path between Kew and Richmond, 1956, *J.E.L.*; *Hb.L.* \*

p. 156

*A. VERLATORUM* Lamotte. V.-c. 16. Waste ground, Erith, 1954; *J.F.H.* & *P.C.H.* conf. *D.H.K.* Pits near Sevenoaks railway station, 1956. *D.McC.*, *J.F.H.*, *P.C.H.* & *J.E.L.*; *Hb.L.* V.-c. 17. Mitcham

Common, 1942, *P.H.C.*; *Hb.L.N.H.S.* det. *D.H.K.*; 1956; *J.E.L.* Kennington, 1955; *L.G.Ph.* Hooley, 1954; *H.Br.* Beddington Lane and Beddington Sewage Farm, 1956; *J.E.L.* V.-c. 18. Rubbish-tip, Barking, 1953; *J.E.L.* & *J.E.W.*; 1956; *J.E.L.* & *B.T.W.* Rubbish-tip, Loughton, 1954-56; *R.M.P.* conf. *E.C.W.* North Ockendon, 1956; *J.E.L.* V.-c. 20. Rubbish-tip, Bushey, spreading and apparently coming from seed, 1955; *R.A.G.* & *R.M.H.* V.-c. 21. Rubbish-tip, New Years Green, 1954; *T.G.C.* & *D.H.K.*

p. 158

*PETASITES JAPONICUS* (Sieb. & Zucc.) F. Schmidt. V.-c. 21. Harrow-on-the-Hill, in two places, 1953, *R.M.H.*; *Hb.L.*

p. 158

*DORONICUM PARDALIANCHES* L. V.-c. 16. Near Lullingstone Castle, 1953; *G.M.B.* V.-c. 21. Well established by the lake, Syon Park, 1955-56; *D.H.K.*

p. 160

*SENECIO SQUALIDUS* L. V.-c. 20. Colney Heath; London Colney; Aldenham; Cole Green, 1955; *J.G.D.*

p. 161

*ECHINOPS SPHAEROCEPHALUS* L. V.-c. 16. Waste ground, South Darenth, 1954; *J.F.H.* & *P.C.H.*

p. 164

\**CIRSIUM HETEROPHYLLUM* (L.) Hill. *Melancholy Thistle*. Alien. Europe, including N. Britain. V.-c. 17. Persisting in relics of old bog garden, Gatton Park, 1955; *E.M.C.I.*, *B.M.C.M.*, *H.Br.* & *J.E.L.*

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\**C. OLERACEUM* (L.) Scop. Alien. Europe. V.-c. 17. Persisting in relics of old bog garden, Gatton Park, 1955; *E.M.C.I.*, *B.M.C.M.*, *H.Br.* & *J.E.L.*

p. 165

*SERRATULA TINCTORIA* L. V.-c. 16. North side of Crofton Wood, 1954; *G.M.B.*

p. 165

*CRUPINA* (Pers.) Cass.

\**C. VULGARIS* Cass. Alien. S. Europe. V.-c. 18. Woodford Green; *C.N.*

p. 166

*CENTAUREA*. For an account of the *CENTAUREA NIGRA* complex see Marsden-Jones, E. M. & Turrill, W. B., *British Knapweeds, a study in synthetic taxonomy*. London. 1954. Records of the following hybrids are cited from the Area:—

*C. NEMORALIS* × *NIGRA*. V.-c. 17. Banstead Downs, 1936; Mickleham Downs; Box Hill.



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*C. JACEA* × *NIGRA*. V.-c. 17. Merton, 1927. V.-c. 21. By river Brent near Boston Manor railway station.

p. 166

*C. JACEA* × *NEMORALIS*. V.-c. 17. Lower Morden, 1920-21; Warlingham, 1925.

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\**C. DILUTA* Ait. Alien Mediterranean region. Frequent on rubbish-tips during the last few years when it has occurred commonly in many parts of the country. V.-c. 16. Rubbish-tip, Longfield, just outside the Area, 1956; *J.F.H.*, *P.C.H.*, *E.B.Ba.*, *J.E.L.* & *D.McC.* V.-c. 17. Near Chipstead railway station, 1954, *B.W.*, *B.M.C.M.*, *J.E.L.*, *D.McC.* & *H.Br.*; *Hb.L.* Rubbish-tip, Mitcham Common, 1956; *D.P.Y.* & *J.E.L.* V.-c. 18. Rubbish-tip, Barking, 1953. *D.P.Y.*, *J.E.L.* & *J.E.W.*; *Hb.L.* Ripple Level, 1956; *J.E.L.*, *B.T.W.* & *D.McC.* V.-c. 21. Rubbish-tip, Greenford, frequent, 1954; *B.W.*; *J.E.L.*, *T.G.C.* & *D.H.K.*; 1955; *D.H.K.* Rubbish-tip, Hanwell, 1954; *D.H.K.*

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*C. SOLSTITIALIS* \*var. *INTERMEDIA* Gugl. V.-c. 16. Rubbish-tip, Downe, 1935; *D.E.K.* det. *A.M.*

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*CARTHAMUS TINCTORIUS* L. V.-c. 17. Rubbish-tip, Mitcham Common, 1956; *J.E.L.* V.-c. 18. Rubbish-tip, Barking, 1953; *D.McC.* & *B.W.*; *R.A.G.* & *J.E.L.*; *Hb.L.* V.-c. 21. Rubbish-tips, Hanwell and Greenford. 1953; *D.H.K.*

#### Part 4.

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\**HIERACIUM SALTICOLA* (Sudre) Sell & West. V.-c. 21. Ruislip Reservoir, *E.W.G.*; *Hb.Mus.Brit.* det. *P.D.S.* & *C.W.*

p. 173

*H. TRICHOCAULON* (Dahlst.) Roffey. V.-c. 21. North West Heath, Hampstead, 1954; *J.Fa.* det. *P.D.S.* & *C.W.*

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*H. RIGENS* Jord. V.-c. 16. Railway embankment, Sundridge Park, 1954; *F.R.B.* conf. *P.D.S.* & *C.W.* Swanscombe Cutting, Watling Street, 1955; *H.M.P.* det. *P.D.S.* & *C.W.*

p. 174

*H. SPRAGUEI* Pugsl. This endemic species has recently been rediscovered in several places in v.-c. 24. just outside the Area (see *Proc. B.S.B.I.*, 2. 80 (1956)).

p. 175

\**TARAXACUM PALUSTRE* (Lyons) DC. agg., *T. PALUDOSUM* (Scop.) Schlecht. *Marsh Dandelion*. Marshes. Rare. V.-c. 16. Keston Common; *G.M.B.*

p. 176

LACTUCA SALIGNA L. V.-c. 16. River wall, Stone Marshes, 1955; *H.M.P.*

p. 177

CICERBITA MACROPHYLLA (Willd.) Wallr. V.-c. 20. Disused brickfield, Welwyn Garden City, 1956; *H.D.G.* V.-c. 21. Bush Hill Park, near Enfield, 1954; *D.A.* Waste ground, Regents Park, 1955-56; *H.C.Ho.* det. *D.H.K.* Garden of disused house, Bayswater Road, 1956; *R.G.* Railway bank, Acton, 1956; *D.H.K.*

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## SCORZONERA L.

\*SCORZONERA HISPANICA var. LATIFOLIA C. Koch. Alien. S. Europe. V.-c. 21. Roadside, Twickenham, 1956; *L.M.P.S.* det. *A.M.*

p. 180

CAMPANULA PERSICIFOLIA L. V.-c. 16. Otford Downs; *G.M.B.*

p. 180

C. MEDIUM L. V.-c. 17. Chalky railway cutting between Riddlesdown and Upper Warlingham stations, 1953; *K.E.B.*

p. 182

PYROLA MINOR L. V.-c. 16. Old pit, Toys Hill, near Brasted, 1953, *F.R.*; *S.E. Nat.*, 59, 24.

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MONOTROPA HYPOPHEGA Wallr. V.-c. 17. Warlingham; *D.P.Y.*

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CENTUNCULUS MINIMUS L. V.-c. 16. Joyden's Wood, 1954; *F.R.*, *J.F.H.* & *P.C.H.*

p. 194

MYOSOTIS CAESPITOSA K. F. Schultz. V.-c. 18. Curtis Mill Green, 1954; *B.T.W.*

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\*CALYSTEGIA DAHURICA (Herbert) Don. Alien. E. Europe. Garden outcast. Established on waste ground. This species has recently been recorded for Britain (see *Proc. B.S.B.I.*, 2, 22 (1956)). It is very closely related to pink-flowered forms of *C. SYLVESTRIS* and is so far recorded only from v.-c. 21. Springwell, 1955; *B.W.*, *J.E.L.* & *D.H.K.* It is likely to be found elsewhere in the London Area.

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\*CUSCUTA CAMPESTRIS Yuncker. Alien. America. Established on waste ground. Very rare. V.-c. 17. Herbarium grounds, Kew, apparently parasitic on *Bromus carinatus*, 1950-56; *E.M.-R.*

p. 200

DATURA FEROX L. V.-c. 17. Rubbish-tip, Mitcham Common, 1956; *J.E.L.*; *Hb.L.*  
V.-c. 21. Rubbish-tip, Greenford, 1954, *J.E.L.*, *T.G.C.* & *D.H.K.*; *Hb.K.*

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VERBASCUM PHLOMOIDES L. V.-c. 18. Great Coldharbour Ness, 1956;  
*J.E.L.*, *B.T.W.* & *D.McC.*

p. 201

V. VIRGATUM Stokes. V.-c. 16. Waste ground, Erith, 1926, *St.J.M.*;  
*Hb.St.J.M.*

p. 202

V. BLATTARIA L. V.-c. 17. Fallow field, Chipstead Valley, 1955,  
*B.M.C.M.*; *Hb.L.*

p. 209

VERONICA FILIFORMIS Sm. V.-c. 20. Road bank, Loudwater, near  
Rickmansworth, 1957; *G.W.C.* & *T.G.C.*

p. 212

\*RHINANTHUS CALCAREUS Wilmott. Calcareous downs. Very local.  
V.-c. 16. Plentiful below Saltbox and on downs north-east of Jewell's  
Wood, Biggin Hill, 1955; *F.R.*, *G.M.B.* & *P.C.H.*

p. 213

OROBANCHE ELATIOR Sutton. V.-c. 16. Field north of Watling Street,  
opposite Darenth Wood, 4 plants, 1954-55; *H.M.P.* V.-c. 17.  
Tadworth, 1956; *J.E.L.*

p. 219

MENTHA × SMITHIANA R. A. Graham. V.-c. 20. Rubbish-tip, Bushey,  
1955; *R.A.G.* & *R.M.H.*

p. 223

SALVIA REFLEXA Hornem. V.-c. 17. Rubbish-tip, Mitcham Common, 1956, *J.E.L.*;  
*Hb.L.*

p. 224

NEPETA CATARIA L. V.-c. 18. Rainham, 1956; *L.M.P.S.*

p. 226

GALEOPSIS SPECIOSA Mill. V.-c. 20. Garden weed, Watford, 1954; *W.F.B.*

**Part 5.**

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AMARANTHUS CAUDATUS L. V.-c. 17. Rubbish-tip, Mitcham Common, 1956, *J.E.L.*;  
*Hb.L.* det. *J.P.M.B.*

p. 232

A. RETROFLEXUS \*var. RUBRICAULIS Thell. V.-c. 18. Waste ground, Dagenham,  
1952, *N.Y.S.*; *Watsonia*, 2, 414.

p. 233

*A. BLITOIDES* S. Wats. V.-c. 20. Rubbish-tip, Bushey, 1955; *R.A.G. & R.M.H.* det. *J.P.M.B.*

p. 235

\**CHENOPODIUM SUECICUM* J. Murr. Alien. Europe. Established on waste ground. Rare, or overlooked. V.-c. 20. Rubbish-tip, Bushey, 1955; *R.A.G.* det. *J.P.M.B.*

p. 235

*C. FICIFOLIUM* Sm. V.-c. 20. Hertford Heath, 1955; *J.G.D.*

p. 235

*C. GLAUCUM* L. V.-c. 20. Rubbish-tip, Aldenham, 1955; *J.G.D.*

p. 236

\**BETA CICLA* (L.) L. Alien of cultivated origin. V.-c. 21. Rubbish-tip, Hanwell, 1955; *D.McC.*

p. 237

*ATRIPLEX HORTENSIS* L. V.-c. 17. Rubbish-tip, Hooley, 1955, *J.E.L. & H.Br.*; *Hb.L.*

p. 238

*SALICORNIA RAMOSISSIMA* Woods. V.-c. 18. Great Coldharbour Ness, 1956; *J.E.L., B.T.W. & D.McC.* det. *D.H.D.*

p. 238

*PHYTOLACCA AMERICANA* L. V.-c. 21. Car park, Fulham Palace grounds, a single large plant, 1955; *B.W. & D.H.K.*

p. 241

*POLYGONUM AMPLEXICAULE* D. Don. V.-c. 21. Shrubbery, Forty Hall, Enfield, 1955; *L.J.J.* det. *B.W. & E.B.Ba.*

p. 241

\**P. ORIENTALE* var. *GLABRATUM* Hook. Alien. India. Garden escape. Established on waste ground. Rare. V.-c. 21. Rubbish-tip, Hill End, Harefield, 1953; *R.A.G.* det. *J.P.M.B.*

p. 241

\**P. COMPACTUM* Hook. f. Alien. Japan. V.-c. 21. Planted by the lake, Buckingham Palace grounds, 1956; *J.C.C., J.E.L., D.McC. & D.H.K.*

p. 241

*P. SACHALINENSE* Maxim. V.-c. 17. Godstone Road, one mile south of Caterham, 1955; *J.A.Ha.* det. *J.E.L.*

p. 244

*RUMEX CONGLOMERATUS* × *PALUSTRIS*. V.-c. 17. Beddington Sewage Farm, 1956; *J.E.L.*

p. 245

*R. CRISTATUS* DC. V.-c. 18. Great Coldharbour Ness, 1956; *L.M.P.S.* det. *J.E.L.*; *J.E.L.*, *D.McC.* & *B.T.W.*

p. 246

\**R. CONFERTUS* × *CRISPUS*. V.-c. 17. Rough field, Old Coulsdon, 1955; *H.Br.* det. *J.E.L.*

p. 247

\**EUPHORBIA PLATYPHYLLOS* L. V.-c. 16. Stone, 1920-21, *St.J.M.*; *Hb.St.J.M.*

p. 250

*BUXUS SEMPERVIRENS* L. V.-c. 21. Copses, Knightscode Farm, Harefield, well established but no doubt originally planted, 1956; *B.P.P.*

p. 256

*JUGLANS REGIA* L. V.-c. 16. Near Greenhithe, 1955; *H.M.P.* V.-c. 21. Near West Drayton, 1956; *L.N.H.S. Excursion.*

p. 257

*SALIX* × *SEPULCRALIS* Simonk. It is this hybrid, and not *S. BABYLONICA*, which is commonly planted, and the records given under that species should be placed here.

p. 260

*POPULUS BALSAMIFERA* L. V.-c. 16. Bostall Heath, 1953; *J.F.H.* & *P.C.H.*

p. 262

*ELODEA CALLITRICHOIDES* (Rich.) Casp. V.-c. 17. Abundant in the stream near the Thames, Old Deer Park, Richmond, 1956; *B.W.*; *J.E.L.*; *Hb.L.* V.-c. 21. Thames at the eastern end of the Strand-on-the-Green, in quantity, but apparently only floating, 1955; *D.H.K.*

p. 262

*LAGAROSIPHON MAJOR* (Ridley) Moss. V.-c. 17. Abundant in a pond. Cannon Hill Park, Raynes Park, 1956; *R.C.W.* comm. *D.P.Y.* V.-c. 18. Whipps Cross, 1956; *J.B.P.*

p. 263

*EPIPACTIS PALUSTRIS* (L.) Crantz. V.-c. 20. Bog near Wormley Wood, 1955; *F.R.*

p. 264

\**E. PHYLLANTHES* G. E. Sm. Woods and plantations. Very rare. V.-c. 16. Near Lullingstone, in beech plantation, 1956; *K.E.B.*; *F.R.*, *P.C.H.*, *J.F.H.*, *J.E.L.* & *D.McC.*—teste *D.P.Y.*

p. 264

*E. PURPURATA* Sm. V.-c. 20. Wormley Wood, 1955; *J.E.L.* & *B.T.W.*

p. 265

ORCHIS SIMIA Lam. V.-c. 16. In 1956 several young plants appeared by the one recorded on p. 265, which was on private ground at Otford. As the destruction of the colony was threatened by change of ownership of the property Dr. F. Rose transferred the plants to another place on private land in the district.

p. 265

O. USTULATA L. V.-c. 17. A. P. Snell's record was on Epsom Downs (not Walton Downs) and we are indebted to A. E. Ellis for the note that it was last seen there about 1932.

p. 266

O. PRAETERMISSA Druce. V.-c. 18. Ramney Marsh; *C.E.B.* V.-c. 21. Harefield Moor; old chalkpits, Harefield; canal side between Denham and Harefield; *D.H.K.*

p. 266

O. ERICETORUM (E. F. Linton) E. S. Marshall. V.-c. 20. Marsh near Bayford Wood, 1955; *J.G.D.* det. *V.S.S.*

p. 267

HIMANTOGLOSSUM HIRCINUM (L.) Spreng. V.-c. 16. Eynsford, 1921; *Hodgson* (photo in *Hb. Univ. Cantab.*). Near Sevenoaks, 1933; *Knight* in *The Times*. V.-c. 17. Box Hill, 1927, *G.H.S.*; *Hb.Kew.* Edge of Farthing Downs; *E.C.B.* per *H.Br.*

p. 269

GYMNADENIA CONOPSEA \*var. DENSIFLORA (Wahlenb.) Rehb. V.-c. 20. Small bog by Wormley Wood, 1955; *F.R.*

p. 271

GALANTHUS NIVALIS L. V.-c. 16. Pond Wood, Chislehurst, probably originally planted, 1955; *J.F.H.* & *P.C.H.*

p. 273

POLYGONATUM ODORATUM (Mill.) Druce. V.-c. 17. Stuart Road, Warlingham, garden escape, 1956; *D.McC.*

p. 274

ALLIUM URSINUM L. V.-c. 24. Ranston Covert, Denham, 1955; *B.P.P.*

## Part 6.

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JUNCUS PALLIDUS R.Br. V.-c. 21. Still at Bedfont, 1956; *T.G.C.*, *G.W.C.* & *D.H.K.*

p. 280

*TYPHA ANGUSTIFOLIA* L. V.-c. 16. Dartford Marshes, 1953; *E.B.Ba.*  
V.-c. 17. Little Heath, Oxshott, 1915; *E.B.B.* By Thames opposite  
Hurst Park Racecourse, 1956; *B.IV.*

p. 282

*WOLFFIA ARRHIZA* (L.) Hork. ex Wimm. This species was introduced  
at Burgh Heath (v.-c. 17) by A. E. Ellis with plants he brought from  
North Stoke, Sussex.

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*CYPERUS LONGUS* L. V.-c. 17. Arbrock Common, 1956; *J.E.S.*

p. 295

*CAREX VESICARIA* L. V.-c. 21. Plentiful around the pond at Knights-  
cote Farm, Harefield, 1956; *B.P.P.*, *T.G.C.* & *D.H.K.*

p. 299

*C. PAIRAEI* F. Schultz. V.-c. 17. Wimbledon Common, 1946; Rich-  
mond Park, 1949; *B.IV*

p. 299

*C. POLYPHYLLA* Kar. & Kir. V.-c. 17. Croham Hurst, 1955; *D.P.Y.*  
det. *E.N.*

p. 302

*SETARIA VERTICILLATA* (L.) Beauv. V.-c. 17. Weed in allotment, Kew Gardens,  
1945; *B.W.*

p. 303

*SPARTINA TOWNSENDII* H. & J. Groves. V.-c. 16. Mud-flats above  
Littlebrook Power Station, Dartford, 1956; *A.G.S.*

p. 304

*ALOPECURUS AEQUALIS* Sobol. V.-c. 17. Sheen Common, 1943; Ham  
Common, 1945-54; *B.W.*

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#### LAGURUS L.

\**L. OVATUS* L. *Hare's-tail*. H., 289. Alien. Mediterranean region. V.-c. 21.  
Waste ground, Ealing, 1956; *T.A.B.*

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*HELICTOTRICHON PUBESCENS* (Huds.) Pilger. V.-c. 17. Ham Meadows,  
near Richmond, 1944; *B.W.* V.-c. 20. Meadow, Cassiobury Park, 1953;  
*E.B.Ba.* V.-c. 21. Finchley Common, 1890; Northwood, 1912, *J.E.C.*;  
*Hb.Mus.Brit.*

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*ARRHENATHERUM ELATIUS* \*var. *BIARISTATUM* (Peterm.) Druce. V.-c.  
17. Littleworth Common, 1956; *J.E.S.* det. *A.M.*

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CATABROSA AQUATICA (L.) Beauv. V.-c. 16. By side stream of Darent, near bridge at Sutton Corner; near bridge over Darent at Horton Kirby, 1956; *J.F.H. & P.C.H.* V.-c. 19. Fishers Green, 1956; *R.M.P.* V.-c. 20. Cheshunt, 1956; *R.M.P.*

p. 313

BRIZA MAXIMA L. V.-c. 17. Gravel pits, Ham, a few plants, 1953; *H.T.C.*

p. 313

\*POA SUBCAERULEA Sm. *Spreading Meadow-grass*. H., 169. Marshy pastures, meadows and streamsides. Rare, or overlooked. V.-c. 18. Marsh at Berwick Pond, near Rainham, 1956; *K.L.A.* det. *A.M.* V.-c. 21. West Heath, Hampstead, 1950, *D.H.K.*; *Hb.K.* det. *A.M.*

p. 313

P. PALUSTRIS L. V.-c. 18. Bromley-by-Bow Gasworks, 1956; *B.T.W.*, *J.E.L. & R.W.* V.-c. 21. Old market garden, Isleworth, 1933, *C.E.H.*; *Hb.L.*

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GLYCERIA × PEDICELLATA TOWNS. V.-c. 17. Arbrook Common, 1956; *J.E.S.* det. *A.M.*

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G. PLICATA Fr. V.-c. 20. Cheshunt, 1956; *R.M.P.*

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G. DECLINATA Bréb. V.-c. 17. Richmond Park, 1945-56; Wimbledon Common, 1947-56; footpath on West End Common, Esher, 1956; *B.W.* V.-c. 18. Ongar Park Wood, 1956; *R.M.P.*

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PUCCINELLIA DISTANS (L.) Parl. V.-c. 21. Hackney Marshes, 1909, *J.E.C.*; *Hb.Mus.Brit.*

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P. FASCICULATA (Torr.) Bickn. V.-c. 18. Purfleet, 1956; *R.M.P.* Great Coldharbour Ness, 1956; *J.E.L.*, *B.T.W.* & *D.McC.*



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\*Despite much searching among the archives of the Society initials which are so starred remain unidentified. They are cited from the records compiled prior to 1943.

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**London Bird Report**, 1936-46, each 6d; 1947-52, each 1s 3d; 1953-5, each 3s 6d.  
**Transactions of the London Natural History Society**, 1916-20, each 1s.  
**Map of the Society's Area**, 6d.

### " LONDON NATURALIST " REPRINTS.

Note.—Dates in brackets refer to issue of L.N. and are not dates of publication.

- 21, 22, 25, 30. **Survey of Limpsfield Common**: 1939, 3d; 1940, 2d; 1942, 2d; 1943, 1d.
24. **Randolph William Robbins (1871-1941)**, (1941), 3d.
- 29, 33, 35, 44, 46, 51, 60, 67, 71, 75, 81, 87, 99, 103. **Survey of Bockham Common**: 2, 1943, with maps, 2d; 3, 1944, with map, 5d; 4, 1945, 3d; 5, 1946, with map, 5d; 6, 1947, 6d; 7, 1948, 6d; 8, 1949, 1s; 9, 1950, 9d; 10, 1951, 9d; 11, 1952, 9d; 12, 1953, 1s 6d; 13, 1954, 1s 6d; 14, 1955, 1s 6d; 15, 1956, 1s 6d.
- 34, 36, 45, 47. **Epping Forest Survey**: 3, 1944, with maps, 6d; 4, 1945, 3d; 5, 1946, 3d; 6, 1947, with map, 5d.
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- 49, 72, 76, 82, 83. **City Bombed Sites Survey**: 1947, 3d; (1948 O.P.), (1949 O.P.); 1950, 3d; 1951, 3d; 1952, 3d; 1953, 9d; 1954, 9d.
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- 70, 73, 77, 83, 90, 100, 104. **Hand List of the Plants of the London Area**, by D. H. Kent and J. E. Lousley, Part I (1950), 2s 6d; Part II (1951), 2s 6d; Part III (1952), 2s 6d; Part IV (1953), 2s 6d; Part V (1954), 2s 6d; Part VI (1955), 2s 6d; Part VII (1956), 2s 6d.
- 74, 92, 101. **The Flies of the London Area**, I, Conopidae, by L. Parmenter (1951 O.P.); II, Culicidae, sub-family Culicinae (Mosquitoes), with key to species of Culex, by E. R. Nye 1954, 1s 6d; III, Trypetidae, by M. Niblett (1955), 1s.
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**LONDON NATURAL HISTORY SOCIETY.**

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**T**HE Society is an amalgamation of the City of London Entomological and Natural History Society, founded in 1858, and the North London Natural History Society, founded in 1892.

Meetings are held on Tuesday evenings, either at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1, or at the Linnean Society's rooms, Burlington House, Piccadilly, W.1. The half-yearly Programme should be consulted as to the venue of any particular meeting. The room is open from 6 p.m. to 9 p.m., and meetings begin punctually at 6.30 p.m. and end about 8.30 p.m., unless other arrangements are announced. The Library and Collections are available to members at the Royal Society for the Protection of Birds headquarters, 25 Eccleston Sq., S.W.1, from 6 p.m. to 8 p.m. on the second Monday and fourth Thursday in each month.

At all indoor meetings specimens of Natural History interest are exhibited, and papers on various subjects are read and discussed. Visitors may be introduced by members of the Society, and are cordially welcome. Frequent field meetings are held at week-ends, particulars of which are contained in the Programme.

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