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No. 44

**THE LONDON
NATURALIST**

**the Journal of the
LONDON NATURAL HISTORY SOCIETY**

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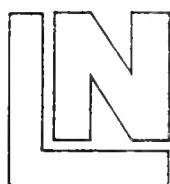
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LONDON NATURAL HISTORY SOCIETY

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Mrs. Small, 13 Woodfield Crescent, W.5.

Report of the Society for 1964

THE total membership of the Society now stands at 1,624 which represents an increase of sixteen over the figure for the previous year.

It is with deep regret that we record the deaths of the following members during this year:

J. Allibone, G. W. Collett, Mrs. C. E. Forrester, A. Monk-Jones, Miss Frances Pitt, Miss M. Titmuss, D. C. Webster and A. W. Westrup.

Two new names have been added this year to the roll of Honorary Vice-Presidents of our Society: these are E. M. Nicholson and R. C. Homes.

Mr. Nicholson has been a member of the Society for twenty years and has rendered many valuable services to natural history. A founder member of the B.T.O., he was for many years the editor of *British Birds* and is the present Director General of the Nature Conservancy.

Mr. Homes joined the Society in 1932 and was elected chairman of the Ornithological Section in 1939, a position which he held until the outbreak of war. Returning from military service he continued his active membership in various capacities and served as President of the Society in 1955 and '56. He has been associated with many projects in the Society and also with national bodies such as the B.T.O., of which he was chairman for four years, but perhaps he is best known to our members for his work as Chairman of the "Birds of the London Area" Book Committee. The first edition of this book, published in 1957, was an outstanding success, and when a second edition was proposed it was Mr. Homes again who undertook to revise the book and produce a considerable amount of new material. This new edition has been published this year by Rupert Hart-Davies and we are indebted to Mr. Homes, and many other members of the Ornithological Section, for their efforts in bringing to fruition this project which has brought considerable prestige to the Society.

Following the successful showing of the Society's colour film "London Birds" at Fairfield Halls, Croydon, in 1963, the Fairfield Hall authorities promoted a further showing at the Ashcroft Theatre on two evenings in June this year. The film has also been shown at nine other venues this year, resulting in a total profit of over £200 to the Society. The master copy which will be retained as a valuable historical record is now stored in the film vaults of Philmatic Laboratory. The Society is indeed grateful to the members of the Film Presentation Committee for their efforts in promoting the film for a second year and above all to the commentators who have given generously of their time on behalf of the Society.

Our General Secretary, Mrs. L. M. P. Small, has joined the Conservation Committee of the Council for Nature; she is also a member of a small committee which has been established by the Council for Nature to co-ordinate reports from natural history societies interested in the Lea Valley area following the publication of the Civic Trust's report "A Lea Valley Regional Park" in the hope that such information will be considered when the proposed development plan is put into action. Mrs. Small has been nominated as the Representative for the member bodies of the Council for Nature in South East England for 1965.

The survey team at Bookham Common has consistently carried on with its research for many years, often in adverse weather. We are very glad to report that the National Trust has now given permission for our

Society to erect and maintain a hut in the garden of the keeper's house "Merritts Cottage" on Bookham Common, for the use of our team. We are grateful to the National Trust for their permission so readily granted; to the chairman, Dr. A. M. Easton and members of the Bookham Common Management Committee for their co-operation; and to an anonymous member who made a contribution of £100 to defray the cost of the hut and its erection.

A collection in aid of the World Wild Life Fund taken at a General meeting where we were addressed by Mr. George Cansdale raised nearly £20.

A new and improved map of our area has been devised for the use of the Society's official recorders. An anonymous donation of £50 has been received from a member towards the cost of printing the first ten thousand copies, which are now ready. These maps will also be available to members for their own use at a low price.

There has been a gratifying increase in the number of members attending informal meetings of the Archaeological Section and many of the field meetings were very popular. An address by Miss Joan Harding on her important excavation of a Late Bronze Age homestead at Weston Wood, Albury, Surrey aroused much interest and many members availed themselves of the opportunity to see this site when a party visited the Guildford area later in the year.

Shortly after the war, Miss Kathleen Kenyon undertook a series of excavations to find out more about Roman Southwark, and the large quantity of pottery which she found is now in the Cuming Museum. Our members are working on the pottery from the Newcomen Street site and arranging it for easy reference.

This issue of the *London Naturalist* reports the 1963 excavations at Merton Priory directed by Mr. D. J. Turner. Members have assisted in a rescue excavation at Carshalton and at other "digs" in the London area.

The continuing success of the *Calystegia* Survey started by the Botanical Section in 1962 has encouraged them to embark on a far more ambitious project, namely to ascertain in some detail the distribution of all plants found within our area. Further information on these two projects will be found elsewhere in this volume.

Lectures were arranged dealing with floras as diverse as those of the Rocky Mountains and Trinidad, New Zealand and Europe, while the field meetings ranged from Wimbledon Common to Scotland. In July members of the Section spent a week in Scotland at a joint field meeting with the Wild Flower Society, visiting areas around Ben Lawers and Forres. These excursions were lead by Miss Mary McCallum-Webster and our members would like to record their thanks for her considerable efforts which made this week a great success.

Members should not forget about the Society's herbarium which is now housed in the South London Botanical Institute and may be seen on application to the sectional curator Mrs. A. G. Side; also our remarkable collection of Bryophytes, which is in the custody of Mr. R. M. Payne and from which specimens can be borrowed by post for study in the comfort of your own home.

Conservation is a highly topical subject for naturalists at the present time and the indoor meetings of the Ecological section during the past year were primarily concerned with this theme, including lectures on the Ruislip and Studland Heath Nature Reserves.

The Bookham Common Survey, now in its twenty-third year, is still the principal field operation of the Section but for members whose spare time is limited more help at the annual visit to Headley to study heath regeneration would be welcome. The recorders are always anxious to receive new records and in particular of frogs, toads, newts and grass snakes for which it is hoped to publish distribution maps.

The Epping Forest Field Section held eighteen field meetings during the past year, embracing a wide range of natural history interest. The average attendance has been lower than other years and this is puzzling since it cannot be ascribed to the weather or to the mud which is usually a hazard in the Forest.

The Entomologists also report a poor attendance at field meetings despite a varied choice of venues but there was some compensation on the form of several excellent lecture evenings. Two members recounted their entomological experiences in Madeira and Borneo and much interest was shown in recordings of British Orthoptera made by Mr. J. F. Burton.

The Easter field meeting of the Geological Section was held on the Isle of Wight this year under the leadership of Mr. R. E. Butler and Mr. R. F. Moorman. Good Friday morning was spent on the eastern part of the Island, where exposures in the Bembridge Limestone are very fossiliferous. Fossil eggs of a large land snail were among the interesting finds. On the Saturday members walked along the coast from Sandown to Bembridge. The Wealden deposits north-east of Sandown were examined in the morning, and after lunch on Culver Down the Eocene deposits in Whitecliffe Bay were studied. Here the Bracklesham beds contain nummulites and *Cardita* shells. On the Sunday afternoon members visited Ventnor and Luccombe Bay, and on the Monday there was a coach trip to Newtown, Colwell Bay and Alum Bay.

The field meeting to Oxfordshire in May was very popular. There was also a visit to the unique Lower Greensand deposits at Leighton Buzzard. Other districts visited included the Isle of Thanet for Chalk and Folkestone for the Gault Clay.

There was a successful programme of indoor meetings, including an account by Mr. Butler of the development of the use of building stone, and an interesting talk by Mr. D. R. Brothwell on finding disease in Ancient Man.

The demonstrations arranged during the year included visits to the Natural History Museum for reference to fossil reptiles, fossil fishes and fossil plants, and a visit to the Geological Museum for a demonstration on Gemstones.

Ornithology for many years now has attracted the interest of a large proportion of amateur naturalists and this is well exemplified by the attendance at our Section's indoor meetings which now often exceeds 150 members and friends.

The indoor meetings of the Ornithological section comprised a wide variety of lectures on areas of interest throughout Europe and on scientific studies such as Bird Population as well as a series of monthly informal meetings.

Once again a very full programme of field meetings were organised and these were well supported, including three week-end expeditions to Solway Firth, Cley and the New Forest, as well as sixty-eight other excursions.

As well as supporting the B.T.O. national enquiries into the status of small birds of prey and the common bird census, the section is currently

undertaking three investigations of local interest, bird life on rubbish tips, status of breeding birds in S.W. London, and breeding colonies of Reed and Sedge Warblers.

There has been a welcome increase in ringing activity at the Beddington sewage farm station. Members can visit Beddington for instruction in ringing or for bird watching by arrangement.

The Section's quarterly news Bulletin continues to flourish and for any active member it represents excellent value for money. In addition to current reports and articles it will in future publish letters from members on matters of interest to the Section.

Finally an innovation which proved to be a considerable success was the first Section dinner, which was attended by eighty members and friends. This was a very enjoyable evening and it is hoped to make this dinner an annual event.

The weather was kind to the Ramblers on their Sunday outings, and their Saturday visits to places of interest in London remained deservedly popular. A visit to the headquarters of the Society for the Protection of Ancient Buildings was preceded by a lecture given by Mrs. Dance in which she gave many examples of the Society's achievements.

During this year the Borough of Heston and Isleworth convened a meeting of representatives from local artistic and cultural organisations including our South-West Middlesex Group which has led to the formation of the Hounslow Council for the Arts. The dates of our Group's meetings for the coming year will be included in a local diary of events taking place in the borough, to be published by the Council.

The London Area

Its History and Future Use

By J. EDWARD LOUSLEY

(Presidential Address delivered December 3, 1964)

I HAVE chosen the London Area as the subject of my address tonight because it seems to me to be one of outstanding importance at the present time. During the past year your various committees have given a great deal of thought to the boundary and subdivision of our Area leading up to the preparation of a new base map, which is now in the hands of our printers. It is appropriate, therefore, to review past experience and to consider how we can obtain the maximum benefit from the new recording facilities, having regard to the special characteristics of the Area we study.

It is obviously of first importance that a Society should have a clear and unambiguous definition of the area studied, and that this area should be subdivided so that records and other information can be presented in an orderly fashion. It is most desirable that workers studying different groups should all present their findings in such a way that their results can be compared. Similarly, it is important that a Society's records should be presented in such a way that they can be related to those of other organizations studying adjacent or wider areas. All these objects can be achieved by the use of a base-map which is based on the National Grid with the boundary of the area superimposed.

Our London Area is defined as a circle with a twenty-mile radius from St. Paul's Cathedral, and this has been the basis of our recording work for the last fifty years. When the North London Natural History Society amalgamated with the City of London Entomological and Natural History Society in January 1914 to form a Society under our present title, one of their first acts was to define the Area as we still know it. Since then there have been great changes, and I need only remind you of the vast building programmes after each of the world wars and the rapid suburbanization of much of London's countryside in recent years. Really "wild" habitats are now much scarcer. Nevertheless your Council have reaffirmed during the year that the boundary is to remain unchanged. Since the proper study of our Society is London I am sure that this decision is a wise one.

Now it is obvious that an arbitrary circle drawn on a map is likely to bisect important habitats. These include, for example, Reigate Heath (where the circle passes through the windmill), and Box Hill. In such cases we have endeavoured to take a practical view, and we have included records which may be *slightly* outside the circle rather than risk losing any which rightly belonged to us.

Sub-division of the circle came early. Before the amalgamation of the two Societies mentioned, the Botanical Section of the Research Committee of the North London, which had been set up in 1900, divided their area into 12 arbitrary "divisions", each of which they numbered. Immediately after amalgamation the part of the circle south of the Thames was similarly divided so that there were 24 divisions in all. These were based, in a rough and ready way, on soils with a view to bringing out ecological

groupings in the distribution—a form of study fashionable at the time. Although their boundaries followed clear landmarks such as roads and rivers, these divisions proved extremely difficult to use on account of their odd shapes. Also they failed to follow vice-county or even county boundaries, so that, for example, Division 8 North, (the Lea Valley) included records for Middlesex, Herts., South Essex, and North Essex. It was therefore extremely difficult to relate the records to those of other workers. These divisions were used for *Botanical Records of the London Area* (1928-1936) but have not been employed since.

A big step forward was taken in 1948 when C. P. Castell prepared for us an excellent map which has proved a great help in our work. This showed the Watsonian Vice-county boundaries, the Inner London Area, to which I will refer later, and the lines of the 10-kilometre squares of the National Grid. The map was reproduced on a scale of 2 miles to the inch, and subsequently was reprinted in blue so that it could be used for preparing illustrations where the printed outline was not to appear. The records in the *Hand List of Plants of the London Area* (1951-1957) were based on this map.

In 1953, while the Hand List was in course of publication, the Botanical Society launched its Maps Scheme using the 10-kilometre squares of the National Grid as a basis for recording the plants of the whole of the British Isles. This, as you know, culminated in the *Atlas of the British Flora* published in 1962, and it demonstrated the great advantages of grid-recording as a practical method of collecting and arranging large numbers of records and stimulating even coverage of the ground. The L.N.H.S. made a valuable contribution to this scheme but it brought home to us the inadequacy of our own system. Since 1957 the 10-kilometre squares concerned have been cited in our published botanical records, and six figure grid references added to our card index when these are available.

While 10-kilometre squares are adequate for recording distribution over Britain as a whole, a finer grid is necessary for more detailed work over limited areas. The fineness of the grid must depend on the effort available. Ideally the basis for recording should be 1-kilometre squares and that is possible for groups where the number of species and number of likely records is small: mammals for example. Dr. Beven's map of the distribution of the Grey Squirrel in the London Area published in 1957 was based on the 1-kilometre squares of the National Grid. Mr. Teagle's map of the distribution of the Harvest Mouse in the last issue of the *London Naturalist* showed only 10-kilometre squares but the localities could easily be transferred to the finer mesh. We must however face the fact that there are some 3,300 1-kilometre squares in our Area so that for a very common species such as the Annual Meadow-grass, which may be in every such square, a very large number of records would be involved. With any considerable number of species to deal with, records on such a basis would be quite unmanageable. For example with a thousand species which on the average occur in half the 1-kilometre squares, the number of records to be expected would be in excess of two million. It would be quite impossible to deal with such numbers without full time staff equipped with appropriate machines.

The Botanical Section have therefore adopted a compromise. The 1-kilometre squares are combined in groups of four, known as "tetrads". There are thus 25 tetrads to each 10-kilometre square, and there are about

825 tetrads in the London Area. The botanists have to deal with a little over a thousand flowering plants and ferns giving an estimated total of perhaps 300,000 records in practice. In addition they may later on extend the scheme to some of the cryptogams, perhaps starting with mosses and hepatics. Tetrads are clearly marked on the new map Mr. Castell has prepared and other Sections might consider adopting a similar scheme.

I would now like to return to the question of the boundary of our Area. Versatile though the National Grid may be in enabling us to fix our localities on Ordnance Survey maps of all scales, and in making it possible to collaborate with adjacent areas with records based on the same system, it still inflicts us with the problem that its straight lines have to be adapted to our circle. One method of doing this would be to "square the circle" but St. Pauls' does not stand at a junction of grid lines, and this would involve not only taking in a great deal of additional country but also extending the Area for a greater distance to the east and north than elsewhere. This would destroy easy comparison with the records of the last 50 years, and your Council decided firmly against it. To extend each 10-kilometre square broken by the circle would also take in considerable extra ground and result in a most irregular shape which would not be acceptable. It is therefore proposed to retain the circle with the very minor modification that the whole of a tetrad will be recorded if part of it falls within the circle.

This circle of ours embraces over 1200 square miles and includes a wide range of habitats. Much of it is taken up by what Fitter has described as "the largest aggregation of human beings ever recorded in the history of the world as living in a single community". This aggregation has been, and still is, growing steadily, and the growth is well documented, so that information is readily available. The way in which plants and animals can live in close association with Man can be more readily studied in our Area than anywhere else in the world, and much of our work is concerned with this aspect. The ornithologists have had an area defined as "Inner London" since 1929 which includes some forty square miles of the most densely populated core of the capital. It is an area of considerable ecological significance and much of it has been built up for a very long period. Extending outwards from this core are areas which have been built up for varying lengths of time and to various extents. This is likely to be reflected in any distribution maps we prepare covering the whole of the London Area and may well produce surprising results.

I suggest that the ultimate goal at which we should aim is a series of distribution maps depicting the occurrence of all species in our Area. Even though this is unlikely to be achieved in our lifetimes for some of the more obscure groups as, for example, some of the insects, it is well within our powers to cover say flowering plants and ferns, mammals, breeding birds, amphibia and reptiles within a reasonable period. Given transparent overlays for the maps to show such features as soils, streams and open water, air pollution, built-up areas and open spaces we would then have the material for comparing the distributions of species one with another, and with the factors likely to influence the occurrences of many of them. Given sufficient maps of appropriate species we could then start to relate the distribution of animals to the plants on which they feed, or which give them shelter. We would have a clearer picture of which species can persist in built-up areas, and which can sustain heavy air

pollution. Such a series of maps would be of immense value to the work and interests of the Society.

The provision of a full series of distribution maps is a very long-term project, but the preparation of a sufficiently large number to be valuable is well within our powers in the course of a few years. Carrying out the work would be an enjoyable exercise in which a very large number of members could collaborate, and our large membership provides the means by which we can take advantage of the unique opportunities of our Area. I hope that other sections besides the botanists will take up grid-recording seriously and systematically and make full use of the new base-map which will soon be available.

Mapping the Plants and Animals of the London Area

The Society's new Mapping and Recording Scheme

IN order to prepare the highly successful *Atlas of the British Flora*, which appeared in 1962, the Botanical Society of the British Isles introduced the method of recording the distribution of flowering plants and ferns in the British Isles, by noting the occurrence of species in each 10 kilometre square of the National Grid. Our Botanical Section took on the responsibility for squares in our area and by enthusiastic and efficient cooperation ensured that this area was adequately covered. Spurred on by the success of the national recording scheme and atlas, the botanists are eager to record and map the plants of the Society's area in greater detail in the field than was possible by the 10 km square method.

The Society has now prepared an outline plan for this purpose, 8 inches square, showing the boundary of the Society's area, the Vice-counties and gridded to show not only the 10 km and 1 km squares, but also 2 km squares which have been adopted by the botanists as the most practicable recording unit. There are 45 10 km squares and over 3,000 1 km squares in the Society's area. About 800 "Tetrads" or 2 km squares suffice to cover the area and it is considered possible for the Society's members to cover each tetrad adequately in the field.

Not only the plants, but mammals, reptiles, amphibians, fishes and mollusca are already being recorded and *mapped* and it is hoped that the use of the map for recording will spread. In this way, we shall be the first to attempt such a detailed recording of such a large area and we shall be in an excellent position to find the answers to the many interesting problems of wild-life distribution in our area that are bound to arise. The wild-life of our area is changing rapidly and a repetition of the survey at intervals will demonstrate not only the change, but its rate and possibly its cause and will draw attention to the conservation needs of particular species.

Your help is needed to ensure the success of this mapping scheme and the experts are ready to help you at special meetings being arranged for your benefit, if you feel that your knowledge of plants, animals or methods of recording them is not yet adequate.

The plans have been prepared primarily for, and are supplied on loan, to

the Society's recorders and other members undertaking projects sponsored by the Sections. They are, however, also available to members at a cost of 2s. 6d. for 10 post-free.

Botanical Records for 1964

Compiled by J. EDWARD LOUSLEY

London's weather in 1964 was considerably more favourable than in the two previous years. January and February were dry months, and we had our coldest April spell for 53 years. A changeable May was followed by unusually cold days in June, but the weather then turned warmer, and July, August and September were sunny with many warm days. October and November were mild enough to prolong the growing season, with December a month of great contrasts when Kew recorded its lowest temperature on the grass for 59 years at 10°F. (-12°C.). Plants showed little evidence of shortage of water, and although there were no heat-waves, summer temperatures were sufficiently high to suit native species.

The number of records contributed was well up to the level of recent years, and they were more evenly distributed over our Area than has been usual in the past. There was a particularly welcome influx of records for Hertfordshire from several contributors, and from South Essex. North Essex remains the weakest part of our Area for current coverage. Another welcome feature was the way in which some of our helpers added full notes about status and the nature of the habitat to their records. Such notes transferred to the Society's card index make it very much more valuable than a bare list of localities in which the species has been found. For some reason I find it difficult to understand, there was a falling off in the provision of Grid References. In recent years it has been our practice to include these in our records, and to cite the 10-kilometre squares in this annual report, and it was thought that the practice of supplying full six figure references was well established. From January 1, 1965 the Botanical Section will embark on a new system of recording and it will not be possible to make use of records unless full grid references are given.

The new arrangements, described on page 11 of this issue of *The London Naturalist*, will enable far more of our members to collaborate than has been the case in the past. By noting the occurrence of all the species which occur in each of the "tetrads" into which our Area is divided we aim at building up a detailed and accurate map of the distribution of every plant. It is obvious that work of this magnitude would be impossible if we attempted to deal with *all* the records individually, and for the bulk of them some less laborious system must be found. We have therefore had special cards printed on the lines of those used for the B.S.B.I. Maps Scheme, and contributors are asked to mark up separate cards for each tetrad: these cards should be sent to Mr. Holland. It is hoped that members will give this work their whole-hearted support. Those of them who "adopt" individual tetrads and search them thoroughly will find it a particularly interesting and rewarding experience. Since this method will give us a far more detailed and uniform knowledge of the distribution of

plants throughout our Area than we could ever achieve by the present system, the card index which I have kept for some 19 years will in future be used only for records of special interest.

Although our main recording in future will be based on cards marked up for individual tetrads, observations of uncommon plants from anywhere in our Area will still be welcomed provided at least four-figure grid references are supplied. Such observations may be sent either to me or to Mr. Holland and it is hoped to continue this series of annual reports to include the more noteworthy additions to our knowledge of the flowering plants and ferns of the London Area.

During 1964 a number of important discoveries were made. On the grounds of sheer rarity Mr. F. C. Studley's discovery of a hawkweed, *Hieracium lactucella*, at Harrow deserves pride of place. This has only certainly been found in Britain before in a pasture in Wiltshire in 1904 and, although it is probably an introduction, the new record is of great interest. Mr. R. M. Payne's discovery of a fern, Limestone Polypody, *Thelypteris robertiana*, on an old wall at Staines is only the second report of this species from our Area. The interesting records of orchids include the Spotted Orchid, *Dactylorhiza fuchsii*, noticed independently by myself and Miss K. E. Springett on Hampstead Heath, and Marsh Helleborine, *Epipactis palustris*, found by Mr. D. A. J. Hunford in a chalkpit near Grays. Clubmosses are exceeding rare with us, and Mr. B. F. C. Sennett's find of *Lycopodium clavatum* in a gravel pit south of St. Albans was very unexpected, while Mr. B. Wurzell's confirmation that Chaffweed, *Anagallis minima*, still grows on Reigate Heath is also noteworthy. Less progress was made in investigating estates not open to the public than in some previous years, but Mr. S. T. Jermyn's visits to Warley Place, formerly the home of Miss E. A. Wilmott, and long left to nature, has produced most useful lists of native as well as relict garden plants. The year also saw the publication of an account of the *Natural History of the Garden of Buckingham Palace* including lists of the plants which occur there (see page 158). This project had its origin in visits to the garden on June 5 and September 4, 1956 arranged by Lt.-Col. J. Codrington who was accompanied by D. H. Kent, myself and D. McClintock. On these visits 175 species of vascular plants were listed and some of these published in the *London Naturalist* for that year (*Lond. Nat.*, 36, 11 and 15). In the new publication 260 species are claimed as wild or naturalised though the claims of some of the additional plants to be regarded other than as hortals are extremely dubious.

The nomenclature used in this report is based on the *List of British Vascular Plants* (1958) prepared by J. E. Dandy, and for species in that *List* authors' names are omitted in order to save space. The numbers following place names are those of the 10-kilometre squares of the National Grid (for a full explanation see *Lond. Nat.*, 37, 182, 1958).

V.-c. 16, WEST KENT

Growing near Crayford railway station (57) were three uncommon plants found by B. Wurzell and J. Mason:—*Medicago falcata*, *M. × varia*, and *Solanum sarachoides*. The first was recorded from Crayford as long ago as 1916 and, although there are no intervening records, it may have persisted. The *Solanum* is a nightshade introduced from America which has become established in other parts of England. Amongst other records contributed by B. Wurzell are *Ulmus carpinifolia × plotii* found in 1962 at

Keston Common (46) and in 1963 near Stone (57), and *Ulmus carpinifolia* × *glabra* × *plotii* found in 1962 near Hextable (56), all of which have been determined by Dr. R. Melville. A long list of most useful records was contributed by J. R. Palmer. In addition to many aliens they included *Stachys arvensis* from fields near Downe (46) and *Descurainia sophia* from near the Ravensbourne near Bromley Common (46) where it seems to be unusually persistent as D. E. Kimmins recorded it from Bromley Common in 1957.

R. M. Burton's list, with full grid references, has been a great help in filling in some of our gaps in distributions and it includes Rusty-back Fern, *Ceterach officinarum*, from Downe (46), and Cypress Spurge, *Euphorbia cyparissias*, from railway banks near New Eltham (47) and Lewisham (37). H. M. Pratt has continued the series of annual notes with which he has supplied us for so many years, and B. Miles reports *Bupleurum tenuissimum* which he collected in 1962 from a flower bed at the top of Shooter's Hill (47)—a remarkable habitat for this salt marsh species. *Parapholis strigosus*, a grass not previously known higher up the Thames than Dartford Marshes, was found by J. R. Palmer at the base of a wall near the Surrey Canal at Rotherhithe (37).

V.-c. 17. SURREY

In spite of the thoroughness with which the Surrey part of our Area has been investigated in past years, it still continues to produce a very large number of interesting records. Within 18 miles of St. Paul's, which is about the same distance out as Darwin's famous orchid bank at Downe, there was a remarkable display of hundreds of orchids in 1964. This was near Coulsdon (35) and reported by D. C. Kelly, who has found 13 species of orchid and two hybrids during the last decade along a fifty yard strip less than half a mile in length. The list is as follows—*Epipactis helleborine*, *Spiranthes spiralis*, *Listera ovata*, *Neottia nidus-avis*, *Gymnadenia conopsea*, *Platanthera chlorantha*, *Ophrys apifera*, *O. insectifera*, *Orchis mascula*, *Dactylorhiza fuchsii*, *D. fuchsii* × *praetermissa*, *D. praetermissa*, *D. fuchsii* × *G. conopsea*, *Aceras anthropophorum*, and *Anacamptis pyramidalis*.

R. Clarke has continued his intensive botanising which has brought so many new localities to light. His records from the built-up areas are especially welcome and include *Juncus bufonius* from near Tooting Bec Common (27), *Phyllitis scolopendrium*, *Athyrium filix-foemina*, and *Hordeum secalinum* from West Norwood Cemetery (37), and *Galium palustre*, *Parietaria diffusa*, and *Lycopus europaeus* from the river wall near Vauxhall Bridge (27). From Godstone Town Pond (35), which is being taken over by Surrey Naturalists' Trust as a nature reserve, he noted *Berula erecta*, *Veronica catenata*, *Chenopodium rubrum* var. *pseudobotryoides*, and *Rumex maritimus*. The latter also appeared in 1964 near Godstone (35) at Ivy Mill, and a marsh north of Tilburstow. At Headley (15) he found *Anthemis arvensis* "frequent in corn", and he also found it in small quantity at Thirty Acre Barn (15); both old localities, but the species is seldom seen nowadays. *Galeopsis speciosa* he records from a potato field at Woldingham (35).

Mrs. J. E. Smith's list of records were mostly from the western side which she keeps under very close observation, but her report of Navelwort, *Umbilicus rupestris*, from a garden wall at Pendell House, Bletchingley (35) is the first modern record from our Area (it grows at Crockham Hill (45) just outside). On garden paths at Pendell Court, Bletchingley

(35) she found *Vulpia myurus*, and a further visit to Hurst Park (16) produced *Stellaria pallida*, and *Montia fontana* subsp. *chondrosperma*. Mrs. Smith's record of *Taraxacum laevigatum* from Oxshott Heath (16) is a reminder that it is a pity that people do not devote more attention to the more easily recognisable dandelion splits, and her discovery of *Eriophorum angustifolium* in a bog on Cobham Old Common (16) is an additional record for Bog Cotton which drainage is making scarcer in our Area.

B. Wurzell has refound *Anagallis minima* in a pond on Reigate Heath (25). This is an old locality, but it has not previously been reported from here for our records. He has also had *Chara contraria* from a pond on Mitcham Common (26) in 1963 determined for him by Mrs. S. P. Phillips. R. M. Burton reports that the two plants of *Alchemilla mollis* found in 1948 (see *Handlist* p. 103) are still near the Stepping Stones, Box Hill (15). From long grass near the edge of Gatton Park (25) C. W. Ward sent me a specimen of *Euphorbia dulcis*. The evening visit of the Botanical Section to Ham Gravel Pits (17) confirmed a number of records and produced some useful new ones, including *Vicia lutea*. Also on an official meeting a bamboo, *Arundinaria japonica* Sieb. & Zucc. was found naturalised in clumps in an old quarry on the Pilgrim's Way near Whitehill (35), and I found the same species growing in the Thames below Teddington Lock (17), Miss E. M. C. Isherwood sent specimens of another bamboo, *Arundinaria recta* (Walt.) Muhl. from a refuse tip near Dover's Green (24).

V.-c. 18, SOUTH ESSEX

During the year S. T. Jermyn obtained permission to visit the grounds of Warley Place, Great Warley (59) and I accompanied him on two of his visits, on the second of which we were joined by R. M. Payne and J. W. Dyce. This was the home of Miss E. A. Wilmott with her famous garden, but since her death in 1934 it has deteriorated to an overgrown wilderness left entirely to nature since the destruction of the house by enemy action over 20 years ago. Many garden plants still survive in spite of the constant battle with vigorous natives, and these species include: *Eranthis hyemalis*, *Dentaria bulbifera*, *Geranium pratense*, *Symphytum tuberosum*, *Veronica filiformis*, *Lathraea clandestina*, *Arum italicum*, *Arundinaria vagans* Gamble which is a dwarf bamboo, and another bamboo *Sasa senanensis* (Franch. & Sav.) Rehd., which flowered abundantly. Plants which could possibly have arrived naturally include *Daphne laureola*, *Lathraea squamaria* (new to our records for Essex), *Thelypteris palustris* (in *Essex Nat.*, 17, 48, 1912 this is said to have been transplanted from Warley Woods), *Osmunda regalis*, and the hybrid fern *Polystichum* × *bicknellii* (named by J. W. Dyce). At a later date Mr. Jermyn hopes to publish elsewhere a full account of the flora.

Early in the year J. T. Smith sent us a list of 95 species he had found on waste ground near Bow Creek Wharf (38), which included *Asperula arvensis*, *Bupleurum lancifolium*, and *Vaccaria pyramidata* named at the Natural History Museum. H. A. Sandford contributed a valuable list which filled many distribution gaps and included *Sambucus nigra* var. *laciniata* from a copse and hedgerow near Broxfield Road, Romford (59) and *Zannichellia palustris* and *Potamogeton pectinatus* from High Ongar (50). In Mount Wood, near Epping (40) *Sasa senanensis* was again found in flower in June on a L.N.H.S. meeting. An important find was *Epipactis palustris* in a chalkpit near Grays (67) by D. A. J. Hunford, thus adding

yet another rare plant of the North Kent chalkpits to the opposite part of Essex. J. Mason and B. Wurzell found *Psoralea americana* L. on Dagenham tips (58), and Dr. A. Adams reports several patches of *Falcaria vulgaris* established in an old gravel pit near West Thurrock (57).

V.-c. 19. NORTH ESSEX

No records of special interest were reported from this part of our Area.

V.-c. 20. HERTS.

In contrast to recent years, we received a most welcome influx of additional records for Hertfordshire in 1964 amongst which were 36 species of which we had no previous note for the county. A most useful list was supplied by Dr. J. G. Dony, who is compiling a new county flora. This included *Lycopodium clavatum* found by B. F. C. Sennitt in a wet flush with *Sphagnum* in a disused gravel pit south of St. Albans (10), *Cuscuta epithymum* found by R. F. Turney in 1963 on Chorley Wood Common (09) and *Anacamptis pyramidalis* found in 1959 by Miss C. Leech in Bottom Wood, Maple Cross (09). Dr. Dony himself detected *Bidens frondosa* at Dobb's Weir (30), which is only the second time this spreading species has been recorded in our Area, *Potamogeton berchtoldii* in 1962 at Rye Meads (31) and Old Parkbury gravel pits (10), *Hippocrepis comosa* in a chalkpit near Little Berkhamstead (20), and *Verbascum lychnitis* var. *album* at St. Albans (10). He tells us that the maritime *Cerastium tetrandrum* was quite frequent on the railway from Bricket Wood (10) to Radlett (19) in 1955 but has become rare either owing to improved methods of keeping the permanent way clear of plant growth, or the gradual disappearance of the steam locomotive. The latter kept the railroad perpetually damp and possibly assisted the continuous spread of this species from the coast. J. Mason reported Butcher's Broom, *Ruscus aculeatus*, from Oak Hill Park, Barnet (29) and *Bromus inermis* in quantity forming large bright green patches between Oakleigh Park Station and the tunnel half a mile to the south.

I. G. Johnson's records for the county included *Helleborus viridis* var. *occidentalis* from Maple Cross (09), and *Onopordon acanthium*, *Convolvulus tricolor*, and *Plantago indica* from Maple Cross Sewage Farm (09). The lists supplied by E. B. Bangerter of plants found by him at East Barnet (29) in 1963 added *Galinsoga ciliata*, *Veronica agrestis*, and *Ruscus aculeatus* to our records for the county. B. Wurzell added *Lepidium smithii*, from near Little Berkhamstead (20) and *Impatiens glandulifera* from Whippendell Woods (09), and J. F. and P. C. Hall, *Valerianella dentata* found at Brickendon (31) in 1960. J. Mason has known several patches of *Hordeum jubatum* established in rough grassland on Oak Hill Park (29) since 1960, and in 1964 he found *Potentilla norvegica* at Oakleigh Park Railway Sidings (29).

V.-c. 21. MIDDLESEX

The interesting discoveries of *Hieracium lactucella* at Harrow (18) by F. C. Studley, of *Thelypteris robertiana* at Staines (07) by R. M. Payne, and of *Dactylorhiza fuchsii* on Hampstead Heath (28) by Miss K. E. Springett and myself, have already been mentioned. I. G. Johnson's most useful list of records included *Cephalanthera damasonium* from Park Wood (09) found in 1962, *Blechnum spicant* from Grimsdyke (19) found in 1957, and

Impatiens parviflora in 1964 by the Metropolitan Line just west of Baker Street (28). B. Wurzell collected *Chara delicatula* Ag., named by Mrs. S. P. Phillips, and *Rumex palustris* from Shortwood Common (07) and with J. Mason and E. Clement he found a number of interesting aliens including *Vicia pannonica*, *Carthamus tinctorius* and *Bromus carinatus* at the Hounslow Heath refuse tip (17), and others at Yiewsley rubbish tips. He confirmed that the Australian *Juncus pallidus*, believed to have been introduced with wool, was still at the gravel pit at East Bedfont (07) where it was first found in 1945, and nearby grew *Polypogon monspeliensis* which is commonly introduced with wool though it may have been brought here in some other way.

Lists from built-up areas are especially welcome, and we are grateful to N. A. Martin for lists of plants found in 1963 in Queen's Wood, Highgate Wood, and by the railway round Highgate Wood (28).

V.-c. 24. BUCKS.

The small part of this county which falls within our Area has received a little more attention than usual during the year. Additional species include *Adoxa moschatellina* found by I. G. Johnson at Tilehouse Lane (09) in 1962 and Rush Green (08) in 1963, *Galinsoga ciliata* found by D. H. Kent as a flower-bed weed near Denham (08), and *Dactylorhiza fuchsii* of which B. P. Pickess found about 500 spikes in a gravel pit, and a plant on the railway bank, near Denham Golf Club Halt (08).

We are grateful to the following for the contribution of records during 1964, those who sent lists being marked with an asterisk:—

Dr. A. Adams, *E. B. Bangerter, P. M. Benoit, E. B. Benson, *R. M. Burton, *R. Clarke, E. Clement, Mrs. C. M. Dony, *Dr. J. G. Dony, J. W. Dyce, Mrs. J. F. Hall, P. C. Hall, Ft/Lt. P. Halligey, P. C. Holland, D. Hunford, Miss E. M. C. Isherwood, S. T. Jermyn, *Ian G. Johnson, *D. H. Kent, D. C. Kelly, Miss C. Leech, L. Lloyd-Evans, *J. E. Lousley, *N. A. Martin, *J. Mason, Dr. R. Melville, B. Miles, *A. F. Mussellwhite, *J. R. Palmer, R. M. Payne, Mrs. S. P. Phillips, *B. P. Pickess, *H. M. Pratt, *H. A. Sandford, N. Y. Sandwith, P. D. Sell, B. F. C. Sennitt, P. G. Sheasby, Mrs. L. M. P. Small, *Mrs. J. E. Smith, *J. T. Smith, Miss K. E. Springett, F. C. Studley, R. F. Turney, C. W. Ward, Dr. Cyril West, *B. Wurzell.

Further Additions and Corrections to the Flora of Central London

Compiled by DOUGLAS H. KENT

“A contribution to the flora of Central London” was published in 1960, with an addenda in 1961 and a supplementary paper containing additions and corrections in 1962. The present paper incorporates the records of interesting taxa new to the flora of Central London as well as additional localities for plants previously noted up to the end of 1964.

Two important papers dealing with the flora of the area have appeared. The first, by David McClintock (1964) contains a systematic list of the plants noted in Buckingham Palace grounds during a detailed study of the natural history of the grounds. The second paper, by David Allen (1965) provides a list of the wild plants seen in Hyde Park and Kensington Gardens during a prolonged and careful survey.

The Park Lane—Hyde Park Corner and Marble Arch improvement schemes are now virtually completed and Hyde Park and Kensington Gardens have been more or less “tidied up”. Although the ending of the schemes have caused a reduction in the number of interesting ephemerals listed by Allen (1965) an interesting new factor in the distribution of casual adventives is the broadcasting of “Swoop” and other bird seed mixtures in the parks, and indeed even in the grounds of Buckingham Palace. Alien species which have originated as seed in these mixtures include *Bupleurum lancifolium*, *Salvia reflexa*, *Guizotia abyssinica*, *Centaurea diluta*, *Lolium rigidum* and *Phalaris canariensis*.

The arrangement of the list that follows is that of Kent (1960 and 1962) and the nomenclature is based on that of Dandy (1958). English names are provided only for species additional to Kent (1960 and 1962). The following signs are used:—

* Plant merely casual.

† Plant of foreign or cultivated origin.

! Following a locality indicates that the plant has been seen there by the compiler; ! following a recorder's initials indicates that the record was made in the company of the compiler.

§ Plant additional to those listed by Kent (1960 and 1962).

I am indebted to friends and correspondents who have provided records, and especially to D. E. Allen, Lady Anne Brewis and D. McClintock.

INDEX TO NAMES OF RECORDERS AND SPECIALISTS

A.Br.	Brewis, Lady Anne	J.E.L.	Lousley, J. E.
A.F.M.	Musselwhite, A. F.	J.M.	Mason, J.
A.M.	Melderis, Dr. A.	M.W.G.	Gardiner, Mrs. J. C.
B.M.	Miles, B.	P.C.H.	Holland, P. C.
B.Wu.	Wurzell, B.	P.H.	Halligey, Flt.-Lt. P.
D.E.A.	Allen, D.E.	R.C.	Clarke, R.
E.J.C.	Clement, E. J.	R.D.M.	Meikle, R. D.
I.G.J.	Johnson, I. G.	R. R.	Rönaasen, Miss R.
J.C.C.	Codrington, Lt.-Col. J. C.	S.M.W.	Walters, Dr. S. M.
J.C.G.	Gardiner, J. C.		

PTERIDOPHYTA

SPHENOPSISIDA

EQUISETACEAE

EQUISETUM ARVENSE L. Hyde Park, 1963, A.Br.

PTEROPSISIDA

ASPLENIACEAE

PHYLLITIS SCOLOPENDRIUM (L.) Newm. Under drain covers, Buckingham Palace grounds, 1961 only (McClintock, 1964).

§ASPLENIUM RUTA-MURARIA L. *Wall Rue*. Wall, Buckingham Palace grounds, 1961 only (McClintock, 1964).

ASPIDIACEAE

§DRYOPTERIS DILATATA (Hoffm.) A. Gray. *Broad Buckler-fern*. Buckingham Palace grounds, rare; originally on peat blocks (McClintock, 1964).

TAXACEAE

§†TAXUS BACCATA L. *Yew*. Buckingham Palace grounds, seedlings (McClintock, 1964).

RANUNCULACEAE

RANUNCULUS BULBOSUS L. Battersea Park; Elephant and Castle, 1963, A.F.M. Buckingham Palace Grounds (McClintock, 1964).

*R. FICARIA L. Hyde Park Corner, introduced with turves, 1963, A.Br.

§*†AQUILEGIA VULGARIS L. *Columbine*. Europe, including parts of Britain. Garden escape. Buckingham Palace grounds, near rubbish, 1962 (McClintock, 1964).

PAPAVERACEAE

§*PAPAVER RHOEAS var. STRIGOSUM Boenn. Hyde Park, one plant, 1962 (Allen, 1965).

§*P. DUBIUM L. *Long-headed Smooth Poppy*. Near Festival Hall, S.E.1, 1962, P.H.

*†P. SOMNIFERUM L. Kensington Gardens (Allen, 1965).

FUMARIACEAE

*†CORYDALIS LUTEA (L.) DC. Hyde Park, a single plant on a soil-dump near Marble Arch, 1962 (Allen, 1965).

*FUMARIA OFFICINALIS L. Buckingham Palace grounds, 1962 (McClintock, 1964). Oval Cricket Ground, introduced with soil, 1964.

CRUCIFERAE

§*†BRASSICA OLERACEA L. *Cabbage*. Buckingham Palace grounds, from bird-seed, 1963 (McClintock, 1964). Hyde Park, a single plant, 1961; derived from bird-seed (Allen, 1965).

*†B. JUNCEA (L.) Czern & Coss. Buckingham Palace grounds, from bird-seed, 1963 (McClintock, 1964).

- §*†SINAPIS ARVENSIS f. ORIENTALIS (L.) Aschers. Bird Sanctuary, Hyde Park, 1962 (Allen, 1965).
- *s. ALBA L. Buckingham Palace grounds, occasional (McClintock, 1964). Albert Gate, Hyde Park, 1962, (Allen, 1965).
- *RAPHANUS RAPHANISTRUM L. Near Festival Hall, S.E.1, 1962, P.H. Tower Hill, 1963, A.Br. Buckingham Palace grounds, rare (McClintock, 1964).
- §*var. OCHROLEUCUS (Stokes) Peterm. The Hyde Park plant noted by D.E.A. and D.McC. in 1961 (Kent, 1962) is referred to var. *ochroleucus* by Allen (1965).
- CORONOPUS SQUAMATUS (Forsk.) Aschers. Tower Hill, 1963, A.Br.
- †C. DIDYMUS (L.) Sm. Tower Hill, 1963, A.Br.
- †CARDARIA DRABA (L.) Desv. Tower Hill; Chelsea Hospital grounds, 1963, A.Br.
- CARDAMINE FLEXUOSA With. Buckingham Palace grounds, 1961 (McClintock, 1964).
- C. HIRSUTA L. Kensington Gardens, 1961 (Allen, 1965). Buckingham Palace grounds (McClintock, 1964).
- BARBAREA VULGARIS R.Br. Hyde Park, opposite Grosvenor House, 1962 (Allen, 1965). Hyde Park Corner, 1963, A.Br.
- RORIPPA SYLVESTRIS (L.) Bess. Buckingham Palace grounds (McClintock, 1964).
- R. ISLANDICA (Oeder) Borbás. Kensington Gardens, odd plants by the Serpentine (Allen, 1965).
- ERYSIMUM CHEIRANTHOIDES L. Portman Square, W.1, 1963, J.C.G. and M.W.G.
- †SISYMBRIUM ALTISSIMUM L. Hyde Park, under railings by new subway opposite Grosvenor House, a very hirsute form with arcuate-recurved siliquae, 1962 (Allen, 1965).
- §ARABIDOPSIS THALIANA (L.) Heynh. *Thale Cress*. Hyde Park; Kensington Gardens, 1962 (Allen, 1965). Buckingham Palace grounds (McClintock, 1964).

CAPPARIDACEAE

- †CLEOME SPINOSA L. Hyde Park, a single plant on rubble at east end of Rotten Row, 1962! (Allen, 1965).

RESEDACEAE

- RESEDA LUTEOLA L. Hyde Park, several plants on waste ground by Marble Arch, 1962 (Allen, 1965).

VIOLACEAE

- §*VIOLA RIVINIANA Reichb. *Dog Violet*. West Terrace, Buckingham Palace grounds, 1961 only (McClintock, 1964).
- *V. ARVENSIS Murr. Buckingham Palace grounds, 1963 (McClintock, 1964).

GUTTIFERAE

- HYPERICUM PERFORATUM L. Buckingham Palace grounds (McClintock, 1964).
- H. TETRAPTERUM Fr. Buckingham Palace grounds (McClintock, 1964).
- §H. HUMIFUSUM L. *Trailing St. John's Wort*. Buckingham Palace grounds, perhaps now gone (McClintock, 1964).

CARYOPHYLLACEAE

- SILENE VULGARIS (Moench) Garcke. Elephant and Castle, 1963, A.F.M. Harp Lane car park, near Tower Hill, 1963, A.Br.
- §*†VACCARIA PYRAMIDATA Medic. Europe. Trinity Gardens, E.C.3, a few plants, 1964, J.M.
- STELLARIA GRAMINEA L. Stag Place, S.W.1, 1963, D.McC. (Lousley, 1964). Buckingham Palace grounds, 1962 (McClintock, 1964).
- §SAGINA CILIATA Fr. *Fringed Pearlwort*. Cascade, Buckingham Palace grounds (McClintock, 1964).
- *SPERGULA ARVENSIS L. Buckingham Palace grounds, with imported soil, 1964 (McClintock, 1964).

ILLECEBRACEAE

- §*SCLERANTHUS ANNUUS L. *Annual Knawel*. Kensington Gardens, new soil patches beside Temple Lodge and south-east of Speke Memorial, 1962! (Allen, 1965).

PORTULACACEAE

- †MONTIA PERFOLIATA (Willd.) Howell. Garden weed, Old Church Street, Chelsea, 1963, E.J.C. Kensington Gardens, in plenty in tulip border by Victoria Gate, 1962! (Allen, 1965).

CHENOPODIACEAE

- CHENOPODIUM FICIFOLIUM Sm. Hyde Park, 1960-62 (Allen, 1965).
- C. MURALE L. Hyde Park, one under railings near Marble Arch, 1962! (Allen, 1965).
- C. RUBRUM L. Buckingham Palace grounds (McClintock, 1964).
- §*†BETA VULGARIS L. *Beet*. Soil-dump west of Marble Arch, Hyde Park (Allen, 1965).
- §*†SPINACIA OLERACEA L. *Spinach*. Hyde Park Corner, 1962, D.McC.

LINACEAE

- *†LINUM USITATISSIMUM L. Buckingham Palace grounds, one plant, 1963 (McClintock, 1964).
- §L. CATHARTICUM L. *Fairy Flax*. Cascade, Buckingham Palace grounds (McClintock, 1964).

GERANIACEAE

- GERANIUM MOLLE L. Oval Cricket ground, 1963.

OXALIDACEAE

- †OXALIS CORNICULATA L. Buckingham Palace grounds, rare (McClintock, 1964).

BALSAMINACEAE

- IMPATIENS PARVIFLORA DC. By Metropolitan Railway line just west of Baker Street, 1964, I.G.J. (Lousley, 1965).

AQUIFOLIACEAE

- ILEX AQUIFOLIUM L. Buckingham Palace grounds, seedlings, (McClintock, 1964).

VITACEAE

- *†VITIS VINIFERA L. Hyde Park Corner, a single plant on rubble, 1962 (Allen, 1965).

LEGUMINOSAE

- †MEDICAGO SATIVA L. Hyde Park, one plant, 1962 (Allen, 1965).
 §*†M. ARABICA (L.) Huds. *Spotted Medick*. Hyde Park, a single plant on waste ground by Marble Arch, 1962 (Allen, 1965).
 §*†TRIFOLIUM MICRANTHUM Viv. *Least Yellow Trefoil*. Hyde Park, a single plant on waste ground by Marble Arch, 1962 (Allen, 1965).
 *ORNITHOPUS PERPUSILLUS L. Hyde Park, three plants on bare ground by Marble Arch, 1962 (Allen, 1965).
 VICIA HIRSUTA (L.) Gray. St. James's Park, 1962, A.Br.
 †LATHYRUS LATIFOLIUS L. Buckingham Palace grounds, 1960-61 (McClintock, 1964).
 *†PISUM SATIVUM L. Hyde Park (Allen, 1965).

ROSACEAE

- §FILIPENDULA ULMARIA (L.) Maxim. *Meadow Sweet*. Buckingham Palace grounds, two single plants near the Cascade (McClintock, 1964).
 RUBUS LACINIATUS Willd. Buckingham Palace grounds, rare (McClintock, 1964).
 §R. RUBRITINCTUS W.C.R.Wats. Buckingham Palace grounds (McClintock, 1964).
 R. PSEUDOBIFRONS Sudre. The Hyde Park and Kensington Garden records given by Kent (1960) are errors, teste Allen (1965).
 †R. PROCERUS P. J. Muell. Hyde Park; Kensington Gardens, D.E.A. det. B.M. (Allen, 1965).
 POTENTILLA ERECTA × REPTANS. Hyde Park, patch on embankment! east of Lido, 1962! (Allen, 1965). Buckingham Palace grounds (McClintock, 1964).
 §†ALCHEMILLA GLABRA Neygenf. *Lady's Mantle*. Europe, including parts of Britain. Garden escape. Regent's Park, spreading from flower beds and springing up between paving stones, 1963, B.Wu. (Lousley, 1964).
 APHANES ARVENSIS L. Tower Hill, 1963, A.Br. The record from Buckingham Palace grounds (Kent, 1960) probably belongs under the next species.
 §A. MICROCARPA (Boiss. & Reut.) Rothm. Hyde Park, large patch on bare ground by Marble Arch, 1962; Kensington Gardens, soil patches beside Temple Lodge and south-east of Speke Memorial, 1962 (Allen, 1965). Buckingham Palace grounds, D.McC. conf. s.M.W. (McClintock, 1964).
 PRUNUS SPINOSA L. The record given for Kensington Gardens (Kent, 1960) refers to Hyde Park (Allen, 1965).
 §†P. DOMESTICA L. *Wild Plum*. Alien. Europe. Buckingham Palace grounds (McClintock, 1964).
 §*†P. AMYGDALUS Batsch. *Almond*. Alien. Europe. Hyde Park, seedling on rubble by Hyde Park Corner!, D.E.A., det. D.McC (Allen, 1965).
 §†SORBUS INTERMEDIA (Ehrh.) Pers. Europe. Wall of car-park by Westminster Abbey, a large seedling, 1962, A.Br.

SAXIFRAGACEAE

- §*†SAXIFRAGA STOLONIFERA Meerb. *Strawberry Saxifrage*. Orient. Garden outcast. Rubbish-heap, Buckingham Palace grounds, 1962 (McClintock, 1964).

LYTHRACEAE

- §LYTHRUM SALICARIA L. *Purple Loosestrife*. Frequent by the lake, Buckingham Palace grounds! (McClintock, 1964); no doubt originally planted.

ONAGRACEAE

- EPILOBIUM PARVIFLORUM Schreb. Hyde Park Corner, 1962, A.Br.
 §*E. LANCEOLATUM Seb. & Mauri. *Spear-leaved Willow-herb*. Cascade, Buckingham Palace grounds, 1961 only (McClintock, 1964).
 *†OENOTHERA BIENNIS L. Hyde Park Corner Extension, 1961-62 (Allen 1965).
 †O. ERYTHROSEPALA Borbás. A large colony by the railway near Paddington, 1964.
 §*†O. PARVIFLORA L. *Small-flowered Evening Primrose*. N. America. Garden escape. Hyde Park Corner Extension, 1962! (Allen, 1965).

UMBELLIFERAE

- ANTHRISCUS SYLVESTRIS (L.) Hoffm. Southwark Cathedral Churchyard, one plant, 1964, P.C.H.
 §*†BUPLEURUM LANCIFOLIUM Hornem. Europe. Hyde Park and Kensington Gardens, single specimens under railings on the west bank of the Serpentine, 1962!, D.E.A., det. D.McC. (Allen, 1965).
 CONOPODIUM MAJUS (Gouan) Loret. Tower Hill, 1963, A.Br. Near Festival Hall, S.E.1, 1962, P.H. Vincent Square, S.W.1, 1964, D.McC. Buckingham Palace grounds (McClintock, 1964).

EUPHORBIACEAE

- §MERCURIALIS PERENNIS L. *Dog's Mercury*. Buckingham Palace grounds (McClintock, 1964); perhaps originally introduced with shrubs.
 *EUPHORBIA EXIGUA L. Kensington Gardens, new soil patches beside Temple Lodge and south-east of Speke Memorial, 1962 (Allen, 1965).

POLYGONACEAE

- *POLYGONUM LAPATHIFOLIUM L. Buckingham Palace grounds, one plant, 1963 (McClintock, 1964).
 †P. SACHALINENSE F. Schmidt. Buckingham Palace grounds! (McClintock, 1964).
 §†P. POLYSTACHYUM Wall. ex Meisn. India. Garden outcast. Kensington Gardens, several plants at back of Long Walk shrubbery, north of Palace Gate (Allen, 1965).
 RUMEX CONGLOMERATUS Murr. Buckingham Palace grounds, very rare (McClintock, 1964).

URTICACEAE

- PARIETARIA DIFFUSA Mert. & Koch. River wall east of Vauxhall Bridge, 1964, R.C. (Lousley, 1965).
 §†SOLEIROLIA SOLEIROLII (Req.) Dandy (*Helxine soleirolii* Req.) *Mind-your-own-business*. Europe. Garden escape. Buckingham Palace grounds (McClintock, 1964).

URTICA DIOICA L. Buckingham Palace grounds, not seen lately (McClintock, 1964).

BETULACEAE

§BETULA PENDULA Roth. *Silver Birch*. Hyde Park, two on waste patches near Hyde Park Corner, 1962! (Allen, 1965).

§ALNUS GLUTINOSA (L.) Gaertn. *Alder*. Buckingham Palace grounds, seedlings, rare (McClintock, 1964).

CORYLACEAE

§CARPINUS BETULUS L. *Hornbeam*. Kensington Gardens, seedling under hedge of enclosure on east bank of Serpentine (Allen, 1965).

FAGACEAE

§†CASTANEA SATIVA Mill. *Sweet Chestnut*. S. Europe. Buckingham Palace grounds, seedlings, rare (McClintock, 1964). Kensington Gardens, seedlings, 1960-62 (Allen, 1965).

†QUERCUS CERRIS L. Hyde Park, waste ground west of Marble Arch, seedlings, 1962 (Allen, 1965). Buckingham Palace grounds, seedlings (McClintock, 1964).

SALICACEAE

SALIX CAPREA L. Buckingham Palace grounds, seedlings, rare (McClintock, 1964).

§S. CINEREA subsp. OLEIFOLIA Macreight (subsp. *atrocinera* (Brot.) Silva and Sobrinho). Buckingham Palace grounds, two seedlings (McClintock, 1964).

§S. AURITA × CINEREA. Hyde Park, two among rubble by Hyde Park Corner, 1962, D.E.A., det. R.D.M. (Allen, 1965).

ERICACEAE

§CALLUNA VULGARIS (L.) Hull. *Ling*. Buckingham Palace grounds, introduced with peat blocks! (McClintock, 1964).

§Var. INCANA Reichb. Buckingham Palace grounds, on peat blocks (McClintock, 1964).

§ERICA TETRALIX L. *Cross-leaved Heath*. Buckingham Palace grounds, rare on peat blocks! (McClintock, 1964).

§†E. CILIARIS L. *Dorset Heath*. S.-W. England. Buckingham Palace grounds, rare on peat blocks (McClintock, 1964).

PRIMULACEAE

§LYSIMACHIA VULGARIS L. *Yellow Loosestrife*. Buckingham Palace grounds, occasional! (McClintock, 1964); no doubt originally planted.

BUDDLEJACEAE

†BUDDLEJA DAVIDII Franch. Buckingham Palace grounds, seedlings (McClintock, 1964).

CONVOLVULACEAE

§CUSCUTA EPITHYMUM (L.) L. *Common Dodder*. Buckingham Palace grounds, infesting one plant of Ling on peat blocks, 1964 (McClintock, 1964).

SOLANACEAE

HYOSCYAMUS NIGER L. Hyde Park, about 20 rosettes on newly levelled ground over new car-park, 1962, (Allen, 1965).

SOLANUM DULCAMARA L. The plant with white flowers is reported from Chelsea Hospital grounds, 1963, A.Br.

*†LYCOPERSICON ESCULENTUM Hill. Buckingham Palace grounds, seedlings, 1961 (McClintock, 1964).

SCROPHULARIACEAE

VERBASCUM THAPSUS L. St. James's Park, 1962, A.Br. Buckingham Palace grounds, rare (McClintock, 1964).

§*†VIRGATUM Stokes. *Twiggy Mullein*. Europe, including S.-W. England. Hyde Park Corner, one plant, 1962, D.E.A., det. D.McC. (Allen, 1965).

§*KICKXIA SPURIA (L.) Dumort. *Round-leaved Fluellen*. Hyde Park, four plants on waste ground west of Marble Arch, 1962 (Allen, 1965).

§*K. ELATINE (L.) Dumort. *Sharp-leaved Fluellen*. Kensington Gardens, several plants on soil patches beside Temple Lodge and south-east of Speke Memorial, 1962 (Allen, 1965). Buckingham Palace grounds, 1963 (McClintock, 1964).

§*SCROPHULARIA NODOSA L. *Knotted Figwort*. Buckingham Palace grounds, one plant, 1962 (McClintock, 1964).

§†MIMULUS MOSCHATUS Dougl. ex Lindl. *Musk*. N. America. Kensington Gardens, weed in borders by Albert Memorial (Allen, 1965). Buckingham Palace grounds, weed in flower beds (McClintock, 1964).

§VERONICA SERPYLLIFOLIA L. *Thyme-leaved Speedwell*. Cascade, Buckingham Palace grounds (McClintock, 1964).

V. HEDERIFOLIA L. Buckingham Palace grounds (McClintock, 1964).

V. ARVENSIS L. Cascade, Buckingham Palace grounds (McClintock, 1964).

V. POLITA Fr. Oval Cricket Ground, introduced with soil, 1963.

OROBANCHACEAE

§OROBANCHE MINOR L. *Small Broomrape*. Alley off Ebury Bridge Road, S.W.1, 1963, J.C.C. (Lousley, 1964).

VERBENACEAE

*†VERBENA PATAGONICA Moldenke (*V. bonariensis* auct.). Buckingham Palace grounds, seedling, 1961 (McClintock, 1964).

*†V. × HYBRIDA Groenl. & Rümpl. Buckingham Palace grounds, seedling, 1961 (McClintock, 1964).

LABIATAE

MENTHA ARVENSIS L. Buckingham Palace grounds, 1963 (McClintock, 1964).

M. ARVENSIS × SPICATA = M × GENTILIS L. Buckingham Palace grounds (McClintock, 1964).

§M. AQUATICA L. *Water Mint*. Island, Buckingham Palace grounds (McClintock, 1964)

LYCOPUS EUROPAEUS L. River wall, Vauxhall Bridge, 1964, R.C. (Lousley, 1965).

- §*†SALVIA REFLEXA Hornem. N. America. Hyde Park, patch under railings north-west of Lido !; new traffic island by Dorchester Hotel, 1962 !, D.E.A., det. D.McC. (Allen, 1965).
- §*†STACHYS ARVENSIS (L.) L. *Field Woundwort*. Europe. Hyde Park, a single plant by temporary hut near Marble Arch, 1962 ! (Allen, 1965).
- S. SYLVATICA L. Buckingham Palace grounds (McClintock, 1964).
- BALLOTA NIGRA L. All specimens so far seen from Central London are referable to subsp. FOETIDA Hayek.
- GALEOPSIS TETRAHIT L. Hyde Park Corner, 1963, A.Br.
- G. BIFIDA Boenn. Cascade, Buckingham Palace grounds (McClintock, 1964).
- §GLECHOMA HEDERACEA L. *Ground Ivy*. Lawn near the National Gallery, 1964, D.McC.
- §AJUGA REPTANS L. *Bugle*. Buckingham Palace grounds, very rare (McClintock, 1964).

PLANTAGINACEAE

- PLANTAGO MEDIA L. West Terrace, Buckingham Palace grounds, 1961 (McClintock, 1964).
- §*†P. INDICA L. Europe. Suffolk Lane, E.C., 1963, B.Wu. (Lousley, 1964).

RUBIACEAE

- SHERARDIA ARVENSIS L. Buckingham Palace grounds, from bird seed, 1963 (McClintock, 1964).
- GALIUM VERUM L. Buckingham Palace grounds (McClintock, 1964).
- §G. PALUSTRE L. subsp. PALUSTRE. *Marsh Bedstraw*. River wall east of Vauxhall Bridge, R.C. (Lousley, 1965).

COMPOSITAE

- †HELIANTHUS ANNUUS L. Hyde Park, one by subway by Marble Arch, 1962 ! (Allen, 1965).
- *†GUIZOTIA ABYSSINICA Cass. North Terrace, Buckingham Palace grounds, from bird seed, 1963-64 (McClintock, 1964).
- §†PETASITES FRAGRANS (Vill.) C. Presl. *Winter Heliotrope*. Europe. Garden escape. Ice House, Buckingham Palace grounds (McClintock, 1964).
- PULICARIA DYSENTERICA (L.) Bernh. Buckingham Palace grounds, one plant, 1963 (McClintock, 1964). Green Park (Allen, 1965).
- GNAPHALIUM ULIGINOSUM L. Tower Hill, 1963, A.Br.
- †SOLIDAGO GIGANTEA Ait. Buckingham Palace grounds, 1961 only (McClintock, 1964).
- §*ANTHEMIS COTULA L. *Stinking Mayweed*. Gallery Bank, Buckingham Palace grounds, 1963 (McClintock, 1964).
- §*A. ARVENSIS L. *Corn Chamomile*. Kensington Gardens, two isolated plants, 1962 (Allen, 1964).
- §CENTAUREA NEMORALIS Jord. *Slender Hardhead*. Chelsea Hospital grounds, 1962, A.Br. Kensington Gardens (Allen, 1965). Buckingham Palace grounds, one plant, 1962 (McClintock, 1964).
- *†C. DILUTA Ait. Buckingham Palace grounds, with bird seed, 1964 (McClintock, 1964).
- LACTUCA SERRIOLA L. Tufton Street, S.W.1, 1962, A.Br. Buckingham Palace grounds, one plant, 1963 (McClintock, 1964).

†CREPIS VESICARIA subsp. TARAXACIFOLIA (Thuill.) Thell. Gallery Bank, Buckingham Palace, 1963 (McClintock, 1964).

ALISMATACEAE

ALISMA PLANTAGO-AQUATICA L. Buckingham Palace grounds, but possibly gone (McClintock, 1964).

JUNCACEAE

†JUNCUS TENUIS Willd. Buckingham Palace grounds, one tuft opposite the Cascade, 1963 (McClintock, 1964).

J. BUFONIUS L. Buckingham Palace grounds (McClintock, 1964).

§J. INFLEXUS L. *Hard Rush*. Hyde Park, a single plant at edge of pavement next to Apsley House, within former boundary of park, 1962; Kensington Gardens, planted in pools at the Fountains where it occasionally becomes self sown (Allen, 1965). Cascade, Buckingham Palace grounds (McClintock, 1964).

J. EFFUSUS L. Buckingham Palace grounds (McClintock, 1964).

§*J. ARTICULATUS L. *Jointed Rush*. Buckingham Palace grounds, 1961 only (McClintock, 1964).

IRIDACEAE

§IRIS PSEUDACORUS L. *Yellow Flag*. Lake, Buckingham Palace grounds! (McClintock, 1964); probably originally planted.

§†CROCOSMIA × CROCOSMIFLORA (Lemoine) N.E.Br. *Montbretia*. Garden outcast. Near the Dorchester Hotel, 1962, D.E.A.!

ARACEAE

†ACORUS CALAMUS L. Lake, Buckingham Palace grounds! (McClintock 1964); originally planted.

COMMELINACEAE

§*†ZEBRINA PENDULA Schnizl. *Wandering Sailor*. Mexico. Garden outcast. Rubbish-heap, Buckingham Palace grounds, 1962 (McClintock, 1964).

TYPHACEAE

TYPHA LATIFOLIA L. Lake, Buckingham Palace grounds; exterminated by 1960 (McClintock, 1964).

CYPERACEAE

C. MURICATA L. Bennett's Yard, Victoria, S.W.1, R.R. (Lousley, 1964). Hyde Park, traffic island north of Apsley House, 1961-62!, D.E.A., conf. J.E.L. (Allen, 1965).

C. REMOTA L. Albert Gate, Hyde Park, 1962, A.Br.

C. OVALIS Gooden. Cascade, Buckingham Palace grounds, one plant, (McClintock, 1964).

GRAMINEAE

§MOLINIA CAERULEA (L.) Moench. *Purple Moor Grass*. On peat blocks shoring up flower beds, Buckingham Palace grounds, 1964 (McClintock, 1964).

- FESTUCA RUBRA L. Buckingham Palace grounds (McClintock, 1964).
- F. OVINA L. The Kensington Gardens record given by Kent (1960) is probably referable to the next species. Buckingham Palace grounds (McClintock, 1964).
- F. TENUIFOLIA Sibth. Kensington Gardens, turf about Round Pond!, D.E.A., conf. J.E.L. (Allen, 1965).
- §†LOLIUM MULTIFLORUM × PERENNE = L. × HYBRIDUM Hausskn. Sown on Gallery Bank, Buckingham Palace grounds (McClintock, 1964).
- †L. TEMULENTUM L. Delete record from Hyde Park, 1961 (Kent, 1962). This was an error.
- §*†L. RIGIDUM Gaud. Europe. Hyde Park, new traffic island by Dorchester Hotel, 1962!, D.E.A., det. D.McC. (Allen, 1965).
- †POA PALUSTRIS L. Hyde Park, by head of Serpentine, 1962, A.Br., conf. J.E.L. (Allen, 1965).
- §*†AGROPYRON DESERTORUM (Fisch.) Schult. Europe. Hyde Park, patch on traffic island north of Apsley House, 1962!, D.E.A., det. A.M. (Allen, 1965).
- †HORDEUM DISTICHON L. Hyde Park Corner, 1962. Hyde Park, a single plant in shrubbery by Albert Gate, 1961, D.E.A., det. A.M. (Allen, 1965).
- TRISETUM FLAVESCENS (L.) Beauv. Buckingham Palace grounds (McClintock, 1964).
- DESCHAMPSIA CESPITOSA (L.) Beauv. Car park by National Gallery, 1962, A.Br. Buckingham Palace grounds, one tuft on islet, 1963 (McClintock, 1964).
- AGROSTIS GIGANTEA Roth. Buckingham Palace grounds (McClintock, 1964).
- *†PHALARIS CANARIENSIS L. Near Festival Hall, S.E.1, 1962, P.H.
- §*†TRITICUM TURGIDUM L. *Rivel*. Hyde Park Corner, 1962, A.Br.
- §*†T. AESTIVUM L. *Bread Wheat*. Hyde Park Corner, 1961-62!; near Marble Arch (Allen, 1965).

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A Survey of Calystegia in the London Area

Third Progress Report 1964

IT was stated in last year's Report on this survey of the two species of Bindweed, *Calystegia sepium* (L.) R. Br., *C. silvatica* (Kit.) Griseb. and the intermediate form, that at least another season's work was needed. This has been carried out with encouraging results but has not yet proved sufficient to provide adequate coverage of our area. The Botanical Section Committee has therefore decided to continue for one more season and possibly more if necessary. This decision is based on the continued enthusiastic support of volunteer helpers in the field, who now number well over 40 and who have added more than 150 cards to the 500 already returned.

Not only has the index figure been worked out for these additional cards according to the method outlined by C. A. Stace (in *Watsonia*, 5, 88-105, 1961) but the results from all cards have been plotted on a map to show the distribution by 1 km. grid squares of the two species and their intermediate. This map has been kept up to date and shown at Botany Section meetings so that members may readily appreciate the progress made. It would again be premature to give any assessment of the final ratio of distribution but it is of interest to note that of this season's records nearly one half have been of *C. sepium*, the remainder being divided more or less equally between *C. silvatica* and the intermediate. Index figures obtained before this season, as reported last year, indicated a preponderance of the intermediate form.

This increase of records of *C. sepium* may well be co-incidental with an increase of visits to localities nearer the perimeter of our area. It is true that many 1 km. squares have been surveyed in the more central parts of the area, notably at Mill Hill, Hendon and Hampstead in Middlesex (V.-c. 21), near Crystal Palace in Surrey and at Petts Wood and Bromley in Kent but evidently efforts have been made to get to the outer edge of our circle. In West Kent (V.-c. 16) helpers have gone out to Eynsford, Farningham and Lullingstone; in Surrey (V.-c. 17) squares in the Banstead area have been worked. Havering, Navestock and Romford are further localities from South Essex (V.-c. 18) but, once again, we must admit a dearth of results from North Essex (V.-c. 19). Hertfordshire (V.-c. 20) has been represented by Borehamwood and Essendon and, at last, we have results from squares, at Denham and Uxbridge, in Buckinghamshire (V.-c. 24). From these more rural situations *C. sepium* is the most commonly recorded Bindweed.

A second map, on which have been blocked out all 1 km. squares where work has been done, has also been exhibited at botanical meetings in order that members may see at a glance where the gaps are in our survey. In finishing this report with my usual request for assistance, offers of which should be sent to me at the Department of Botany, British Museum (Natural History), South Kensington, S.W.7, I am most thankful to say that a simple guide to the whole process of recording data for the survey, prepared by Peter Holland, will be available to all volunteer helpers. There can be no excuse!

E. B. BANGERTER

A Hand List of the Plants of the London Area

MYXOMYCETES

By BRUCE ING, M.A.

INTRODUCTION

THE following account of the Slime Moulds recorded in the London Area extends the Hand List, which previously dealt with flowering plants, ferns, stoneworts and bryophytes, to include a group of little known fungus-like organisms.

The shortage of collectors is obvious and recourse to the literature has been frequent. All known herbaria with London material have been examined but the contents are cited only where the record has not been published.

The London Area is defined by a circle of radius twenty miles centred on St. Paul's Cathedral—a map was published in the *London Naturalist*, 30, 1951.

The list that follows is compiled from literature, herbaria and specimens and records contributed by members of the Society and others interested in the natural history of the area. Several recorders are members of the Council for Nature's Conservation Corps.

The records are arranged under Watsonian vice-counties, with the boundaries as defined by H. C. Watson in *Cybele Britannica*, 1859. The vice-counties concerned, in whole or in part, are as follows:

V.-c. 16 West Kent	V.-c. 17 Surrey
18 South Essex	19 North Essex
20 Herts.	21 Middlesex
24 Bucks.	

NOMENCLATURE

The nomenclature and arrangement is based on Martin (1949) with later amendments. Where the name differs from that in Lister (1925) the older name is added in parentheses.

PLAN

The entries are arranged thus:—

- (a) scientific name of the species, followed by synonym where desirable;
- (b) habitat and frequency in the British Isles;
- (c) records under vice-counties;
- (d) individual records, date where important and recorder's initials, or reference to literature or herbarium. ; separates different recorders within a vice-county.

INDEX TO RECORDERS' NAMES

A.S.	Stubbs, A.	J.F.H.	Harper, J. F.
B.I.	Ing, B.	J.R.	Ross, J.
F.M.C.	Cameron, Miss F. M.	P.C.H.	Holland, P. C.
F.W.E.	Evens, F. W.	P.K.C.A.	Austwick, P. K. C.
J.B.H.	Hall, J. B.	T.D.V.S.	Swinscow, T. D. V.

INDEX TO LITERATURE

(See Reference List)

A	Alexander, 1923	M 2	Massee, 1892.
B & G	Bevis & Griffin, 1909	M 3	Massee, 1906.
G	Gregory, 1951.	R 1	Ross, 1939.
H	Howse, 1879.	R 2	Ross, 1946.
M 1	Marriott, 1925-7.	S	Saunders, 1911.

INDEX TO HERBARIA

BM	British Museum, Natural History	K	Royal Botanic Gardens, Kew
CMG	Cambridge University, Botany School	SLBI	South London Botanical Institute
IC	Imperial College, Botany Department		

ACKNOWLEDGEMENTS

Thanks are due to all the recorders and those others who have helped not only in compiling the list but in encouraging and fostering an interest in myxomycetes in the London Area. I wish to record my gratitude to the authorities and staff of the following institutions: Royal Botanic Gardens, Kew; British Museum, Natural History; South London Botanical Institute; Imperial College, Dept. of Botany; Cambridge University Herbarium, for permission to consult the collections in their charge and for help in many ways.

NOTES ON LOCALITIES

- V.-c.17. "Weybridge" refers mainly to Woburn Park; see Alexander (1923).
 "Brooklands" are the grounds of the Brooklands County Technical College, Weybridge.
- V.-c.18. "Epping Forest" includes all records from Wanstead Park and the old records for Leytonstone.
- V.-c.21. "Hampstead Heath" refers to the West Heath; Ken Wood is recorded separately.
 "Ruislip" refers to the woodland areas around the Lido, and to the Local Nature Reserve.

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CERATIOMYXALES CERATIOMYXACEAE

CERATIOMYXA Schroet.

C. FRUTICULOSA (Mull.) Macbr., on wet rotten wood, common. V.-c.16, Abbey Wood, M 1. V.-c.17, common throughout the area. V.-c.18, Epping Forest, R 2. V.-c.20, Whippendell Wood, G. V.-c.21, Canons Park, S; Stanmore and Harrow Weald Commons, Hampstead Heath, B.I. V.-c.24, Black Park, B.I.

LICEALES

LICEACEAE

LICEA Schrad.

L. VARIABILIS Schrad. (*L. flexuosa* Pers.), on decorticated pine sticks, uncommon. V.-c.17, Weybridge, A; Oxshott, 1963, B.I. V.-c.18, Epping Forest, R 2.
L. TENERA Jahn, on elm stick, very rare. V.-c.18, Wanstead Park, 1898, A. Lister. The first British record.
L. PUSILLA Schrad., on dead wood, uncommon. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2.
L. MINIMA Fr., on dead coniferous wood, uncommon except in moist chamber culture. V.-c.17, Weybridge, A; Oxshott, B.I.

RETICULARIACEAE

TUBIFERA Gmel.

T. FERRUGINOSA (Batsch) Gmel., on decayed coniferous logs, frequent. V.-c.17, Weybridge, A; Mickleham, K; Oxshott, K; Wimbledon Common, IC; Kew Gardens, M 3. V.-c.18, Epping Forest, R 2.

LYCOGALA Mich.

L. FLAVOFUSCUM (Ehr.) Rost., inside rotten trunks of elm and birch, rare. V.-c.17, Weybridge, A.
L. EPIDENDRUM (L.) Fr., on fallen logs, especially beech. Very common throughout the area.

DICTYDIAETHALIUM Rost.

D. PLUMBEUM (Schum.) Rost., on logs, mainly beech and birch, frequent. V.-c.16, Abbey Wood, M 1; Oxleas Wood, Downe, 1963, B.I. V.-c.17, Weybridge, A; Kew, P.K.C.A.; Chipstead, B.I. V.-c.18, Epping Forest, R 2. V.-c.21, Ruislip Woods, 1963, B.I.

RETICULARIA Bull.

R. LOBATA Lister (*Liceopsis lobata* Torr.), on stumps of pine and *Castanea*, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Brooklands, 1962, B.I.; Oxshott, K. V.-c.18, Wanstead Park, R 2.

R. INTERMEDIA Nann.-Brem., on dead wood of *Rhododendron* and *Castanea*, rare. V.-c.17, Brooklands, 1961, B.I. First British record.

R. JURANA Meylan (*R. lycoperdon* var. *jurana* G. Lister), on dead sticks and logs, common. V.-c.17, Bookham Common, 1962, B.I. V.-c.18, Chingford, 1961, B.I. V.-c.20, Bricket Wood, 1962, B.I. V.-c.21, Ruislip Woods, Hampstead Heath, 1963, B.I.

R. LYCOPERDON Bull., on logs and dead standing trunks, common throughout the area.

ENTERIDIUM Ehr.

E. OLIVACEUM Ehr., on logs and sticks, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Oxshott, SLBI; Kew, M 2; Bookham Common, B.I. V.-c.18, Epping Forest, R 2. V.-c.21, Ruislip Woods, 1963, B.I.

E. LICEOIDES G. Lister, on pine sticks, rare. V.-c.17, Weybridge, Oxshott, A.

CRIBRARIACEAE

LINDBLADIA Fr.

L. EFFUSA (Ehr.) Rost., on sawdust and coniferous wood, rare. V.-c.17, Oxshott, A; Kew, M 3. V.-c.18, Epping Forest, R 2. V.-c.24, Black Park, 1962, B.I.

CRIBRARIA Pers.

C. ARGILLACEA (Pers.) Pers., on dead coniferous wood, common. V.-c.16, Abbey Wood, M 1. V.-c.17, common everywhere. V.-c.18, Epping Forest, R 2. V.-c.24, Black Park, 1962, B.I.

C. INTRICATA Schrad., on sticks and dead wood, rare. V.-c.17, Weybridge, A; Kew, M 3.

C. PIRIFORMIS Schrad., on coniferous wood, rare. V.-c.24, Black Park, 1962, B.I. var. *notabilis* Rex, sawdust heaps, rare. V.-c.17, Oxshott, A.

C. RUFA (Roth.) Rost., on dead coniferous wood, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, Oxshott, A; Brooklands, B.I. V.-c.18, Epping Forest, R 2. V.-c.20, Redwell Wood, 1961, T.D.V.S. V.-c.24, Black Park, 1962, B.I.

C. AURANTIACA Schrad., on coniferous wood, common. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Brooklands, B.I.; Kew, M 3; Reigate, BM. V.-c.18, Epping Forest, R 2. V.-c.19, Epping Forest, 1964, P.C.H.

C. VULGARIS Schrad. (*C. aurantiaca* p.p.), on dead wood, uncommon. V.-c.18, Epping Forest, R 2.

C. VIOLACEA Rex, on rotten beech and coniferous wood, rare. V.-c.16, Abbey Wood, M 1.

C. CANCELLATA (Batsch) Nann.-Brem. (*Dictydium cancellatum* (Batsch) Macbr.), on oak stumps and coniferous sticks and logs, frequent. V.-c.17, Weybridge, Oxshott, A; Brooklands, B.I.; Kew, M 3; Lingfield, BM. V.-c.18, Epping Forest, R 2.

var. *fusca* (Lister) Nann.-Brem. with the type, uncommon. V.-c.17, Weybridge, A; Brooklands, B.I. V.-c.18, Epping Forest, R 2.

TRICHIALES
DIANEMACEAE

CALOMYXA Niewland (*Margarita* Lister)

C. METALLICA (Berk.) Niewland (*Margarita metallica* Lister), on dead leaves, rare. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Limpsfield Common, R 1. V.-c.18, Epping Forest, R 2.

DIANEMA Rex

D. DEPRESSUM (Lister) Lister, on sticks and rotten trunks, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Box Hill, 1961, B.I.

PROTOTRICHIA Rost.

P. METALLICA (Berk.) Masee, on sticks, rare. V.-c.17, Weybridge, A; Kew, M 3.

TRICHIACEAE

PERICHAENA Fr.

P. CHRYSOSPERMA (Currey) Lister, on bark, rare. V.-c.18, Brentwood, 1962, B.I.

P. VERMICULARIS (Schw.) Rost., on dead leaves, uncommon. V.-c.16, Bickley, B & G. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2. V.-c.20, London Colney, S.

P. DEPRESSA Libert, on bark, common. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Sydenham Hill, H; Box Hill, P.C.H. V.-c.18, Epping Forest, R 2. V.-c.20, Chorleywood Common, 1963, B.I. V.-c.21, Ruislip Woods, 1961, B.I.

P. CORTICALIS (Batsch) Rost., on bark, common. V.-c.16, Abbey Wood, M 1. V.-c.17, common everywhere. V.-c.18, Epping Forest, R 2; Brentwood, BM. V.-c.20, Chorleywood Common, 1963, B.I.

P. PEDATA G. Lister (*P. chrysosperma* p.p.), on dead leaves and stalks, rare. V.-c.16, Abbey Wood, M 1; Ruxley, 1962, B.I. V.-c.18, Epping Forest, R 2.

P. MINOR (G. Lister) Hagelst. (*Hemitrichia minor* G. Lister), on dead stalks and bark of living trees, rare. V.-c.17, Weybridge, A.

ARCYODES O.F. Cook (*Lachnobolus* Fr.)

A. INCARNATA (Alb. & Schw.) O. F. Cook (*Lachnobolus congestus* G. Lister), on dead wood, rare. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2.

ARCYRIA (Hill) Wiggers

A. FERRUGINEA Sauter, on dead wood, common. V.-c.16, Abbey Wood, M 1; Eltham, B & G. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2. V.-c.21, Enfield, K; Hampstead Heath, BM; Highgate Woods, S; Finchley, F.W.E.; Perivale Wood, J.B.H.

A. INCARNATA (Pers) Pers., on dead sticks, especially oak, very common throughout the area.

A. OERSTEDTHI Rost., on dead coniferous wood, uncommon. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2. V.-c.21, Ruislip Woods, K.

A. NUTANS (Bull.) Grev., on dead logs, especially beech. Common throughout the area.

A. CINEREA (Bull.) Pers., on sticks and moss on logs, common. V.-c.16, common. V.-c.17, common everywhere. V.-c.18, common everywhere. V.-c.20, Chorleywood Common, B.I. V.-c.21, Perivale Wood, 1961, Ruislip Woods, 1963, B.I. V.-c.24, Black Park, 1962, B.I.

A. CARNEA (Lister) G. Lister, on rotten wood, rare. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2.

A. POMIFORMIS (Leers) Rost., on logs, particularly hornbeam, common. V.-c.16, Abbey Wood, M 1. V.-c.17, Limpsfield Common, R 1; Weybridge, A; Bookham Common, C; Box Hill, B.I., Chipstead, 1963, B.I. Brooklands, 1964, J.B.H. V.-c.18, common. V.-c.21, Perivale Wood, Ruislip Woods, Hampstead Heath, Queen's Wood, Highgate, B.I. V.-c.24, Black Park, B.I.

A. DENUDATA (L.) Wettst., very common throughout the area on dead wood of all kinds.

HEMITRICHIA Rost.

H. STIPATA (Sow.) Macbr. (*Arcyria stipata* Lister), on dead wood, rare. V.-c.17, Reigate, A; Selsdon Wood, 1962, B.I.

H. LEIOTRICHIA (Lister) G. Lister, on dead leaves and sticks, rare. V.-c.18, Epping Forest, R 2.

H. CLAVATA (Pers.) Rost., on dead wood, frequent. V.-c.16, Abbey Wood, M 1; Downe, 1963, B.I. V.-c.17, Weybridge, Reigate, A; Norbury Park, K; Box Hill, B.I. V.-c.18, Epping Forest, R 2. V.-c.20, Bushey, G.

H. STIPITATA (Masse) Macbr. (*H. clavata* p.p.), on dead wood, frequent. V.-c.17, Box Hill, South Hawke, Bookham Common, B.I. V.-c.20, Redwell Wood, Northaw, T.D.V.S.

H. VESPARIUM (Batsch) Macbr., on rotten logs, especially elm, common. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Box Hill, Esher, B.I. V.-c.18, Epping Forest, R 2. V.-c.20, Essendon, T.D.V.S. V.-c.21, Ken Wood, BM.

TRICHIA Haller

T. VARIA (Pers.) Pers., very abundant on rotten wood of all kinds, throughout the area.

T. ALPINA (R.E.Fr.) Meylan, an alpine species, on rotten leaves, rare. V.-c.17, Weybridge, 1922, A. "on decaying leaves of *Prunus lauro-cerasus*, at Weybridge, Surrey, April 1922, showing that it is not an exclusively alpine form" (Lister, 1925).

T. CONTORTA (Ditm.) Rost. on sticks and dead wood, frequent. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, Reigate, A. V.-c.18, Epping Forest, R 2.

var. *inconspicua* (Rost.) Lister, on piles of leaves and old stems, frequent. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Box Hill, P.C.H. V.-c.18, Epping Forest, R 2. V.-c.21, Enfield, K.

var. *karstenii* (Rost.) B. Ing (*Hemitrichia karstenii* (Rost.) Lister) on bark, not common. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A.

T. LUTESCENS Lister, on sticks, rare. V.-c.17, Weybridge, A.

T. SCABRA Rost. on rotten logs, particularly elm, common. V.-c.17, widely distributed. V.-c.18, common. V.-c.20, Bricket Wood, S; Redwell Wood, Hoddesdonpark Wood, T.D.V.S. V.-c.21, Shepperton, CMG; Highgate, F.W.E.; Harefield, 1963, J.F.H.

T. FAVOGINEA (Batsch) Pers. on dead wood, rare. V.-c.21, Highgate, M 2.

T. AFFINIS de Bary, on mossy stumps, etc., common. V.-c.16, 17, 18, very common. V.-c.20, St. Albans, BM; Wormley Wood, B.I.; Hoddesdonpark Wood, T.D.V.S. V.-c.21, Brentford, 1963, A.S.

- T. PERSIMILIS Karst., on dead wood, common throughout the area.
 T. VERRUCOSA Berk., on coniferous wood, rare. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, Oxshott, A. V.-c.20, Hoddesdonpark Wood, 1959, T.D.V.S.
 T. DECIPIENS (Pers.) Macbr., on dead wood, very common everywhere.
 T. BOTRYTIS (Gmel.) Pers., on dead wood, very common everywhere.
 var. *flavicoma* Lister, on dead leaves, uncommon. V.-c.17, Weybridge, A; Limpsfield, R 1. V.-c.18, Epping Forest, R 2. V.-c.20, Chorleywood Common, 1962, B.I.
 T. FLORIFORMIS (Schw.) G. Lister, on dead stumps, increasingly common. V.-c.16, Hayes Common, 1962, B.I. V.-c.17, widespread. V.-c.18, Epping Forest, 1946, J.R. V.-c.21, Ken Wood, 1947, J.R.; Hampstead Heath, Ruislip, 1963, B.I.

OLIGONEMA Rost.

- O. SCHWEINITZII (Berk.) G. W. Martin (*O. nitens* Rost.), on submerged logs, rare. V.-c.17, Weybridge, A; Kew, M 3. V.-c.18, Epping Forest, R 2. V.-c.19, Wake Valley, 1947, P.K.C.A.

STEMONITALES
COLLODERMATACEAE

COLLODERMA G. Lister

- C. OCULATUM (Lipp.) G. Lister, on mossy trunks, including living trees, uncommon. V.-c.17, Weybridge, A; Limpsfield Common, R 1. V.-c.18, Epping Forest, R 2.

STEMONITACEAE

AMAUROCHAETE Rost.

- A. FULIGINOSA (Sow.) Macbr., on pine stumps, rare. V.-c.17, Weybridge, Oxshott, A. V.-c.18, Epping Forest, R 2; Brentwood, 1963, B.I.

BREFELDIA Rost.

- B. MAXIMA (Fr.) Rost., inside hollow trunks, uncommon. V.-c.16, Dar-enth, BM. V.-c.17, Weybridge, A; Kew, K. V.-c.18, Epping Forest, R 2. V.-c.20, Hatfield, K.

DIACHEA Fr.

- D. LEUCOPODIA (Bull.) Rost., on living stems of bramble, grass, etc., frequent. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Kew, M 3; Chipstead, 1963, B.I. V.-c.18, Epping Forest, R 2.

ENERTHENEMA Bowman

- E. PAPILLATUM (Pers.) Rost., on dead sticks and living trunks, common. V.-c.16, Abbey Wood, M 1; Greenwich, H; Downe, 1963, B.I. V.-c.17, Weybridge, A; Bookham Common, 1963, B.I. V.-c.18, Epping Forest, R 2. V.-c.21, Hampstead Heath, 1963, B.I.

STEMONITIS Gled.

- S. TRECHISPORA (Torr.) Macbr. (*S. fusca* var. *trechispora* Torr.), on *Sphagnum* and leaves in wet places, rare. V.-c.21, Ruislip, 1963, B.I.
 S. NIGRESCENS Rex (*S. fusca* var. *nigrescens* Torr.), on dead wood and moss, rare. V.-c.16, Abbey Wood, M 1. V.-c.18, Epping Forest, BM.
 S. FUSCA Roth, on stumps and logs, common throughout the area.

- S. HYPEROPTA* Meylan, on pine stumps, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Reigate Hill, BM. V.-c.18, Epping Forest, R 2.
- S. MICROSPERMA* B. Ing, (*S. hyperopta* var. *microspora* Lister), on dead leaves, rare. V.-c. 18, Epping Forest, R 2, BM.
- S. CONFLUENS* Cooke and Ellis, on logs, rare. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2; Coxtie Green, 1961, P.K.C.A.
- S. AXIFERA* (Bull.) Macbr. (*S. ferruginea* Ehr.), on dead wood, frequent. V.-c.16, Abbey Wood, M 1. V.-c.17, widespread. V.-c.18, Epping Forest, R 2. V.-c.19, Waltham, 1964, P.C.H. V.-c.20, Bricket Wood, G. V.-c.21, Highgate, M 2.
- S. SMITHII* Macbr. (*S. ferruginea* var. *smithii* Lister), on herbaceous stems, rare. V.-c.16, Ruxley, 1963, B.I. V.-c.18, Epping Forest, R 2.
- S. FLAVOGENITA* Jahn, on wood and herbaceous stems, frequent. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Brooklands, 1964, J.B.H. V.-c.18, Epping Forest, R 2. V.-c.21, Highgate, S; Highgate Wood; Ruislip, 1963, B.I.
- S. HERBATICA* Peck, on wood and living stems, uncommon. V.-c.16, Abbey Wood, M 1; Ruxley, 1964, B.I. V.-c. 18, Epping Forest, R 2. V.-c.21, Regent's Park, BM.

COMATRICHA Preuss

- C. FLACCIDA* (Lister) Morgan (*Stemonitis splendens* var. *flaccida* Lister) on pine wood and various habitats, see Ing, B., 1964. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Wimbledon Common, 1961, Banstead Heath, Oxshott, 1963, B.I. V.-c.18, Epping Forest, R 2. V.-c. 21, Regent's Park, BM; Stanmore Common; Chelsea, 1963, B.I.
- C. LONGA* Peck, on dead wood, a tropical species, introduced with hot-house plants. V.-c.17, Kew Gardens, orchid house, 1938, K. First British Record.
- C. LAXA* Rost., on dead wood, uncommon. V.-c.16, Ruxley, 1963, B.I. V.-c.17, Weybridge, A; Box Hill, 1961, B.I. V.-c.18, Epping Forest, R 2. V.-c.20, Chorleywood Common, 1963, B.I.
- C. ALTA* Preuss (*C. nigra* var. *alta* Lister), on dead wood, uncommon. V.-c.17, Weybridge, A; Sydenham Hill, H; Box Hill, 1961, B.I. V.-c.18, Epping Forest R 2. V.-c.21, Osterley Park, 1963, AS.
- C. NIGRA* (Pers.) Schroet., on dead wood and sticks, the commonest species, abundant everywhere.
- C. ELEGANS* (Racib.) Lister, on pine sticks, uncommon. V.-c.17, Weybridge, A; Box Hill, Bookham Common, Oxshott, B.I. V.-c.18, Epping Forest, R 2. V.-c.19, Epping Forest, B.I. V.-c.20, Wormley Wood, 1961, B.I.
- C. FIMBRIATA* G. Lister and Cran, on bramble stems and living bark, often found in moist chamber culture. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2. V.-c.21, Ruislip, 1964, B.I.
- C. RUBENS* Lister, on leaves and herbaceous stems, rare. V.-c.18, Epping Forest, R 2.
- C. TYPHOIDES* (Bull.) Rost., on wet rotten wood, common throughout the area.
- C. PULCHELLA* (C. Bab.) Rost. on living stalks, grass and wood, frequent. V.-c.16, Farningham, BM. V.-c.17, Weybridge, A; Brooklands, 1962, B.I.; Limpsfield Common, R 1. V.-c.18, Epping Forest, R 2. V.-c.20, Bricket Wood, 1962, B.I. V.-c.21, Monken Hadley Common, CMG; Queen's Wood, Highgate, 1963, B.I.

var. *fusca* Lister, on leaves, frequent. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2.

C. TENERRIMA (M. A. Curt.) G. Lister, on wood and herbaceous stems, rare. V.-c.16, Ruxley, 1962, B.I. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2.

LAMPRODERMA Rost.

L. ARCYRIOIDES (Somm.) Rost. (*L. violaceum* Rost.), on dead wood and leaves, not common. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Kew, M 3. V.-c.18, Epping Forest, R 2. V.-c.21, Ken Wood, K.

L. ARCYRIONEMA Rost. on dead wood, rare. V.-c.18, Epping Forest, R 2. V.-c.21, recorded in Lister (1925) but no locality or specimen can be traced.

L. SCINTILLANS (Berk. and Br.) Morg., on dead leaves, particularly holly, common. V.-c.16, Abbey Wood, M 1; Hosey Common, Downe, B.I. V.-c.17, Weybridge, A; Limpsfield Common, R 1; Kew, M 3. V.-c.18, Epping Forest, R 2; Brentwood, 1963, B.I. V.-c.20, Chorleywood Common, B.I. V.-c.21, Wood Green, CMG; Hampstead, Highgate, Ken Wood, BM; Highgate Wood, 1963, B.I.

PHYSARALES

PHYSARACEAE

FULIGO Haller

F. SEPTICA (L.) Web. var. *flava* (Pers.) Morg., the usual form on stumps and logs, very common throughout the area.

var. *septica*, on dead wood, etc. Kew, 1961, B.I.

var. *candida* (Pers.) R. E. Fr., on wood and herbaceous leaves, sometimes a pest in greenhouses. Weybridge, A.

var. *rufa* (Pers.) R. E. Fr., on stumps, rare. Weybridge, A.

F. MUSCORUM Alb. and Schw., on mosses, rare. V.-c.18, Epping Forest, R 2.

F. CINEREA (Schw.) Morg., on straw and wood, uncommon. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2. V.-c.24, Black Park, 1962, B.I.

F. INTERMEDIA Macbr. (*F. cinera* var. *ecorticata* G. Lister), on leaves, rare. V.-c.18, Epping Forest, R 2.

BADHAMIA Berk.

B. NITENS Berk. on fungi on trees, and on mosses, rare. V.-c.16, St. Paul's Cray, H. V.-c.17, Weybridge, A; Kew, M 3; Bookham Common, 1963, B.I.

B. CAPSULIFERA (Bull.) Berk., on rotten wood, uncommon. V.-c.17, Weybridge, A; Kew, K. V.-c.21, Twickenham, K; Isleworth, BM.

B. POPULINA A. and G. Lister, on leaves and wood, rare. V.-c.18, Epping Forest, R 2.

B. UTRICULARIS (Bull.) Berk., on fungi on trees, especially *Stereum* on beech, common. V.-c.16, Eltham, BM; Abbey Wood, M 1; Downe, B.I. V.-c.17, widespread. V.-c.18, Epping Forest, R 2. V.-c.21, Highgate Woods, 1913, F.W.E.

B. OVISPORA Racib., on wood and moss, rare. V.-c.20, Bushey, G.

B. FOLICOLA Lister, on leaves and wood, uncommon. V.-c.17, Weybridge, A; Kew, K; Richmond, BM. V.-c.18, Epping Forest, R 2; Chigwell, BM. V.-c.21, Isleworth, S.

- B. MACROCARPA* (Ces.) Rost., on dead wood, uncommon. V.-c.16, Sidcup, BM; Bickley, B and G. V.-c.17, Weybridge, A; Brooklands, 1963, J.B.H. and J.F.H.; Kew, M 3. V.-c.18, Epping Forest, R 2. V.-c.21, Shepperton, BM; Kensington, K; Hampstead Heath, B.I.
- B. PANICEA* (Fr.) Rost., on dead wood, common. V.-c.16, Blackheath, K; Abbey Wood, M 1; Dunton Green, K. V.-c.17, Kew, K; Barnes Common, BM; Weybridge, A; Brooklands, B.I; Chipstead, 1963, B.I. V.-c.18, Epping Forest, R 2. V.-c.21, Shepperton, CMG; Canons Park, S; Harlington, Highgate, K; Hampstead Heath, B.I.; Osterley, 1963, A.S.
- B. OBOVATA* (Peck.) S. J. Smith (*B. rubiginosa* Rost.), on mosses, rare. V.-c.18, Epping Forest, R 2.

PHYSARUM Pers.

- P. OVISPORUM* G. Lister, on dead leaves, rare. V.-c.18, Epping Forest, R 2.
- P. VERNUM* Somm. ex Fr. on leaves and stalks, uncommon. V.-c.17, Weybridge, Oxshott, A; Bookham Common, 1962, B.I. V.-c.18, Epping Forest, R 2; Chigwell, S.
- P. CINEREUM* (Batsch) Pers., on leaves and grass, sometimes a pest of lawns, common. V.-c.16, Abbey Wood, M 1; Bickley, B & G. V.-c.17, widespread. V.-c.18, Epping Forest, R 2. V.-c.21, Perivale Wood, 1961, B.I.
- P. VIRESCENS* Ditm., on stems and grass, rare. V.-c.16, Chiselhurst, K. V.-c.17, Kew, BM. V.-c.18, Epping Forest, R 2. V.-c.24, Black Park, 1963, B.I.
- P. AURISCALPIUM* Cooke, on sticks and straw, rare. V.-c.18, Brentwood, 1963, B.I.
- P. BIVALVE* Pers. (*P. sinuosum* Weinm.), on living stalks and dead plant material, common. V.-c.16, 17, 18, common and widespread. V.-c.21, Shepperton, CMG; Stanmore, S; Hampstead Heath, 1963, B.I. V.-c.24, Black Park, 1962, B.I.
- P. BITECTUM* G. Lister, on bramble stems and straw, uncommon. V.-c.17, Weybridge, A; Brooklands, Headley Heath, Chipstead, B.I. V.-c.18, Epping Forest, R 2. V.-c.21, Hampstead Heath, 1983, B.I.
- P. CONTEXTUM* (Pers.) Pers., on dead leaves, rare. V.-c.16, Darent, BM. V.-c.17, Kew, M 2. V.-c.18, Epping Forest, R 2. V.-c.20, Bushey, BM. V.-c.21. Enfield, K.
- P. CRATERIFORME* Petch, on leaves and living trees, rare. V.-c.17, Weybridge, A.
- P. GLOBULIFERUM* (Bull.) Pers., on dead coniferous wood, rare. V.-c.17, Weybridge, A.
- P. NUCLEATUM* Rex, on dead wood, rare. V.-c.16, Abbey Wood, BM.
- P. DIDERMOIDES* (Pers.) Rost., on straw, not common. V.-c.16, Greenwich, H. V.-c.17, Weybridge, A.
- P. LEUCOPUS* Link, on dead leaves, uncommon. V.-c.16, Eltham, B & G. V.-c.17, Kew, M 3. V.-c.21, Highgate, K.
- P. PUSILLUM* (Berk. & Curt.) G. Lister, on straw, dead grass and sticks, uncommon. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2.
- P. NOTABILE* Macbr. (*P. connatum* G. Lister), on bark and straw, uncommon. V.-c.17, South Hawke, 1963, B.I.
- P. LEUCOPHAEUM* Fr. (*P. nutans* var. *leucophaeum* Lister), on dead wood and moss, common. V.-c.16, Abbey Wood, M.1. V.-c.17, 18, 21, common everywhere.

P. PSITTACINUM Ditm. on stumps and moss, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.18, Epping Forest, R 2.

P. COMPRESSUM Alb. & Schw. on dead wood and moss, common. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Brooklands, 1962, B.I. V.-c.18, Epping Forest, R 2.

P. STRAMINIPES Lister, on straw and leaves, rare. V.-c.17, Weybridge, A. V.-c.21, Wood Green, CMG.

P. GYROSUM Rost., in hothouses and coldframes, uncommon. V.-c.17, Kew Gardens, K.

P. NUTANS Pers. on dead wood of all kinds, very common throughout the area.

var. *robustum* Lister, on wood and moss, common. V.-c.17, Chipstead, 1963, B.I. V.-c.18, Epping Forest, R 2.

P. VIRIDE (Bull.) Pers., on coniferous wood and brashings, common. V.-c.16, Abbey Wood, M 1. V.-c.17, Limpsfield Common, R 1; Weybridge, A; Bookham Common, 1963, F.M.C., J.B.H. and J.F.H. V.-c.18, Epping Forest, R 2. V.-c.19, Epping Forest, P.C.H. V.-c.20, Chorleywood Common, B.I.

var. *aurantium* (Bull.) Lister, on dead wood, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.17, Richmond Park, BM. V.-c.18, Epping Forest, R 2.

var. *incanum* Lister, on wood and dead gorse stems, uncommon. V.-c.18, Epping Forest, R 2. V.-c.20, Chorleywood Common, B.I. V.-c.21, Ruislip, 1961, B.I.

CRATERIUM Trent.

C. LEUCOCEPHALUM (Pers.) Ditm., on dead leaves, common. V.-c.16, Abbey Wood, M 1; Southborough, H; Chiselhurst, M 2. V.-c.17, Weybridge, A; Headley Heath, B.I. V.-c.18, Epping Forest, R 2. V.-c.21, Monken Hadley Common, CMG; Highgate, K.

C. AUREUM (Schum.) Rost., on dead leaves, uncommon. V.-c.16, Downe, 1964, B.I. V.-c.17, Weybridge, A; Kew, M 3. V.-c.18, Epping Forest, R 2.

C. MINUTUM (Leers) Fr., on dead leaves and herbaceous stalks, very common throughout the area.

LEOCARPUS Link

L. FRAGILIS (Dicks.) Rost., on herbaceous stems, grass, leaves and wood, very common throughout the area.

DIDYMIACEAE

DIDERMA Pers.

D. SIMPLEX (Schroet.) G. Lister, on dead leaves, heather stems and sticks, rare. V.-c.18, Chingford, 1956, J.R.

D. SPUMARIOIDES (Fr.) Fr. on dead leaves, uncommon. V.-c.16, Greenwich, H. V.-c.17, Weybridge, A. V.-c.18, Epping Forest R 2. V.-c.20, Bishops Wood, Rickmansworth, K. V.-c.21, Hampstead, Highgate, M 2.

D. GLOBOSUM Pers., on leaves and moss, rare. V.-c.17, Mickleham, K.

D. TESTACEUM (Schrad.) Pers. on wood and leaves, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.17, Selsdon Wood, 1963, T.D.V.S. V.-c.21, Ruislip, Perivale Wood, 1963, B.I.

- D. EFFUSUM* (Schw.) Morg. on leaves, uncommon. V.-c.16, Blackheath, BM; Abbey Wood, M 1. V.-c.17, Weybridge, A; Chipstead, 1963, B.I. V.-c.18, Epping Forest, R 2. V.-c.20, Bushey, BM. V.-c.21, Highgate, K.
- D. DEPLANATUM* Fr. on moss and leaves, rare. V.-c.16, Abbey Wood, M 1; Blackheath, M 2; Chiselhurst, BM; Petts Wood, K. V.-c.17, Limpsfield Common, R 1; Weybridge, A. V.-c.18, Epping Forest, R 2.
- D. HEMISPHAERICUM* (Bull.) Hornem., on dead leaves, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Sydenham Hill, H. V.-c.20, Hatfield, S. V.-c.24, Black Park, B.I.
- D. MONTANUM* (Meylan) Meylan, on moss and leaves, rare. V.-c.18, Epping Forest, R 2. V.-c.21, Perivale Wood, 1962, B.I. V.-c.24, Black Park, 1962, B.I.
- D. ASTEROIDES* (A. & G. Lister) G. Lister, on moss, rare. V.-c.17, Weybridge, A.
- D. FLORIFORME* (Bull.) Pers., on dead wood, frequent. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Brooklands, 1963, J.B.H.; Wimbledon, A; Kew, M 2; Chipstead, P.C.H., Selsdon Wood, T.D.V.S. V.-c.18, Epping Forest, R 2. V.-c.21, Isleworth, BM; Winchmore Hill, CMG.
- D. RADIATUM* (L.) Morg. var. *umbilicatum* (Pers.) Meylan, on dead wood, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.21, Canons Park, S.

MUCILAGO Mich.

- M. SPONGIOSA* (Leyss.) Morg. on grass stems, sometimes a pest of lawns and pastures, common. V.-c.16, Darenth Wood, H; Chiselhurst, K; Downe, 1963, B.I. V.-c.17, Kew, M 2; Sydenham Hill, H; Oxshott, P.K.C.A.; Wimbledon Common, Bookham Common, B.I. V.-c.18, Epping Forest, R 2. V.-c.21, Highgate, BM; Twickenham, Ruislip, B.I.

DIDYMIUM Schrad.

- D. SERPULA* Fr. (*D. complanatum* Rost.), on leaves, uncommon. V.-c.18, Epping Forest, R 2; Brentwood, 1963, B.I. V.-c.21, Wood Green, Winchmore Hill, CMG. V.-c.24, Black Park, B.I.
- D. STURGISII* Hagelst. (*D. anomalum* Sturgis), on leaves, rare. V.-c.17, Weybridge, A, the only genuine British record.
- D. ANELLUS* Morg., on dead leaves, uncommon. V.-c.17, Weybridge, A; Limpsfield Common, R 1. V.-c.18, Epping Forest, R 2.
- D. CRUSTACEUM* Fr., on grass stems and leaves, rare. V.-c.17, Weybridge, A.
- D. CLAVUS* (Alb. & Schw.) Rabenh., on dead leaves, uncommon. V.-c.16, Abbey Wood, M 1. V.-c.17, Weybridge, A; Kew, M 2; Limpsfield Common, R 1; Chipstead, Oxshott, 1963, B.I. V.-c.18, Epping Forest, R 2; Brentwood, B.I. V.-c.21, Monken Hadley Common, CMG; Perivale Wood, B.I.; Osterley, 1963, A.S.
- D. SQUAMULOSUM* (Alb. & Schw.) Fr., on leaves, stalks, dung and plant litter, very common throughout the area.
- D. LAXIFILA* G. Lister & Ross, in leaf litter, uncommon. V.-c.17, Wimbledon Common, 1963, B.I. V.-c.18, Epping Forest, R 2; Brentwood, 1963, B.I. V.-c.21, Highgate Wood, Queen's Wood, Hampstead Heath, 1963, B.I. (Lister, 1945).

D. MELANOSPERMUM (Pers.) Macbr., on pine needles, moss, rarely wood, common. V.-c.16, Chiselhurst, M 2; Eltham, 1963, B.I. V.-c.17, Oxshott, A; P.K.C.A.; B.I.; Kew, M 2; Byfleet, BM; Shirley, 1963, B.I. V.-c.18, Epping Forest, R 2; Brentwood, 1963, B.I. V.-c.21, Highgate, S; Enfield, K; Ruislip, Highgate Wood, B.I. V.-c.24, Black Park, B.I.

D. MINUS (Lister) Morg. (*D. melanospermum* var. *minus* G. Lister), on leaves, rare. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2. V.-c.21, Monken Hadley Common, CMG.

D. NIGRIPES (Link) Fr., on leaves, especially holly, common throughout the area.

D. IRIDIS (Ditm.) Fr. (*D. nigripes* var. *xanthopus* Lister), on leaves, common. V.-c.16, Bromley, SLBI. V.-c.17, Weybridge, A; Brooklands, J.B.H. & J.F.H.; Limpsfield Common, R 1; Penge, Chipstead, 1963, B.I. V.-c.18, Epping Forest, R 2; Brentwood, B.I. V.-c.21, Perivale Wood, Highgate Wood, Hampstead Heath, B.I. V.-c.24, Black Park, B.I.

D. MEGALOSPORUM Berk. & Curt. (*D. nigripes* var. *eximium* Lister), on leaves and old horse dung, rare. V.-c.17, Oxshott, A. V.-c.18, Epping Forest, R 2; Brentwood, B.I. V.-c.20, Chorleywood Common, 1963, B.I.

D. VACCINUM (Dur. & Mont.) Buchet, on straw heaps, rare. V.-c.17, Reigate, A.

D. LISTERI Masee (*D. dubium* Rost. p.p.), on leaves, rare. V.-c.17, Weybridge, A. V.-c.18, Epping Forest, R 2.

D. DIFFORME (Pers.) S.F. Gray, on plant litter and nettle stems, very common throughout the area.

D. TRACHYSPORUM G. Lister, on straw and leaves, rare. V.-c.17, Weybridge, A; Kew, Reigate, BM. V.-c.18, Epping Forest, R 2.

LEPIDODERMA de Bary

L. TIGRINUM (Schrad.) Rost., on pine needles and coniferous wood, rare. V.-c.17, Kew, M 3.

L. CHAILLETII Rost., on herbaceous stems, rare. V.-c.18, Epping Forest, R 2.

Mammals in the London Area 1962

By W. G. TEAGLE

THE publication of mammal records for the years 1960 and 1961 has encouraged several new members to join the ranks of the regular contributors, and it is to be hoped that their numbers will increase as the years go by, bringing information from the neglected and little explored parts of the Society's Area, particularly in Hertfordshire and Essex. As has been said before, it is really difficult to go *anywhere* in the countryside without finding traces of mammals, and members attending field meetings in the Society's Area could do much to fill in the gaps in the distribution maps. Many records already reach the Recorder as a result of observations made during a field meeting primarily arranged for botanists or ornithologists, but more would be welcomed. From recent programmes one could extract a long list of localities visited by field parties from which we have few or no mammal records, even of the commonest species—the Brent Reservoir, Coopersale Common, Hainault Forest, Northaw, Ongar Park, Osterley Park, Roydon, Sewardstone, Shenley, Stanmore, Whippendell Wood and, inexplicably, Epping Forest! We now have an additional reason for trying to improve our knowledge of the distribution of our mammals—our wish to contribute to the National Distribution Scheme recently launched by the Mammal Society of the British Isles with the object of studying the patterns of mammal distribution over the British Isles as a whole.

Even the more sedentary naturalist can help, and back-garden mammalogy produces data on the presence and activities of Hedgehog, Fox, Badger, Grey Squirrel and a number of small rodents. Domestic cats also assist by providing specimens. Bird of prey pellets continue to yield valuable information, although it may be difficult or even impossible to ascertain the precise locality at which the prey species may have been obtained. As an indicator of the small mammal species which inhabit a particular hedgerow, ditch or bramble patch the jettisoned milk-bottle is superior to the owl pellet, and the chances of finding a milk bottle containing the remains of several dead mammals are infinitely greater than those of finding an owl pellet. The attention of members has already been drawn to the fact that bottles left about by litter louts can be responsible for the deaths of small mammals (Burton and Yalden, 1964), but recent work carried out by J. F. Harper, P. A. Morris and D. W. Yalden indicates that the matter is more serious than was imagined. A paper on the subject (Morris and Harper in press) makes disturbing reading, especially when one considers that $6\frac{1}{2}$ million milk-bottles are "lost" *every week*! Many of these will have been left in places where they are liable to trap shrews and small rodents, and as an indication of the amount of harm they can cause it may be mentioned that during the winter of 1964/65, from a corner of a caravan site at Swanage, Dorset, the writer's wife, Mrs. J. F. Teagle, found the remains of 52 mammals in 17 milk-bottles!

All mammal records are welcome, especially those of the commoner species, e.g. Grey Squirrel, Hedgehog and Rabbit. The Hedgehog is to be the subject of a special paper in the near future, and the reader's attention is drawn to the paragraphs dealing with this animal in the Systematic List (p. 45) which mention the areas from which information

is still badly needed. Just as important as notes on live Hedgehogs seen are those of animals found dead on the road.

The ideal mammal record is one which mentions the species, the date, the precise locality, the number of animals seen, and any interesting detail, e.g. concerning the habitat, the actions of the animal(s), etc. In order that the distribution of London's mammals can be mapped on a 1 km. National Grid square basis it is essential that observers should give the Recorder more information concerning the locality than is sometimes forthcoming. To give the locality as "Epping Forest", "Hampstead Heath" or "Streatham" is insufficient, since these places (and hundreds like them) may each cover several 1 km. grid squares. Previous appeals for records have requested that six-figure National Grid references should be quoted (Burton and Yalden, *op. cit.*, Teagle, 1963 and 1964). Such detail, which pin-points an observation, would always be welcome, and is indeed often very necessary, as for example, when the site of a Badger sett is reported. In many cases, however, a four-figure reference would be acceptable, and certainly preferable to no reference at all. It would be of considerable help to the Recorder if at least four-figure references could also be given when reporting occurrences of mammals within the built-up area, *as well as* the name of the road and the nearest road junction. (Observers who may be unfamiliar with the technique of working out National Grid references will find an explanation at the bottom of any current 1" or 2½" O.S. map).

The following records, one rural, the other suburban, and both imaginary, may be regarded as exemplary:—

Weasel. June 4, 1964. Crockenhill, Kent. One carrying small mammal across track beside orchard. TQ515663. (The four-figure reference would be TQ5166).

Hedgehog. October 2, 1964. One found dead (run over) in Lee Road, Blackheath, S.E.3, near junction with Manor Way. TQ3975. Suburban road with large gardens.

Records should now be sent to my successor as Recorder, J. A. Burton, Exhibition Section, British Museum (Natural History), Cromwell Road, London, S.W.7, as soon after the end of the year as possible.

Neither animal nor plant recorders in the past have acknowledged the existence of the County of London which, when created in 1888, took over parts of Middlesex, Surrey and Kent. This present paper follows what has been the accepted procedure, and the initials appearing in the Systematic List stand for the counties of Buckinghamshire, Essex, Hertfordshire, Kent, Middlesex and Surrey.

Other abbreviations used are: G.C. = Golf Course, G.P. = Gravel Pit, L.N.R. = Local Nature Reserve, m.o. = many observers, R. = River, Res. = Reservoir, and S.F. = Sewage Farm. The check list numbers and scientific names are taken from Corbet (1964).

I should like to thank all those members and non-members who sent in records for 1962 and material for earlier years which has yet to be published, and special thanks are again due to those who made a concentrated search for mammals in their home districts as well as further afield. I should also like to acknowledge the help given by the following Recorders who have made available the mammal records of their respective societies, Bryan Pickess of the Ruislip and District N.H.S., K. White and Peter Tinning of the Lewisham N.H.S. and D. M. Edwards of the Sidcup N.H.S. My grateful thanks go to John Burton and Dr. Geoffrey Beven

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SYSTEMATIC LIST

INSECTIVORA

1. HEDGEHOG. *Erinaceus europaeus* L.

There are still all too few records of Hedgehogs for the Essex sector of the Society's Area, but it would appear that the species is generally distributed throughout the London suburbs, where garden shrubberies provide shelter, compost heaps and out-buildings serve as hibernacula, and lawns and flower beds are good feeding grounds. Here too, natural predators are few, while human friends are numerous and often ready to put out scraps or bread and milk.

The suburban Hedgehog, however, faces one of the hazards experienced by its human neighbours, the threat of being run over on the roads, and 66 animals were reported killed in 1962. The fact that as many as 26 of these were reported by two observers (PAM and DWY), working in a limited

area in Surrey, may perhaps suggest the magnitude of the slaughter in the London Area as a whole.

We still have very little information for the rural parts of the Area, and the innermost urban limits of distribution are still not properly known. In Surrey, Hedgehogs were seen in June and September in the Inner London locality of Battersea Park (WG, HH) and a young animal with its spines just hardening was found early in July in Lugard Road, Peckham, S.E.15 (VN).

Few Hedgehogs were reported before the beginning of May. One animal was known to be still hibernating in a garage at Carshalton, Surrey on March 20, and the first road casualty was found on April 24. There were 13 December records of wakeful Hedgehogs, eight of them for the first five days of the month, when there was a certain amount of frost, and one animal found dead on the road at West Molesey, Surrey on Christmas Day by PAM and DWY had apparently only recently been killed. PAM and DWY found a total of seven in their winter nests under brushwood within a small section of Bushy Park, Middlesex on December 16 and 18.

Hedgehogs were reported from the following localities:—

- E Chigwell, Chingford, Gidea Park, Harold Wood (JDD, MHO, MP, RBW).
- K Barnehurst, Bickley, Catford, Chelsfield, Eltham Park, Erith, Eynsford, Falconwood, Forest Hill, Greenwich Park, Knockholt, Lee, Lewisham, New Eltham, Orpington, Pett's Wood, nr. Shoreham, Shortlands and Welling (m.o.).
- M Acton, Brentford, Bushy Park, Cricklewood, Ealing, Fulham, Grange Park, Greenford, Harrow, Hatch End, Hatton, Highgate, Hornsey, Hounslow, Lower Halliford, Muswell Hill, Northwood, Park Royal, Perivale, Southgate, Strawberry Hill, Tottenham, Twickenham and Wembley (m.o.).
- S Addlestone, Battersea Park, Beddington S.F., Bookham Common, Carshalton, Chertsey, Chessington, Clapham, Claygate, Cobham, Dulwich, Epsom, Esher, Fetcham, Herne Hill, Hersham, Leatherhead, Molesey, New Malden, Nutfield, Oxshott, Peckham, Richmond, Roehampton, Streatham, South Croydon, Surbiton, Tolworth, Wallington, Walton-on-the-Hill, Walton-on-Thames, Wandsworth, West Molesey, West Norwood and Wimbledon, including Wimbledon Common and Wimbledon Park (m.o.).

2. MOLE. *Talpa europaea* L.

We still have but a sketchy idea of the Mole's distribution in the Society's Area, and at present the only parts which have been covered reasonably well lie between Chertsey, Epsom and Leatherhead in Surrey, between Orpington, Otford and Cudham in Kent, in the Colne Valley between Uxbridge and Rickmansworth (the borders of Middlesex, Bucks., and Herts.), and an area around the Ruislip L.N.R. in Middlesex. Elsewhere Moles have been recorded at widely scattered places and no clear pattern of distribution emerges. One thing seems certain—that the Mole is seriously threatened by the advance of the built-up area, not so much because of the destruction of its habitat (indeed suitable habitats often remain) but because the animal finds few friends amongst allotment-holders, gardeners, groundsmen and greenkeepers, and is deliberately eliminated. The average person's reaction to Moles seems to be the desire to get rid of them!

While all records of molehills are welcome, those from the outer ring

of the built-up area are especially wanted. Reports of presence or absence from what might be termed the "sports field/golf course belt" of suburbia would be of particular interest. The valley of the R. Brent in Middlesex would seem to be well worth examining. (The present report includes records from two localities in this area, Horsenden Hill and Twyford Abbey). In the rural areas molehills can often be found in fields bordering rivers and streams, but as yet there are no reports for the Lea Valley below Waltham Abbey or above Fishers Green, and none for the Mar Dyke in Essex, the Darent below Eynsford, Kent, the R. Colne between Staines Moor and Uxbridge, Middlesex and above Rickmansworth, Herts. Broad-leaved woodland is another habitat worth investigating; indeed Godfrey (1962) suggests that it is probably there that the Mole is most abundant.

It may be worth repeating that mounds covered in vegetation should not be reported as molehills, as they are usually anthills, and that only fresh heaps of soil should be noted.

Moles were reported in 1962 from the following localities:—

- E Chigwell, molehills S. of Debden station on Dec. 22 (JFT, WGT). This is the only record so far for the Roding valley. Nr. Waltham Abbey, a skeleton found in Galleyhill Wood on July 28 (PAM, DWY).
- H Molehills in Highfield Wood, near Hoddesdon (JFT, WGT) and at West Hyde (BPP).
- K Molehills at the following:—Chevening Park, Cudham, Erith Marshes, Eynsford, Farnborough, Keston, Knockholt, Lullingstone Park, Pett's Wood, Ruxley G.P. and Shoreham (seven observers). Ruxley, one found dead on Jan. 11 (VG).
- M Molehills on allotment and in orchard at Grange Park (BHC), at Horsenden Hill, Greenford (PMS), at two places on Hampstead Heath (RHK, DWY), at Twyford Abbey, Park Royal (PMS), and in Whitewebbs Park, Enfield (NAM). A few records also from more rural areas: Harefield, Hillingdon, Northwood (Haste Hill G.C.), Perry Oaks S.F., Pinner Park, Ruislip (Lido, Poor's Field and Ruislip L.N.R.) and Staines (m.o.).
- S Molehills at Addlestone, Ashted Common, Beddington S.F., Bookham Common, Burgh Heath, Caterham, Cheam (Nonsuch Park), Chertsey, Chessington, Cobham, Epsom, Esher, Headley, Hersham, Hinchley Wood, Leatherhead, Limpsfield Common, Long Ditton, Nutfield, Oxshott, nr. Stoke D'Abernon, Thorpe, Walton-on-Thames and Wimbledon Common (m.o.). Hersham S.F., one caught on June 22 (GHG). Nr. Stoke D'Abernon, one found dead in Thornet's Wood on July 15 (PAM, DWY). West Norwood, one found dead in Uffington Road, S.E.27, well within the South London suburbs, in November (CER).

3. COMMON SHREW. *Sorex araneus* L.

- K Cudham, one caught in Longworth trap set in hedge in village on night of Sept. 8/9, and two found dead further S., nr. Silversted on Sept. 9 (AM, MET, WGT). Lullingstone Park, one found dead on June 20 (VG).
- M Grange Park, one taken from a cat, The Chine, N.21, in May (BHC). Northwood/Ruislip, caught in Longworth traps set over night and during daylight hours in grounds of Battle of Britain House by students of Maria Grey College between June 20 and 28; one found dead in Copse Wood by FT and another on Poor's Field by LE on June 19; one

found dead on Poor's Field on June 26 with seven embryos (EMC, WGT). Pinner, one found dead in Wakelane Hill on July 7 (DCS). Stocker's Lake, (but in M, not H), two squeaking shrews found in a tin can on May 5 (PAMy, BPP).

S Beddington S.F., common, although only occasionally seen; nine skulls in Tawny Owl pellets found on Jan. 14 (BRG). Bookham Common, two trapped during March (JCL). Esher, one caught on allotments on Aug. 19 (PAM). Walton-on-Thames, one under corrugated iron on a rubbish dump on June 22 (GHG). Weybridge, one found dead on allotments on Mar. 30 (JA, PAM).

4. PYGMY SHREW. *Sorex minutus* L.

K Ruxley G.P., one found dead on Feb. 10 (VG).

M Bushy Park, remains found in bird-of-prey pellet on Apr. 24 (PAM, DWY). Ealing, one found dead in Avalon Road, W.13 on Dec. 27 (PMS). Ruislip, one found dead on June 19 and another on June 23, on Poor's Field (LE, WGT).

S Bookham Common, five caught during March (JCL).

5. WATER SHREW. *Neomys fodiens* Schreber.

S Bookham Common, one trapped on Central Plain on Mar. 21 (JCL).

This was the only dated record submitted. There were other reports of the species from other parts of the Society's Area but insufficient information was given.

CHIROPTERA

All records of bats given under their specific names are of animals which have been examined in the hand. Even mammalogists with specialist knowledge of this group will admit the extreme difficulty of identifying bats seen in flight, and for this reason records of bats seen on the wing, even those confidently stated to be "Pipistrelles", can only be accepted as of "Bats, spp. unidentified". Apparatus by which flying bats may be recognised by means of their ultrasonic voices is at present on trial, with encouraging results.

Records even of unidentified bats are welcomed, especially from the urban areas, and the Recorder would be glad to receive any dead bats found. Surprising records can be obtained in this way, e.g. a badly crushed corpse found by an amateur naturalist on a road in a Dorset village in 1964, and a mummified body treasured by a Dorset schoolgirl since 1963 have both proved to be specimens of the Grey Long-eared Bat *Plecotus austriacus* (Fischer), only recently recognised as a British species (Corbet, 1964a)!

11. WHISKERED BAT. *Myotis mystacinus* (Kuhl)

K Westerham, two hibernating on Jan. 1, one on Jan. 13, one on Feb. 10 and one on Nov. 4 (JAB, GBC, WGT *et al.*)

12. NATTERER'S BAT. *Myotis nattereri* (Kuhl)

K Westerham, one hibernating on Feb. 10 (GBC, WGT *et al.*)

14. DAUBENTON'S BAT. *Myotis daubentoni* (Kuhl)

K Westerham, two hibernating on Jan. 13, and two mating in hibernaculum on Nov. 18 (JAB). Southern (1964) does not mention any cases of this being observed in British hibernacula but quotes similar observations made in Germany in October (Eisentraut, 1949) and in the Netherlands in February (van Nieuwenhoven, 1956).

18. NOCTULE. *Nyctalus noctula* (Schreber)

H Rye Meads, one caught in mist net on June 2 (RMRG).

M Highgate Wood, two found in hole in a tree on Oct. 1 (NAM).

S Esher, c. 15 distributed from a hollow branch of a tree on Sept. 3; ten of them caught for examination (PD, PAM, MO).

19. PIPISTRELLE. *Pipistrellus pipistrellus* (Schreber)

E Epping Forest, one found behind loose bark of an oak in Monk's Wood on Aug. 25 (AL).

H Rye Meads, bats caught in mist nets as follows:—three females on July 16; two females (one lactating) and two males on Aug. 2; one male on Sept. 23 (RMRG).

M Holland Park, Inner London, one found dead on Mar. 27. Specimen in Society's collection (EPB, WGT).

S Hersham, a female picked up in R. Mole by some boys on Aug. 25 and identified by DWY on Aug. 26.

21/22. LONG-EARED BAT sp. ?*Plecotus auritus* (L.).

K Nr. Swanley Village, one found hibernating in a dene-hole by PCT *et al.* on Dec. 29 was considered at the time to have been of the common species, *P. auritus* (L.), but was not critically examined. Two found in the same locality in 1965 were certainly Common Long-eared Bats (JAB *in litt.*). The Grey Long-eared Bat *P. austriacus* (Fischer) is at present (April, 1965) only known in the British Isles from specimens from Dorset, Hampshire and Jersey, and it has only been examined alive in Dorset. Its diagnostic characters have been described by Corbet (1964a).

BATS (spp. unidentified)

Several records of bats in flight were submitted, but only those for Inner London and for late autumn are given.

K Lewisham, one on Nov. 2 (JH). Ruxley G.P., one large and one small on Nov. 25 (WGT).

M St. James's Park, Inner London, a small bat with a dark underside flying at about 10 feet from the surface of the lake at 12.50 p.m. on Apr. 11 (AFM). Westminster, one near Victoria Station in October (WDP).

CARNIVORA

24. Fox. *Vulpes vulpes* (L.).

An account of the way the Fox has adapted itself to life in the London suburbs is in course of preparation. The extent of its penetration into the built-up area south of the Thames is now fairly well known; in 1962 it

was found as near to the centre of London as Greenwich Park. Much more information is wanted concerning its status in suburban Essex, while there are several gaps in our knowledge of its distribution in the more rural parts of the Society's Area. To complete the Society's survey reports are needed for the following districts:—the Herts., Bucks. and Essex sectors of the Area, Middlesex between the R. Colne and Greenford, in Surrey an area S. of a line drawn through Leatherhead, Epsom, Whyteleaf and Warlingham, and Kent east of the R. Darent. Reports of occurrences in suburban or urban areas are always of interest, as are press cuttings, particularly from local papers.

Foxes were reported in 1962 from the following localities:—

- E Harold Wood (RBW), and Rainham Marsh (RHK, EP, REP).
- H Wormley Wood (JFT, WGT).
- K Beckenham, Bexley, Brasted, Bromley, Chelsfield, Chislehurst, Farnborough, Greenwich Park, New Eltham, North Cray, Pratt's Bottom, Ruxley, Sidcup, Stone, Sundridge and Woolwich (m.o.).
- M Bedford Park, Grange Park, Hampstead Heath, Harefield, Mill Hill, Northwood, Perry Oaks S.F., Ruislip and Queen Mary Res. (m.o.).
- S Addlestone, Banstead, Beddington S.F., Bookham Common, Carshalton, Chessington, Cobham, Croydon, East Molesey, Epsom, Esher, Hersham S.F., Hinchley Wood, Leatherhead, Limpsfield, Mickleham, Nutfield, Oxshott, Purley, St. George's Hill, Selsdon, South Croydon, Tilburstowhill Common, Thames Ditton, Walton-on-Thames, Weybridge (m.o.).

27. STOAT. *Mustela erminea* L.

- H Hamper Mill G.P., one on Oct. 6. Maple Cross, one at Maplodge G.P. on Mar. 10 (SEC).
- S Claygate, one in Lower Wood on June 24 (RHK). Hersham S.F., one on May 12 (LM). Weybridge, one being mobbed by birds in observer's garden on Oct. 25 (GHG).

28. WEASEL. *Mustela nivalis* L.

- E Epping Forest, one at High Beach on Mar. 25 (JM). Rainham Marshes, one on Sept. 2 (RHK). South Weald, one in Weald Park on Apr. 23 (RBW).
- H Rye Meads, a young animal caught in a Chardonneret trap on Sept. 1 (TWG). West Hyde G.P., one on Jan. 14 (PAMy, BPP).
- K Beckenham, one in Beckenham Place Park on July 12 (GWH). Nr. Crockenhill, one dead in road on Feb. 18 (DC, WEC). Pett's Wood, one near railway station on Feb. 26 (VG). Ruxley, one dead on Feb. 4 (FJH); one dead on Mar. 15 (CHD); a road casualty on Mar. 25 found 6" from a dead Blackbird which it had presumably been carrying (VG); one alive on May 23 (VG). [A small mustelid, presumed to have been of this species, seen on Apr. 23 at a Blackbird's nest, from which two to three newly-hatched young disappeared (FJH)]
- M Harefield, one at Springwell G.P. on Apr. 1 (IGJ). Mill Hill, one shot in grounds of St. Joseph's Convent on Dec. 28 (FCR). Perivale, one chasing four Wood Mice in the snow, Perivale Lane, on Dec. 27 (PMS). West Ruislip G.C., one on Apr. 29 (IGJ). Yeading, one caught alive in April in bin containing stock of House Mice *Mus musculus* L. at Ministry of Agriculture, Fisheries and Food establishment (RR, FPR).

- S Esher, one seen at Littleworth Common on Apr. 8; one at Claremont on May 20; a road casualty near R. Mole on June 30 (PAM, DWY). Headley, one crossing road at Headley Park on July 7 (PAM). Hersham, a female caught in a Longworth trap at the edge of a rubbish heap in Mud Town Lane on Aug. 21 (DWY). Hersham S.F., one on Aug. 4 (DP). Nutfield, one on July 8 (BAK). BAK also reported that in early April a friend at Nutfield saw her cat carry an apparently dead Weasel into the house. When handled the animal revived and closed its teeth on her thumb, so tightly that her husband had to grasp it by the neck to force it to release its hold. Selsdon Wood, one on May 6 (RHK). Weybridge, one in open woodland on Sept. 10. Nr. Whiteley Village, one being mobbed by Chaffinches on May 13 (GHG).

31. BADGER. *Meles meles* (L.).

The results of the Society's enquiry into the distribution of the Badger, which was started late in 1959 and forms part of the National Badger Survey organised by the Mammal Society of the British Isles, are unfortunately not yet ready for publication. For details of the Survey members are directed to the *London Naturalist* for 1962 (43, 57-58). Since there has apparently been some confusion amongst members, it should perhaps be mentioned that the L.N.H.S. Recorder of Mammals was asked to act as the Mammal Society's "County" Recorder for the London Area, although the L.N.H.S. recording territory overlaps with those of the County Recorders for Surrey, Kent, Herts. and Essex.

In the hope that some information may yet be forthcoming from those parts of Herts. and Bucks. which lie in the Society's Area, the period under review is extended to the end of 1964, and it is requested that all information for the years 1959-1964 inclusive should be sent to W. G. Teagle, 41 Bell Street, Herston, Swanage, Dorset before the end of 1965. Records for 1965 and subsequent years should be sent to the present Recorder of Mammals, J. A. Burton, who can supply the Mammal Society's official Badger recording forms and instruction sheets.

Even close to London Badgers are still molested by people with uninformed or prejudiced opinions of the animals' habits, and details which might lead to interference with occupied setts will not be published. Precise information concerning their situation and the habitat, soil, vegetation, etc. are, however, required for analysis, and will be preserved in the Society's archives.

PINNIPEDIA

35. COMMON SEAL. *Phoca vitulina* L.

- K Erith, a young seal, identifiable from press photographs as a Common Seal, was found alive on the Thames foreshore on July 15 and was returned to the water by the R.S.P.C.A. (*Daily Telegraph* of 16.vii.62 and *Daily Mirror* of 20.vii.62).

ARTIODACTYLA

DEER spp.

- E Nr. Waltham Abbey, tracks and droppings found in Galleyhill Wood on July 28 appeared to be those of Fallow Deer *Dama dama* (L.) (PAM, DWY).

- H Slot found on Aug. 9 in Highfield Wood, nr. Hoddesdon and in Wormley Wood. At first locality prints were *c.* 2.5–3.75 cm. long, a size which suggested Muntjac *Muntiacus* sp. The cleaves, however, were not uneven in size as shown in Page (1957). One clear print in Wormley Wood measured *c.* 4.5 cm. and belonged to a larger species (JFT, WGT).
- K Lullingstone Park, about seven deer "in the autumn" (NA). A similar number of unidentified deer was seen here by VG in 1961 (Teagle, 1964).
- S Walton-on-Thames, a deer was reported in the early hours of Aug. 7 "near the traffic lights at Oatlands Drive", and on Aug. 8 just after 3 a.m. in Hersham Road and at 8 a.m. in the garden of 3 Adelaide Road (*Surrey Herald*, 10.viii.62). The deer was seen by the householder, Mr. Anthony, behaving in a manner very reminiscent of James Thurber's famous unicorn, i.e. "cropping the roses in the garden". GHG interviewed Mr. Anthony and two police officers who had seen the deer, and from the descriptions obtained it seems most likely that the animal was a Roebuck *Capreolus capreolus* (L.).
44. FALLOW DEER. *Dama dama* (L.).
- E Epping Forest, the annual deer count in December gave a total of 69 (AQ).
- S Chessington, a doe seen in 60-Acre Wood on Dec. 23 was almost certainly an escape from Chessington Zoo (PAM, DWY).

LAGOMORPHA

53. BROWN HARE. *Lepus capensis* L. (*L. europaeus* Pallas).
- E Nr. Waltham Abbey, one near Galleyhill Wood on July 28 (PAM, DWY).
- H Essendon, numbers stated to have "greatly increased" in the neighbourhood (per GHG).
- K Chelsfield, two on Apr. 7. Lullingstone Park, one on Mar. 18 (VG). North Cray, two at Mount Misery on May 27 (CHD). Otford, one at edge of Greenhill Wood on Aug. 16 (JFT, WGT). Ruxley G.P., one in May (FJH). Stone Marshes, one on June 10 and one on July 14 (VG, FJH).
- M Harrow Weald, two shot during the year on Copse Farm land (EV). Northwood, one in middle of Copse Wood on June 21; one in field nr. Mad Bess Wood on June 27, three on Northwood G.C. on May 19; one dead in Rickmansworth Road on Nov. 7; three in Kewferry Road on Nov. 9 (LE, JJs, WGT). Perivale Wood, one on Feb. 23 (MT).
- S Buckland, one dead near railway on June 26 (LHz). Nutfield, one to two on May 19 and 21, June 28 and July 22; a tractor driver mowing a field on June 6 dismounted to remove a leveret (BAK). Thorpe, one on Sept. 27 (GHG).
55. RABBIT. *Oryctolagus cuniculus* (L.).

Rabbits were reported as plentiful in many areas, and in July the National Trust allowed pest control officers access to Bookham Common, Surrey to deal with the increased population (GB). Myxomatosis was reported from Ruxley G.P., Kent by VG in April and FJH in June, and from Nutfield, Surrey in August by BAK. A vacated breeding stop was found in a stack of straw bales at Hersham S.F. on May 6 (PAM, WGT).

Records held at the moment suggest a very patchy distribution, and there are many blank areas on the map which could probably be filled without difficulty, e.g. along the North Downs in Surrey, in Kent E. of the R. Darent, over the greater part of the Bucks., Herts. and Essex sectors, and in Middlesex between Perry Oaks S.F. and Ruislip. It may be that the Rabbit is considered not worth reporting or it may be that the animals themselves are infrequently seen. The latter is often the case when the population is small, but Rabbit droppings are easily recognized and these will betray the animals' presence. At most of the following localities, in fact, only droppings were seen.

- E Brentwood S.F., Epping Forest (Fox Burrows and Ditches Ride), Harold Wood, Thorndon Park, Upminster Common, Waltham Abbey and Warley (PAM, AFM, WGT, RBW, DWY).
- H Newgate Street (NAM) and near Wormley West End (Wormley Wood and Bencroft Wood) (JFT, WGT).
- K Biggin Hill, Bostall Woods, nr. Cudham, Dartford, Dartford Marshes, Elmstead Woods, Farnborough, Farningham, Halstead, Higham's Hill, Keston, Knatt's Valley, Knockholt, Lullingstone Park, Mottingham, Otford, Pratt's Bottom, Romney Street, Ruxley G.P., Shoreham, Sundridge, Swanscombe and Westerham (m.o.).
- M Bushy Park, Grange Park, Greenford (Horsenden Hill), Hampstead Heath, Northwood, Perivale Wood, Perry Oaks S.F., Queen Mary Res., Ruislip and Staines (10 observers).
- S Banstead, Banstead Downs, Beddington S.F., Bookham Common, Burgh Heath, Carshalton, Caterham, Chertsey, Claygate, Cobham, Epsom Downs, Esher, Ham Common, Headley Heath, Hersham, Hersham S.F., Hinchley Wood, Kingston-upon-Thames, Leatherhead, Limpsfield Common, Long Ditton, Mitcham Common, Nork, Oxshott, Richmond Park, South Croydon, nr. Stoke D'Abernon, Sutton, Thames Ditton, nr. Thorpe, Tilburstowhill Common, Walton-on-Thames, Weston Green, Weybridge and Wimbledon Common (m.o.).

RODENTIA

57. GREY SQUIRREL. *Sciurus carolinensis* Gmelin.

When the 1961 report (Teagle, 1964) was prepared it was assumed, from the absence of reports for 1961, that the Grey Squirrel had yet to return to its old Inner London haunts in Regent's Park. As a result of some correspondence which appeared in *The Observer* in September, 1964, a record was received of an animal seen on the pavement near Bedford College in the year in question (Mrs. P. A. Pinsent *in litt.*). In 1962, on Aug. 4, DTr saw a very tame squirrel outside the South Gate of the Zoological Gardens, and on Nov. 18 a drey was seen near Bedford College and another near the Open Air Theatre (JFT, WGT). A recent report (RHK *in litt.*) suggests that the species is now (1965) present in increased numbers.

All records of Grey Squirrels are wanted, but especially for urban and suburban areas. There is still very little information about their presence along what must have been their invasion route to Regent's Park, the residential area to the S. of Hampstead Heath which includes Belsize Park, Frognal, St. John's Wood and Primrose Hill. Notes would also be welcomed for the Middlesex localities of Willesden, Hendon and Crickle-

wood, and a second-hand report of a squirrel in Queen's Park, N.W.6 needs confirmation.

Counts of squirrels were made in a few suburban open spaces, e.g. in the Kent sector, nine in Beckenham Place Park on Nov. 30 (JH, PK), and at Greenwich Park, 12-13 on Mar. 11, 19 on Oct. 20 and 14 on Oct. 29 (AFM *et al.*). To judge from the number of dreys to be seen in Highgate Wood, Middlesex, the total of seven squirrels observed there by AFM on June 29 may represent only a modest fraction of the total population.

Squirrels were noted feeding from the hand in Highgate Wood, at Waterlow Park, another Middlesex locality, and in Greenwich Park, Kent, where on Oct. 20 they treated visiting students from Morley College as though they were perambulating, food-dispensing trees! There were other incidents illustrating the animals' adaptability to suburban life. In Barnfield Wood Road, Beckenham, Kent, a doe brought up a litter in a space under the eaves of a house (GVR), while on Aug. 12 GHG saw a drey amongst the chimneys of the police station at Walton-on-Thames, Surrey. Squirrels again invaded the roof space of a house in Teddington, Middlesex, and on Dec. 29, at the beginning of the long period of severe weather, one sitting in the roof guttering, was watched breaking frozen snow off the edge of the roof and eating it like a nut (EMG).

The species was observed at the following localities:—

- B Denham (JFT, WGT).
- E Childerditch Common, Epping, Epping Forest and Warley (AFM, JFT, WGT, RBW).
- H Wormley Wood (JFT, WGT).
- K Beckenham, Blackheath, Bromley, Bromley Common, Charlton, Chelsfield, Chislehurst, Crystal Palace, Cudham, Eltham district (Oxleas Wood, Jack Wood, Castle Wood, Eltham Common and Shooters Hill), Greenwich Park, Honor Oak Park, Keston Common, Mottingham, Orpington, Pett's Wood and nr. Shoreham (m.o.).
- M Bushy Park, Ealing, East Finchley, Golders Green, Golders Hill Park, Grange Park, Hampstead, Hampstead Heath, Harrow Weald, Hatch End, Highgate, Highgate Wood, Hornsey, Mill Hill, Northwood, Osterley Park, Perivale, Regent's Park, Ruislip, Southgate and Teddington (m.o.).
- S Arbrook Common, Ashted, Ashted Common, Banstead, Bookham Common, Box Hill, Brockwell Park, Carshalton, Carshalton Beeches, Cheam (Nonsuch Park), Chertsey, Chessington, Claygate, Cobham, Coulsdon, Croydon, Dulwich Park, Esher, Esher Common, Epsom, Ewell, Hersham, Hinchley Wood, Kenley, Kew Gardens, Kingston Vale, Leatherhead, Littleworth Common, Oxshott, Putney, Putney Heath, Richmond Park, South Croydon, Surbiton, Titsey, Tooting Bec Common, Walton-on-Thames, Wandsworth, Weston Green, Weybridge and Wimbledon Common (m.o.).

59. DORMOUSE. *Muscardinus avellanarius* (L.).

- [S Effingham, one found just outside the Society's Area on Jan. 16 and kept by Mr. W. G. Kingham, Lynwood House, Effingham Common, where it was seen by PAM, WGT and DWY.]

There have been a few unconfirmed reports of Dormice in the Area in past years, and the species is now known to occur within the Kentish sector. The remains of Dormouse were also discovered by GB in an owl pellet from Bookham Common in 1964 (see p. 113). These records suggest that the species is being overlooked.

61. HARVEST MOUSE. *Micromys minutus* (Pallas)

No fresh information has been received for the year 1962 since the paper on this species in the London Area was published (Teagle, 1964a). Further details of the following 1962 occurrences can be found in that paper.

H Rye Meads, one caught on Nov. 25 and others seen subsequently (RMRG).

M Perry Oaks S.F., a nest found on Apr. 28 (GHG).

S Banstead, two caught on Feb. 1 (FPR). Bookham Common, four-five caught, Mar. 18-25 (JCL); three nests found on Apr. 8 (GB, EMH, WGT). Epsom, 22 caught, Feb. 5-8 (FPR). Hersham S.F., nests found on Jan. 7 and Feb. 4 (DP).

62. WOOD MOUSE (LONG-TAILED FIELD MOUSE). *Apodemus sylvaticus* (L.).

H Barnet, one in garden of Elton Avenue on May 2 (AMt).

K Forest Hill, one found dead in garden in Fermor Road, S.E.23 on Mar. 24 (PCT, KW). Sidcup, one caught by cat in garden, Norfolk Crescent on July 24 (TW).

M Ealing, two found dead in September (PMS); one caught in Longworth trap at Fox Res. on Dec. 18 (PG). Northwood/Ruislip, caught in Longworth traps around Battle of Britain House between June 20 and 28 (SMcQ, WGT). Perivale, four chased by a Weasel in Perivale Lane on Dec. 27 (PMS). Shepperton, caught in Longworth traps at two localities, Oct. 23, 25 and 26 (DWY).

S Caught in Longworth traps at Chertsey (four localities), Cobham, Esher (two localities), Hersham, Richmond and Wallington (OKC, PAM, RR, DWY). Esher, one found dead on Mar. 4 (GB). Weybridge, one found on July 25 to have taken over an old nest of a Robin built in a *Ceanothus* growing against a house wall, 3½ ft. from the ground. A dome of moss had been added (GHG).

63. YELLOW-NECKED MOUSE. *Apodemus flavicollis* (Melchior)

S Hersham, single animals caught in Longworth traps on rubbish tip on Aug. 20, 21 and 22 and Sept. 2; two caught in Longworth traps at road verge, Burhill G.C. on Aug. 28. Weybridge, one caught on Dec. 5 (PAM, WGT, DWY).

62/63. *Apodemus* sp.

The following are records of mice not examined critically or of remains found in owl pellets. The skulls of *A. sylvaticus* and *A. flavicollis* cannot always be distinguished with certainty.

S Beddington S.F., remains of two in Tawny Owl pellets on Jan. 14 (BRG). Bookham Common, remains of two in a Tawny Owl pellet found on Feb. 11 (GB). Cobham, a squashed, dried and barely recognizable corpse found at Downside on Sept. 2 (PAM, WGT, DWY). Ham,

remains found in a Barn Owl pellet from Ham House stables in November (GB). Thames Ditton, a mouse of this genus in Esher U.D.C. depot, Brooklands Road on Sept. 20 (PAM). Wallington, a large mouse of this genus, which may have been *A. flavicollis*, was caught in a Longworth trap in Blenheim Gardens on Mar. 2, but escaped before it could be closely examined (OKC).

67. BANK VOLE. *Clethrionomys glareolus* (Schreber)

- K Nr. Biggin Hill, one watched at eye level feeding in a Holly bush in early February (GBC). Cudham, one caught in Longworth trap on night of Sept. 8/9 (AM, MET, WGT).
- M Northwood/Ruislip, single animals caught in Longworth traps near Battle of Britain House in May and June; one caught in Longworth trap on Ruislip L.N.R. on Mar. 25 (BPP, WGT).
- S Bookham Common, one found dead in milk bottle on Jan. 19 (JBH). Claygate, one under sheet of metal near Arbrook Farm on Apr. 24; one caught dead in Coverts Road on May 9 (PAM, DWY). Hersham, four caught in Longworth traps in late August (DWY). Hersham, S.F., three caught in Longworth traps on night of May 12/13 (LM).

68. WATER VOLE. *Arvicola terrestris* (L.).

- E Waltham Abbey, one in Cornmill Stream on June 16 (AFM).
- K Nr. Cudham, one by pond at Lett's Green on Apr. 16 (JH). Shoreham, one in R. Darent on July 2 (DJB). Stone Marshes, one on May 26 (VG).
- M Perry Oaks S.F., two on Jan. 5 (PAM, RW, DWY); one on Mar. 24 (HJF).
- S Bookham Common, one swimming in Isle of Wight Pond on Feb. 11 and numerous burrows noted in newly cleaned Bookham Stream; a skull found on Mar. 11 (GB). Hersham S.F., single animals seen throughout the year (DP). Molesey, one feeding in R. Mole on Sept. 1 (PAM). Putney Heath, one on Mar. 25 in ditch between the Heath and the Portsmouth Road (FCR).

69. SHORT-TAILED VOLE (FIELD VOLE). *Microtus agrestis* (L.).

- K Crystal Palace, one brought in dead by cat on Jan. 8 and one brought in alive on Jan. 9, winter quarters of L.C.C. Children's Zoo (JFT).
- M Bushy Park, remains of at least eight voles found in small bird of prey pellets found on Apr. 24 (WGT). Ealing, observed at Fox Res. on Dec. 18 (PG). Greenford, one in Rockware Avenue on Mar. 25 (HJF). Hampstead Heath, one caught in Longworth trap near Ken Wood and one near The Spaniards on Oct. 14 (PAM, DWY). Harrow, seven caught by a cat at Harrow View between March and October (EMCp). Northwood, a nest with two dead young found near Battle of Britain House on June 27 (WGT). Perry Oaks S.F., one on Apr. 8 (HJF). Staines Moor, at least two under a sheet of card on Jan. 5 (PAM, RW, DWY).
- S Beddington S.F., sheets of corrugated iron and other material on the gravel pit were examined at frequent intervals, and numbers of voles were seen to build up during the year. Very few were seen in the first few months, but *c.* 20 were noted on Sept. 25 and *c.* 40 on Dec. 16. The remains of 79 animals were recovered from 37 Tawny Owl pellets found on Jan. 14 (BRG). Three young on Oct. 6 (AFM). Bookham Common, remains of one in a Tawny Owl pellet found on Feb. 11 (GB).

Chessington, one under metal sheet, Park Farm on Sept. 16 (PAM). Cobham, three juveniles under one metal sheet and an adult with three juveniles under another, Painshill Farm on Nov. 3 (PAM, DWY). Esher, a road casualty on the A307 on Jan. 14; caught in Longworth traps between Claremont and Stable Pond in August; remains of three in a bird pellet from Claremont on Sept. 7 (PAM). Ham, remains of 78 found in Barn Owl pellets from Ham House stables (GB). Hersham S.F., caught in Longworth traps in January and May (GHG, LM). Thames Ditton, four under a metal sheet on the Palace Estate on Dec. 16 (PAM, DWY). Walton-on-Thames, one under a metal sheet on May 12 (GHG); caught in Longworth trap nr. Walton Bridge in late August and early September (DWY).

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Distribution of Reptiles and Amphibians in the London Area

By D. W. YALDEN, B.Sc.

R. S. R. FITTER summarized the known distribution of "herptiles" (the current, American, name of convenience for these groups) in the London Area in his checklist (Fitter, 1949) and included the records available up to 1956 in two further papers of additional notes (Fitter, 1950, 1960). No attempt has been made since that paper to summarize the present status of these animals in the London Area, though additional details for the Woolwich area (Rigden, 1955), N.W. Kent (Burton, 1962) and Bookham Common (Panchen, 1951; Beven, 1963) have appeared in this journal.

In addition to these records, Lt. Col. Taylor has revised the national distribution of these species (Taylor, 1963), publishing new maps on which recent records are registered as dots, in place of the old maps (Taylor, 1948, reproduced in Smith, 1954) where occurrences were recorded by vice-counties. A number of records were submitted from the London Area, and these are quoted here when the relevant information has not been received more directly.

Special mention must be made of the excellent survey of the distribution of these species in Epping Forest (Wheeler, Malenoir and Davidson, 1959).

This paper is an object lesson in recording; all too frequently one is presented with the statement in the literature that a species is "common" or "rare" or "generally distributed" in a locality or in a long list of localities. Such statements, with no indication of the basis on which they are made, are very little help to subsequent workers, in subsequent decades, trying to analyse changes in status. It is, of course, far simpler to include such detail in surveys of smaller areas, but even if there is too much detail to be included in a published paper, the background information should be kept in the files of the relevant society so that it does remain accessible to subsequent workers. It is much regretted that such information for Fitter's three papers does not appear to be available.

This paper includes all the records received up to the end of 1964 for the London Area, i.e. within 20 miles of St. Pauls. I have followed the style adopted by Teagle (1963 *et seq.*). The letters B, E, H, K, M and S represent the Counties, London not being recognized as a county for these purposes. Other abbreviations are:—G.C.—Golf Course; G.P.—Gravel Pit; m.o.—many observers; R.—River; Res.—Reservoir; S.F.—Sewage Farm.

Finally, I must thank those people who have made even this inadequate record possible. A number of stalwarts have continued to submit regular records, including G. H. Gush, J. A. Burton, A. F. Mussellwhite, D. M. Edwards, (for Sidcup N.H.S.) and P. C. Tinning (for Lewisham N.H.S.). J. W. Steward summarized the situation in Hertfordshire for me, and also very kindly allowed me to mention his notes on accidental importations. I am grateful to Dr. J. F. D. Frazer for arranging access to the manuscript of Lt. Col. Taylor's paper (Taylor, 1963) which contains details of the localities represented on his maps and is deposited in the library of the Nature Conservancy. Finally, I must thank my predecessor, W. G. Teagle, for much advice and encouragement, and P. A. Morris, who invariably collaborates in my own field work, and was responsible for more of the herptile records from my own home area than I.

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AMPHIBIA

URODELA (= CAUDATA)

Triturus vulgaris (L). Common Newt, Smooth Newt.

Undoubtedly the commonest newt in the London Area and often occurs in temporary pools.

- B No records.
- E Harold Wood, 6 in garden pond, 1960, 3 in 1961 (RBW); Epping, 4 in pond Coopersale House 1964 (AFM); Epping Forest, quite common and well distributed, but never found in great numbers. At least 26 recorded from 10 ponds in the Forest, present in 9 ponds in adjacent areas, but the maximum number caught in any one pond was only six; in this pond and one other it was the only newt caught. (Wheeler *et al.*, 1959).
- H Seen Borehamwood 1961 (JBT). Common throughout the county, and especially in the gravel pits around St. Albans, the Colne Valley, and the area Essendon-Newgate Street (JWS 1964).
- K Singletons recorded Orpington 1960 (CB), Forest Hill (KW), New Eltham 1961 (DME), Ruxley G.P. 1961 (TW). Up to 7 in garden pond, Chelsfield (VAG). Rigden (1955 and *in litt.* 1964) gives additional areas around Woolwich as Abbey Wood, Plumstead Marshes, grounds of the Royal Arsenal, and the R.A.C.S. sports ground, New Eltham. Other areas given by Taylor (1963) include Swanley, Brasted, Bromley and Chislehurst.
- M Recorded as present, or single ones only from Hounslow 1960 (CWP), Harefield 1961 (BPP, WM, WGT), Mill Hill 1961 (JBT), Riverdene Open Space, Edgware (DM), Kingsbury (RP) and Holland Park 1960, 1964 (EPB). This last is well within the "inner limit of recent records" (Fitter, 1949), and may have originated by introduction. 4 in garden, King's Ave., Ealing 1963 (PG). Other localities given by Taylor (1963) include Hampstead Heath, Potters Bar, Harrow, West Harrow, Ruislip Nature Reserve.
- S Oxshott, 5 in small pond at Claypit, Apr. 1960. This pond now flooded by main pit where breeding undoubtedly occurs; 1-3 individuals found under tin each year 1961-1964, (PAM, DWY). Walton-on-Thames, Weybridge, Hersham and Claygate, breeding in six small ponds 1960-1964 (one since filled in) with 7 the maximum caught in any one pond, GHG, PAM, DWY). Another garden pond at Weybridge, GHG recorded the last adult in the pond Aug. 5, 1961, adults and juv. under stone the next day. 6 adults and 12 juvs. found under nearby logs on Oct. 1, when 2 juvs. still in pond. Those juvs. on land ranged from 30 to 52 mm. body length; those in the water were 18 and 21 mm. The first newts returned to the pond Mar. 28, 1962, and two gilled tadpoles (16 and 18 mm. body length) were still in the pond Sept. 11, 1962. Recorded present or singletons only from Farleigh, Godstone, Beddington S.F. and Epsom Common, (JAB, AMH, or FCR). Breeding reported from ponds, Dulwich Woods, Apr. 1961, many ♂♂ but few ♀♀ in a pond since filled in (DK); but still present in another pond (JAB); Norbury (nr. Croydon), Beddington Park, Streatham, Norwood Grove (20-50 pairs in ornamental pond), Selsdon Bird Reserve and Bookham Common (Crater Pond, Lower Eastern Pond, FCR, Isle of Wight Pond, Panchen, 1951).

Triturus helveticus (Razoumowski). Palmate Newt.

This species is generally regarded as a species of higher ground, generally absent from low lying alluvial plains such as the Thames Valley, and its distribution is certainly more restricted in the London Area than that of *T. vulgaris*. The basis for this ecological divergence is not at all clear. Creed (1964) studied the distribution of the newts in some New

Forest ponds, and there was no evidence of any correlation with pH or pond size. Nor does the simple cooling effect of altitude seem relevant since, while *T. helveticus* occurs in Europe only as far north as France and W. Germany, *T. vulgaris* occurs into Sweden, and to lat. 64°N in Finland (Smith, 1954). Both species occur into the North of Scotland however, so that *T. helveticus* evidently has a more maritime distribution. Possibly some difference in the hibernating habits of the two species is important, and the occurrence of *T. helveticus* on higher ground represents an avoidance of "frost hollow" areas.

Although undoubtedly less common than *T. vulgaris*, it is probably under-recorded because of the difficulty of distinguishing the two species other than as breeding males. The female of *T. vulgaris* can generally be recognized by a black-spotted throat, but Creed (1964) adds that the throat is unspotted in juveniles of both species.

B No records.

E Found to be very common in Epping Forest (Wheeler *et al.*, 1959). Recorded in 9 ponds, up to 30 caught in one pond, at least 53 caught during the year. In 8 of these ponds, *T. vulgaris* was also present. 46 of the 53 came from just two ponds, in which this species was evidently dominant.

H Not found anywhere except the Tring and Berkhamstead area (outside the London Area) JWS.

K Farningham Wood, 24 caught in a small shallow pond, May 29, 1960 (PCT *et al.* from Lew). Known here for 15 years. Previously recorded from Chislehurst and Shooters Hill G.C. (Fitter, 1950), and Bromley (Taylor, 1963).

M Ruislip Nature Reserve (Taylor, 1963).

S Bookham Common; Mayfield, Isle of Wight and Crater Ponds (Panchen, 1951, FCR); Weybridge 1960 (Taylor, 1963).

Triturus cristatus (Laurenti). Crested Newt.

B No records.

E Only 3 caught from one pond in Epping Forest, and one larva from a nearby pond during the 1958 survey (Wheeler *et al.*, 1959). Also Woodford (Taylor, 1963).

H Fairly common in most parts of the county, particularly around St. Albans between Aldenham and Stamford, and the woods west of Hoddesdon (JWS).

K One at Plumstead Jan. 1961, (RGR, Sidcup N.H.S. Report, 1961). Earlier records from Lewisham, Shooters Hill G.C. and Sidcup (Fitter, 1950, 1960), and introduced into Lesnes Wood (Rigden, 1955). Taylor (1963) adds Bromley, Foots Cray Place.

M Reported from Pinner Hill G.C. 1961 (WEM), Stanmore Pond 1964, (RP) and Enfield (Taylor, 1963).

S Oxshott, up to 3 caught, on 5 occasions in 1960, (PAM, DWY), and one seen Apr. 15, 1961 (PAM). Walton-on-Thames; singletons caught twice, Apr. 1961 (GHG, PAM). Weybridge, breeding in small pond in grounds of hotel 1964, (GHG). Bookham Common, present in Crater Pond, 1963, 1964 (FCR), and Isle of Wight Pond, (Panchen, 1951); Leatherhead, 1 found under tin, Jul. 1, 1962, (PAM, DWY); Dulwich Woods, 6 caught Apr. 16, 1960, (DK), in a pond since filled in, but believed to breed still in another pond nearby, (JAB, 1964).

ANURA (SALIENTIA)

Rana temporaria L. Common Frog.

Though supposedly common, this animal seems to be increasingly scarce, though still widely distributed. The decrease in numbers must be due in part to the spread of suburbia, with consequent filling of ponds and replacing ditches by pipes. Wheeler *et al.* (1959) and JWS (*in litt.*) mention unscrupulous dealers collecting more animals than the population can stand, while Wheeler *et al.* (*op. cit.*), also Woolacott (1963), refer to the possible importance of newts devouring the eggs. My own observations, however, suggest that a major factor around London is the collection of spawn by young children—because it floats in conspicuous clumps, and is generally laid in shallow water, frog spawn is especially vulnerable. Wheeler *et al.* mention this point.

- B 1 seen, Beechengrove Wood, Aug. 11, 1962 (AFM).
- E 1 seen near Walthamstow Res. Mar. 16, 1963 (AFM). Epping Forest, rather rare, only 1 seen during 1958 survey; spawn found in three ponds only, and only in small amounts, perhaps indicating 2-3 females; and breeding was reported from two other ponds (Wheeler *et al.*, 1959). Also recorded from Leytonstone (Taylor, 1963).
- H "Widespread in county but nowhere abundant, numbers decreased over last 10 years"; commonest S.W. of St. Albans, Arkley—Mill Hill, and along the valleys of R. Colne, Ver and Gade, where they breed along the edges of the streams rather than in ponds (JWS). Reported from Cuffley and Hoddesdon (Taylor, 1963).
- K Catford, spawn in small water-filled sink in garden, (perhaps the result of introduction 2 years before), Mar. 1960 (PCT). Breeding reported Cudham, Chelsfield, Brasted, 1960 (VAG); North Cray, by R. Cray 1961 (KW), Chislehurst (garden pond) 1962 (DMT). Also recorded Ruxley Gravel Pit (VAG); Westerham (JAB); Bromley, Crockham Hill, Shoreham (Taylor, 1963).
- M Ealing, bred in garden pond Brunner Rd. to 1959 and Woodfield Crescent (1960-1964) (LMPS). 2 seen by Pittshanger Park in R. Brent (PG). Breeds in Riverdene Open Space, Edgware; Grove Pond, Stanmore; and ponds at Hampstead (DM). Bushy Park, small amounts of spawn 1960, 1962, (MO, PAM, DWY). Holland Park, bred 1960, '61, '64, up to 19 frogs counted (EPB)—this record with the one for Buckingham Palace Gardens, (Fitter, 1960), is well within the "inner limit of recent records" (Fitter, 1949) but introduction cannot be ruled out. Also present Kingsbury (RP), Hendon, Finchley, Hampstead Heath, (Taylor, 1963).
- S Weybridge, Hersham, Walton-on-Thames, Addlestone, Oxshott, 12 breeding sites known 1960-1964, mostly garden ponds, none with more than 6 pairs reported; at least 5 other colonies disappeared since 1955, (PAM, DWY, GHG). Epsom Stew Pond, a little spawn much persecuted by children (Apr. 3, 1960), young frogs in possession of small boy "and lots more" (July 19, 1964) (PAM, DWY, FCR). Ewell, c. 10 pairs, garden pond, Reigate Rd. (Apr. 16, 1964, JAB). Richmond Park, small amount spawn, stream from Ham Gate Pond (Apr. 13, 1960, PAM); c. 100 froglets Pen Pond Plantation (Jly. 18, 1964, FCR); 1 seen Sidmouth Plantation, May 12, 1961, (DR). Wandsworth, breeding in garden pond, Buckhold Road (Apr. 4, 1962, JFH). Beddington S.F., not recorded since May 8, 1960 on gravel pit, but breeds in ponds and

river Beddington Park (AMH, JAB). Farleigh, breeding in 2 ponds, and in a third until it dried up 1961 (JAB). Breeding also Dulwich Woods (1-2 pairs only); Streatham, Rookery; Norbury, top of Norbury Hill (JAB); and recorded from Claygate (PAM), Selsdon, Carshalton (JAB), Wallington, Lingfield, Burgh Heath, Mitcham, Cheam, Nutfield and Kenley (Taylor, 1963). Bookham Common, considerable numbers breeding Isle of Wight Pond (Panchen, 1951), recorded also 1954, '62 (Beven, 1963) and '64, (FCR); other ponds have also been used at various times, (possibly continuously, but records are incomplete), including Lower Eastern Pond (1942, '43, '64), South Eastern Pond (1942, '43), Upper Eastern Pond (1946, '48, '49), and Gun Pit F. (*op. cit.* and FCR).

Rana esculenta L. Edible Frog.

The recent records of this introduced frog in Britain all pertain to the London Area. The species has had the same chequered career as elsewhere.

- E Walthamstow, present 1938, and still there 1958, also at Snaresbrook and Leytonstone (Taylor, 1963).
- K Dunton Green, present 1942 to 1960, when ponds filled in and colony exterminated (Taylor, 1963). Dartford Creek, 3-4 seen, 1950, possibly this species (Burton, 1962).
- M Hampstead Heath, 200 plus in Highgate No. 1 Pond, and also present in Viaduct Pond, Highgate No. 2 Pond, and Leg of Mutton Pond (Fitter, 1949). A few in Highgate No. 1 Pond 1959 (Taylor, 1963).
- S Richmond Park and Ham Common, well known localities from 1929 on (Fitter 1955), but probably extinct 1961 (Taylor, 1963). Esher Common, colony of 20+, 1958, 1959 (Yalden and Morris, 1961) were not recorded 1960 or 1961 after pond had been drained for cleaning during the winter 1959-60. However, singletons have been seen or heard each year 1962-64, so the colony may possibly survive. Beddington S.F., single pair, introduced 1961, not recorded since; Godstone, 1 heard June 24, 1964 (AMH, JAB).

Rana esculenta ridibunda (Pallas). Marsh Frog.

This frog introduced and firmly established on Rye Marshes, is now regarded as a subspecies of *R. esculenta* rather than a full species (Menzies, 1962, following Kauri, 1959), but is separated here for convenience of back reference.

- E Wanstead Park, released 1948 (Fitter, 1949), and one pond in Epping Forest, still present 1959 (Taylor, 1963).
- S Beddington S.F., single pair introduced 1961, still present 1962, but not recorded since (AMH).

Bufo bufo L. Common Toad.

The toad has perhaps suffered rather less of a decline in numbers than the frog, particularly because its spawn is much less vulnerable to children, also perhaps because of its better tolerance of dry conditions, a factor of importance when more and more surface run-off is conducted through closed drains in suburban areas. On the other hand it is much more traditional in its use of breeding sites, making it more vulnerable to dealers, and also more liable to extermination when breeding ponds are built over.

- B Chorleywood, Beechengrove Wood, 1 seen Aug. 11, 1962, (AFM).
- E Epping Forest, abundant in the 1958 survey, recorded breeding in six ponds; 45 were counted in one pond, and "many hundreds were seen in other ponds" (Wheeler *et al.*, 1959). Recorded Walthamstow Res. (Taylor, 1963).
- H Fairly common everywhere, especially S. of St. Albans, Hatfield Park and Lemsford areas; mainly in the deeper ponds for breeding (JWS).
- K Brasted; spawn in large spring-line pond, Apr. 9, 1960 (VAG). Keston, many toadlets seen Keston Bog, 1963 (KW, PCT). Also, single animals recorded from Farningham, Eynsford (PCT *et al.*); Sidcup—Ruxley G.P., Knockholt Pound, Chelsfield, Lullingstone Castle (VAG), Crockenhill, Petts Wood (KW), and New Eltham (Montebello Road) (DME). Rigden (1955) adds Lesnes and Abbey Woods, Plumstead and St. Pauls Cray.
- M Stanmore, several caught in pond (1962 RP). Singletons found Westminster, just off Whitehall, Oct. 2, 1960 (RHK); Twickenham, 1960 (LB); Teddington, 1964 (VB); Ealing, 1960-64 (LMPS); Shepperton, 1964 (DWY); and Ruislip Nature Reserve. This last was dug out of a temporarily dry drainage channel on Feb. 16, 1964 by BPP, PAMy, and is of interest since the channel still floods in wet weather, yet toads are supposed (Smith, 1954) to hibernate on dry land. A further record of two seen in an aqueduct at Queen Mary Res. Nov. 24, 1960, by PAM is of interest because of the lateness; toads usually leave the water after breeding. Reported also Stanmore Common and Hampstead Heath (Taylor, 1963).
- S Weybridge, 3 breeding colonies known, one estimated at 250 pairs, Mar. 28, 1964, other two of 6-12 pairs (GHG, PAM, DWY). Hersham, small breeding colony, c. 6 pairs Mar. 28, 1964, but another larger colony c. 50 pairs, nearby, 1950-55, was apparently exterminated by building activity, either by destruction of the terrestrial habitat or pollution. Oxshott, Claypit, evidently a large breeding colony—PAM described tadpoles in a thick band around the edge May 14, 1960, and at least 5 corpses of adults were found Mar. 26, 1964 (PAM, DWY). Additionally there were 24 sight records, referring to 13 occasions 1961-64, of adults or toadlets (CK, PAM, RW, DWY). (This site is threatened by a housing site and by use of the pit as a council rubbish tip). Richmond Park, breed in Pen Ponds and Ham Gate Pond (PAM, DWY, GHG, FCR). Epsom Stew Pond, toadlets July 19, 1964 (FCR). Bookham Common, breed regularly in Isle of Wight Pond in large numbers—GB counted 64 on Apr. 8, 1962; also in Upper Eastern Pond "in very large numbers (several hundred)" (Panchen, 1951), and in a gun pit on Eastern Plain 1944 and 1953 (Beven, 1963). Additional to these breeding records, sight records come from East Molesey (RLE); Battersea Park (one on Aug. 31, 1960), (JFH); Claygate, (PAM); Norbury (NJB); and Beddington (AMH), while road casualties, (often indicative of migration from hibernating to breeding stations), are reported from Kingston Hill, Nutfield, Carshalton, Bletchingley, Norbury Hill and Long Ditton (m.o.).

Bufo calamita Laurenti. Natterjack Toad.

This little toad, readily distinguishable by its small size, yellow vertebral

stripe, running, vole-like gait and continuous, nightjar call, undoubtedly occurred in the London Area between the wars (Fitter, 1949), but must now be regarded as extinct.

K One recorded May 1961 at Chislehurst (Taylor, 1963), must be discounted, as no details have been forthcoming, and furthermore "several hundred" were reported from Ruxley G.P.—and were *B. bufo*, (DME, *pers. comm.* 1964).

S 3 released on Esher Common, July 1964 (PAM).

REPTILIA

Rather more difficult to record than amphibians, reptiles can only be discovered by painstaking searching for basking animals on sunny days, or by turning over corrugated iron, etc., which can be very productive for *Anguis*, *Natrix* and *Lacerta vivipara*.

LACERTILIA

Lacerta agilis L. Sand Lizard.

The range of this animal in Britain is now very restricted (see Taylor, 1963), and it is probably extinct in the London Area.

S The possible Godstone colony (Fitter, 1949), has not provided any further evidence. St. Georges Hill G.C., 1 seen Feb. 18, 1961, by GHG—this observer is familiar with both British species of *Lacerta* and is quite certain that this was the species concerned. He has, however, failed to find it or others subsequently, and suggests it may have been an escaped pet.

Lacerta vivipara Jacquin. Common Lizard.

This, the smaller and viviparous species, is still common in many of the wilder parts of the Area.

B No records.

E Ingrave, one by River Oak, June 5, 1960 (LMPS). Epping Forest, common and widespread on all the plains and open spaces; recorded on the maps from 49 sites, (Wheeler *et al.*, 1959). Recorded also Ongar and Brentwood (Taylor, 1963).

H Only a few scattered colonies, at Colney Heath and Broxbourne Woods (W. of Hoddesdon) (JWS). Recorded from Chorleywood (Taylor, 1963).

K Shoreham (Timberden Bottom), 2 seen Apr. 2, 1960 and 2 caught Aug. 1, 1960 (VAG). Farningham, 1 seen Farningham Wood, May 29 and 4 on June 19, 1960 (PCT *et al.*). Westerham, 1 seen Hosey Common, Apr. 24, 1960; and 1 seen Squerryes Park June 5, 1960 (PCT, VAG *et al.*). Farnborough, 1 seen Green St. Green, Apr. 2, 1960 (VAG). Eynsford, 1 seen Lullingstone Park, May 28, 1961 (NA), and up to 4 seen on 3 dates, 1964, at the Birches (PCT, PAD, GWH). Rigden (1955) records the species from Bostall Heath, Lesnes Wood and Plumstead Common, and Burton (1962) from Dartford, Swanscombe and Stone Marshes, Magpie Bottom (Eynsford) and Holwood Park (Keston).

M Brent. Res., common on broken rocks and concrete (DM). Also recorded from Stanmore, Kenton and Harrow (Taylor, 1963).

S Esher, 65 individuals marked (West End Common), July 1960 to Mar. 1961; Esher Common, up to 4 seen on 9 occasions; Oxshott Claypit, up to 5 seen or caught on 20 occasions; Weybridge, Queens Rd., up to 10 seen 4 occasions; also recorded Hersham (Burhill G.C.), St. Georges Hill G.C., Whiteley Village, Oxshott Heath, Cobham, Claygate, Esher

(Arbrook Common, Weston Green, Fairmile Common, Claremont Estate, Littleworth Common), Wimbledon Common, Betchworth and Mickleham (all PAM, DWY, *et al.*, 1960-64); Weybridge, 1 or 2 from 5 sites (GHG 1961); Beddington S.F., 1 seen on gravel pit, May 7, 1961, and one on railway embankment May 20, 1962 (AMH); Bookham Common, recorded over the southern half, especially near the station (Panchen, 1951); Burgh Heath (Taylor, 1963).

Anguis fragilis L. Slow-worm.

Rather local in distribution, but often common when it does occur.

- B Recorded from Gerrards Cross 1958 (Taylor, 1963).
- E Tilbury Dock, tail only of one found June 22, 1964 (AFM). Epping Forest, up to 8 recorded from 14 sites within the survey area, and 1 outside (Wheeler *et al.*, 1959).
- H Small colonies, mostly in East of county—Broxbourne Woods, Hertford Heath, Cuffley Park, and around Hitchin (JWS).
- K Shoreham (Coombe Firs), one found under old mattress, Aug. 16, 1962 (JFH, WGT); Eynsford, (The Birches), one basking Apr. 26, 1964 (PCT); Otford, one found dead June 3, 1962 (KW); Sydenham, one found in garage of 20 Thorpewood Avenue, July 24, 1964 (sw). Rigden (1955) records specimens from Plumstead Common, Lesnes Woods and Bostall Heath, probably also the Royal Arsenal. Taylor (1963) records it from Crockenhill.
- M Ealing, 2 caught *c.* 1956 on railway embankment between Castle Bar Halt and Ruislip Road East (MPK, vs). Also recorded from Greenford Halt, Kenton; Southgate, between Stanmore and Belmont (all 1960), Perivale (1961), and Yiewsley (1962) (Taylor, 1963).
- S Weybridge, (St. Georges Hill G.C.), Walton-on-Thames, Whiteley Village, 1 seen at each of 5 sites 1962 (GHG). Hersham, single ones from 3 sites 1959-62; Esher, 2 caught West End Common, May 1959, and one May 10, 1964 (DWY). Arbrook Common, one on Mar. 5, 2 on Apr. 13, 1961, 2 on Aug. 26, 1962 (CK); also recorded from Esher Common and the centre of Esher (PAM, DWY). Claygate, 9 records on 4 occasions, referring to two sites (1960-64). Oxshott, Claypit, up to 3 found under tin on 11 occasions, 1960-64 (PAM, DWY). Banstead, one found dead Aug. 27, 1961 (PAP, WGT). Betchworth, 2 caught under railway sleepers in old chalk quarry, Aug. 7, 1963 (PAM, DWY). Limpsfield Common, one seen June 28, 1964 (FCR). Bookham Common, "records few and scattered" (Panchen 1951). Taylor (1963), adds Mickleham, Kenley as localities.

OPHIDIA

Coronella austriaca Laurenti. Smooth Snake.

No further evidence seems to be available for the Godstone colony suggested by Fitter (1949).

Natrix natrix (L.) Grass snake.

Still quite widely distributed in outer areas, especially in damp habitats.

B No records.

E Epping Forest, widely distributed and common, 44 snakes recorded on 9 dates in 1958, from 25 sites (Wheeler *et al.*, 1959). Taylor (1963) records the species from Ongar, N. and S. Ockenden, 1960.

- H Fairly common in some parts of the county, particularly Broxbourne Woods; around Brickendonbury; the Lea Valley from Hoddesden northwards; the Colne Valley and in the Park Street—Elstree area, (JWS).
- K Single snakes seen Shoreham (Magpie Bottom) June 18, 1960 (GW); Farningham, (Farningham Woods) May 29, June 19, 1960, July 29, 1962 (VAG, AT, DT, PCT); Eynsford (Lullingstone Park, Eynsford Castle) May 28, 1961, July 16, 1960 (NA, HJV); Otford, July 17, 1960; Dunton Green May 8, 1960; Chelsfield Mar 31, 1961 (all VAG). Rigden (1955) adds "quite common Abbey Wood and Plumstead Marshes, it also occurs in Lesnes Woods, Plumstead Common, Bostall Heath, Erith; Pelham Rd., Bexley Heath, (3 seen Aug. 1953) and the Royal Arsenal (3 caught 1949-50)". Burton (1962) records single specimens on Apr. 24, 1949 from Holwood Park, Keston; Jul. 9 and Jul. 23, 1950 from Stone Marshes. Taylor (1963) adds New Eltham as a recorded locality.
- M Ruislip Common, 2 seen May 7, 1960 (DWY *et al.*); Mill Hill G.C., 1 seen Sept. 8, 1961 (D.My).
- S Addlestone, 1 seen Sept. 25, 1962; Weybridge, individuals seen near Silvermere Mar. 8 and May 31, 1961, at Ham Moor, June 11, 1961, St. Georges Hill Aug. 5, 1962 and at Caenshill (caught by cat) Aug. 1963 (all GHG); also one caught at St. Georges Hill, May 14, 1961. (PAM, DWY), and two mating, Oatlands Park, July 1, 1962 (GHG). Single animals seen at Hersham (S.F. and Burhill G.C.), Thorpe, Byfleet and Walton-on-Thames (York Rd.), on various dates 1960-62 (GHG, DWY, RW). Walton-on-Thames, next of *c.* 12 eggs found on waste ground Terrace Rd., and shown to DWY by schoolboys, Sept. 24, 1964. Esher, West End Common, 3 caught 1960, 1 seen 1963; Claremont Pk., 1 seen Aug. 23, 1962; Lower Green, 1 killed Aug. 1, 1963, (all PAM, DWY, PD, CK). Oxshott, Claypit, quite numerous, up to 3 caught under tin on 21 dates, 1960-64 and total of 40 "snake-sightings" (PAM, DWY, *et al.*). Epsom Common, ones seen Sept. 24, 1960, June 21, 1964 (per DWY, FCR); Fetcham, 1 in garden pond Aug. 1964 (photo seen by DWY). Bookham Common, 1 on Mar. 12, 1961 (EMH) and on May 10, 1964 (FCR); "common", recorded mostly from Eastern and Central Plain (Panchen, 1951). Battersea, one found on roundabout just outside Battersea Pk., Sept 9, 1962 and report of another earlier in the year. Both were killed. Possibly introduced with garden plants (JFH). Taylor (1963) adds Oxted, Bletchingley (both 1958) and Claygate (1961) as known localities.

Vipera berus (L.) Adder.

Regrettably this, the most interesting of the British herptiles, is rather rare or at least localized round London, mainly because of ignorant human persecution. I have handled many myself, wearing gloves, and not (yet) suffered. Left alone, they invariably slide quickly away once they realize they have been observed.

- E Epping Forest, the 1958 survey showed it to be still pleasantly common in the northern part of the Forest, mostly on the open plains. A total of 77 were recorded on 20 days, and it was thought that at least 43 individual animals were seen (Wheeler *et al.*, 1959).
- K Westerham, 4 seen Apr. 24, 1960, one climbed five foot into a holly bush when pursued (VAG, DT, PCT). Shoreham, 1 seen June 11, 1960

(AA) and a report of a 15 year old boy bitten by one Aug. 12, 1962, *Sevenoaks News*. (It should be remembered that adder bite is rarely fatal, and then only to the infirm or very young. The usual cause of fatality following adder-bite is not the snake's bite, but anaphylactic shock caused by the anti-serum. Anyone who is bitten by a snake and has recently had any injection of serum prepared from horses, such as anti-tetanus, should warn the hospital of this fact before accepting anti-serum). Farningham, 1 seen May 29, 1960 (KW), another in 1961 (JD); Eynsford, 2 seen June 10, 1962 (KW), and up to 3 seen on 3 dates, Apr., June 1964 (PCT, PAD).

- M Scratchwood, common on railway siding at least up to 1959 (DM *in litt.*, 1964). Sudbury, report of 10 year old boy bitten by one, May 26, 1961 (*Daily Telegraph*, May 27).
- S Esher, small colony, up to 3 caught, on 19 occasions, 1960-64. 8 different individuals caught, marked, and released during 1960-61 (PAM, DWY). Taylor (1963) adds Kew as a locality on the strength of a Botanical Society Record Card; perhaps this should be regarded with suspicion.

In addition to the foregoing members of the fauna, a number of records are obtained of odd individuals of foreign species occurring in the Area. These are perhaps of academic interest only, though the possibility of one or two species establishing themselves cannot be ignored. They can be loosely grouped into two classes, those which are probably escaped pets, and those which are introduced entirely by accident.

PROBABLE ESCAPED PETS

ANURA

Hyla arborea L. Tree Frog.

(Though commonly so termed, this species is in fact allied to the toads (*Bufo*idae), rather than the frogs (*Rana*idae)). A frequent pet, which occurs commonly in South Central Europe. Fitter (1960) records one from Hayes, Kent, in 1952. It has been introduced to the Isle of Wight and New Forest (Frazer, 1964), perhaps successfully.

URODELA.

Salamandra salamandra (L.) Spotted Salamander.

Another common pet. Rigden (1955) records one caught in Wickham Lane, Woolwich, 1952, which was still alive in the Woolwich Borough Museum, 1964.

CHELONIA.

Emys orbicularis (L.) European Terrapin.

A common pet, which has also been the subject of numerous attempts at introduction. A large individual, shell length $5\frac{1}{4}$ " , seen and captured at Oxshott Claypit, Surrey, 1959, released, and seen again Aug. 20 and Sept. 2, 1960 (PAM, MO, DWY). Also, Aug. 23, 1960, an American terrapin, probably *Pseudemys scripta* Schoepff, found dead on a road at Hersham, Surrey obviously an ex-pet.

LACERTILIA.

Lacerta viridis (Laurenti). Green Lizard.

One caught by R. Thames, Kingston, Surrey, behind the British Home Stores, Apr. 15, 1961 (PAM, MO, RW, DWY).

OPHIDIA.

Natrix maura (L.) Viperine snake.

2 found at Joyden's Wood, Kent, 1953 (Edwards, 1953).

Natrix tessellata (Laurenti). Tessellated Snake.

One from South London, 1955 (Frazer, 1964).

ACCIDENTAL IMPORTATIONS

The animals falling into this category are even more strictly of academic interest, particularly since many of them come in, for instance, banana cargoes, or similar produce, from climates very different from our own. The problem is, however, of some importance in herpetology, for a number of species have established themselves outside their normal range by this means.

My attention was drawn to this question by a number of newspaper reports (*Evening News*, Aug. 19; *Daily Mirror*, Aug. 20; *Surrey Comet*, Aug. 23, 1964) of two "green-eyed monsters" which hatched from their eggs in a typewriter factory at Kingston, Surrey. It seems that the eggs had been laid in the lining of a typewriter sent from Trieste, Yugoslavia (not Tripoli, *vide Daily Mirror*), and as the machine was disassembled for repair, the eggs rolled out, and hatched in the palm of a hand. This was during one of the very hot spells of weather that summer. The two young lizards were kept for a short while, but one died and the other escaped. Examination of the dead one showed it to be a Mediterranean Gecko, *Hemidactylus turcicus* (L.), which is of particular interest, since this is a species originally found only in the Mediterranean region which has established itself by accidental introduction in Cuba, Florida, Mexico, etc. I am most grateful to my neighbour, Mr. P. Cutler, who obtained the specimen for me, and in whose hand the eggs hatched.

J. W. Steward has made a particular study of accidental introductions, and has kindly given me the following records of incidents from the London Area 1960-1964.

ANURA.

Hyla albomarginata Stix. About 15 specimens, probably all from Brazil, where it is a common tree frog in banana plantations.

*Aparosphenodon bruno*i Miranda-Ribeiro. 1 specimen of this bony-headed frog, also from Brazil.

Eleutherodactylus sp. 1 specimen reported of this American genus, in which the feet have no webbing between the toes; and one specimen reported of a large toad, probably *Bufo marinus* (L.) or *B. ictericus* Stix.

LACERTILIA.

Phyllodactylus sp. One specimen of this gecko, from Brazil, and two eggs which hatched.

Mabuya sp. One specimen, probably from India, of this common tropical Scincid lizard.

Amphisbaena sp. Probably *A. alba* L., one specimen of this S. American worm-lizard.

OPHIDIA.

Leptophis depressirostris Cope. 3 specimens of this tree snake.

In summary, it must be obvious that we need to know far more, not only of the distribution, but also of the numbers of herptiles surviving in the London Area. In many respects these animals are far more susceptible to change of habitat than birds or mammals. By virtue of their breeding habits the amphibians especially are vulnerable to the kind of change which suburbanization usually encourages. It is to be hoped that more interest will be taken in them, particularly in steps to conserve their habitats. Schools might well encourage their children not to over-collect frog spawn, since the resultant tadpoles rarely survive to maturity. There is a conflict here, in that zoology must be taught, to arouse interest, and the interest sustained to teach conservation; but moderation can achieve much.

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London Fish Since 1962

By DAVID MARLBOROUGH, B.Sc.

Two years have passed since the publication of the last list of London fishes (Marlborough, 1962). Enough records have accumulated since then to justify this further list. They are not exclusively from the period 1962-1964; some date back further. The records given here are those received by the Recorder during these two years.

An inevitable feature of all Recorders' reports has been insistent appeals for yet more information: this is not an exception. But it is encouraging to note that this report is drawn almost exclusively from records sent to the Recorder, and not, as in the past, largely from publications designed as guides to anglers. A welcome trend, it can only be furthered by the sending of any fish records members may have—particularly of small fish not normally angled for.

I would like to take this opportunity to thank all those who have supplied me with records, particularly J. Burrett, who has kept records of notable fish caught in the Thames by anglers since 1952. His book (Burrett, no date) was a source for the 1962 report. The full list of informants, and the initials by which their contributions are indicated, is as follows:—J. Burrett (JB); P. Butler (PB); G. H. Gush (GHG); M. Hemmant (MH); D. Joslin (DJ); personal observations (DM); D. W. Yalden (DY).

This report was compiled, and is presented, in the same manner as that of 1962. Care has been taken to avoid duplication and confusion of waters as far as possible. In particular, I would like to thank B. P. Pickess for a standard nomenclature of the waters to the south of Rickmansworth.

SPECIES LIST

TROUT. *Salmo trutta* L.

THAMES and LEA. Trout have been taken from the Thames at Ham, Penton Hook, Chertsey, Bell Weir, and Teddington (JB). This corresponds to the previous distribution, of individuals in certain localities, probably of high oxygen concentration.

MIDDX. and BUCKS. Reports of Trout from R. Misbourne at Denham (MH). Wheeler (1958) records them from the Colne here and at other stations. I investigated this report at Easter 1964, and found the River Misbourne fishless, but was told of recent pollution and of dead Trout found at Denham Chase.

DY reports a dead fish found against the grids of Ashford M.W.B. Waterworks, which takes water from the Queen Mary and King George VI Reservoirs. This fish was later identified as *S. trutta*, female, from the head (the body was eaten). It was first identified as a "sea trout", the migratory form; but it is more likely to be the common non-migratory race. PB reports the latter as caught occasionally in the Queen Mary Reservoir.

HERTS. R. Chess, near Rickmansworth (MH) and DM; R. Gade near Watford, a few reported (DM).

RAINBOW TROUT. *Salmo irideus* Gibbons (= *S. gairdnerii*).

An American fish, widely introduced because of its high growth rate.

MIDDX. and BUCKS. R. Misbourne, near Isle of Wight Farm (MH).
See remarks above.

HERTS. Stocked in upstream reaches of R. Chess, come down as far as Rickmansworth (MH); reports only, of escapes into R. Gade at Watford (DM).

GRAYLING. *Thymallus thymallus* L.

HERTS. "Well established in middle reaches of R. Chess" (MH), and therefore penetrating into the L.N.H.S. area, though not abundant.

PIKE. *Esox lucius* L.

THAMES and LEA. Large fish caught at Molesey, Walton and Twickenham (JB), generally well distributed.

SURREY. Burwood Park Pond, Walton-on-Thames; New Lines Pond, Addlestone (GHG).

HERTS. On the fringe of the area, general in smaller Lea tributaries, such as R. Beane and R. Rib. (DM).

CARP. *Cyprinus carpio* L.

THAMES and LEA. Fish up to 17½ lbs weight taken at Chertsey, Canbury, and Richmond (JB).

SURREY. Burwood Park Pond, Walton-on-Thames (GHG); and attempted stocking, probably unsuccessful.

HERTS. Lake in grounds of convent near Cheshunt (PB).

CRUCIAN CARP. *Carassius carassius* L.

HERTS. Stocker's West Lake, Rickmansworth (DM). This is Ruislip and District N.H.S. name (after Pickess); synonym is "Springwell Lake" (L.A.A.).

BARBEL. *Barbus barbus* L.

THAMES and LEA. Common down length; recorded afresh at Chertsey, Molesey and Kingston (JB). Also in Lea tributaries, Waverley Stream at Cheshunt (MH); relief channels as far down as Enfield (PB).

GUDGEON. *Gobio gobio* L.

THAMES and LEA. New record at Isleworth (JB).

TENCH. *Tinca tinca* L.

THAMES and LEA. New records at Canbury and Richmond (JB).

MINNOW. *Phoxinus phoxinus* L.

HERTS. Most stretches of New River below Ware (PB); abundant in small Lea tributaries on fringe of area, e.g. Rivers Rib and Beane (DM).

CHUB. *Squalius cephalus* L.

THAMES and LEA. New records at Penton Hook and Kingston (JB)

HERTS. R. Chess, near Rickmansworth (MH). The 1962 list indicated

“small streams outside the area”: one such is the R. Rib at Wadesmill, near Ware (DM).

DACE. *Leuciscus leuciscus* L.

THAMES and LEA. Common along length; additional places are Teddington, Isleworth, Kingston and Petersham (JB).

MIDDX. and BUCKS. Large shoals observed along margins of Staines North Reservoir (DM).

HERTS. R. Chess near Rickmansworth (MH), carefully distinguished from the Chub also present. Also Rivers Rib and Beane around Hertford/Ware (DM).

ROACH. *Rutilus rutilus* L.

THAMES and LEA. Abundant in all reaches; new named places are Richmond, Staines, Sunbury, Kingston and Twickenham (JB).

SURREY. Warren Pond, Walton-on-Thames (GHG); R. Wey, Weybridge (GHG).

ROACH HYBRIDS. JB reports a 2½lb. “hybrid” from the Thames in his Roach lists. Probably Roach × Bream?

RUDD. *Scardinius erythrophthalmus* L.

THAMES and LEA. Single record from Chertsey (JB).

SILVER BREEM. *Blicca bjoerkna* L.

Even the presence of this fish in the London area has been in some doubt, few records being verified.

THAMES and LEA. Single specimen caught at Staines (JB); this is not verified.

MIDDX. and BUCKS. Twickenham A.S. Pit, Wraysbury (MH).

This is the first confirmed record of Silver Bream in the L.N.H.S. area; specimens were identified and preserved by an experienced taxidermist. Identification point was the number of rays in the anal fin.

BRONZE BREEM. *Abramis brama* L.

THAMES and LEA. Common in most reaches in area; places specifically named are Laleham, Teddington, Canbury, Isleworth and Twickenham (JB).

HERTS. Verulam A.S. pits near Colney Heath (DM).

EEL. *Anguilla anguilla* L.

HERTS. Northmet Pit, near Cheshunt; Broadwater (Lea Navigation) near Amwell. Records from National Anguilla Club Bulletin.

PERCH. *Perca fluviatilis* L.

THAMES and LEA. Common; JB specifically cites Staines, Twickenham and Molesey. He also says that Perch catches in the lower Thames (i.e. tidal reaches) have become much more common since 1955.

SURREY. R. Wey, Weybridge (GHG).

HERTS. Stockers West Lake, near Rickmansworth, very common (DM).

BULLHEAD. *Cottus gobio* L.

THAMES and LEA. Specimen taken at Walton-on-Thames (DJ).

COMMENTS

The faults of all previous lists of fish records are still embodied in this one. The artificial divisions into river systems and counties are maintained for the sake of continuity, but for no other reason. Some records were supplied with O.S. grid references, but the majority were not; so such references were not quoted. Now that a new map of the area is contemplated, many of these faults will be eliminated, and it is hoped to quote grid references for all future records, and assign them to all past records as well.

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The Macrolepidoptera of the South Herts. Plateau

Some selected records and an appeal to members

By ALAN C. JACKSON

I am at present in the process of compiling a survey of the Macrolepidoptera of the clay region of southern Hertfordshire which is known to geographers as the South Herts. Plateau. The name is in some respects a misnomer, since the region consists only of south-east Hertfordshire, and until recently included a fairly large portion of Middlesex, which under the Greater London Plan has now entered Hertfordshire. The region I have designated for the survey is the rectangle of land enclosed by the towns of Enfield, Barnet, Hertford and Hatfield. The reasons behind the choice of this region will be fully explained when the survey is completed, which will be at least one year from now.

Because the survey will take such a long time to prepare I feel that many of my more interesting records should be made known now, whilst they remain topical. In the present paper I have selected a few of these records, which I hope will serve both to attract some attention to the Lepidoptera of the region from other entomologists, and to encourage members of the Society to send me any records they may have of butterflies and moths which they have seen in the region, however common the species may have been. I would be particularly interested in notes from field meetings which the Society has held in the region.

The most valuable of the recent records are probably those of species whose range and status have changed appreciably in recent years. In the next few paragraphs I have selected some of these species and have included other recent records from neighbouring parts of Hertfordshire and

Middlesex in order to avoid merely giving a meaningless list of my own captures.

Hadena compta Fab. (the Varied Coronet) is one such species, and I took a specimen at my mercury-vapour trap at Potters Bar on July 24, 1962. This is nearly a year earlier than the record of Mr. Bernard Skinner (de Worms, 1964), who took one at West Norwood during June, 1963. The identification was confirmed at the British Museum (Natural History) and would seem to have been the first record of the species in the London Area. Other most interesting records are several specimens of *Thera juniperata* L. (the Juniper Carpet) which also occurred at Potters Bar. I have an unreliable record of one which was discovered in a recently acquired piece of furniture in the autumn of 1962, but took several specimens in the garden at Potters Bar in mid-October, 1964. Mr. R. I. Lorimer recorded the species from Totteridge in 1963 (de Worms, 1964). The explanation given with his report was that the larvae may have been imported on ornamental Juniper, but this seems unlikely in view of my records from Potters Bar, for I know of no Juniper in the vicinity of my light-trap. The specimens were in fresh condition and therefore had not wandered far from their breeding place. Another species which seems to be extending its range is *Cerura hermelinea* Goeze (the Poplar Kitten). I took one at Potters Bar on August 12, 1964. Mr. E. W. Classey reported one from Feltham in 1959, which was a new record for that part of Middlesex (de Worms, 1962), and Mr. Barry Goater took one in 1963 at Mill Hill, where the species is rare (de Worms, 1964).

I am surprised to read that *Drepana binaria* Hufn. (the Oak Hook-tip) is considered quite rare, one being taken by Mr. E. W. Classey in July, 1959 at Feltham and one at Whetstone by Mr. P. Ward in 1960, which was apparently a new species for the district (de Worms, 1962). I recorded sixteen from Potters Bar in 1962 and many more in 1964. Mr. P. Ward has recorded *Lycophotia varia* Vill. (the True Lover's Knot) at Whetstone in June, 1962 and again in July, 1963. The insect is apparently very rare in most of Hertfordshire and had not been noted before from that part of the Area (de Worms, 1964). I can add three records from Potters Bar, single specimens occurring on July 1 and August 11, 1962, and another on July 29, 1964. *Cucullia absinthii* L. (the Wormwood Shark) is an insect which has steadily increased its range and one was taken at Barnet by Mr. R. Johnstone on August 19, 1962, and is now in my possession. Several specimens of *Aporophyla lutulenta* Borkh. (the Deep Brown Dart) have been reported recently. Mr. P. Ward observed the species in September, 1961 and September, 1962 at Whetstone (de Worms, 1962 and 1964), and it was considered a rarity for the region. Mr. Barry Goater reported one from Mill Hill on September 11, 1963, the last specimen having been taken there in 1958 (de Worms, 1964). I observed one at Potters Bar on September 14, 1964 which was in a very fresh condition and had presumably been bred nearby.

Lygephila pastinum Treits. (the Blackneck) was reported from Hounslow by Mr. C. W. Pierce in 1959 (de Worms, 1962) and another was taken by Mr. P. Ward at Whetstone on July 18, 1963 (de Worms, 1964). I can add to this list two specimens taken on July 12, 1964 at Potters Bar. A few days before and after that date I took two male specimens of *Gastropacha quercifolia* L. (the Lappet)—one on July 10, the other on July 15—in the trap at Potters Bar. Mr. E. W. Classey recorded the

species from Feltham in July, 1959 (de Worms, 1962). There are earlier records from Totteridge, South Mimms and Mill Hill.

The last few species I have mentioned may just be isolated occurrences and the records may not, in fact, indicate that the species are increasing their range. I now propose to look at several more noteworthy records from the South Herts. Plateau, the significance of which is uncertain until further recent records from other observers can be obtained.

For example, on May 8, 1962 two examples of *Drymonia ruficornis* Hufn. (the Lunar Marbled Brown) were recorded from Potters Bar, and another came two days later. Several were obtained by Mr. Goater at Mill Hill in 1956–1958, and the species has been fairly recently recorded from Ruislip (de Worms, 1959) but these are the only other recent records of the species which I have been able to find. It is therefore impossible to assess the significance of the three at Potters Bar in 1962. Similar records include *Polia nitens* Haw. (the Pale Shining Brown) at Potters Bar on July 1, 1962; *Polia nebulosa* Hufn. (the Grey Arches) in Broxbourne Woods on June 3, 1961; and a specimen of *Panolis flammea* Schiff. (the Pine Beauty) at Potters Bar on April 22, 1962, which has also been recorded from Enfield. *Colocasia coryli* Linn. (the Nut-tree Tussock) was recorded from Cuffley Greatwood on July 20, 1964, and two occurred at Potters Bar on the 26th and 29th of the same month.

An example of *Episema caeruleocephala* L. (the Figure of Eight) was taken at Potters Bar on October 26, 1964 and *Trichiura crataegi* L. (the Pale Oak Eggar) was taken at the same locality on August 29, 1964. *Zenobia subtusa* Fabr. (the Olive) also made an appearance at Potters Bar on July 28, 1964 and a most unexpected visitor to that locality was an example of *Arenostola fulva* Hubn. (the Small Wainscot) taken on September 4, 1964. In the Cuffley Greatwood *Sterrha emarginata* L. (the Small Scallop) was observed on July 22, 1964. A specimen of *Cossus cossus* L. (the Goat moth) was taken at Southgate by Mr. A. J. V. Lines on July 20, 1962 and is now in my possession.

After that selection from the more unusual species I have encountered in the region, I would like to point out a few of the more local species which have small but flourishing colonies within the area. One of these is *Lymantria monacha* L. (the Black Arches), which Dr. A. H. Foster reported from Northaw in his list of the Lepidoptera of Hertfordshire (Foster, 1937). I took a specimen within a mile of Northaw on July 22, 1961. This would seem to indicate that a colony still thrives in that vicinity. A colony of *Parastichtis suspecta* Hubn. (the Suspected) seems to be flourishing nearby in the Cuffley Greatwood. I have taken the species there in 1962 and 1964. *Apatele leporina* L. (the Miller) also has a colony in the Greatwood, and so have *Dicycla oo* L. (the Heart moth), *Hipparchus papilionaria* L. (the Large Emerald) and *Boarmia roboraria* Schiff. (the Great Oak Beauty), the latter having been recorded by Rutherford at Northaw in 1952 (de Worms, 1958).

The last important record I have is of *Cryphia muralis* Forst. (the Marbled Green) at Potters Bar on July 28, 1962. This is the only known example of the species from Middlesex this century and I can find none from Hertfordshire. The specimen was identified by Mr. Tams at the British Museum (Natural History).

I hope I have made it plain that there are many interesting Lepidoptera to be found in the South Herts. Plateau, and that there is a lack of records from the region at present. I have mentioned only moths so far, but

records which members may have of butterflies would be most valuable, for there are also many interesting butterflies in the region. I have seen *Limenitis camilla* L. (the White Admiral) in the Broxbourne Woods in 1960 and they have recently been seen in Hadley Woods, near Barnet. I have also seen *Argynnis selene* Schiff. (the Small Pearl-Bordered Fritillary) at the same locality. Old records, in which I am particularly interested, indicate that *Apatura iris* L. (the Purple Emperor), *Nymphalis antiopa* L. (the Camberwell Beauty) and *Nymphalis polychloros* L. (the Large Tortoiseshell) have all occurred in the region (de Worms, 1950).

If the survey is to be of scientific value it must, of course, be comprehensive. This means that the commoner species merit more attention than the rarities. I feel sure that there must be records from field meetings held at the Cuffley Greatwood and the Broxbourne Woods, and if any member has even the briefest of records from the region I would be glad if he would get in touch with me.¹

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Vol. xx, 223 seq.

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An Analysis of the Macrolepidoptera Recorded from the Garden of Buckingham Palace

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

THE Proceedings of the South London Entomological and Natural History Society (1963: Part ii) published in December 1964 are devoted to a survey of the flora and fauna of Buckingham Palace carried out by a team of distinguished naturalists from the beginning of 1960 till September 1964.

Every branch of the animal kingdom is covered, including all Orders of Insects, and the Lepidoptera receive very special treatment under the direction of Mr. J. D. Bradley and Mr. R. M. Mere. During the period under review no less than 343 species of all groups of the Lepidoptera were recorded. This figure constitutes some 14 per cent of the total number for the British Isles. Since so many of the species noted had not apparently been previously recorded for what is technically designated as INNER LONDON, I have thought it of especial interest to undertake this analysis in comparison with records from other parts of Central London, and in particular with the results obtained by the late Mr. L. C. Bushby who ran a mercury vapour moth-trap between 1951 and 1954 on the roof of one of the buildings in the Zoological Gardens in Regent's Park, some two miles from Buckingham Palace.

Almost all the moths recorded from the Palace garden were obtained by running a mercury-vapour light trap on suitable nights when the Royal Family were not in residence. In the special section on the Lepidoptera an account is given of the sites where this trap was set and the methods used in counting and recording. Since this review only embraces those Families arbitrarily known as the Macrolepidoptera, it can be said at the outset that, except in one instance, all the species recorded from these groups had already been enumerated on the list for the county of Middlesex. The one exception is a small exotic moth *Earias biplaga* Walker belonging to the Westermanniinae, which was taken in the trap on July 17, 1964 and is a species NEW to the British Isles. It emanates from tropical countries, where it is often a pest in cocoa, especially in Africa. It must have been accidentally imported with produce, probably in the pupal state, and hatched out in the vicinity.

I have considered it of interest to go through the 153 species of the Macrolepidoptera obtained in the Palace garden noting those not previously recorded for Inner London (designated by an asterisk) and commenting on others of particular note. In many cases the presence of certain species was most unexpected, especially some of those associated with water and marshes. They probably bred in the vegetation surrounding the large lake in the Palace grounds. The light-trap was first used on June 17, 1960 and during the subsequent years was run fairly regularly in most weeks between March and November.

Analysing the species and starting with the Butterflies, as the authors point out it is surprising that only five kinds were noted in the Garden, when no less than 23 species have been recorded for Inner London up to 1959. Of the Pieridae only *Pieris brassicae* L. (the Large White) and *P. rapae* L. (the Small White) were seen whereas *P. napi* L. (the Green-veined White) has often been abundant in the centre of the Metropolis.

Again the Nymphalines are only represented by *Aglais urticae* L. (the Small Tortoiseshell) and *Vanessa atalanta* L. (the Red Admiral). One wonders at the apparent absence of *Vanessa io* L. (the Peacock) and *Pyrameis cardui* L. (the Painted Lady), both regulars for Central London, especially where Buddleias flourish. The answer to this dearth of butterflies may be that insufficient time was spent by day during the summer months in the Garden where only one member of the *Lycaenids* (Blues) was listed, *Celastrina argiolus* L. (the Holly Blue). *Lycaena phlaeas* L. (the Small Copper) is a surprising absentee, as this insect is sometimes quite common in the London Parks. Of the Satyrids *Maniola jurtina* L. (the Meadow Brown) might well have been a potential visitor to the Palace, since it had often appeared in the City.

Turning to the Moths, three of the commoner Hawks are on the list. These comprise *Sphinx ligustri* L. (the Privet), only seen once, *Mimas tiliae* L. (the Lime), observed commonly, a regular Londoner, and a few of *Laothoe populi* L. (the Poplar). Again it is remarkable that both *Smerinthus ocellatus* L. (the Eyed Hawk) and *Deilephila elpenor* L. (the Large Elephant) did not put in an appearance during these four years, since they used both to be in numbers in the larval state on the City bombed sites. It may well be that with the rebuilding these two insects have left Central London now that their respective pabula, willow and willow-herb, have once more become rarities in the main Metropolis.

Of the Notodonts (Prominents), that group of moths so readily attracted to light, only *Phalera bucephala* L. (the Buff-tip) is mentioned whereas five other species of this Family are on record from the Centre. Among these is *Dicranura vinula* L. (the Puss) which, it might be supposed, would have been a certain visitor to the light. The other four, also all poplar feeders, were taken in the Zoo light-trap in the early 1950's. They include *Pterostoma palpina* L. (the Pale Prominent), *Pheosia tremula* Clerck (the Swallow Prominent), *Cerura bifida* Brahm. (the Poplar Kitten) and *Clostera curtula* (the Chocolate Tip). Despite the apparent absence of poplar in the immediate vicinity of Buckingham Palace, the only representative of the *Thyatiridae* (Lutestrings) taken there was *Tethea ocularis* L. (the Figure of Eighty) which feeds exclusively on the poplar tribe. Of the two species of *Drepanidae* (Hooktips) a single male of *Drepana binaria* Hufn. (the Oak Hook-tip) is a most unlikely insect for Central London, though again one was taken at the Zoo in 1953. It was also recorded in Chelsea in 1891. The two *Lymantriids* (Tussocks) on the list comprise *Orgyia antiqua* L. (the Vapourer), of which males were obtained flying by day, and also that well-known Londoner *Leucoma salicis* L. (the White Satin), but that other very prevalent species from all over the Area, *Euproctis similis* L. (the Goldtail), was not attracted. Of the eight species of the *Arctiidae* (Tigers and Ermines) three are new to I.L. They are *Cyrcia mendica* Clerck (the Muslin)*, *Eilema lurideola* Zinck. (the Common Footman)* and *Eilema complana* L. (the Scarce Footman)*. The last species, inadvertently omitted from the text, is a denizen of heaths and sandhills with very few records for Middlesex. Of the other members of this Family the two Ermines *Spilosoma lubricipeda* L. (the White), *S. lutea* Hufn. (the Buff) and *Arctia caja* L. (the Garden Tiger) were met with annually as also was *Hippocrita jacobaeae* (the Cinnabar), all regular inhabitants of the Central regions of London.

Coming to the large Family of the Noctuid moths, of the 83 species enumerated thirteen new ones are added to the 110 already recorded for

Inner London. Taking these species by groups, all the commoner *Agrotidae* (Darts) are recorded except *Euxoa nigricans* L. (the Garden Dart) which is a notable absentee, since it is another true Londoner. *Graphiphora augur* Fab. (the Double Dart) is not an insect one would expect to find in the Central area of a big town. Yet it was met with in most years and was also on the Zoo list in 1952. Among the Yellow Underwings *Lampra fimbriata* Schreber (the Broad-bordered) was seen occasionally, though its first record for I.L. was at the Zoo in 1953. Of the pod feeders a most unexpected arrival was *Hadena conspersa* Schiff. (the Marbled Coronet)*, in 1964, an inhabitant of downs and rocky coasts: so far Feltham, Ruislip and Mill Hill are its only other localities in Middlesex. Among the Brocades *Hadena thalassina* Schiff (the Pale-shouldered), also first seen in 1964, has only one other record for the central area from Myddelton Square. *Ceramica pisi* (the Broom Moth) whose larvae used to swarm on the bombed sites, was a fairly frequent visitor, but a particularly interesting capture was a melanic *Bombycia viminalis* (the Minor Shoulder Knot)*, also new to I.L. and essentially a sallow feeder. This insect has been showing increasing melanism in the south of England in conformity with many other species. Two of the Minors are also newcomers, *Procus fasciuncula* Haw. (the Middle-barred)*, and *P. latruncula* Schiff. (the Tawny-marbled)*. The third species noted, *P. furuncula* Schiff. (the Cloaked Minor), has often been seen in Central London, but *P. literosa* Haw. (the Rosy Minor)*, obtained in 1964, is one of those insects, normally seen in coastal areas, which seems to be turning up more and more inland. Only one *Cucullia absinthii* L. (the Wormwood Shark) which only reached London after 1945, was reported, in 1961. It is now quite a common insect in most parts of the Metropolis. Another surprise was a *Parastichtis suspecta* Hübn. (the Suspected)*, in 1963, usually only found in heaths with birch as its pabulum. There are hardly any other birch feeders on the list. The Dagger Moths are well to the fore, as might be expected, with apparently quite a spate of that staunch Londoner *Apatele aceris* L. (the Sycamore). But the records of some of the marsh-loving species are of particular interest. These include the little *Petilampa minima* Haw. (the Small Dotted Buff)*, apparently quite common in the Garden, also the even smaller *Coenobia rufa* Haw. (the Small Rufous)*, taken in 1964 and a single *Celaena leucostigma* Hübn. (the Crescent)*, noted in 1963. Like *Arenostola pygmina* Haw. (The Small Wainscot) also on the list and only taken before in Kensington Gardens, these insects must be breeding virtually on the spot, in and around the various lakes in the Parks. *Caradrina ambigua* Schiff. (Vine's Rustic), once thought to be purely of immigrant origin, seems to have become well established in the London Area, as it was taken each year in the trap, having been also recorded from the Zoo in 1953 and 1954. Another member of this genus, *C. alsines* Brahm. (the Uncertain)*, also turned up commonly, but had not been recorded before for I.L. Among the autumn insects are *Gortyna micacea* Esp. (the Rosy Rustic) which appeared in 1964, also taken at the Zoo in 1953, but the only two Chestnuts were *Agrochola circellaris* Hufb. (the Brick) and *A. lychnidis* Schiff. (the Beaded Chestnut), both fairly widespread in the Area. The two elm feeders *Cosmia affinis* L. (the Lesser-spotted Pinion) and *C. trapezina* L. (the Dunbar) had only before been reported from the Zoo, both in 1954 while *Thalpophila matura* Hufn. (the Straw Underwing) which appeared once in 1962, was also only previously taken at the Zoo in

1953. Of three species of the *Plusiinae*, *Plusia pulchrina* Hübn. (the Beautiful Golden-Y)*, recorded in 1964, was a newcomer for the Central Area as also was *Hypena proboscidalis* L. (the Large Snout)* among the *Hypeninae* (the Scouts). Both *Unca trigemina* Werneberg (the Dark Spectacle) and *U. triplasia* L. (the Spectacle) which came on several occasions, again had earlier records only from the Zoo trap.

Among the Geometrid moths, of the 45 species on the list no less than 19 had not appeared before for Inner London, which had 53 of these moths to its credit up to the end of 1963. Of these newcomers several were most unexpected, while a number of commoner insects which had not hitherto turned up in the central region were now added to its list. In this latter category can be counted the two Twin-spot Carpets *Xanthorhoe ferrugata* Clerk (the Dark-barred)*, *X. spadicearia* Schiff. (the Red)* also *Epirrhoe alternata* Müll. (the Common Carpet)*, *Hydriomena furcata* (the July Highflyer)*, and *Oporinia dilutata* Schiff. (the November Moth)*. A surprise capture in 1962 was *Scopula conjugata* Borkh. (the Mullein Wave), mainly associated with rocky coasts, which has reached central London having also been taken in 1958 in Chelsea and Camberwell. *Thera obeliscata* Hübn. (the Grey Pine Carpet) which appeared singly in 1961 and 1962, had been noted only once at the Zoo in 1952. Firs are not common in Central London. The Hypericum feeder *Anaitis efformata* Guen. (the Lesser Treble Bar)*, is not an insect one would expect to find at Buckingham Palace, since it is usually met with on chalk downs. Yet apparently it provided several records. Another interesting capture is *Acasis viretata* Hübn. (the Yellow-barred Brindle)*, a privet feeder. But the well-known London denizen *Hemerophila abruptaria* Thunb. (the Waved Umber), also virtually confined to privet, did not appear, though it is prevalent in most of the Squares and Parks. A further visitor of note for 1964 was *Ecliptoptera silaceata* Schiff. (the Small Phoenix)*, since its chief pabulum is the balsam tribe. *Lygris mellinata* Fab. (the Spinach)*, so common in gardens as a currant feeder, has at last found its way into the centre of London, as it turned up in the Garden once in 1963. Another fairly common insect to appear for the first time was *Deilinia pusaria* L. (the White Wave)*. The regular migrants do not seem to have graced the Garden to any great degree. For besides the ever-present *Plusia gamma* L. (the Silver-Y), the only other one was *Nycterosia obstipata* Fab. (the Gem) of which one female was taken in the trap in November 1961. It is a fairly frequent visitor to the Area as a whole. *Perizoma alchemillata* L. (the Small Rivulet)* is yet another insect which would seem most unlikely in the central region, since it feeds exclusively on Hemp-nettle, a plant found mainly in damp woodlands. It came as a single example in 1964. That large group of the Pugs was naturally well represented by ten species of which seven were new for I.L. These included *Eupithecia pulchellata* Steph. (the Foxglove Pug)* with one in 1961, *E. lariciata* Freyer (the Larch Pug)*, one in August 1962, *E. linariata* Schiff. (the Toadflax Pug)* in 1964, *E. succenturiata* L. (the Bordered Pug)*, a wormwood feeder, *E. abbreviata* Steph. (the Brindled Pug)*, an oak feeder, *E. icterata* de Vill. (the Tawny Speckled Pug)* and *Chloroclystis rectangulata* L. (the Green Pug)*. It will be seen what a wide variety of plants and vegetation these species feed on, such as larch which is non-existent in the middle of the Metropolis. The Thorns too provide some interesting records. Another redoubtable Londoner appeared quite commonly, *Ennomos quercinaria* Hufn. (the August Thorn), though

it is virtually unknown in many parts immediately south of the Area. Again *Deuteronomos fuscantaria* Steph. (the Dusky Thorn) an ash feeder, was equally numerous, though only once previously obtained for I.L., at the Zoo in 1954. That November insect *Colotois pennaria* L. (the Feathered Thorn), only once taken near the Centre at Clerkenwell, was another abundant species as also were *Cleora rhomboidaria* Schiff. (the Willow Beauty) and *Lycia hirtaria* Clerk (the Brindled Beauty). Two full-fed larvae from elm yielded *Erannis aurantiaria* Hübn. (the Golden Umber), an insect last recorded for I.L. from Chancery Lane in 1897.

Another surprise for Inner London was the capture in the grounds of the Palace of the two Burnets *Zygaena trifolii* Esp. (the Five-spot), one in 1962 and *Z. lonicaræ* Schev. (the Narrow-bordered Five-spot) in 1964. The nearest the former species has been noted is at Finchley and for the latter Stanmore.

It is very evident how valuable this survey of the Palace garden has been in adding to our knowledge of the Macrolepidoptera of the central area of London and how many new and in many instances most unexpected species it has produced, 37 in all for I.L., bringing the total to date to 262, including 23 butterflies.

Hemiptera-Heteroptera of the London Area

PART II

By ERIC W. GROVES, F.R.E.S.

“Sir, spare your threats:

The bug which you would fright me with I seek”

Shakespeare, *The Winter's Tale*, iii 2

INTRODUCTION

Since the publication of Part I of this paper (see *London Naturalist*, 43, 34-66, 1964) a new list of the British Heteroptera, prepared by Dr. T. R. E. Southwood and Mr. D. Leston, has appeared. This was published as pp. 36-52 to Pt. I of the second revised edition of Kloet & Hincks, *A Check List of British Insects* (Royal Entomological Society, London, July 1964). The names and arrangement in the new list differ in certain respects from that in the same authors' *Land and Water Bugs of the British Isles* (London, 1959)—the sequence used by the present author for the London list.

It is not intended to alter the arrangement of species in this or succeeding parts of the *Hemiptera-Heteroptera of the London Area* (having already begun by following that in *Land and Water Bugs of the British Isles*) but nomenclatural changes given in the new Kloet & Hincks list, and any that may be published subsequently, will be adopted. References will be given whenever such up-to-date names are used, and any earlier names of Southwood and Leston's book that become relegated to synonymy will also be noted.

SOURCES OF RECORDS

The following sources of records, additional to those listed in Part I, have also been consulted:—

(a) Published and Manuscript.

33. *The Entomologist*, 1→ 1841→.

(d) WOODROFFE, G. E., The Hemiptera-Heteroptera of some cinder-covered wasteland at Slough, Bucks., 87, 10-17 (1955).

35. *Essex Naturalist*, 1→, 1840→.

(b) SANDS, W. A., Hemiptera-Heteroptera in Essex in 1950, 28, 295 (1951).

42. Personal records of J. H. Flint (from Essex).

43. Personal records of H. W. Janson (mainly from Herts.).

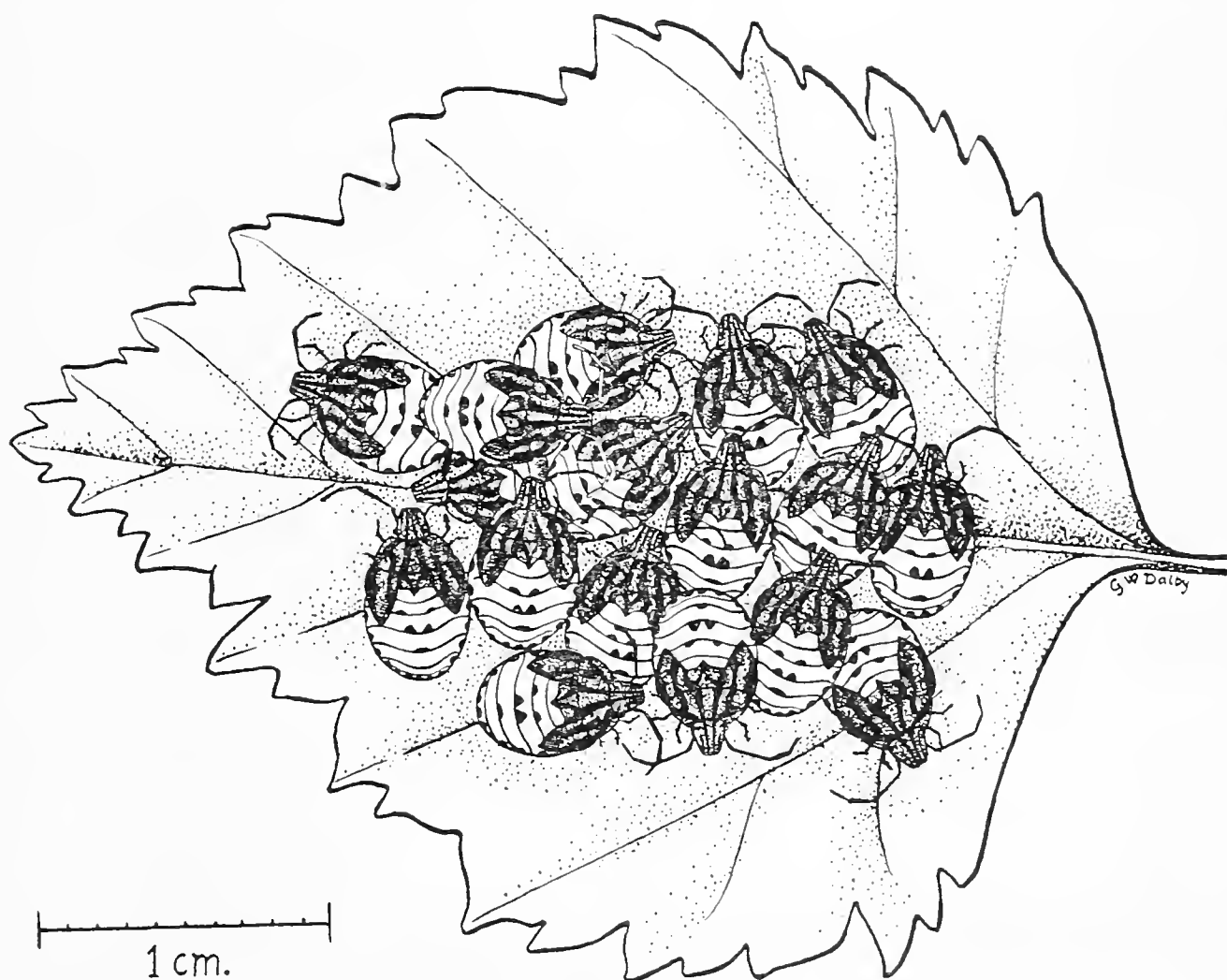
44. Records from the collection of S. Wakely (mainly Surrey and Kent with a few from Essex).

45. Records of G. B. Ryle (from Surrey) communicated by W. J. Watts in pers. comm. 21.x.52.

46. Personal records of G. G. E. Scudder (from Kent).

47. Heteroptera recorded during 1961 by P. H. Ward in his mercury-vapour light trap sited at Whetstone, Herts.

48. Entomological records (appearing occasionally) in *Croydon N. H. & Sci. Soc. (Entomological Section), Monthly Circulars* (duplicated), 1961→.



del G. Dalby

A drawing made of an observation by the author of nineteen 5th instar larvae of *Elasmucha grisea* clustered together on the underside of a birch leaf, Bookham Common, 14.x.56. (See part I, p.12.) This species of plant bug is known to be gregarious for much of its larval life. (Note that only 17 larvae can be seen in the drawing as when they were observed two were completely covered by neighbouring larvae in the tight cluster).

49. GROVES, E. W., 1965, The Plant Bugs (Hemiptera-Heteroptera) of Ruislip Local Nature Reserve, Middlesex, *Jour. Ruislip N.H.S.*, No. 14 (in press).
50. SWAIN, H. D., 1955, Entomological Survey of Basingstoke Canal from Pirbright Bridge to Frimley Green, 1954-55. (Unpublished report prepared for the Nature Conservancy.)
51. Personal records of A. A. Allen (mainly in W. Kent with a few from Surrey and elsewhere).
52. Heteroptera (collected mainly by T. R. E. Southwood) listed on pp. 80-82 of RICHARDS, O. W. Insects other than Lepidoptera, in McCLINTOCK, D., *et al.*, 1964, Natural History of the garden of Buckingham Palace, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1963 (2), 1-140.
- (b) Museum and Society Collections referred to
 NM = Norwich Museum.
 SL = South London Entomological and Natural History Society's collection.

INDEX TO RECORDERS' NAMES

The following are in addition to those already listed in Part I:—

A. H. G. Alston	(AHGA)	E. Lewis	(EL)
R. W. Attwood	(RWA)	George Lewis	(GL)
D. Collins	(DC)	R. A. Preston-Mafam	(RAPM)
J. C. Deeming	(JCD)	T. A. Marshall	(TAM)
James Edwards	(JE)	Harry Moore	(HM)
J. H. Flint	(JHF)	O. G. Neath	(OGN)
E. W. Janson	(EWJ)	W. F. Snow	(WFS)
H. W. Janson	(HWJ)	E. R. Speyer	(ERS)
P. Jerrard	(PJ)	C. E. Stott	(CES)
H. K. Kenward	(HKK)	F. W. Terry	(FWT)
R. M. Leake	(RML)	T. E. Woodward	(TEW)

LYGAEIDAE (Ground bugs)

There are 75 British species and 3 aliens belonging to this family of which 58 British species and 1 alien have been recorded in the London area.

Heterogaster urticae (Fab.) Sp. 68 p. 79

D&S p. 222 (*Phygadicus urticae*) S p. 78

B p. 150 (Sp. 83)

Widely distributed throughout the London area, occurring on most large patches of Stinging Nettle. It hibernates during winter as adult at the bases of the nettles or in grass clumps nearby, and sometimes beneath bark of fallen trees.

MIDDX. Hammersmith, *JAP* (BM); *GCC* (37); Hampton Court, 13.i.51, under bark of dead elm, *DL* (SL); Greenford, x.52, n.c. (BM); Ruislip N.R., 18.vi.57, ♂ and ♀, *EWG* (49); Heston, 28.vi.41 (♂ and ♀ in cop.) and 4.viii.40, *HStJKD* (HD); Hounslow, 4.ix.43, *HStJKD* (HD).

HERTS. Rickmansworth, 11.vi.50, 49 ♂♂ and 29 ♀♀ by sweeping nettle, which included a single ♂ with oligomery of the antennae (a rare condition in this species), *DL* (SL), (EMM 86, xxxii) and (1/1950-51, 13-14); Royston, v.01, *EAB* (BM) and (11).

ESSEX. Epping Forest (Wake Arms), 17.vi.60, at a No. 242 omnibus window, *FB* (18); and beyond the boundary at Writtle, viii.53, *JHF* (42) and at Canvey Island, 2.ix.51, *SW* (44).

KENT. Charlton, *D&S* (4) and (22); Blackheath, *AAA* (22); Kidbrook, *WW* (39); Lee, *WW* (39); Abbey Wood, 1898, *WW* (4), (22) and (39); Abbey Wood marshes (Erith marshes), 24.vii.54, *EWG* (24); Darenth, *JAP* (BM); 19.v.01, *ECB* (NM); *GCC* (37); Darenth Wood, 27.vi.07, *HStJKD* (HD); 4.viii.21, *PH* (BM); Fawkham, 12.ix.53, *GGES* (HD); Longfield, 4.x.64, *GGES* (46); Southfleet, *AMM* (22); Gravesend, 23.xi.30 and 27.ix.31, *ECB* (NM); 17.ix.48, on path, *TRES* (13).

SURREY. Probably much more common than available records would suggest. Kew (Royal Botanic Gardens, 15.x.45, at a window in the Herbarium), *HKAS* (7/1948, 113-124); Betchworth, *JAP* (3); Effingham Common, 2.iv.49, hibernating under bark of old tree stump, *SL* (1/1949-50, 70); Merton Abbey, 23.vi.01, *FWT* (HD); and beyond the boundary at Woking, 24.ix.53, n.c. (BM).

BUCKS. Langley, 22.vi.50, *GEW* (40); Slough (ICBFS), 18.xii.29, at light, *WHG* (41); 1.ix.34, on nettles, *WHG* (41); Datchet, 29.iv.56, *GEW* (40); and other localities, *GEW* (40).

Heterogaster artemisiae (Schill.) Sp. 69 p. 80
D&S p. 224 (*Phygadicus artemisiae*) S p. 79
B p. 150 (Sp. 82)

This rare species occurs on chalk slopes and quarries or in sandpits. It has not been recorded in the London area for nearly 60 years.

SURREY. Reigate Hill, vi.1873, *ES* (HD) (36) and (3); Caterham, *GCC* (3); Mickleham, 1863, *ECR* (28) and (36); *GCC* (3); 1.vii.06, ♂ and ♀, and 19.viii.06, ♂ and ♀, *ECB* (NM); Boxhill, *JAP* (BM); Ranmore, *EAB* (3); Gomshall, *EAB* (3); Abinger, viii.1899, *EAB* (BM).

Chilacis typhae (Perr.) Sp. 70 p. 80
D&S p. 231 S p. 77 B p. 149 (Sp. 81)

Found occasionally on the flower heads of the reed mace (*Typha latifolia*) where a large colony of this plant occurs in standing water. Essex records required.

MIDDX. Boston Manor, 20.viii.40, *HStJKD* (HD); Ruislip N.R., 21.v.56, ♂♂ and ♀♀ on dead flower heads of *Typha*, *EWG* (49); Uxbridge, 7.viii.34, two ♀♀ on *Typha* seed-heads, *DCT* (33a).

HERTS. Beyond the boundary at Harpenden (Rothamsted Expt. Station grounds), 7.viii.35, a single ♂ to light, *DCT* (12).

KENT. Blackheath, at mercury vapour light, *AAA* (22).

SURREY. Reigate, 1867, *J&TL* in *JAP* coll. (BM); Bookham Common, 29.vii.50 and 7.viii.50, on *Typha* heads, *DL* (SL) (1/1950-51, 13-14 and 76) and (34); 29.ix.51, *SW* (44); and beyond the boundary at Chobham, 19.iv.58, larvae only on shaggy heads of *Typha*, *GEW* (40); and Abinger, *JAP* (BM).

BUCKS. Hedgerley, 24.viii.52, on shaggy heads of *Typha*, *GEW* (40); Iver, 20.ix.57, *GEW* (40).

Henestaris halophilus (Burm.) Sp. 72 p. 81

S p. 76

B p. 148 (Sp. 80)

A rare saltmarsh bug known in Britain only from the marshes of North Kent. It is associated with the Sea Purslane (*Halimione portulacoides*). Only a single record has been made in our area and that on the extreme eastern boundary. Most other records are from marshes farther down the Thames estuary.

KENT. Gravesend, 6.ix.44, a single ♂, *AMM* (NM).

Ischnodemus sabuleti (Fall.) Sp. 73 p. 82

D&S p. 220

S p. 75

B p. 146 (Sp. 78)

Rare at the turn of the century but has since increased its distribution in S.E. England. Local, but often in large colonies where it occurs.

MIDDX. Hampstead Heath, 27.x.45, abundant, *CHA* (17); Boston Manor, 28.vi.42, n.c. (HD) and (*EMM* 93, 17); Osterley, 16.iv.49, *BPM* in *WJLeQ* coll. (21); Ruislip N.R., 1952-58 various dates, a large colony observed in *Phalaretum*, *EWG* (49); Harefield, 12.ix.35, a large colony by the Grand Union Canal, *DCT* (BM) and (33a); 4.v.43, *PJLR* (20); Uxbridge, 12.v.34, occurring sparingly on *Carex*, *DCT* (33a); 23.viii.64, both macropters and micropters, *PJLR* (MM); Enfield Chase, 10 and 18.iii.56, abundant on rushes in lake, *JCD* (BM); Hounslow Heath, 1952, in swarms, a very large colony, *GEW* (33b); 8.viii.53, such an enormous population in the same swamp that "a dozen sweeps of the net produced enough *Ischnodemus* to fill a half pound jam-jar!" *GEW* (33c); 9 and 27.vii.53, *DL* (SL).

HERTS. Elstree, 16.vii.44, abundant, *CHA* (17); Rickmansworth, 23.iii.57, *WJLeQ* (21); Chorley Wood Common, 27.v.63, *PSB* (16); Hatfield, *EWJ* (38); *EAB* (11); Hoddesdon, 21.vii.54, on reeds, *ERS* (BM); Panshanger, 20.v.51, *DL* (SL); and beyond the boundary at Harpenden, 21.iv.53, in the grounds of Rothamsted Expt. Station, *TRES* (1/1953-54, 4).

ESSEX. Epping Forest (Wood Green), *EAN* in *EAB* coll. (BM) and (38); 7.viii.50, among reeds, n.c. (35a); 28.iv.51, *RDW*, "the first known brachypterous specimen [in this country], *DL*" (1/1951-52, 13) and (SL); (Wake Arms), 29.iv.60, *FB* (18) and *KCS* (14).

KENT. Blackheath, *AAA* (22); Ruxley Gravel Pit, Foot's Cray, 21.i.61, 4.ii.62 and 17.iii.63, *KCS* (14) and (22); Horton Kirby, 7.v.59, *KCS* (14) and (22); Farningham, 25.v.63, *PJLR* (MM).

SURREY. Merton, *JAP* (28), (3), (36) and (38); (BM); Esher, *JAP* (BM); 22.iv.49, *BPM* in *WJLeQ* coll. (21); Bookham Common, 1955-58 various dates, swept from edge of IOW pond and Western Plain, *EWG* (24) and (2/38 (1959), 57); 19.vii.64, *PBS* (16); Weybridge, 30.vi.63, *PSB* (16); Chobham Common, 31.v.63, *WJLeQ* (21); vii.64, *GEW* (40), and at Runnymede, 16.vi.55, *GEW* (40).

BUCKS. Little Chalfont, vii.61, *GEW* (40); Amersham, 10.vi.51 and 22.vii.56, *WJLeQ* (21); Slough (PILG), various dates *GEW* (40) and (*EMM* 87, 201); and beyond the boundary at Burnham Beeches, 7.vi.57, *WJLeQ* (21).

Nysius thymi (Wolff) Sp. 74 p. 84

D&S p. 226

S p. 70

B p. 138 (Sp. 71)

A species favouring dry cindery or stony ground that is colonized by a thin vegetational cover of spreading plants such as *Polygonum aviculare* and *Spergularia rubra*.

MIDDX. Golders Green, vii.44, on top of a bus, *CHA* (17); Lampton, 31.vii.44, *HStJKD* (HD); Harefield, 17.ix.33, a single ♂ in moss, *DCT* (33a); Hounslow Heath, 26 and 27.vii.53, *DL* (SL); South Kensington (British Museum—Natural History), 31.vii.24, in the Museum grounds, *OGN* (BM).

HERTS. Whetstone, 29.viii.61, a single ♂ caught in mercury-vapour light trap, *PHW* (47); West Hyde, 29.ix.34, under *Polygonum* in gravel pit, *DCT* (12).

ESSEX. Epping Forest, x.06, *EAB* (BM).

KENT. Westerham, 20.vii.22 (PH).

SURREY. Coulsdon, 3.viii.08 (var. *maculata*), a single ♂, *ECB* (NM); Weybridge, *JAP* (BM), and beyond the boundary at Shalford, viii.1886, *EAB* (BM).

BUCKS. Slough (ICBFS), 11.ix.34, on the ground of flax-plots, *WHG* (41).

Nysius ericae (Schill.)

This was recognised as separate from *N. thymi* by G. E. Woodroffe in 1959 (see EMM, 95, 265). Some of the records given under the previous species may subsequently be found referable to *ericae*. London area records of *ericae* so far authenticated are as follows:—

MIDDX. Hounslow Heath, 1952, *GEW* (all material designated under *N. thymi* in 33b).

BUCKS. Slough (Upton Court Road, waste plot), *GEW* (all material designated under *N. thymi* in 33d)); (PILG) ix.60 *GEW* (40).

Nysius helveticus (H.-S.)

Sp. 75 p. 85

S p. 70 (*N. lineatus*) B p. 137 (Sp. 70, *N. lineatus*)

A rare Lygaeid of open heaths in three English counties where it is associated with *Calluna*.

KENT. Plumstead, *WW* (4), (39) and (22). This is a record of some 70 years ago from a now vanished Kent heath (Southwood and Leston, p. 85).

SURREY. Reigate, n.c. (36); Oxshott, 24.viii.52, *WJLeQ* (21); Weybridge, *JAP* (BM) and (36); and beyond the boundary at Woking, viii. 1888, *ES* (3) (36) and (HD); Chobham, viii.1874, *ES* (3) (HD); 13.ix.56, on *Erica cinerea*, *GEW* (40); and Ash Vale 8.ix.51 *WLJeQ* (21).

Kleidocerys resedae (Panz.)

Sp. 77 p. 86

S p. 73 (*Ischnorhynchus resedae*) B p. 143 (Sp. 76, *I. resedae*)

Found most often on birch (less frequently on alder) during summer, moving to the shelter of heather during winter. Occasionally it is taken on other trees, and since 1952 there have been records of it on rhododendron. Essex records wanting.

MIDDX. Hampstead, *GCC* (37); Hampstead Heath, 23.v.43, *CHA* (17); ix.49, common on oaks, *DL* (1/1949-50, 36-38); Edgware (Scratch Wood), 28.v.44, *CHA* (17); (Moat Mount), i.60, in Song Thrush nest in rhododendron bush, *PJ* (BM); West Middlesex (without precise locality), 12.ix.35, on *Betula*, *DCT* (33a); 27.viii.35, larvae on *Alnus*, *DCT* (33a); 6.viii.34, hibernating (*sic*) in *Abies*, *DCT* (33a).

HERTS. Beyond the boundary at Berkhamstead on *Betula*, 23.ix.36, *DCT* (12).

KENT. Kidbrook, *WW* (39); Darenth, *GCC* (37), (4) and (22).

SURREY. Coombe Wood, *ES* (3); Mickleham, 21.vi.03, *ECB* (NM); *JAP* (BM); *GCC* (37) and (3); Ashtead, 4.vi.05, *ECB* (NM); Ashtead Common, 28.ix.46, *FJC* (1/1946-47, 77); Ashtead Wood, 14.ix.47, common on oaks, *SL* (1/1947-48, 71); Bookham Common, iv., *DL* (34); 14.vi.53, on *Calluna*, *EWG* (2/38, 60); Oxshott Heath, vii.1870, *AB* in *AJC* coll. (HD); 12.x.00, *AJC* (HD); 16.vi.01, *ECB* (NM); *COW* (BM); *TRB* (37) and (3); 22.iv.49, *BPM* in *WJLeQ* coll. (21); 2.ix.50, *DL* (1/1950-51, 79); *AAA* (51); 17.ix.64, *PJLR* (MM); Esher Common, *JAP* (BM); (HD); *AAA* (51); Weybridge, 16.iv.49 and 25.v.47, on *Betula*, *TRES* (13); 25.xi.62, *PSB* (16), and just beyond the boundary at Egham, 1.ix.55, on *Alnus*, *GEW* (40); Byfleet, 8.ix.35, numerous on oak, *FJC* (1/1935-36, 28); 8.vii.50, *DL* (1/1950-51, 73), and Effingham Common, 2.iv.49, *SL* (1/1949-50, 70).

BUCKS. On the boundary at Hedgerley, 3.viii.55, on *Alnus*, *GEW* (40); Slough (PILG), various dates, *GEW* (40); Langley, 21.ix.54, on *Rhododendron*, *GEW* (40); Harton, ix.58, on *Alnus*, *GEW* (40); and beyond at Burnham, 20.ix.1900, *PH* (BM) and (26).

Kleidocerys truncatulus subsp. *ericae* (Horv.) Sp. 78 p. 87

D&S p. 233 (*Ischnorrhynchus resedae*) S p. 74 (*I. geminatus*)

B p. 144 (Sp. 77, *I. geminatus*)

Occurs on heaths, being found almost exclusively on *Calluna* and *Erica* spp. Not yet recorded for Essex, Herts. and Middx.

KENT. Plumstead, 1890, *WW* (39), (4) and (22). The heath on which this was recorded has long since disappeared.

SURREY. Headley Heath, *JHPS* (8 and 9); Boxhill, 5.viii.1893, *AJC* (HD); Oxted, 11.vi.1893, *AJC* (HD); Mickleham, 19.viii.06, *ECB* (NM); Coulsdon, 28.vii.08, *ECB* (NM); Oxshott, 1891, *AB* in *AJC* coll. (HD); 29.vii.05 and 24.ix.09, *ECB* (NM); 27.v.11, *EAB* (BM); 20.vi.23, *LCB* (MM); 2.ix.50, *DL* (1/1950-51, 79); 30.vi.51, common on *Erica* and *Calluna*, *FJC* (1/1951-52, 73); 17.ix.64, *PJLR* (MM); Esher Common, *JAP* (BM); *AAA* (50); 4.viii.55 and 21.viii.54, *EWG* (24); Horsell Common, 27.viii.32, *ECB* (NM); Limpsfield Common, 21.iii.45, *CHA* (17).

BUCKS. Stoke Common, 17.viii.52, *WJLeQ* (21); Hodgemoor Wood, 19.ix.53, *WJLeQ* (21).

Pachybrachius fracticollis (Schill.) Sp. 79 p. 90

D&S p. 170 (*Plociomerus fracticollis*) S p. 82 (*P. fracticollis*)

B p. 152 (Sp. 84, *Pamera fracticollis*)

A rare bug of the bogs and fens of the New Forest and East Anglia. Only a few records made elsewhere, two of which are not far outside our boundary.

SURREY. Holmbury, n.c. (but probably *WW*) (SL); Ash Vale, 13.viii.53, *DL* (SL).

Pachybrachius luridus (Hahn) Sp. 80 p. 91

S p. 82 (*Plociomerus luridus*) B p. 153 (Sp. 85, *Pamera lurida*)

Another very rare species found only in *Sphagnum* bogs at three localities in Britain, of which the Surrey one is just outside our boundary (though an old record).

SURREY. Chobham Common, vi. 1876, *ES* (HD) & (3).

Peritrechus lundii (Gmel.) Sp. 81 p. 91

D&S p. 188 (*P. luniger*) S p. 96 (*P. luniger*)

B p. 168 (Sp. 103, *P. sylvestris*)

Appears to be associated with fields under cultivation and the hedgerows nearby, though occasionally has been taken in pasture fields and on heaths. Found on various species of plants and hibernates in dead leaves and under moss. Essex records wanting.

MIDDX. Hounslow Heath, 1953, a single specimen at roots of *Juncus* on the heath, *GEW* (33c).

HERTS. "Widely distributed in sheltered hedgerows, in ivy at bases of trees and walls", *DCT* (12); West Hyde, 7.ix.35 and 14.ix.34, *DCT* (12); and beyond the boundary at Little Gaddesden, vii.36, *DCT* (12); Tring 29.ix.34, *DCT* (12); and Harpenden, 28.x.37, *DCT* (12).

KENT. Shooters Hill, *WW* (4) and (22); Plumstead, *AAA* (22); Bexley, ix, *D&S* (28), (4) and (22); Darenth Wood, iv, *D&S* (28), (4) and (22).

SURREY. Bookham, 14.v.1899, *WJA* (SL); Caterham, *GCC* (3); Reigate district, *J&TL* (36); Oxshott, *TRB* (3), and beyond the boundary at Gomshall, *EAB* (3); Leith Hill, *EAB* (3); Shalford, *EAB* (3), and Woking, 19.v.1888, under heaps of coarse grass, *ES* (HD) (3) and (EMM, 25, 35).

BUCKS. Little Chalfont, 4.iv.54 and 11.ix.51, *WJLeQ* (21); Hodgemoor Wood, 11.iv.54, *WJLeQ* (21); Slough (ICBFS), 22.iii.21, in straw from old duck coop, *WHG* (41); (PILG), 10.iv.53, *GEW* (40); and beyond the boundary at Burnham, n.c. (26).

Graptopeltus lynceus (Fab.)

Sp. 87 p. 94

S p. 101 (*Aphanus lynceus*) B p. 171 (Sp. 109, *A. lynceus*)

A bug mainly of dry sandy habitats such as dunes and sandpits though occasionally occurring inland on the chalk. No recent records except from Bucks.

HERTS. Watford, 1.ii.25, *PH* (BM).

KENT. Dartford Heath, *JS* (HD) (4), (37) and (2).

SURREY. Croydon, n.c. (36); Shirley, xi, in an old sandpit amongst tufts of grass, *D&S* (3), (37) and (38).

BUCKS. Hedgerley, 25.v.55, on *Myosotis ramosissima*, *GEW* (HD) (40) and (EMM 89, 223); and beyond the boundary at Burnham, 18.iv.01, *PH* (BM) and (26).

Raglius alboacuminatus (Goeze)

Sp. 89 p. 95

D&S p. 174 (*Calyptonotus pedestris*) S p. 103 (*Aphanus pedestris*)

B p. 172 (Sp. 111, *A. alboacuminatus*)

This rare bug should be looked for on warm sunny days in spring when it runs actively amongst stick fragments and dead leaves. It is said to hibernate gregariously during winter beneath bark of old or fallen trees.

MIDDX. Ealing, 20.iv.54 and 20.v.50, in a garden, *BPM* (SL) (MM) (21) and (1/1950-51, 8).

KENT. Lee, v, under decaying leaves, *D&S* (28), (4) and (22); Darenth, *GCC* (37); 25.vi.39, n.c. (SL); in chalk pit, *AMM* (22); Gravesend, vii.1877, *AJC* (HD); *ES* (37) and (22); 19.iv.48, running on lawn, *TRES* (13) and (22); *JAP* (BM).

SURREY. Chobham, viii.1874 *ES* (HD); *ES* in *EAB* coll. (BM); (36) and (3); Croydon, *WB*, (37) and (3); Purley Downs, *D&S* (28), (36) and (3).

Megalonotus antennatus (Schill.) Sp. 90 p. 95D&S p. 206 (*Rhyparochromus antennatus*)S p. 85 (*R. antennatus*) B p. 153 (Sp. 86, *R. antennatus*)

A somewhat locally distributed Lygaeid which occurs in damp litter amidst grasses and rushes in woods, the larvae becoming adult by August. It hibernates beneath grass debris and leaves.

ESSEX. Epping Forest, 25.ii.50, n.c. (SL).

SURREY. Caterham, GCC (37) and (3); Chipstead, 16.v.10, ECB (NM); Buckland Hill, 4.ii.23, CES in ECB coll. (NM); Reigate Hill, ES (36), (37) and (3); Reigate district, by sweeping J&TL (32); and beyond the boundary at Ewhurst, viii.1889 and viii.1896, EAB (BM).

Megalonotus praetextatus (H.-S.) Sp. 91 p. 96D&S p. 205 (*Rhyparochromus praetextatus*)B p. 86 (*R. praetextatus*) B p. 155 (Sp. 87, *R. praetextatus*)

This bug, which has a similar life history to the previous species, prefers light sandy soils. There has been only a single record in the London area so far, so a search should be made in similar likely localities, particularly on other West Surrey heaths.

SURREY. Weybridge, JAP (BM).

Megalonotus dilatatus (H.-S.) Sp. 92 p. 96D&S p. 204 (*Rhyparochromus dilatatus*) S p. 83 (*R. dilatatus*)B p. 155 (Sp. 88, *R. dilatatus*)

Another rare species, favouring dry sandy places particularly if there are patches of ground covered with dead leaves. It is said to be gregarious. Essex and Herts. records wanting.

MIDDX. Hampstead Heath, 8.vi.50 (dark form) ♂ and ♀, sandy heath clearing at base of grass, DL (SL).

KENT. Blackheath, 1901, WW (4), (39) and (22); Shooters Hill, 1900, WW (4), (39) and (22); Plumstead (Bostall Woods), 4.v.54, AAA (22) and (EMM 95, 96); Otford, viii.20 and 3.iii.23, PH (HD); and beyond the boundary on Wrotham Heath, 14 and 23.viii.43, AMM in ECB coll. (NM).

SURREY. Croham Hurst, JAP (BM); Shirley, JAP (BM); Addington Hills, viii, D&S (28) and (37); Reigate Heath, in sandpits, J&TL (32); Oxshott, 25.v.02, WJA (SL); Esher, JAP (BM); TAM (37); Weybridge, viii and ix, common (*sic*) under moss and among debris, D&S (28); TRB (37); ES (37); Woking, v.1888, ES (HD); 23.vi.09, HStJKD (HD); 2.v.14, ECB (NM); Chobham, vii.1880, ES (HD); and beyond the boundary Holmbury, iv.1894, EAB (BM); Abinger, viii.1899, EAB (BM); Coldharbour, viii.1895, EAB (BM); and Hurtwood Common, 6.v.41, ECB (NM).

Megalonotus chiragra (Fab.) Sp. 93 p. 96D&S p. 203 (*Rhyparochromus chiragra*) S p. 84 (*R. chiragra*)B p. 156 (Sp. 89, *R. chiragra*)

A species of light sandy soils on commons and heaths and occasionally in quarries, particularly where there is leaf litter and low creeping vegetation. A colour variant, var. *nigricornis*, having all-black antennae, is sometimes found amidst colonies of the typical form.

MIDDX. Harefield, 8.viii.54, WJLeQ (21); West Middlesex (without precise locality), 1933-36, common and widely distributed at roots of grass, in moss and rubbish taken frequently throughout viii, ix and also in v, DCT (33a); Heston, 4.vi.42, HStJKD (HD).

HERTS. West Hyde, 14.ix.34, at roots of grass in gravel pit, *DCT* (12).
 ESSEX. Epping Forest (Monks Wood), ix, *CN* (35a); and beyond the boundary at Stanford-le-Hope, 26.iv.64, *PJLR* (MM).

KENT. Otford, 1922-23, various dates, *PH* (BM); Darenth, 19.v.01, *ECB* (NM); 4.viii.21, *PH* (BM); Shooters Hill, *JAP* (BM); Swanscombe cutting, 27.viii.61, *WRD* (15) and (22); Gravesend, *JAP* (BM).

SURREY. Chipstead, 21.x.06, 29.iii.08, 7.iii.20 and 19.xi.11, *ECB* (NM); Coulsdon, 20.v.07, 25.iii.23 and 14.v.32, *ECB* (NM); Headley Lane, 27.v.1860, *AJC* (HD); Weybridge, 4.x.1900, *HStJKD* (HD); and beyond the boundary at Woking, *GCC* (HD); v.1888, *ES* (HD); Abinger, viii.1900, *EAB* (BM); 19.viii.43, *ECB* (NM); and Leith Hill, viii.1895, *EAB* (BM).

BUCKS. Little Chalfont, 24.ii.52 and 4.x.52, *WJLeQ* (21); Hedgerley, 6.vi.53, *GEW* (40); Datchet, 29.v.53, in gravel pit, *GEW* (40); Slough (PILG), 23.iv.51, *GEW* (40); and beyond the boundary at Taplow, 22.vii.52, *GEW* (40) and (EMM 88, 255).

Megalonotus sabulicola (Thoms.)

S. p. 84 (*Rhyparochromus chiragra* var. *sabulicola*)

B p. 157 (*R. chiragra* var. *sabulicola*)

This insect was considered at specific level by Southwood in 1963 (see Entom. 96, 124). It may be recognised from *chiragra* by the fact that its mid and hind tibiae are yellow (cf red-brown in *chiragra*) and its 3rd antennal segment has a broad band of yellow (cf. all black in *chiragra*. Allen (*in litt.*) says that the specimen taken by him in Darenth Wood, Kent and cited by Masee in his Kent list (22) is not *sabulicola* but *chiragra*. Therefore no true *sabulicola* records have yet been confirmed from the London area. Material from elsewhere in Britain would indicate it to be a species of sandy localities mainly by the sea. In Europe generally it has a southern distribution but in Canada where it has been introduced (*vide* Scudder, G.G.E., 1961, Proc. Ent. Soc. Brit. Columbia, 58, 26) it occurs in inland habitats that are certainly not sandy (Scudder, *pers. comm.*).

Rhyparochromus pini (Linn.)

Sp. 94 p. 97

D&S p. 173 (*Calyptonotus pini*) S p. 103 (*Aphanus pini*)

B p. 173 (Sp. 112, *A. pini*)

A locally distributed bug of heathlands especially where there is an open cover of heather and pine trees. It is very active on warm sunny days and may be found running over pine needles or amongst debris beneath heather clumps. Should be looked for in Bucks.

MIDDX. Ealing, 8.iii.50, *BPM* (EMM. 86, 293).

ESSEX. Epping Forest (High Beach), x.1890, under heather and dead leaves, *CN* (35a); (Chingford), x.1890, *EAB* (BN); 21.iv.1901, *ECB* (NM); Epping, *FBJ* (5) and (35a).

KENT. Darenth Wood, *GCC* (4) end (22).

SURREY. Addington Hills, under heather, *D&S* (28) (3); Shirley, *GCC* (3); Oxshott Heath, 8.i.50, n.c. (SL); *AAA* (51); 30.v.63 and 17.ix.64 *PJLR* (MM); Esher Common, 15.ix.53, *FJC* (SL); Weybridge, *JAP* (BM); 25.v.47, at roots of heather, *TRES* (13); and beyond the boundary at Woking, 15.viii.1891, *AB* in *AJC* coll. (HD); *ES* (3); 3.ix.06, *HStJKD* (HD); viii.28, *JJC* (HD); Chobham Common, beneath heather, n.c. (28); viii.1884, *ES* (HD) and (3); 23.v.1893, *AB* in *AJC* coll. (HD); 12.viii.1899 and 27.i.1893, *AJC* (HD); 13.x.40, *ECB* (NM); Ash Vale, 3.ix.49, adults of

both sexes very common, *DL* (21) (SL) and (1/1949-50, 18); 10.ix.50, very common beneath *Calluna* and *Erica*, *DL* (SL) and (1/1950-51, 80); 8.ix.51, *DL* (SL); *WJLeQ* (21); Abinger, viii.1900, *EAB* (BM); Gomshall, viii.1896, *EAB* (BM) and (3); Ewhurst, *EAB* (3); Chilworth, 6.vi.44, *ECB* (NM); and between Merrow Downs and Gomshall, 27.v.05, *AJC* (HD).

Trapezonotus arenarius (Linn.)

Sp. 96 p. 98

D&S p. 192 (*T. agrestis*) S p. 99 (*T. agrestis*)

B p. 169 (Sp. 105)

Trapezonotus desertus Siedenstücker

Trapezonotus dispar (Stål)

under Sp. 96 p. 99 as *T. quadratus*

S p. 99 (*T. agrestis* var. *dispar*)

B p. 170 (Sp. 106)

These three species are considered together as they were all treated as forms under *arenarius* in Southwood and Leston's book. This species complex has since been critically examined by Woodroffe and the forms raised to species status (see *Entom.*, 1960, **93**, 218). Whilst the only sure means of distinction is in the male parameres, broadly speaking *arenarius sens. strict.* is usually of the coastal dunes; *desertus* is the common, widely distributed, inland species found on heathland, dry waste places and chalky areas; and *dispar* is the species of woodlands.

The records which follow are for *arenarius sens. lat.*, though any voucher specimens for these records that may still be extant will probably prove on examination to be *desertus*.

KENT. Darenth Wood, *JWD* (4).

SURREY. Limpsfield, 21.iii.45, *CHA* (17); Chipstead, 29.vi.18, *ECB* (NM); Reigate, on houses, *J&TL* (36); *ES* (3); Redhill, at roots of grass, *J&TL* (36); Boxhill, 4.iii.34, ♂, 2.vii.11 ♀, 14.iv.20 ♂, *ECB* (NM); Oxshott, 27.ix.96, *WJA* (SL); Chertsey, *TRB* (3); and beyond the boundary at Woking, *ES* (3); Chobham, *TRB* (3); Ash Vale, 10.ix.50, *DL* (1/1950-51, 80); 8.ix.51, *WJLeQ* (21); 12.iv.64, *PJLR* (MM); Holmbury, *EAB* (3); Ewhurst, *EAB* (3); Farley Heath, 15.v.32 ♂, *ECB* (NM); and Leith Hill, *EAB* (3).

The true *arenarius* is unlikely to be found in the London area but authenticated records for *dispar* (= *quadratus* Fab.) as now recognised are as follows:—

dispar (= *quadratus* Fab.)

KENT. Darenth Wood, 4.viii.21, *PH* (HD); and beyond the boundary at Wrotham, *AMM* (22); and Trottiscliffe, 12.vii.59, *AMM* (MM).

SURREY. Barnes Common, 29.iv.13, *HStJKD* (HD); Reigate Heath, 4.viii.55, *GEW* (40); Boxhill, 7.v.22, *PH* (HD); Esher Common, 28.viii.61, singly under heather, *AAA* (51); Oxshott Heath, 22.vii.64, *AAA* (51); and beyond the boundary at Chobham Common, 18.iv.58, *GEW* (40); Ash Vale, *GEW* (40); Guildford, 13.ix.41, two ♀♀, *ECB* (NM); Chilworth, 23.viii.43, *ECB* (NM); and Farley Heath, 26.iv.36, *PH* (HD).

BUCKS. Slough (PILG), 1.vii.60, *GEW* (40).

Macrodema micropterum (Curt.)

Sp. 97 p. 99

D&S p. 208 (*Hypnophilus micropterus*)

S p. 88

B p. 159 (Sp. 92)

Locally distributed on heaths particularly those of West Surrey where it is usually found beneath heather. Eggs are laid in May by the overwintering adults which soon die off after oviposition. Newly emerged adults appear at the end of July.

KENT. Plumstead Common, *D&S* (28), (4) and (22); Westerham, *AAA* (22).

SURREY. Addington Hills, *D&S* (28); Coombe Wood, *D&S* (28); Limpsfield Common, 12.iii.45, *CHA* (17); Headley, 18.ix.01, *COW* (BM); Ockham, 2.iv.49, at base of heather, *DL* (SL); Oxshott Heath, 14.iii.1893, *AJC* (HD); 29.ix.1895 and 6.ix.1896, *WJA* (SL); 28.ix.02 and 5.ii.05, *ECB* (NM); 18.iv.20, *HStJKD* (HD); vii.1951-58, *DL* (EMM 94, 70); 26.vi.64, a few under heather, *AAA* (51); Esher Common, *JAP* (BM); 28.viii.61, two specimens at heather roots, *AAA* (51); Woking, vii.1888, *ES* (HD); 1.iv.1898, *AJC* (HD); and beyond the boundary at Chobham, vi.1886, *ES* (HD); 30.viii.1895, *AJC* (HD); iv.01, *WES* in *ECB* coll. (NM); 31.v.63, *WJLeQ* (21); 12.viii.56, including macropters, *GEW* (40); Weybridge, *D&S* (28); *JAP* (BM); *FP* (HD); 26.vi.02, and 13.v.06, *HStJKD* (HD); Ash Vale, 8.ix.51, *DL* (SL); Effingham Common, 2.iv.49, very common at base of heather, *SL* (1/1949-50, 70); Shere, 11.viii.35, *ECB* (NM); Albury, 22.viii.31, *ECB* (BM); Horsley, 1.v.04, *AJC* (HD); Ewhurst, viii.1889, *EAB* (BM); Leith Hill, viii.1889, *ES* (HD); Farley Heath, viii.1892, *EAB* (BM); Peaslake, viii.1892, *EAB* (BM); Chilworth, viii.1886, *EAB* (BM); Frensham Common, 6.viii.64, a single specimen running on sandy heath, *AAA* (51); and Hindhead Common, 13.vii.63, *PSB* (16).

BUCKS. On the boundary at Fulmer (Stoke Common), 17.viii.52, *WJLeQ* (21); and beyond at Burnham Beeches, 26.iii.52, *GEW* (40).

Aphanus rolandri (Linn.)

Sp. 99 p. 100

S p. 101

B p. 171 (Sp. 108, *Calyptonotus rolandri*)

A rare ground-loving species which favours sheltered corners of cultivated fields particularly if facing the sun. It seems to hide beneath litter or stones if windy. Masee (22) says it may be trapped in old sacking or corrugated cardboard if these are placed in likely situations. London area records so far have only been from Kent.

KENT. Plumstead, *GCC* (37) and (4); Dartford, *GCC* (37) and (4); Darenth, *D&S*, under refuse in a pea-field in autumn, and taken on the wing in spring, (28), (37), (38), (4) and (38); Darenth chalk pit, *AAA* (22).

Tropistethus holosericeus (Scholtz)

Sp. 101 p. 101

D&S p. 200

S p. 87

B p. 157 (Sp. 90)

Another rare and local species to be found on chalky slopes (more rarely on sand) beneath moss and stones.

HERTS. West Hyde, 28.ix.34, among stones in gravel pit, *DCT* (12).

KENT. Hayes, iii.07, *WES* in *ECB* coll. (NM); Otford, 25.xi.22, *PH* (BM); 27.ix.25, *ECB* (NM); Darenth Wood, 4.ix.21 and 14.v.22, *PH* (BM); Brasted, 9.v.22, *PH* (BM).

SURREY. Wandsworth, *ES* (3); Shirley, 20.viii.04, *ECB* (NM); Chipstead, 19.viii.06, *ECB* (NM); 16.iv.12, *EAB* (BM); Coulsdon, iii.06, *WES* in *EAB* coll. (BM); 25.xi.06 ♂ and ♀; 13.iv.07 ♂ and ♀; 14.v.32 ♂ and ♀; 21.v.32 ♂ and ♀; 8.iv.33 ♂ and ♀; 6.v.33 ♂, *ECB* (NM); Buckland Hill, ♂ and ♀, *JAP* (BM); (36); 7.iii.05, *ECB* (NM); Reigate, *ES* (3); Reigate Hill (36); Headley Lane, *TRB* (3); 28.v.05, *AJC* (HD); Boxhill, 10.iv.03, *WW* (1/1903, 47); 24.x.1896, *AJC* (HD); 10.x.06, *HStJKD* (HD); 3.viii.1896, *AJC* (HD); 7.v.22, *PH* (HD); (Juniper Valley), 12.ix.53, two

adults found beneath moss, *DL* (1/1953-54, 91) and (SL); Mickleham, *GCC* (3); 15.v.04 ♂, *ECB* (NM); Gomshall, *EAB* (3); Abinger, viii.1899 and vi.1900, *EAB* (BM); Dorking, 1897, in ants' nest, *FBJ* (10 p. 158).

BUCKS. Beyond the boundary at Burnham Beeches, *WES* in *EAB* coll. (BM); 18.iv.01, *PH* (BM); and at Wendover, 19.viii.15, *EAB* (BM).

Acompus rufipes (Wolff.)

Sp. 102 p. 102

D&S p. 218

S p. 92

B p. 162 (Sp. 96)

In the London area this local bug occurs in marshy habitats and bogs on heaths mainly in West Surrey. It seems to be associated with the marsh valerian (*Valeriana dioica*) and is found either on the plant or at the base amongst the roots where it is wet. Rare.

SURREY. Redhill, *J&TL* (36), (37) and (3); Oxshott, *TRB* (3); and beyond the boundary at Weybridge, *TRB* (3); and Chobham, 26.vi.56 and 28.v.57, on *Valeriana dioica*, *GEW* (40) (HD) and (EMM 92, 47).

Stygnocoris rusticus (Fall.)

Sp. 104 p. 103

D&S p. 214 (*Stygnus rusticus*) S p. 93 (*S. rusticus*)

B p. 163 (Sp. 97)

Found on both sandy and chalky soils where the ground is dry and covered with low plants. Southwood and Leston's book says that patches of *Stellaria media* often harbour this species and that plant may be its food. Masee (22) considers it associated with *Prunella vulgaris*.

MIDDX. Hampstead Heath, 1949, on sandy ground at grass roots, *DL* (1/1949-50, 36-38); Northwood, 13.iii.43, *PJLR* (20); Hounslow Heath, 1952, common on ash and rubble tip, *GEW* (33b).

HERTS. West Hyde, 29.ix.34, *DCT* (12); Rickmansworth, 19.vii.35, *DCT* (12); and beyond the boundary at Harpenden, 16.ix.37, *DCT* (12).

ESSEX. Purfleet, *RML* (5); and beyond the boundary at S. Benfleet, 9.ii.36, *RWA* in *SW* coll. (44).

KENT. Lee, viii, *D&S* (28), (4) and (22); Beckenham, ix, *D&S* (28), (4) and (22); (Hither Green Lane), 1897, *WW* (39); Blackheath, in garden, 28.vii.62 and 21.viii.62, in cop. at roots of *Prunella vulgaris*, casual specimens by sweeping or found in litter, first taken viii.57; several single examples swept from *Achillea millefolium*, viii.62, ix.63 and twice in 1964, *AAA* (51) (22) and (EMM 95, 96); Charlton, *AAA* (22); Otford, 29.viii.22, *PH* (HD); ix.22, *PH* (BM); Brasted, viii.20, *PH* (BM); and Longfield, 3.ix.64, *GGES* (46).

SURREY. Sanderstead, *JAP* (BM); Caterham, *GCC* (37) and (3); Coulsdon, 25.ix.06 ♀, 23.viii.07 ♂ and ♀, 12.viii.18 ♂ and ♀, *ECB* (NM); Reigate, *ES* (37) and (3); Bookham Common, viii, *DL* (34); Mickleham, *JAP* (BM); Boxhill, 27.viii.50, *DL* (1/1950-51, 77); Surbiton, vii.1872, *ES* (HD); Oxshott, 12.x.1900, *AB* in *AJC* coll. (HD); Esher, *JAP* (BM); Weybridge, *TRB* (3); and beyond the boundary at Chobham, viii, 1874, *ES* (HD) and (3); developed form, rare (36); Byfleet, 24.iv.17, *EAB* (BM); Gomshall, *EAB* (3); Ewhurst, viii.1889, *EAB* (BM) and (3); and Leith Hill, viii.1895, *EAB* (BM) and (3).

BUCKS. Latimer, 8.ix.57, 12.ix.54 and 14.x.56, *WJLeQ* (21); Fulmer, 21.x.56, *WJLeQ* (21); Hedgerley, 24.viii.52, *GEW* (40); Slough (ICBFS), 3.x.31, ♂ and ♀ collected on shrubs, *WHG* (41); (Upton Court Road waste plot), *GEW* (33d), and beyond the boundary at Coombe Hill, 6.ix.52, *WJLeQ* (21).

Stygnocoris sabulosus (Schill.) Sp. 105 p. 103 as *S. pedestris*
 Ref.: Slater, Cat. Lyg. World, 2, 1025 ff. (1964)
 D&S p. 215 S p. 94 (*Stygnus pedestris*)
 B p. 164 (Sp. 98, *Stygnocoris pedestris*)

The most common species of *Stygnocoris* in the London area, occurring, as the last, on dry chalky or sandy ground. On heaths it is often beneath heather and on light soils it may be found at roots of grass and moss, or on warm days by sweeping.

MIDDX. Hampstead Heath, 1.viii.43, *CHA* (17); Hounslow Heath, 1952, common beneath *Calluna*, *GEW* (33b).

HERTS. Chorley Wood, 3.xi.51, *WJLeQ* (21); Royston, 16.v.10, *EAB* (BM); and beyond the boundary at Berkhamstead Common, 18.ix.34, abundant under *Erica*, *DCT* (12); Berkhamstead (Northchurch), 14.x.62, *PSB* (16); and at Wymondley, *EAB* (11). Must be more frequent in the county than present records show.

ESSEX. Epping Forest, generally in moss and under leaves, and at Monk Wood, by sweeping heather, *CN* (35a); 9.vi.49 and 9.x.49, *DL* (SL); (Chingford), x.1890, 8.x.11 and 2.ix.11, *EAB* (BM).

KENT. Lee, 1900, *WW* (4), (39) and (22); Blackheath, *AAA* (22); St. Paul's Cray Common, 16.ix.05, *HM* (1/1905-06, 52); Dartford Brent, *D&S* (28), (4) and (22); Ruxley Gravel Pit, Foot's Cray, 15.xii.62 and 4.ii.62, *KCS* (14) and (22); Darenth Wood, 14.viii.21, *PH* (BM); Farningham Wood, 4.xi.62, *KCS* (14) and (22); Hayes Common, 31.x.37, *RWA* in *SW* coll. (44); 23.xi.63, *KCS* (14); Joyden's Wood, Bexley, 10.ix.60, *KCS* (14) and (22); Otford, ix.22, *PH* (BM); *AAA* (22); Brasted, viii.20, *PH* (BM); and Longfield, 30.viii.64, *GGES* (46).

SURREY. Coulsdon, 28.vii.08 ♂ and 25.xi.06 ♀, *ECB* (NM); Chipstead, 19.viii.06 ♂ and 22.ix.09 ♂, *ECB* (NM); Riddlesdown, 29.vi.64, a few by sweeping, *AAA* (51); Reigate, *FPP* (HD); Redhill, at roots of grass, *J&TL* (32); Bookham Common, circa 1900, *WW* quoted by *DL* (34); 13.ix.56 ♀, 29.ix.57 ♀ and 16.x.58 ♂, *EWG* (24); Headley Lane, 6.viii.24, *HStJKD* (HD); 22.ix.34, *LCB* (MM); Boxhill, 2.ix.1892, *AJC* (HD); 3.x.1896, *AJC* (HD); 9.vi.17, *EAB* (BM); 7.v.22, *PH* (BM); 5.xi.33 ♂ and 4.iii.34 ♂, *ECB* (NM); 15.ix.34, *FJC* (SL) and *AEG* (MM); 27.viii.50, *DL* (SL) and (1/1950-51, 77); 12.ix.53, *WJLeQ* (21); 1.viii.62, 25.vii.63 and 1.viii.62 by sweeping, and 24.ix.59 in moss, *AAA* (51); Mickleham, *JAP* (BM); 19.viii.06 ♂, *ECB* (NM); 19.vii.33, *JJC* (HD); Ranmore Common, 27.viii.62, *PSB* (16); Oxshott, *AJC* (HD); 30.viii.03 ♂, *ECB* (NM); 2.ix.50, *DL* (SL) and (1/1950-51, 79); 28.vii.57, *GGES* (HD); 17.ix.64, *PJLR* (MM); Esher, ix.1897, *WJA* (SL); Weybridge, 22.ix.63, *PSB* (16); and beyond the boundary at Woking, 1.viii.1874, *ES* (HD); 8.ix.41, *FJC* (SL); 5.ix.06, *HStJKD* (HD); Horsell Common, 27.viii.32 ♀, 3.ix.33 ♂, and 3.xi.33 ♀, *ECB* (NM); Chobham, 8.x.57, *GEW* (40); Byfleet, 8.ix.13, *EAB* (BM); Ash Vale, 8.ix.51, *WJLeQ* (21); 21.iv.64, *PJLR* (MM); and Blackheath and Farley Heath, 30.viii.36, numerous at roots of heather, *FJC* (1/1936-37, 36).

BUCKS. Latimer, 18.ix.34, *DCT* (12); 3.iii.57, *WJLeQ* (21); Little Chalfont, 4.x.52, *WJLeQ* (21); Hodgemoor Wood, 11.x.52, *WJLeQ* (21); Halton Wood, 25.xi.51, *WJLeQ* (21); Iver, 6.vi.53, *GEW* (40); Slough, 25.vi.53, *GEW* (40); (ICBFS), 12.viii.31, a ♀ from beneath *Deschampsia cespitosa*, *WHG* (41); (PILG), 9.ix.53, *GEW* (40); and beyond the boundary at Coombe Hill, 1.iii.52 and 6.viii.60, *WJLeQ* (21); 21.x.62, *PSB* (16).

Stygnocoris fuliginus (Geoff.) Sp. 106 p. 104

D&S p. 216 (*S. arenarius*) S p. 94 (*Stygnus arenarius*)

B p. 165 (Sp. 99)

A fairly common species usually found on damper ground than *pedestris*, such as the commons on London clay and pastureland and meadows on heavy soils.

MIDDX. South Kensington, 1.iii.49, in grounds of Natural History Museum under bricks and stones, *JFB* (BM); Finchley Road, London, N.W.8, 24.vii.50, *DL* (SL); Hampton, 8.v.44, *HStJKD* (HD); Hounslow Heath, 1953, common on the ash and rubble tip, *GEW* (33c); Northwood 22.x.43, *PJLR* (20); South Harefield, 29.iii.34, in sand-pit, *DCT* (33a).

HERTS. Barnet, viii.1885, *EAB* (BM); West Hyde, 27.viii.34, *DCT* (12); Watford, 21.viii.32, *DCT* (12).

ESSEX. Loughton, 30.vii.50, *DL* (SL); and beyond the boundary at Benfleet, 23.i.38, *RWA* (SL) and in *SW* coll. (44); and Danbury Common, 30.vii.60, *JHF* (42).

KENT. Lee, 1898, *WW* (39), (4) and (22); Plumstead, 1898, *WW* (39); *AAA* (22); Blackheath, *AAA* (22); Bostall Woods, *AAA* (22); Crayford Ness, 30.xii.59, *KCS* (14); Ruxley Gravel Pit, 21.i.61, *KCS* (14); Foots Cray, 26.ii.61, *KCS* (14); Darenth, *FPP* (HD); Horton Kirby, 12.iii.60, *KCS* (14) and (22); Farningham Wood, 4.xi.62 and 10.iii.63, *KCS* (14) and (22); Westerham, xi.20, *PH* (BM); iii.22, *PH* (BM); and just beyond the boundary at Ryarsh, *AMM* (22).

SURREY. Richmond Park, 26.xii.04 ♀, *ECB* (NM); 1.iv.05, *AJC* (HD); Putney, 17.i.20, *HStJKD* (HD); Coulsdon, 13.iv.07 ♂, 10.iii.07 ♂, 22.vii.11, *ECB* (NM); Reigate, 9.v.20 ♂ and ♀, *ECB* (NM); Reigate Heath, in sand pit, *J&TL* (32); Bookham Common, 26.ix.55, a single specimen, *EWG* (24); Headley Lane, 28.v.15, *AJC* (HD); Mickleham, *JAP* (BM); Oxshott, 30.viii.1895, *AJC* (HD); Arbrook Common, 24.v.53, *SL* (1/1953-54, 80); and beyond the boundary at Woking, 19.v.1888, under heap of coarse grass, *ES* (EMM 25, 35) and (HD); Chobham Common, 19.iv.06, *HStJKD* (HD); Ewhurst, ix.1899, *EAB* (BM); Shalford, viii.1886, *EAB* (BM); and Farley Heath, 21.viii.32 ♀, *ECB* (NM).

BUCKS. Amersham, 23.viii.52, *WJLeQ* (21); Latimer, 21.iii.53, *WJLeQ* (21); Iver, 6.vi.53, *GEW* (40); Slough, 19.v.54, *GEW* (40); (PILG) various dates, *GEW* (40).

Plinthinus brevipennis (Latr.) Sp. 107 p. 104

D&S p. 211 (*P. brevipennis*) and p. 212 (*P. bidentulatus*)

S p. 90

B p. 161 (Sp. 94)

A local species frequenting sandy areas and occasionally chalk slopes and old quarries. The adults hibernate beneath moss and leaf litter.

MIDDX. Northwood, 3.vi.39, *HStJKD* (BM); Uxbridge, 25.vii.35, common in rubbish, *DCT* (33a).

HERTS. West Hyde, in a rubbish heap, 27.viii.34, *DCT* (12).

ESSEX. Dagenham, *TRB* (37).

KENT. Plumstead, *JAP* (BM); 19.viii.57, in leaf litter, *AAA* (22); Bostall Wood, *AAA* (22); Darenth, *JAP* (BM); viii and ix, under moss including macropterous form, *D&S* (28), (36), (37), (4) and (22).

SURREY. Barnes, *JAP* (BM); Wimbledon, *GCC* (37) and (3); Claygate, *JAP* (BM); Reigate, *WB* (37) and (3); Reigate Heath, in sand pit, *J&TL* (32); Redhill Common, *J&TL* (32); Esher Common, 11.iii.61, a single specimen by grubbing at the foot of a birch tree, *AAA* (51); Weybridge, *JAP* (BM) and (37); *ES* (3); and beyond the boundary at Woking, v.1888,

ES (HD) and (3); Chobham, *ES* (3); Byfleet, 19.vi.15, *EAB* (BM); Gomshall, *EAB* (3); Abinger, ix.1899, *EAB* (BM); Shalford, viii.1886, *EAB* (3) and (BM); Ewhurst, *EAB* (3); and Farnham, *JAP* (BM); 10.v.52, *WJLeQ* (21).

BUCKS. Langley, *BPM* in *GEW* coll. (40); and beyond the boundary at Burnham, 1902, *PH* (BM).

Lasiosomus enervis (H.-S.) Sp. 108 p. 104
S p. 91 B p. 161 (Sp. 95)

A rare Lygaeid recorded from only a single locality in the London area where it was found beneath litter.

SURREY. Weybridge, sandy heath, *TRB* (3) and (38).

(Not far beyond our boundary it has been taken by Southgate and Woodroffe in Windsor Forest (Berks.), 14.iii.53, beneath a heap of dry verge side cuttings at the side of one of the drives (see Woodroffe, *EMM* 89, 168).)

Ischnocoris angustulatus (Boh.) Sp. 109 p. 105
D&S p. 209 (*Hynophilus hemipterus*) S p. 87
B p. 158 (Sp. 91, *I. angustulus*)

Another bug of heathy areas where it has been found running on the ground beneath *Calluna* and *Erica*. Masee (22) considers the species to be associated with ants.

KENT. Dartford Heath, *D&S* (28), (4) and (22); Darenth, 4.ix.21, *PH* (BM).

SURREY. Coombe Wood, *D&S* (28); Addington Hills, *D&S* (28); Reigate, *JAP* (BM); Redhill Common, at roots of grass, *J&TL* (36); Boxhill, 15.ix.17, *EAB* (BM); Oxshott, 28.ix.02 ♂ and 5.ii.05 ♀, *ECB* (BM); 2.ix.50, 2.ix.51 and 24.viii.52, *DL* (SL) (1/1950-51, 79) and (*EMM* 94, 70); 16.ix.50, *WJLeQ* (21); 28.vii.57, *GGES* (HD); Esher, *JAP* (BM); 25.ix.51, *FJC* (SL); and beyond the boundary at Woking, *JAP* (BM); v.1888, *EAB* (BM) and (38); v.1888, *ES* (HD); Chobham, iv.01 ♂, *WES* in *ECB* coll. (NM); 25.ic.53, *GEW* (40); Horsell, *JAP* (BM); Ash Vale, 8.ix.51, *WJLeQ* (21); *DL* (SL); Shere, 11.viii.35 ♂, *ECB* (NM); Albury, 22.viii.19, *ECB* (NM); Ewhurst, viii.1896, *EAB* (BM); Chilworth, viii.1886, *EAB* (BM); and St. Martha's viii.1892, *EAB* (BM).

BUCKS. Beyond the boundary at Burnham Beeches, 23.iii.02, *PH* (BM) and (26).

Drymus pilipes (Fieb.) Sp. 110 p. 106
D&S p. 199 S p. 116 B p. 178 (Sp. 118)

Another rarity whose few London area records are from only two counties, Kent and Surrey; the Kent record being just beyond the boundary. It has been found in moss amongst coarse grasses and all but one of the records are from chalky habitats.

KENT. Just beyond the boundary at Trottscliffe, *AMM* (22).

SURREY. Purley, 10.ix.01, ♂ and ♀, *ECB* (NM); Chipstead, 24.ix.10 ♀, *ECB* (NM); near Croydon, in moss, *ECR* (28), (36) and (3); Betchworth n.c. (36); Boxhill, 12.ix.20 ♀, *ECB* [Butler (38) mentions a specimen taken by E. C. Bedwell on Boxhill that was parasitized by a nematode worm, *Mermis* sp.]; Mickleham, *JAP* (28) and (36); *TRB* (37) and (3); and beyond the boundary at Chobham, *TRB* (3).

Drymus pilicornis (Muls.) Sp. 111 p. 106
 D&S p. 202 (*Rhyparochromus pilicornis*) S p. 116
 B p. 180 (Sp. 120)

Most records for this species are from the chalk downs of Kent and Surrey where it occurs in moss amidst grass. Boxhill is a locality where it has been known for many years.

SURREY. Caterham, GCC (37) and (3); Boxhill, 4.ix.95, AJC; WW (1/1905-06, 93); 8.x.33 ♂ and ♀, 18.x.36 ♂ and ♀, and 26.ix.37 ♂, ECB (NM); 2.x.49, DL in WJLeQ coll. (21); 25.viii.64, in moss, GEW (40); Mickleham, JAP (BM); Oxshott, 19.ii.05 ♀, ECB (NM); and beyond the boundary at Weybridge, TRB (37) and (3); Abinger, viii.1899, EAB (NM); Gomshall, in chalk pit amongst moss, EAB (3) and (38).

BUCKS. Beyond the boundary at Wendover, 19.viii.15, EAB (BM) and (38).

Drymus latus (D&S.) Sp. 112 p. 107
 B p. 178 (Sp. 119)

A very local and rare species also occurring in moss amongst the coarse grasses of hedgebanks or beneath leaves on slopes, both on the chalk.

HERTS. West Hyde, 14.ix.34, in moss, DCT (12).

KENT. Brasted ix.20, PH (BM). (Outside the area it has recently been recorded (Sept. 1961) after a lapse of 40 years, in a chalky situation on Coney Hill, Chatham in thick grass and moss, AMM (1/1961, 21).)

SURREY. Caterham, i.1878, ES (HD).

BUCKS. Little Chalfont, 24.ii.52 and 4.x.52, WJLeQ (21).

Drymus sylvaticus (Fab.) Sp. 113 (p. 107)
 D&S p. 196 S p. 115 B p. 180 (Sp. 121)

This is the most common species of the genus and has been recorded from all counties of the London area. Dry soils are preferred where the adults are usually found at roots of grass and other coarse plants. Allen (*in litt.*) has found *sylvaticus* on several occasions at roots of Labiatae, especially *Ballota nigra*, and believes there to be a possible connection with the bug feeding either on the seeds or other vegetative parts of members of this plant family.

MIDDX. South Kensington, 26.vi.41, courtyard of Natural History Museum, HStJKD (HD); Highgate, JAP (BM); Hampstead Heath, 1.viii.43, CHA (17); 30.viii.49, very common on sandy ground of West Heath, DL (SL) and (1/1949-50, 36-38); 13.v.51, on sand, DL (SL); Edgware, 9.iv.44, CHA (17); Northwood, 20.xi.43 and 17.iii.44, PJLR (20); Harefield, 1.iv.44, PJLR (20); Hounslow Heath, 1952, common on ash and rubble tip, GEW (33b); 22.x.59, a single specimen, AAA (51).

HERTS. Chorley Wood, 18.iv.53, WJLeQ (21); Rickmansworth, EAB (11); Royston, 25.v.12, EAB (BM) and (11); St. Albans, viii.1885, EAB (BM); and beyond the boundary at Harpenden (Rothamsted Expt. Station grounds), 21.iv.53, TRES (1/1953-54, 4).

ESSEX. Chingford, 17.ii.12, EAB (BM); Epping Forest, 28.i.11 and 18.vi.10, EAB (BM); generally distributed under dead leaves and at roots of plants, CN (35a); 7.i.49, RDW (SL); and beyond the boundary at Danbury Common, viii.53, JHF (42).

KENT. North Kent (with out precise locality), 8.v.1892, AJC (HD); Lee, WW (4), (39) and (22); Plumstead, 21.viii.1893, AJC (HD); WW (39); 20.x.57, on sandy slope, AAA (51); Blackheath Common at roots of

Ballota nigra, 19.viii.58, nymphs and a teneral adult; 13.viii.64, several teneral adults; 21.viii.62, plenty of V instar nymphs at roots of *Prunella* which were mostly adult a week later; 7.v.63 several at roots of *Mentha spicata*; 21-24.iii.61, plenty in traps of dead grass; 12.v.60, one example off a pear tree; 15.v.62, several by sweeping; all these records by AAA (51); Kidbrook, WW (39); Foots Cray, KCS (22); Ruxley Gravel Pit, 21.i.61, 26.ii.61, 15.xii.62 and 17.iii.63, KCS (14); Erith Marshes, 18.iii.05 ♀, ECB (NM); Dartford, 25.viii.06 ♀, ECB (NM); Darenth Wood, 15.xii.56, KCS (14); Farningham, 22.iv.58, under *Ballota nigra*, AAA (51); Farningham Wood, 5.ii.61 and 17.iii.60, KCS (14); 4.xi.62, KCS (14); Downe (Darwin's Bank), 29.iv.62, at grass roots on chalk, KCS (14); Otford, 3.x.20 and 12.iii.22, PH (BM); AMM (22); Shoreham, 27.ii.60, KCS (14); AMM (22); Westerham, 11.iii.22, PH (BM); Ide Hill, WRD (22); Longfield, 30.viii.64, GGES (46); and Fawkham, 29.xii.54, KCS (14).

SURREY. Wimbledon Common, 11.ii.1895, ECB (NM); 6.vii.41, V instar, FJC (SL); Tatsfield, 6.iv.21, LCB (MM); Limpsfield, iii.45, CHA (17); Coulsdon, 25.xi.06 ♂, ECB (NM); Chipstead, 11.ii.34 ♂, ECB (NM); 16.iv.12, EAB (BM); Riddlesdown, 29.vi.64, by sweeping and at grass roots, AAA (51); Buckland Hill, 17.v.05 ♀, ECB (NM); Reigate (Wingate Hill), 3.iii.50, in roots of tufted grass on Downs, GBR (45); Redhill, at roots of grass on marshy ground, J&TL (36); Bookham Common, 9.vi.34, AEG (MM); 4.v.52, DL; vi, viii, DL (34); Boxhill, viii.1892, EAB (BM); 21.iii.1893, AJC (HD); 12.ii.33 ♂, 5.ix.33 ♂, 4.iii.34 ♂, ECB (NM); 31.x.43, LCB (MM); 12.ix.53, WJLeQ (21); Mickleham, JAP (BM); v.1896, WJA (SL); iv.61, GEW (40); Ranmore, 25.iv.64, PJLR (MM); Oxshott, 9.viii.1893, AJC (HD); 19.ii.1899 ♀, 30.viii.03 ♀, ECB (NM); 28.v., COW (BM); Arbrook Common, 24.v.53, SL (1/1953-54, 80); Weybridge, 22.ix.63, PSB (16); and beyond the boundary at Woking, v.1888, ES (HD); Chobham, AJC (HD); Byfleet, 8.ix.13, EAB (BM); Basingstoke Canal between Pirbright Bridge and Frimley Green, 1954-55, HDS (50); Abinger, viii.1899, EAB (BM); Gomshall, viii.1899, EAB (BM); and Shalford, viii.1886, EAB (BM).

BUCKS. On the boundary at Slough (ICBFS), 4.viii.33 and 11 and 24.v.34, at base of grass stems, WHG (41); (PILG) 11.x.57 and various dates, GEW (40); Fulmer (Stoke Common), 29.ix.59, GEW (40); Chalfont St. Peter, 14.viii.25, EAB (BM); Hodgemoor Wood, 11.iv.53, WJLeQ (21); Amersham, 23.viii.52, WJLeQ (21); Little Chalfont, iii.57, 1.ix.53 and 4.x.52, WJLeQ (21); Latimer, 5.ix.50, WJLeQ (21); and beyond at Wendover, 19.viii.15, EAB (BM); Coombe Hill, 1.iii.52, WJLeQ (21) and Longdown Hill, 1.v.54, WJLeQ (21).

Drymus ryei (D&S.)

Sp.1 14 p. 108

D&S p. 197 (as a var. of *D. sylvaticus*) B p. 181 (Sp. 121 var.)

Found in similar situations to the previous species but much less frequently. Essex records wanting.

MIDDX. Highgate, JAP (BM); Harefield, 15.iii.52, WJLeQ (21).

HERTS. Barnet, viii.1885, EAB (BM); Royston, 26.v.17, EAB (BM).

KENT. Lee, 1902, WW (39); Otford, 3.x.20, PH (BM); 4.x.21, HStJKD (HD); 12.iii.22, PH (HD); 7.v.22 ♂ and ♀, 21.x.34 ♂, ECB (NM); AMM (22); Blackheath, AAA (22); Darenth, 20.v.05 ♂, ECB (NM); Birch Wood, JAP (BM).

SURREY. Coulsdon, 11.ii.12 ♂ and ♀, ECB (NM); Chipstead, 23.x.10 ♀, ECB (NM); Walton Heath, 8.iv.33 ♀, ECB (NM); Headley, 17.iv.49,

BPM in *WJLeQ* coll. (21); Headley Lane, 27.v.1900, *AJC* (HD); Boxhill, amongst dead leaves and rubbish, uncommon, *WW* (1/1905-06, 93); 14.iv.12 ♂ and ♀ and 12.ii.23 ♂, *ECB* (NM); Mickleham, *JAP* (BM); and beyond the boundary at Woking, v.1888, *ES* (HD); and Chobham, vii.1880, *ES* (HD).

BUCKS. Slough (PILG), iii.58, *GEW* (40); and Latimer, 14.vi.53, *WJLeQ* (21).

Drymus brunneus (Sahlb.)

Sp. 115 p. 108

D&S p. 198

S p. 116

B p. 181 (Sp. 122)

Widely distributed species occurring on commons, heaths and in woods, generally in damper situations than those preferred by *sylvaticus* or *ryei*. It is found beneath moss and leaf litter, where it also hibernates.

MIDDX. Highgate, *JAP* (BM); Hampstead Heath, 27.vii.43, *CHA* (17); Hounslow Heath, 1952, occasional under *Calluna* on the heath, *GEW* (33b).

HERTS. West Hyde, 7.ix.35, in moss, *DCT* (12); and beyond the boundary on Berkhamstead Common, 31.vii.60, *WJLeQ* (21).

ESSEX. Epping Forest, 7.i.49, *RDW* (SL); (Loughton), ix.1893 and 8.ix.15, *EAB* (BM); (High Beach), ix.07, *EAB* (BM); (Chingford), ix.1892, *EAB* (BM); (Monk Wood), *CN* (35a); (near Wake Valley pond), *CN* (35a); (Theydon), under bark, ix.1915, *CN* (35a).

KENT. Plumstead, 28.x.1893, *AJC* (HD); (Bostall Woods), 19.viii.57, at roots of oak, *AAA* (51) and (22); Chislehurst, 5.iv.65, swampy woodland litter, *AAA* (51); Darenth Wood, 14.viii.21, *PH* (BM); 7.iii.54 and 15.xii.56, *KCS* (14) and (22); Eynsford (Beechen Wood), 22.ii.64, *KCS* (14); Westerham, iv.21 and 11.iii.22, *PH* (BM); 17.vi.51, *DL* (SL) and (1/1951-52, 72); 25.vii.59, *KCS* (14); Brasted, v.20, *PH* (BM); and on the boundary at Seal, *KCS* (22).

SURREY. Shirley, 3.vi.09, *HStJKD* (HD); Wimbledon Common, 10.iii.21, *LCB* (MM); 19.ix.03 ♂, *ECB* (NM); Surbiton, viii.1892, *ES* (HD); Bookham Common, 20.x.63, *PSB* (16); Effingham, 18.iv.53, *SW* (44); Oxshott Heath, 27.v.11, *EAB* (BM); 28.iv.63, *PJLR* (MM); Esher Common, *JAP* (BM); 31.iii.1893, *AJC* (HD); viii.1892, a macropterous ♂ and ♀ taken by sweeping in a damp place, *ES* (38); 17.ix.58, a single specimen in wet moss, *AAA* (51); Weybridge, *JAP* (BM); 1906, captured with the ant, *Formica rufa*, *HStJKD* (HD); and beyond the boundary at Byfleet, 18.ix.51, an asymmetric example of ♀ with right side brachypterous and left side normal, *WJW* (SL), (EMM 88, 206) and (1/1951-52, 50); Basingstoke Canal, between Pirbright Bridge and Frimley Green, 1954-5, *HDS* (50); Wisley, 13.iii.65, *PSB* (16); and Farley Heath, 14.xi.59, on *Castanea*, *SW* (44).

BUCKS. Slough (PILG), 11.x.57, *GEW* (40); 18.x.57, *GEW* (HD); and beyond the boundary at Burnham Beeches, viii.93, *EAB* (BM); 22.vi.12, I and III instar larvae, *EAB* (BM); 4.viii.57, *WJLeQ* (21); 18.ix.57, *GEW* (40); and Wendover, 17.viii.15, III instar larva, *EAB* (BM).

Lamproplax picea (Flor.)

Sp. 117 p. 109

S p. 117 (*Drymus piceus*) B p. 182 (Sp. 123, *D. piceus*)

Rare and very local. This bug occurs in damp bogs amongst *Sphagnum* moss.

MIDDX. Harefield Moor, 17.ix.32, six specimens at roots of *Juncus*, *DCT* (33a).

ESSEX. Epping Forest (High Beach), ix.1892, *EAB* (BM); ix.1892, Wake Valley pond, in *Sphagnum*, *CN* (35a). (Possibly both the same record.—*EWG*.)

SURREY. Wimbledon Common, *ECR* (36), (37) and (3); Headley Lane, *TRB* (37) and (3); Bookham Common, 20.x.63, *PSB* (16); and beyond the boundary at Chobham Heath (Gracious Pond) beneath cut water plants, viii.1874, *ES* and *EAB* (BM), (HD), (3), (36) and (38); and Leith Hill, ix.1899, *EAB* (BM).

BUCKS. Beyond the boundary at Burnham Beeches, viii.1893, in *Sphagnum*, *EAB* (BM) and (38).

Scolopostethus pictus (Schill.) Sp. 118 p. 110
D&S p. 182 S p. 111 B p. 185 (Sp. 127)

Another rare species which seems in most of the British records to have been taken by sorting through corn-and hay-stack refuse. It hibernates as an adult.

SURREY. Reigate district, *J&TL* (36).

BUCKS. Ballinger near Chartridge, 19.vi.49, *DL* (SL) and in *WJLeQ* coll. (21).

Scolopostethus affinis (Schill.) Sp. 119 p. 110
D&S p. 183 (*S. adjunctus*) S p. 111
B p. 187 (Sp. 129)

Common and widely distributed throughout the London area. Often associated with Stinging Nettle though also found in leaf litter, beneath grass cuttings, at roots of grass and in moss. The macropterous form is occasionally found. Further records from Herts and Essex required.

MIDDX. Cripplegate bombed sites, 11.iii.50, *DL* (SL); Buckingham Palace grounds, viii. and ix.61, a few amongst litter in N.W. corner, *TRES* (52); Holborn Granary, *AJC* (HD); Hammersmith, *JAP* (BM); Finchley, 2.vii.44, *CHA* (17); Edgware, 9.iv.44, *CHA* (17); Hampstead Heath, 1949, at roots of nettle in winter, very common. About 25% exhibited antennal oligomery, *DL* (1/1949-50, 36-38); 10.iv.49, *DL* (SL); 31.v.50, quarry at The Spaniards, *DL* (SL); Ruislip N.R., 21.v.56, *EWG* (49); Harefield, 21.vi.52 and 13.ix.52, *WJLeQ* (21); Hounslow Heath, 1952, locally abundant on the ash and rubble tip, *GEW* (33b).

ESSEX. Orsett, 1.x.55, *KCS* (14).

HERTS. On the boundary at Harpenden (Rothamsted Expt. Station grounds), 21.iv.53, *TRES* (1/1953-54, 4); 5.vii.54, *GGES* (HD); and beyond at Wymondley, *EAB* (11).

KENT. Blackheath, 19.v.1900, *AB* in *AJC* coll. (HD); very common, often crawling up walls as well as in litter and taken by sweeping (macropters not rare), *AAA* (51) and (22); Lee, *WW* (4) and (22); Lewisham, *WW* (4) and (22); Kidbrook, *WW* (4) and (22); Foots Cray (Ruxley Gravel Pit), 21.i.61, 26.ii.61 and 17.iii.63, *KCS* (14); Darenth Wood, 1890, *AJC* (HD); 29.iv.54 and 14.iii.54, *KCS* (14); Farningham Wood, 11.iii.56, 6.i.60, 17.iii.64 and 15.xii.62, *KCS* (14); Horton Kirby, 12.iii.60 and 18.xii.55, *KCS* (14) and (22); Gravesend, 25.iii.34 ♂, *ECB* (NM); Otford, 12.iii.22, *PH* (BM); and Westerham, 24.vii.60, a single specimen by sweeping, *AAA* (51) and (22).

SURREY. Kew Gardens, i.56, *AHGA* (BM); Streatham, 26.vi.62 *PSB* (BM) and (16); Limpsfield, iii.45, *CHA* (17); Croydon, *FPP* (HD); Shirley, 8.vi.07 ♂ (NM); Coulsdon, 10.iii.07 ♂, *ECB* (NM); viii.62, in garden, *EWG* (24); Banstead, 16.vi.1900 (1/1900, 14); Reigate, 18.ii.51,

amongst *Digitalis* leaves, *GBR* (45); Redhill, under stones and etc., *J&TL* (36); Buckland Hill, 7.v.05, ♂ and ♀, *ECB* (NM); Headley Lane, 13.vi.49, *AEG* (MM); 17.vi.49, *FJC* (SL); Boxhill, 27.viii.50, *SL* (1/1950-51, 77); Bookham Common, 4.iii.51, *DL* (SL); Esher Common, 22.iii.1896, *WJA* (SL); and beyond the boundary at Woking, v.1888, *ES* (HD); Chobham, vi.1876, *ES* (HD); Basingstoke Canal, between Pirbright Bridge and Frimley Green, 1954-5, *HDS* (50); Ewhurst, viii.1889, *EAB* (BM); and Shalford, viii.1886, *EAB* (BM).

BUCKS. Slough (ICBFS), 29.iv.33, beneath a plank, *WHG* (41); (PILG), various dates, *GEW* (40); Datchet, various dates, *GEW* (40); Latimer, 16.viii.52, *WJLeQ* (21); Hedgerley, 25.iv.54, *GEW* (40); Common Wood, 30.ix.51, *WJLeQ* (21); and Amersham, 14.ix.52, *WJLeQ* (21).

Scolopostethus grandis (Horv.)

Sp. 120 p. 111

S p. 111

B p. 186 (Sp. 128)

This rare species occurs in woodland and hedgerows beneath dead leaves, stones and small piles of twigs, and has also been found under heather. It overwinters as an adult.

MIDDX. Harefield, 21.vi.52, *WJLeQ* (21).

HERTS. Beyond the boundary at Royston, *EAB* (11).

ESSEX. Walthamstow, 1896, *CN* (35a); Epping Forest, iv.1896 and ix.1898, between St. Peters Church and the Waterworks, under dead leaves near nest (since disappeared) of *Formica rufa*, *EAB* (BM) (38) and (35a).

KENT. Blackheath, *AAA* (22).

SURREY. Weybridge, 25.xi.62, *PSB* (16); and beyond the boundary at Woking, v.1888, *ES* (HD) (BM) and (3); vii.1888, *ES* (HD); Chobham, vi.01, *ES* (HD) and (3); Shere, v.04, *EAB* (BM); Gomshall, viii.1890, (BM); and Leith Hill, viii.1895, *EAB* (BM) and (3).

BUCKS. Hedgerley, 24.viii.52, *GEW* (40).

Scolopostethus puberulus (Horv.)

Sp. 121 p. 111

S p. 112

B p. 190 (Sp. 132)

Also rare, this Lygaeid has been recorded at one locality in the London area. Elsewhere in S. England its most usual habitat seems to be in moss on the chalk slopes. In East Anglia it prefers marshy conditions.

ESSEX. Epping Forest (Wake Arms) iv.02 and v.04, *EAB* (BM).

Scolopostethus thomsoni (Reut.)

Sp. 122 p. 111

S p. 112 (*S. neglectus* Edw.)

B p. 188 (Sp. 130)

Commonly and widely dispersed, this bug is found in a variety of habitats including woodland, waste ground, commonland, damp meadows and also gardens. The bases of nettle clumps seem especially favoured. It hibernates in the adult state.

MIDDX. Ruislip N.R., 15.v.63, two adults and many larvae at bases of nettles, *WFS* (49); Harefield, 22.viii.16, *EAB* (BM); 21.vi.52, *WJLeQ* (21); Hounslow Heath, 14.vii.53, several large colonies on the ash and rubble tip, *GEW* (33c).

HERTS. On the boundary at Harpenden, 28.vi.55, 2.vii.55 and 12.-viii.55, *GGES* (HD); and beyond at Wyndley, viii.1880, *EAB* (BM); and Knebworth, 1911, *EAB* (BM).

ESSEX. Epping Forest (Theydon), vii.22, *CN* (35a); and beyond the boundary at Danbury Common, viii.53, *JHF* (42).

KENT. Lee, *WW* (4) and (22); Lewisham, *WW* (4) and (22); Kidbrook, *WW* (4) and (22); Blackheath, 26.viii.64, a single macropterous ♀ by sweeping in garden, very rare, *AAA* (51) and (22); Plumstead, *AAA* (22); Farningham Wood, 27.iv.62, *KCS* (14) and (22); Otford, *AMM* (22); Horton Kirby, 27.iv.62, *KCS* (14) and (22); and beyond the boundary at Ryarsh, *AMM* (22); and Borough Green, *KCS* (22).

SURREY. Addington, *FPP* (HD); Chipstead, xii.1900, *WJA* (SL); Boxhill, 27.viii.50, *DL* (1/1950-51, 77); Bookham Common, 7.viii.50, *DL* (SL); viii. and ix, *DL* (34); 29.iii.44, *LCB* (MM); Oxshott, 9.vii.1898, *AJC* (HD); 17.iv.25, *LCB* (MM); and beyond the boundary at Woking, vii.1888, *ES* (HD); Chobham, vi.1888, *ES* (HD); vii.1892, *ES* (HD) and (BM); 12.viii.02, *AB* in *AJC* coll. (HD); 5.vii.53, *GEW* (40); Ripley, 18.v.51 *HDS* (SL); Basingstoke Canal between Pirbright Bridge and Frimley Green, 1954-5, *HDS* (50); Camberley, 4.x.47, *LCB* (MM); Gomshall, viii.1892, on marsh, *EAB* (BM); Shere, viii.1892, *EAB* (BM); Albury Heath, vii.1892, on nettles, *EAB* (BM); Ewhurst, viii.1898, *EAB* (BM); Shalford, viii.1886, *EAB* (BM); Farley Heath, viii.1892, on nettles, *EAB* (BM); and Peaslake, viii.1892, *EAB* (BM).

BUCKS. On the boundary at Datchet, vii.56, in garden, *GEW* (40); Slough (ICBFS), 4.v.29, *WHG* (41); (PILG) various dates, *GEW* (40); and Fulmer, 2.vi.57 and 26.vi.55, *WJLeQ* (21); and beyond at Burnham Beeches, viii.1893, *EAB* (BM); Hodgemoor Wood, 19.iv.52, *WJLeQ* (21); Little Chalfont, 26.iv.54, *WJLeQ* (21); Penn Wood, 1.vii.51, *WJLeQ* (21); Amersham, 6.vii.52, 18.vii.53, 23.viii.52, and 14.ix.52, *WJLeQ* (21); Little Missenden, 13.vii.52, *WJLeQ* (21); Chesham Vale, 5.vii.52, *WJLeQ* (21); and Coombe Hill, 7.vii.63, *PSB* (16).

Scolopostethus decoratus (Hahn)

Sp. 123 p. 112

D&S p. 185 (*S. affinis* D.&S)

S p. 112

B p. 189 (Sp. 131)

Also common and occurring widely. It is found almost always beneath Heath (*Erica* spp.) and Ling (*Calluna vulgaris*) on heathlands around London, though it has, on a few occasions, been taken far away from where these plants are growing. Herts. records wanting.

MIDDX. Hampstead, 15.ix.79, IV instar larvae, *EAB*; Ruislip Common, 20.ix.34, common under *Erica*, *DCT* (33a); Hounslow Heath, 1952, very abundant beneath *Calluna* on the Heath, *GEW* (33b).

HERTS. Beyond the boundary at Berkhamstead Common, 2.x.35, under *Erica*, *DCT* (12).

ESSEX. Epping Forest, common under heather, *CN* (35a); Chingford, x.1890, *EAB* (BM).

KENT. Plumstead, 1892, *WW* (39), (4) and (22); Blackheath, 17.ix.59 and 3.x.59, in garden doubtless strays from heather in another garden not far off, *AAA* (51) and (22); Dartford Heath, 26.iv.52, *KCS* (14) and (22); Farningham Wood, 17.iii.60, 5.ii.61 and 4.xi.62, *KCS* (14) and (22); and Westerham, v.21. and 11.iii.22, *PH* (BM).

SURREY. Putney Heath, 24.x.46 and 12.xii.46, *TEW* (EMM 85, 199); Shirley, *JAP* (BM); Limpsfield, iii.45, *CHA* (17); Reigate Heath, 4.iv.51, in moss beneath *Calluna*, *GBR* (45); Redhill Common, at roots of grass, *J&TL* (36 as *S. affinis*); Esher Common, *JAP* (BM); 21.viii.54, *EWG* (24); throughout the year under heather and also in summer by sweeping, very common, *AAA* (51); Oxshott Heath, 21.ix.1895, *AJC* (HD); 3.iv.1896, *WJA* (SL); 30.viii.03 ♂ and 5.ii.05 ♂, *ECB* (NM); 2.ix.50, *DL* (SL) and

(1/1950-51, 79); 16.ix.50, *WJLeQ* (21); 2.ix.51, *DL* (SL); 24.viii.52, *WJLeQ* (21); 4.viii.55, *EWG* (24); 13.x.60, *MA* (HD); 17.ix.64, *PJLR* (MM); throughout the year under heather and also in summer by sweeping very common, *AAA* (51); Ockham Common, 2.iv.49, *DL* (SL); Weybridge, *JAP* (BM); and beyond the boundary at Wisley, 13.iii.65, *PSB* (16); Byfleet, 8.ix.35, numerous on oak (*sic*), *FJC* (1/1935-36, 28); 8.vii.50, *DL* (1/1950-51, 73); Woking, v.1888, *ES* (HD); Chobham Common, iv.1892, *ES* (HD); 31.v.63, *WLJeQ* (21); various dates, *GEW* (40); Ash Vale, 10.ix.50, *DL* (SL); 12.iv.64, *PJLR* (MM); Basingstoke Canal between Pirbright Bridge and Frimley Green, 1954-5, *HDS* (50); Shere, v.04, *EAB* (BM); Abinger Hammer, 11.v.12, *EAB* (BM); Ewhurst, viii.1890, *EAB* (BM); Chilworth, viii.1880, *EAB* (BM); Leith Hill, viii.1895, *EAB* (BM); and Holmbury, iv.1894, *EAB* (BM).

BUCKS. On the boundary at Slough (PILG), 22.iv.53, *GEW* (40); and beyond at Hodgemoor Wood, 11.v.51, *WJLeQ* (21); Burnham Beeches, viii.1893, *EAB* (BM); 1902, *PH* (BM); various dates, *GEW* (40); and Coombe Hill, 7.vii.63, *PSB* (16).

Eremocoris podagricus (Fab.)

Sp. 125 p. 113

S p. 107

B p. 176 (Sp. 116)

A very local species usually taken singly on bare ground amongst roots of herbage or grass, in rubble, or beneath dead leaves under bushes, most often in old chalk pits or on chalk slopes. It overwinters as an adult.

KENT. Woolwich Arsenal (Erith Marshes), 14.x.62, *PCJ* (BM); Darenth Chalk Pit, *AMM* (22); Otford, *AMM* (22); Shoreham, 30.iv.62 and 13.x.62, *KCS* (14); Fawkham, 7.iv.50, *GGES* (46); and beyond the boundary at Ryarsh, *AMM* (22); and at Burnham Downs, viii. and ix.59 *AMM* (MM).

SURREY. Chipstead, 2.v.03 ♂, *ECB* (NM); x.60, *GEW* (40); Coulsdon, 5.v.06 ♂, *ECB* (NM); Buckland Hill, 4.iii.23 ♀, *ECB* (NM); Colley Hill, 13.v.50, on path, *BPM* in *WJLeQ* coll. (21) and (1/1950-51, 57); Riddlesdown, 29.vi.64, two specimens at roots of herbage, *AAA* (51); Headley Lane, 21.ix.34, *LCB* (MM); Bookham, vii.1900, *WJA* (SL); Boxhill, 17.iv.54, a single specimen taken on the southern slopes, *SL* (1/1954-55, 78); 25.ix.37 ♂ and 10.v.36 ♀, *ECB* (NM); Shere (Juniper Hill), *EAB* (38); and Abinger, 28.v.41, *ECB* (NM).

BUCKS. Longdown Hill, 29.iv.57, a pair found near base of a hedge beneath *Myosotis* growing on bare chalk, *GEW* (40) and (EMM 93, 207).

Eremocoris fenestratus (H.-S.)

Sp. 126 p. 114

D&S p. 177 (*E. erraticus*)

S p. 107

B p. 177 (Sp. 117)

Recently Woodroffe has critically reviewed the British species of *Eremocoris* (see EMM 1962, 98, 262-3 (1963)) and has shown that the Scottish specimens previously considered as *fenestratus* are, in fact, inseparable from the Continental and widely spread Palaearctic species *abietis*, and it is only those records from southern England (*excluding* Kent) that are the true *fenestratus*. (Woodroffe concludes that the Kent records are *abietis*, see next species). Its host plant is juniper (*Juniperus communis*) and it is found either on the branches or in the litter of needles on the ground beneath the bushes.

SURREY. Sanderstead Downs, taken singly by beating *Juniperus*, *D&S* (28), (36) and (3); x.1861, *GL* (BM); Croydon, x, *JAP* (BM); *WB* (37) and (3); Caterham, *GCC* (37) and (3); Reigate, on the Downs beneath

and on *Juniperus*, *ES* (37), (3) and (38); Redstone, *J&TL* (32); Headley Lane, taken singly by beating *Juniperus*, *D&S* (28), (36) and (3); Mickleham, *GCC* (37) and (3).

BUCKS. Beyond the boundary at Coombe Hill, 6.ix.62, adult and larvae beneath *Juniperus*, *GEW* (40) and (EMM 98, 207).

Eremocoris abietis (Linn.)

Ref.: Woodroffe, G. E., in EMM 1962, 98, 262 (1963)

Woodroffe when critically examining the British species of *Eremocoris* (see above reference and remarks under previous species) found that the Kent and Scottish examples previously regarded as *fenestratus* proved to be *abietis*. The single London area record from Otford collected by Dr. A. M. Masee and given in his first Kent list as *fenestratus* (Trans. Soc. Brit. Ent. 1954, 11, 258, though not repeated in his revised list (22)) will most likely be *abietis* also.

Taphropeltus contractus (H.-S.)

Sp. 127 p. 114

D&S p. 186 (*Scolopostethus contractus*)

S p. 113 (*Notochilus contractus*) B p. 184 (Sp. 125, *N. contractus*)

A widespread though somewhat local species occurring on chalk slopes, dry waste ground, and in hedge bottoms where it is found beneath leaves, moss or under low growing plants. It hibernates in the adult state under stones and in hollow stems.

MIDDX. Palmers Green, 26.iv.09, *EAB* (BM); Finchley, 2.vii.44, *CHA* (17); Lampton, 31.vii.44, *HStJKD* (HD); Hounslow Heath, 1952, occasional on the ash and rubble tip, *GEW* (33b); 26 and 27.vii.53 and 9.viii.53, *DL* (SL); Harefield, 8.viii.54, *WJLeQ* (21); West Middlesex, everywhere in rubbish, haystacks, gardens and hedge bottoms, but never abundant in any one place, *DCT* (33a).

HERTS. St. Albans, viii.1885, *EAB* (BM); 1923, *BSH* in *PH* coll. (BM); and beyond the boundary at Letchworth, 11.iv.14, *EAB* (BM) and (11); very widely distributed but never abundant, hibernates under stones and in hollow stems, etc., as imago, *DCT* (12).

ESSEX. Beyond the boundary at Writtle, viii.53, *JHF* (42).

KENT. Kidbrook, *WW* (39); Lee, *WW* (39); *JAP* (BM); Lewisham, *WW* (39); Eltham, *JAP* (BM); Plumstead, 20.ix.57, a single specimen on sandy slope, *AAA* (51) and (22); Blackheath, 9.v.59, 5.v.60, 7.v.60, 9.v.60 and 16.v.53, single examples taken in garden always in May, *AAA* (51); 17.x.62, on house wall, *AAA* (51) and (22); Dartford, 25.viii.06 ♂, *ECB* (NM); Footh Cray (Ruxley Gravel Pit), 26.ii.61, *KCS* (14); Darenth Wood, ix.21, *PH* (BM); Otford, 4.ii.28, 22.iv.23, 30.ix.22, 25.xi.22 and 17.xii.22, *PH* (BM); *AMM* (22); and Westerham, 1923, *PH* (BM).

SURREY. Shirley, *JAP* (BM); Coulsdon, 8.x.16 ♀, *ECB* (NM); Chipstead, 16.iv.12, *EAB* (BM); Ewell, 10.ix.20, *EAB* (BM); Buckland Hill, *J&TL* (36); 4.iii.23 ♂, 7.v.05 ♀ and 12.v.07 ♀, *ECB* (NM); Reigate, on houses, *J&TL* (36); Reigate Tunnel, *J&TL* (36); Oxshott, 10.v.02, *AB* in *AJC* coll. (HD); and beyond the boundary at Woking, v.1888, *ES* (HD); and Leith Hill, viii.1895, *EAB* (BM).

BUCKS. Slough (PILG), 25.iv.53, *GEW* (40); and just beyond the boundary at Latimer, 5.ix.50, *WJLeQ* (21); and Amersham, 9.vii.49, *DL* (SL).

Taphropeltus hamulatus (Thoms.) p. 134B p. 184 (Sp. 126, *Notochilus hamulatus*)

Refs.: Saunders, E., EMM 44, 252 (1908); Woodroffe, G. E., EMM 1959, 95, 262 (1960).

This was first introduced as a British species by Saunders in 1908 (see above ref.) though several authors since have regarded it as merely a small form of *contractus* or at most a dark variety of the same. More recently (1960) Woodroffe (see above ref.) has again considered it at specific level. He has shown it as being separable mainly (though there may be a few exceptions) by its having the base to the hemelytra dark brown and apex of the corium without, or with only a very small, pale spot (cf. base of hemelytra pale and apex of corium with conspicuous pale spot in *contractus*). It has been found on the ground amongst moss on the chalk and is rarer than the last species.

London district (without further localization) GCC in ES coll. (HD) and (EMM 44, 252).

KENT. Dartford, 25.viii.06 ♂, ECB (NM); Lewisham, WW (EMM 44, 252) and (22).

SURREY. Buckland Hill, 7.v.05 ♀, ECB (NM); Headley Lane, 28.iii.36 ♀, ECB (NM); Boxhill district, AMM (cited by GEW in EMM 95, 264); and beyond the boundary at Byfleet, 19.vi.15, I instar larva, EAB (BM); Abinger Hammer, 12.ix.59, in chalk pit on N. Downs, a small colony of adults and nymphs amongst mossy chalk fragments, GEW (EMM 95, 262-4).

Taphropeltus limbatus (Fieb.) Sp. 128 p. 114S p. 113 (*Notochilus limbatus*) B p. 183 (Sp 124)

In Britain this rare bug is essentially a species of Wessex and the S.W., either coastal or not far inland. The old Middlesex record alluded to in Southwood and Leston (p. 114) and probably the basis for the entry for that county in Masseur's County Distribution chart (EMM 91, 7-27, 1955) is that quoted by Butler (38, p. 183). He cites a single specimen having been taken by E. C. Bedwell (no date given) in wet moss in a ditch in Bowes Park, north London. This park has long since disappeared under bricks and mortar of residential Wood Green. It is most unlikely that it will be found in this locality again, though as a V instar nymph has been recorded just beyond our boundary in the Windsor Forest (Berkshire), 8.viii.33, HStJKD (HD), there is a possibility, albeit somewhat remote, that it may be turned up in a likely damp situation in the western part of the London area. The New Forest records are from besides streams or in *Sphagnum* moss.

Gastrodes abietum (Berg.) Sp. 129 p. 115D&S p. 167 (*G. abietis*) S p. 119 (*G. abietis*)B p. 190 (Sp. 133, *G. abietis*).

On the Continent the distribution of this bug coincides closely with that of the Norway Spruce (*Picea abies*) and in this country it has been found wherever plantations of this conifer have been established. Though it is probably present throughout the spruce forests of the Scottish Highlands, the paucity of records so far (certainly those from English counties) reflect the difficulty of collecting this bug which keeps mainly to the young cones on the topmost branches. As it has been taken just outside the

London area on Chobham Common, Surrey, *TRB* (3) it is possible it may occur inside the boundary if likely spruce plantings on other West Surrey heaths are searched.

Gastrodes grossipes (De Geer) Sp. 130 p. 117

D&S p. 168 (*G. ferrugineus*) S p. 118 (*G. ferrugineus*)

B p. 191 (Sp. 134)

This species is locally common being found wherever numbers of Scots Pine (*Pinus sylvestris*)—its main host—are growing together. Occasionally it has been taken on the Maritime Pine (*Pinus pinaster*), the Corsican Pine (*P. nigra* var. *maritima*), the Austrian Pine (*P. nigra* var. *nigra*), and more rarely the Norway Spruce (*Picea abies*). Unlike the previous species it may readily be taken by beating the lower branches. It hibernates as adult in between the scales on the cones. Essex records wanting.

MIDDX. Uxbridge, viii.33, on *Pinus sylvestris*, *DCT* (33a).

HERTS. Beyond the boundary at Berkhamstead Common, 2.i.34, hibernating as imago in cones of *Pinus sylvestris*, *DCT* (12).

KENT. Hayes Common, 12.vi.30 ♂, *ECB* (NM); Plumstead (Bostall Wood) on Scotch firs, *WW* (39); Birch Wood, *TAM* (37).

SURREY. Limpsfield, 10.iii.45, *CHA* (17); Headley Lane, *TRB* (37); Boxhill, 2.x.55, *EWG* (24); Mickleham, viii.1886, *EAB* (BM) (37) and (3); Oxshott Heath, 16.v.1897 ♂, *ECB* (NM); 27.v.11, *EAB* (BM); 23.iii.23, *LCB* (MM); 30.vi.51, both nymphs and adults on firs, *FJC* (1/1951-52, 73); 24.viii.52, *DL* (SL); 18.vii.53, beaten from firs, occasional, *FJC* (1/1953-54, 84-86); 15.ix.63 and 17.vii.54, beaten singly from pine, *AAA* (51); Esher Common, *JAP* (BM); 18.v.01, *SWK* (1/1901, 12); *GCC* (37) and (3); 13.viii.51, larva, *FJC* (SL); Ockham, 7.iv.34, beaten from pines, abundant, *SL* (1/1934-35, 7); Weybridge, *TRB* (37) and (3); on the boundary at Byfleet, 9.vii.50, *DL* (SL); near Wisley Pond, 2.iv.49, on *Pinus sylvestris*, *SL* (1/1949-50, 70); and beyond at Woking, *ES* (3); Horsell Common, 7.viii.33 ♂, *ECB* (NM); 13.vi.53 and 10.iv.55, *SW* (44); 13.v.56, *FB* (18); Guildford, 20.v.43, *LCB* (MM); Blackheath, 30.viii.36, on firs, *FJC* (1/1936-37, 36); Farley Heath, viii.1892, *EAB* (BM) and (3); Shere, viii.1892, *EAB* (BM) and (3); and Leith Hill, vi.1900, *EAB* (BM) and (3).

BUCKS. On the boundary at Little Chalfont, 19.xi.51, in a spruce cone, *WJLeQ* (21); and beyond at Amersham, 7.iii.53, from spruce cones, *WJLeQ* (21); and Burnham Beeches, 26.iii.52, *GEW* (40).

Cymus clavicularis (Fall.) Sp. 131 p. 119

D&S p. 235

S p. 72

B p. 143 (Sp. 75)

A locally frequent species found in dry or cindery places in meadows, waste places or on rubbish tips, often associated with *Polygonum aviculare* and *Rumex acetosella*. It hibernates as adult at grass roots or in moss.

MIDDX. South Harefield, 7.viii.33, under *Polygonum* in a sand pit, *DCT* (33a); Hounslow Heath, 1952, under *Polygonum aviculare* on ash and rubble tip, *GEW* (33b).

HERTS. West Hyde, 29.ix.34, *DCT* (12); Barnet (Arkley), 21.viii.49, *CHA* (17); Whetstone, 29.viii.61, a single ♂ caught in a m.-v. light trap, *PHW* (47); and beyond the boundary at Tring, 27.iii.34, hibernating as adult at roots of grass, *DCT* (12).

ESSEX. It has been taken beyond the boundary at Danbury Common, viii.53, *JHF* (42).

KENT. Lee, 1893, *WW* (39); Shooter's Hill, 1900, *WW* (39); Plumstead Marshes, 1901, *WW* (39), (4) and (22); Lewisham, ix, *D&S* (28), (4) and (22); Blackheath, 20.7.1901, *AB* in *AJC* (HD); 23.x.52, a single specimen in dead leaves from beech hedge in garden, *AAA* (51) and (22); Dartford, ix, *D&S* (28), (4) and (22); Bromley, vii.1886, *ES* (HD); Swanscombe (Park Wood), 9.v.64, *KCS* (14); Bexley (Joyden's Wood), 11.vii.64, *KCS* (14); Otford, 25.xi.22, *PH* (BM); 16.viii.25 ♂ and ♀, *ECB* (BM); Westerham, 1922, *PH* (BM).

SURREY. Addington, iii.07 ♀, *WES* in *ECB* coll. (NM); Riddlesdown, 9.v.59, a single specimen swept from short chalk turf where *Carex glauca* was also growing, *AAA* (51); Reigate, iii.05 ♂ and ♀, *WES* in *ECB* coll. (NM); Ashted, 25.ix.48, *DL* (SL); Boxhill, 6.viii.17 ♂ and 4.iii.34 ♂, *ECB* (NM); 31.x.45, *LCB* (MM); 23.iv.60, *DL* (HD); Mickleham, x, *D&S* (28); Bookham Common, viii.15, *WJA* (SL); 30.vii.51, *DL* (SL); 20.viii.50, at base of grass, thistle, etc., in waste cindery ground, *DL* (SL); vii and ix, under short grass beside the cindery track of Bayfield and Central Plains, *DL* (34); Oxshott Heath, 18.v.01, *AB* in *AJC* coll. (HD); 2.ix.50, on ground beneath heather, *DL* (SL) and (1/1950-51, 79); 16.ix.50, *DL* (SL) and in *WJLeQ* coll. (21); 24.vii.52, *DL* (SL); 24.viii.52, *WJLeQ* (21); 20.xi.52, *DL* (SL); Esher, *JAP* (BM); and beyond the boundary at Woking, *JAP* (BM); v.1888, *ES* (HD); Chobham Common, 2.vi.1879, *ES* (HD); 13.vii.59, *GEW* (40); Byfleet, 27.vii.1899, *AB* in *AJC* coll. (HD); 8.vii.50, *DL* (SL) and (1/1950-51, 73); Abinger, viii.1899, *EAB* (BM); Chilworth, viii.1886, *EAB* (BM); and Ash Vale, 10.ix.50, *DL* (SL).

BUCKS. Slough (Upton Court Road waste plot) 1953-54, *GEW* (33d); (PILG), 1.vi.55, *GEW* (40) and (HD); on the boundary at Fulmer (Stoke Common), 24.v.53, *WJLeQ* (21); and Hedgerley, 6.vi.53, *GEW* (40); and beyond at Burnham Beeches, 26.vi.02 ♂ and ♀, *ECB* (NM); n.c. (26); and Coombe Hill, 30.vi.61, *WJLeQ* (21).

Cymus melanocephalus (Fieb.)

Sp. 132 p. 120

S p. 72

B p. 142 (Sp. 74)

An occasional species (more common in Surrey) found in damper situations than the previous species, and associated with *Juncus* spp. and *Lotus uliginosus* particularly by stream and pond sides. Like *clavicularis* it also hibernates as adult. Herts. records wanting.

MIDDX. Hampstead Heath (West Heath), 5.ix.49, *DL* (SL) and (1/1949-50, 36-38); Northwood, 22.x.43, *PJLR* (20); Hounslow Heath, 1952, by sweeping *Salix* etc., in swamp, *GEW* (33b).

ESSEX. Beyond the boundary at Widford, 28.vii.60, *JHF* (42); and Danbury Common, 30.vii.60, *JHF* (42).

KENT. Just beyond the boundary at Higham, 26.v.60 and 14.vii.63, *KCS* (14) and (22); and at Cliffe, 26.vi.60 and 30.viii.64, *KCS* (14).

SURREY. Caterham, *GCC* (37) and (3); Reigate, n.c. (36); Wimbledon Common, 31.v.1892 ♂ and ♀, *ECB* (NM); Bookham Common, 29.iii.44, *LCB* (MM); 30.vii.51, 5.viii.50, 9.ix.51, *DL* (SL); 9.ix.51, *WJLeQ* (21); 9.viii and 16.viii.53, IV and V instar larvae, *EWG* (24); 16.viii. and 13.ix.53, adults ♂♂ and ♀♀, *EWG* (24); 8.vii.56, 10.vii.55 and 14.vii.58, *EWG* (24); 2.viii.60, *DL* (HD); 26.ix.64, locally common in one area, by sweeping *Juncus*, *AAA* (51); Oxshott Heath, 8.i.50, n.c. (SL); Esher Common, *GCC* (37) and (3); Weybridge, 1871, n.c. (BM); and beyond the boundary at Woking, vii.1892 and viii.1882, *ES* (HD) and (3); Chobham Common, vii.1874, *ES* (HD) (BM) and (36); vi.1876, *ES* (HD); viii.1882, *EAB* (BM);

Gracious Pond, *EAB* (38); 28.vii.1894, *AJC* (HD); 19.v.08, *HStJKD* (HD); 22.vii.33 ♂, *ECB* (NM); 5.viii.33, *JJC* (HD); 30.vi.34, *JJC* (HD); Byfleet, 8.vii.50, *DL* (SL) and (1/1950-51, 73); Basingstoke Canal, between Pirbright Bridge and Frimley Green, 1954-5, *HDS* (50); Ash Vale, 4.ix.49 and 10.ix.50, *DL* (SL); and Albury Mill Pond, 12.v.54, two or three specimens on sedges, *FJC* (1/1934-35, 13).

BUCKS. Slough, in swamp, *GEW* (40); and beyond the boundary at Burnham Beeches, 20.ix.1900, *PH* (BM).

Cymus glandicolor (Hahn) Sp. 133 p. 120
D&S p. 236 S p. 71 B p. 140 (Sp. 72)

The most common species of the Cymini occurring in the London area. It is usually found in damp situations where the vegetation is lush and includes various species of sedge e.g. *Carex nigra*, *C. acuta* and *C. vesicaria*, which are its host plants. More rarely it has been found in drier situations amongst short grass, particularly where the sedge *Carex glauca* occurs. Herts. records required.

MIDDX. Edgware, 5.vi.48, *CHA* (17); Harefield Moor, 19.ix.34, on *Juncus*, *DCT* (33a).

ESSEX. Beyond the boundary at Danbury Common, viii.53, *JHF* (42).

KENT. Lee, x, in tufts of *Carex* in an old clay pit, *D&S* (28) and (4); *JAP* (BM); 1898, *WW* (39); Grove Park, *WW* (39), (4) and (22); and Westerham, ii.21, *PH* (BM).

SURREY. Redhill, at bottom of haystacks &c., *J&TL* (36); Boxhill, 1.viii.62, a colony of nymphs with a single adult by sweeping on a short stretch of chalk hills barer of vegetation than its surroundings, the food plant here perhaps being *Carex glauca* though this was not actually noted, very local, *AAA* (51); Bookham Common, vii.17, *WJA* (SL); 29.iii.44, 16.iv.43 and 12.viii.42, *LCB* (MM); 7 and 20.viii.50, *DL* (SL); v-viii, adults, amidst *Myosotis*, *Mentha*, *Typha* and *Equisetum* at east end of I.O.W. Pond, *DL* (34); and beyond the boundary at Woking, vi.1892, *ES* (HD); Chobham, vi.1886, *ES* (HD); viii.1882, *EAB* (BM); 25.v.51, *GEW* (40); 31.v.63, *WJLeQ* (21); Byfleet, 22.vii.1899, *AB* in *AJC* coll. (HD); 14.v.49, along Basingstoke Canal, *SL* (1/1949-50, 72); 8.vii.50, *DL* (1/1950-51, 73); Basingstoke Canal between Pirbright Bridge and Frimley Green, 1954-5, *HDS* (50); Albury Mill Pond, 12.v.34, two or three on sedges, *FJC* (1/1934-35, 13); Gomshall, viii.1899, *EAB* (BM); and Ash Vale, 4.ix.49, *DL* (SL).

BUCKS. Slough, 2.viii.58, *GEW* (40); Wraysbury Gravel Pits, *GEW* (40).

Cymus obliquus (Horv.) Sp. 134 p. 120
B p. 141 (Sp. 73)

A rare and very local bug associated with the Wood Club rush (*Scirpus sylvaticus*)—itself a local plant of swampy situations at edges of ponds and streams and in damp woods.

SURREY. Wimbledon Common, 13.v.1895 ♀, *ECB* (NM) (cited also by Morris in 1/1959, 13); and beyond the boundary at Gomshall, *EAB*; before 1910 (cited in *EMM* 45, 59 and Southwood and Leston, p. 121).

Though both these records are old, it seems likely that this species may well turn up again either within the boundary or near the perimeter, for Woodroffe recently took a specimen on Thursley Common, 26.vi.64 (see *EMM* 100, 187). Also beyond our boundary and just into Berkshire, it has been captured several times at Silwood Park, Sunninghill near Ascot,

in the years since it was first noticed there in abundance in 1956 (see Southwood and Leston, p. 121). Localities where *Scirpus sylvaticus* is known to grow should be searched in May, June and July for this bug.

Metopoplax ditomoides (Costa)

Foreign Species p. 133

A single male specimen of this western Mediterranean species was taken by Woodroffe, 16.ix.52, on a rubbish tip on Hounslow Heath, Middlesex, in company of two other species of bug, *Macroparius thymi* and *Chlamydatus pusillus*, beneath a plant of Knotgrass (*Polygonum aviculare*) (vide Woodroffe, G.E., in Entom. **86**, 38 and 224-5 (1953)). No further specimens have since been discovered.

(End of Part II)

Survey of Bookham Common

TWENTY-THIRD YEAR

Progress Report for 1963

GENERAL (C. P. Castell)

Perhaps the most important event in the twenty-three years of the Survey has been the erection, in December 1964, of a hut to serve as a field centre. This was rendered possible for the first time through the building by The National Trust of a keeper's cottage (Merritt's Cottage) at the Isle of Wight enclosure and the appointment of a Keeper at the end of 1963. Permission was most kindly, and readily, given by the National Trust's Bookham Commons Management Committee for the erection of a hut in the cottage grounds and the Trust generously leased the site to the Society for a nominal peppercorn rent. The Society's Council agreed to finance the purchase of a hut (14 × 10 ft.), the provision of electricity and water supply and of some furniture. Welcome aid towards this came in the form of an anonymous donation from a member of £100.

The absence of a tea-place, of a lunch-place sheltered from the cold in winter and from the rain in summer and of somewhere for members to meet to plan and discuss operations and to keep equipment, have all been keenly felt for years and may have contributed to the falling off of both numbers and enthusiasm in the survey team. The provision of the hut is both a challenge and an incentive to renewed enthusiasm and greater effort from the Ecology Section's Survey.

The Conservation Corps cleared scrub from the north bank of Upper Eastern Pond in September, with the intention of subsequently clearing some of the marshy part of the pond to create open water conditions. In October, the Corps cleared willows from part of the north-west margin of the Isle of Wight Pond, where they had been seriously encroaching on the open water.

VEGETATION (C. P. Castell)

South East Pond was cleared of most of its dense vegetation by the Conservation Corps at the end of 1963. Several visits were made in 1964 and notes taken of the surviving marginal plants and of the species colonising the bed, which dried up during the summer.

The vegetation of the gun pits in Eastern Plain was examined. Most of the pits are now overshadowed by birches and willows and the floors covered with leaf litter and bare except for young trees and occasional clumps of rushes (*Juncus effusus*) and the grass *Molinia caerulea*.

Crater Pond, which was completely overgrown with willows and had been cleared by the Conservation Corps in August 1962, supported once more, in October 1964, *Potamogeton natans* and an abundance of *Myriophyllum alterniflorum*, which had not been seen since 1958.

Mr. Macer-Wright drew the attention of the writer to several clumps of the Cross-leaved Heath, *Erica tetralix*, which were in flower in September in an old deturfed area (Ref. 465); the species had not been recorded previously for the Common.

Mr. F. C. Reeves has continued his mapping of the distribution of Bracken in the plains.

BIRDS (G. Beven)

The breeding season census was repeated in 1964, in the samples of oakwood, and on the scrub and grassland. The numbers of spring territories of singing males in 40 acres of dense oakwood (Eastern Wood) in the years 1962, 1963 and 1964 respectively were as follows:—Great Tit 11, 12, 17, Blue Tit $16\frac{1}{2}$, 19, 19, Wren 12, 1, $5\frac{1}{2}$, Song Thrush 5, 4, 7, Blackbird 8, 8, 10, Robin 32, $21\frac{1}{2}$, 32, Willow Warbler $1\frac{1}{2}$, $2\frac{1}{2}$, $1\frac{1}{2}$, Chiffchaff, $1\frac{1}{2}$, 2, 5, Dunnock $4\frac{1}{2}$, 4, 5 and Chaffinch 7, $5\frac{1}{2}$, 7.

Thus the Robin population seems to have made a complete recovery from the effects of the severe winter of 1962-63. The Great Tits and the Song Thrushes have increased and the Blue Tits remained at a high density. The virtual extermination of the Wrens in Eastern Wood during the severe winter presented a unique opportunity to watch the arrival of new birds into the wood. It might have been expected that the vacant territories would have had new occupants by the autumn of 1963, but in fact the newcomers did not arrive until the spring of 1964, chiefly in April with one or two in June. In previous years an increase in numbers in April had also been noticed, so it seems probably that wandering Wrens enter the wood in April each year looking for vacant territories. During the colder months the available food supply for Wrens is probably barely adequate, as although the number of them in the wood in January seems almost as high as in the autumn, there is usually a decrease in February and March. This decrease is thought to be mainly due to winter mortality, but some Wrens may perhaps leave the wood in the colder weather. In any case it appears that each spring the wood is restocked with birds from outside. There were again 5 or 6 pairs of Starlings in Eastern Wood and three nests were found, indicating that the recently increased numbers of this species were maintained.

Mr. W. D. Melluish reports the following numbers of spring territories on 61 acres of scrub and grassland (Western, Isle of Wight and Bayfield Plains) during 1963 and 1964 respectively:—Wren 1, 1, Blackbird 5, 8, Robin 4, 6, Whitethroat 8, 6, Willow Warbler 8, 7, Dunnock 7, 5, Chaffinch 9, 10, Yellow Hammer 5, 7 and Reed Bunting 2, 3. In 1964 a similar breeding season census was also made on another area of scrub and grassland of about 35 acres (Central Plain), giving the following figures:—Wren 1, Song Thrush 5, Blackbird 7, Robin 17, Whitethroat 6, Willow Warbler 13, Dunnock 6, Chaffinch 8 and Yellow Hammer 2.

A pair of Sparrowhawks was found nest-building on April 15, 1963 by P. A. Alderson (*Lond. Bird Rep.* for 1963, No. 28 p. 29), and on October 13, 1963 a Sparrowhawk dashed in and out of the scrub and quickly disappeared carrying a small object, which was probably the Robin we had been watching on a bush a moment before, but the incident was over so quickly that we could not be certain. Sparrowhawks, however, remain scarce at Bookham, although there is at least one resident pair of Kestrels. A Water Rail was seen at the Isle of Wight pond on November 8, 1964 by C. P. Castell and L. Manns. One Woodcock was roding on May 5, 1964 and Mr. E. H. Herbert found three downy young in Central Wood during that month. P. J. Oliver records a Short-eared Owl on September 16, 1962 (*Lond. Bird Rep.* for 1962, No. 27, p. 37). Longtailed Tits were drastically reduced after the cold winter of 1962-3 and in 1963 we could not find any pairs in an area of about 120 acres of grassland with thick scrub and "outskirts" of oakwood. However in the spring of 1964, 2 or 3 pairs were present, indicating a partial recovery (there were 7-8 pairs in

1961 and 1962). There were still no breeding pairs in Eastern Wood (Usually 1-2 pairs).

At least two singing Grasshopper Warblers were present in 1964. Goldcrests have been more in evidence in the autumn and are presumably increasing again. Of great interest was the return of the Redbacked Shrike which left the common after 1955 and was apparently absent until 1963. Then a pair built two nests which were unsuccessful (E. J. Clement and W. R. Ingram, *Lond. Bird Rep.* for 1963, No. 28, p. 56). In 1964 a pair were present again and this time nested successfully as at least two juveniles were seen on August 9.

In the recent amendment to the check list of birds (*Lond. Nat.* 1963, 42, 98) the Lesser Redpoll is described as "now not uncommon in small numbers feeding on the plains in autumn and winter in most years". In 1962 and 1963 it was more numerous than usual and survived the severe winter of 1962-3 remarkably well, as it did also in many other parts of Britain. During the spring and summer of 1963 at least one male occupied a territory on the plains (Western, Isle of Wight, Bayfield and Central Plains), while in 1964 in this season at least two territories were occupied. Thus a few birds may now be nesting on the Common.

During the year Mr. L. Manns commenced a study of the fauna of the oak-hawthorn leaf litter layer in Eastern Wood. Samples have been taken from an area of $\frac{1}{4}$ square metre and consisted of leaf litter, small twigs and a scraping of about $\frac{1}{8}$ th inch of soil surface. The samples were collected at different times of the year from the same part of the wood, and the numbers of individuals of the different species were counted. These were chiefly spiders, enchytraeid worms, springtails, mites, woodlice, various insect larvae, earthworms and slugs. Preliminary results suggest that the number of individuals in the leaf litter is least during the colder months and also when the ground is dry. The study of this seasonal variation may show whether it is likely to be an important factor in the winter survival of some of the birds.

MAMMALS (G. Beven)

A Water Shrew *Neomys fodiens* Pennant was found dead on August 3, 1964 (ref. 836) by F. C. Reeves. There is suggestive evidence that a number of Rabbits *Oryctolagus cuniculus* (L.) are living on the surface of the ground especially on the low lying plains such as Central and Bank's Plains, where the ground is too marshy for burrowing. More work needs to be done on this subject. A Brown Hare *Lepus capensis* L. was seen on April 9, 1961 by F. C. Reeves on Western Plain (ref. 42) (*Lond. Nat.* 1964, 43, 126).

Each spring the ground in parts of Eastern Wood is littered with young flowering shoots of Pedunculate and Turkey Oaks, bitten off by Grey Squirrels *Sciurus carolinensis* Gmelin, which seem to eat only a fraction of what they destroy. In addition to these, in the spring of 1964 one Willow *Salix sp.* had a very large number of its yellow catkins bitten off, either separately or whole twigs up to 8 inches long. The pieces on the ground seemed to have been dropped without any further nibbling. This destruction was considered to have been caused by Grey Squirrels.

The bones of a Dormouse *Muscardinus avellanarius* (L.) were found in a Tawny Owl pellet in Eastern Wood (ref. 617) on June 27, 1964. This is the first evidence we have that the Dormouse may occur on Bookham Common, although it is just possible that the Owl caught it elsewhere. There are few recent records of the Dormouse in the London area, but

W. G. Teagle informs me that one was captured alive on Effingham Golf Course, not far from Bookham in 1962. Dormouse remains are unusual in Tawny Owl pellets.

Notes on the Geology and Soils of Bookham Common

By C. P. CASTELL

A KNOWLEDGE of the geology and of the soils derived from the local rocks is fundamental to an understanding of the vegetation of an area. Logically, therefore, a study of this aspect of the natural history of Bookham Common should have been undertaken in the early days of the survey and an account published as a foundation on which the botanists could base their studies of the vegetation in relation to edaphic factors.

However, the Society's geologists appear to have found little of interest in the area, but they were, nevertheless, persuaded to pay two visits, in 1949 and in 1950, to investigate a small part of the Common by augering.

The study of soils is not usually undertaken by the amateur naturalist, but fortunately through the good services of Mr. A. H. V. Smith, a few soil samples were analysed in 1950.

The writer had hoped that, long ago, someone better qualified than himself would have written up the results. This very incomplete account is offered to make available such information as the survey has accumulated and to encourage members and other readers to take up this much neglected aspect of the survey.

Bookham Common lies on London Clay, $\frac{3}{4}$ mile North of the Chalk at Great Bookham and Little Bookham. The London Clay in the highest parts of the Common is covered by Plateau Gravel and in the lowest by Alluvium. Other parts are covered in places with sand and pebbles probably washed down from the higher Plateau Gravel. (Figs. 1-4).

The LONDON CLAY, some 400 feet thick in this part of the London Area, is the usual heavy and sticky brown clay. For a great part of the year, the Hollows and the lower lying plains to the West are marshy and waterlogged, because of the underlying clay, which is at or near the surface over most of the common.

The PLATEAU GRAVEL, Pleistocene in age, occupies the high ground around High Point, just above the 200 ft. contour and forms an area roughly triangular in shape, with its base about $\frac{1}{4}$ mile long from N. to S. and its apex off the Common, some $\frac{1}{2}$ mile away to the East. The Bookham Common patch is the largest in this part of Surrey, a rather smaller one occurring on Epsom Common, but a large mass forms the high ground of Oxshott Heath and Esher Common, all at a height of 200 ft. These deposits are sandy gravels containing rounded, Tertiary flint pebbles, angular flints from the Chalk and pieces of chert derived from the Lower Greensand, several miles to the South. The general thickness is about four feet, but no sections were visible during the mapping of the area by the Geological Survey in 1928. "A sand and gravel pit formerly existed about a third of a mile south-east of Sheepbell Farm,

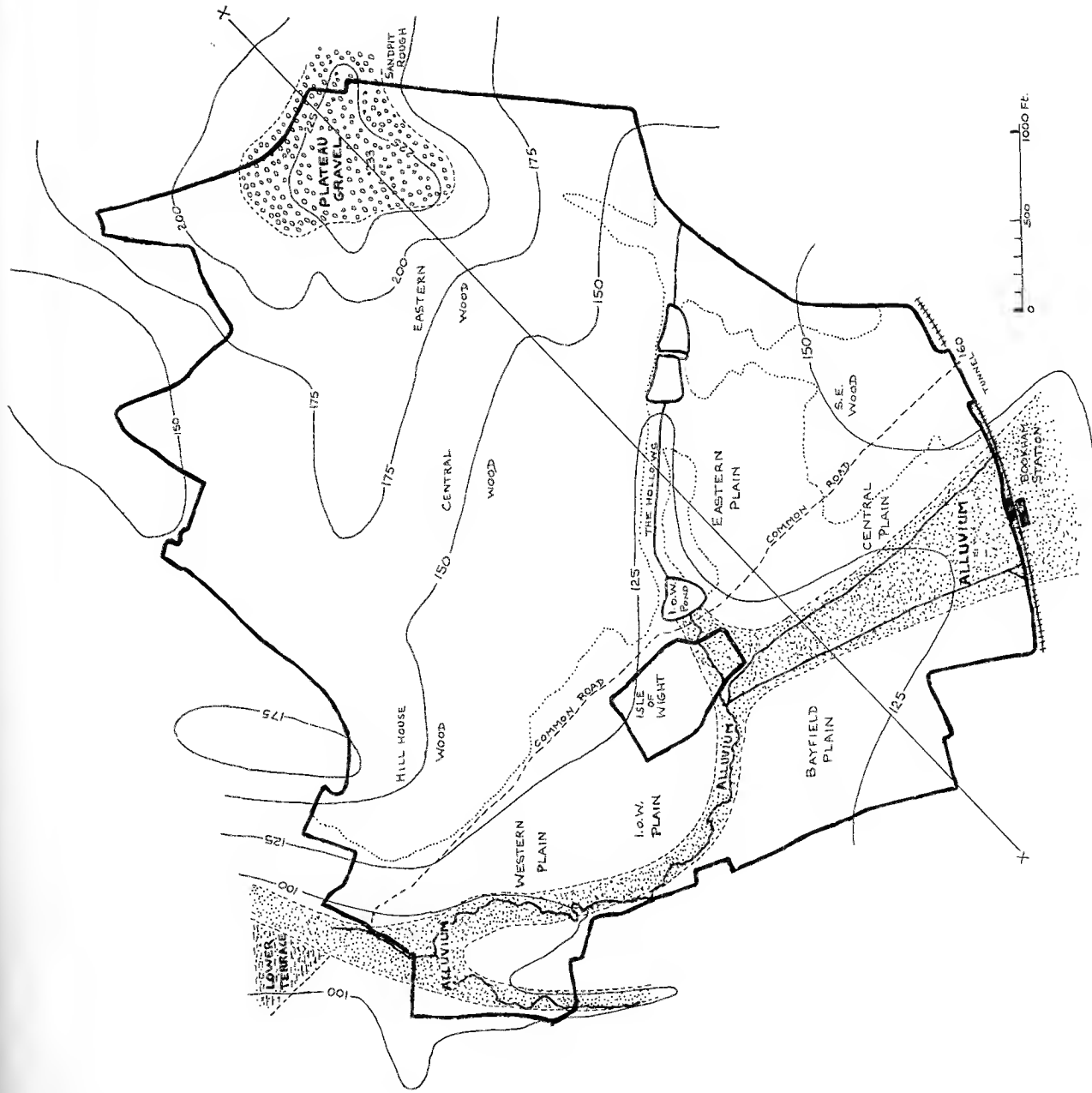


Fig. 1. Bookham Common. Geology and contours at 25ft. intervals. XX, line of section (fig. 2).

but is now built over". (Dines and Edmunds, 1933, p. 157). The name Sandpit Rough still appeared immediately east of the Common and south of Markoak Gate, on the 1912 revision of the 6 inch to the mile Ordnance Survey map, before the houses along the Cobham Road were built. At the western end, the junction of the Gravel with the underlying London Clay is marked by a feeble spring.

According to the Geological Survey Memoir (Dines and Edmunds, 1933, p. 156), "no conclusive evidence of the age of these Plateau Gravels has been found". Dewey and Bromehead (1921, p. 44) considered them as part of a glacial outwash from snow or ice-covered ground to the south. Wooldridge (1928), on the other hand, considered them as part of a series of deposits left by an early Pleistocene river with a very gently sloping bed and an extensive basin, leaving deposits, the remains of which he considers to occur at about the 200 ft. level over a large part of the London Basin, a feature he called the "200 ft. Platform".

Turner (1934, p. 48) draws attention to the conspicuous river-cliff at Cobham, well over 70 ft. high and stretching for about 200 yards along the left bank of the river. "At the top of the bluff is a flat, having a general level of 170 to 175 ft, which merges gradually into Bookham Common lying mostly at a little over 200 ft. This common appears to be a relic of an ancient flat or peneplain⁽¹⁾ older than the Fairmile Terrace". The latter is at Fairmile Common, Esher and is considered to be equivalent to the High Terrace of the River Mole, which is of Boyn Hill or Great Interglacial age.

Wooldridge and Linton (1955, p. 151) conclude that the 200 ft. platform "marks the most widely spread episode of river planation (the levelling of the land surface by river action) since the emergence of the Pliocene sea-floor. In a broad sense, it is probably contemporaneous with the Winter Hill Stage in the Thames Valley. It was uplifted and to some extent dissected before the advance of the main or eastern ice-sheet into Essex".

The conclusions of Turner and Wooldridge are accepted by most geologists and it would seem, therefore, that the 200 ft. surface of the London Clay at Bookham is a relic of an early Pleistocene pre-glacial land surface, the result of a very long period of denudation and river action. It was formed before the great Second Glaciation, when the ice sheet covering Britain reached as far south as North London. The surface has been protected from further denudation by the capping of gravel, itself a relic of a far more extensive sheet laid down by river action at about the same time as the Second or Main Glaciation.

The sands and pebbles washed out from these gravels form superficial deposits of no great thickness on the slopes below the gravel cap. The term "Hillwash" is used for such deposits at the bottom of slopes—the result of the gradual downward movement of the surface soil caused by rain, frost and other natural agencies acting over long periods of time, often thousands of years. Just west of the gravel the Geological Survey noted 2 ft of fine sand overlying the heavy London Clay.

The ALLUVIUM at Bookham is not described in any publication, but is mapped by the Geological Survey as gravel in some parts and as sandy and gravelly clays in others. It extends as a belt through Central, Isle of Wight and Western Plains from the Railway Station, where it is some 300 yards wide in the area occupied by Central and Isle of Wight Ditches and

(1) A peneplain is an area, almost a plain, of gently undulating lowland—the final result of denudation over a very long period of time by frost, rain, rivers etc.

50 yards wide along Bookham Stream; it joins up with another belt along Banks Stream and leaves the Common at Hundred Pound Bridge. This alluvial belt forms a marked flat feature in the centre of the plains. The surface, at 140 ft O.D. near the Station, drops to about 95 ft. at Hundred Pound Bridge. The tiny streams, little more than ditches, are obviously misfits in the valley they now occupy, and which has cut some 20 feet below the level of Eastern Plain, S.E. Wood and Bayfield Plain. An interesting feature of Bayfield Plain is the presence of large unworn flints up to nearly a foot in length, to be seen occasionally when the ditches are deepened or widened. Here also a wartime bomb-crater and a trench dug in 1948 both showed loam with abundant unworn flints more than 6 ins in length. Augering in the floor of the bomb-crater reached clay at about 3 ft. below the general ground level of the adjacent part of the plain.

In July 1954, a trench, 4 to 5 ft. deep, was dug across the Common for pipe laying parallel to Church Road, south of the Railway Tunnel and then alongside Common Road to Hundred Pound Bridge. The trench passed through part of the alluvium south of the tunnel, where the following section was visible:

Gravel of small flint pebbles	...	...	...	1 ft.
Loam	...	...	...	2 ft.—2 ft. 6 ins
Large more or less unrolled flints (some flints up to 9 ins. but mostly 2-3 ins. long)	...	...	...	1 ft (base not seen)

Near the tunnel only loamy clay with a few scattered small flints was visible. South-east Wood showed yellow and mottled clay varying to loam with sandy patches; in Eastern Plain somewhat loamy sands with occasional flints, mostly small and many broken, a few reaching 6 ins in length; yellow clay at the N. end; below Isle of Wight Pond, Loam: Opposite Isle of Wight Cottage, stiff clay.

The stream in the western arm of the alluvium arises in Little Bookham Village, near the junction of the Thanet Sands and the London Clay. The Geological Survey maps a strip of gravel from about a $\frac{1}{2}$ mile south of Bookham Station for another $\frac{1}{2}$ mile on to the Chalk in a southerly direction more or less continuous with the Bookham Common Alluvium. At Great Bookham, another patch of gravel lies at the head of the valley containing the eastern arm of the Bookham Common Alluvium. Bank's Stream rises at Lower Farm, at the southern tip of Effingham Common, just north of a much larger mass of gravel.

According to Dines and Edmunds (1933, p. 157), these gravel deposits consist of nodular flints, blocks of chalk, flint pebbles, sand and occasionally Lower Grænsand chert, all derived either from the Chalk or from higher level superficial deposits lying on the Chalk. They have adopted the Scandinavian name of Tæle (or Tjæle) Gravels for them. They form "a series of waste fans lying on the lower clay lands of the Tertiary beds immediately north of the Chalk outcrop; and each is associated with a coombe in the dip slope of the Chalk. These coombes appear to have been excavated in glacial times either wholly, or in part, by the water which laid down the waste fans of the tæle gravel". During glacial times the soil was probably frozen to a considerable depth and in summer only the uppermost few feet would thaw out. This permanently frozen subsoil, which occurs in subarctic and arctic regions today, is known as Tjæle in Scandinavia and as Permafrost in America. Melt water from snow or ice on normally porous rocks such as chalk would, under such

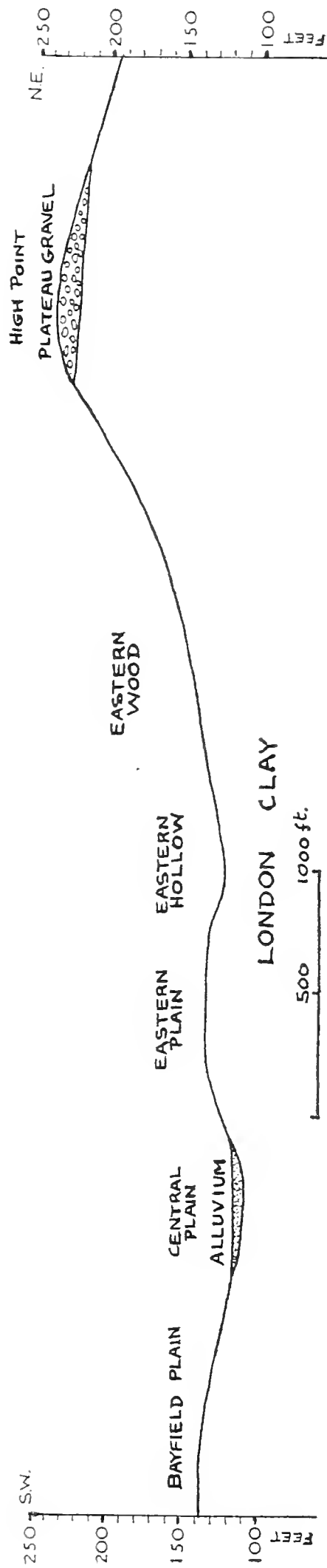


FIG. 2. Section across Bookham Common along line XX of fig. 1. Vertical scale about 6 times horizontal.

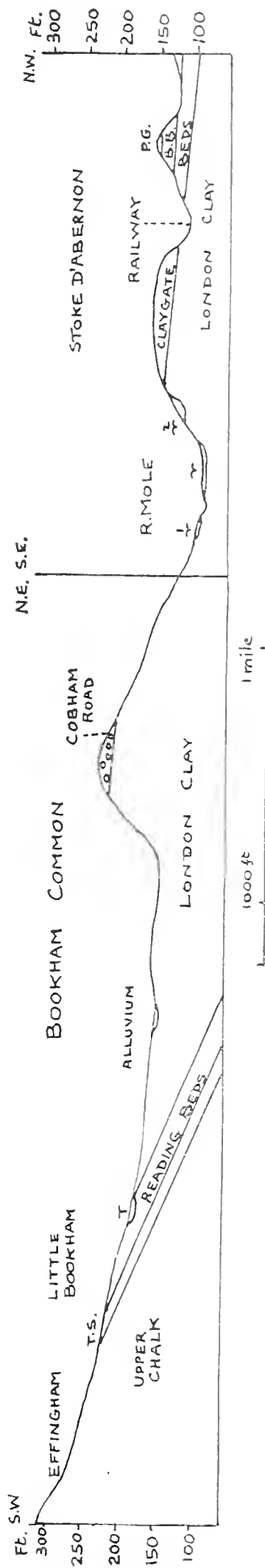


FIG. 3. Section along line XX of fig. 4. Vertical scale about 12 times horizontal; the dip of the Upper Chalk, Thanet Sands and Reading Beds ($c.3^\circ$) is therefore greatly exaggerated.

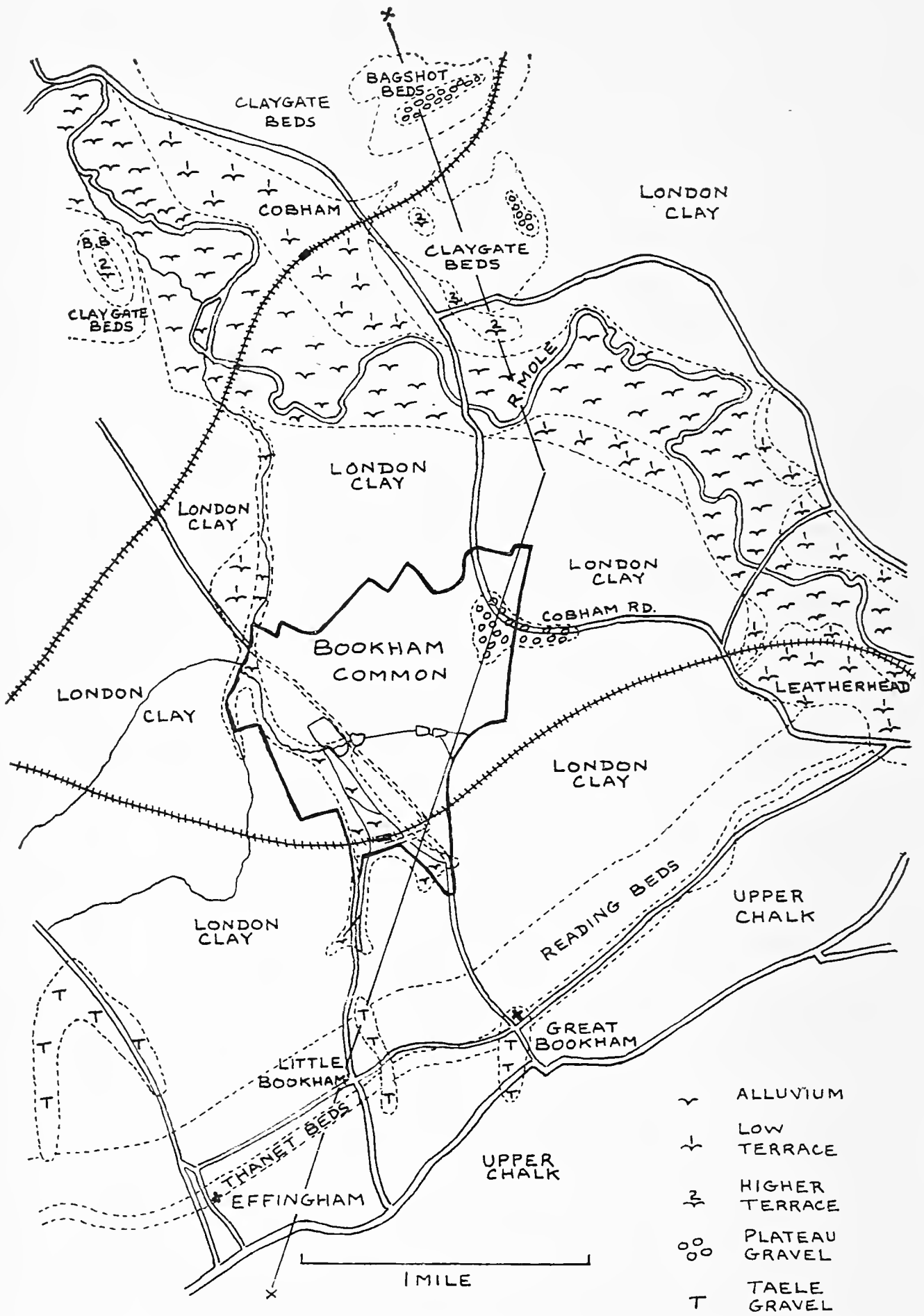


FIG. 4. Sketch map showing the relation of the geology of Bookham Common to that of the surrounding country. XX, line of section (fig. 3).

conditions, accumulate on the surface and form torrential streams in the spring, carrying away chalk and its flints northward down the dip slope and scouring out valleys, aided no doubt by the bodily downward movement, or "solifluction" of the thawed out frost-shattered surface sludge of chalk and soil.

The existing small streams of Bookham Common could hardly have transported these large flint nodules and most of the "alluvium" would appear to be an extension of the higher taele deposits and probably of the same age i.e. dating from the Last Glaciation.

RIVER TERRACE GRAVELS. Just outside the Common, but less than a hundred yards of Hundred Pound Bridge and at about 90 ft. O.D., a patch of gravel extends about $\frac{1}{4}$ mile along the west bank of Bookham Stream. This is mapped by the Geological Survey as part of the Low or Younger Terrace of the River Mole, where it is of constant occurrence along the bank at 5 to 10 ft. above the river. It is regarded by Wooldridge and Hutchings (1957, p. 95) as equivalent in age to the Taplow Stage of the Thames or Last Interglacial.

HILLWASH. Two visits were made in 1949 and 1950 by members of the Geology Section (B. Ainsley, R. E. Butler, C. P. Castell and M. P. Kerney) to investigate, by augering, the deposits overlying the London Clay in the Gun-pits, two to three feet deep, of Eastern Plain. The detailed results, which follow, show how variable soil conditions are in Eastern Plain. The thin veneer of hillwash is ignored by the geologist, who maps the area as London Clay.

The Superficial Deposits of the Eastern Plain Gun-pits

- A. Side: Sand, with small angular flint pebbles. Floor: Brown clay to 6 ft. Oct. 1949.
- B. Side: Fine sand with ironstone concretions (often containing flints) and sporadic flints. Floor: Clayey sand *c.* 6 ins. over clay to *c.* 2 ft. 6 ins. Oct. 1949.
- C. Side: Mottled grey and brown sandy clay, with occasional small angular flint pebbles. Floor: Gritty and clayey sand to 5 ft, some flints. Water-bearing at 2 ft. 6 ins., very wet below 3 ft. Oct. 1949.
- D. Side: Sand with small angular flint pebbles. Floor: Gritty sandy clay to 2 ft. 3 ins. Auger stopped by flint. Oct. 1949.
- E. Side: Sand. Floor: 10 ins. of coffee coloured sand; loamy sand at 15 and 21 ins.; sandy clay at 25 ins.; clayey sand at 29 ins. Oct. 1950.
- F. Side: Very fine sand. Floor: Limonitic clayey sand to 3 ft. with sulphurous smell (probably from decomposition of pyrite). Oct. 1949.
- G. Side: Gravelly sand with large flints (Black hearted). Floor: Sandy with many flints to 2 ft, then brown clay to 3 ft. Oct. 1949.
- H. Floor: Clayey sand at 3 ins.; coffee coloured sand at 9 ins.; clayey sand at 15, 24 and 28 ins. No notes on side of pit. Oct. 1950.
- J. Side: Fine white sand. Floor: Sandy clay, water-bearing at 3 ft. Oct. 1949.
- L. (Narrow trench). Side: Soil 1 ft.; sand 2 ft. with ferruginous concretions. Floor: Clayey sand at 6, 12, 18 and 24 ins.; clay reached at 30 ins., clay at 36 ins. Oct. 1950

Augering at Bayfield Plain Bomb Crater (Ref. 735). Floor of clayey sand, water-logged in several parts of the crater. Clay reached at *c.* 3 ft. below general ground level of plain. (Oct. 1950).

DEPOSITS IN AND NEAR BOOKHAM COMMON

(Approximate ages in thousands of years and correlation with Thames Terraces and Glaciations)

	Hillwash and Alluvium (in part)	Post-Glacial
	<i>Pleistocene</i>	
10-120	Taele Gravels and Alluvium (in part)	Last Glaciation
150-200	River Terrace Gravels of the Mole	Taplow Terrace or Last Interglacial
250-450	Fairmile Terrace of R. Mole	Boyn Hill Terrace or Great Interglacial
<i>c.</i> 500	Plateau Gravel and 200 ft. Platform	Winterhill Terrace or Second (Maximum) Glaciation
	<i>Eocene</i>	
<i>c.</i> 60 million	London Clay	

THE SOILS

Little work has been done on the soils of Bookham Common. pH readings, mostly with the BDH soil indicator solution, were made between December 1944 and February 1945 and of some of the gun pits in E. Plain in 1947 and 1950. Mr. A. H. V. Smith made mechanical analyses of a number of soil samples in January 1950, mostly in connection with the survey then being undertaken of the vegetation of the gun-pits in Eastern Plain (Bangerter and Castell, 1949, 1951). Mr. Smith went abroad soon afterwards and being unable to continue the work, he handed over the results to the writer.

Most naturalists are unfamiliar with methods used in the mechanical analysis of soils and the following notes will, it is hoped, help the reader to understand the methods used in presenting the results.

The pH or acidity of four of the soil samples was estimated by means of a Barium sulphate soil testing outfit, using a BDH Soil Indicator solution. This gives an approximate reaction of the soil and, in practice, it is possible to estimate only to 0.25 of a pH division using the colour chart provided.

The organic content of the same four samples was determined by titrating with Potassium dichromate in the presence of sulphuric acid; this oxidises the organic matter in the soil and the excess of dichromate was then estimated by titration with Ferric sulphate.

Based on analyses of peats, it is assumed that soil organic matter contains 58% Carbon and the percentage of Carbon given by the above method is multiplied by 1.724 to determine the organic content. Hydrogen peroxide is used in the preliminary stages of mechanical analysis to assist in the dispersal of the particles by oxidising the humified organic material which acts as a colloidal cement, but this gives no indication of the total organic material.

In the first stage of the actual mechanical analysis, the sample is sieved, anything coarser than 2 mm in diameter is rejected; gravel and stones larger than this are by convention excluded from soil analysis. The remainder is passed through a sieve retaining particles of more than 0.2

mm. diameter. The finer material is not usually separated by sieving, but use is made of the principle of subsidence. The methods used depend on the fact that the velocity of fall of a particle in a liquid is proportional to the square of its radius.

The sample of soil is shaken up with water and allowed to settle. Portions of the suspension in water are withdrawn with a pipette at standard distances from the surface after standard times. The suspension in the topmost layer will contain only the finest particles, that in the next layer a mixture of these particles and those of the next larger size. An increasing number of grades of particle size will be encountered with increasing depth from the surface. From experiments with particles of known diameters, it has been possible to work out a standard procedure which will enable suspensions of particles to be separated into groups according to their size ranges. In the simplest method, a clay suspension above and a silt and clay suspension below are obtained and their dry weights are expressed as a percentage of the soil sample.

Mr. Smith used a more detailed method; six sieve sizes were used for the coarser material—2 mm., 1.2 mm. (B.S. Sieve no. 14), 0.6 mm. (no. 25), 0.3 mm. (no. 52), 0.15 mm. (no. 100) and 0.075 mm. (no. 200). The following small particle size ranges were separated: 0.055, 0.04, 0.026, 0.018, 0.015, 0.011, 0.0075, 0.0055, 0.0045, 0.00172 mm.

The conventional limits which were adopted for grain size are as follows: Coarse sand 2.0—0.2 mm; Fine sand 0.2—0.02 mm; Silt 0.02—0.002 mm.; Clay 0.002 mm.

The classification of soils used is that shown in the triangular chart (fig. 5). The type of soil is defined by the percentages of the three constituents i.e. sand (coarse and fine), silt and clay. The percentages are read along each of the sides of an equilateral triangle, the apices representing 100% of each constituent. The soil type is determined by the intersection of lines drawn from the percentage value parallel to the side opposite the respective apex. Thus, the point S represents a soil composed of 20% sand, 30% silt and 50% clay and would be classified as a clay.

A portion of the triangle is shown enlarged in fig. 6 to show the position of the samples analysed.

The detailed percentage analyses of particle sizes are plotted in the form of "summation curves" on logarithmic graph paper and a selection is shown in fig. 7. A point on such a curve might indicate that 20% of the sample (ordinate of graph) is finer than 0.002 mm. (abscissa) i.e. 20% is clay; at 0.02 mm., 30% finer i.e. $30 - 20 = 10\%$ is silt; at 0.2 mm., 80% finer, i.e. 50% fine sand ($80 - 30$), leaving 20% coarse sand.

As will be seen, the type of soil can be deduced from inspection of the shape of the curve, which is related to the relative percentages of the large and small particles.

The following soil types have been recognised in 22 samples collected by E. B. Bangerter and C. P. Castell from the gun-pits in Eastern Plain (nos. 1-11, Jan., 1950) and from other sites (nos. 12-22, Feb., 1950) and analysed by A. H. V. Smith. The detailed analyses are tabulated separately.

1. Pit A, ramp near water edge. Sandy clay loam.
2. Pit B, side of pit, under moss (*Atrichum undulatum*). Sand.
3. Pit C, ramp. Sand.

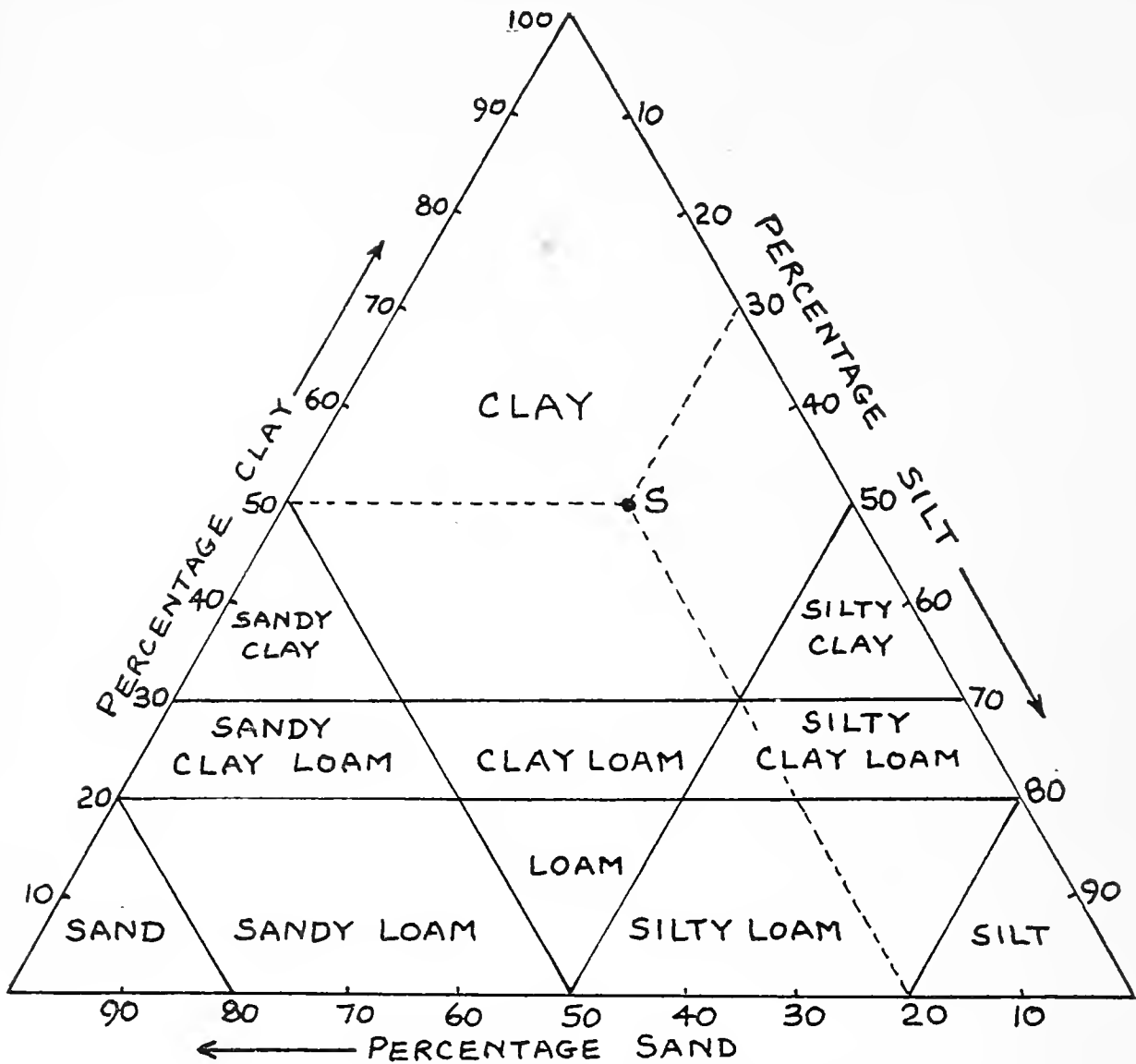


FIG. 5. Soil Classification Chart.

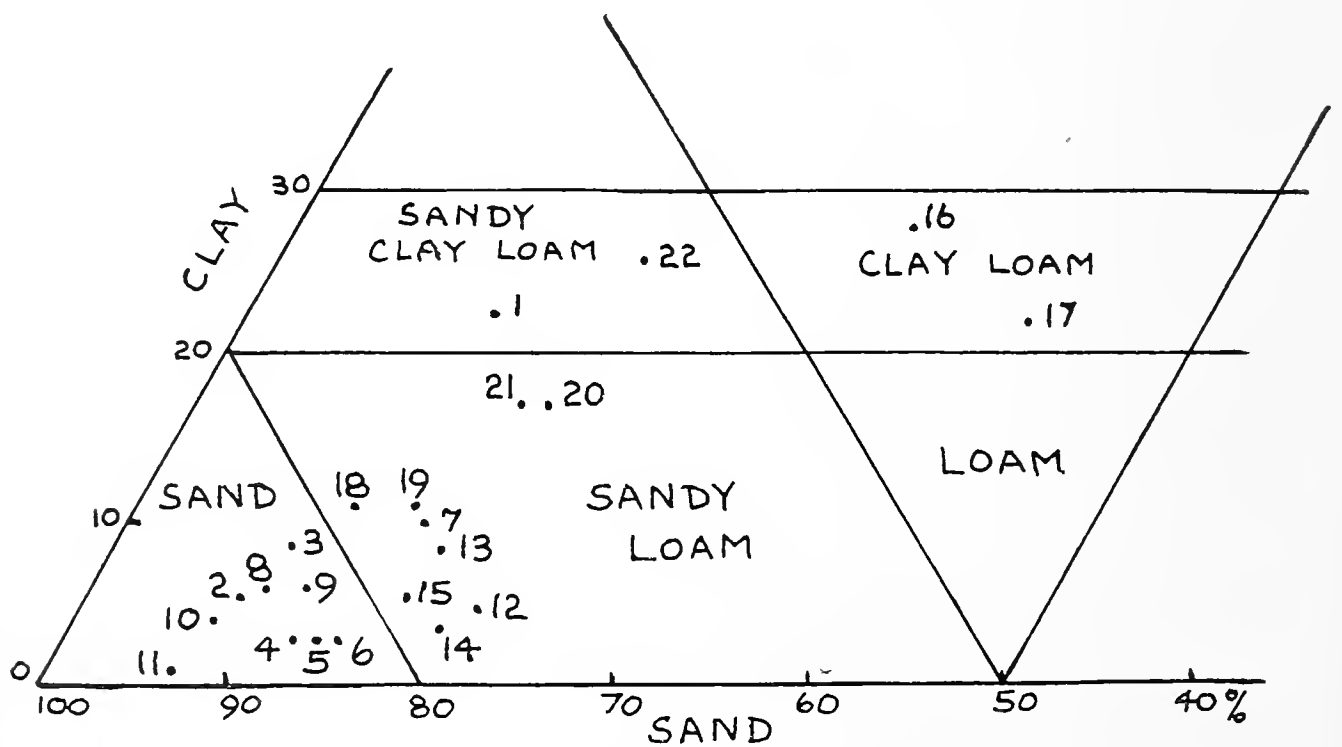


FIG. 6. Part of Soil Chart showing position of the Bookham Common Soils.

4. Pit D, side of pit at about floor level, under moss (*Dicranella heteromalla*). Sand.
5. Pit E, floor. Sand.
6. Pit F, ramp. Sand.
7. Pit G, side. Sandy loam.
8. Pit G, floor. Sand.
9. Pit H, floor. Sand.
10. Pit J, floor. Sand.
11. Pit J, side. Sand.
12. S.E. Wood (917). Under oak with bramble and bracken. Oak leaf humus at 4 ins. depth, occasional flints. Sandy loam.
13. The same, at 7-8 ins. depth. Sandy loam.
14. E. Plain (834) in Molinietum, opposite Pit F, at 5 ins. depth. Sandy Loam.
15. E. Plain (822) in Pteridetum at 1 ins. depth (water-logged below 1 in.). Sandy loam.
16. Central Wood (555). Under oak scrub with bramble and bracken. Oak leaf humus at 2 ins. depth, occasional flints: Clay loam.

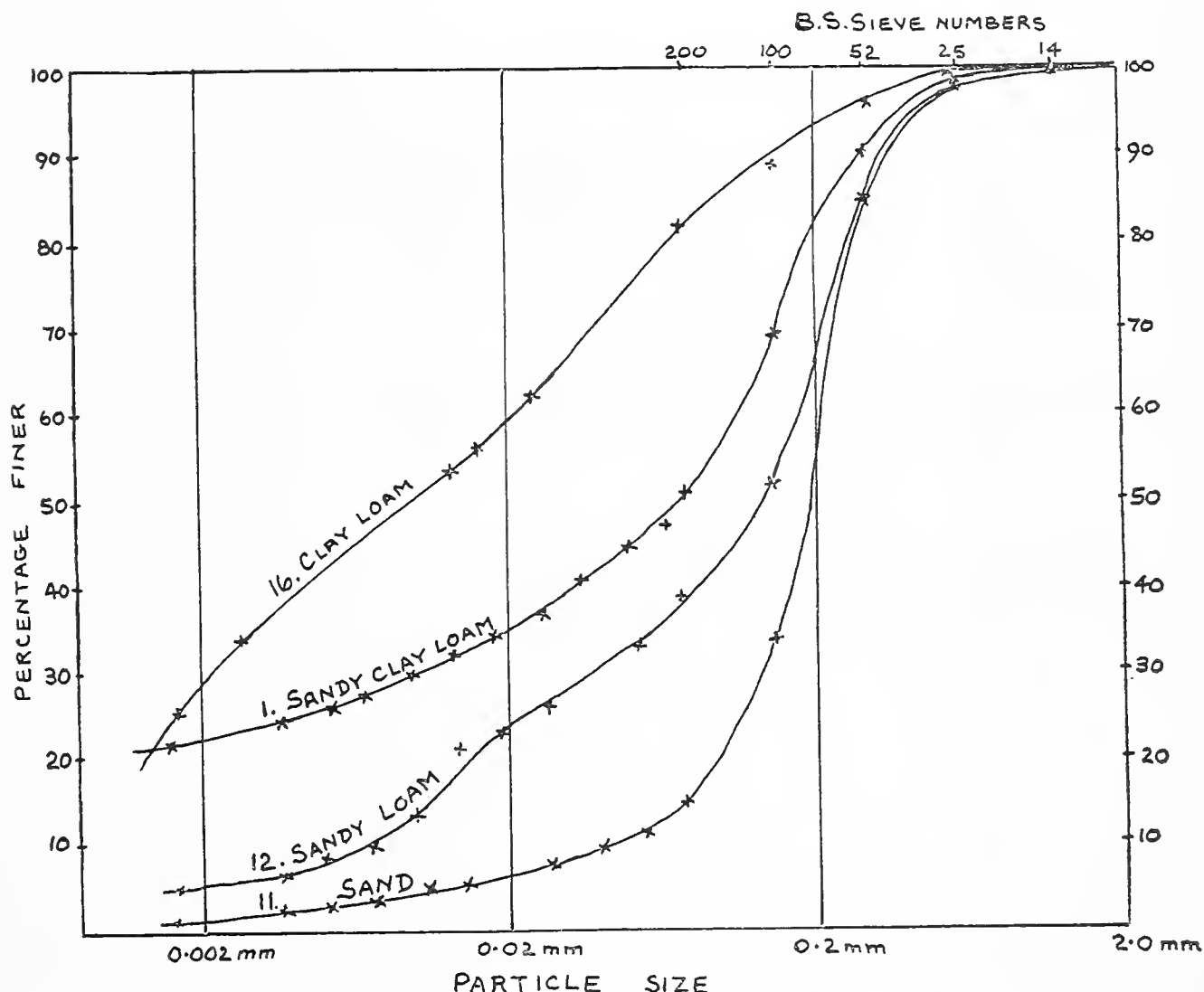


FIG. 7. Mechanical Composition Curves for four of the soil samples from Bookham Common.

17. The same at 5 ins. depth. Clay loam.
18. Central Wood (288). Under oak with holly, bramble and bracken. Oak leaf humus with rolled flints, depth 2 ins. Sandy loam.
19. The same, depth 5-7 ins. Sandy loam.
20. E. Wood (622). Under oaks with *Quercus cerris*, hazel and bramble. Oak leaf humus, with frequent flints. Sandy loam.
21. The same at 5-7 ins. depth. Sandy loam.
22. Western Plain (188). In open Pteridetum with *Ulex*, at 2 ins. depth. Clay loam.

It will be seen that the samples from sites in E. Plain were mostly sands or sandy loams bordering on sands. Pit A is exceptional, yielding a sandy clay loam, but it is at the lowest part of E. Plain in the north west corner. E. Wood and the upper part of Central Wood yielded sandy loams and the lower part of Central Wood a clay loam, which was also found in Western Plain. The number of samples from sites outside Eastern Plain is far too small to warrant useful comment.

The relative abundance of pebbles appears to have little bearing on the conventional classification of soil types. At Bookham, the important factor would be the nature of the interstitial soil so that the geologist's "gravel" might be classified by mechanical analysis methods as either a clay or a sand. Sandy loams were indicated by the samples in the Plateau Gravels from Eastern Wood near High Point and here the proportion of sand was much less than in Eastern Plain.

ANALYSES OF SOIL SAMPLES

Sample no.	1	2	3	4	5	6	7	8	9	10	11
Loss due to pretreatment	0.9	1.0	1.0	1.2	1.2	1.2	1.0	0.6	0.6	0.5	0.2
Coarse sand	19.8	51.5	47.5	50.4	37.6	42.5	33.7	47.7	45.7	53.7	45.9
Fine sand	44.6	35.6	35.2	35.1	46.6	40.5	41.6	37.7	38.7	35.3	46.9
Silt	12.9	6.5	7.7	10.4	11.6	12.8	13.8	8.0	8.8	6.8	6.3
Clay	21.8	5.4	8.6	2.9	3.0	3.0	9.9	6.0	6.2	3.7	0.7
pH					5.5	5.75		5.5	5.5		
Organic matter					2.1	2.3		0.9	0.8		
	12	13	14	15	16	17	18	19	20	21	22
Loss due to pretreatment	2.3	1.3	1.7	2.2	1.7	1.3	1.1	1.2	1.7	1.5	1.1
Coarse sand	34.2	34.5	35.4	33.3	7.9	6.9	21.7	18.8	8.9	9.8	1.9
Fine sand	41.0	40.5	42.3	45.0	32.4	30.6	56.4	56.3	56.0	56.6	53.4
Silt	18.1	15.3	16.9	14.6	30.0	39.5	9.9	12.8	16.4	15.0	18.3
Clay	4.4	8.4	3.7	4.9	28.0	21.7	10.9	10.9	17.0	17.1	25.3

Some pH readings

These were all made in the early days of the survey and can serve to give only a very rough idea of the range of acidity on the Common.

Electrical determinations by Bailey, Jan. 1945; Sheepbell Pond (S.E. corner), 5.4; Kelseys Pond, 6.1; Isle of Wight Pond, at sluice 6.0, at overflow 6.4; Gun-pit F (Eastern Plain), soil from side of pit 4.7, water in pit 4.6; Eastern Ditch in E. Plain, 4.6.

Determinations by A. H. Norkett. Gun-pits in E. Plain. A, 5.8; E, 6.4; F, 5.5; L, 5.1. May-June, 1947.

Approximate readings with B.D.H. Soil Indicator by C. P. Castell. Central Wood (Ref. 5739). Under oaks, black leaf humus at surface, 6.0; at depth of c. 2½ ins., 5.0-5.5. Dec. 1944.

Bayfield Pond, 7.5-8.0; Bayfield Plain Bomb Crater (Ref. 735), 6.5-7.0;

Isle of Wight Pond, at sluice and overflow 6.5-7.0; Kelseys Pond, 6.5-7.0; Sheepbell Pond, 5.5; South East Pond 5.0; Upper Eastern Pond, 7.0. Feb. 1945.

No definite conclusions can be reached on the relationship between the distribution of soils and plants on the Common. Few soil samples have been investigated and, although from the geological map, it would seem that a considerable contrast in soil conditions might be evident between Plateau Gravels, Alluvium and London Clay, hillwash on the slopes and on the lower ground tends to obscure such differences.

Steele (1947), in discussing his maps of the woodland vegetation, notes an ill-defined zonation in the field and shrub layers, holly and hazel predominating in the north and east, but replaced by brambles and hawthorn towards the southwest. His remarks merit repetition: "The reasons for the zonation in the shrub and field layers should be investigated. Are they related to the higher ground in the north and west, or to soil changes, or do they result from the advance of the woodland in a south-easterly direction? We hope it may be possible in further work at Bookham to investigate and solve some of these problems". The problems still remain unanswered.

In Eastern Plain, the sandy nature of the soil and water logging results in a high acidity (pH *c.* 5.5) sufficient in one place to support Bog Moss (*Sphagnum*) and, in general, a dominance of Purple Melic (*Molinia caerulea*). The acidity of the alluvial plains appears to be much lower (that of Bayfield Crater Pond was 7-7.5) and they are dominated by Tufted Hair Grass (*Deschampsia cespitosa*).

Much more work requires to be done both on the soils and on the vegetation before any conclusions can be reached on their possible inter-relationship.

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Limpsfield Common Revisited

By J. EDWARD LOUSLEY

THE field meeting arranged by the Ecological Section for June 28, 1964 was something of an historic occasion. Its purpose was to compare the present state of Limpsfield Common with the detailed records made 25 years earlier, and three out of the four members appointed in 1937 to the sub-committee set up to organize the Survey were present.

The decision to carry out a survey of Limpsfield Common was made in 1936, and had enthusiastic support until the outbreak of war. Lengthy and valuable reports appeared in the *London Naturalist* each year until 1941 when it was decided to start a new survey of Bookham Common, which still continues. L. Parmenter was Secretary of the Ecological Section and of the sub-committee and responsible for Diptera and some of the work on birds, whilst C. P. Castell and J. E. Lousley worked mainly on botanical aspects. These three attended the 1964 visit. The party were provided with copies of the base map showing the division of the Common into areas prepared in 1937 (*Lond. Nat.*, **16**, for 1936), and of the vegetation map completed in January 1939 (*Lond. Nat.*, **18**, for 1938).

Little difficulty was found in tracing the well chosen boundaries of the areas (mostly roads and paths), but in many cases it proved impossible to find any resemblance between the outlines of the plant communities and the present vegetation. The changes far exceeded anything I would have thought possible and the combined recollections of the three very active workers of 25 years ago failed to reconcile parts of the Common with the vegetation we knew then. A particularly good example of this is the Happy Valley (K(a),K(b)) where we had lunch. I brought with me a carefully prepared line transect made in October 1937, and photographs taken at the time. I also had notes made when the vegetation was surveyed for the 1939 map. This material bore little relationship to the Happy Valley as we found it.

It is difficult to generalize, but perhaps the most impressive changes over much of the Common were the reduction in ling and gorse, and the increase in bracken and oak. Fortunately there is information about the first three of these in 1938 in a paper by W. G. Shelton, formerly Hon. Secretary of the "Limpsfield Common Committee of the Local Residents" (*Lond. Nat.*, **18**, 53-55, 1938). Ling was then being burned to encourage young growth, but the vegetation map in 1939 showed considerable areas where it was still dominant, and in places it was 2 ft. tall. In 1964 it was seen only in small quantity and mostly in a feeble state. Gorse, *Ulex europaeus*, was regarded as a fire danger in 1938, and the vegetation map showed it then as locally dominant. In 1964 it was greatly decreased, and drawn-up dying bushes under trees in some areas (e.g. W.), and blackened stumps in others where it was formerly abundant, suggested that shade and fire were the main causes.

The increase in bracken was causing concern even before the war when it was scythed or crushed with Holt's Bracken Breaker. West Heath received treatment for at least three years, and it was perhaps the cessation of this treatment during the 1939-1945 war which initiated the great increase of bracken in Area B and elsewhere. Twenty five years ago it was difficult to find a pure stand of bracken; now pure stands are common and often 5 ft. tall. Bracken has now replaced grass heath and ling

in many places. The increase of oak, *Quercus robur*, is a new development. Trees about 10 ft. tall are especially common which suggests that there may have been abundant regeneration during or soon after the war, but younger trees, as well as seedlings are also plentiful. There is also much new scrub of various species, and Sweet Chestnut, *Castanea sativa*, which was known only in North Wood (X) before the war, was noticed in several areas, and is clearly spreading in K(b).

In contrast to the rest of the Common, three areas showed little change. On the Golf Course (U) and Cricket Ground (V) mowing had kept the grassland much as it was in 1939, while in Ridlands Wood (T) with old trees the rate of change is necessarily slow.

The visit provided a rare opportunity of comparing present vegetation with careful records of its earlier state, but although notes were made of each area on the official visit and on one I made a month later, a great deal more work is required before a detailed comparison can be made. Many commons round London are becoming overgrown with bracken and scrub and while the withdrawal of grazing by horses and cattle is an important factor, there are other important influences including the reduction in the number of rabbits, trampling, fires and changes in drainage. The preparation of a new vegetation map, and a careful comparison with the old one and the other records would be a valuable exercise. The pre-war survey of Limpsfield Common provided important training for those who took part and was fully justified on this score alone—its value as a record is now apparent. Perhaps the Society will arrange a similar visit in 1989 to see the changes after fifty years—the one in 1964 was a day some of us will never forget.

The Lake in St. James's Park

By F. T. K. PENTELOW, O.B.E., M.A., F.I.Biol.

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HISTORY

IN pre-Norman times the Whitehall area was a marsh alongside the Thames. Into it discharged streams from the high ground to the north making channels through it for their passage to the Thames. The largest of these streams was the Tyburn which ran down what is now Marylebone Lane, behind Bond Street to the foot of Hay Hill, across the lowest part of Piccadilly then south across Green Park to where Buckingham Palace now stands. There it divided into three parts, one passing down Vauxhall Bridge Road, another through the grounds of Westminster Abbey, and the third across St. James's Park, following the line of the present lake, crossing Horse Guards Parade and discharging into the Thames somewhere near the present Charing Cross Underground station. It is to be expected, and old prints confirm, that numerous subsidiary channels existed.

When an island of gravel and sand known as Thorney Island was chosen as a site for Westminster Abbey and St. Stephen's Chapel the drainage of the marsh began, though the process was slow until the sixteenth century when Whitehall Palace was built as a residence for the Sovereign. This led to a rapid development of the area, for houses for the nobility were built around the Palace. About 1536, St. James's Park, which belonged to the Hospital of St. James in the Fields, was acquired by the King and enclosed as a Royal Park to serve as a pleasure ground for the Palaces of Whitehall and St. James.

In 1660 part of the channel of the Tyburn in the Park was converted into an ornamental water termed the "Canal". The work involved appears to have been little more than trimming the banks and planting flanking avenues of trees. At the same time the Mall was laid out as a formal street (which may have interfered with the supply of water to the canal from the northern part of the Tyburn) and avenues were planted along it and along Birdcage Walk (Pepys, 1660). At the south east of the canal a number of the subsidiary streams were converted into a duck decoy in 1665.

In 1725 the Chelsea Waterworks Company were permitted to lay mains in the Park and to form a lake by "joining the Canal by Devonshire House and the Old Pond by the Deer Pen Grove". The lake was extended 40 yards to the north-west in 1729.

When the Allied Sovereigns visited London in 1814, a temporary wooden bridge of Chinese design surmounted by a seven-story pagoda was erected across the Canal under the direction of John Nash and was illuminated for the celebrations. Unfortunately fireworks set light to the pagoda and burnt its three upper storeys (Walford). In spite of this the bridge survived till 1827 (Cecil, 1907). At this time (1827) Nash laid out St. James's Park in its present form and altered the straight uniform "Canal" into the lake as it exists today. A new suspension bridge of iron, designed by Mr. Rendell and decorated by Sir Matthew Digby Wyatt was built in 1857 (Lang, 1951). That was replaced by the present bridge in 1957.

The capacity of the lake is said to be 10,000,000 gallons (8,544,287

excluding the Duck Pond at the eastern end). The area is given as 11 acres.

Whether once the Canal was formed and the Mall constructed in 1660 the lake continued to receive water from the Tyburn is uncertain, but when in 1822, as a result of evil smells from the lake, Thomas Telford was asked to investigate and advise on a remedy, he clearly thought that the main source of water was the Thames, the water flowing up the culvert under the Horse Guards Parade. This culvert was designed to fill the lake at high water and empty it (if necessary) at low. He explained that the foul condition of the lake was due to the connection to this culvert of the drains from many houses so that it had become polluted by sewage and silted up. No doubt at this time the water table in St. James's Park stood very near the surface and the lake received also a good deal of land drainage. The lake was partially emptied in 1826 and some of the mud removed.

As it was impossible to re-sewer the area to remove domestic drainage from the culvert Telford recommended that the lake should henceforth be replenished with rainwater and that the use of the Thames as a source should be discontinued. In about 1832 a reservoir, fed from the Serpentine, was built on Constitution Hill and used as the water supply for the lake.

A new sewer to take the drainage from the lake was built in 1855-56 and it ran "between the front of the Horse Guards and Whitehall Place."

In 1855 it was said that the lake had again become unsatisfactory because the Serpentine, the source of water for the lake, was seriously polluted by sewage which it received via the Westbourne and other brooks from the developing residential areas north of Hyde Park. In consequence of this there was in 1856-57 a radical reorganization of the water supply. The lake was emptied, and the bed was levelled and then floored with lime concrete 9 inches thick laid on brick rubble. As it was said that "there was loss of human life by drowning, particularly in the skating season" it was decided that the greatest depth of water should not exceed 5 feet at the outlet at the eastern end, and that it should be 3 feet at the western end and should nowhere exceed 2 feet 6 inches within 15 feet of the margin.

Then a well was sunk on Duck Island to a depth of 30 feet and from this the water was pumped into an underground tank on the island. A fifteen-inch pumping main runs from this tank to the Serpentine. Near the Wellington Arch there is a branch from it to supply the lake in the garden of Buckingham Palace, and when the Queen Victoria Memorial was built in 1911 the fountains were supplied with water by an 8-inch main from the 15-inch pipe; the basins of the Memorial overflow back into St. James's Park Lake. Since 1857 the lake has received its water from the overflow of the tank on Duck Island. The water has to be pumped along the main to the Serpentine, but when pumping was not in progress the pipe could once be used to supply St. James's Park Lake by gravitation from the Serpentine, but this has been impossible since the re-arrangement of the mains consequent upon the Park Lane Improvement Act of 1958.

When in 1856 the lake was emptied to be cleaned and concreted it was found that it received drainage from the walks and surrounding grounds with a portion of the Mall, and to avoid this a pipe drain was laid down each side of the lake to discharge into the new sewer, so taking land drainage out of the lake.

In 1866 it was reported that the water supply had diminished owing to the construction of the Thames embankment and further investigation showed that the well on Duck Island was supplied by infiltration from the Thames, so in 1867 the water supply was improved by extending the adits through the gravel.

The reservoir on Constitution Hill, which had ceased to be used as a water supply for the lake in 1857, was removed as part of the Hyde Park Corner improvement in 1882.

During the 1939-45 war the lake was used as a water supply for the emergency fire service and in 1943 the water supply was augmented from wells near the western end of the lake.

HISTORY OF THE CONDITION OF THE WATER

This must be one of the most public sheets of water in the world and its condition is a matter of daily interest to a very large number of people. Consequently anything wrong with its appearance or smell attracts immediate public comment and for a large part of its history there have been complaints of one kind or another.

The first records of bad smells were in 1818 and 1822 and it was on that account that Thomas Telford was asked to investigate and report. His conclusion was that the trouble was due to pollution by domestic sewage of the channel by which water entered the lake (see above) and it appears to have been a consequence of his findings that a few years later the source of water was changed from the Thames to the Serpentine.

In 1855 the lake was again reported to be in an unsatisfactory condition owing to the pollution by sewage of the Serpentine from which its water supply was derived. In consequence the lake was emptied, the bed concreted and a new water supply derived from wells in the Park was obtained (see above).

In 1871 the sides of the lake were damaged by frost and it was emptied and cleaned out.

In 1909 it was reported that "water from the lake is offensive to the eye and to the nose" and as the water supply was from wells and presumably therefore unpolluted this condition was correctly attributed to algal growths in the water. It was accordingly suggested that the lake should be dosed with copper sulphate to kill the algae. The Chief Engineer of the Office of Works thought it a dangerous remedy for he feared it would harm the water fowl and also that the algae increased insect life on which the birds would feed. However, copper sulphate was used in 1910 and 1911 and it was said the algae were destroyed but "no harm was done to plants or fish". Nevertheless the cure cannot have been complete for in the autumn of 1911 the lake was emptied and cleaned out and 4,000 square yards of the bed were reconcreted.

The lake was then refilled and treatment with copper sulphate was continued until it was emptied again in September 1914. During the preceding summer its condition must have been unsatisfactory, for the Bailiff of the Royal Parks was pressing for it to be cleaned; he said that otherwise "the weed will grow much stronger and faster and be more difficult to keep down".

It appears that the lake was not refilled after its cleaning in 1914 for it was said that it would form a guide to enemy aircraft. Later on in the war huts were built on the bed and used as Government offices. During this time land weeds grew on the concrete bed.

By 1922 the huts had all been cleared away and in June an attempt was made to refill the lake but the leakage was so great that in 1923 it had to be refloored with reinforced concrete and the maximum depth was reduced to 4 feet 6 inches. At the same time a submerged weir was built across the eastern end of the lake separating off the "Duck Pond" from the other portion. It was also decided at this time no longer to allow boating on the lake, a pastime which had been enjoyed from 1847 until the war. Boathouses, the landing stage and the flagstaff shown in old prints were consequently removed.

The lake was cleaned out again in 1926, but there were complaints of an "evil odour" in May 1927. It was cleaned out again early in 1928, but in June of that year there were complaints about the colour of the water. It was emptied again in the autumn of 1930.

In 1932 it was said that it had become the practice to clean out the lake every other year but even so its condition does not appear to have been thought satisfactory for in 1933 two new overflows were made at the eastern end to allow surface scum to be drained off.

In 1934 it was reported that an annual cleaning was a necessity, perhaps because in that year and in 1935 there was a tremendous development of water fleas (said to be *Daphnia*) which died off and decayed, causing a worse smell than ever.

At about this time it was suggested that the fundamental cause of these troubles of algal growths and noxious smells was that the lake was biologically unbalanced; that a natural body of water contains an assembly of plants and animals, including fish, which tend to act as a system of checks and counter-checks so that a fairly stable biological system becomes established, and quite often there are no troubles of the kind commonly experienced in St. James's Park. Under the current regime this could never happen there for what with chemical treatment and frequent cleanings out there was never time for any normal development of an aquatic flora and fauna to take place. Accordingly it was suggested that chemical treatment and routine cleaning should be discontinued and that the lake should be stocked with fish, with a selection of crustacea and molluscs which would live on the bottom and use the mud deposit as food, and with aquatic flowering plants.

Though this proposal was not accepted in full, when in January 1938 the routine cleaning of the lake was due, only the eastern end (the duck pond) was emptied and cleaned and sticklebacks were introduced. In January, 1938, five tubs planted with *Potamogeton* sp. were put into the lake in the hope that the plants would grow and encourage the Little Grebe to return to the park as a breeding bird, but by August of that year all the weed had been eaten by ducks. It was reported that summer that though the western end had not been cleaned there was no smell there but there was a heavy growth of filamentous algae. There was however a report of a bad smell in June, presumably at the eastern end.

Then in 1939 came the war and the lake became a water supply for the fire service, so it could not be emptied and remained more or less full until January 1946. There were complaints of smell in 1942 so the vegetable growths were removed and the top two inches of water drained off to get rid of scum. By this time there were bomb craters in the lake bed so there was a leak necessitating a daily make-up of 300,000 gallons.

In January 1946 the lake was emptied, an unexploded bomb removed and the concrete bed repaired.

When the lake was refilled in 1946 it was again managed on the system of regular cleaning and treatment with copper sulphate. This was continued until it was emptied in 1953, though 50 fish, Roach, Perch, Dace and Golden Orfe were put in in 1947. There were again complaints of smell in 1952 and in 1954. In the latter year there was a very heavy growth of filamentous algae which was identified at the British Museum (Natural History) as *Rhizoclonium hieroglyphicum* Kützing. It attracted particular attention because it resulted in the death of a large number of ducklings. In fact 107 corpses were found, mostly young Tufted Duck, a species particularly used to diving; the young birds apparently dived, became entangled in the weed and drowned. During this period Mr. W. G. Teagle (then employed by the Ministry of Works) made some observations on the fauna of the lake. In September 1949 he recorded the dragon-fly *Sympetrum striolatum* (Charp.) and when the lake was empty in 1953 he collected several specimens of the Wandering Snail (*Lymnaea peregra* Müller) and the Water Slater (*Asellus aquaticus* L.). In 1954 he reported that he had frequently seen water beetles in the lake, but he did not identify them.

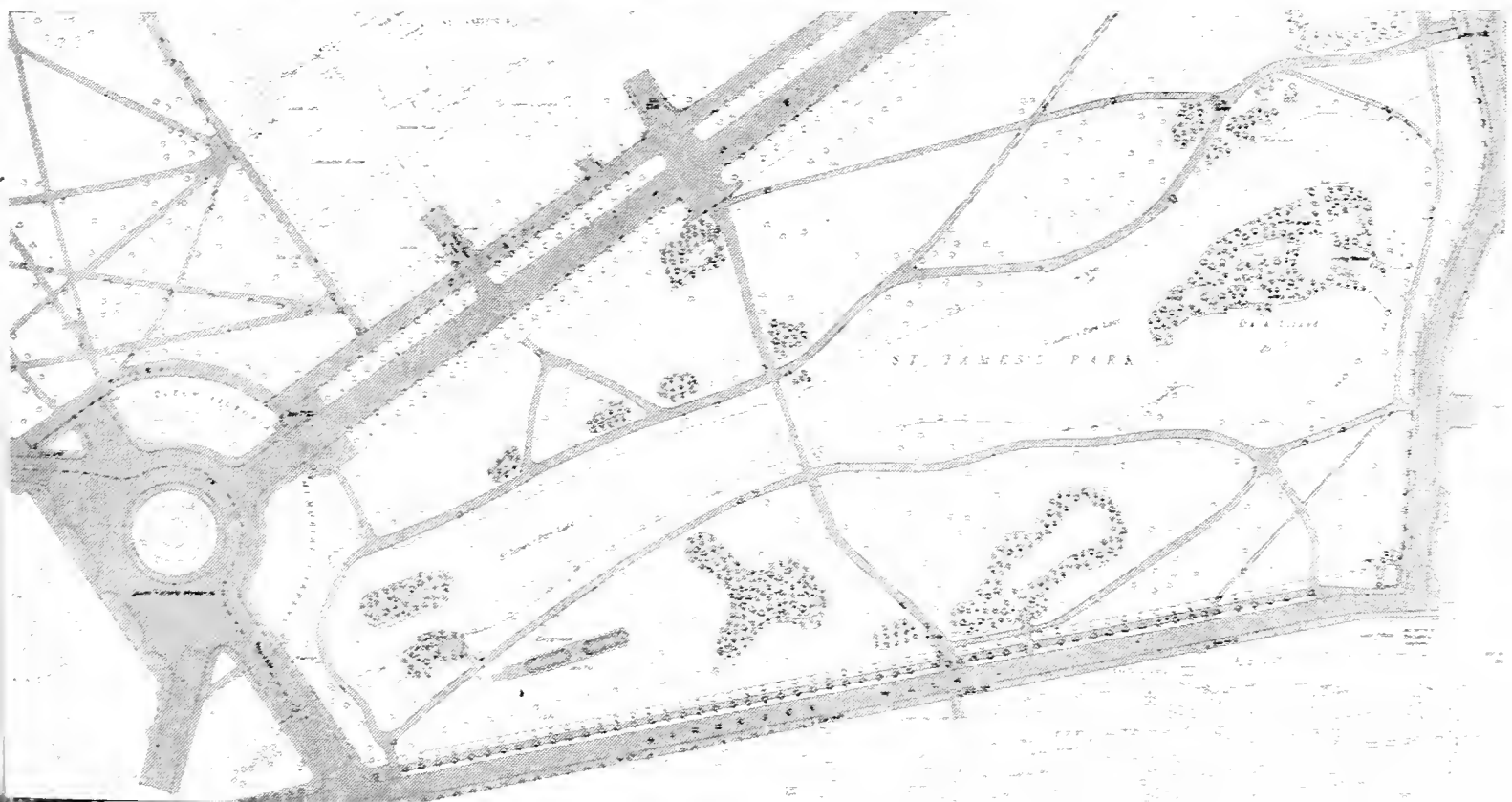
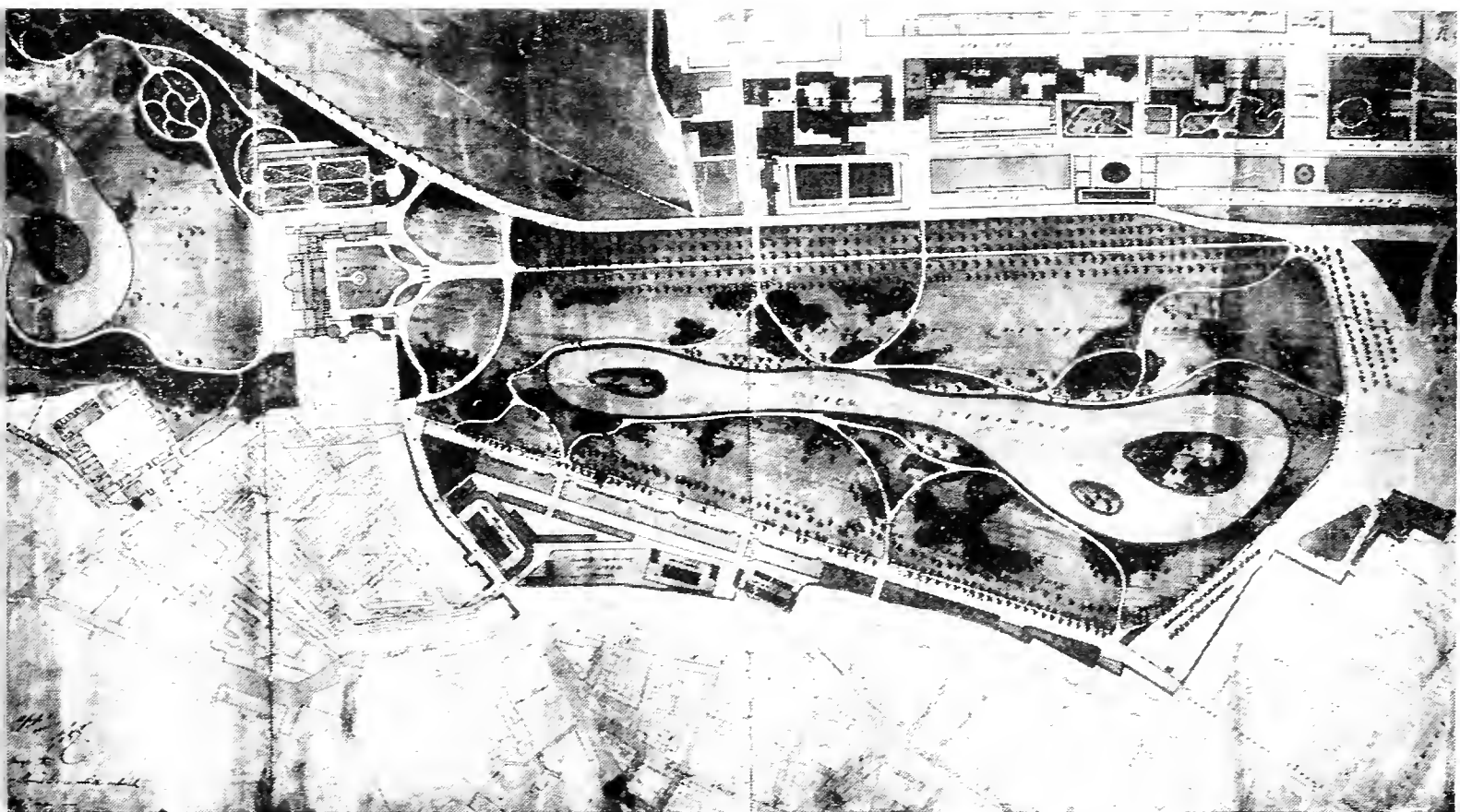
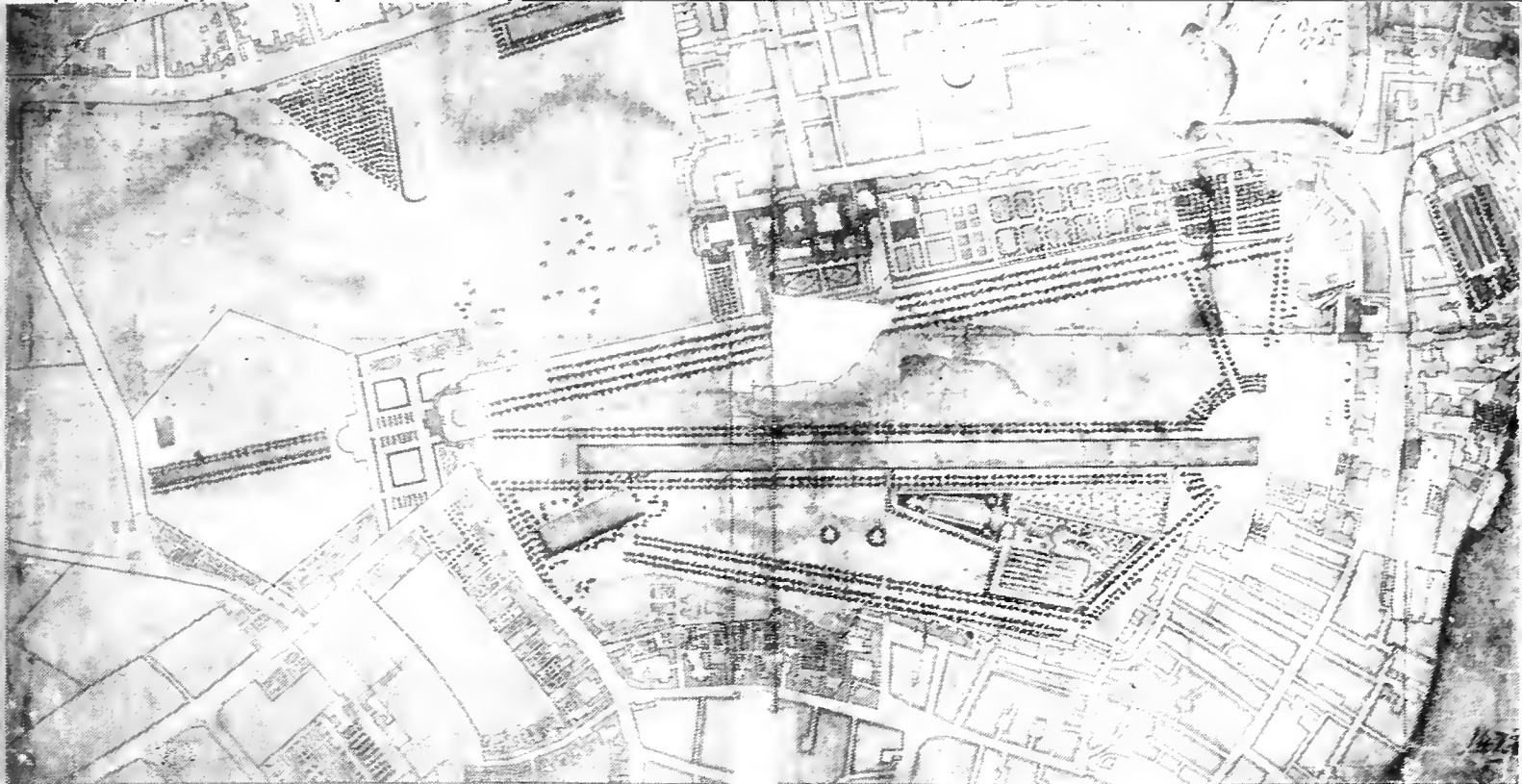
In January 1955 it was decided to discontinue the cleaning and adopt the policy of trying to keep the lake in a balanced condition, to see if that would reduce the persistent and expensive nuisance of the growth of filamentous algae. Aquatic flowering plants (*Elodea*, *Myriophyllum* and *Potamogeton*) were planted at various places near the shores of the lake and several species of water snail (*Lymnaea peregra* (Müll.), *L. stagnalis* (L.), *Viviparus viviparus* (L.) and *Planorbis carinatus* Müll.) were introduced. The fish put in in 1947 were still flourishing though the Orfe had not bred. The lake was neither emptied nor treated with chemicals in 1955 and 1956, and the heavy growths of algae were removed by hand labour.

Although the water plants failed to establish themselves it was reported in December 1957 that "The measures taken to maintain a balanced ecology have proved successful in drastically reducing the growth of *Rhizoclonium*".

In 1958 a small amount of this blanket weed had to be removed in the summer, but since then it has been no trouble; there was very little in the remarkably sunny summer of 1959 and there has been none since.

No doubt there have at all times been a great number of other species of algae present in the water, but so long as they have not been a nuisance no one seems to have been interested in them and the algal flora of the lake remains unknown. It has, however, been commonly observed that every year since the filamentous algae disappeared the water has from time to time been very grey or green, and this is undoubtedly due to vast quantities of microscopic algae in the water. In the autumn of 1961 one of these outbursts of algal growth (known technically as a "bloom") was investigated by Mr. B. A. Whitton, a research student in the Botany Department of University College, London, and he reported that the dominant organism was a blue-green alga known as *Oscillatoria limnetica* (Lemmerman).

Between May 27 and 31, 1960, there was a heavy mortality of fish in



the lake. This was due partly to deoxygenation and partly to a high concentration of carbon dioxide, for analysis showed the water to contain only 0.75 parts per million of oxygen and 26.3 p.p.m. of carbon dioxide, conditions which have been shown, by experiment, to be rapidly lethal to coarse fish.

Later that summer, in July, there were complaints of smell at the eastern end of the lake and it was apparent that a great deal of mud had accumulated near Duck Island. Consequently this part of the lake was dammed off, drained and cleaned out in February 1961. The fish in this part of the lake were recovered alive and transferred to the Pen Ponds in Richmond Park. They consisted of 15 to 20,000 Roach of an average length of 6½ inches, and a few Perch.

There was another fish mortality in early June 1961. Such an event always gives rise to public comment, and to try to avoid similar occurrences when weather conditions seem likely to result in deoxygenation of the lake at night, water is now circulated from the lake through pumps into the air whence it falls back as a fine spray. There was no fish mortality in 1962, 1963 or 1964.

The fish mortalities drew attention to the importance of the fluctuations in the amount of dissolved oxygen in the lake water, and since May 1962 the amount present has been determined weekly (usually every Thursday morning between 9 a.m. and noon). The figures show that the oxygen content varies considerably from place to place and from time to time. It is usually highest in the middle by the bridge and lowest at the western and eastern ends; it is probably significant that the two ends are the places where there is the greatest accumulation of mud. As examples of the variation the highest values recorded were 16.1 parts per million on June 7, 1962, 15.7 p.p.m. on May 8, 1962 and 14.9 p.p.m. on July 29, 1963; the lowest values were 0 p.p.m. on October 11, 1962, 0.6 p.p.m. on February 7, 1963 when the lake was frozen over and 0.5 p.p.m. on September 6, 1962.

These figures do not, however, tell the whole story for in a shallow body of water like this lake, carpeted with decaying and therefore oxygen-absorbing mud and containing at times vast quantities of green algae which produce oxygen by photosynthesis during the day and absorb it by respiration during the night, there are often considerable diurnal variations as well as irregular variations from time to time and from place to place. Accordingly since September 12, 1963 daily records have been obtained by an automatic recorder. These show a diurnal variation of the type expected: thus from September 12 to 20 the oxygen concentration rose to between 13.8 and 10.4 p.p.m. during the day and fell to between 8.3 and 4.3 p.p.m. at night. From September 22 to 26 however there was a general deoxygenation, and the highest readings fell to 4.2, 3.6 and 1.9 p.p.m. by day and to 0.9, 0.6 and 0 p.p.m. during the night and early morning. The records were then interrupted and when they were resumed on October 7 the diurnal variation was at about the same level as it was from 12 to 20 September. The oxygen concentration fell again on October 15 and varied somewhat irregularly up to November 1. The lake was however never during this period anaerobic and sometimes during the day oxygen concentrations reached 15.3 p.p.m.

Again owing to complaints of smell the eastern end of the lake was dammed off and the mud removed in the autumn of 1962.

In June 1963, ten years after the whole lake was last emptied and

cleaned, a survey was made to determine the amount and nature of the mud present at various points on the lake bed. Over the greater part the quantity was inconsiderable, generally between one and two inches and only in one or two places as much as three inches. There was more in the central channel but, even so, mostly only about three inches.

There were two very considerable accumulations which were visible from the bank, one at the western end west and south of the island and the other at the eastern end roughly east of a line joining the boat landing and the restaurant. At these places the mud was up to a foot thick and at the edges came to the surface of the water, polluting the atmosphere with a powerful and unpleasant odour.

The mud was of the same kind all over the lake, whether it was thick or thin, and appeared to consist of bird droppings in all stages of decomposition, mixed with leaves, twigs, cigarette ends, toffee papers and similar debris. It had a remarkably disagreeable odour and could be described as a "young" mud for there was no sign that it was rotting down to form soil or humus. During this survey no macroscopic animals except a few bloodworms (larvae of the non-biting midges (*Chironomus* spp.)), were found in the mud and it may be that all the attempted introductions of snails etc. have failed.

THE ECOLOGY OF THE LAKE

As has already been explained St. James's Park Lake is an artificial sheet of water made for ornamental purposes. From the time of Charles II it has been the resort of water fowl, some exotic and tame, or nearly so, and others native or migrant and wild. There have been Cormorants in the lake for long periods of years from about 1660 onwards, and a rock for their accommodation was put in in 1895. In 1899 there were Penguins and Pelicans and the rock for the latter was built in that year: there have been Pelicans there ever since. Besides the pinioned ducks and geese of many species which live on the lake permanently, several wild species nest there (Mallard, Tufted Duck, Pochard and the introduced Canada Geese) as well as Coot and Moorhens, and others occur as winter or passage visitors. Black-headed Gulls have become numerous outside the breeding season in the last fifty years or so, and other species of gull occur in small numbers.

All lakes whether natural or artificial, large or small, tend to silt up, to become swamps, then marshes and then dry land. They do this because owing to the lack of current they entrap any solid matter which comes into them, whether it is brought in by the inflowing streams or is blown on to the surface by wind. The rate at which this process happens varies with the size and situation of the lake: it may be millions of years for a large deep lake set in a country of hard rocks, or a few decades for a small shallow pond in a country of soft, easily eroded soil or sand. Like all the others, St. James's Park Lake accumulates mud, though since it was provided with water from wells in 1857 nearly all the accumulation comes by air from the surrounding land, some as dust, but mostly in the form of leaves from the very large number of deciduous trees in the Park. This is supplemented by the droppings of the numerous birds living on the lake and to no inconsiderable extent by the offerings of the public who delight in feeding the ducks; bread, cake, biscuits, sandwich fillings and fruit offal are perhaps mostly eaten by the birds, but some find their way direct to the mud and not all pass through the digestive system of a bird first.

There is, too, a fair amount of litter such as discarded paper, cardboard and cigarette ends.

It is possible, though perhaps not very likely, that if the lake had been left to itself since its formation in 1725 it might by now have been filled in but the rate of filling should not be exaggerated. Organic materials like dead leaves and bird droppings decompose in course of time and eventually yield manurial matter, some of which is soluble in water and some not; it is only this latter which forms a permanent addition to the mud. According to the records the lake was first cleaned in 1826, a hundred years after its formation, but after the bed was concreted in 1857, for one reason or another it has been cleaned at very frequent intervals and there is certainly no "old" mud in it.

Lakes can be classified in many ways and one way in which biologists do it is by reckoning their capacity for producing living organisms. Those that are barren and produce little plant and animal life are said to be oligotrophic, and those which produce a lot, eutrophic. There is an intermediate class known as mesotrophic but there is no doubt that on this classification St. James's Park Lake is highly eutrophic and must be expected to produce very large crops of living organisms of one kind or another. The analysis of the well water supplied to the lake shows that it is a fairly hard water containing a high concentration of nutritive salts. The addition to this of large quantities of excreta from birds, leaves from the surrounding trees and foodstuffs from the public produces a very productive water indeed.

TABLE I
ANALYSIS OF WATER FROM ST. JAMES'S PARK
(September 3, 1963)

	<i>Milligrams per litre</i>	
	<i>From the well</i>	<i>From the lake at the centre of the bridge</i>
Total Dissolved Solids (dried at 180°C.)	981	829
Alkalinity (as Ca CO ₃)	300	210
Total Hardness (as Ca CO ₃)	540	395
Calcium Hardness (as Ca CO ₃)	460	320
Magnesium Hardness (as Ca CO ₃)	80	80
Sulphate (as SO ₄)	250	230
Chloride (as Cl)	180	187
Nitrate (as N)	4.6	absent
Silicate (as Si O ₂)	14	6
Total Iron (as Fe)	0.1	0.1
Total Copper (as Cu)	absent	absent
Sodium (as Na)	115	122
Potassium (as K)	28	28
Free CO ₂	46	5
Free Ammonia (as N)	0.017	1.15
Albuminoid Ammonia (as N)	0.066	1.033
Nitrate (as N)	0.002	0.055
Total Phosphate (as P ₂ O ₅)	0.24	absent
4 hr. oxygen absorbed	1.05	3.2
pH	(7.1)	(7.7)

Table I gives the composition of the well water and shows how it changes in the lake as a result of exposure to the air (loss of carbon dioxide and increase in pH value), the growth of algae (reduction in the concentrations of nitrate, phosphate and silicate) and the fouling by water birds (increase in free and albuminoid ammonia, nitrite and "oxygen absorbed").

Information on the actual fauna and flora of the lake is very scanty. This is perhaps not surprising, for freshwater biology was of little account until the twenties of this century and at that time the lake was being cleaned so frequently that a study of its biology was bound to be unrewarding.

It is quite likely that the noisome smells which were observed in 1818 and in the 1850's and which were ascribed to the pollution of the water supply were not directly due to that cause but to odoriferous algal growths or to the decay of crops of water fleas, for the provision of a pure water supply gave no real relief, but what the lake was like in those days, whether it contained fish, aquatic plants or filamentous algae is nowhere stated.

It was, however, said in 1910 when the lake was treated with copper sulphate that the algae were destroyed but no harm was done to plants or fish. One would assume from that that the algae present were of the filamentous kind known as "blanket weed" and that there were also higher plants present, but their species is not stated.

When the lake was refilled in 1922 after the 1914-18 war an attempt was made to grow water plants in it but the birds pulled them all to pieces.

In a Parliamentary Question in 1926 there was a reference to fish in the lake but there is no indication what they were unless they were Three-spined Sticklebacks, for in 1934 it was said that at one time there were thousands of them in the lake and that they had come down the pumping main from the Serpentine.

At various times since 1955, as has already been said, attempts have been made to introduce bottom-living animals with the intention that they should assist the decomposition of the dead leaves and other organic matter accumulating in the lake by feeding on them. The introduction of freshwater mussels has also been considered because with their filter-feeding mechanism they might remove suspended matter from the water and improve its appearance. This idea has not been followed up because clearly a great many mussels would be required to produce a sensible improvement and the larvae of the common swan mussels *Anodonta* and *Unio* are parasitic on fish and in large numbers might be dangerous to them; the zebra mussel *Dreissena polymorpha* (Pallas) has an unfortunate tendency to spread into pipes and culverts and to flourish in them to such an extent as to choke them, so there would be a considerable risk in introducing this species.

The lake is at most times a very suitable habitat for various species of fish, for the Three-spined Sticklebacks which were re-introduced into the lake in 1938 did well. Since the lake was not emptied between then and the end of the war they presumably survived all that time. It appears however that they did not survive the various cleanings and treatments between 1946 and 1953 for none have been seen for some years. Of the fish introduced in 1947 the Perch and Roach thrived and bred vigorously for many thousands died in 1960 and 1961 but many of all sizes were still present in 1963 and from the number of young fish observed have clearly continued to breed. The Golden Orfe were found dead in 1960.

As the number of Roach and Perch was so clearly increasing and as there is no fishing in the lake it was decided early in 1961 that it would help to maintain a balance if some predatory fish could be introduced; the growth in the population of Perch and Roach might be kept in check and there would be a greater variety of fish in the lake. It was thought undesirable to introduce Pike, for they would prey on young water fowl as well as on fish and it was decided therefore to stock with Rainbow Trout in the expectation that they would become piscivorous and eat at least the fry of Roach and Perch. Unfortunately shortly after they were introduced they died in the 1961 mortality.

In April 1962 about 1,000 elvers (young Eels) were put in, again to diversify the fish fauna and perhaps, when they grew up to prey on the Perch and Roach. They are bottom-living fish difficult to observe and their progress has not been recorded. In 1964 large Rainbow Trout and Goldfish taken from the Jewel Tower moat were put into the lake.

The death of large numbers of fish in the lake in the early summers of 1960 and 1961 has already been mentioned and ascribed to low concentrations of oxygen and high concentrations of carbon dioxide in the lake water. The occurrence of low concentrations of oxygen and high concentrations of carbon dioxide at night and particularly just before dawn is a common consequence of very abundant algal growths. These organisms, which consume carbon dioxide and produce oxygen by photosynthesis by day reverse the process at night and by respiration consume oxygen and produce carbon dioxide. It is, however, curious that in St. James's Park Lake, as well as in many other lakes, these fish mortalities are more common at the end of May and in early June than at other times during the summer when to all appearances algal growths are just as prolific. It may be that at this time of the year during or just after the breeding season the fish are more sensitive to unfavourable conditions and succumb more easily than at other times of the year.

SUMMARY

It has been thought desirable to publish this account of the lake and its biology now so as to place on record the facts known at present. They are scanty, but the past cannot be overtaken, and it is hoped that this public confession of our ignorance about one of the best known sheets of water in the land will encourage those naturalists who have the time and opportunity to concern themselves with other aspects of the lake than its bird life, and to record their observations for the benefit of posterity.

ACKNOWLEDGEMENTS

The historical information in this account of the lake has been derived mostly from the files of the Ministry of Public Building and Works, and I am greatly indebted to Mr. F. E. E. Fox and his colleagues of that Department for making the information available and for reading and amending the manuscript. I am also grateful to Lord Hurcomb, G.C.B., K.B.E., Chairman of the Committee on Bird Sanctuaries in the Royal Parks, who has also read a draft and made some helpful suggestions. The data on the chemistry of the lake water have been placed at my disposal by the kindness of the Government Chemist and the Director of the Water

Pollution Research Laboratory of the Department of Scientific and Industrial Research. Finally I must express my thanks to my colleague, Mr. W. G. Hartley, who has done much of the field work described in this paper.

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Corrections

BIGNELL, V. F., 1964, The Roman Road from Dunmow to London. *Lond. Nat.*, **43**, 78-82.

Page 80, correction to scales of lower diagram.

Scales

Horizontal 1 in - 12 ft

Vertical 1 in - 6 ft

Section of trench at Bush Wood excavation

SEEL, D. C., 1964, Some water-snails in the Ruislip Local Nature Reserve. *London Naturalist*, **43**, 112-118.

p. 114. For "Carnation Sedge (*Carex flacca*)" read "Lesser Pondsedge (*Carex acutiformis*)",

and for "Water Pepper (*Polygonum hydropiper*)" read "Amphibious Bistort (*Polygonum amphibium*)".

Excavations at Merton Priory, Merton, Surrey

Second Interim Report

By D. J. TURNER

A SECOND season of excavation organized as before near the site of the Augustinian Priory of St. Mary, Merton, was carried out in 1963. The work clarified some of the problems remaining at the end of the first season and produced additional dating evidence.

During the first season a cobbled roadway had been discovered running N.W.–S.E. across the corner of the allotment area available for excavation. This was further uncovered and sectioned in 1963, and was found to be partly overlain by a rough floor extending eastwards towards the cellarers range of the Priory. This floor extended out of the allotments and under a railway goods yard where it is at present inaccessible. The floor was of small irregular pieces of Upper Greensand, some of which had dressed faces, laid on a bed of clay. It had been greatly disturbed, probably at the time of the destruction of the Priory. The clay layers beneath the floor contained some pieces of chalk, and a group of the larger chalk fragments had been mistaken for possible disturbed footings at the close of the 1962 season.

A second irrigation ditch was revealed running parallel to that found in 1962. The stratification produced by the silting up and final filling of the ditches was determined by sectioning the first ditch. The ditches could be dated to the eighteenth century.

Finds of pottery, metal, bone, etc., were greater during the second season than the first but the bulk of the material came as before, from the disturbed midden material in the destruction layer. Suggested dating, derived mainly from the pottery evidence, places the roadway in the first half of the fourteenth century and the floor some time in the fifteenth. Caution is necessary because the dating of the mediaeval pottery is not precise and the amount of material in well stratified positions was small.

THE EXCAVATIONS

The grid laid out in 1962 (Turner, 1963) was extended during the second season's work. The boundary of the site is at an angle to the axis of the grid, which had been set up parallel to the cobbled roadway, and this gave rise to modification of the sixteen foot grid. (Fig.1).

During 1962 only the western half of the roadway had been sectioned. The section was continued in the second season across the eastern half (Fig. 2) and this disclosed a small ditch at the eastern boundary of the road. Loose cobble from the surface of the road filled the ditch which could not have been open for many years. The ditch fill contained fragments of green glazed Surrey ware of 14th century date (see below). This dates the ditch, approximately, but only dates the making of the road if the ditch was made at the same time. In the absence of any sign of an upcast mound associated with the ditch, it seems arguable that this was so. Certainly the ditch cannot be earlier than the road.

To the east of the road and overlaying it at one point was a floor of irregular pieces of Upper Greensand laid on a series of dumped layers of clay. In this dumped clay were occasional fragments of soft chalk, some of them up to about 6" long. Also in the clay was some pottery, the

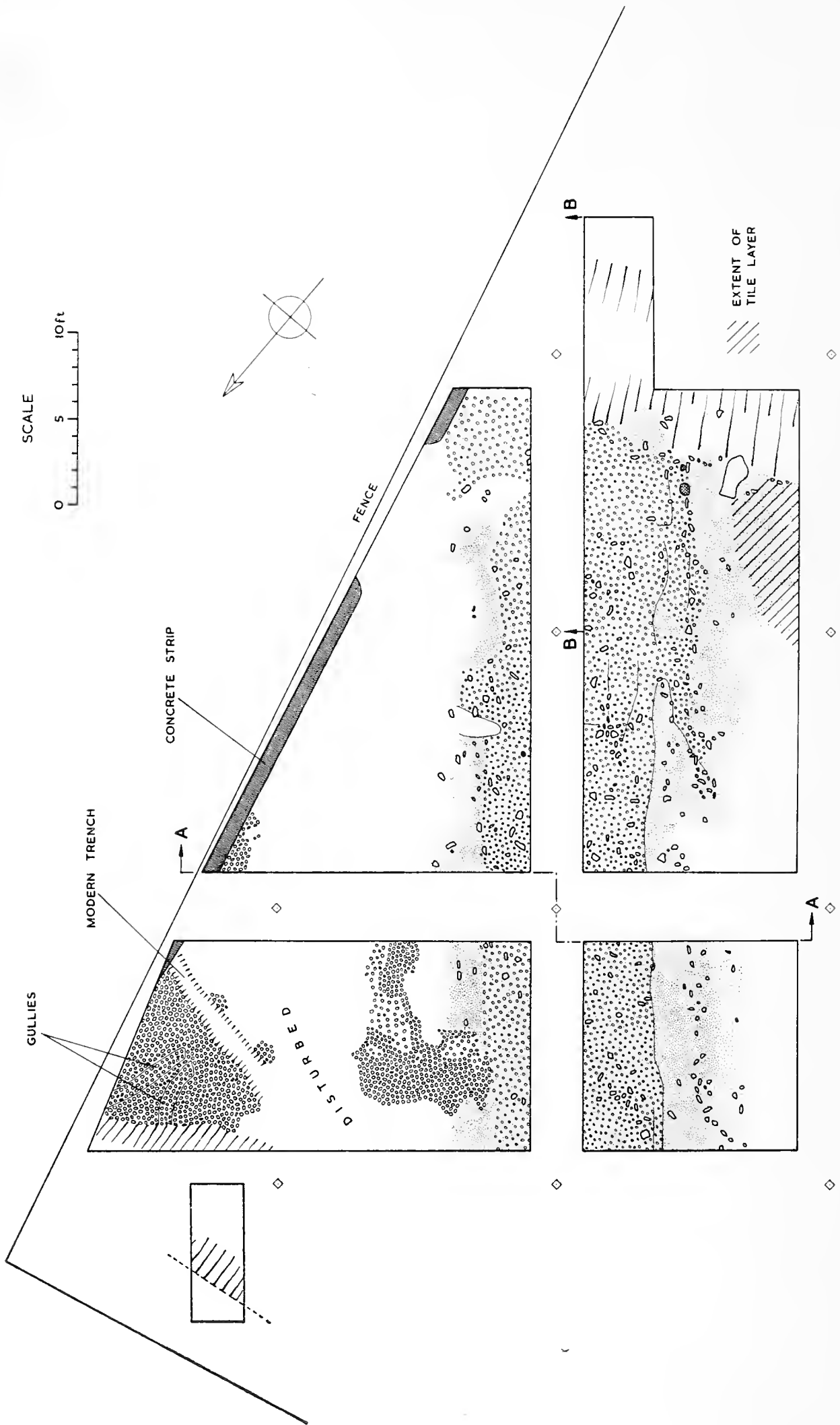


Fig. 1. Plan of excavations 1962-3. (For a general site plan see Turner, 1963)

latest being sherds of Cheam ware of probable 15th century date. Many of the Greensand pieces were dressed on one or more surface and it is possible that all the Greensand was re-used building stone. The floor was little more than 3" thick and large areas of it had been completely disturbed. It could never have had great strength and as the disturbances were filled with the destruction layer that overlay the site it is probable that the disturbance dates from the destruction following the dissolution of the Priory in 1538. The clay underlying the floor completely sealed the filled-in side ditch of the road at the point where the floor overlay the road.

Two irrigation ditches were found dating from the eighteenth century. One of them was sectioned completely (Fig. 3) and the sequence of wet silting, dry silting and deliberate filling was shown. The clay layer (layer 2) that was sterile in the southern irrigation ditch was also present in the northern. Here, far from being sterile, it contained a considerable amount of mid-19th century material.

The overall stratification was consistent where tested and is shown in Figs. 2 and 3.

FUTURE WORK

The allotment site is now unlikely to produce much further information. A few areas of derelict land lie on the north side of Station Road and it is hoped that future work here may relate the cobbled road to the approaches to the Priory and to the cemetery that lay to the west of the Priory.

To the west of the present main stream of the Wandle is the site of Abbey House. A photograph taken in 1913, when this building was demolished and the well-known Norman doorway found, has recently been rediscovered. This shows that the doorway was set in a substantial ashlar faced wall, apparently contemporary with the doorway. Part of the site of Abbey House is now occupied by buildings of Liberty's factory, but it may be possible that excavations in the vicinity could produce further evidence of the ancillary buildings of the Priory.

ACKNOWLEDGEMENTS

The gratitude of all connected with the excavations is due to Mr. A. Slinger of Liberty and Co., Ltd., and his wife, whose willing co-operation and friendly interest have throughout made the work possible. Approximately seventy people took part in the excavations over the two years' work, too many to mention everybody by name. However, the director's especial thanks for help are due to John Collett, John Cross, Malcolm Sims, Bill Rudd, Cyril Easterling, Mr. and Mrs. J. Bell, Peter Pickering, Nicholas Farrant, Susan Mallec, Albert Bartrum, the late Mr. Polan, and Linda Fowler. The director's wife helped untiringly throughout, both in the work of excavation and site supervision. Help in preparation of this report has come from many directions, but most notably from John Cresswell who has prepared the illustrations.

THE FINDS

Flint

45 pieces of clearly or possibly deliberately struck flint were recovered from the excavation. Most fragments were waste flakes and were unpatinated. Only six fragments showed some slight signs of retouching

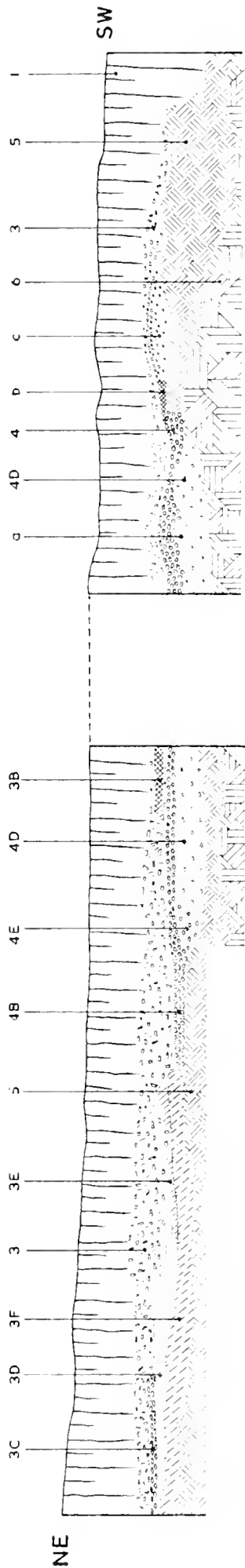


Fig.2. Section A-A across roadway

LEGEND

- 1 Top soil
- 2 Clay
- 2A Brown/black clayey layer with patches of chalky soil, fragments of tiles, brick & stone
- 2B Clayey silt
- 2C Sandy silt
- 3 Destruction layer
- 3C Greensandstone 'floor'
- 3D Clay layer with chalk fragments near base
- 3E Chalk lumps & chalky soil
- 3F Grey soil
- 4 Roadway
- 4B Flint cobble
- 4D Orange gravel
- 4E Stony ditch fill
- 5 Brown loam
- a Black loam
- a Ash
- b Crushed tile & stones
- c Small cobble over stony soil

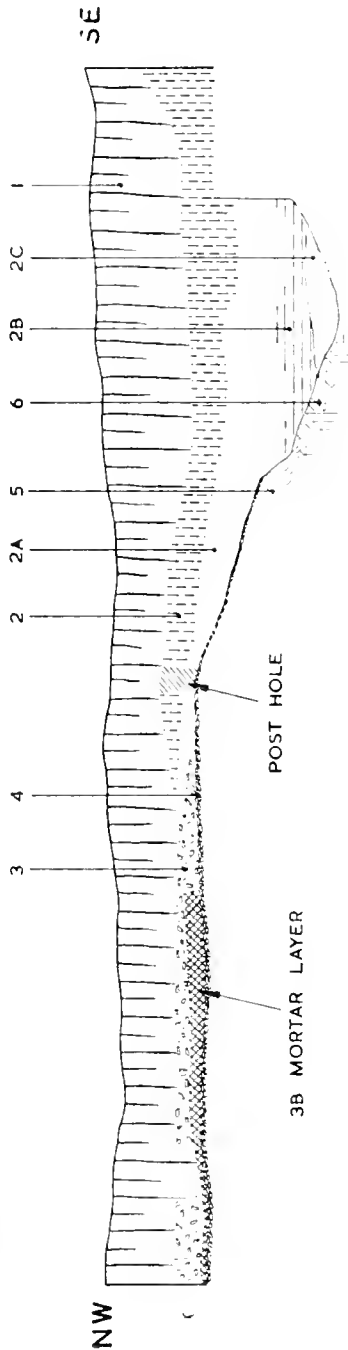


Fig.3. Section B-B of southern irrigation ditch

(13%). Three flakes are narrow blades resembling those from mesolithic sites. Of the retouched flint, one was a carefully made end scraper and another was a possible gun flint.

Mediaeval Pottery

It is not proposed here to deal exhaustively with the large quantity of pottery found during the two seasons' excavations. That is best left until the final report. Most of the pottery found was in a highly fragmentary condition and the bulk of it came from the destruction layer. Some stratigraphical evidence was forthcoming and five main typological groups were distinguishable.

Shell tempered ware

Grey or black, lightly shell tempered ware with a red-brown surface. At Northolt (Hurst, 1962), less than twenty miles from Merton, the mediaeval shell tempered ware is black with purplish-brown surface. It derives from St. Neots ware and dies out by *c.* 1150. The shell tempered ware from Merton and other N.E. Surrey sites is likely to be related to that of Kent. At Eynesford similar pottery has been dated down to *c.* 1300 (Spencer, 1964). However, at Merton the shell tempered ware is stratigraphically distinctly earlier than the grey gritty ware (*q.v.*) and so is probably earlier than 1300.

Grey gritty ware

Hard grey or pinky-grey pottery made on a fast wheel. Grits stand out giving a surface harsh to the touch. The fabric resembles that produced by Limpsfield potteries (Spencer, 1964; Dunning, 1959 (a)) but is also similar to the hard mediaeval grey wares of Northolt (Hurst, 1962, p. 267) and to the pottery from the Manor of the More, Rickmansworth (Biddle, 1959) and other sites in Hertfordshire (Renn, 1964). The Merton rim forms resemble those from Ashtead (Frere, 1941) and Limpsfield. The ware found at Merton was almost certainly manufactured somewhere in N.E. Surrey. Both the Limpsfield and Ashtead potteries have been given a date of *c.* 1300 and the similar ware from Northolt is dated 1250-1325.

Cream slipped ware

This usually had a brown surfaced, grey fabric. The slip is often covered by glaze which may vary from the palest of greens to deep olive, sometimes mottled with yellow. A Limpsfield ware jug and an ovoid jug of this ware were found at Lesnes Abbey associated with polychrome ware of *c.* 1300 (Dunning, 1959 (b)). The fabric resembles that from known pottery kilns on the London Clay, such as Tylers Hill near Canterbury (Stillet, 1943) which did not produce slipped ware. It is probable that the slipped ware was manufactured somewhere on the London Clay south of the Thames. Similar pottery has been found in London (London Museum 1954, No. A 25645) and Stonar (Unpublished, Deal Castle Museum).

Off-white Surrey ware

The largest group of the pottery recovered from the excavation was of this pale-grey to buff sandy ware. The ware is well fired and hard. A

high proportion of the sherds are glazed, the glaze ranging widely in colour. The sherds seemed mainly to belong to jugs: flanged cooking pot rims and bifid rims, so characteristic of similar pottery at Northolt, were not found at Merton. Bases are both thumbled and plain. Handles are either circular or D-shaped; they are usually lightly stabbed and, when D-shaped, carry as decoration two grooves running the entire length of the handle on the outside of the flat face. Similar ware was dated 1300-1425 at Northolt but could easily have persisted later at Merton. The fabric fades imperceptibly into fabric identical with that from the Cheam potteries.

Cheam ware

Markedly finer and thinner than the off-white Surrey ware although much pottery intermediate in fabric was found. The pottery is similar to much of that found at Cheam (Marshall, 1924) and it is probable that it came from there. Glaze, on parts of vessels only, is usually mottled olive green to brown but one or two fragments with mottled yellow to apple green were also found. Bases were flat and base angles plain. Both round and strap handles occurred. The dating of Cheam ware is problematic but its floruit was probably during the fifteenth century.

Printed Tiles

Numerous fragments of printed floor tiles were found. Amongst these the following patterns could be identified (only fragments were found at Merton: where the whole pattern is described this is reconstructed from known examples found elsewhere):—

- (1). Design of two superimposed foliate crosses. Also known from several sites in the City of London; from Canterbury and Lesnes Abbey, Kent; Baginton Priory, Warwick; and Gengeo, Hants. (Chatwin, 1936: Fig. 10, No. 6; London Museum, 1954: Fig. 79, No. 37).
- (2). Guilloche pattern with oak leaves (?) in the interstices. A variation of a pattern which has been found with a number of variations. Numerous sites from Winchester to Lesnes Abbey, but mainly in Bucks. One of the variants was also found at the kiln site at Penn, Bucks. (Hohler, 1941 and 1942, P. 61, 62, 63 and 64.)
- (3). Corner fragment probably from design consisting of pierced cross in ring from which springs fleur-de-lys into the angles and trefoils towards the middles of the sides. Also known from Chalcombe Priory, Sussex; Reading Abbey, Berks; Savoy Palace, London; and St. Albans Abbey, Herts. (Hohler, 1941 and 1942: P. 71; London Museum, 1954: Fig. 80, No. 50, Haberly, 1937: No. CXXX). (This fragment was incorrectly given as belonging to London Museum type 49 in the first interim report).
- (4). Fleur-de-lys with long leaves and foot askew, set diagonally. Debased version of design known at several sites in Buckinghamshire. (Hohler, 1941 and 1942: P. 42).
- (5). Four quatrefoils springing symmetrically on three stems from the inner of two concentric quadrants; in the inner angle two indented petals and a triangle, with a bar across it, enclosing a trefoil; in the outer angle a mask with a ring about it between two ornaments.

Also known from Eddlesborough, Little Marlow, Radnage and Stone, Bucks.; and various sites in the City of London. (Hohler, 1941 and 1942: P.151; London Museum, 1954: Fig. 77, No. 22).

- (6). Several fragments were found of this pattern. A lion passant in lozenge formed by four segments of circle enclosing trefoil ornaments. Also known from Cookham, Berks.; Pitstone, Bucks.; Blackfriars, Dunstable, Beds.; Chesterford, Essex; Bushey Hall, Watford, Herts.; and various sites in the City of London. Possibly also from Merton College, Oxford. (Hohler, 1941 and 1942: P. 38; London Museum, 1954: Fig. 76, No. 2; Haberly 1937: No. CLIV).
- (7). Fragments showing part of cusped quadrant with empty cusps. Variations of this design normally enclose a dragon below the quadrant and have fleur-de-lys and trefoils in the outer angle. (Hohler, 1941 and 1942: P. 120, 121, 123, 124; London Museum, 1954: Fig. 77, No. 19).
- (8). Heraldic gyronny. Two variations of this pattern were found. One was similar to Haberly No. CCXXIX, the other was the reverse pattern to Haberly No. CVII. Variations of these designs have been found at many different sites. (Haberly, 1937; London Museum, 1954).

Jettons

Two further jettons were found during the 1963 season.

1. From the uppermost of the layers sealed below floor. Size 6.
 Obv. A king, standing under a canopy of E.E. architecture.
 Leg.: GRA REX, perhaps for Dei Gratia Rex. (c.f. Barnard, 1916, p. 102, No. 39).
 Rev. A short cross-crosslet decorated (one of the numerous decorative varieties of the cross-crosslet for which there is no special heraldic or other term) cantoned by eagles displayed, within an inner granulated circle.
 Leg.: AMOR VINCIT OMNINI . . . (in gothic script)
 (c.f. Barnard, 1916, p. 101, No. 37).
 Partly pierced on rev.

An Anglo-Gallic jetton probably struck at an English mint in France. The partial piercing is a common characteristic of Anglo-Gallic jettons and is discussed by Barnard (1916, p. 95) who states:—

“A peculiarity of the jettons generally accepted as Early English or Anglo-Gallic is that most of them are partly or wholly pierced in the middle. . . It has been suggested (Rouyer and Hucher, 1858) that to render the flans more exactly circular, they were worked on a lathe and held in place during this operation by a little spike of hard metal which penetrated the centre of the flan. It may be that the cavity thus made also served to hold the flans fast during the striking, a similar spike being fixed in the die. This is supported by the fact that in an examination of many hundreds of such counters I have never met with a case in which the flan has slipped under the hammer. Why this should have been a feature of Anglo-Gallic and no other, not even French, jettons is, so far not clear”.

In the case of the jetton from Merton, the partial piercing is central to

the flan but not to the design. Also the piercing is surrounded by a slight raised rim of metal that has resisted wear to a greater extent than the adjacent parts of the surface. This suggests that the piercing was later than the striking of the jetton and supports the contention that the jetton was worked on a lathe.

Barnard suggests that the Anglo-Gallic jettons were not struck later than the end of the 14th century. The partial intelligibility of the legend on this example suggests that it falls late within the series, and a date towards the end of the fourteenth century might be implied. Little is known of the survival capacity of individual jettons.

2. From the destruction layer. Size $6\frac{1}{2}$.

Obv. The Châtel Tournois within a granulated inner circle.

Leg.: Indecipherable gothic script. (c.f. Barnard, 1916, p. 110, No. 4).

Rev. A cross of three strands fleurdelisée and fleurannée with a quatrefoil in the centre, all within a tressure of four arches fleuroncée at each angle.

Leg.: AVG in the spandrels of the quatrefoil (gothic script) (c.f. Barnard, 1916, pp. 112-3, Nos. 7 and 15).

The type of Châtel-Tournois was ubiquitous on European coins for more than two centuries, but especially popular in the 14th century. It presents a motive of stylised ground plan and elevation, representing, conventionally, the town, castle and church of Tours. There are many variations in the treatment of the châtel type. In the case of the jetton from Merton, the town walls are given in ground plan as three sides of a square with two round towers at the unenclosed side. In the centre rises the elevation of the church spire, crowned with a fleur-de-ly: in the examples detailed by Barnard the spire is surmounted by a cross potent. In front of the town is the ground plan of an outwork.

The reverse is of a character commonly found on mediaeval jettons and resembles the reverses of various French coins from Louis VIII (1223-6) onwards.

Bone

Cylindrical bone handle, turned on a lathe, $2\frac{5}{16}$ " long, $\frac{1}{4}$ " dia. One end is slightly tapered and possesses a short socket for a tang. The other end is decorated with two circumferential grooves on a head that is $\frac{1}{8}$ " long and $\frac{5}{16}$ " diameter. Possibly from a punctilius. Found in the clay sealed below the greensand floor and thus 15th century or earlier.

Iron

The treatment of iron objects is still continuing and nothing can be added at this stage to the note in the first interim report.

Bronze Pins

Sixty-five more spherical headed bronze pins and fragments of approximately 18 others were found during the 1963 season. Their characteristics were similar to those described in the first interim report.

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Conservation in the London Area in 1964

THERE is no doubt that the most outstanding occurrence during the year was the publication of the Civic Trust's report "A Lea Valley Regional Park", which contained proposals for the development of the Lea Valley as a recreational area. This was an imaginative concept that would certainly result in a much-needed increase in the recreational facilities available to the ever-increasing population of the London area. Insufficient account, however, was taken of the high scientific value of parts of the Valley, much of which would be lost if the plans were carried through as proposed.

A working party of members of this Society was set up to prepare a report (see p. 151) on the natural history of the area and to make recommendations for the setting aside of parts of the Valley in the interests of nature conservation. This report, together with those from other interested bodies, would be collated by the Council for Nature and a comprehensive report on the scientific interest and the conservation proposals would be forwarded to all the local authorities and other organisations concerned in the development area.

Some two hundred members and visitors attended a very successful general Society meeting in March on the subject of "London's Vanishing Wild Life", with Mr. K. R. Crawshaw, Secretary of the Essex Naturalists' Trust, as guest speaker. Members' questions were answered by a panel of Naturalists' Trust and Society members, and two films were shown.

A number of field meetings, with the object of introducing to members some of the principles and problems of conservation, were held during the year. Although these only met with varying success, the Committee felt that so important a theme needs to be brought continually to the notice of members, and that the field meetings should be continued, every effort being made to publicise them and to encourage attendance.

The year produced the usual crop of events throughout the area, and members of the Society and the Naturalists' Trusts have been active in a variety of ways.

The primary review of the statutory Sites of Special Scientific Interest in ESSEX was completed by the Naturalists' Trust, who had also taken action at Grays Chalk Pit where dumping of soil and waste was threatening the important flora. Also at Grays, the Dene Holes had been scheduled as an Ancient Monument and restoration work was being carried out at one of them.

A survey of Epping Forest was commenced by the local branch of the British Naturalists' Association, and should prove a useful addition to the knowledge of the area. The survey of another site, Coopersale Common, was completed during the year.

In Hainault Forest, the London County Council has completed seven years of its ten-year management plan. Some 7,000 native hardwood trees had been planted and the lake had been cleaned and deepened to nine feet in the centre.

The laying of the methane gas pipeline through HERTFORDSHIRE had caused a certain amount of temporary disturbance, particularly in Bishop's Wood, where there had been some risk to the interesting flora. A considerable amount of re-forestation was being carried out in the wood, the eventual result of which would be that some 60% of the site would be an amenity area planted with native hardwoods and some exotics, and having graded paths, and the remainder planted with Red Oak and Beech, with Douglas Fir and Scots Pine as a nurse crop. This development was being carried out by the Economic Forestry Group on behalf of the Rickmansworth Council. A meeting was held in August between the Group and the Herts. and Middx. Trust for Nature Conservation and, as a result, the Trust asked the Hertfordshire County Council to suggest certain modifications to the management plan in order to preserve the more outstanding areas within the wood.

At Bricket Wood, there was a proposal to extend the Building Research Station, and although the most important parts of the wood were not to be affected, concern was felt over the continual erosion of the boundaries of the area.

At the beginning of the year, large-scale hedgerow destruction and tree-felling were noted along the roads from Moor Mill to Bricket Wood. Representations were made to the St. Albans Rural District Council and the Hertfordshire County Council, when it was learned that the developments were part of a road-widening scheme—one of the cases in which the inevitable had to be accepted.

There seemed to be, however, a general policy of hedgerow-clearance and tree-felling in the county which was a matter of concern to the Society and the Trust. Allied to this was the collection by the Trust of records of notable roadside verges as a preliminary to the scheduling of them for conservation.

The Committee was pleased to hear that the application to build a World Exhibition Centre at Osterley, MIDDLESEX, had been refused, as also had the proposal to build a marina at Syon Park on the site of the heron and cormorant roost.

Planning permission had been granted for the extraction of gravel in an area at the north end of Staines Moor, an activity which, in this case, would probably be an eventual asset, but the increasing amount of gravel digging in Middlesex was an ever-present threat to areas of interest.

A noteworthy development this year was the setting-up of the Colne Valley Conservation Society, with a scientific committee to give advice on matters such as river pollution, which should prove a useful addition to the body of interest in conservation.

Plans for housing development at the Fox Reservoir site at Ealing include a public open space of about 1½ acres, part of which was to be a bird sanctuary. It would seem that, in its context of a site surrounded by

houses, the area set aside was much too small and was an example of taking action without full realisation of the problems involved.

The Harefield Moor geological site was being covered by rubbish-tipping, but action by the Trust had resulted in a further agreement between the owners and the Nature Conservancy to preserve the exposures.

Negotiations were proceeding satisfactorily for the leasing by the Trust of a five-acre reserve at Bourne Farm, near Harefield, an area of semi-natural woodland, a small lake and part of an old sandpit. This would give an interesting variety of habitats with an important educational potential, situated as it was in a densely populated area.

Late in the summer, it was noted that grubbing-out of Hornbeam was being carried out in Copse Wood, Ruislip. At the request of the Society and the Ruislip and District Natural History Society, the Nature Conservancy took the matter up with the local council. The results were most unsatisfactory, and the question was now in the hands of the Trust in the hope that something could be achieved locally.

Work under the Stanmore Common management plan had been started by Harrow Council, the schemes of clearance having been modified at the request of the Society.

Dumping of spoil in Bayhurst Wood had all but wiped out an extensive area of orchids and covered a badger-sett, but representations to the local and county council resulted in a cessation of the dumping and also an offer to the Trust to take over the management of the wood.

Following the felling of mature oak woodland at Trent Park, the Middlesex County Council was approached by the Trust. The interest of the area was pointed out and a request made for a modification of the management plan in order to preserve certain localities of particular value to which the Council agreed. This is an example of co-operation for which we were most grateful.

Harrow Weald Common again suffered from the effects of widespread horse-riding making its paths impassable to pedestrians in wet weather (a problem affecting many of our commons to an ever-increasing extent). The Conservators marked off a perimeter riding-track, and it was hoped that this would restrict the damage to the area. Harrow Weald Common was fortunate in being under the control of a body of Conservators and in having full-time Keepers to ensure that threats to the area were dealt with promptly.

It was unfortunate that only two new offers of assistance were received in answer to the appeal in the last *London Naturalist*. By a coincidence, both of these were from members in our West Hertfordshire area, and they were soon helping our activities by submitting reports on areas of natural history interest. Our County Representative asked that his appreciation of the generous assistance given by these members and by the Harrow Weald Common Conservators be put on record.

A report was received from SURREY, that the negotiations for the leasing of the Naturalists' Trust's second nature reserve were well under way. This reserve, at Godstone, would consist of a pond and an area of marsh and meadow with an interesting flora and would no doubt prove most useful for educational purposes.

The ploughing of some chalk grassland at Nore Hill had been noted, with a resulting threat to two areas of orchids. An agreement was made with the farmer to preserve these particular sites.

At Limpsfield Chart, there had been a considerable amount of tree-felling and re-planting with conifers during the year, but efforts were being made to save a beech wood which, growing here on sand, gave an interesting contrast to the other beeches on chalk in the area.

Local councils have been active in the plans for the development of the riverside at Ham, to include a substantial sanctuary area, but the proposals had been held up owing to difficulties over the purchase of some 33 acres of private land in the area concerned, on which there had been a planning application for private development.

Esher and Arbrook Commons were again in the news with a report in the local press of a Surrey County Council announcement that the proposed Esher by-pass was to be routed across the commons in the form of a six-lane highway. It appeared, however, that this was not the final position, as there would have to be a public inquiry and a ministerial decision before the matter was settled.

The proposal to build a new town complete with an amusement centre on an area adjoining Ruxley Gravel Pit in KENT was the subject of a public inquiry in September. The Kent Naturalists' Trust was represented at the inquiry and a letter of protest was sent from the Committee. This was an example of the ever-increasing pressure on London's green belt, a major factor in the field of conservation in all our counties.

During the year the Trust completed the re-survey of the Sites of Special Scientific Interest in the county.

At Downe Bank the Trust took a lease of a further 5 acres adjacent to its freehold property. With this, Darwin's locality for the Musk Orchid became part of the Reserve, together with the part that can properly be called his "Orchis Bank". A survey of the bird life of the Reserve was carried out during the year.

Although primarily a review of the events of 1964, it may not be inappropriate to end with a note regarding one of our plans for the future. The Committee is hoping to collect sufficient information during the coming year to publish in the *London Naturalist* in 1966 a full paper on the sites of natural history interest in the Society's area. This is a task in which members, whatever their interest, could and should take part by sending to the Secretary of the Committee, records about any site however trivial they may seem.

L. MANNS, *Conservation Secretary*.

Report on the Natural History of the Lea Valley

By JOHN CRUDASS and BRIAN MEADOWS

Recommendations for the amendment of proposals put forward by the Civic Trust for the provision of the Lea Valley National Park.

INTRODUCTION

In 1961 the then Mayor of Hackney convinced representatives of a number of local authorities, during a boat trip along the River Lea below Tottenham Lock, of the need for joint action in the cleaning up of the river and adjoining land. Nearly two years later in April 1963, a meeting of local authority representatives agreed to ask the Civic Trust to undertake a study of the Lea Valley with a view to its development as a recreational area.

The resulting recommendations were published in July 1964 under the Title "A Lea Valley Regional Park".

OBJECT

Due to a series of accidents, no report or recommendation was received by the Trust from the naturalist bodies with the inevitable result that the views of such groups were largely ignored. Where proposals were made, they were of little value because of a lack of experience and intimate knowledge by those preparing the report. It is not the intention to condemn the Trust for this; the blame clearly lies with those societies etc. who should have ensured that their views were fully documented and submitted. On the contrary the Civic Trust must be congratulated on their work which in the main produces an admirable outline of what should be done in the valley.

We were asked by the London Natural History Society to carry out a survey of the whole of the Lea Valley and put forward proposals for improvements in the scheme designed to ensure that wild-life has a fair chance of continued existence and expansion, at the same time allowing the naturalist to follow his bent without hindrance from the activities alien to the development of the former or the quiet enjoyment of the latter.

METHOD

The valley from the Thames to Ware has been surveyed, sites of known interest to naturalists considered, and the importance of existing wildlife weighed against the loss or disruption which would occur were the schemes proposals to come to fruition. Where recommendations for some activity coming within this sphere has been made, these have been considered and commented upon.

RECOMMENDATIONS

1. *Mill Meads Park*. (Ref. 1. pp. 21-23, site 6. MR. TQ 385830)

An area of wasteland, allotments etc., bounded on the one side by Abbey Creek which supports a surprisingly rich littoral aquatic flora and a fairly dense reed-bed, chiefly of *Glyceria*. Black Redstarts and Pied Wagtails breed along the Creek, Skylarks were seen and heard singing in 1964, and Kestrels hunt over the area.

It is proposed to establish a Fun Palace on this site and in the circumstances, taking into account the surrounding densely built up area and the high possibility of further interference, it is not recommended that this proposal be contested.

2. *Stratford Plain*. (Ref. 1. pp. 21-23, sites 3 and 4. MR. TQ376840).

Also an area of wasteland colonised by perennial herbs now being replaced by scrub. This is a good site for entomological studies, and ornithologically is interesting since Skylarks, Whitethroats, Yellow Wagtails and Partridges are still found here even though the site is within three quarters of a mile of the inner London boundary. (Ref. 2. p. 31). Kestrels still hunt over the area although in more rural Essex there has been a serious decline in recent years.

Playing fields are the suggested development here and for the same reasons put forward in the case of Mill Meads the proposal is not opposed.

3. *Coppermills Reservoirs*. (Ref. 1. pp. 24-29, sites 1. MR. TQ355885).

This is the name given in the Trust report to that group of six reservoirs lying to the South of the A503 and which are an important breeding area for Gt. Crested Grebes, ducks and Herons. In addition they are a wild-fowl refuge of some consequence during the winter months, particularly favoured by Smew (Ref. 3. p. 25). In view of the possible development of the Kempton Park Racecourse, the protection of the Heronry is of especial importance. The Trust proposal is fully supported but it must be remembered that the prime function of the M.W.B. is the supply of drinking water to the public so that the management of the reserve cannot be delegated to naturalists. The Metropolitan Water Board have always been most reasonable in allowing access to naturalists and this fact gives us confidence that our interests will be preserved.

4. *Tottenham Park*. (Ref. 1. pp. 30-31, site 18. MR. TQ355900) and *Banbury Reservoir* (Ref. 1. pp. 30-31, site 10. MR. TQ362913).

This refers to the group of reservoirs to the North of A503 and more commonly known as The Low and High Maynard's and the Lockwood, together with the Banbury.

The proposal that walks allowing limited public access be created around the reservoirs is not recommended as one to be encouraged, but providing this is the limit there appears to be no serious reason to have the proposal deleted. In any case, enquiries suggest that the Metropolitan Water Board are not in favour of allowing such access and it is highly probable that it will continue to be limited to naturalists and anglers.

These reservoirs are of importance to breeding and wintering ducks, and also in summer as a feeding area for Swifts and Hirundines.

5. *Enfield Lock*. (Ref. 1. pp. 32-33, sites 14 and 15. MR. TQ379982 and 383988).

A large gravel pit more usually known as Sewardstone, the Southern section of which is used as a dump for fly-ash by the Central Electricity Generating Board, and which is particularly rich in aquatic plants and insect life. Some of the adjacent land is subject to flooding and at times during winter numbers of Snipe, Golden Plover and Green Sandpipers frequent the area. Little Ringed Plover attempt to breed annually but are usually prevented from doing so by egg-collectors. Particular pressure is exerted by youths and indiscriminate shooters.

Preservation of the area is essential as an outlet for insects, birds and

mammals which breed in the adjoining Ministry of Aviation and Royal Small Arms Factory areas, to both of which access is denied.

The Civic Trust proposal suggesting hot-houses, water gardens, riding stables etc. is not seriously objectionable, the land around the pit remaining partially open whilst the water gardens can be so planned that the existing aquatic flora will be preserved.

6. *Waltham Abbey* (Ref. 1. pp. 32-33, sites 3 and 4. MR. TQ380015).

The sites referred to consist of the wood to the West of the old River Lea and the water meadows to the East between it and road B194.

These are to be retained in their present form and as such are a valuable wild life refuge, provided access is controlled. Only in this way can the widespread shooting now prevalent be stamped out.

7. *Cheshunt Lakes*. (Ref. 1. pp. 34-37, sites 19-23, 28 and 31 MR. TQ375035).

The old established pit which forms the basis of this development is known as Fishers Green and includes some overgrown islands which provide nesting sites for rails, ducks and other aquatic birds. Grasshopper Warblers have frequently been heard reeling from these sites which are also favoured by Teal; in fact this appears to be one of the principal feeding sites in the Lea Valley for this latter species, and the only pit at which it has been proved to nest. The adjoining waste land and low lying meadows attract breeding Yellow Wagtails in large numbers, Redshanks, Whinchats, Meadow Pipits and an occasional pair of Corn Buntings.

The gravel pit on the West side of the navigation identified as site 28 (MR. TQ370035) has, it is understood, already been scheduled as to its Southern part a sailing lake, and its Northern a nature reserve. The Trust plan appears to show that the major part of this pit, i.e. that section lying north of the track at MR. TQ369028, as being filled in and proposes its use as a golf course. It is felt that the scheduling previously referred to will preclude this.

The proposals for the area include a rowing course and sailing lake together with their ancillary buildings, a golf course (already mentioned) and other sporting facilities. Notwithstanding its value from the naturalist point of view, it is not considered that any objection should be made, but the islands already existing and used by various species of birds as breeding places should, wherever possible, be retained for such purposes and arrangements be made for their full protection. That area already scheduled as a nature reserve whilst not at this time particularly rich in flora or fauna will be of value when the adjoining area proposals come into being and the wild life is forced by the inevitable disturbance to seek out other places.

8. *Broxbourne Lakes*. (Ref. 1. pp. 34-37, sites 8, 9, 12, 13 and 14. MR. TQ377056).

More usually known as Nazeing Marsh the area is scheduled for use as a golf course, playing fields, a lake for water skiing and power boating, and parkland.

This location is most valuable and important in all aspects of natural history. Steps should be taken without delay to exert pressure in the appropriate direction to have the area declared a nature reserve and put under the control of a competent authority. It is also desirable that the day to day control and management should be in the hands of a full-time

warden. The plant community is diverse and includes a large and increasing bed of *Phragmites communis* which supports a colony of Reed Warblers. In addition, Sedge Warblers, Grasshopper Warblers and Water Rails have bred here besides ducks and other aquatic species. At present no islands exist but these should be artificially created to provide breeding places for ducks, grebes, Little Ringed Plover and Common Terns. The former already breed and the latter have summered, in the valley. An area of land adjacent to the pit kept free from extensive plant growth would prove attractive to Redshank (which now breed at Fishers Green nearby), Yellow Wagtails and possibly Whinchats and Meadow Pipits. The banks could be maintained for Sand Martin colonies whilst part of the area could be allowed to develop into carr. Snipe, a species which needs encouragement since it has lost ground in the Lea Valley because of drainage etc. will breed in damp carr where the shrub is checked and *Juncus* (rush) retained. The planting of trees and shrubs of various types to provide food would bring in the more arboreal species of bird. Additionally the regulation and maintenance of circulation and siltation of water would allow the development of a suitable littoral flora.

With the aforesaid residential warden, the area which is in an isolated situation could become a study centre of value not only to the naturalist groups but also to the educational establishments of the district.

9. *Broxbourne Lakes*. (Ref. 1. pp. 34-37, site 2. MR. TQ377073).

This site, North of the Broxbourne-Nazeing road and between the railway line in the West and the River Lea in the East is scheduled in the report as a landscaped riverside park.

The area consists of a stretch of water with gravel peninsulars projecting from the banks, a surrounding area of gravel and some shrub. The water is very attractive to breeding duck and grebes, and in winter is a haven for flocks of the former. With similar "tailoring" to that suggested for Nazeing Marsh this tract could also become a highly productive area, not only for ornithologists, but for all branches of natural history.

In this case therefore, as in that of Nazeing Marsh, it is strongly recommended that pressure be brought to bear to ensure that the area is declared a nature reserve.

10. *Broxbourne Lakes*. (Ref. 1. pp. 34-37. site 4. MR. TQ389074).

Generally known as Nazeing Meads, the part of the area upon which to concentrate is the separate section in the North East corner. A partially reclaimed gravel pit, this now comprises an extensive area of reed and carr which maintains the largest Reed Warbler colony in Metropolitan Essex, besides being a station for brush grass and orchids. Separate from the main stretch of water which is proposed as a "mile long sailing lake", this area of some 10 acres could quite easily be fenced off and kept apart.

In addition to its great ornithological value, it could prove to be of great importance for ecological work to biology students in the study of plant communities and succession.

It is recommended therefore that efforts be made to have this area redesignated and preserved for this purpose.

11. *Rye House*. (Ref. 1. pp. 38-39, sites 14 and 16. MR. TQ384102 and 388106).

Site 16 is more commonly known as the Lea Marsh and is bounded on the West by the River Lea and on the East by the Rye Meads Sewage

Purification Works, whilst site 14 is an area of water meadows on the Eastern edge of the same works.

The whole of this area is particularly rich in plants and animals and represents a viable ecological unit, comprising effluent lagoons, marshland, water meadows and flooded gravel workings. The effluent lagoons are the focal point of the area, providing as they do abundant food supplies but relatively little in the way of cover suitable for birds. The periphery of the lagoon area consisting of reed-beds, hedgerows, trees and bushes provides nesting sites for many species whilst the marsh and water meadows support breeding Snipe, Lapwing, Redshank, Mallard, Coot, Moorhen, Yellow Wagtails, Reed Buntings etc. Passage birds find the area a particular attraction and visit it in large numbers. In winter, the water table being at or near the surface, the flooded water meadows become a favourite resting place for ducks, gulls, plovers etc.

The proposal that the Lea Marsh be a picnic area and the water meadows playing fields spells doom to the species nesting in these sites and just as certainly to the nesting birds on the boundary of the Sewage Works with which they are in close contact. As a result the highly valuable work now being carried out at the Rye Meads Ringing Station would come to an end. This work is not of course confined to ornithological matters but embraces the whole field of natural history.

It is strongly recommended that these two areas be permitted to remain unspoiled as an integral part of an important and unique ecological unit.

12. *Amwell Springs*. (Ref. 1. pp. 38 and 39, sites 1. MR. TQ378127).

That part of the Lea Valley which lies between Stanstead Abbots and Ware does not lie wholly in the London Society's area, but it is quite obvious that the small area outside must have an effect on and be affected by the remainder and cannot be disregarded.

It is proposed that four lakes be provided for bird-watching and fishing and it is obvious that in years to come these lakes will be of great value. However, their existence during the period of the next few years cannot affect the recommendations for the remainder of the valley since as is well known, the formation of such lakes does not immediately result in their being used by wintering and/or breeding birds. To mention just one point, plants, aquatic and otherwise, which provide food take time to develop. This proposal is appreciated and supported.

SUMMARY OF RECOMMENDATIONS

1. It is considered that the scheme put forward by the Civic Trust is bold and imaginative and deserves to succeed, and to have the support of naturalists for so doing.

2. It is recommended that the London Natural History Society direct its efforts and use its immense influence to have the Trust's proposals amended in the following respects:—

(a) *Cheshunt Lakes*

That islands now existing in the Fishers Green pit be retained in their present condition to provide sites for breeding ducks and grebes, and that some form of protection be provided and maintained to prevent access to these by the general public.

(b) *Broxbourne Lakes*

That the area known as Nazeing Marsh be designated a Nature Reserve with a Residential Warden. This does not seem to us to be impossible in

view of the fact that the County Naturalist Trusts and many Natural History Societies would benefit and presumably therefore give financial support, in addition to which the Home Counties Education Authorities with access to such an area for field studies could surely be induced to lend their aid.

(c) *Broxbourne Lakes*

That the area between the railway line and the River Lea be similarly designated a Nature Reserve in conjunction with (b) above.

(d) *Broxbourne Lakes*

That the small drained area of carr to the N.E. of the Nazeing Meads pits be set aside as an area for ecological study and as a nature reserve also in conjunction with (b) and (c) above.

(e) *Rye House*

That the two sites mentioned be allowed to remain as, respectively, marshland and water meadows in order to supplement and support the flora and fauna of the Purification works area, and also because they are, within the meaning of the word, the only "wetlands" remaining in the central part of the Lea Valley.

CONCLUSIONS

The proposals put forward are intended to benefit the naturalists for whom this report speaks, who unfortunately were not able to put forward their point of view and so ensure that adequate provision was made for the protection and development of wild life in the Lea Valley.

An attempt has been made, notwithstanding great temptations, to maintain a fair balance between recreational requirements which are of vital and increasing importance, and the similarly significant point of view of the naturalist. It is accepted that an outlet such as is suggested by the Civic Trust has become an urgent necessity for the Metropolitan area but it is essential that all aspects of natural life in the area should have a reasonable chance to flourish under conditions of beneficial protection. Should the foregoing recommendations be implemented, then Londoners would have easy access to what could become a magnificent Nature reserve in which botanists, entomologists, ornithologists and in fact all types and conditions of naturalists could pursue their chosen line of study. In addition to this the highly diverse works now being carried out at the Rye Meads Ringing Station would carry on unhindered.

In conclusion, it is pointed out that the Lea Valley is, both Archeologically and Geologically, of great importance, and the possibility of appointing a director to take action on endangered sites should be considered.

REFERENCES

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2. *The Essex Bird Report 1960*. The Essex Bird Watching and Preservation Society.
3. *The London Bird Report* No. 28 for 1963.

ALSO CONSULTED

- KEYWOOD, K. P. and MELLUISH, W. D. A Report on the Bird Population of Four Gravel Pits in the London Area, 1948 to 1951. *The London Bird Report* No. 17 for 1952, pp. 43 to 72.
- CRAWSHAW, K. R. and JERMYN, S. T. A Report on the Lea Valley from Hackney Marshes to Meadgate Gravel Area, Herts.

Books

The Identification of Flowering Plant Families, by P. H. Davis and J. Cullen. 122 pages. Oliver & Boyd. 12s. 6d.

The need for an up-to-date, portable guide to the identification of plant families has been evident for some years, and this book is intended to meet it. The main contents are a well illustrated account of the terminology applied to the relative positions of floral organs and to placentation, a key and short descriptions of the families, and a glossary. The purpose of the authors is to provide university students with a reference book to be used for practical exercises and no doubt it will serve this use, but wider application is very limited.

The selection of families for inclusion in the key is based on the occurrence of representatives north of 30°N., but to this there are exclusions and additions. No indication is given of the limits accepted for particular families and hence, as the authors point out themselves, the reader, having found the name of the family must then compare it "with the family of the same name in another work in which further identification is to be made". There is still a need for an inexpensive work which will provide the names of families related to standard works. J.E.L.

The Concise British Flora in Colour, by W. Keble Martin. 231 pages, including 100 plates. Michael Joseph, London, 1965. 35s.

At long last, after a period of some sixty years, the work of the Rev. Keble Martin has culminated in a publication available to us all. To be able to obtain a volume containing no less than 1,480 figures mostly in colour for 35s. is little short of miraculous when the high artistic ability of the author is considered. The preface tells us that the advice of many specialists was sought for critical groups. A useful glossary of botanical terms, a list of abbreviations of the names of authors of species and indexes of the botanical and English names of plants are all supplied. As the nomenclature has been edited by our member Mr. D. H. Kent, we are assured that it is up to date. What more can we want?

A short description only of each species is given in the text, with a word or two on habitat, but together with the drawing these should be sufficient for identification in most cases. In the copy before me reproduction seems to be somewhat better in some plates than in others, a tendency to blurred outlines being observable here and there. Not all the microspecies of a genus such as *Hieracium* are illustrated but representatives of the main groups, which is quite enough for most of us. Pubescence, perhaps the most difficult of all characters to illustrate, is shown well in most cases and it is because I have been wrestling with it in some *Veronica* species that I quibble at its non-appearance in the pictures. Some plates are most pleasing as a whole but a few do suffer from overcrowding; to spread the illustrations out, however, would have undoubtedly increased the cost.

I do not intend to search for further small points to criticise but I will conclude by saying that if you want a book of coloured illustrations of British wild plants which will really help you to identify them then spend 35s. on this one.

E.B.B.

Proceedings and Transactions of The South London Entomological and Natural History Society, 1963. Part II. 140 pages, 8 plates. Published by the Society, 1964. Price 20s.

This part is devoted entirely to the history and natural history of the gardens of Buckingham Palace. The work was carried out over a period of about four years by a team of 26 specialists in various branches of natural history, and many others assisted with the identification of material. Almost every group of both animals and plants is dealt with.

The survey shows that, in spite of its situation in the centre of London and being subject to severe atmospheric pollution, the garden supports a wide range of animals and plants. The species of birds inhabiting the garden are much the same as those to be found in the public parks of London but their density is about three times as great, without doubt because of the greater privacy.

The study of the invertebrate fauna is of necessity incomplete. The making of a complete list would necessitate more frequent visits than was possible. The use of a light trap has enabled the Lepidopterists to compile a very comprehensive list of the Butterflies and Moths, including two species new to Britain, one of which may be breeding here. The lists of the other orders of insects could certainly be augmented if more collecting were done, but it must be remembered that gardening in the area is very intensive so that plant-feeding insects would be discouraged, and the general tidiness that prevails results in a complete absence of such important insect habitats as carrion, dung and dead wood. The lake and its vegetation seem to support less invertebrate life than one would have expected.

Some 260 species of wild and naturalized plants are listed and 50 of these are not known elsewhere in Central London. However, many of these have been introduced by gardening activities and have not established themselves. Atmospheric pollution and dryness of the climate are factors unfavourable to Bryophytes and Lichens, and it is a pleasant surprise to learn that as many as 26 species of moss and five of liverworts are to be found growing so near the centre of the Metropolis.

In a publication which is so well produced and free from errors it is regrettable that so many of the specific names of the plants should have been printed with an initial capital letter.

A very full index completes a work which will be of great value to all students of London's natural history.

K.C.S.

[The Macrolepidoptera and the flowering plants are dealt with more fully in the papers at pages 77 and 18 respectively].

British Palaeozoic Fossils, 208 pages, 69 plates. British Museum (Natural History), London, 1964. Price 12s. 6d.

This is the last of a series of three excellent publications issued by the British Museum (Natural History) in response to a public request for books to enable the non-specialist to know what fossils he is likely to find and help him to identify them.

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"British Palaeozoic Fossils" has maintained the excellent quality achieved by the previous works. It covers the whole of the Palaeozoic

Era, which dates from the commencement of the Cambrian Period, approximately 600 million years ago, until the close of the Permian Period, a span of around 375 million years.

Much of the preparation has again been carried out by Mr. C. P. Castell who has also expertly supervised the excellent illustrations which, with a few exceptions, are the work of Miss J. C. Webb and Mr. D. Erasmus.

Dr. W. T. Dean has written the introduction and is responsible for the stratigraphy. In compiling the stratal tables he has had a lot of useful help from members of the staff of both the British Museum (Nat. Hist.) and H.M. Geological Survey and also from several other authorities at various museums in this country.

The excellent introduction describes the various beds in great detail and mentions numerous localities where the representative fossils can be collected. This information will be of immense value to collectors.

The publication is excellent value for the very moderate cost.

R.F.M.

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MATTHEWS, L. HARRISON, 1952, *British Mammals*, London.

YOUNG, G. W., 1905, The Chalk Area of North-East Surrey. *Proc. Geol. Assoc.*, **19**, 196-206.

The corresponding references in the text would be (Matthews, 1952) and (Young, 1905).

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