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The London Naturalist, 1944.

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Editorial.

IT will be observed that this year the *London Naturalist* carries a number on its cover as well as the usual date. This means that this is the 24th issue since the *Transactions of the London Natural History Society* became the *London Naturalist* in 1922. The change has been made to facilitate ease of citation in scientific papers, which has hitherto been rendered difficult because, e.g., the *London Naturalist* for 1922 was published in 1923.

The London Naturalist and its supplement *The London Bird Report* are published yearly, and provide a record of the activities of the members of the London Natural History Society and other London naturalists. Contributions are welcome from members of the Society on any natural history or archaeological subject and, if space permits, from non-members on any aspect of the natural history or archaeology of the London Area. The London Area, as defined by the Society, is comprised within a radius of twenty miles from St Paul's Cathedral, and includes the whole counties of London and Middlesex, together with parts of Bucks, Herts, Essex, Kent and Surrey. A map of this area is obtainable from the General Secretary, price 2d. All papers intended for publication in the *London Naturalist* or the *London Bird Report* should be submitted in the first instance to the Secretary of the appropriate Section (addresses on p. 75), and not directly to the Editor. Other correspondence may be sent to the Editor at 39 South Grove House, Highgate, N.6.

The Resignation of Mr Hornblower.

THE Council received with great regret the resignation of the Hon. General Secretary, Mr A. B. Hornblower, owing to ill health as from May 1, 1945. Mr Hornblower had held this important post for sixteen years, during which time the Society's membership and financial position have been greatly strengthened, despite the difficulties latterly entailed by war conditions. This was in no small measure due to Mr Hornblower's untiring efforts on the Society's behalf, and the Council felt that members would like to express their gratitude and appreciation of his services in some tangible way. The President therefore issued an appeal to members to contribute to a Testimonial Fund. Some 140 members subscribed the sum of £137 11s, and a cheque for this amount was handed to Mr Hornblower, together with a list of the subscribers. The President received a letter from Mr Hornblower in which he said: "It is indeed a noble testimonial, and I am deeply touched by the kindliness and generosity of the subscribers to it. Please convey my best thanks to all you can; there are too many for me to acknowledge individually." The Council also decided to make Mr Hornblower an Honorary Vice-President of the Society, an honour which he deeply appreciated.

J. B. F.

The Docks and Sorrels of the London Area.

By J. Edward Lousley.

DOCKS and Sorrels together comprise the genus *Rumex*, a group which usually receives scant attention from the amateur botanist. The reason for this neglect is not very obvious for, even as subdivided to-day, the species are not critical in the same sense as those of say the genera *Rosa*, *Rubus* and *Hieracium*, and with a little care and the use of no more complicated apparatus than the usual pocket-lens they may be distinguished by the veriest tyro. Neither is the genus entirely lacking in beauty. This has been recognised by artists who have often introduced *R. Hydrolapathum* into riparian scenes, and few people can have failed to observe the wonderful colourings which sheets of *R. Acetosa* and *R. Acetosella*, our two common Sorrels, often impart to the landscape. As further examples, one might cite the delicate golden perianths of *R. maritimus* and the rich carmine which those of *R. Patientia* often acquire.

London has long been recognised as a good district for the study of Docks, and amongst the rarer species known to the old botanists were *R. sanguineus* var. *purpureus* which Merrett knew from woods about Hampstead in 1667, and *R. palustris* which was found by Doody " In St George's-Fields, by Lamb's Conduit, and many Places about London," by Sherard " Ad Annisyclear, in the Ditch by the Road, on the left Hand before you go to Hoxton Square," and by Rand " In Tothill-fields," all prior to 1724 (Ray's *Synopsis*, ed. 3). These old botanists were likewise acquainted with most of the common species with which we are familiar.

For several years the writer has been engaged in revising the British Rumices and is now writing a series of papers giving detailed accounts of the various species. The purpose of the present article is to summarise as simply as possible the published changes and additions as they affect London botanists, and to outline the present distribution of the plants within 20 miles of St Paul's Cathedral. It must be made clear that it is not a revision of the Society's records though the material here given will doubtless prove useful when that is undertaken.

R. conglomeratus Murray. This species is very common throughout the area wherever moist conditions prevail, and also occurs occasionally on dry waste-ground.

The hybrids with *R. crispus* I have found at Walton-on-Thames; with *maritimus* at Wennington; with *obtusifolius* ssp. *agrestis* at Mortlake; and with *pulcher* ssp. *eu-pulcher* at Littleworth Common.

R. sanguineus Linn. The differences between this species and the last are set out in the form of a table in the *B.E.C. Report* for 1941/2 as the two plants are frequently confused, and many of the characters

given in the books are unreliable. If the fruits are carefully examined it will be seen that those of *conglomeratus* have a large oblong tubercle on all three fruiting valves while in *sanguineus* one of the valves carries a globular tubercle which occupies almost the whole width of the valve, while the other two valves are either devoid of tubercles or have much smaller ones. The species is divided into two varieties or subspecies as follows:—

Var. a. PURPUREUS Stokes. This is the *R. sanguineus* of the London Catalogue, and is a rare alien formerly much cultivated for medicinal purposes. The broad purple veins to the lower leaves are very characteristic, but it has been much confused with red-veined forms of the next variety. No present station for *purpureus* is known to me within the area, but it formerly occurred at Hampstead, as stated above.

Var. b. VIRIDIS Sibthorp (*R. condylodes* of the London Catalogue). This is the common Green-veined Dock which cannot well be mistaken for any other species when found as the characteristic woodland form, but it is often mistaken for *conglomeratus* when growing in sun-exposure. It is common about London and seen to perfection by the woodland tracks on Bookham Common.

R. MARITIMUS Linn. I have gathered Golden Dock in recent years near Wennington, and by two ponds about a mile apart near Godstone. It has been found by members near Totteridge, Romford and Rainham, and I have specimens gathered by A. W. Graveson at St Margaret's, Hertford. There are old records for a number of other places in our area but it has always been a rare plant. It should be noticed that in spite of the name chosen by Linnaeus the species is by no means restricted to maritime habitats. *R. maritimus* is often confused with *R. palustris* but careful examination of the fruits and attention to the contrasting characters given in the *B.E.C. Report* for 1941/2 should obviate future difficulty. At Wennington a series of photographs was taken at intervals of the plants as they appeared throughout one winter, and thus it was proved that at this station the plant was not behaving as a summer annual as is sometimes the case.

R. PALUSTRIS Smith. (*R. limosus* Thuill. in some lists). London has always been famous for this species which persisted at St George's Fields until at least 1800. In recent years I have seen it in plenty about the Brent Reservoir, Hendon, at Dagenham in the marsh ditches, and in a disused gravel-pit near Mitcham Junction. I have also seen a few plants near Kew Bridge and on a bombed site at Chelsea, and there are older records for elsewhere in the area. An interesting feature of the Hendon colony is the manner in which it forms a strand line along the shore of the Welsh Harp, the line being formed just at the level at which the floating fruits are deposited by the water in winter.

R. PULCHER L. Three subspecies of the well-known Fiddle Dock are now known to occur in Britain but only the one given below is native. The two aliens differ greatly in their fruits, and rarely exhibit

the panduriform leaf outline associated with the common subspecies. One of them, ssp. *divaricatus* (L.) Murbeck has been found at Kew, doubtless on waste-ground, and both should be looked for on our larger rubbish-dumps.

Subsp. EU-PULCHER Rechinger fil. The native Fiddle Dock is still to be found on sandy or light soil in the Thames Valley above London as at Barnes Common, near Richmond, Littleworth Common and Halliford Green, and in the Kentish marshes below London. I have seen it as an adventive near Stanstead St Margarets and there are a few scattered records from members from elsewhere in the district.

R. OBTUSIFOLIUS Linn. This common species has been divided into subspecies of which the three occurring in the London area may be distinguished by the following key:—

1a. Valves entire, or almost so. All three tubercles well developed, usually subequal, often occupying almost the whole width of the valve ..... ssp. *sylvestris* (Wallr.) Rech. fil.

1b. Valves toothed.

2a. Valves rather narrow, ovate-triangular, all three bearing well developed tubercles. Teeth very short (c. 0.5 mm.) ssp. *transiens* (Simonk.) Rech. fil.

2b. Valves ovate to broad ovate-triangular, more or less obtuse, one or all three bearing well developed tubercles. Teeth usually long (1-3 mm.). Undersides of leaves and petioles usually hairy ... ssp. *agrestis* (Fries) Danser.

Subsp. AGRESTIS (Fries) Danser is an all too abundant weed all over the London area. To all intents and purposes it is a native though its predilection for man-made habitats suggests that it may have been anciently introduced.

Subsp. TRANSIENS (Simonkai) Rechinger fil. This is the Thameside plant formerly known to British botanists as var. *sylvestris* (Wallr.). First recorded as found between Hammersmith and Putney in 1872 it is now known on both sides of the Thames up to just above Kew Bridge. The finest colony is on the north bank at Chiswick.

Subsp. SYLVESTRIS (Wallroth) Rechinger pat. Like the last subspecies this is an alien which appears to have become established; its home is in Eastern Europe, whereas *transiens* is a Central European plant. The subspecies is known in our area only from the banks of the Lea canal near Stanstead St Margarets and Wormley, and as a solitary plant from near Mitcham Junction.

Hybrids of *R. obtusifolius* with *palustris* have been noted at Hendon and Mitcham Junction; with *Patientia* at Chiswick and Mortlake; with *pulcher* ssp. *eu-pulcher* at Barnes Common; and with *sanguineus* var. *viridis* at Warlingham and Chelsham.

R. CRISPUS Linn. The Curled Dock is our commonest species and is a pernicious agricultural weed. Unlike *R. obtusifolius*, it commonly occurs amongst growing crops, is also found in natural habitats, and is undoubtedly native. It has been divided into the following varieties:—

(a) Var. ARVENSIS Hardy. The common plant which is everywhere. The form *unicallosus* (Peterm.) Lousley has been found on the Thames-bank at Walton-on-Thames.

(b) Var. LITTOREUS Hardy. This includes the plant formerly known as var. *trigranulatus*. It affects maritime habitats and ascends the Thames almost to our boundary so may yet be found within it.

(c) Var. ULIGINOSUS Le Gall is the Thames-side "*elongatus*" of our books. It is a very striking variety which grows down on the estuarine mud below the embankment, and owing to reconstruction work it may have become extinct. I last gathered it at Kew Bridge and Mortlake in 1933, but observed it at the former station for several years after this.

(d) Var. ROBUSTUS Rech. pat. is large and coarse in all its parts. I have only seen it near Brentford, and it is adventive in Britain.

Hybrids of *R. crispus* with *obtusifolius* are very common. Hybrids with *R. Patientia* ssp. *orientalis* have been collected at Grays, and with *R. sanguineus* var. *viridis* at Walton-on-Thames and Chelsham.

R. HYDROLAPATHUM Huds. The Great Water Dock is frequent by most of the rivers and streams in the area. By the Thames it has decreased considerably in recent years partly owing to the construction of stone embankments, and partly because the plants are commonly used as stands by fishermen to the injury of the leaves and buds. *R. Hydrolapathum* is probably only able to exist in our climate because of the protection from frosts afforded by the rhizomes being sunk deep in the mud well below water-level.

Elsewhere in Britain the hybrid with *R. obtusifolius* is fairly common, and it should be searched for in our area. It is the plant which appears in some of our Floras as *R. maximus* Schreb., and may be recognised by the leaves being of a much thinner texture than those of *R. Hydrolapathum* and not tapering to the base as is usual in that species, and by the very erratic development of fertile fruits which usually have a few teeth on their margin.

R. ACETOSA Linn. The very variable Common Sorrel is common throughout our area. It is a characteristic meadow species growing up to flower and fruit with the hay. The species is dioecious, but male plants are very rarely seen in herbaria as they are less conspicuous than the female plants, which continue to grow until the fruit is set. In contrast to the next species the habit is caespitose, a condition brought about by the internodes of the rhizomes failing to elongate as in *Acetosella*.

R. ACETOSELLA Linn. Sheep's Sorrel is again a very variable plant but a great many of the varieties which have been described are mere habitat forms and unworthy of taxonomic distinction. It is often stated to be restricted to acid soils, but in the absence of competition it can grow luxuriantly on chalk. Thus it is to be seen in company with *R. Acetosa* on bare chalk by the Leatherhead By-pass where the pH of the soil water is 7.5 to 8.0. *R. Acetosella* occurs commonly throughout our

area. It is often introduced into London gardens and waste-places in horse-manure, as the fruits are able to pass unharmed through the intestines of that animal.

The remaining species are all aliens.

R. Patientia Linn. This magnificent Dock may be described as recalling an enormous *crispus*, larger in all its parts, and 4 to 8 feet in height. It has certainly been well established in our area for a very long time. At Stone Marshes it was collected in 1903 and 1923, but I am unaware if it persists there. At Dagenham it occurs at intervals for about 1¾ miles and was first found there in 1927. A little further down the Thames at Grays it forms enormous thickets taller than a very tall man. I first found it by the Thames above London in 1933 near Barnes Railway Bridge, where it occurs on both sides of the river, being in enormous quantity on the north bank. From there it occurs at frequent intervals up the river to above Kew Bridge, and again at Ham Gravel Pits. It is astonishing that so large and handsome a plant should have been so little noticed by London botanists.

R. Patientia has been divided by Rechinger into a number of segregates; of these ssp. *eu-Patientia* Rechinger fil. and ssp. *orientalis* (Bernhardi) Danser occur in our district, but they are not always easy to distinguish.

R. triangulivalvis (Danser) Rech. fil. This is one of the segregates of the North American plant formerly collectively known as *R. salicifolius*. It may be easily recognised by the characteristic pale green linear-lanceolate leaves which gradually taper to both ends, by the peculiar production of secondary panicles from the axils, and by the olive, deltoid, trigranulate fruits. In the London area I have only collected it myself at Eastfields, Mitcham, in 1928, but it has also been found near Hammersmith, at Mortlake, at Dagenham, Grays and Tilbury, at Uxbridge and Temple Fortune, and at Hertford within our area and Ware just outside it. It is probably not persistent but again it is remarkable that such a characteristic plant has not previously been brought to the notice of the Society.

R. obovatus Danser. This species is of South American origin and has usually markedly obovate leaves, and fruits rather like those of *pulcher*. It has been recorded from Ham, Dagenham, and Hackney Marshes within the area, and from Ware just outside. I have never collected it near London myself.

R. dentatus Linn. Rather a similar plant to the last, and a native of southern Asia and the Mediterranean region. It is most easily distinguished by having smooth tubercles, whereas those of *obovatus* are warty, but there are many other differences. It has certainly been collected at Ware, and probably at Wandsworth and is quite a likely plant to be refound.

Many of the difficulties often encountered in naming Docks will be avoided if care is taken to gather only specimens in really ripe fruit. When one is thoroughly familiar with the group it is usually possible to name immature material—at least approximately—but the beginner will find that many hours can be wasted on young specimens which he could probably name at a glance if left to maturity. If the plants can be visited twice it is best to gather good lower leaves first and to go back for fruiting specimens a week or two later. But it must be remembered that all the material must come from the same individual plant or confusion is likely to result. Hybrids may usually be recognised as such at a glance by the irregular production of fruits, the remaining flowers dropping off infertile. But there are a few exceptions to this rule especially in the case of the common hybrid *R. crispus* × *obtusifolius*.

As the search for unusual vegetables is of wide interest at the present time, it is fitting to conclude with a note on three species of *Rumex* in the British list which are used for this purpose. Many reputable seedsmen stock seed of what they call " Common Sorrel " which is very different from the meadow plant we know under this name. It is a very large variant of *R. Acetosa* or one of its Continental allies, and most productive. I have grown this for five years and find that the leaves, although " acid " like the wild plant, impart a very pleasant taste to a boiling of perpetual spinach, which is greatly improved by the addition.

A second Sorrel, *R. scutatus*, is sold by seed as " French Sorrel," but I have found that, unlike the last, the seed does not germinate freely. The leaves are much smaller but much less acid, and are a very useful addition to salads.

The third Rumex, *R. Patientia*, is sold as " Patience Dock " and should germinate freely enough. It has long been used as a vegetable in France and elsewhere, and is intended to be used like spinach. Members may like to collect their own seed from wild plants, and should find it a very high-yielding vegetable. Seed is being widely advertised for sale just now (at rather high prices) and its distribution may lead to an increase in records for the species.

It remains to be added that descriptions of the plants discussed, with accounts of their life-history, and full details of my records will be found in my papers given below, copies of which are in the Society's library.

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Lousley, J. E. : *Notes on British Rumices.* Still in course of publication. Part 1, Report of the Botanical Society and Exchange Club of the British Isles for 1938, pp. 118-157, 1939; Part 2, *ibid.*, 1941/2, pp. 547-585, 1944.

Ray, J. : *Synopsis Methodica Stirpium Britannicarum*, ed. 3 (posthumous), pp. 140-144, 1724.

Botanical Records for 1943.

Compiled by J. Edward Lousley.

THE Society's *Botanical Records of the London Area* were prepared by Messrs E. B. Bishop, R. W. Robbins and H. Spooner and published as eight annual supplements to the *London Naturalist* from 1927 to 1935. Reprints of some of these are still available. After publication the additional records made by members year by year were entered by Robbins in the voluminous manuscript which contains much more detail than it was possible to print, and which is now in my care as Botanical Recorder. Thus a great mass of material has accumulated, though much remains still to be done, and it is hoped that members will continue to co-operate with a view to the production of a new edition of *Botanical Records of the London Area*, for which purpose an anonymous benefactor has generously made a special fund available.

Now that Mr Spooner is the only member of the original trio available, it is inevitable that new workers must undertake the production, but I feel sure that all members will agree that the high standard of accuracy aimed at in the original work must be maintained, and that any changes agreed upon should be with a view to even greater accuracy. With this object in view it is hoped that, except in the case of quite unmistakable species or plants of great rarity, voucher specimens will be added to the Society's herbarium to support new records. Even a scrap—for example the labellum of an *Orchis*—is often sufficient to fix the plant and prove the record, if that scrap is well chosen.

For some years Robbins was in the habit of recording the more important finds of the year in this journal, and the present note is intended to be a continuation of his work. It is impossible to get together here the records for the years that have lapsed, and all the records now given, with the exception of a few where the contrary is indicated, are of plants noticed in 1943. The numbers in brackets following the records refer to divisions of the London area, *vide infra*.

By far the most important botanical discovery of the year was made by R. W. Hale, who found *Oenanthe pimpinelloides* L. on a golf course between Bickley and Pett's Wood (20), whence he has presented specimens to the Society collected on 3rd July. This locality lies within the Watsonian vice-county 16, W. Kent, to which it is a valuable new county record. The species is known from 18 English vice-counties, and has one station in Ireland. Of the vice-counties adjacent to W. Kent, it is known from Surrey (where it is extremely rare and perhaps extinct), but not from East Kent, South Essex, or Middlesex.

W. J. L. Sladen has made a very interesting list of plants from the site of bombed buildings near King's Road, Chelsea (6). Amongst other interesting plants he showed me here in September were *Artemisia Absinthium* L., *Rumex palustris* Sm., and *Chenopodium murale* L. He has also found a new station for several of our rarer Orchids near Headley.

J. H. G. Peterken has found *Ceterach officinarum* Lam. & DC. on a railway bridge in the Epping district (9), and he has shown some members the fine colony of *Dryopteris Thelypteris* (L.) A. Gray still flourishing in the same district. Here it grows in shade and hence has a rather different appearance from the colonies of the same species which the writer has seen in full sun-exposure in various other parts of the British Isles.

The Rev. P. H. Cooke has sent in a large number of records which will be useful in filling many gaps in recorded distribution. His numerous additions to the herbarium will be invaluable for confirmation of records for the area.

My own observations for the year include *Stellaria neglecta* Weihe and *Camelina sativa* Crantz (aggr.) from Wimbledon Common (14), *Hieracium praecox* Sch.-Bip. (teste Pugsley) from Sline's Oaks, Warlingham (18), *Epilobium roseum* Schreber from a laneside near the Tower of London (8), *Crepis biennis* L. from Tot Hill, Headley (17) and a narrow-leaved *Salsola* which may be provisionally named *S. Kali* L. var. *tenuifolia* Tausch, or *S. pestifer* Nelson, from a field of carrot in the Chipstead Valley (17). The nomenclature and taxonomic status of the last-named plant requires further study, but it occurs as a pest in many parts of the Northern Hemisphere and is known in N. America as "Russian Thistle"; it has previously occurred in our area on rubbish-dumps as at Dagenham (12). The continued existence of *Gentiana anglica* Pugsley on Riddlesdown (18), of *Carex divisa* Huds. on the Thames embankment between Putney and Barnes (14), and of *Wolffia arrhiza* (L.) Wimm. at Burgh Heath (17) have been verified. Perhaps a more important observation was *Stachys annua* L. near Merstham (18), as this rare plant has an affinity for ground near the North Downs which lead Hanbury and Marshall (*Fl. Kent*, 282, 1899) to suggest that it might be native. *Herminium Monorchis* (L.) Br. was seen in great quantity on Box Hill (17) at a spot where it often fails altogether, and the great sheets of *Iberis amara* L. above Headley Lane, where I noted it in 1935 in lesser quantity (*Journ. Bot.*, lxxiv, 197, 1936), were clearly seen by many members from the opposite slopes of Box Hill.

E. J. Bunnett discovered a fine colony of *Madia sativa* Molina in a field of flax near Nutfield (19), and I was able to collect material from here for the Society's collection in August. This queer Composite with viscid capitula is a native of Chile, and a pest in western U.S.A., and it suddenly appeared in many places in Britain in the last war, as it has done again in this. H. J. Burkill found the closely allied *M. capitata* Nutt. in 1942 near Horsley, outside our area.

L. G. Payne has verified the continued existence of *Leersia oryzoides* (L.) Brand near Byfleet, where this rare grass has become very scarce in recent years. The locality is just outside our area.

An unfamiliar Chenopod found by myself, C. P. Castell, and W. H. Spreadbury on Wimbledon Common (14) on 18th October 1942 has been determined by Mr J. P. M. Brenan as *Chenopodium album* L. × ⟨*Berlandieri* Moq. subsp. *Zschackei* (Murr) Zabel var. *typicum* (Ludw.)

Aellen (=*C. variabile* Aellen var. *Murrii* Aellen). As is often the case with these supposed hybrids of *Chenopodium*, it was abundant and uniform and occurred over a considerable area where debris from bombed London had been dumped.

Radicula austriaca (Crantz) Dr. is an alien which has probably come to stay, and it may be seen in quantity along the Middlesex side of the Thames between Barnes Bridge and Chiswick Bridge (6). It may be known from the very similar but native *Radicula amphibia* (L.) Dr. by the small spherical fruits, and entire or slightly dentate leaves.

Another plant which has been found in our area—at Hurlingham, in the West End, at Tulse Hill, Caledonian Road, and near Claygate—but in this case has not yet been brought to the notice of our members, is *Galinsoga quadriradiata* Ruiz & Pav. var. *hispida* (DC.) Thell. This may be known from the familiar *G. parviflora* Cav. by the flexuous glandular hairs more than 0.5 mm. long which clothe the pedicels and upper parts of the stem, and by the receptacle-scales not being trifid as in the common plant. It is hoped that members will look out for this interesting species.

Enquiries are often made as to the effect of the war on our flora, and a brief report should be reassuring. The only absolute loss through ploughing-up known to me within our area is that of a fine colony of *Bunias orientalis* L. in a valley near Farleigh (18). The well known field in the Chipstead Valley where *Teucrium Botrys* L. and *Ajuga Chamaepitys* (L.) Schreb. grow has been ploughed, but fortunately they persist in quantity elsewhere in the vicinity. More serious alterations have taken place outside our area, but so far as I am aware our gains through the new flora on bombed sites far exceed our losses.

It is hoped that members will send in records of plants they find to J. E. Lousley, 7 Penistone Road, Streatham Common, S.W.16, indicating if possible the divisions in which they find them. These divisions are shown on the map which is still obtainable from the General Secretary (price 2d), but it must be remembered that in the *Botanical Records of the London Area* the divisions south of the Thames have been re-numbered. It will be of great assistance if members will avoid sending in records for localities, or in the case of the less rare plants for divisions, which have already been published in the records. Long lists giving all the plants seen in the course of a day's ramble are to be avoided. The present record of a single year's work by only a few of the members is some indication of the interesting things still to be seen even in such a well-worked area as that covered by the Society's activities.

Botanical Records for 1944.

Compiled by J. Edward Lousley.

IN spite of all difficulties some excellent plant records were made by members during 1944, and these include several species not previously recorded by the Society. Only a selection of the more interesting finds can be included here.

In early April W. H. Spreadbury discovered two clumps of *Anemone nemorosa* L. var. *apetala* E. J. Salisbury near Ashtead (15 or 17). His specimens agreed well with the original description and illustration (*Annals of Botany*, xxx, 525-8, 1916) and the colony will be kept under observation to ascertain if the variation is permanent.

During the summer the bed of Fetcham Mill-pond (15) had remained dry and on 7th August at the instigation of H. J. Burkill, a small party of botanists from the Society examined the vegetation which had sprung up. The survey was made from the ecological point of view, but the finds of interest to field botanists included two grasses—*Poa palustris* L. and *Agrostis gigantea* Roth var. *ramosa* (Gray) Philipson (both det. C. E. Hubbard), and a Willowherb—*Epilobium adenocaulon* Hausskn. (teste G. M. Ash) which occurs elsewhere in our area but remained undetected in Britain until 1936 (*Journ. Bot.*, lxxiii, 177-184, 1936). On the previous day *Anagallis foemina* Mill. was found on an excursion in Norbury Park (17) on the boundary of our area.

Some excellent observations have again been made by W. J. L. Sladen including *Poa palustris* L. (teste C. E. Hubbard) and *Carum Carvi* L. from the top of an Air-raid shelter in Hyde Park (6), both as adventives. Mrs B. Welch rediscovered *Scilla autumnalis* L. near Molesey (13), and I have myself seen it in 1944 near Ham (14) which is also in Surrey, and at Hampton Court (3) in Middlesex. It is pleasing to record the continued existence in three localities of this delightful little plant which has so long been known about London and hopes are raised that it will yet be refound on Blackheath.

Excellent work on the Middlesex flora is being done by D. H. Kent and his records for the year include *Rumex palustris* Sm. and *Sambucus nigra* L. var. *leucocarpa* Koch near the canal at Hanwell (3). Mrs H. R. Davies has sent in a number of interesting notes from the Chelsea district (6) including *Datura Stramonium* L. from Creswell Place in 1942 and 1943, *Atropa Belladonna* L. from near Chelsea Hospital and *Hyoscyamus niger* L. from the garden of St Mark's College.

The writer had two excursions with R. W. Hale in division 20 and interesting plants seen included *Chenopodium murale* L., *C. hybridum* L., and *Verbascum Lychnitis* L. var. *album* (Mill.) × *V. Thapsus* L. from near St Mary Cray, *Dianthus Armeria* L. from near Orpington, and *Hypericum montanum* L. from near Bickley. At the end of August, *Sambucus nigra* L. var. *laciniata* Mill. was seen in a remote part of Headley Heath (17) where C. E. Britton discovered it in 1919 and another of his old finds, *Verbascum nigrum* L. × *V. Thapsus* L. still oc-

curred nearby, while *Damasonium Alisma* Mill. was in a pond at the far end of the heath from the one in which H. J. Burkill has seen it in recent years. The station where I formerly knew the rare *Carex tomentosa* L. as a Middlesex plant near Shepperton (3) has been destroyed, but I was pleased to find it again at a new locality a short distance away. During the year I have made a survey of the flora of the bombed sites in the City of London, on which 112 species were noted. Here and elsewhere a very distinct hybrid between *Senecio squalidus* L. and *S. viscosus* L. was noticed and this is being described in a botanical periodical as new to science under a name which members of this Society should regard as appropriate.

It is clear from the records contributed in recent years that more than one member is confusing the very common *Lactuca Serriola* L. in its various forms with the rare *L. virosa* L. They are easily distinguished by the colour of the fruits, which are jet black in *L. virosa* and only grey or dark grey in the common species. There are other differences but the simple distinction given should suffice to prevent future confusion.

The number and quality of the records contributed during the year is evidence of a renewed interest in field botany among the members of the Society. Contributors during the year include Mrs H. R. Davies, R. W. Hale, Miss L. J. Johns, D. H. Kent, W. J. L. Sladen, W. H. Spreadbury and Mrs B. Welch, to whom our thanks are due. It is to be hoped that 1945 will provide opportunities for even greater activity.

Entomology Notes for 1944.

By H. J. Burkill, M.A., F.R.G.S.

ONCE more no butterfly questionnaire was sent out to members, so few records were received, but from information given me and from observations in Surrey it seems that *Polygonia c-album* L. was scarcer than in recent years, while *Limenitis camilla* L. was locally plentiful. *Maniola tithonus* L. was abundant and *Lycaenopsis argiolus* L. more plentiful than for some years.

Larvae of *Aglais urticae* L. and *Nymphalis io* L. were seen in large number but evidently were heavily parasitised as few imagines were about later on. Larvae of *Gonepteryx rhamni* L. were frequently parasitised. Cabbage Whites were seen in some numbers, mostly males, and no serious damage by larvae was reported to me.

The year was generally a poor one for Lepidoptera, and apparently also for insects of other orders. Tabanids were scarce again at Bookham. An interesting find there was *Hartigia linearis* Schrank, a Sawfly whose larvae live inside stems of *Agrimonia eupatoria* L. Cameron in 1890 gave Bristol, London District, and Hastings as localities for this insect. Enquiries elicited a few more, as Dr K. G. Blair had taken the fly at Horsley and in Wiltshire, Mr Benson reported it from Herts and Bucks, and Mr W. D. Hincks and Mr J. M. Brown have each captured a specimen in Yorkshire. We have found the larvae frequent in the Leatherhead to

Effingham and Cobham area. Search for it in stems of other food plants only led to negative results, but observations on the species are being continued.

Plant Gall Records for 1944.

By H. J. Burkill, M.A., F.R.G.S.

THOUGH nothing in the way of a formal programme was attempted, members of the Plant Galls Section jointly and individually carried out a considerable amount of field work or experimental investigation and achieved some successful results, but the weather was at times not helpful, a severe frost in May killing off large numbers of the Oak catkin galls, and of course wiping out the prospects for the autumn generations. Mr Niblett succeeded in getting *Andricus solitarius* Fonsc. by sleeving *A. occultus* Tschek, thus linking up two forms and so filling up a gap in the Alternating Generations table.

A gall containing a pupa of what was probably *Sesia formicaeformis* Esp. was found on *Salix repens* L. but proved to be parasitised.

Saperda populnea L. galling *Salix purpurea* L. was another new addition to our lists. Another beetle, *Apion scutellare* Kirby, was found galling *Ulex minor* Roth. in some numbers on Bookham Common.

Cecidomyiidae galls were generally scarce, and the midges were having a bad season.

Muscidae. *Euribia* species were again conspicuous. *Melanagromyza simplicoides* Hendel was found on *Salix caprea* L. and *S. atro-cinerea* Brot. and on *Populus tremula* L. *Chlorops cingulata* Meigen was noted plentifully in the early months on *Brachypodium sylvaticum* R. & S., but fresh galls in the autumn were scarce.

Aphididae. These were much fewer than usual.

Eriophyidae. *Eriophyes dispar* Nal. seemed to be literally in millions on *Populus tremula* L. near Oaken Cottage, Little Bookham, but was not as abundant this year as last year near Cobham. Mr A. A. Dallman of Doncaster sent me a specimen of *Teucrium scorodonia* L., found some years previously in Cheshire, which looked as if it had been attacked by mites, but nothing was detected on microscopical examination, and we know of no record of such a gall. *E. cladophthirus* Nal., which was so abundant on *Solanum dulcamara* L. in Leatherhead in 1943, was very scarce in the same hedge though the host plants were there.

Erratum.

" Swallow Holes and Springs in the Chalk of the Mole Valley," by F. H. Edmunds. *L.N.* for 1943, pp. 2-7. In the table of strata on p. 2, the second group of strata should read as follows:—

(2)	Thanet Sand—a few feet	A group of highly permeable beds. The
	Chalk—about 800 ft. thick	chalk occupies the country between
	Upper Greensand—about 40 ft. thick	Leatherhead and Dorking.

The Survey of Bookham Common.

THIRD YEAR.

Progress Report.

THE third year of the survey has been a still more difficult one for the Ecological Section. The requisition of a large part of the Common rendered work on bird song-post distribution impossible. This, combined with the intense enemy air activity in the summer and the loss of the tea facilities at Peacedene, has resulted in a great decrease in systematic survey work and most members have had to content themselves with desultory observations.

Nevertheless, some work was continued on the birds, beetles, dragonflies, freshwater molluscs, plant-galls, flowering-plants and mosses. A fungus-foray in October by the Botanical Section in conjunction with the British Mycological Society produced a most satisfactory list of nearly 200 species.

The papers which follow summarize the preliminary work carried out by five members on certain limited sections of the fauna and flora of some of the ponds and streams. For the benefit of new members and others, the map of Bookham Common from the *L.N.* for 1942 is reproduced again here (Fig. 1; opposite p. 34).

The Ponds and their Vegetation.

By C. P. Castell, B.Sc.

These notes are intended primarily as an introduction and background to the papers which follow. I am indebted to Messrs J. L. Harrison, L. G. Payne, and R. M. Payne for many observations which have been incorporated or summarized below. Information concerning the former condition of the ponds would be welcomed. One of the most interesting areas on the Common is the series of ponds and wet hollows which occupy a shallow valley on London Clay, running from east to west [67 to 57] (the numbers in square brackets are base-map references) and falling, through a distance of about 800 yards, from a height of about 140 feet above Ordnance Datum at the head of Greendell Ditch to 115 feet at the Isle of Wight. They are all sheltered on the north by Central and Eastern Woods and to a great extent by Hollow and South East Woods which adjoin them to the south.

This chain of ponds and hollows originally comprised five separate ponds, and as late as 1887 they were all shown as ponds on the Ordnance Survey 1-inch-to-the-mile map. However, the 1901 revision no longer showed water in the areas known to us as Eastern and Western Hollows. This transition from the condition of ponds with open water to that of marshy hollows was a consequence, probably, of the natural vegetational succession. This, however, appears to have been aided considerably by a gradual breakdown and breaching of the embankments separating the

ponds, by the construction of Hollow Ditch and, more recently, by the periods of abnormal drought of the last few years. Local rainfall statistics are, unfortunately, not available, but the records published in the Society's Epping Forest Survey (*L.N.* for 1943, pp. 44-45, and *infra*, p. 38) indicate the trends which have been characteristic of the London area for the period 1942-1944. The rainfall for each of these years has been considerably below normal. Eighteen consecutive months from February 1943 to July 1944 were subnormal, with a total deficiency of 12.4 inches; the rainfall for this period amounting to only two-thirds of the average. Since then, the rainfall has been abnormal for each month; the total for five months of 13.8 inches representing an increase of 20% over the average for this period. This recent abundance of rain has resulted in the ponds and streams resuming what appears to have been at least the usual winter condition.

In the notes on vegetation no distinction has been made between marsh and swamp types of plant communities in any of the ponds, but where zonation has been observed the order of communities listed is from the open water to the margin. Only the commoner or more characteristic species are listed; the nomenclature is that of the London Catalogue of British Plants, 11th Edition, 1925.

The following abbreviations are used: d, dominant; sd, sub-dominant; a, abundant; f, frequent; l, local or locally; o, occasional.

UPPER EASTERN POND. [67]

This pond, at present the largest stretch of water on the Common, has a total area of about 3670 square yards, but, during the last thirty years, it has silted up considerably from the top, or eastern end and the area of permanent surface water is now very much less (the 1912 O.S. 6-inches-to-the-mile map shows the whole area as open water). A shallow verge, beyond which the pond deepens suddenly, extends about 10 feet from the west bank. Drainage is received principally from Greendell Ditch and occasionally from South East Ditch and the ditch (not shown on the map) which runs from the marshy Eastern Wood Clearing [566]; any overflow formerly ran into Lower Eastern Pond by means of a ditch at the S.W. corner, but a more recent cut in the embankment now renders it impossible for water to reach its former overflow level. An island, bearing an oak and some willows, occurs at about 100 feet from the upper, western end; the tree on it is shown on the 1895 six-inch map but not on subsequent editions. The pond is inclined to be stagnant and has been observed to have a muddy bottom with much decaying vegetation. It is apparently less subject to fluctuations in water level than most of the ponds on the Common, and during the three years of the Survey, it has presented a fairly uniform aspect, though there has been a tendency for the swamp vegetation of the eastern end to encroach upon the area of open water and, in the summer of 1944, it was possible to walk dryshod to the island from the south side. The pond is sheltered to the north and south by Eastern and South East Woods respectively, but to the east, it is more open.

VEGETATION.

Based on observations made in Summer 1942, November 1943, and September 1944.

Aquatics, in open water at the western end of the pond: *Potamogeton natans*, *P. crispus*, and *Elodea canadensis*, with *Ranunculus aquatilis* L. agg., *Lemna minor*, and *L. trisulca* nearer the margin.

Marsh and Swamp Species:

N.W.—(1) *Sparganium ramosum* (d), *Glyceria fluitans* (la), *Alisma Plantago-aquatica*, *Equisetum limosum*, *Lysimachia Nummularia*. (2) *Juncus effusus*, *Polygonum Hydropiper*, *Solanum Dulcamara*.

N.—(1) *Alisma Plantago-aquatica* (d). (2) *Equisetum limosum* (d). (3) *Sparganium ramosum* (d). (4) *Juncus effusus* (d), *Salix cinerea* (*atrocinerea*) juvenile (o).

W.—*Sparganium ramosum* (d).

S.W.—*Equisetum limosum* (d), *Mentha aquatica*.

S.—*Cnicus palustris*, *Deschampsia caespitosa*, *Juncus effusus*.

E.—(1) *Equisetum limosum* (d), *Sparganium ramosum*. (2) *Mentha aquatica* (d). (3) *Epilobium hirsutum* (d), smothered by *Calystegia sepium*, also *Angelica sylvestris*, *Carex vulpina*, *Cnicus palustris*, *Deschampsia caespitosa*, *Juncus effusus*, *J. inflexus* (*glaucus*), and *Stachys palustris*. (4) including lower part of Greendell Ditch: *Agrimonia Eupatoria*, *Arrhenatherum elatius*, *Carex vulpina*, *Cnicus palustris*, *Epilobium palustre*, *Stachys palustris*, *Urtica dioica*.

LOWER EASTERN POND [59, 67]

has an area of 4460 square yards and lies at a slightly lower level than Upper Eastern Pond from which it receives some drainage in the winter, when it may be half or even completely covered with shallow water for two or three months, but it is dry by early summer. Water escapes through a culvert near the base of the western embankment. There is no trace, in the present partly demolished brickwork, of a sluice to control the outflow of water and, owing to the low position of the pipe, it appears improbable that more than a few inches of water can now be retained in the pond. It would appear to have become overgrown with the present marsh vegetation within the last twenty or thirty years, as although the 1937 revision of the O.S. maps shows the pond covered with " reeds," in 1912 it was mapped as open water. The pond is sheltered to the north and south by the trees of Eastern and South East Woods and to a lesser extent by the embankments to the east and west and the shrubs growing on them.

VEGETATION.

This was investigated mainly in June and July 1942 and the following communities were recognised:

(1) Central area.—*Equisetum limosum* (d), *Glyceria fluitans* (ld), *Sparganium ramosum* (ld), *Eleocharis palustris* (lsd), *Galium palustre* (la), *Alisma Plantago-aquatica* (la), *Lysimachia Nummularia* (f), *Ranunculus aquatilis* L. agg., *Juncus effusus*, *Myosotis caespitosa*, *M. palustris*.

(2) To the east of (1).—*Galium palustre* (d), *Potentilla Anserina* (a).
(3) Surrounding (1) and (2).—*Potentilla Anserina* (d), *Ranunculus repens* (ld), *Agrostis ? alba* (a), *Carex vulpina* (la), *Solanum Dulcamara* (lf), *Sonchus arvensis* (l), *Equisetum limosum*, *Eleocharis palustris*, *Glyceria fluitans*, *Lysimachia Nummularia*, *Myosotis caespitosa*.
(4) North margin.—*Salix cinerea*, *Agrostis alba* and other grasses.
(5) South margin.—*Agrostis* spp., *Deschampsia caespitosa*, and other grasses, with *Potentilla Anserina*.
(6) An area, some 15 feet in width, showing rapid transition from marsh to the drier conditions of the embankment at the western end and in which the following "zones" could be recognised:

(i) *Eleocharis palustris* (ld), *Equisetum limosum* (ld), *Glyceria fluitans* (a), *Agrostis alba* (la), *Galium palustre* (la), *Potentilla Anserina* (lf).
(ii) *Galium palustre* (d), *Equisetum limosum* (a), *Agrostis alba* (la), *Eleocharis palustris* (lf), *Alopecurus geniculatus* (l).
(iii) *Potentilla Anserina* (d), *Equisetum limosum* (sd), *Agrostis alba* (la), *Lysimachia Nummularia* (la), *Alisma Plantago-aquatica* (f), *Alopecurus geniculatus* (lf), *Carex vulpina* (lf), *Eleocharis palustris* (lf).
(iv) *Agrostis alba* (ld), *Potentilla Anserina* (a), *Pulicaria dysenterica* (ld), *Carex vulpina* (la), *Equisetum limosum* (f), and *Equisetum arvense*, *Lysimachia Nummularia*, *Ranunculus repens*, *Stellaria graminea*, *Trifolium repens*, *Urtica dioica* (all lf).

ISLE OF WIGHT POND [57-58].

This pond, with a total area, according to the map, of about 3970 square yards, formed at one time the largest expanse of water on the Common, but the vegetational succession which, we have already seen, has been operating on the other ponds in this series, has here been greatly accelerated by the disrepair of the embankment at the western end and has led in recent years to a considerable reduction in the area of actual surface water. Thus, in August 1942, the water area shrank to a minimum of about six feet square by the embankment, and although it increased in the winter months, it had again decreased to a very small area in the summer of 1943. In May 1944 there was an appreciable area of surface water, but by early July the pond was completely dry—apparently for the first time. The summer of 1944 was marked by a prolonged drought, and the pond was still dry in early October. The heavy autumn rainfall, however, brought the level up to the outflow again by the early part of November. Thus it can be seen that the Isle of Wight Pond has offered only a very small area of permanent surface water (and a still smaller area of open water, i.e. free from surface vegetation) during the three years of our survey, and that this permanent area has, moreover, tended to diminish each year.

Drainage is received from Eastern and Western Hollows and any overflow from Lower Eastern Pond by way of Hollow Ditch and from Woodland Ditch. Excess water formerly escaped, probably through a pipe,

into a ditch at the N.W. corner, but the pond has not reached this level for some years owing to a cut, at a lower level, in the embankment and to continual losses through breaks and crevices in the brickwork near the sluice-gate, by means of which the pond can be emptied. The pond is sheltered by Central Wood to the north and by Hollow Wood to the south-east, but is open to the west and south-west.

VEGETATION.

Investigated mainly in Summer 1942.

(1) Aquatics of open water.—*Potamogeton natans* (d). Other characteristic species were *Alisma Plantago-aquatica*, *Apium inundatum*, *Lemna minor*, *L. trisulca*, *Ranunculus peltatus*.

(2) Central marshy area (submerged in winter months).—*Equisetum limosum* (d), *Eleocharis palustris* (a), *Typha latifolia* (ld), *Sparganium ramosum* (ld), *Pulicaria dysenterica* (ld in upper part to east), *Lycopus europaeus* (f), *Alisma Plantago-aquatica* (l), *Salix cinerea* (*atrocinerea*) (l in upper part).

(3) Marginal area (not, or rarely, submerged since commencement of survey).—*Eleocharis palustris* (a-ld), *Equisetum limosum* (a-ld), *Glyceria fluitans* (f, ld), *Juncus effusus* (f, ld), *Sparganium ramosum* (f, ld), *Typha latifolia* (ld), *Mentha* sp. (f-la), *Potentilla Anserina* (f-la), *Alopecurus geniculatus* (la), *Hydrocotyle vulgaris* (f), *Lysimachia Nummularia* (f), *Ranunculus Flammula* (f), *Veronica scutellata* (lf), *Carex hirta* (l), *C. leporina* (*ovalis*) (l), *C. vulpina* (l), *Cnicus palustris* (l), *Lychnis Flos-cuculi*, *Myosotis palustris*.

(4) Outer marginal area.—*Agrostis alba* (ld), *Veronica scutellata* (lf), *Cardamine pratensis*, and *Cnicus palustris*, *Deschampsia caespitosa*, *Equisetum palustre* (by bank), *Juncus conglomeratus*, *Ranunculus repens* (all l).

BAYFIELD POND [76].

This small semi-stagnant pond, which apparently receives no drainage and lies on rising ground in the S.W. corner of the Common, has a total area of about 440 square yards and has become progressively drier during the course of our survey. In 1942 it contained a fair amount of water until the end of June, but by early September it was quite dry and, although it filled up during the winter, it soon became dry again in the summer of 1943. In 1944 it was almost dry by the end of May, and remained dry until the rains of November.

On the north and west banks are several old and decrepit examples of *Salix fragilis*, one of which is severely attacked by a fungus, *Pleurotus* sp. These trees appear to be ones marked in that position on the 1869 six-inch map, and therefore probably well over 80 years old. The pond is more or less sheltered by hawthorn scrub and bracken except for narrow gaps to the E. and S.W.

VEGETATION.

Observations made in July 1942.

W. and N.W. (the deeper part of the pond).—*Ranunculus peltatus* and *Apium inundatum*, with *Lemna trisulca* and *Veronica scutellata*.

S. and S.E.—The following zonation of communities was visible:
(1) *Apium inundatum* and *Galium palustre*. (2) *Glyceria fluitans*. (3) *Juncus articulatus* (*lamprocarpus*). (4) *Myosotis ? caespitosa*. (5) *Eleocharis palustris*. (6) *Juncus inflexus* (*glaucus*), *J. effusus*, *J. conglomeratus* and *Mentha* sp.
N. and E.—*Solanum Dulcamara* (d) and *Stachys sylvatica*.

KELSEY'S POND [25]

has an area of 580 square yards and lies in the hollow which runs N.E. from High Point Path. It receives drainage from two ditches draining fields to the north, near Kelsey's Farm and to the west, and from a ditch draining part of Stents Wood to the south; any overflow escapes by a ditch running E.S.E. The pond dries up completely in the summer, but except during the very dry winter of 1943-4, it has filled up after the autumn rains. It is open to the north and west, but fringed and overhung by trees on the east and south.

VEGETATION.

Observations were made in August 1942, when there was much uncolonised mud and a very open plant community.

(1) On the pond mud.—*Alisma Plantago-aquatica* (f), *Polygonum Hydropiper* (la) with *Glyceria fluitans*, *Nasturtium officinale*, *Ranunculus repens*, *Solanum Dulcamara* and young plants of *Callitriche* sp. and *Ranunculus* sp. (*peltatus* or *sceleratus*).
(2) Marginal.—*Glyceria fluitans* (ld), *Urtica dioica* (la), *Chenopodium* sp. (la), *Alisma Plantago-aquatica*, *Carex remota*, *Cnicus lanceolatus*, *C. palustris*, *Epilobium palustre*, *Geum urbanum*, *Holcus lanatus*, *Hypericum pulchrum*, *Juncus effusus*, *Lycopus europaeus*, *Mentha* cf. *aquatica* × *arvensis* (*sativa*), *Myosotis* sp., *Nasturtium officinale*, *Ranunculus repens*, *R. sceleratus*, *Rumex condylodes* (*nemorosus*), *R. obtusifolius*, *Scrophularia aquatica*.

In June 1942 half the pond area was covered by *Nasturtium officinale* and, in July, *Alopecurus geniculatus* was abundant on the southern margin. In December 1944 much of the pond was covered by *Ranunculus repens*, which was then submerged for the first time.

SHEEPBELL POND [38].

This pond, with an area of about 500 square yards, lies on high ground at the edge of the capping of sandy gravel and is probably an old gravel pit reaching the underlying London Clay. It is a permanent pond, but very stagnant, the water level showing little seasonal fluctuation and apparently maintained by seepage from the gravel, any excess water draining away to the N.W. through Sheepbell Ditch. Lying in the middle of Sheepbell Wood, it is surrounded and overshadowed by trees on all sides.

VEGETATION.

Observations were made in August 1942 and May 1943, when the only aquatic plants visible were *Lemna minor*, and *L. polyrrhiza* which covered

the surface. A narrow fringe of marsh or swamp plants included *Polygonum Hydropiper* (a-ld), *Alisma Plantago-aquatica* (f), *Juncus effusus* (f), *Lycopus europaeus* (f), *Rumex condylodes* (f), *Salix caprea* (lf), with *Arenaria trinervia*, *Apium nodiflorum*, *Epilobium* sp., *Holcus lanatus*, *Mentha aquatica*, *Ranunculus repens*, *Solanum Dulcamara* and *Stellaria uliginosa*.

SOUTH EAST POND [at junction of 83, 86, 91, and 94]

has an area of 930 square yards according to the map, but it is now approaching the last phase of the vegetational invasion of a pond. The northern bank is overshadowed by several large oaks and along the eastern margin by a dense mass of young oaks and willows. Lying in the middle of South East Wood and completely surrounded by trees, it is probably the most sheltered "pond" on the Common. There is no obvious drainage into the area, but an old disused shallow ditch near the N.W. corner and running N. probably once drained excess water to Eastern Ditch. The pond shows no surface water for most of the year, although the floor remains damp and spongy, but, for a few of the winter months, parts are covered with shallow water.

VEGETATION.

Observations, made in August 1942, showed that most of the pond was completely covered by *Sparganium ramosum* (d), and *Solanum Dulcamara* (sd), with little other vegetation except for several *Salix cinerea* and *S. caprea* and *Juncus effusus* (o). In the late autumn of 1944, the pond was red with masses of fruits of *Solanum Dulcamara*. The surface of the mud between the bases of *Sparganium ramosum* was bare of vegetation except for local patches of *Lemna minor* left stranded around them. A distinct community occupied the S.W. corner of the pond and was composed of *Juncus effusus* (d), *Sparganium ramosum* (sd), *Solanum Dulcamara* (a), *Epilobium palustre* (o), *Deschampsia caespitosa* (o), and *Agrostis tenuis* and *A. canina*.

Two other well marked communities could be recognised:

(1) Along the N. and N.W. margin.—*Ranunculus repens* (d), *Solanum Dulcamara* (a), *Juncus effusus* (la), *Cnicus palustris* (f), *Rumex condylodes* (f), *Urtica dioica* (f), *Holcus lanatus* (o), *Agrostis alba* (o), *Deschampsia caespitosa* (o), and *Glyceria fluitans* (o).

(2) Along the N.E. margin.—*Epilobium palustre* (l), *Lysimachia Nummularia* (l), with *Ranunculus Flammula*, *R. repens*, *Cnicus palustris*, *Galium palustre*, *Holcus lanatus*, *Hydrocotyle vulgare*, and *Lotus uliginosus*.

CRATER POND [5447].

An interesting phenomenon directly occasioned by the war is the creation of a number of artificial ponds which occupy sites of bomb craters. One particular crater caused during the winter of 1940-41 has been under observation throughout the Survey. It is some ten feet in diameter and is c. 800 feet from Isle of Wight Pond and c. 900 feet from the nearest point on Bookham Stream. During 1942, it was full of water

and has remained so continuously, with slight variations in level. There was no visible vegetation within the crater in June 1942, but *Typha latifolia* and *Juncus* sp. were present in 1943, and by 1944 the plant community comprised, in the centre, *Typha latifolia* (d) and *Alisma Plantago-aquatica*, and nearer the margin, *Juncus conglomeratus*, *J. effusus*, *J. inflexus*, and *J. articulatus* L. agg.

The Water Snails of Isle of Wight and Upper Eastern Ponds.

By Major J. L. Harrison, A.R.C.S., B.Sc., F.R.E.S., F.Z.S.

This note makes no pretence at being a complete study of the Mollusca population of these two ponds. As the departure of the author overseas has compelled him to abandon work on this subject, the methods and preliminary results are set down for future reference.

The intention was to study the relative numbers of different species of snails at different times of the year, and in different places. So far it has been practicable to sample only in Spring 1942 and late Autumn 1944, and once in December 1942.

The sampling methods were twofold. In ponds with a good area of water, a small net was towed through the vegetation, a slight difference in pull making it a simple matter to sample either the surface or middle depth. For sampling the bottom of such ponds the net was weighted and pulled very slowly. In the dry pond bed, samples were taken by searching over a limited area; a quadrat method would be applicable, but was not in fact used. It is likely that with the latter method some correction for conspicuousness should be applied.

The degree to which such samples are representative can be gauged from how nearly the results can be reproduced. Table I gives the results of three consecutive hauls, on each of two occasions, with a metal soup-strainer through the surface of the vegetation of Isle of Wight Pond, each haul being with the same net and through the same distance.

All species were identified on the spot, and thereafter returned to the water, with the exception of a few check specimens and those of *Pisidium* spp. With a little practice field identification was found to be quite possible.

So far only 43 samples have been collected, a number far too few to give any real picture of the snail population, when it is remembered that these are distributed in various parts of the ponds. The consolidated totals are of some interest, however, and are given in Table II.

It must be remembered that we are measuring the relative numbers of snails, and that their absolute numbers, with varying methods of sampling, are meaningless. For this reason the numbers of snails in the Isle of Wight Pond are expressed as a percentage of the number of *Planorbis planorbis*, which seemed uniformly abundant.

It will be seen at once that there was a great increase of *Succinea putris* in Isle of Wight, and of *Planorbis vortex* in Upper Eastern

Pond, and equally remarkable decrease in *Planorbis albus* in Isle of Wight, and of *Limnaea pereger* in Upper Eastern Pond. The change in numbers of *Succinea putris* can be explained by the inclusion of samples from the dried-up bed of the pond, but no such explanation is suitable for the other species. Whether these changes are seasonal ones, or reflect a long term change, will only be shown when samples have been taken regularly over a period of several years.

The nomenclature is that adopted by A. E. Ellis, *British Snails*, 1926.

TABLE I.

Species.	April 1942. 1	2	3	September 1942. 1	2	3
Planorbis planorbis	74	115	115	32	23	12
P. corneus	2	2	—	2	—	2
P. carinatus	—	—	1	—	—	—
P. albus	39	9	36	—	—	1
Limnaea pereger	10	35	4	3	3	2
L. stagnalis	—	1	—	—	—	—
L. palustris	—	—	2	—	—	—

TABLE II.

	Totals. Spring 1942	Autumn 1944	Isle of Wight Pond. As % of *P. planorbis* 1942	1944	Upper Eastern Pond. May and December 1942	Autumn 1944
P. planorbis	627	176	100	100	32	30
P. corneus	23	8	4	5	15	8
P. carinatus	14	—	2	—	—	1
P. vortex	—	—	—	—	2	161
P. albus	138	1	22	0	—	—
L. pereger	97	50	15	28	22	1
L. stagnalis	4	—	1	—	—	—
L. palustris	19	10	3	6	—	—
Aplecta hypnorum	2	1	0	0	—	—
Succinea putris	—	36	—	21	—	—
Pisidium spp.	65	10	10	6	—	—

Notes on the Distribution of Dragonflies on Bookham Common.

By R. M. Payne.

The dragonflies (Odonata) of Bookham Common have been studied for three seasons (1942-1944), though on account of current conditions the continuity of the work has been impeded by the removal of certain of our workers from time to time. Although a good many observations have been made, the data so far obtained are by no means sufficiently comprehensive to permit the preparation of an adequate ecological account of the Odonata native to the Common, and there have in fact been many serious omissions in the planning and execution of our work from the ecological viewpoint. Nevertheless, it has been thought desirable to place on record in as concise a form as possible a summary of the results of three years' work, with particular reference to the terri-

torial distribution of the several species over the area covered by the Survey. It is hoped that the publication of these notes will serve as a stimulus to further research on the many problems that still require investigation in connection with the Odonata on Bookham Common; some of the more obvious of these problems are indicated in the course of this paper.

At the outset one serious omission in our method of work must be mentioned. Owing mainly to the practical difficulties involved, no observations of the insects in the larval stage have been made; and the inadequacy of the evidence of distribution afforded by a study merely of the imagines is fully realised. It did not seem feasible, however, to remedy this omission in present circumstances.

For most of the observations on which these notes are based either Mr L. I. Carrington or the writer is responsible. Valuable assistance has also been afforded during the course of the Survey by Messrs H. J. Burkill, J. L. Harrison and L. Parmenter, and we are particularly indebted to Miss C. E. Longfield, who besides confirming identifications in a number of doubtful cases has given much help in the preparation of this paper and has contributed a number of observations.

It is proposed to divide this paper into two main parts, dealing firstly with the several communities of dragonflies on the Common and secondly with the status of each species, to the extent permitted by the limited scope of our observations. In the latter part some reference will be made to pre-Survey occurrences of the species in the area, where these are on record.

The nomenclature used throughout is that adopted by Longfield (1937).

PART I.

Whilst dragonfiies have been observed on the wing in all parts of the Common, breeding must of course be confined to the areas where surface water lies for at least part of the year, and particular attention has therefore been paid during the Survey to the occurrence and behaviour of dragonflies at the several water areas, where special note has been taken of evidence of pairing and oviposition as an indication that breeding is taking place.

The areas of surface water to which special attention has been given fall into six divisions, each with its distinctive characteristics, physical and vegetational:—

A. Upper Eastern Pond.
B. Isle of Wight Pond.
C. Bayfield Pond.
D. Crater Pond [5447].
E. Isle of Wight Ditch and Bookham Stream.
F. Bank's Stream.

It may be mentioned here that no dragonflies have been seen during the Survey at either Sheepbell or Kelsey's Ponds. Both these

ponds are of course overhung and shaded by trees: Sheepbell is situated in thick woodland, and is probably too stagnant for dragonflies to breed, and Kelsey's, though similar in situation to Bayfield Pond, is much more overhung and less permanent than the latter.

At South-East Pond the only record during the Survey is of a few specimens of *Coenagrion puella* in June 1942: this pond is completely surrounded by trees and has no surface water during the summer months.

A full description of the ponds on the Common is contained in Mr C. P. Castell's paper above, which should be read in conjunction with the present notes.

A. UPPER EASTERN POND [67].

The following seven species of Odonata have occurred at this pond each year during the Survey and have been seen to oviposit, from which it may be inferred that they form the present breeding community:—*Aeshna cyanea, Aeshna grandis, Libellula quadrimaculata, Sympetrum s. striolatum, Sympetrum sanguineum, Ischnura elegans, Coenagrion puella.*

At least one pair of *Anax imperator* was present in 1942 and again in 1943, and a ♀ was observed ovipositing on 28.6.42. It is probable that this species could therefore be added to the list of breeding species.

Aeshna mixta has occurred at Upper Eastern Pond each year, and a note on the probable status here of this species is given in Part II.

Five further species have been observed from time to time at this pond, but no evidence of breeding has so far been obtained. Those marked * will be dealt with more fully in Part II: we give here merely the dates of occurrence:—

28.6.42—A very few *Pyrrhosoma nymphula.**
11.7.43—Several *Enallagma cyathigerum.**
27.5.44—A single ♀ *Brachytron pratense.**
A few *Libellula depressa* hawking.
9.7.44—Several *Lestes sponsa.**

B. ISLE OF WIGHT POND [57-58].

As indicated in Mr C. P. Castell's paper, this pond has maintained only a very small area of permanent surface water during our Survey. Its maximum winter area is doubtless capable of supporting a very considerable population of dragonfly larvae, but at the time when the life-cycle of most species is commencing the pond is invariaby approaching its lowest ebb, and this implies (a) a reduced area in which oviposition is possible, and (b) reduced chances of survival for the emerging larvae consequent upon comparative overcrowding and the inevitable results. At the same time and under these unfavourable conditions the larvae of previous years are approaching maturity, and the reduced food supplies that will be available at this stage of their existence must lessen the number that attain the imaginal state. Thus it would appear that Isle of Wight Pond cannot support the dragonfly

population which its superficial area and its appearance in the winter months would suggest it to be capable of supporting.

During the summer of 1942 the following six species of dragonflies were observed at this pond:—*Libellula depressa*, *Sympetrum s. striolatum*, *Sympetrum sanguineum*, [*Agrion splendens*—a single specimen], *Ischnura elegans*, *Coenagrion puella*.

S. s. striolatum was seen ovipositing, and there is little doubt that *L. depressa* and *C. puella* also bred here, since in 1943 the community consisted of:—*Aeshna mixta*—ovipositing on 10th October, *Libellula depressa*, *Sympetrum s. striolatum*, *Pyrrhosoma nymphula*, *Coenagrion puella*.

In 1944, however, only three species were seen, viz.:—*Libellula depressa*, *Pyrrhosoma nmyphula*, *Coenagrion puella*.

It is interesting to note that these are all species which emerge from the larval state early in the season: it will be recalled that the pond had completely dried up by 9th July, i.e., before either *Aeshna mixta* or *Sympetrum s. striolatum* would normally emerge.

C. BAYFIELD POND [76].

1942 was the only season in which dragonflies were seen at this pond, when the following three species occurred:—*Libellula depressa*—a single ♂ on 14th June; *Pyrrhosoma nymphula*—one specimen on 14th June; *Coenagrion puella*—abundant during June, oviposition being observed on 28th.

D. CRATER POND [5447].

The peculiar circumstances which have rendered this pond of great interest ecologically are referred to above by Mr C. P. Castell (p. 21).

A single species of dragonfly has occurred at this pseudo-natural pond each year during the Survey, viz., *Libellula depressa*. A pair was observed here on 28.6.42, when oviposition was taking place in the muddy water. The species was again observed during 1943, and a single ♂ and 2 ♀♀ were present on 27.5.44.

L. depressa would thus appear to be the first species to have colonized this new pond, and it will be interesting to note if any further species attempt to breed here as the pond matures. The small size of the pond will, of course, limit the development of a dragonfly community.

E. ISLE OF WIGHT DITCH AND BOOKHAM STREAM.

The straight ditches and meandering streams which cross the grassland plain from near the railway station to the junction with Bank's Stream near Hundred Pound Bridge are slow-flowing and are nowhere wider than c. 3 feet, except where they enlarge into small pools such as Manor Pond and West Pond. The following four species of Odonata frequent this habitat:—*Aeshna cyanea*, *Libellula depressa*, *Pyrrhosoma nymphula*, *Coenagrion puella*.

During the early part of the season *C. puella* is the dominant zygopterid, being generally about twice as numerous as *P. nymphula*.

Both these species have been seen to oviposit along the whole length of the streams. *L. depressa* ranges the streams during early summer, but has not been seen to oviposit. A ♀ *A. cyanea* was observed ovipositing in Isle of Wight Ditch on 29.9.43.

F. BANK'S STREAM.

Bank's Stream has an appreciably faster rate of flow than Bookham Stream, and though its average width is only 2 or 3 feet it normally carries a greater volume of water in its comparatively deep channel.

This is the only stretch of water on the Common where *Agrion virgo* has been observed: it has occurred here each year during the Survey, and as many as ten specimens have been noted on one day (6 ♂♂, 4 ♀♀, 13.6.43) along the short length of the stream between its entry on to the Common by Bank's Cottage and its junction with Bookham Stream near Hundred Pound Bridge.

During 1942 and 1943 no other species were seen on Bank's Stream, but on 27-28.5.44 single specimens were seen of *Libellula depressa*, *Pyrrhosoma nymphula* and *Coenagrion puella*.

PART II.

Species unrecorded for Bookham Common prior to the Survey have been marked *. The following abbreviations are used: I.O.W., Isle of Wight; U.E., Upper Eastern; S.L.E. & N.H.S., South London Entomological and Natural History Society.

1. *Brachytron pratense* Müller.*

A single ♀ was captured over Upper Eastern Pond on 27.5.44. The species had not hitherto been observed on the Common, but since it is on the wing very early in the season it may have been overlooked in previous years.

An effort should be made to ascertain whether *B. pratense* breeds in U.E. Pond.

2. *Aeshna cyanea* Müller.*

This species has been generally common throughout the period of the Survey. It has been seen to oviposit each year in U.E. Pond, and once in I.O.W. Ditch (as mentioned in Part I), but most of our observations, especially during the months of July and August, have been of individual specimens on the wing in various parts of the Common, viz.. Stents Wood, Eastern Wood, Central Wood, High Point Path and Eastern Hollow. It has, of course, a propensity for hawking along woodland rides.

3. *Aeshna grandis* L.

This species was recorded by Lucas (1900), and was observed by Miss C. E. Longfield at I.O.W. Pond on 26.8.34 and by Mr L. Parmenter on 1.9.35. During the Survey it has been seen each year in small num-

bers at U.E. Pond, where it evidently breeds, and singly in clearings in the woodland, mainly in August.

4. *Aeshna mixta* Latreille.*

There is apparently an established colony of this species at U.E. Pond, where a ♀ was seen to oviposit in dead leaves of *Sparganium ramosum* on 13.9.42, and several specimens were seen on the wing on 11.10.42 and again on 9.9.44 and 8.10.44, but in view of its known migratory habits, further close observation is required before it can be claimed that the species breeds here.

A single ♀ was observed ovipositing on *Equisetum limosum* at I.O.W. Pond on 10.10.43.

5. *Anax imperator* Leach.

This species was recorded by Lucas (1900), and in the Victoria County History (1902) he said of it on Bookham Common: " has occurred sometimes plentifully."

A single pair only was observed in 1942 and 1943 at U.E. Pond, so it cannot be said to be plentiful at the present time.

Cordulia aenea L.

This species was recorded by Lucas (1900) (1902), but has not been observed during the Survey.

6. *Libellula quadrimaculata* L.*

This species was not recorded by Lucas, but Mr L. Parmenter saw a single ♀ on 12.5.40, and it has been plentiful each year during the Survey at U.E. Pond.

7. *Libellula depressa* L.

This species, which was recorded by Lucas (1900) and by a field meeting of the S.L.E. & N.H.S. on 4.6.04, ranges freely over the Common during the early part of the summer. Oviposition has been observed only in the crater pond [5447], but there is little doubt that closer observation will reveal other breeding-sites in the small pools in Bookham Stream and elsewhere.

8. *Sympetrum striolatum striolatum* Charpentier.

This species was recorded by Lucas (1900), and again by Dr K. G. Blair (1931) on 31.7.30. It has occurred in numbers each year during the Survey.

There is no doubt that in 1942 it was more plentiful at I.O.W. Pond than at U.E. Pond, though it obviously bred in both. In that year oviposition was observed at I.O.W. Pond as late as 8th November, when the species was still abundant there, and showed a propensity, perhaps correlated with the lateness of the season, for settling boldly on one's shoulders and arms.

In 1943 *S. s. striolatum* occurred in greater number at U.E. Pond than at I.O.W. Pond, and oviposition was not observed at the latter. During 1944 it has apparently been confined to U.E. Pond, where it was plentiful on 10th September and 8th October.

Sympetrum vulgatum L.

Lucas (1900) stated " Mr C. A. Briggs has a male which he took at Bookham Common in 1891."

9. *Sympetrum sanguineum* Müller.*

This species was first noted at I.O.W. Pond by Miss C. E. Longfield on 26.8.34, and it was seen again on the Common by Mr L. Parmenter on 1.9.35. During the Survey it has been abundant each year at U.E. Pond, but has occurred at I.O.W. Pond only in 1942, when 2 ♂♂ were noted on 9th August.

S. sanguineum, which has been observed here between 14th July and 13th September, is at its maximum numbers during August, and is then the predominant dragonfly at U.E. Pond. *S. s. striolatum* reaches maximum abundance in September and early October, so that a comparison of the relative abundance of the two species is not easy, but a subjective estimate would be that *sanguineum* is more numerous each year than *striolatum* when each is at its height.

Sympetrum danae Sulzer.

This species was recorded by Lucas (1900), but has not been observed during the Survey.

10. *Agrion virgo* L.*

As mentioned in Part I, *A. virgo* appears to be confined on the Common to Bank's Stream, and it is interesting to note that in his description of this species Lucas (1900) says that it " flies . . . along the edges of streams that are overgrown or fringed with bushes." It is noticeable that hawthorn and bramble scrub approaches the edge of Bank's Stream along a great part of its length, while Bookham Stream flows through more open grassland.

11. *Agrion splendens* Harris.

The occurrence of this species on the Common cannot, in the writer's opinion, be regarded as established. It was first recorded by a field meeting of the S.L.E. & N.H.S. on 9.6.34, and a single specimen was observed at I.O.W. Pond on 14.6.42. In view, however, of the almost invariable association of *A. splendens* with the running water of brooks and streams it seems unlikely that it would breed in I.O.W. Pond, and further observation is required.

12. *Lestes sponsa* Hansemann.

This species was first recorded by Dr K. G. Blair (1931) on 31.7.30. It was next seen by Miss C. E. Longfield on 26.8.34, and by Mr J. L.

Harrison on 8.6.35 and Mr L. Parmenter on 1.9.35. During 1942 and 1943, the first two years of the Survey, it was apparently absent from the Common, but on 9.7.44 some dozen specimens were seen at U.E. Pond. It would not be thought that a species with such feeble powers of flight could colonize a pond from any distance, but in this connection it is interesting to note that Mr C. O. Hammond (1943) has placed on record the visit of a ♂ *L. sponsa* to a pond at Wood Green, to reach which it " must have come several miles."

13. *Pyrrhosoma nymphula* Sulzer.

This species was recorded by the S.L.E. & N.H.S. field meeting on 9.6.34, and was observed by Mr L. Parmenter on 15.6.38 and 12.5.40. During the Survey it has been seen to be most frequent on Bookham Stream, although a few specimens occurred at the edge of I.O.W. Pond on 13.7.43 and 27.5.44, and a very few at U.E. Pond on 28.6.42. A single specimen was noted at Bayfield Pond on 14.6.42 and another on Bank's Stream on 27.5.44.

14. *Ischnura elegans* Van der Linden.

This species was recorded by Lucas (1910) on 9.6.09, and was seen by Miss C. E. Longfield at I.O.W. Pond on 26.8.34 and by Mr L. Parmenter on 15.6.38. It is at present an infrequent species on the Common, and occurs in very small numbers. In 1942 it occurred at U.E. Pond and at I.O.W. Pond, where a single var. *violacea* Selys was seen on 14th June, but during 1943 and 1944 it has been noted only at U.E. Pond.

15. *Enallagma cyathigerum* Charpentier.

This species presents an interesting problem. It was recorded by Lucas (1900), but there are no further records until Miss C. E. Longfield found it at I.O.W. Pond on 26.8.34, and during 1942 it did not apparently occur on the Common. Having regard to its predilection for open water (Longfield (1937)), the opinion was formed that the gradual encroachment of vegetation on both U.E. and I.O.W. Ponds had probably led to its disappearance. On the afternoon of 11.7.43, however, several specimens (♂♂ and ♀♀) were observed at U.E. Pond! The species was not seen again that year, nor has it been observed during 1944, and its status on the Common cannot therefore be said to have been determined. The problem will repay further study.

16. *Coenagrion puella* L.

This species was first recorded by Lucas (1900). The S.L.E. & N.H.S. field meeting on 4.6.04 found it " plentiful " and on 31.5.05 it was " the only species seen " (Lucas (1907)). On the S.L.E. & N.H.S. field meeting on 9.6.34 it was " present in swarms," and Mr L. Parmenter saw " many " on 9.6.35, and described it as common on 5.6.38.

It is undoubtedly the most widespread and at its height the most plentiful dragonfly on the Common. It has occurred each year during

the Survey at (a) U.E. Pond, where there is a numerous colony, (b) I.O.W. Pond, where it was very plentiful in June 1942, less so in 1943 and only a few specimens were seen on 28.5.44, and (c) I.O.W. Ditch and Bookham Stream, where it frequents particularly the widenings and pools such as Manor Pond.

In 1942, when there was generally more water on the Common, it occurred also at Bayfield, Lower Eastern and South East Ponds; at the last two it was the only species to be seen. In May 1944 a single specimen was seen on Bank's Stream.

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Coleoptera of Bookham Common: Some Extracts from my Notebook, 1943.

By L. G. Payne.

On 11 out of the 12 scheduled monthly dates for 1943, recording visits were made to the three pond areas known as South Eastern Pond, Lower Eastern Pond, and Kelsey's Pond. It was hoped that a comparative survey of the beetle fauna of the marginal vegetational areas of these ponds might provide data sufficient to suggest reasons for distributional variation, but results obtained so far, on single-handed working, have not produced material which would justify any original thesis on the inter-relation of beetles and plants in connection with soil and situation. In place, therefore, of attempting to draw conclusions which might not sustain detailed investigation, I have thought it best to give my personal notes on a typical year's working. Weather notes are included, as this factor affects the beetle population to a considerable degree.

For convenience sake, the following abbreviations are used:—

S.E.P. = South Eastern Pond.
L.E.P. = Lower Eastern Pond.
K.P. = Kelsey's Pond.

Map grid references are given in square brackets.

January 10. A mild sunny Sunday after a night of frost. Pyramids of gnats over S.E.P. prompted the question—is there a minimum temperature at which gnats hover? About four square yards of water in the pond area. A small clump of *Juncus inflexus* was dug up here

and shaken over a cloth to produce *Acupalpus luridus* Dj. and *Bembidion clarki* Dw., the latter in abundance.

The depression known as L.E.P. was completely, but shallowly, covered with water. A large marginal tuft of the grass *Deschampsia caespitosa*, similarly treated, was found to harbour the following beetles in an active condition:—*Pterostichus diligens* St., *P. vernalis* Pz., *Agonum obscurum* Hb., *Bembidion biguttatum* F., *B. clarki* Dw., *Coccinella 7-punctata* L., *Coccidula rufa* Hb., *Chrysomela polita* L., *Galerucella tenella* L., *Haltica lythri* Ab., *Chaetocnema concinna* Mm. This grass forms a dense tufted stock and the accumulations of decaying stems of successive years probably creates a frost-proof refuge for the coleopterous fauna.

By sifting oak leaves on the margin of K.P. at the north end of the Common, *Pterostichus strenuus* Pz. and *Bembidion clarki* Dw. were taken.

February 14. Cold, fine, with sunny intervals.

S.E.P. now had a greater water area than at any other time during the period under review, and by sifting the detritus of oak leaves and *Sparganium* stems the following species, all Geodephaga, were obtained:—*Acupalpus luridus* Dj., *Pterostichus diligens* St., *Bembidion guttula* F., *B. clarki* Dw., *B. doris* Pz.

L.E.P. was also full, taking the overflow from Upper Eastern Pond and passing it on noisily to the rill which flows through Eastern Hollow and ultimately to Isle of Wight Pond. L.E.P. by searching, as on the previous occasion, produced *Stenolophus mixtus* Hb., *Pterostichus minor* Gy., *P. diligens* St., *Agonum obscurum* Hb., *A. fuliginosum* Pz., *Bembidion biguttatum* F., *B. clarki* Dw., *B. dentellum* Tb., *Haltica lythri* Ab., *Chaetocnema concinna* Mm.

K.P., also at its maximum capacity, was being fed by rills from the N.W. and S.E., the only occasion on which I have noticed these two trickles in function. Here, fallen willow leaves gave *Bembidion clarki* Dw., *B. dentellum* Tb., *Asaphidion flavipes* L., *Phaedon armoraciae* L.

March 14. Dry, cloudless and sunny.

The water area of S.E.P. already falling, but many frogs and quantities of spawn under the sallows. Again the following beetles were taken:—*Agonum obscurum* Hb., *A. fuliginosum* Pz., *Bembidion mannerheimi* Sg., *B. clarki* Dw., *B. doris* Pz.

L.E.P. Here again the water content was less, with water flowing neither in nor out. The reddish Clavicorn *Coccidula rufa* Hb. was noted.

K.P. had a slight inflow from the N.W., with *Acupalpus luridus* Dj. the only beetle.

April 11. Cloudy, cool and dry. An unusual beetle taken by S.E.P. was *Anatis ocellata* L., a species normally associated with Scots Pine

and Larch. On this occasion, Mr L. I. Carrington showed me a dead jay in Hill House Wood [5411] which, on examination, yielded the two large carrion beetles *Necrophorus humator* L. and *Oeceoptoma thoracicum* L.

S.E.P. Water by central sallow bush only.

L.E.P. Quarter of depression only under water. *Agonum obscurum* Hb. abundant.

K.P. Centre only with water. No beetles seen.

May 9. Very windy, cold and sunless, with cold sleety showers. A bad day for beetles except upon hawthorn blossom in the northern extension of South East Wood [91], where results from sweeping were varied and prolific. From one bush I obtained the following characteristic species:—*Epuraea depressa* Il., *Meligethes atratus* Ol., *Malthodes marginatus* Lt., *Malachius bipustulatus* L., *Lochmaea crataegi* Fo., *Anaspis frontalis* L., *Rhynchites aequatus* L.

S.E.P. No water. *Coccinella 7-punctata* L. under oak leaf.

L.E.P. Slight trickle of water from Upper Eastern Pond.

Carabus nemoralis Ml. ♂ under detached grass sod [8359].

June 12. Cool wind, sunny. S.E.P. showed no visible water, but the surface was soft and spongy. The plants *Sparganium ramosum* and *Solanum Dulcamara* had now asserted their dominance. On the latter the interesting *Psylliodes dulcamarae* Kh. and *Pria dulcamarae* Sc. were noted. A few bright metallic *Chalcoides aurata* Mm. were on sallow leaves here, but the geodephagous species, so generally in evidence earlier in the year, were now scarcely to be seen.

L.E.P. No water.

K.P., which was barely surfaced with water, had half its area under a fine crop of *Nasturtium officinale*. Several *Chrysomela polita* L. were found on this. The most noteworthy beetle of the day, however, was *Agonum sexpunctatum* L. from a marshy rut on Eastern Plain in the limited plant association of *Carex hirta* and *Sieglingia decumbens*. It is in precisely similar conditions near Byfleet that I have seen this local beetle.

July 11. Dull, very wet underfoot after all-night rain. All vegetation luxuriant. *Galium palustre* was now creeping over the Woody Nightshade of the S.E.P. depression, which was without water.

L.E.P. No water. Typical summer beetles taken here to-day were *Anisosticta 19-punctata* L., *Cantharis pallida* Gz., *Luperus longicornis* F., *Galerucella tenella* L., *Crepidodera transversa* Mm.

Aestivating under log in dry shallow pit [8388] were several specimens of the water beetle *Agabus chalconotus* Pz. *Phytodecta viminalis* L. was abundant on several low sallows by Stents Path [28].

K.P. No water, and sufficiently firm to walk across. The grass *Alopecurus geniculatus* dominant on south margin. From this were obtained the weevil *Barypithes araneiformis* Sk. and the uncommon sternoxid beetle *Agrilus angustulus* Il. The long-legged, red brown *Serica*

brunnea L. was taken on hazel by Woodland Path [52] and an interesting find on holly in Central Wood was the longicorn beetle *Leiopus nebulosus* L. The bells of one large foxglove in the same wood afforded hundreds of the small *Meligethes aeneus* F.

August 8. Cool, sunny.

S.E.P., L.E.P. and K.P. All dry and negotiable.

L.E.P. Beetles from marginal vegetation included *Amara aulica* Pz., *Anisosticta 19-punctata* L., *Lema lichenis* Vt., *L. melanopa* L., *Galerucella tenella* L., *Aphthona lutescens* Gy., *Chaetocnema concinna* Mm.

September 12. Warm, sunny.

S.E.P. was entirely dry but gave *Cercyon convexiusculus* S. from decayed stems of *Sparganium*.

L.E.P. Dry, yielded *Bembidion dentellum* Tb. and *Lochmaea suturalis* Th.

K.P., the muddy surface of which was slightly quaking, provided *Elaphrus cupreus* Df. very typical of quaking mud surfaces, *Stenolophus mixtus* Hb., *Pterostichus nigrita* F., *Agonum ruficornis* Gz., *Bembidion lunulatum* Fc., *B. dentellum* Tb., *Lema lichenis* Vt. The most interesting coleopterous record of the year was made to-day, when a pair of the crimson malacoderm *Platycis minutus* F. were seen on the trunk of the ancient willow lying horizontally across the east margin of this pond. They were left in the hope that this rare species might increase in the area.

A pellet of the Barn Owl, collected by Mr T. L. Bartlett on Eastern Plain and subsequently dissected by myself, consisted of oat husks with elytra of *Agonum*, *Harpalus* and *Aphodius* species, all medium-sized beetles not exceeding half-an-inch in length.

October 11. Misty early, later sunny and windless. All usual pond areas dry.

Beetles of L.E.P., mainly by sweeping, were *Agonum ruficornis* Gz., *A. obscurum* Hb., *Bembidion doris* Pz., *Adalia bipunctata* L., *Coccidula rufa* Hb., *Hydrothassa aucta* F., *Lochmaea caprea* L., *Chalcoides aurata* Mm., *Cassida rubiginosa* Ml.

K.P., by sweeping:—*Stenolophus mixtus* Hb., *Acupalpus luridus* Dj., *Bembidion mannerheimi* Sg., *B. dentellum* Tb., *Dromius 4-maculatus* L., *Coccidula rufa* Hb., *Phaedon tumidulus* Gm., *Cassida flaveola* Tb.

November 14. No visit.

December 12. Cold, dull, thin snow in parts.

S.E.P. No water visible. *Hydrobius fuscipes* L. under stone. *Pterostichus minor* Gy. and *P. diligens* St. under sack.

L.E.P. Very small water area. From brickwork by culvert were taken:—*Dromius melanocephalus* Dj., *Tachyporus hypnorum* F., *Lath-*

BOOKHAM COMMON

THE LONDON NATURAL HISTORY SOCIETY ECOLOGICAL SURVEY BASE MAP

GRID REFERENCES.

THE AREA IS CONSIDERED TO BE ENCLOSED IN A SQUARE DIVIDED INTO 9 EQUAL AREAS, EACH OF WHICH IS SUBDIVIDED INTO 9. THIS SUBDIVISION CAN BE CARRIED AS FAR AS IS NECESSARY. THUS THE GRID REF. NO. OF MANOR POND IS 5779

robium fulvipenne Gr., *Stenus cicindeloides* Gr. A small round hole, by horse dung in Kelsey's Path [51], seemed worth investigating, and at a depth of ten inches yielded *Geotrupes typhoeus* L. ♀. By the border of the Common [19] are some matured sycamore trees with "flaky" bark. Many beetles were found here under the bark, some of which were obviously only winter residents in that position. The list showed:—*Dromius agilis* F., *D. agilis* F. v. *bimaculatus* Dj., *Phosphuga atrata* L. v. *brunnea* Hb., *Adalia 10-punctata* L., *Lema puncticollis* Ct., *Chrysomela polita* L., *Phyllotreta nemorum* L.

Curiously enough, neighbourng trees of oak and elm, all with loose bark, were entirely devoid of beetle life. Why is this?

It is noteworthy that the two uncommon beetles *Psylliodes dulcamarae* Kh. and *Pria dulcamarae* Sc. which are associated with the plant *Solanum dulcamara* and only with this plant, have been taken at S.E.P., but not at K.P., where the plant also occurs.

It will be noted that only two species have been observed as common to all three pond areas. These are *Bembidion clarki* Dw. and *Coccidula rufa* Hb.

Species frequency tables, based on varying soil sites on the Common, should provide useful information, but this aspect could only be undertaken with the aid of a band of knowledgeable workers. It is hoped these may be forthcoming after the war.

The nomenclature of Coleoptera is in accordance with T. H. Beare, *Catalogue of the Coleoptera of the British Isles*, 1930.

Please Send your Records to the following:

The followiug sectional recorders would be glad to receive records relating to the London area (20 miles round St Paul's) from members and others:

Mammals, Birds, Reptiles, Amphibia: R. S. R. Fitter, 39 South Grove House, N.6.

Insects, Plant Galls: H. J. Burkill, 3 Newman's Court, Cornhill, E.C.3.

Botany: J. E. Lousley, 7 Penistone Road, S.W.16.

The Epping Forest Survey.

THIRD YEAR.

Progress Report.

By the Council of the Chingford Branch.

ECOLOGICAL work on the Cuckoo Pits Area of Epping Forest has progressed considerably during 1944, and it has now been decided to publish a detailed report on this area. The major part of the report is printed below; remaining sections, which cannot yet be completed, will be published as opportunity offers.

It is proposed to make a similar survey of another portion of the Forest in the vicinity of the first area, and Ludgate Plain with its surrounding forest has been chosen as suitable for this purpose. It is hoped to publish a preliminary account of this area next year.

The Chingford Branch is indebted to Mr H. Hawkins and Miss M. L. Mathieson for regular reports on the climate of the district, and Mr Hawkins's annual report for 1944 is printed below. A summary of the climatic conditions in previous years was published in the report of the Epping Forest Survey for 1943.[1]

[1] *London Naturalist* for 1943, p. 43.

D. G. T.

The Climate, 1944.

By H. Hawkins.

Observed at 119 Beresford Road, Chingford (latitude 51° 40′, longitude 0° 00′).

General Remarks.

The outstanding features of the year's weather were:—

(1) *The Very Mild Late Winter.*

The first few days of January were notable for temperatures approaching normal April figures. In late January and early February we had the warmest spell for 10 years—the night of 2nd February was warmer than a normal mid-May night. On 26th March a summer temperature of 72° F. (shade) was recorded—by the next morning it had dropped 40° to freezing point.

(2) *Record Spring Drought and Late Spring Frosts.*

In the first six months only 6.16 inches of rain fell and the combined totals of March, April and May only amounted to 2 inches. The water situation became critical, and it was reported that the daily flow of the Thames was about a quarter of what it should have been. Serious frosts occurred on four nights of mid-May, causing considerable damage to fruit trees.

(3) *Whitsun Heat-wave.*

The end of May gave four days with maximum shade temperatures of over 80° F., culminating with a shade temperature of 90° on Whit Monday, which was equalled only once in the year, during August.

(4) *Cold and Wet June.*

June had the lowest average shade temperature for 16 years with dull cloudy skies, and any day could have been described as a " nice February day."

(5) *Phenomenal Autumn Rains.*

Whereas 6.16 inches of rain fell in the first six months, the last six months yielded 15.61 inches, giving a total of 21.77 for the year. This compares with 20.4 inches in 1943 and 23.1 in 1942. The months of September, October and November yielded over 10 inches of rain together, which is over 3 inches above normal.

(6) *The Cold Spell of December.*

The year's lowest temperature was recorded on Boxing morning—21° F. Screen and 18° Grass temperature. On the 27th of this month the temperature never rose above 27° and was the coldest day of the year. With the heavy hoar frost came fog, and the more the fog condensed the heavier the frost grew.

Explanatory Notes (to table on p. 38).

Hours of Observation: 8 a.m. and 8 p.m. by ordinary clock.

Instruments in Use: Thermometers:—Dry Bulb, Wet Bulb, Maximum Shade, Minimum Shade, all in regulation Stevenson Screen.
Barometer.
Rain Gauge, Snowdon pattern.

Temperature: Minimum night temperature given is that registered by thermometer in Stevenson Screen and not on grass. All readings are shade temperatures.
Maximum Range for the month is the difference between the absolute maximum and minimum readings.
Average Range for the month is the difference between the average maximum and average minimum readings.

Rain: *A Wet Day* is one which yields at least 0.04 inches.
A Rain Day is when 0.01 inches or above is recorded.
Trace: When the gauge shows under 0.01 inches of rain, or when the observer knows that there has been some precipitation, but no sign of it appears in the gauge.

Month-by-Month Statistics.

Full particulars are summarized in the following table:—

Month.	Barometer (Inches of Mercury). Max.	Min.	Ave.	Temperature (Shade) in degrees Fahr. Max.	Min.	Ave. Max.	Ave. Min.	Ave.	Ave. Daily Range.	Max. Range.	Rain. Amount in inches.	No. of Wet Days.	No. of Rain Days.	No. of days on which there was a trace.	Gales. No.	Thunderstorms. No.	Fog. No. of Days.
Jan.	30.75	29.40	30.27	55	26	44.77	39.03	43.40	8.74	29	1.57	8	11	2	2	—	4
Feb.	30.60	29.50	30.20	55	25	43.69	33.65	38.67	10.04	30	0.84	8	15	3	—	—	1
Mar.	30.75	29.70	30.19	72	24	50.13	33.45	41.79	16.68	48	0.07	1	3	—	1	—	3
Apr.	30.60	29.50	30.08	76	29	61.30	42.20	51.75	19.10	47	1.43	7	13	—	—	—	1
May	30.45	29.50	30.10	90	28	67.45	41.65	54.55	25.80	62	0.51	6	7	5	2	4	—
June	30.20	29.40	29.90	78	38	69.06	49.30	59.18	19.76	40	1.74	9	12	2	1	2	—
July	30.10	29.60	29.87	83	46	73.19	54.77	63.98	18.42	37	1.78	11	13	7	1	1	—
Aug.	30.20	29.55	29.92	90	49	77.06	55.42	66.24	21.64	41	2.43	8	10	3	--	3	—
Sept.	30.40	29.50	29.99	74	36	65.30	47.53	56.41	17.77	38	3.19	13	14	4	3	—	3
Oct.	30.25	29.10	29.82	61	31	56.77	42.90	49.83	13.87	30	3.25	14	22	4	4	2	4
Nov.	30.40	29.25	29.81	60	30	49.46	37.96	43.71	11.50	30	3.73	17	20	4	4	—	—
Dec.	30.70	29.05	30.00	56	21	42.90	33.93	38.41	8.97	35	1.23	10	19	4	2	—	9
Year	30.75	29.05	30.01	90	21	58.67	42.65	50.66	16.02	69	21.77	112	159	38	20	12	25

Report on the Survey of the Cuckoo Pits Area, 1942-44.

CONTENTS.

1. Introduction and Acknowledgments.

Owing to war-time difficulties and shortage of workers, it has not been possible to make the survey of the Cuckoo Pits area as comprehensive as is really desirable. Nevertheless, in the three years during which the survey has been in progress, a considerable amount of data has been accumulated, and the Chingford Branch Council have decided that some of this should be published for record and for the guidance of workers in the future. The sections of data published in the present report are in themselves more or less complete. It must be emphasized that *this report represents only a preliminary stage of the ecological study.*

The survey is a team effort of the members of the Chingford Branch and of other members who visit Epping Forest from time to time. The report is similarly the result of team-work, and is therefore published anonymously. However, individual acknowledgments and responsibilities are listed below:—

Recorders: — K. E. Hoy, E. T. Nicholson, J. H. Peterken, E. B. Pinniger, and D. G. Tucker.

Sections of Report drafted by:—

Sections 1, 2, and 4—D. G. Tucker.
Sections 3.1 and 3.2—J. H. G. Peterken.
Sections 3.3 and 6.3—J. Ross.
Section 5—K. E. Hoy and D. G. Tucker.
Sections 6.1. and 6.2—E. B. Pinniger.

General Organiser and Editor of Report:—D. G. Tucker.

In addition, particular acknowledgment is due to the following for their regular and active field-work in connection with the survey:—R. Mears, D. C. Rattenbury, J. F. Tucker, and W. A. Wright; and to the following for special help from time to time:—Miss G. F. Woodhurst, K. W. Bourne, G. F. Mugele, L. Parmenter, L. G. Payne, J. H. Richter, E. A. Round, P. F. C. Rumsey and A. C. Wheeler and various members of the British Mycological Society.

2. General Account of Area.

A brief description of the Cuckoo Pits Survey Area was published in the *L.N.* for 1942, together with the survey map showing the vegetation units. This preliminary account explained the subdivision of the area adequately, and no further description need be given here. For convenience of reference, however, this map is included again here (Fig. 4; facing p. 64), and the vegetation units are summarised in Table 1.

TABLE 1.

Summary of Vegetation Units.

Unit.	Nature of Vegetation.
A	Oak-hornbeam woodland; bramble.
B	As A, together with bracken.
C	As B.
D	As B.
E	Series of ten small ponds and marshy areas; rushes.
F	Open, gravel soil; grasses, bracken, rushes, a little bramble and heather.
G	Pond, shallow, often dry. Overgrown with sallow and rushes.
H	Small pond, mostly dry; bare.
J	Small pond, mostly dry; rushes and grasses.
K	Pond, only partially overgrown with reedmace, bur-reed, and grasses and rushes.
L	As A.
M	Open; grasses, sedges and rushes; bramble and blackthorn spreading.
N	Forest rides; only trodden grass.
P	The Cuckoo Brook; running water, many plants along the banks.

Note.—Oak=*Quercus Robur*, Hornbeam=*Carpinus Betulus*, Bramble=*Rubus fruticosus* agg., Bracken=*Pteris aquilina*, Rushes=mainly *Juncus effusus* and *J. sylvaticus*.

The particulars of the vegetation as previously given are still substantially correct, the only changes to record being (a) the drying-up of the ponds (*v. infra*) and (b) a grass fire on Pear Tree Plain (unit M) in May, 1944, which destroyed the upper parts of the clumps of *Deschampsia caespitosa** and *Rubus fruticosus*, over an area of perhaps 1000 sq. yds. This fired area showed signs of recovery by the end of the summer.

In the paragraphs below some general particulars are given relating to altitudes, soil, and pond and stream water.

2.1. Altitudes.

In the preliminary description, it was stated that the land rises perhaps 20 feet from the stream to the gravel cap where the ponds are situated. Accurate measurements of the altitude (above O.S. Liverpool datum) at various points have been made (by Mr G. F. Mugele) and are as follows:—

Reference Point 1—158 ft.—lowest point of area.
Stream opposite R.P.2—165 ft.

*For the authority of all plant names throughout the report, refer to Section 3 (Table 4, etc.).

Pond region—185 ft.
Reference Point 9—188 ft.—highest point of area.
Pear Tree Plain (M)—about 180 ft.
The stream thus falls 7 ft. in a length of about 1000 ft.

2.2. The Soil.

The soil of the survey area is essentially sandy. The gravel cap around the ponds is, of course, almost entirely composed of coarse particles, but even in the lower and wetter parts, near the stream, the proportion of clay particles is low. This may be due to the washing down of sand from the higher parts. In the woodland portions, there is a layer of pure humus (leaf-mould) about one inch deep; in the open portions there is no pure humus, but, of course, the proportion of humus is high in the surface layer. Details of sample analyses made by Dr. D. G. Tucker are given in Tables 2 and 3.

TABLE 2.

Soil Analyses, Woodland Area A, near stream.

[Note.—All figures quoted are percentages of the dry weight.]

Depth (Inches).	1	3	12	36	72
Loss on Air Drying	50	17	12	15	18
Loss on Steam Drying	17	4	3	3	4
Loss on Ignition	29	10	6	2	8
Stones (> 2 mm.)	3	—	—	—	—
Coarse Sand (2 to 0.2 mm.)	34	36	40	35	37
Fine Sand (0.2 to 0.02 mm.)	30	44	35	30	20
Silt and Clay (< 0.02 mm.)	4	10	19	33	35

TABLE 3.

Soil Analyses, Other Parts of Area.

[Note.—All figures quoted are percentages of the dry weight.]

Location and Remarks.	F, 1″ depth, N.W. corner of Pond G.	M, 2″ depth, Centre of Plain.	P, from muddy bed of stream.
Loss on Air Drying	7	22	82
Loss on Steam Drying	4	6	4
Loss on Ignition	13	23	10
Stones	—	—	10
Coarse Sand	66	29	44
Fine Sand	19	44	33
Silt and Clay	2	4	3

The loss of weight on air-drying represents the proportion of free water in the soil. This factor is therefore more variable than the others. The loss on steam-drying represents the water held by colloids. The loss on ignition gives the proportion of humus in the soil. The separation into the various sizes of basic particles was effected by suspension in water and decantation at intervals of time corresponding to the rate of precipitation of the various sizes of particle. All figures quoted are percentages of *dry weight* (i.e. the weight after steam drying).

It will be seen that the proportion of the finer particles increases rapidly with depth in the lower woodland, but even at 6 ft. the proportion of sand is high. The soil of the higher parts is almost entirely sand, apart from the humus and water content.

2.3. The Water Reaction (Acidity).

The reaction of the water in Pond K and in the stream P has been measured by Mr E. B. Pinninger, both in 1943 and in 1944 (summer). The pH values have differed by only about 0.2 from year to year. The figures are given below:—

Pond K: (a) Near south bank, pH 6.4.
(b) Among rush and bur-reed near north bank, pH 5.8
(c) Near east bank, pH about 7.0.
(d) South-west corner, among *Glyceria*, pH 5.6.

Stream P: pH 7.7.

A block comparator with buffer tubes was used for these tests, and for Pond K the indicator was Brom Cresol Purple, and for the stream Phenol Red.

It is to be concluded that the pond water is by no means of uniform reaction, but varies between neutral and distinctly acid, the zones of any particular reaction apparently remaining constant. The stream is distinctly alkaline, but this is probably due to the liming of fields near its source.

3. Plant Distribution—General.

The area is not particularly rich in species, many plants known to be present in Epping Forest being absent from the survey area. The greatest number of species is to be found on the banks of the Cuckoo Brook (Area P).

Table 4 in Section 3.1 shows the full list and frequency of species recorded. It is not pretended that it is complete, and additional notes will always be welcome. Enough has been recorded to give an idea of the nature of the area and the several plant communities to be found therein.

Woodland. (A. & D.)—with little or no Bracken, *Pteris Aquilina* L. The chief associates of the dominant Hornbeam, *Carpinus Betulus* L., are pedunculate oak, *Quercus Robur* L. (vc)*, Holly *Ilex Aquifolium* L. (c) and Hawthorn, *Cratægus monogyna* Jacq. (c). On the ground there are few flowering plants to be seen other than trailing species of bramble, *Rubus fruticosus* L. (agg.) (vc), and—chiefly in Area D—the grasses *Holcus mollis* L. (vc), *H. lanatus* L. (c), and *Festuca ovina* L. (agg) (c). Wood Sorrel, *Oxalis acetosella* L., is locally common in area A and Marsh Thistle *Cnicus palustris* Willd., locally common in area D. The chief ground mosses in this habitat are *Dicranella heteromalla*

*Abbreviations:—(d) dominant, (vc) very common, (c) common, (l) local, (o) occasional.

Schp., *Webera nutans* Hedw., *Brachythecium rutabulum* B. and S., *Hypnum cupressiforme* L. These are all common, as also is the liverwort *Lophocolea heterophylla* (Schrad.) Dum.

Woodland. (B, C & L)—with much bracken. Here the canopy of the trees opens out. The same species of trees and large shrubs are in much the same proportion as in areas A & D. On the ground *Pteris* becomes dominant, little else appearing except at the edges of the paths, where the chief associates are *Potentilla erecta* Hampe, *Galium saxatile* L., and the grasses—chiefly in B—*Anthoxanthum odoratum* L., *Agrostis canina* L., and *Festuca ovina* L. (agg.). In the shadier parts where the *Pteris* thins out, *Rubus* spp. compete with it and become in places co-dominant. The moss *Brachythecium purum* Dixon is locally common in area C amongst grasses.

Grassland. This comprises Pear Tree Plain (area M) only, where the dominant grass is *Deschampsia cæspitosa* Beauv. On the south side a dense thicket of scrub is encroaching, consisting of *Prunus spinosa* L. (ld), *Cratægus monogyna* Jacq., *Rosa canina* L. (agg) *R. arvensis* Huds., and *Rubus* spp. Locally *Pteris* also is dominant. Associated with *Deschampsia*, the common plants are *Stellaria graminea* L., *Galium saxatile* L., *Potentilla erecta* Hampe, *Cnicus palustris* Willd., *C. arvensis* Hoffm., *Achillea Ptarmica* L., *Juncus effusus* L., *Juncus sylvaticus* Reich., *Carex leporina* L., *C. hirta* L., the grasses *Festuca ovina* L. (agg.) and *Holcus lanatus* L. and the mosses *Aulacomnium palustre* Schwaeg. and *Hypnum aduncum* Hedw. The dampness of the area is indicated by many of the above, but the ground has dried considerably in the last two years. It will be interesting to observe the future effect of the grass fire in May, 1944.

Area F, which surrounds ponds E and G, has a somewhat different association of plants from the other parts of the survey area. Typical heathland plants are mixed here with no particular dominant species. Some small fairly pure patches are found locally of *Calluna vulgaris* Hull, *Luzula campestris* DC., *Deschampsia flexuosa* Trin., the mosses *Polytrichum formosum* Hedw. and *P. juniperinum* Willd., and the liverwort *Cephalozia bicuspidata* L. (Dum.). *Pteris* is invading here also, and will probably increase.

The Ponds are dealt with later as a special study.

The Cuckoo Brook and its banks constitute the southern boundary of the survey area. The actual boundary has been regarded as approximately six feet beyond the further bank. The brook is shady for most of its length, having the hornbeam woodland on each side. The water is nearly always very shallow, and at times almost dries up. No plants appear to be growing entirely in the water, although some are very low down the slope of the bank such as *Carex sylvatica* Huds. (c), *Epilobium palustre* L. (o), *Veronica Beccabunga* L. (o), and *Scrophularia nodosa* L. (o). The most common plants on the top of the banks are *Ranunculus Ficaria* L., *R. repens* L., *Lysimachia Nummularia*

L., *Nepeta hederacea* Trev., *Polygonum Hydropiper* L., *Rumex condylodes* Bieb., *Urtica dioica* L., and *Bromus giganteus* L. The most common mosses are *Dicranella heteromalla* Schp., *Mnium hornum* L., *Eurhynchium Stokesii* CM. (B & S). (=*prælongum* Hobk.), and *Hypnum cupressiforme* L. Nowhere along the brook does any plant appear to achieve local dominance, with the possible exception of the moss *Dicranella heteromalla* Schp.

The Rides (Area N) are very much trodden, and the vegetation in the less trodden parts is simply an extension of the adjoining area. There is little of ecological significance. A few plants of the common groundsel *Senecio vulgaris* L. were found on one ride, but this common plant has been recorded from no other part of the survey area.

The nomenclature used in Sections 3.1 and 3.2 is that given in *The London Catalogue of British Plants*, 11th edition, 1925, and the *Census Catalogues of British Mosses*, 2nd edition, 1926, and of *British Hepatics*, 3rd edition, 1930, published by the British Bryological Society, subject, however, to changes in certain moss names as given in the B.B.S. report for 1938 (1939), page 117.

3.1. Flowering Plants.

A full list of the species recorded, together with particulars of their abundance in the various vegetation units, is given in Table 4. The symbols representing the abundance, or frequency of occurrence, are as follows:—

d = dominant (over a major part of the vegetation unit).
ld = locally dominant (over a small part of a unit).
a = abundant (over a major part of the vegetation unit).
la = locally abundant (over a small part of a unit).
vc = very common.
c = common.
lc = locally common.
l = local (more than 6 plants, or a good patch, in one station).
o = occasional (thinly scattered).
r = rare (not more than 6 plants, or a small patch).

TABLE 4. FLOWERING PLANTS.

Area :	A	B	C	D	E	F	G	H	J	K	L	M	N	P
Ranunculus sceleratus L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
R. Flammula L.	—	—	—	—	—	—	o	—	—	c	—	o	o	—
R. auricomus L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
R. repens L.	—	—	—	—	—	—	—	—	—	c	c	c	o	c
R. Ficaria L.	—	—	—	—	—	—	—	—	—	—	—	—	—	lc
Nymphaea alba L.	—	—	—	—	—	—	—	—	—	r	—	—	—	—
Barbarea vulgaris Br.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Cardamine flexuosa With.	—	—	—	—	—	—	—	—	—	—	—	—	—	c
Viola Riviniana Reichb.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Lychnis dioica Mill.	—	—	—	—	—	—	—	—	—	—	—	—	—	c
Cerastium vulgatum L.	—	—	—	—	—	—	—	—	—	—	—	o	—	o
Stellaria media Vill.	—	—	o	—	—	—	—	—	—	—	o	—	—	o
S. Holostea L.	—	—	o	—	—	—	—	—	—	—	—	o	o	c
S. graminea L.	—	—	—	—	—	—	—	—	—	o	—	c	—	—
S. uliginosa Murr.	—	—	o	—	—	—	lc	—	—	o	o	—	o	o
Arenaria trinervia L.	—	—	o	—	—	—	—	—	—	—	—	o	—	c
Hypericum tetrapterum Fr.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
H. humifusum L.	—	—	—	—	—	—	—	—	—	—	—	o	—	—
Oxalis Acetosella L.	c	o	—	—	—	—	—	—	—	—	—	—	—	c
Ilex Aquifolium L.	c	c	c	c	—	o	o	—	—	o	o	—	o	o
Acer campestre L.	—	—	—	—	—	—	—	—	—	—	r	—	—	r
Genista anglica L.	—	—	—	—	—	r	—	—	—	o	—	—	—	—
Lotus uliginosus Schk.	—	—	—	—	—	—	—	—	—	o	—	c	—	—
Ornithopus perpusillus L.	—	—	—	—	—	—	—	—	—	o	—	—	—	—
Vicia sepium L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Prunus spinosa L.	—	—	—	c	—	—	—	—	—	—	—	ld	—	r
Rubus fruticosus L. (agg.)	vc	vc	vc	c	—	o	o	o	—	o	c	c	o	c
Geum urbanum L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Fragaria vesca L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Potentilla erecta Hampe	—	c	—	—	—	c	—	—	—	c	c	c	c	—
P. Anserina L.	—	—	—	—	—	—	—	—	—	—	—	—	o	r
P. palustris Scop.	—	—	—	—	—	—	—	—	—	c	—	—	—	—
Rosa arvensis Huds.	—	—	—	—	—	—	—	—	—	—	—	c	—	—
R. canina L. (agg.)	—	—	—	o	—	—	—	—	—	—	—	o	—	o
Pyrus Malus L.	—	—	o	—	—	—	r	—	—	—	r	—	—	—

Area :	A	B	C	D	E	F	G	H	J	K	L	M	N	P
Crataegus Oxyacantha L.	—	—	—	—	—	r	—	—	—	—	—	r	—	—
C. monogyna Jacq.	—	—	—	c	—	o	—	—	—	o	—	c	—	o
Callitriche stagnalis Scop.	—	—	—	—	—	—	vc	—	—	o	—	—	—	—
Lythrum Salicaria L.	—	—	—	—	—	—	o	—	—	—	—	—	—	—
Epilobium angustifolium L.	—	—	—	—	—	—	—	—	—	—	—	r	—	—
E. palustre L.	—	—	—	—	—	—	—	—	—	r	—	—	—	o
Sison Amomum L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Angelica sylvestris L.	—	—	r	—	—	—	—	—	—	—	—	c	—	—
Caucalis Anthriscus Huds.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Hedera Helix L.	—	r	—	—	—	—	—	—	—	—	—	—	—	o
Lonicera Periclymenum L.	—	—	—	—	—	o	—	—	—	—	o	—	—	o
Galium saxatile L.	—	o	—	o	—	c	c	—	—	c	c	c	c	—
G. palustre L.	—	—	—	—	—	—	c	—	—	c	—	—	—	o
G. Aparinc L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Scabiosa Succisa L.	—	—	o	—	—	—	—	—	—	o	—	—	—	—
Bidens cernua L.	—	—	—	—	—	—	c	—	—	r	—	—	—	—
Achillea Millefolium L.	—	—	o	—	—	—	—	—	—	—	—	o	—	r
A. Ptarmica L.	—	—	—	—	—	—	—	—	—	—	—	c	—	—
Matricaria inodora L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Tussilago Farfara L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Senecio vulgaris L.	—	—	—	—	—	—	—	—	—	—	—	—	r	—
Arctium minus Bernh.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Cnicus lanceolatus Willd.	—	—	—	—	—	—	—	—	—	—	—	o	—	r
C. palustris Willd.	—	—	—	lc	—	—	—	—	—	—	—	c	—	—
C. arvensis Hoffm.	—	—	—	—	—	—	—	—	—	—	—	c	o	o
Hieracium Pilosella L. (agg.)	—	—	—	—	—	—	—	—	—	o	—	—	—	—
Sonchus arvensis L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Campanula rotundifolia L.	—	—	—	—	—	o	—	—	—	o	—	—	—	—
Calluna vulgaris Hull	—	—	—	—	—	1	lc	—	—	o	—	—	—	—
Lysimachia Nummularia L.	—	—	—	—	—	—	—	—	—	—	—	—	—	lc
Fraxinus excelsior L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Solanum Dulcamara L.	—	—	—	—	—	—	lc	—	—	o	—	o	—	o
Scrophularia nodosa L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Veronica Chamaedrys L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
V. Beccabunga L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Utricularia vulgaris L.	—	—	—	—	—	—	—	—	—	lc	—	—	—	—

Area :	A	B	C	D	E	F	G	H	J	K	L	M	N	P
Mentha aquatica L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Lycopus europaeus L.	—	—	—	—	—	—	—	—	—	o	—	—	—	c
Nepela hcderacea Trev.	—	—	—	—	—	—	—	—	—	—	—	—	—	c
Prunella vulgaris L.	—	—	o	—	—	—	—	—	—	—	—	o	—	o
Slachys sylvatica L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Lamium album L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Teucrium Scorodonia L.	l	—	—	—	—	—	—	—	—	—	—	—	—	—
Planlago major L.	—	—	—	—	—	—	—	—	—	—	—	—	—	l
Polygonum Hydropiper L.	—	—	—	—	lc	—	o	—	—	la	—	r	o	c
Rumex condylodes Bieb.	—	—	—	—	—	—	—	—	—	lc	c	—	o	c
R. obtusifolius L.	—	—	—	—	—	—	—	—	—	—	—	o	—	o
R. Acetosa L.	—	—	—	—	—	—	—	—	—	—	—	c	o	o
R. Acelosella L.	—	—	—	—	—	o	c	—	—	o	—	—	o	—
Mercurialis perennis L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Urlica dioica L.	—	—	—	—	—	—	—	—	—	—	—	—	o	c
Betula alba L.	—	—	—	r	—	o	—	—	—	r	—	—	—	—
Carpinus Betulus L.	d	vc	vc	d	—	c	r	—	—	c	d	o	—	c
Quercus Robur L.	vc	c	c	c	—	c	—	o	—	o	c	o	o	r
Q. cerris L.	—	r	—	—	—	—	—	—	—	—	r	—	—	—
Fagus sylvalica L.	—	—	—	—	—	—	—	r	—	o	—	—	—	—
Salix cinerea L.	—	—	o	—	—	o	ld	—	—	c	—	o	—	—
Tamus communis L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Ruscus aculeatus L.	o	—	o	—	—	—	—	—	—	—	—	o	—	—
Scilla non-scripta Hoffm. & Link	—	o	o	—	—	—	—	—	—	r	r	—	o	o
Juncus effusus L.	—	—	—	—	ld	o	vc	o	ld	c	—	c	lc	c
J. conglomeralus L.	—	—	—	—	lc	—	o	—	—	—	—	c	—	—
J. sylvalicus Reich.	—	—	—	—	—	—	—	—	—	la	—	c	—	—
Luzula campeslris DC.	—	—	—	—	—	lc	—	—	—	c	—	o	o	—
Typha latifolia L.	—	—	—	—	—	—	—	—	—	ld	—	—	—	—
Sparganium ramosum Curt.	—	—	—	—	—	—	—	—	—	ld	—	—	—	—
Arum maculatum L.	—	—	—	—	—	—	—	—	—	—	—	—	—	r
Lemna lrisulca L.	—	—	—	—	—	—	—	—	—	c	—	—	—	—
L. minor L.	—	—	—	—	—	—	lc	—	—	c	—	—	—	—
Polamogeton nalans L.	—	—	—	—	—	—	—	—	—	l	—	—	—	—
Eleocharis palustris Roem & Schultz	—	—	—	—	—	—	—	—	—	lc	—	—	—	—
Carex remola L.	—	—	—	—	—	—	—	—	—	—	—	—	—	c

Area :	A	B	C	D	E	F	G	H	J	K	L	M	N	P
C. leporina L.	—	—	—	—	—	—	—	—	—	—	—	vc	l	—
C. Goodenowii Gay	—	—	—	—	o	—	—	—	—	—	o	o	o	—
C. sylvatica Huds.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
C. hirta L.	—	—	—	—	—	—	—	—	—	—	—	c	o	—
Anthoxanthum odoratum L.	—	lc	—	—	—	l	o	—	—	—	—	o	—	o
Alopecurus pratensis L.	—	—	—	—	—	—	—	—	—	—	—	o	—	—
Milium effusum L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Agrostis tenuis Sibth.	—	—	—	o	—	—	—	—	—	—	—	o	—	c
A. canina L.	—	lc	—	—	—	—	o	—	—	—	—	c	—	—
Aira praecox L.	—	—	—	—	—	o	—	—	—	o	—	—	—	—
Deschampsia caespitosa Beauv.	—	—	—	o	c	o	—	—	—	o	—	ld	—	—
D. flexuosa Trin.	—	—	—	—	—	lc	—	—	—	—	—	o	—	—
Holcus mollis L.	—	—	—	vc	ld	c	l	o	—	c	—	—	lc	l
H. lanatus L.	—	—	—	c	—	—	—	—	—	—	—	c	lc	c
Arrhenatherum elatius M. & K.	—	—	—	—	—	—	—	—	—	—	—	c	o	o
Dactylis glomerata L.	—	—	—	—	—	—	—	—	—	—	—	—	o	c
Poa nemoralis L.	—	—	—	—	—	o	—	—	—	—	—	—	—	c
P. annua L.	—	—	—	—	—	—	—	—	—	o	—	—	l	c
P. pratensis L.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
P. trivialis L.	—	—	—	—	—	—	—	—	—	—	—	—	o	c
Glyceria fluitans Br.	—	—	—	—	l	—	c	—	vc	ld	—	o	—	o
Festuca ovina L. (agg.)	—	c	—	c	—	c	lc	—	—	—	—	vc	lc	c
Bromus giganteus L.	—	—	—	—	—	—	—	—	—	—	—	—	—	c
Brachypodium sylvaticum R. & S.	—	—	—	—	—	—	—	—	—	—	—	—	—	o
Nardus stricta L.	—	o	—	—	—	c	—	—	—	lc	—	—	—	—
Pteris aquilina L.	o	vc	vc	o	—	vc	c	o	—	o	vc	ld	o	o
Lastrea Filix-mas Presl	—	—	—	r	—	—	—	—	—	—	—	—	—	r
L. aristata Rendle & Britten	—	—	o	—	—	—	—	—	—	—	—	—	—	—

3.2. Mosses and Liverworts.

The following notes shew the species recorded with habitat and frequency (c.fr. = with fruit, c.g. = with gemmae):—

MOSSES.

Sphagnum auriculatum Schp., (lc), in ponds G and K.

Tetraphis pellucida Hedw., c.g., on stumps occasionally in ponds G and K.

Polytrichum piliferum Schreb., small tuft on bank of K mixed with other spp. of *Polytrichum*.

P. juniperinum Willd., c.fr. (lc) in F and on banks of G and K. (o) in L and N.

P. formosum Hedw., c.fr. (l) in F and H and on banks of G and K.

Pleuridium nitidum (Hedw.), Rabenh., c.fr. (=*axillare* Lindb.) (l) in mud at edge of pond G.

Ceratodon purpureus Brid. (o) on ground in D.

Dicranella heteromalla Schp., c.fr., the commonest moss in the survey area. Recorded in all divisions except Pear Tree Plain (M). On the ground, banks, stumps and roots of trees.

Dicranoweisia cirrata Lindb. (o) on tree trunks in A, B & C. (lc) in L.

Campylopus pyriformis Brid., one small tuft on a log in E.

Dicranum scoparium Hedw. (ld) in F. (c) on banks of G and K. (o) in D. On bare ground.

Fissidens bryoides Hedw., c.fr., small tuft on a log in A and on bank of Cuckoo Brook.

Aulacomnium palustre Schwaeg. c.g. (vc) amongst grass in M. (o) on bank of pond K.

A. androgynum Schwaeg. c.g., on logs and on ground under scrub, scattered over the area. (lc) in D.

Webera nutans Hedw. c.fr. (vc) on ground near the ponds, and in D. Well distributed over the area.

Bryum capillare L. (o) on logs in A.

Mnium affine Bland., a few tufts on bank of P.

M. undulatum L., one tuft on bank of P.

M. hornum L. (vc) on banks of ponds. (c) on banks of P. (o) elsewhere.

M. punctatum L., one tuft on bank of P.

Brachythecium rutabulum B. & S., c.fr. (o) on ground in various parts of the area. (c) in A.

B. velutinum B & S. (o) on logs in E.

B. purum Dixon, on ground amongst grass. (lc) in A and C. (o) in D.

Eurhynchium Stokesii (C.M.) B. & S. (=*prælongum* Hobk.). On ground and stumps of trees. (vc) on banks of P. (c) in A. (o) elsewhere.

Plagiothecium denticulatum B. & S. (o) on ground in various parts of the area.

Hypnum riparium L., c.fr. (o) on stumps in K.
H. aduncum Hedw. *non* L. (c) amongst grass in wetter parts of M., and in shallow water in pond K.
H. exannulatum Gümb. (c) in shallow water in pond K.
H. cupressiforme L., c.fr., on ground and on roots of trees and on stumps. Common over most of the area.
H. cuspidatum L., one patch in M.
Hylocomium squarrosum B. & S. (lc) in A mixed with grass and *Brachythecium purum*.

LIVERWORTS.

Riccia fluitans L., floating in pond K and attached to the submerged stems of *Utricularia*.
Lunularia cruciata (L.) Dum., one patch on bank of P.
Pellia epiphylla (L.) Corda (o) on bank of P. One patch on ground in A.
Lophocolea heterophylla (Schrad.) Dum., c.fr., the commonest liverwort. On many logs and tree roots, sometimes on ground. In most parts of the area.
L. bidentata (L.) Dum., one patch on ground on bank of G. and on ground in L.
Chiloscyphus polyanthus (L.) Corda, one tuft on bank of P.
Cephalozia bicuspidata (L.) Dum., c.fr., a large patch on ground by pond K. Smaller patches by ponds E, G and H.
Calypogeia Trichomanis (L.) Corda, c.g., rare on stumps in G and J.

3.3. Mycetozoa.

The Mycetozoa, otherwise known as Myxomycetes, Myxogasters or Slime Fungi, usually feed on decaying vegetable matter and, to a great extent, are dependent on moist conditions for their development. With few exceptions, the plasmodia of these organisms feed inside vegetable matter, and it is in the spore-bearing stage that they are found. A notable exception is *Badhamia utricularis* which, as plasmodium, feeds on the surface of living woody fungi.

In a small area of woodland the number of species to be found will probably be restricted and, of the 106 species reported for the County of Essex (and mainly from Epping Forest, inclusive of Wanstead Park), thirty have been recorded for the area of Cuckoo Pits which has been under survey, whereas since September 1939, eighty have been recorded for the County. A very small extension of the surveyed area would have added more species, but, on the other hand, *Oligonema nitens*, first recorded for Essex in October 1942, occurred in the surveyed area, and has not been reported elsewhere in the County up to the time of writing.

The species found in the area are:—

Ceratiomyxa fruticulosa (Müll) Macbr. On decayed wood.
Badhamia utricularis (Bull) Berk. Plasmodium on *Stereum purpureum* Pers., and later as sporangia.

Physarum nutans Pers. On decaying logs and fallen sticks.
Fuligo septica (L.) Gmel. Rotting stumps and logs.
Craterium minutum (Leers) Fries. Dead leaves, etc., under holly trees.
Diderma radiatum (L.) Morg. var. *umbilicatum* (Pers.) Meyl. Shed hornbeam bark.
Didymium Clavus (Alb. & Schw.) Rabenh. Leaves under hollies.
D. nigripes (Link) Fries. Leaves under hollies.
D. squamulosum (Alb. & Schw.) Fries. Leaves under hollies.
Stemonitis fusca Roth. Decaying logs.
S. splendens Rost var. *flaccida* Lister. Dead wood.
S. flavogenita Jahn. Dead wood.
S. ferruginea Ehrenb. Decaying logs in E.
Comatricha nigra (Pers.) Schroet. Sticks and dead wood.
C. typhoides (Bull) Rost. Dead wood.
C. pulchella (Church Bab.) Rost. Leaves under hollies.
Enerthenema papillatum (Pers.) Rost. Decaying log.
Lamproderma scintillans (Berk & Br.) Morg. Leaves under hollies.
Dictydium cancellatum (Batsch.) Macbr. Large development on log lying at verge of G.
Reticularia Lycoperdon Bull. Logs and dead or partly dead standing trees.
Lycogola epidendrum (L.) Fries. Rotting wood.
Trichia varia Pers. Dead wood.
T. decipiens (Pers.) Macbr. Decaying wood.
T. Botrytis Pers. Rotting wood and sticks.
Oligonema nitens (Libert) Rost. Sticks and dead wood that had been submerged in G.
Arcyria ferruginea Sauter. Dead wood.
A. cinerea (Bull) Pers. Dead wood and leaves.
A. pomiformis (Leers) Rost. Sticks and dead wood.
A. incarnata Pers. Dead wood.
A. nutans (Bull) Grev. Decaying wood and sticks.

Times of appearance are not given, as in a small area a species may be found once or twice only, whereas elsewhere its occurrence may extend over four or six months.

4. Plant Distribution: Special Studies of the Ponds.

From most points of view the pond area is the most interesting portion of the survey, and the vegetation of the two main ponds (G and K) has been studied fairly closely.

Charts have been made each year showing the distribution of the main vegetation over the area of each of the ponds G and K. These ponds tend to dry up in the summer, and their vegetation is dense. Conditions have grown drier during the three years of observation, and this has led to a general increase in quantity of vegetation, with particularly noticeable growth of *Solanum Dulcamara* and *Glyceria fluitans*.

In the charts which illustrate the next two paragraphs the following letters have been used to represent species as follows:—

Be = *Betula alba.*
Ca = *Carpinus Betulus.*
Cl = *Callitriche stagnalis.*
Cr = *Crataegus monogyna.*
F = *Fagus sylvatica.*
G = *Glyceria fluitans.*
I = *Ilex Aquifolium.*
Js = *Juncus sylvaticus.*
Je = *Juncus effusus.*
L = *Lythrum Salicaria.*
N = *Nymphaea alba.*
Na = *Nardus stricta.*
P = *Pyrus Malus.*
Pn = *Potamogeton natans.*
Pp = *Potentilla palustris.*
Pt = *Pteris aquilina.*
Q = *Quercus Robur.*
R = *Rubus fruticosus* L. agg.
Ra = *Ranunculus repens.*
S = *Salix cinerea.*
Sn = *Sphagnum auriculatum.*
So = *Solanum Dulcamara.*
Sp = *Sparganium ramosum.*
T = *Typha latifolia.*

In connection with trees, the use of a dot beside the letters indicates that the tree is only a seedling or very young sapling (say up to 10 ft. high); but if the letters are enclosed in a small circle, the tree is larger than this, and can be regarded as permanently established.

4.1. Pond G. (See Fig. 2 opposite.)

This pond has for a long time been overgrown with vegetation, but since the summer of 1943 has been almost devoid of standing water. The chart of the distribution of the vegetation shows the position during 1943. The numbered vegetation units are as follows:—

1. *Juncus effusus.*
2, 3, 4, 5, 6. *Salix cinerea.*
7. *J. effusus.*
8. *Glyceria fluitans* and *J. effusus* (not dense).
9. *G. fluitans.*
10. *Callitriche stagnalis*
11. *C. stagnalis* and *G. fluitans.*
12. *Solanum Dulcamara.*
13. *Lythrum Salicaria.*
14, 15. *S. Dulcamara.*
16. *Carpinus Betulus* (scrub).
17, 18, 19. *Sphagnum auriculatum.*
20. *S. Dulcamara.*
21. *J. effusus.*
22. *C. Betulus* (scrub).
23. *C. stagnalis.*
24. Bare.

There have been considerable changes in the vegetation during the three years of observation, and these are indicated below:—

1942. *Juncus effusus* about the same as in chart.
Salix cinerea occupied considerably smaller area.
Solanum Dulcamara occupied about same area, but much less dense.
Callitriche stagnalis absent.
Large growth of *Bidens cernua* in central part of pond, and some at western end.
1943. As chart.
1944. Pond completely dry.
Much less *C. stagnalis* than in chart.

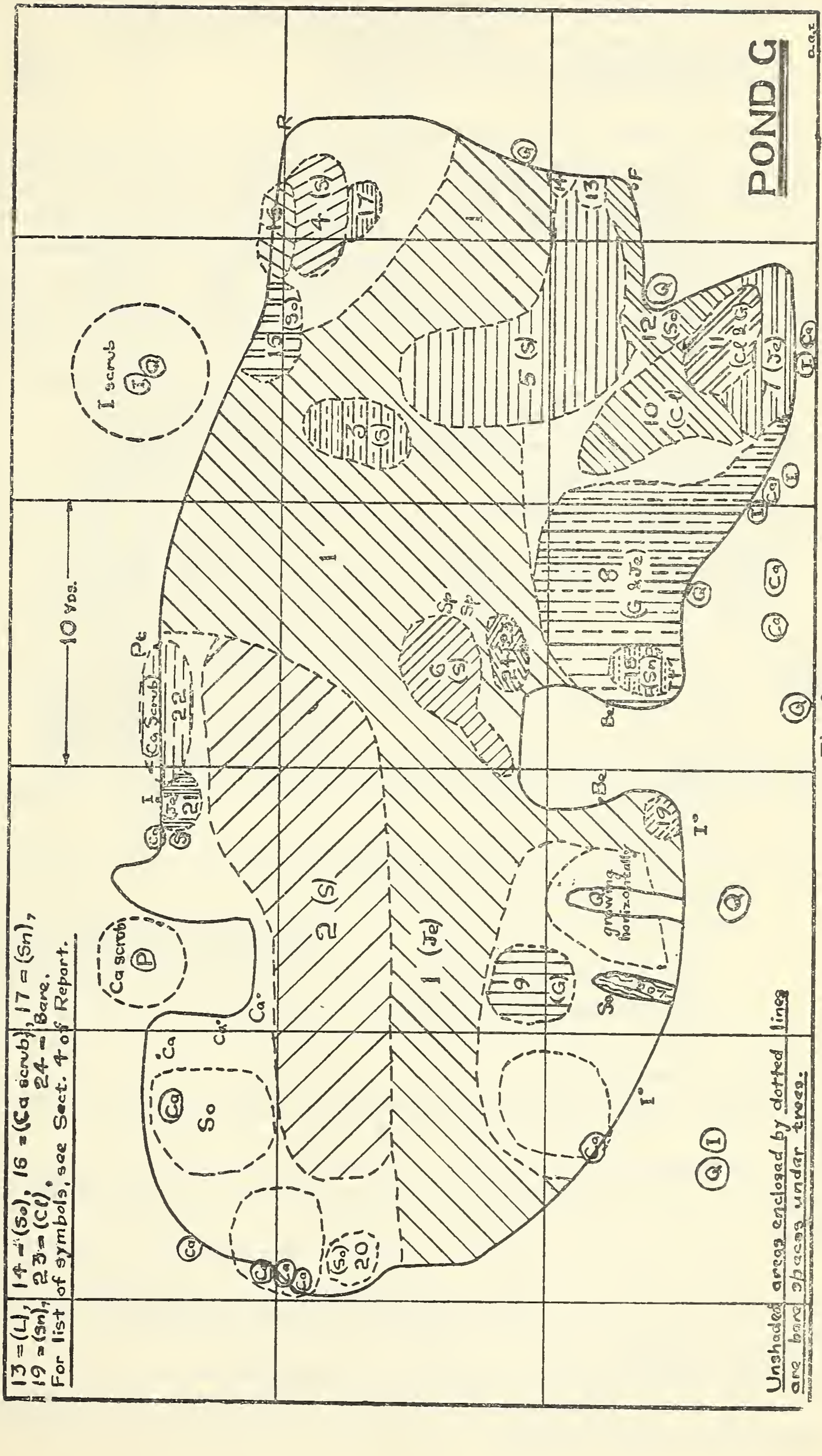

POND G
13 = (L), 14 = (So), 16 = (Ca scrub), 17 = (Sn),
19 = (Sn), 23 = (Cl), 24 = Bare.
For list of symbols, see Sect. 4 of Report.
Unshaded areas enclosed by dotted lines are bare spaces under trees.
10 yds.
I scrub
Ca scrub
Ca scrub
growing horizontally
2 (S)
1 (Je)
8 (G & Je)
5 (S)

Fig. 2.

Lythrum Salicaria failed to flower.
Bidens cernua completely absent.
Sparganium ramosum has spread.

4.2. Pond K. (See Fig. 3 opposite.)

This pond has always had a fair amount of open water, and its nearest approach to dryness was in the summer of 1944, when only about 200 sq. yards of water surface remained, and this was only an inch or two in depth. However, the vegetation is spreading towards the centre of the pond, particularly from the western side. The vegetation chart shows the distribution in the summer of 1943. The numbered vegetation units are as follows:—

1. *Juncus effusus* with *J. sylvaticus* and *Glyceria fluitans.*
2. *Sphagnum auriculatum* with *Potentilla palustris*, *J. effusus* and *G. fluitans.*
3. *Typha latifolia.*
4. *Sparganium ramosum* with *J. effusus* and *J. sylvaticus.*
5. As 4, but predominance of *J. effusus.*
6. *Nymphaea alba.*
7. *Potamogeton natans.*
8. *G. fluitans.*
9. *J. effusus.*
10, 11. *Salix cinerea.*
12. *Carpinus Betulus* (scrub).

The changes over the 3-year period are as follows:—

1942. Very little *Glyceria fluitans* (unit 8 absent).
Typha latifolia rather less.
Potamogeton natans covered a smaller area.
1943. As chart.
1944. Considerable increase of *Glyceria fluitans* (unit 8 greatly extended).
Potamogeton natans almost entirely absent.
Juncus sylvaticus less abundant, now very local.
Sparganium ramosum covers a larger area, extended to south, and there is a distinct line of separation between *Juncus effusus* with some *Sparganium* to the north, and *Sparganium* alone (about 5 yards wide) to the south.

4.3. The Other Ponds.

The other ponds are H, J, and the ten diminutive ponds grouped as E.

Pond J has been dry almost continuously since 1942, but the heavy rainfall of the end of 1944 has produced signs of standing water once more.

In 1944 the main vegetation, which covered most of the area of the pond, was as follows, in the approximate order of abundance:—*Juncus effusus*, *Festuca ovina*, *Glyceria fluitans*, *Solanum Dulcamara* and *Polygonum Hydropiper.*

Pond H has been quite bare and dry throughout.

Ponds E hold water during part of the winter; they are mostly overgrown with *Juncus effusus.*

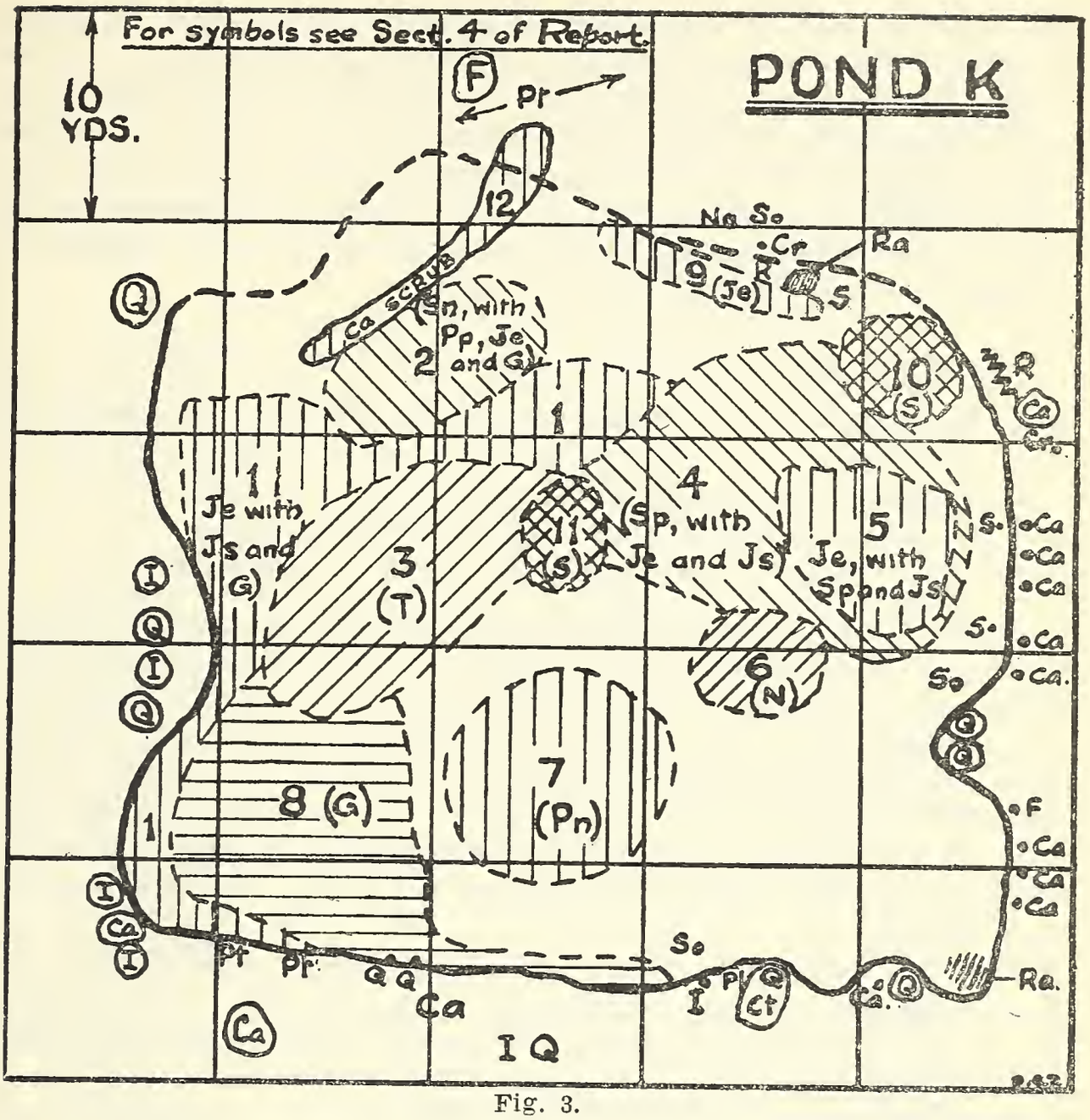


Fig. 3.

5. The Vertebrate Population.

(Sub-kingdom *Vertebrata*.)

The most conspicuous and numerically most abundant vertebrates are, of course, the birds, and for this reason they have been studied much more fully than any other vertebrates. They are not necessarily the most important class, however, if the ecological aspect of their influence on the area is considered. The grazing of deer and rabbits, for instance, may have a far greater effect on the condition and development of the vegetation.

The bird population is dealt with separately from the rest of the vertebrate population in the following section.

5.1. The Bird Population (Class *Aves*).

It has been found surprisingly difficult to make a serious ecological study of the bird population. Problems of conspicuousness, zonation (horizontal and vertical), and census work generally, have been considered, and some preliminary field work carried out; but it is felt that

the only reliable and useful data at present available for publication consists of the relative abundance and breeding habits of the birds recorded for the area during 1942-44. Owing to the small size of the basic survey area, it was found desirable, for bird work, to consider also a larger, secondary, area surrounding the main area, and of half-a-mile radius. The data for this " outer " area (not restricted to the three years 1942-44) is also given here, and forms a useful comparative background for a study of the main area.

The abundance of the various species is defined as follows:—

A = abundant = very common, always to be seen in considerable numbers.
F = frequent = common, generally to be seen in numbers.
O = occasional = definitely not unusual, often to be seen.
R = rare = unusual, of practically no ecological significance.

It should be noted that these terms are not used quite in the ordinary observer's sense, and they refer definitely to the numerical abundance of the species relative to others and in no way to the abundance relative to that of the *same* species in any other or wider area. All are used with the qualifications " resident," " visitor," etc., shown in the check-list* of London birds. The numbers used in the tables are those given in the standard check-lists, including the list already referred to. The scientific names may be obtained by reference to the same numbers in Witherby.†

In a few cases it has been possible to show the parts of the survey area frequented by those birds which do not generally visit all parts. In the case of breeding birds it must be understood that the area shown is that where nests have been found. The subdivisions of the survey area for the present purposes are as follows:—

a. Pear Tree Plain, vegetation unit M.
b. Woodland north of the ponds, units C, D and L (part).
c. Pond region, units E, F, G, H, J, K.
d. Lower woodland, units A, B, L (part), N, P.

Birds are not shown as breeding unless definite evidence has been recorded.

The large number of water birds shown as " No record " for the main area and " R " for the outer area is accounted for by the presence of Connaught Waters, a stretch of water which is suitable for visiting birds to feed and roost, etc.

The total number of species is 64 for the main area (1942-44) and 92 for the outer area.

*R. S. R. Fitter and E. R. Parrinder, " A Check-List of the Birds of the London Area," *London Bird Report*, 1943, p. 20.

†H. F. Witherby, *A Check-List of British Birds*, London, 1941.

TABLE 5. BIRDS.

No.	Species.	Main Area.	Outer Area.
3.	Carrion-Crow	F, breeds, a.	A, breeds.
4.	Rook	Usually only flying over.	F (A, Chingford Plain).
5.	Jackdaw	As 4.	A, probably breeds.
11.	British Jay	F, breeds, a.	A, breeds.
14.	Starling	F (seen only in numbers in Spring and summer), breeds, a.	A, breeds.
18.	Hawfinch	F.	F, breeds.
19.	Greenfinch	O, a and c.	F, probably breeds.
20.	Goldfinch	No record.	F.
24.	Lesser Redpoll	No record.	O.
30.	Linnet	R (once flying over).	O, breeds.
33.	Bullfinch	O, a and c.	F, breeds.
41.	British Chaffinch	F, breeds.	A, breeds.
42.	Brambling	No record.	O.
44.	Yellow Bunting	R, a.	O, breeds.
56.	Reed-Bunting	R, a.	O.
61.	House-Sparrow	No record.	O.
62.	Tree-Sparrow	No record.	O, breeds.
70.	Sky-Lark	No record.	O, breeds.
75.	Tree-Pipit	R, a.	O, breeds.
76.	Meadow-Pipit	R, a.	O.
88.	Yellow Wagtail	No record.	R.
89.	Grey Wagtail	R, c (one record).	R.
90.	Pied Wagtail	R, c (one record).	O.
93.	Tree-Creeper	O, breeds, d.	F, breeds.
96.	Nuthatch	R.	O, breeds.
98.	Great Tit	A, breeds, a, b, c, d.	A, breeds.
100.	Blue Tit	A, breeds, a, b, c, d.	A, breeds.
102.	Coal-Tit	F, breeds, a, b, c, d.	F, breeds.
107.	Marsh-Tit	F, a, b, c, d.	F, breeds.
108.	Willow-Tit	R.	O, breeds.
111.	Long-tailed Tit	O, breeds, a.	F, breeds.
119.	Red-backed Shrike	No record.	O, breeds.
121.	Spotted Flycatcher	No record.	O, breeds.
127.	British Goldcrest	O.	O.
129.	Chiffchaff	O.	F, breeds.
132.	Willow-Warbler	O.	A, breeds.
135.	Wood-Warbler	No record.	R.
161.	Garden Warbler	O.	F, breeds.
162.	Blackcap	O.	F, breeds.
163.	Whitethroat	O.	F, breeds.
164.	Lesser Whitethroat	R.	O, breeds.
173.	Fieldfare	R (one record).	O.
174.	Mistle-Thrush	O.	O, breeds.
175.	British Song-Thrush	O.	F, breeds.
178.	Redwing	O, c.	O.
184.	Blackbird	A, breeds.	A, breeds.
186.	Wheatear	No record.	R.
197.	Whinchat	No record.	R.
201.	Redstart	O, breeds, d.	O, breeds.
203.	Nightingale	R.	F, breeds.
208.	British Robin	F.	A, breeds.
211.	British Hedge-Sparrow	O, a.	F, breeds.
213.	Wren	F.	F, breeds.

No.	Species.	Main Area.	Outer Area.
220.	Swallow	O.	O.
222.	House-Martin	O.	O.
223.	Sand-Martin	No record.	R.
225.	Swift	O.	O.
227.	Nightjar	R (one record).	R.
234.	Kingfisher	No record.	R.
235.	Green Woodpecker	R.	O.
237.	Great Spotted Woodpecker	O.	O, breeds.
238.	Lesser Spotted Woodpecker	R.	O.
240.	Cuckoo	O.	F.
249.	Little Owl	No record.	O, probably breeds.
253.	Tawny Owl	O, d.	O.
263.	Kestrel	O, flying over.	O.
277.	Sparrow-Hawk	O.	O.
289.	Common Heron	R (one record).	O.
300.	Whooper Swan	No record.	R (one record).
302.	Mute Swan	No record.	R, breeds, 1944.
317.	Mallard	O, c.	O, breeds.
319.	Teal	No record.	R.
323.	Wigeon	No record.	R.
328.	Common Pochard	No record.	R.
330.	Tufted Duck	No record.	R (breeds some years).
342.	Goosander	No record.	R.
344.	Smew	No record.	R.
370.	Great Crested Grebe	No record.	R.
380.	Wood-Pigeon	O.	F, breeds.
381.	Stock-Dove	R (usually flying over).	O, breeds.
383.	Turtle-Dove	No record.	O.
393.	Woodcock	R, a, b, c.	R.
421.	Common Sandpiper	No record.	R.
449.	Lapwing	R (flying over).	O.
456.	Stone Curlew	No record.	R (one record).
478.	Black-headed Gull	O (flying over).	O (flying over).
481.	Common Gull	O (flying over).	O (flying over).
482.	Herring Gull	O (flying over).	O (flying over).
485.	British Lesser Black-backed Gull	O (flying over).	O (flying over).
510.	Moorhen	O, breeds, c.	O, breeds.
517.	Pheasant	O.	O.
518.	Common Partridge	No record.	R.

As a kind of summary, the more important and abundant birds are listed below, in approximate order of abundance.

Great Tit, Blue Tit, Blackbird—Abundant.

Robin, Wren, Jay, Carrion-Crow, Coal-Tit, Marsh-Tit, Chaffinch, Hawfinch—Frequent.

Sparrow-Hawk, Tawny-Owl—Although only occasionally seen, they may be of some importance.

From the preliminary censuses it would seem that the average winter population of the main area is about 100 individuals, i.e., about 5 birds per acre. The spring and summer population is, of course, greatly in excess of this.

5.2. Other Vertebrates.

Vertebrate species apart from birds are not numerous. Moreover, most of them are very inconspicuous. A great deal of observation is therefore required to obtain any significant quantity of data. The only species whose status is at all well established are the fallow deer, red and grey squirrel, and rabbit. Deer are regularly seen in the main survey area, and evidence (faeces, etc.) of their presence is common. Sometimes a dozen or more deer are seen together. The squirrels are seen at practically every visit, and several nest in the main area. Ten dreys (used and disused) have been recorded, and it is thought that eight of these are probably the work of the grey, although observation does not suggest that this species greatly outnumbers the red, either in the main survey area or the surrounding forest. Rabbits are seen throughout the area, but are most abundant on the gravel, around the ponds, where there are eleven burrows, seven of which were evidently in use during 1944.

The scientific names given are according to M. A. C. Hinton and others (1935), *List of British Vertebrates*, British Museum (Nat. Hist.).

MAMMALIA.

Insectivora.

Mole, *Talpa europaea* L. Workings are regularly seen all over Pear Tree Plain (M), mole carcase found there, 30.4.44.

Chiroptera.

Bat. Unidentified species, in M, 22.8.43.

Carnivora.

Fox, *Vulpes vulpes crucigera* Bechstein. One seen in May 1940.

Stoat, *Mustela erminea stabilis* Barr.-Ham. One seen at Pond G, June 1941.

Weasel, *Mustela n. nivalis* L. Young one seen, August 1942.

Rodentia.

Rabbit, *Oryctolagus cuniculus* (L.). Frequent, especially around the ponds.

Vole. Unidentified species, in M, 24.5.43.
Ditto. Pond K, 4.10.44.

Grey Squirrel, *Sciurus carolinensis* Gm. Frequent throughout area.

Red Squirrel, *Sciurus vulgaris*. Frequent throughout area.

Ungulata.

Fallow Deer, *Dama dama* (L.). Frequent throughout area.

REPTILIA.

Squamata.

Slow Worm, *Anguis fragilis* L. One dead in M, 30.4.44.

Common Lizard, *Lacerta vivipara* Jacquin. Occasionally seen (three or four at a time) in M.

Grass Snake, *Natrix n. natrix* (L.). Occasionally seen at various places in the area.

AMPHIBIA.

Caudata.

Common Newt, *Triturus v. vulgaris* (L.). Several seen in pond area, 1944, at intervals during spring.

Salientia.

Common Frog, *Rana t. temporaria* L. Surprisingly uncommon. Seen only once or twice in a year.

Common Toad, *Bufo b. bufo* (L.). One record, Pond K, 17.9.44.

PISCES.

Three-Spined Stickleback, *Gasterosteus aculeatus* L. Occasionally found in stream (P).

6. The Invertebrate Population.

(Sub-kingdom *Invertebrata*).

Despite evidence that many phyla of the invertebrata are represented in the population of the survey area, only a small section of one phylum, the Arthropoda, has been studied.

In the class Insecta some work has been possible on the following orders: Orthoptera, Odonata, Hemiptera, Neuroptera, Lepidoptera, Coleoptera, Hymenoptera and Diptera. Detailed information and full lists of species are only available for the Odonata, diurnal Lepidoptera, and those insects causing plant galls.

It must be emphasized that the estimation of frequency of occurrence of sun-loving insects is a difficult matter. Many species have a short season, and unless visits for recording happen to coincide with the season and favourable weather conditions, the number of examples seen will be deceptively small.

6.1. Order Odonata.

The Cuckoo Pits habitat, considering the small area covered, has a large population of Odonata in numbers of both species and individuals. Many species are known to breed, and as they are predaceous insects throughout the active stages of their metamorphosis a marked effect must be exerted on the remaining invertebrate population. Naiads of the larger species devour prey as large as tadpoles and small earth worms, and an adult male *Anax imperator* Leach has been observed taking large flies and the butterfly *Coenonympha pamphilus* L. In turn the naiads are the prey of larger predaceous aquatic animals, but the imagines have few natural enemies.

A list of the fifteen species recorded from the area together with the appropriate data will be found in Table 6. The letters indicating areas are those applied to the original vegetation units, and degree of frequency is indicated as follows:—

TABLE 6. ODONATA.

Generic and Specific Names.	Relative abundance	Area.	Period of flight.	General Data.
Pyrrhosoma nymphula (Sulzer)	A	K	May-Aug.	Breeds at Pond K; frequently flying over vegetation round ponds.
Ischnura elegans (Van der Lind)	F	KG	May-Aug.	Breeds at Pond K; probably bred at G in past years.
Enallogma cyathigerum (Charp.)	F	K	June-Aug.	Breeds at Pond K.
Coenagrion puella (L.)	A	KG	June-Sept.	Breeds at Pond K; formerly bred at G.
Lesles sponsa (Hans)	R	F	June-Aug.	Eliminated as breeding sp. by drying of ponds; may return.
Aeshna grandis (L.)	F		Aug.-Sept.	Strong on the wing. Hawks in suitable open spaces.
Aeshna cyanea (Müll.)	A		Aug.-Sept.	Breeds at K; flies in suitable spots over whole area.
Aeshna mixta (Latr.)	O	Pond area and M	Aug.-Sept.	Migrant species; formerly very rare.
Anax imperator (Leach)	O	K	June-July	Strong on wing; probably only visits area.
Orthetrum caerulatum (L.)	R		May-July	May breed in bomb craters in outer area. New sp. to Forest.
Libellula quadrimaculata (L.)	O	K	May-July	Breeds at K.
Libellula depressa (L.)	A	Whole Pond area	May-Aug.	Breeds at K and at craters in outer area.
Sympetrum s. striolatum (Charp.)	A	Whole Pond area	Aug.-Oct.	Breeds in all permanent ponds.
Sympetrum flaveolum (L.)	VR		Aug.-Sept.	Very rare migrant; recorded prior to 1942.
Sympetrum sanguineum (Müll.)	R		Aug.-Sept.	Status not known.

A = abundant (always seen in numbers).
F = frequent (usually seen in numbers).
O = occasional (a few pairs seen regularly).

R = rare (not seen regularly).
VR = very rare (only recorded once or twice).

Orthetrum coerulescens Fabr. has been once recorded from the outer area and the habitat appears to be suitable for *Cordulia aenea* L. and *Sympetrum danae* Sulzer, which both occur in nearby areas.

6.2. Order Lepidoptera.

The Butterflies are represented by 21 species, many of which breed in the area. Table 7 contains a list of species together with the relevant details. A large number of Moths are known to occur but owing to their nocturnal habits it is difficult to obtain a complete list of species or any figures of relative abundance.

The Lepidoptera exert a great influence on vegetation in the larval stage, and the ravages of such species as *Hibernia defolaria* have been very evident in some seasons. Butterfly larvae are rarely found in large colonies (there are exceptions in the Nymphalidae) and the damage to vegetation is not so obvious. As imagines the insects exert little influence on their habitat, being sun-loving nectar-feeders with few natural enemies at this stage. The larvae of many species constitute a considerable proportion of the diet of some insectivorous birds.

6.3. Plant Galls.

Consideration of the galls on the oak (*Quercus Robur* L.) found in the survey area directs attention to the following facts:—(i) the extent to which the leaves and twigs of the trees are beyond human reach from the ground; (ii) that trees that can be examined at open parts like Pear Tree Plain, those parts near the ponds and on some of the rides have given fairly good results; and (iii) that galls that could be picked up on the rides after stormy nights in autumn gave some indication of what had been happening in the higher parts of some tall trees.

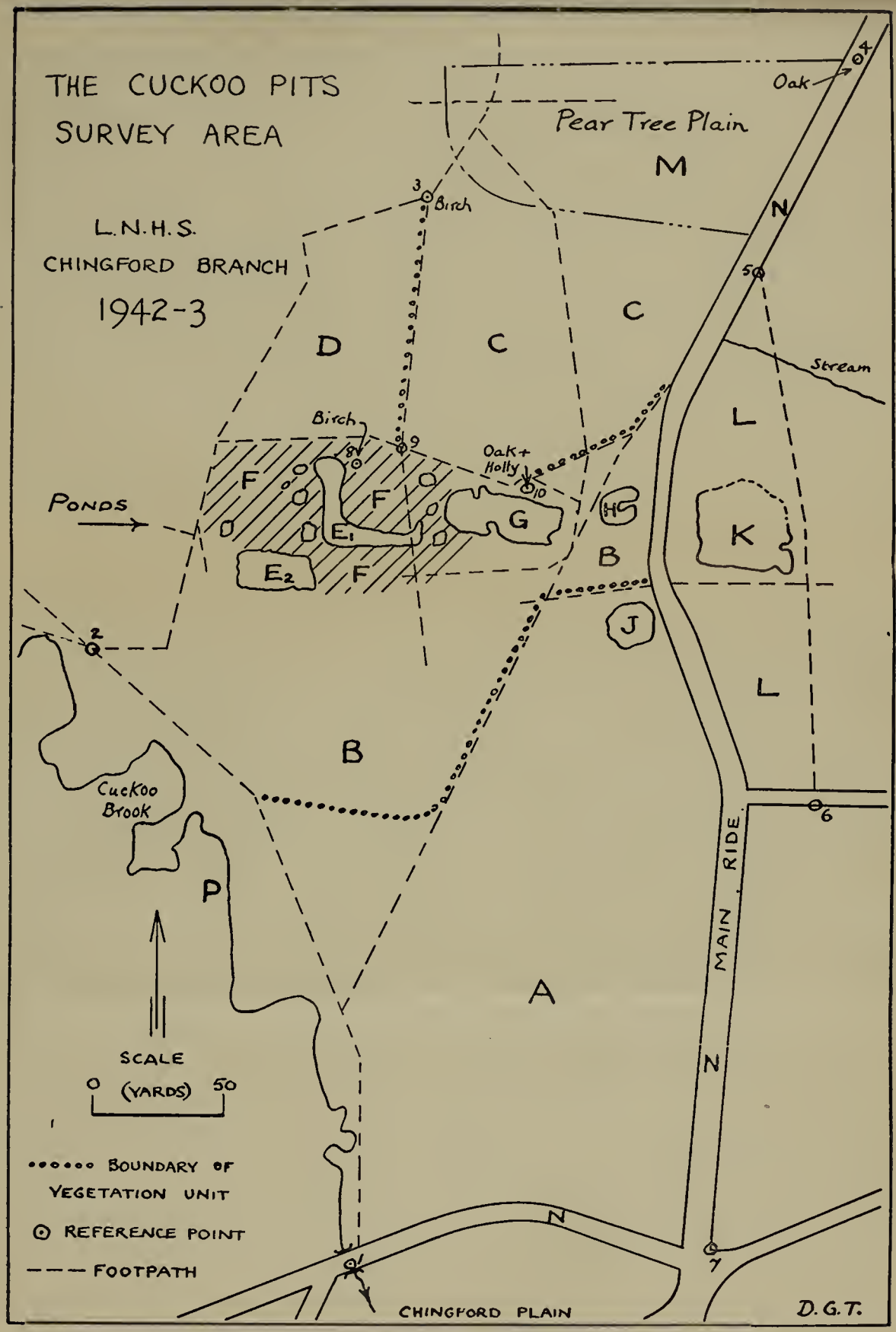
Hymenopterous flies that cause galls on oaks by oviposition are frequently of alternating generations, one generation being sexual and the other agamic; this is the reason for using the term " form " in the appended list. If galls of one generation of a fly are found it is fairly safe to deduce that the galls of the succeeding generation will occur in due course, but in an area like that which has been under survey it does not follow that the galls of the succeeding generation will be easily found.

It is of interest that some galls that were observed in the area (or close to it) in years prior to the commencement of the survey have not been seen there since the survey began. Such are *Andricus foecundatrix* Hartig, form *pilosus* Adler, F; *A. inflator* Hartig, N; *A. solitarius* Fonscolombe, M; and *A. quercus ramuli* L., near M. Galls of *Andricus occultus* Tschek (which, it is highly probable, is the alternate generation of *A. solitarius*) are rarely found in Epping Forest, but two flies identified as this species were captured on an oak tree on Pear Tree Plain on April 30, 1944.

TABLE 7. LEPIDOPTERA (NYMPHALIDAE TO HESPERIIDAE).

Species.	Relative abundance.	Area.	Normal Food Plants.	General Data.
Pararge megera L. ..... The Wall Butterfly	F	Open Spots	Various grasses, e.g. *Dactylis glomerata*, *Poa annua*, etc.	Considerable seasonal variation in numbers.
Maniola jurtina L. ..... The Meadow Brown	F	M	*Poa pratensis*, but other meadow grasses are eaten.	Frequent each year; breeds.
Coenonympha pamphilus L. ... The Small Heath	A	M	*Poa annua*, *Nardus stricta* and possibly other grasses.	Frequent each year; breeds.
Vanessa atalanta L. ..... The Red Admiral	F	Open Spots	*Urtica dioica.*	Migrant; big variations from season to season.
Vanessa cardui L. ..... The Painted Lady	O	M	Most species of thistle, also nettle.	A purely migratory species; a possible Summer brood in some seasons.
Aglais urticae L. ..... The Small Tortoiseshell	A	All Open Spots	*Urtica dioica.*	Larvae often found in large numbers.
Nymphalis io L. ..... The Peacock	F	M	*Urtica dioica.*	Breeds in outer area and possibly at area M.
Polygonia c-album L. ..... The Comma	O	M and Marsh	*Urtica dioica.*	Breeds in outer area; increasing in numbers.
Limenitis camilla L. ..... The White Admiral	O	Paths and Rides	*Lonicera Periclymenum.*	Breeds; status in some years F.
Polyommatus icarus Rott. ..... The Common Blue	O	M	*Trifolium* spp. *Ornithopus perpusillus.*	
Celastrina argiolus L. ..... The Holly Blue	O	—	*Hedera helix*, *Ilex aquifolium.*	Probably breeds in Holly belt.
Lycaena phlaeas L. ..... The Small Copper	F	M	*Rumex* spp., also *Senecio jacobaea.*	Probably breeds at M.
Pieris brassicae L. ..... The Large White	O	M and Marsh	*Brassica* spp.	Migrant; breeds in gardens but may feed on wild plants.
Pieris rapae L. ..... The Small White	F	M and Marsh	*Brassica* spp.	Migrant; more constant in status than *P. brassicae.*

Species.	Relative abundance.	Area.	Normal Food Plants.	General Data.
Pieris napi L. ..... The Green Veined White	F	Well Dist.	*Barbarea vulgaris, Cardamine pratensis*, etc.	Fairly constant in status; breeds.
Colias croceus Fourc. ..... The Clouded Yellow	R	M	*Trifolium* spp., etc.	Rare migrant.
Gonepteryx rhamni L. ..... The Brimstone	F	Well Dist.	*Rhamnus* spp.	Breeds in outer area.
Erynnis tages L. ..... The Dingy Skipper	O	M	*Lotus corniculatus.*	
Pyrgus malvae L. ..... The Grizzled Skipper	F	M and Marsh	*Potentilla* spp., *Rubus* spp.	Breeds, area M.
Thymelicus sylvestris Poda ... The Small Skipper	O	M and Rides	*Holcus lanatus, Brachypodium sylvaticum.*	Breeds, areas M and N.
Ochlodes venata Bremer ..... The Large Skipper	F	Well Dist.	*Dactylis glomerata, Brachypodium sylvaticum, Holcus lanatus.*	Breeds.


THE CUCKOO PITS
SURVEY AREA
L.N.H.S.
CHINGFORD BRANCH
1942-3
Pear Tree Plain
Oak
Birch
Stream
Birch
Oak + Holly
PONDS
Cuckoo Brook
MAIN RIDE
CHINGFORD PLAIN
SCALE
0 (YARDS) 50
Boundary of vegetation unit
Reference point
Footpath
D.G.T.

HYMENOPTERA.

Galls on Oak, *Quercus Robur* L.

(a) Galls from which the gall flies were bred.
Neuroterus tricolor Hartig and form *fumipennis* Hartig.
N. quercus baccarum L. and f. *lenticularis* Giraud.
N. aprilinus Giraud.
Diplolepis quercus folii L. and f. *taschenbergi* Schlechtendal.
Trigonaspis megaptera Panzer.
Biorhiza pallida Olivier.
Andricus ostrea Hartig and f. *furunculus* Beyerinck.
A. curvator Hartig and f. *collaris* Hartig.
(b) Galls from which the gall flies were not bred.
Neuroterus albipes Schenck f. *laeviusculus* Schenck.
N. numismalis Fourcroy.
Diplolepis longiventris Hartig.
D. divisa Hartig.
Adleria (*Cynips*) *Kollari* Hartig.
Andricus quercus corticis L.
A. inflator Hartig f. *globuli* Hartig.

Inquilines.

Synergus incrassatus Hartig bred from gall of *Andricus quercus corticis.*
S. gallae pomiformis Fonscolombe from galls of *Biorhiza pallida* and *Trigonaspis megaptera.*
S. albipes Hartig from gall of *Diplolepis divisa.*

Galls on Rosaceae.

Galls from which the gall flies were bred.
Rhodites eglanteriae Hartig on *Rosa canina* L.
Rhodites nervosus Curtis on *Rosa canina* L. and *R. arvensis* Huds.

Inquiline.

Periclistus caninae from galls of *Rhodites* sp

Gall on Salicaceae.

Gall of *Pontania bridgmani* Cameron on *Salix caprea* L.

DIPTERA.

Gall of *Lasioptera rubi* Heeger on *Rubus* sp. Dipteron bred but not identified.
Gall of *Rhopalomya ptarmicae* Vallot on *Achillea Ptarmica* L. Fly not bred.
Gall of *Perrisia filicina* Kieffer on *Pteris aquilina* L. Fly not bred.
Gall of *Anthomyia signata* Brischke on *Dryopteris* (*Lastrea*) *Filix-mas* Schott. Fly not bred.

ACARI.

Gall of *Eriophyes gibbosus* Nalepa on *Rubus* sp.
Gall of *Eriophyes macrorrhynchus* Nalepa on *Acer campestre* L.
Gall of *Eriophyes similis* Nalepa on *Prunus spinosa* L.

A Bibliography of British Botany.

WITH a view to eventual publication, it is proposed to compile a Bibliography of British Botany. One section of this, on Local Botany, would comprise all publications which it is possible to trace dealing wholly or partly with the flora of any area within the British Isles. This section would include local floras and works on topographical botany, and all publications, such as local and county histories, guide books, periodicals, and newspapers, in which plant lists of particular areas have appeared; manuscripts of sufficient importance and authenticity would also be listed. Where only incidental mention is made of plant localities, as in many of the standard floras of Britain and in monographs, these would be omitted.

The compilation of this section will entail an immense amount of research and will only be possible with the willing co-operation of helpers who have the requisite local knowledge of the literature of their areas.

We should be grateful if those willing to help would communicate with Mr N. Douglas Simpson, Maesbury, 3 Cavendish Road, Bournemouth, Hants, indicating (1) when they can begin work, and (2) in what areas they are interested and to what libraries and periodicals they have access.

J. S. L. Gilmour. N. Douglas Simpson.
H. A. Hyde. G. Taylor.
H. S. Marshall.

Nature Reserves.

THE Nature Reserves Investigation Sub-Committee of the Society is, unfortunately, able to report little progress in the preparation of a full report which it was hoped to have completed during the year. Work of the Committee was brought to a standstill by the intensification of enemy air activity in the London area, and meetings were not resumed until towards the end of the year.

The outstanding event was the preparation in December, at the request of Prof. Abercrombie, of a preliminary list of nature reserves in the London area, for the official use of the Greater London Plan. The Committee's recommendations are being studied in relation to this Plan, the provisional edition of which was kindly presented to the Society by the Ministry of Town and Country Planning. Members of the Committee also took advantage of the Ministry's invitation to visit and study the private exhibition of maps arranged to illustrate the Greater London Plan.

The Sub-Committee continues to consist of Messrs L. J. Tremayne (Chairman), C. P. Castell (Secretary), and Messrs S. Austin, C. S. Bayes and R. S. R. Fitter. C. P. C.

Obituary.

Robert W. Pethen, 1877-1944.

THE Society has lost a loyal and valuable member by the death of R. W. Pethen, who will long be remembered, if only for his devoted work in our library for 14 years. This service he rendered the Society was one side only of his activities; he was an excellent field-naturalist, painstaking and accurate in observation and a successful keeper of a vivarium.

Of a modest and retiring nature, we first knew him on joining the Society in 1922 as showing a sound knowledge of our native birds, only to learn a little later that he had for 30 years made a close and critical study of the Glow-worm (*Lampyris noctiluca* L.). The Ornithological Section claimed him as an active observer from the beginning, and he gave us papers on London bird life in 1923 and 1930, all compact of close and meticulous observation. Later he wrote for the Society's journal on his pet subject, " The Glow-worm " (1933), a paper containing much original matter.

Pethen was never robust in health, and his business career was exacting, despite which no opportunity was missed of indulging his passion for nature study, which undoubtedly helped in overcoming many adverse conditions, both domestic and official. A serious operation in 1933 terminated his business career but left him in a state of invalidity and he retired, with his family, to Purey End, Towcester, only to enjoy an all too short respite, passing away in June 1944.

Those who knew something of his life history and enjoyed his friendship cannot fail to have been deeply impressed and encouraged by his fine example of high integrity and fortitude.

S. A.

BIBLIOGRAPHY.

1. Glow-worms and Lightning (*Knowledge*, Jan. 1913).
2. The Birds of Walthamstow Reservoirs (*London Naturalist*, 1924).
3. Birds of Walthamstow Reservoirs (*London Naturalist*, 1929); notes bringing the 1924 paper up to date.
4. Some Observations on the Glow-worm (*Lampyris noctiluca* L.) (*London Naturalist*, 1933).

PAPERS READ TO THE SOCIETY.

1. Bird Life in North-East London; read to Ornithological Section, April 10, 1923; the MS, now in the Society's Library, formed the basis of the *L.N.* paper, No. 2 above.
2. Luminosity in Nature; read to Chingford Branch, 1926.
3. Glimpses of Bird Life; read to Ornithological Section, Sept. 18, 1928.
4. A Londoner's Memories of Bird Life; read to the Society, June 17, 1930.

Flying Officer Peter Thompson, 1920-1943.

Peter Thompson was born on 24th September 1920 and spent the early years of his life in Gloucestershire. As a boy he was interested in natural history, an interest which he shared with his brother. Together they soon began to note the bird life of the country around their home and were especially attracted to the Severn when the geese arrived. Coming to London in 1937, he transferred his interest to the avifauna and botany of the Society's area and joined the Society in 1939. He was a regular attendant at the meetings of the Ornithological Section and a contributor to the records. His brother moved to Slough and, apart from periodic meetings for field work, they kept up a correspondence on natural history matters. In July 1941 he joined the R.A.F. and went to Canada for his training, where he was commissioned as a bomber pilot. His brother obtained his commission as a navigator after training in South Africa, and the bird notes in the correspondence from their training grounds took on a new interest. Early in 1943 his brother became a prisoner of war after baling out over Lorient and on 22nd September 1943 Peter Thompson failed to return from an operational flight over Hanover. It was subsequently learnt that although several members of his crew baled out, he crashed with the plane. He was an ideal companion in the field and will be greatly missed by his friends in the Society.

C. W.

We also regret to record the deaths of two distinguished members, Mr E. C. Stuart Baker and Dr W. A. Brend.

Mr Stuart Baker, who died at his home in Upper Norwood on 16th April 1944, aged 79, was best known as an authority on the birds of India and their nidification, and made an especial study of the cuckoos. He joined the Society in 1924, and read us papers on " Cuckoos' Eggs and Evolution " on 19th February and 4th November 1924; on " The Animals and People among whom we carry on our Natural History Work in the Jungle of India " on 5th November 1929; on " Finland and its Birds " on 3rd March 1931; on " Egg Collecting " on 5th January 1932; and " The Evolution of the Cuckoo's Egg " on 19th May 1936.

Dr Brend, who joined the Society in 1930, was a man of wide interests, and besides being a B.Sc., a M.D., a barrister and sometime Vice-President of the Medico-Legal Society, was a keen and knowledgeable bird-watcher.

Official Reports for 1944.

Council's Report.

AN access of 74 members and a diminution of 39 brings our net total up to 570, an increase of 35 over the 1943 figure. This is very satisfactory considering the times through which we are passing, and it is worthy of note that Ecology is attracting a high percentage of the newcomers, which bodes well for the scientific value of the Society's work. The Surveys at Bookham and at Chingford are being sturdily and efficiently maintained.

Owing to war conditions and the absence from London of so many of our more active members, attendances at the indoor meetings at Keppel Street fell off to such a degree that it was decided to cancel these fixtures in the syllabus for the second half of the year and transfer them forward to 1945, when it is hoped that circumstances will permit better support for our lecturers.

The London Naturalist and its Supplement, issued in September, contained obituaries, alas, of four of our prominent members. Reference to the Treasurer's Statement shows as satisfactory a condition in finance as can well be expected in present conditions. The Chingford Branch shows an increase in both membership and activities, and is becoming more and more vigorous.

It remains now to point out that the scientific value of the Society can only be maintained by a sufficiency of observers; it therefore behoves each member to introduce as many recruits as possible.

A. B. HORNBLOWER, *Hon. General Secretary.*

Librarian's Report.

DURING the first five months of the year the Library was well used by members who attended meetings and by an increasing number of members serving in H.M. Forces. These latter seem to have found or been granted extra facilities for study a few months prior to D-day, and it is satisfactory to note that most of the books they borrowed found their way back to the crowded library shelves before these members proceeded overseas.

During the last five months of the year ordinary meetings of the Society were not held, but the Library and collections were opened on the first Tuesday evening of each month, although the number of members who made use of these facilities was disappointingly small. Nothing was spent on books or cupboards during the year, but Mr Castell found ways and means of increasing the contents and the usefulness of the Library. Thanks are due to him and to the following members who made gifts of books and periodicals:—Mrs Rait Kerr, Mr Austin, Mr Duffin, Mr Hale, Mr Holte Macpherson, Mr Glegg, and Mr Simes.

Recent gifts to the Library include Gätke's *Heligoland*, Pycraft's *A History of Birds*, *The International Wild Fowl Enquiry*, *A Life of Charles Darwin*, *Floras of Epsom*, *Reigate*, *and Wimbledon* and three books written by members of the Society, Oliver's Pike's *Nature and the Camera*, C. S. Bayne's *The Call of the Birds*, and J. E. Roberts's *A Year with Nature*.

The total number of volumes issued during the year was 156.

Space is as tight as ever in the Library, and any member who is in a position to present the Society with a book-case will be conferring a real benefit on other members.

T. L. Bartlett, *Librarian*.

Curator's Report.

IN mid-October I wrote letters to the four gentlemen and one lady responsible for the various sectional collections asking for the usual annual notes.

Botanical Section. I have received from Rev. P. H. Cooke, Botanical Curator, a list of seven plants, sheets of which have been prepared by Mr Lousley and added to the Herbarium. Two sheets have also been prepared from specimens presented by Mr Ross, and a number of Mr Cooke's own sheets have been added. A few plants from outside the district have been sent to Mr Cooke by Mr Lousley and by myself.

Entomological Section. In the course of a letter Mr Pinniger states: "I arranged the Sphingidae before the bombing started and commenced work on the Notodontidae—despite the buzz bombs I collected a few more Odonata which I hope to place in the cabinets when time and the war permit." He also states that the Collection is in satisfactory condition and that naphthalene has been replaced where necessary.

Ornithological Section. Mrs Parrinder states that additions to the Wing Collection have been made during the year and that Mrs Parkin has presented a number of photographic plates of birds' nests and eggs.

Plant Galls Section. Mr Burkill reports the acquisition of a number of specimens pressed but not yet mounted.

With regard to the experimental opening of the Collections on monthly Tuesdays, and in so far as this comes within the scope of this Report, I have to state that in the early months a fair appreciation was shown of the innovation, which was not however maintained through the summer. At the time this report is made attendance is again on the up-grade.

I am grateful to the sectional curators who have forwarded me the material for the foregoing notes and for their continued interest. Perhaps not very much has been accomplished, and certainly this is not an imposing report, but I feel in all the conditions of this fifth year of total war, conditions which need not be elaborated here, that little more could be expected from your servant, or from his fellow office-holders in this group, and I beg to submit this as my Report for 1944.

L. G. Payne, *Curator*.

Report of the Director of Sectional Organisation.

THE following is a summary of the activities of those Sections still operating despite increasing difficulties, including the enforced abandonment of some indoor meetings at Keppel Street.

Botanists. The only indoor meeting was an address by Mr J. E. Lousley on " British Docks and Sorrels." Seven field meetings were held and well attended, particularly those to the Chelsea Physic Garden and a joint Fungus Foray with the British Mycological Society at Bookham Common.

Entomologists. This Section held six field meetings during the year and specimens in a wide range of orders were collected. At Headquarters a well-attended and interesting lecture was given by Mr E. B. Pinniger on the Order Neuroptera.

Ecologists. Survey work at Bookham Common continues enthusiastically, the monthly meetings affording opportunity for co-operative work, and this scheme is one of the Society's most successful ventures. During the Spring and Summer a large portion of the Common was taken over by the military and the convenient tea room also closed, but thanks to our member Dr Easton, of Bookham, temporary accommodation has been arranged. Much varied and valuable work has been carried through and a " Progress Report " on a year's work and a " Preliminary Report of the Birds " were published in the *London Naturalist* for 1943. Survey work at Limpsfield Common has not yet been resumed but a Bibliography of papers already printed in the *London Naturalist* appeared in the 1943 volume. The Section has added the *Journal of Ecology* to its Reading Circle, which already provides the *Journal of Animal Ecology* for its members.

Ornithologists. Under prevailing conditions the year's activities can be considered satisfactory. Twenty-seven field meetings were arranged and carried out; the Bird Ringing Scheme was well supported, 437 rings being used; and before the suspension of indoor meetings two lectures were provided for the Syllabus. The *London Bird Report* was compiled and published for the eighth year, and with a registered membership of 381 the Section still remains our most popular one.

Ramblers. Four outings were carried through and a lecture on " The Islands of Scotland " by Dr D. G. Tucker provided, but travelling and catering conditions are against much outdoor activity of this Section at present.

Plant Galls. No formal indoor meetings were arranged, but much individual work was carried on by members, including investigations into life-histories, and a large number of insects were bred, specimens being sent to the National Collections at South Kensington.

Reading Circles. It is satisfactory to report that this valuable and successful scheme is well maintained among our members; every encouragement should be given to its expansion by Sectional officials. In this connection the long and loyal services of Mrs B. L. Clanchy should be placed on record. Mrs Clanchy, after acting as Reading Circles Secretary to the Ornithological Section for 13 years, is unfortunately relinquishing her duties on health grounds. We offer her our warm appreciation and grateful thanks.

S. Austin, *Director of Sectional Organisation.*

Chingford Branch Report, 1944.

THE Chingford Branch has shown continued activity during 1944, with very little slackening of interest in spite of the air raids. The Cuckoo Pits Ecological Survey has progressed very considerably, and a fairly comprehensive scientific report has been prepared for publication. It is hoped to extend the survey to a new area next year.

The average attendance at the eight indoor meetings was 29, and at the twelve field meetings it was 15. Ten new Branch Associates have been elected, and 2 new Full Members have been recruited through the Branch.

The papers read to the Branch have been of the usual high standard, and at the September meeting the experiment was tried of staging a small exhibition of photographs and specimens; this proved quite successful, but involved a large amount of work—fortunately, teamwork.

The undersigned Branch Secretary is unfortunately unable to continue his work for the Branch owing to other commitments, and has pleasure (tinged with regret) in handing his duties over to Mr E. A. Round, who, he is confident, will lead the Branch enthusiastically and well in the relatively peaceful days to come.

D. G. Tucker, *Branch Secretary.*

Papers Read to the Society in 1944.

Hints on Forming a Bird Library—C. W. G. Paulson, M.B.O.U., February 19.

Docks and Sorrels—J. E. Lousley, March 18.

An Introduction to the Neuroptera—E. B. Pinniger, April 15.

Flight of Birds—T. L. Bartlett, B.A., M.B.O.U., May 16.

The Islands of Scotland—D. G. Tucker, Ph.D., June 20.

Ornithological Notes for 1944—Members of the Ornithological Section, July 18.

Meetings from September onwards were suspended owing to the attacks of V.1's and V.2's.

STATEMENT OF ACCOUNTS 1944: GENERAL ACCOUNT.

Balance, 1st November 1943	£73	19	11	Rent	£15	15	0
Interest on Post Office Account	5	4	9	Syllabus Expenses (Printing and Postages)	44	3	7
Interest on £75 War Stock	2	12	6	General Printing and Stationery	11	2	4
Subscriptions and Entrance Fees	210	1	6	Postage (Secretary, Treasurer and Librarian)	12	4	10
				Insurance	2	16	10
				War Damage Insurance	2	10	0
				Gratuities	2	0	0
				Subscriptions	3	4	0
				Sectional Expenses	8	10	0
				Entomological Reading Circle Grant	1	2	6
				Secretary's Honorarium	45	0	0
				Chingford Branch Expenses	7	7	2
				Chingford Survey Expenses	4	1	7
				Books Purchased	4	0	0
				Notices re Suspense of Meetings	2	19	6
				Sundries	0	5	0
				Transfer to *London Naturalist* Account	75	16	9
					£242	19	1
				Balance	48	19	7
	£291	18	8		£291	18	8

LONDON NATURALIST ACCOUNT.

Donations	£0	17	6	Printing and Postage of *London Naturalist*	£92	7	3
Advertisements	2	1	0				
Sales of *London Naturalist* and *London Bird Report*	9	11	4				
Reprints, Maps, and Stationery	2	19	8				
Use of Block	1	1	0				
Transfer from General Account	75	16	9				
	£92	7	3		£92	7	3

BOTANICAL RECORDS ACCOUNT.

Balance, 1st November 1943	£30	0	0	Balance, on deposit in Post Office Savings Bank	£30	0	0

The balance of Life Composition Account is increased by £40 to £205, and the balance of Reserve Account remains at £175. The balances are invested in 3½% War Stock or on deposit in the Post Office Savings Bank.

Audited and found correct, 24/11/44.

S. AUSTIN and J. H. G. PETERKEN, *Auditors.*

F. G. DELL, *Treasurer.*

Book Reviews.

Henry Yevele. c. 1320-1400. The Life of an English Architect. By John H. Harvey. Batsford. 15s.

Mr Harvey thinks that there are few laymen who could name even three or four English architects before Inigo Jones. The medieval master mason and architect Henry Yevele must be quite unknown to most people, although much of his work is familiar to dwellers in Southern England—the magnificent nave of Canterbury Cathedral, much of Westminster Hall and the nave and west cloister of Westminster Abbey are among the many beautiful structures for which he was certainly responsible.

Henry Yevele was the foremost architect of his day; it was largely due to his genius and influence that, during the eighty years of his life, a truly national style of architecture, the Perpendicular style, was perfected. He was a contemporary of Chaucer, and Mr Harvey suggests that Yevele's influence on architecture was as great as that of Chaucer on literature and language.

Mr Harvey's book is a full-length biography of this great man. It is a scholarly work and it has obviously required much skill and patience to excavate the facts of Yevele's life from official documents. Apart from the buildings which are known to have been executed to his "devyse," Mr Harvey demonstrates that, by analysis and comparison, many civil, military and ecclesiastical buildings of the time can be ascribed to Yevele or show his influence.

But the book is not one for architects and archaeologists alone: it should appeal to all who care for beautiful buildings and who see the need for men of as great a genius as Yevele to restore the ravages of war, when the era of prefabrication and temporary building comes to an end. Mr Harvey, who is a member of our Society, is to be congratulated on his timeliness in reminding us that a study of the fourteenth century may be of value in solving the problems, especially the architectural problems, of the twentieth century.

E. R. P.

Weatherwise, by John H. Willis. London, George Allen and Unwin Ltd.; pp. 110, 132 figs., 8vo. 7s 6d.

Weatherwise is, to use the author's words, "a descriptive running commentary of our weather through the past 30 years." It consists, in fact, of a weather diary for Norwich over the period 1913-42. In addition to the diary, there is an appendix devoted to monthly temperature, rain and sun figures.

The 132 excellent photographs of the same individual snowdrops and daffodil clumps, and horse-chestnut and beech branches taken on identical dates over some thirty years are certainly a unique, and to the naturalist, the most interesting feature. Unfortunately, the author does not attempt to discuss, or even refer to, these photographs except for five lines in the preface.

The naturalist would, without doubt, welcome the publication, separately, of the present series of photographs of plants with the addition of a further selection from the many other photographs referred to in the text. Any such collection of photographs should be accompanied by a simple introduction to phenology and a running commentary on the weather conditions with special reference to the development of flowering plants. C. P. C.

Reading Circles.

THE following reading circles are run by various Sections, and members wishing to join or obtain further particulars should communicate with the reading circles secretaries, whose addresses are given below. The annual subscription is indicated in brackets.

British Birds (2/6). W. A. Wright, 31 Beresford Road, E.4.

Entomologist ... ... } *Entomologist's Monthly Magazine* } (4/-) *Entomologist's Record* ... ... } H. J. Burkill, 3 Newman's Court, Cornhill, E.C.3.

Journal of Animal Ecology (2/-) ... } *Journal of Ecology* (2/-) ... ... } C. P. Castell, 52 Graham Road, S.W.19.

Journal of the Commons, Open Spaces and Footpaths Preservation Society (free). Miss L. J. Johns, 87 Morley Hill, Enfield, Middx.

North-Western Naturalist (2/-). H. J. Burkill.

Report of the Botanical Society and Botanical Exchange Club (1/-). G. R. A. Short, 36 Parkside Drive, Edgware, Middx.

Sectional Chairmen and Secretaries, 1944.

Archaeology: Chairman, W. C. Cocksedge; Secretary, Mrs Cocksedge, 6 Aldersmead Road, Beckenham, Kent.

Botany: Chairman, L. G. Payne, F.Z.S.; Secretary, G. R. A. Short, 36 Parkside Drive, Edgware, Middx.

Ecology: Chairman, L. G. Payne, F.Z.S.; Secretary, C. P. Castell, B.Sc., 52 Graham Road, S.W.19.

Entomology: Chairman, Miss C. E. Longfield, F.R.G.S., F.R.E.S., F.Z.S., M.B.O.U.; Secretary, R. M. Payne, 22 Marksbury Avenue, Richmond, Surrey.

Geology: Chairman, Lt. J. F. Hayward, Ph.D., M.Sc., F.G.S.; Secretary, C. P. Castell, B.Sc., 52 Graham Road, S.W.19.

Ornithology: R. W. Hale, R. S. R. Fitter, F.Z.S., M.B.O.U.; Secretary, R. S. R. Fitter, R. W. Hale, 6 Grendon Gardens, Wembley Park, Middx.

Plant Galls: Chairman, J. Ross; Secretary, H. J. Burkill, M.A., F.R.G.S., 3 Newman's Court, Cornhill, E.C.3.

Ramblers: Chairman, L. J. Tremayne, F.Z.S.; Secretary, Miss L. J. Johns, 87 Morley Hill, Enfield, Middx.

List of Members.

(Corrected up to 11th June 1945.)

It is particularly requested that Members will inform the Secretary as soon as possible of any change of address.

For list of abbreviations, see end.

Honorary President:

PROF. SIR FREDERICK GOWLAND HOPKINS, O.M., M.A., M.D., F.R.C.P., F.R.S.

Honorary Vice-Presidents:

SIR LAWRENCE CHUBB. E. A. COCKAYNE, M.A., D.M., F.R.C.P., F.R.E.S. PROF. M. GREENWOOD, D.Sc , F.R.S., F.R.C.P. A. HOLTE MACPHERSON, B.C.L., M.A., F.Z.S. J. ROSS.

Honorary Members:

1916 Brown, A., F.Z.S., 64 Sancroft Road, Eastbourne, Sussex. (Arch., Geol., Orn., R.)
1933 Bryce, E. J., Nelson Road, Killara, Sydney, N.S.W. (Zoo.)
1927 Le Souef, A. S., C.M.Z.S., R.A.O.U., Taronga Zoological Park, Sydney, N.S.W.

Members:

1943 Abery, Miss W., Education Department, Box 263, Kampala, Uganda. (Bot., Ecol., Geol.)
1928 Alexander, O. A., c/o Tower House, Guilsborough, Northants. (Ent.)
1944 Allden, Miss B. J., 110 The Ridgeway, Enfield, Middx. (Orn., R.)
1939 *Allen, Miss D. (address not known).
1932 Angell, Miss K. W., Stockwell College, Watcombe Park, St Marychurch, Torquay, S. Devon (Bot., Ecol., Ent., Orn., Pl. G., R.)
1932 Arbon, Mrs J. A., Brookside, Eversley Park Road, N.21. (Arch.)
1942 Archer, H. A., 76 Endlebury Road, E.4. (Orn.)
1939 Ashby, C. B., 20 Denmark Road, Carshalton, Surrey. (Orn.)
1892 Austin, S., F.Z.S., 43 Darenth Road, N. 16. (Arch., Bot., Ecol., Orn., R.)
1931 Back, Dr Marjorie, 10 Great George Street, S.W.1. (Bot., Orn.)
1929 *Bagnall, R. S., D.Sc., F.R.S.E. (address not known). (Bot., Ent., Pl. G.)
1944 Bailey, A. J. M., 3 East Road, Maidenhead, Berks. (Bot.)
1927 Baily, Miss A. R., F.Z.S., Cressex Lodge, Binfield, Berks. (Arch., Bot., Ent., Orn., Pl. G., R.)
1941 Ballingal, N. C., 120 Cranmer Court, S.W.3. (Orn.)
1944 Balter, R. S. D., F.R.E.S., 18 Ferncroft Avenue, N.W.3. (Ent., Micr.)
1934 Banks, H., 66 Sussex Avenue, Isleworth, Middx. (Bot., Ecol., Orn.)
1926 Barnes, Mrs E. C., M.B.O.U., Hungerdown, Seagry, Wilts. (Bot., Ecol., Orn.)
1941 *Barrington, F. J. F., 48 Wimpole Street, W.1. (Orn.)
1941 Bartlett, T. L., B.A., M.B.O.U., 91 Woodend Avenue, S. Harrow, Mx. (Ecol., Orn.)
1903 *Battley, Mrs, 1 Sydney Road, Guildford, Surrey.
1932 Bayliss, C. V., 38 Colwyn Avenue, Blackpool. (Arch.)
1915 Bayne, C. S., Savage Club, 1 Carlton House Terrace, S.W.1. (Ecol., Orn.)
1943 Beamish, A. J., Epping House, near Hertford. (Orn.)
1936 Beckwith, Major W. M., D.S.O., 59 Albert Hall Mansions, S.W.7. (Orn.)
1944 Beddington, A., Lily Farm, Princes Risborough, Bucks. (Ent., Mam., Orn.)
1943 Beesley, J. S. S., 63 Warren Avenue, Bromley, Kent. (Bot., Ecol., Orn.)
1929 *Benson, R. B., M.A., F.R.E.S., British Museum (Natural History), S.W.7. (Bot., Ecol., Ent., esp. Sawflies, Orn., Pl. G., R.)
1932 Bentham, C. H., Eothen, Epsom Lane, Tadworth, Surrey. (Orn.)
1937 Best, Miss M. G., M.R.C.S., L.R.C.P., 115 Widmore Road, Bromley. (Orn.)
1940 Beven, G., Cromer Hyde, Central Road, Morden, Surrey. (Orn.)

1941 Bispham, T., B.Sc., A.I.C., 2 Chestnut Avenue, Wembley, Middlesex. (Orn.)
1937 Blackett, Miss F. R. F., 13 Cranley Place, S.W.7. (Orn.)
1930 Blair, K. G., D.Sc., F.R.E.S., 11 Durrington Park Road, S.W.20. (Ent.)
1939 Blake, E. A., 16 Lindsay Road, Worcester Park, Surrey. (Orn.)
1937 Blake, F. W., 16 Lindsay Road, Worcester Park, Surrey. (Orn.)
1937 Bond, Mrs M. T., 8 Messaline Avenue, W.3. (Orn.)
1941 Bourne, K. W., 47 West Way, N.W.10. (Ecol.)
1945 Braby, C., 5 Arundel Street, W.C.2. (Orn.)
1904 Bradley, S. W., 4 Lucton's Avenue, Buckhurst Hill, Essex. (Bot., Ent., Orn.)
1932 Braithwaite, Miss D. M., 18 Warren Road, E.4. (Orn.)
1910 Braithwaite, Miss N. A., 18 Warren Road, E.4.
1937 Brightwell, L. R., F.Z.S., White Cottage, Chalk Lane, East Horsley, Surrey. (Marine Life.)
1933 Bromley, Miss B., 12a Eton Road, N.W.3. (Orn., R.)
1942 Bromley, F. C., 93 Wolmer Gardens, Edgware, Middx. (Orn.)
1937 Brown, Miss B. E., Gresham Cottage, Granville Road, Limpsfield, Surrey. (Ecol., Orn.)
1926 Browne, Miss C. H., 11 St Mary's Walk, Harrogate, Yorks. (Arch., Bot., Orn., R.)
1940 Browne, Miss E. Gore, 3 Claremont House, Lithos Road, N.W.3. (Orn.)
1938 Buck, F. D., c/o 49 Elthorne Road, N.19. (Col., Ecol.)
1944 Bunt, E. F., 34 Buckleigh Road, S.W.16. (Arch., Bot., Geol.)
1930 *Burgham, Miss J. E., 2 Nevern Place, S.W.5. (Geol., Orn., R.)
1915 Burkill, H. J., M.A., F.R.G.S., 3 Newman's Court, Cornhill, E.C.3. (Bot., Ecol., Geol., Lep., Orn., Pl. G., R.)
1943 Burt, Miss E. H., 40 Bellfield Avenue, Harrow Weald, Middx.
1935 Butterworth, Miss M. H., The Caravan, Ash Walk, Warminster, Wilts. (Bot., Ecol., Orn.)
1928 *Campbell, J. M. H., M.D., 47 Arkwright Road, N.W.3. (Orn.)
1936 Carrington, L. I., The Grey Cottage, Chipstead, Surrey. (Ecol., Ent., Orn., R.)
1933 Carter, J. S., Ph.D., M.Sc., F.I.C., 26 St John's Road, N.W.11. (Orn.)
1932 Castell, C. P., B.Sc., 52 Graham Road, S.W.19. (Bot., Conch., Ecol., Geol., Orn.)
1936 Cawkell, Capt. E. M., 6 Canute Road, Hastings, Sussex. (Orn.)
1930 Chandler, S. E., D.Sc., F.L.S., 74 King's Road, Caversham, Berks. (Bot., Ecol.)
1945 Christopher, Mrs C. O. E., 401 Howard House, Dolphin Square, S.W.1. (Orn., Bot.)
1931 Chubb, Sir Lawrence, 71 Eccleston Square, S.W.1. (R.)
1929 Coates, Miss N. H., Woodhouse, Beaumont Road, S.W.19. (Bot., Orn.)
1904 Cockayne, E. A., M.A., D.M., F.R.C.P., F.R.E.S., 16 Westbourne Street, W.2. (Biol., Lep.)
1925 Cocksedge, W. C., River Plate House, Finsbury Circus, E.C.2. (Arch., Bot., Ecol., Geol., Orn.)
1929 Cocksedge, Mrs, c/o River Plate House, Finsbury Circus, E.C.2. (Arch., Bot., Ecol., Geol.)
1907 Collenette, C. L., F.R.G.S., F.R.E.S., 15 Warren Avenue, Richmond, Surrey. (Api., Bot., Ecol., Ent., Orn.)
1932 Collenette, Mrs, 15 Warren Avenue, Richmond, Surrey. (Orn.)
1936 Collett, R. L., 165/20 Abbey Road, N.W.8. (Orn.)
1914 Connoll, Miss E., 40 Ritherdon Road, S.W.17.
1904 Cooke, Rev. P. H., B.A., 22 Barnett Wood Lane, Ashtead, Surrey. (Arch., Bot.)
1938 Cooper, J. M., c/o Fairview, Higher Drive, Purley, Surrey. (Orn.)
1939 Coote, F. D., F.R.E.S., 32 Wickham Avenue, Cheam, Surrey. (Lep.)
1939 Copithorne, Surgeon Lieut. R. E. C., R.L.V.R., M.R.C.S., L.R.C.P., D.C.H., late of H.M.S. Ark Royal, c/o G.P.O., London.
1937 Crispin, G. H., Meadowcroft, Abbot's Langley, Herts.
1936 Crompton, Miss C. E., Sesame Imperial and Pioneer Club, 49 Grosvenor Street, W.1. (Arch., Orn.)
1927 Cross-Rose, F., 20 Woolstone Road, S.E.23. (Orn.)

1892 Culpin, M., M.D., F.R.C.S., Fairview, Semaphore Road, Guildford. (Biol.)
1928 Cuningham, Miss D. W. M., Milford Cottage, Milford, Godalming, Surrey. (Bot., Ecol., Ent., Orn., Pl. G.)
1930 Cunningham, J., M.B.O.U., Fern Hill, Belfast. (Orn.)
1936 Currie, P. W. E., Capt., c/o 102 Burdon Lane, Belmont, Sutton, Surrey. (Ecol., Orn.)
1943 Cyprian, Miss N. A., 2 Hadden Way, Greenford, Middx. (Bot.)
1892 Cyriax, R. C., 23 Aberdare Gardens, N.W.6. (Arch., Aryan question, Indo-European languages.)
1920 *Dallas, J. E. S., 4 Herkomer Road, Llandudno, N. Wales. (Arch., Bot., Ecol., Orn., Pl. G., R.)
1925 *Dallas, Mrs Rosa F., 4 Herkomer Road, Llandudno, N. Wales. (Arch., Bot., Ecol., Geol., Orn., R.)
1940 Darlington, Miss I., M.A., 39 Craven Avenue, W.5. (Arch., Bot., Orn.)
1933 Davies, Miss E. B., Graffham, Petworth, Sussex. (Ent., Orn.)
1944 Davies, Mrs I. W., 147 Coleherne Court, Redcliffe Gardens, S.W.5. (Bot., Orn.)
1945 Davies, S. H., 8 Crescent Parade, Hillingdon, Middx. (Orn.)
1926 Deane, Miss M. B. H., Box 36, B.P.O., Tangier, Morocco. (Orn.)
1910 Dell, F. G., 55 Russell Road, Buckhurst Hill, Essex. (Micr., Orn., P.L.)
1945 Dickson, J. W., The Middlesex Hospital, Mortimer Street, W.1. (Bot., Photogr.)
1944 Douglas, R. I., 408 Northborough Road, S.W.16. (Ecol., Geol., Herpetology.)
1928 Douglas-Smith, Miss K., 19 Thurlow Road, N.W.3. (Arch., Bot., Ecol., Orn.)
1942 *Duffin, C. J., M.B.O.U., 26 Mount Ephraim Road, S.W.16. (Orn.)
1934 Eales-White, Major J. C., T.D., F.R.E.S., F.Z.S., Squirrel Wood, Seven Hills Road, Cobham, Surrey (Arch., Ent., Orn.)
1944 Easton, A. M., M.B., B.S., Roadside Cottage, Lower Road, Great Bookham, Surrey. (Col.)
1944 Edgington, P. G., 2 Minterne Avenue, Norwood Green, Southall, Mx. (Orn.)
1945 Edwards, V. A., 75 Barn Hill, Wembley Park, Middx. (Ecol., Orn.)
1936 Ellis, W G., Wavecrest, Maesgwyn Road, Penrhyn Bay, Llandudno, N. Wales. (Orn.)
1939 Elphinstone, K. V., Artillery Mansions, S.W.1. (Orn.)
1928 Emberson, L. M., African and Eastern (Near East) Ld., P.O. Box No. 1, Basra, Iraq. (Ecol., Orn.)
1927 English, Miss F., 4 Herkomer Road, Llandudno, N. Wales. (Arch., Bot., Orn., R.)
1944 Eustace, Miss W., Bedford College, N.W.1. (Fr. Water Ecol.)
1937 Evans, H. J., B.Sc., Jesemin, Amersham Road, Little Chalfont, Bucks. (Arch., Geol., Orn.)
1942 Evans, L. R., c/o 35 Champion Grove, S.E.5. (Orn.)
1943 Evans, Miss M. E., Little Brockholt, Capel, Surrey. (Ecol.)
1945 Eyden, Rev. M. J., B.A., Quainton Hall School, Harrow, Middx. (Orn.)
1939 Faulkner, Miss A. M. G., 127 Lower Richmond Road, S.W.14. (Arch., Orn., R.)
1940 Finch, Miss S. A., M.B., B.S., D.T.M. & H., 135 Palmerston Road, N.22. (Arch., Orn., R.)
1944 Firth, F., 193 Farley Road, Selsdon, Surrey. (Orn.)
1944 Firth, F. M., 193 Farley Road, Selsdon, Surrey. (Orn.)
1937 Fisher, J. M. McC., M.A., F.L.S., M.B.O.U., Bureau of Animal Population, University Museum, Oxford. (Ecol., Orn.)
1934 Fitter, R. S. R., B.Sc. (Econ.), F.Z.S., M.B.O.U., 39 South Grove House, N.6. (Ecol., Orn.)
1924 Foster, J. B., B.A., 12 Conway Road, S.W.20. (Orn.)
1944 Fox, Prof. H. Munro, F.R.S., 27 Sussex Place, N.W.1. (Bot., Fr. Water Ecol., Geol., Orn.)
1938 Franks, Miss H., 21 Queen Square House, W.C.1. (Arch., Bot., Ecol., Orn., R.)
1940 Fraser, Miss C. M., B.Comm., Penn Club, 22 Bedford Place, W.C.1. (Orn.)
1937 Freeman, P., B.Sc., A.R.C.S., F.R.E.S., 8 Sebastian Avenue, Shenfield, Essex. (Ecol., Ent.)
1935 French, W. A., Brook Barns, Chigwell, Essex. (Bot., Orn.)

1939 Garrett, V. R., M.A., M.B.O.U., 15 The Pryors, East Heath Road, N.W.3. (Orn.)
1932 Garrido, A. S., c/o 140 Barlow Moor Road, W. Didsbury, Manchester, 20. (Bot., Ecol., Geol.)
1933 Gaster, H., 8a Lunham Road, S.E.19. (Bot., Orn., R.)
1910 Gaze, W. E., 10 The Avenue, Highams Park, E.4. (Bot., Chem., Lep., Orn.)
1939 Gibson, Miss A., M.D., Section 8, St Thomas's Hospital, Hydestile, near Godalming, Surrey. (Orn.)
1939 Gibson, Mrs G. M., 26 Gilston Road, S.W.10. (Bot., Orn.)
1945 Gilchrist, Miss B. M., 43a St John's Wood High Street, N.W.8. (Ecol., Orn.)
1931 Gillett, J. D., F.R.E.S., P.O. Box 40, Jinja, Uganda. (Ent., Rep.)
1942 Glanville, S. R. K., 53 North Road, N.6. (Orn.)
1910 Glegg, W E., F.Z.S., M.B.O.U., The Zoological Museum, Tring, Herts. (Orn.)
1934 Godwin, C., 20 Canonbury Park North, N.1. (Orn.)
1934 Godwin, Mrs M. L., 20 Canonbury Park North, N.1. (Orn.)
1944 Golding, Miss L., Bloomsbury House Club, 34 Cartwright Gardens, W.C.1.
1929 Goodfellow, Miss L., Flat 3, 7 Lyndhurst Gardens, N.W.3. (Orn.)
1939 Goom, Miss E. M., 78 Elmfield Avenue, Teddington, Middx. (Orn.)
1944 Gould, A., 185 New Haw Road, Addlestone, Surrey. (Orn.)
1942 Gould, H. G., 35 Bergholt Avenue, Ilford, Essex. (Orn.)
1934 Gray, Miss J W., 10 Canford Road, S.W.11. (Arch., Bot., R.)
1927 Green, R., F.Z.S., Ruskin Studio, 7 New Court, Lincoln's Inn, W.C.2, and 84 Elgin Road, Seven Kings, Essex. (Orn.)
1899 *Greenwood, Prof. M., D.Sc., F.R.S., F.R.C.P., Hillcrest, Church Hill, Loughton, Essex. (Arch., Biol.)
1920 Grinling, C. H., B.A., Redroofs, Peaslake, Guildford, Surrey. (Bot., Ecol.)
1945 Gurteen, M., Honiley, Balcombe Road, Horley, Surrey. (Orn., Bot.)
1927 *Hale, R. W., 6 Grendon Gardens, Wembley Park, Middx. (Bot., Ecol., Orn.)
1939 Hambly, E. H. T., M.B., B.S., F.R.C.S., Treharrock, Seer Green, Beaconsfield, Bucks. (Ent., Orn.)
1944 Hammond, Miss Q., 21 Kitchener Road, E.17. (Bot.)
1903 Hanbury, F. Capel, Westfield, Hoddesdon, Herts. (Lep.)
1944 Hanson, Miss E. J., B.Sc., 27 Sussex Place, N.W.1.
1897 *Hanson, P. J., Burcroft, Village Road, Bush Hill Park, Middx. (Arch., Ecol., Orn., R.)
1944 Hardcastle, Miss S. M., Bedford College, N.W.1. (Fr. Water Ecol.)
1921 Hardiman, J. P., C.B.E., B.A., Hyron's Cottage, Woodside Road, Amersham, Bucks. (Orn.)
1942 Harris, L. F., 47 High Street, Weybridge, Surrey (Orn.)
1943 Harrison, D. L., Bowerwood House, St Botolph's Road, Sevenoaks, Kent. (Biol., Orn.)
1942 Harrison, J. L., A.R.C.S., B.Sc., F.R.E.S. (Capt., R.A.S.C.), 93a High Street, S.W.19. (Ecol., Ent.)
1944 Haskell, G., 25 Tring Avenue, W.5. (Bot., Ecol.)
1939 Haviland, Mrs B., 8 Sloane Terrace Mansions, S.W.1. (Bot.)
1939 Haviland, Miss D. M., 8 Sloane Terrace Mansions, S.W.1. (Orn.)
1938 Haviland, Miss G. M. B., 8 Sloane Terrace Mansions, S.W.1. (Orn.)
1943 Hawgood, D. A., 2 Kingsmead Road, S.W.2. (Orn.)
1927 Hayward, Lt. J. F., Ph.D., M.Sc., F.G.S., c/o 29 Mount Echo Drive, E.4. (Geol., Zoo.)
1902 Heath, G. H., M.A., 3 Bolney Court, Portsmouth Road, Surbiton. (Lep.)
1937 Hett, G. Seccombe, F.R.C.S., F.R.G.S., F.Z.S., 86 Brook Street, W.1. (Ecol., Icht., Mam., Orn.)
1940 Hick, C. E. St C., Larkfield, Bracknell, Berks. (Lep.)
1938 Highway, Mrs H., 38a Shortlands Road, Bromley, Kent. (Bot., Orn.)
1938 Hindson, M. T., 11 Holland Park, W.11. (Ecol., R.)
1944 Hobhouse, Miss D., 82 Vincent Square, S.W.1. (Orn.)
1937 Höhn, E. O., B.Sc., Dept. of Physiology, Medical School, Guy's Hospital, S.E.1. (Ecol., Orn.)
1944 Holroyde, F. J., 13 Denbridge Road, Bickley, Kent. (Orn.)
1932 Homes, Lt. R. C., c/o Park Cottage, Wisborough Green, near Billingshurst, Sussex. (Ecol., Orn.)

1930 Hopkins, Lieut. G., c/o Braemar, Sandy Lodge Way, Northwood, Middx. (Ecol., Orn.)
1944 Horeman, T. J., 104 Kilmorie Road, S.E.23. (Ent., Orn.)
1905 Hornblower, A. B., 91 Queen's Road, Buckhurst Hill, Essex. (Api., Arch., Ecol., Orn., R.)
1945 Howlett, Mrs F. M., Rosemount, Peck's Hill, Nazeing, Essex. (Arch., Geol.)
1945 Howlett, V. G. A., Rosemount, Peck's Hill, Nazeing, Essex. (Arch., Geol.)
1941 Hoy, K. E., 5 Beverley Crescent, Woodford Green, Essex. (Ent., Orn.)
1945 Hoyle, Miss D. M., 61 Danescroft, Brent Street, Hendon, N.W.4. (Ecol., Orn.)
1938 Hurcomb, Sir Cyril, K.B.E., C.B., 47 Campden Hill Court, W.8. (Orn.)
1939 Hussey, N. W., c/o Penwarne, Stonewall Park Road, Langton, Tunbridge Wells, Kent. (Hym., Orn.)
1937 Hussey, S. V., 40 Flanchford Road, W.12. (Bot., Orn., R.)
1930 Hutton, Miss R. E., Lytton Lodge, Codicote, Hitchin, Herts. (Bot., Zoo.)
1943 Janvrin, J. P., c/o Middlesex Hospital, Medical School, W.1. (Orn.)
1945 Jardine, Miss D. A., 33 Cranborne Road, Potters Bar, Middx. (Orn.)
1927 Jeffery, H. J., A.R.C.S., F.L.S., 14 Coppetts Road, N.10. (Bot.)
1933 Johns, Miss L. J., 87 Morley Hill, Enfield, Middx. (Arch., Bot., Ecol., Orn., R.)
1944 Johnson, P., F.Z.S., 17 The Pryors, East Heath Road, N.W.3. (Orn., Zoo.)
1931 Johnston, F. J., West Park, Sidmouth, Devon. (Ecol., Orn.)

1899 *Kaye, W. J., F.R.E.S., Chantrey Lodge, Longdown, Guildford, Surrey. (Lep.)
1938 Keith, Miss C., 17 Abercorn Place, N.W.8. (Arch., Bot., Orn., R.)
1942 Kemp, Mrs M. M., 33 Ellerton Road, S.W.18. (Orn.)
1944 Kent, D. H., 75 Adelaide Road, W. Ealing, W.13. (Bot., Chem., Ecol.)
1934 Kerr, Mrs H. M. Rait-, 22 Elm Tree Road, N.W.8. (Arch., Ecol., Orn.)
1936 Keywood, K. P., Croft Cottage, Hare Lane, Claygate, Surrey. (Ent., Orn.)
1930 King, Miss C. A., M.D., 8 Lancaster Drive, N.W.3. (Arch., Orn., R.)
1944 Knight, Miss E. B., Cottesmore, Wrawby Road, Brigg, Lincs.
1941 Kramer, J. A., 23 Clifton Avenue, N.3. (Orn.)

1943 Larkin, Mrs E., 145 Elm Walk, Raynes Park, S.W.20. (Bot.)
1944 Larsen, R. T. F., 370, Finchley Road, N.W.3. (Orn.)
1942 Law, Miss M. D. L., 90 Riverway, N.13. (Arch., Ecol.)
1930 Ledlie, R. C. B., M.B., B.Sc., F.R.C.S., 64 Harley Street, W.1. (Bot., Orn.)
1922 Lemon, Mrs M. L., M.B.E., J.P., F.R.G.S., F.R.S.A., F.Z.S., M.B.O.U., Hillcrest, Redhill, Surrey. (Orn.)
1937 Lewer, F. A., Jalna, Cobham Road, E. Horsley, Surrey. (Orn.)
1919 Leyton Public Libraries (E. Sydney, F.L.A.), Central Library, E.10.
1944 Lindley, K. A., 9 Old Oak Road, W.3. (Lep., Orn.)
1927 Lister, Miss G., F.L.S., 871 High Road, E.11. (Bot., Orn.)
1926 *Littlejohn, H. A., 2 Brooklands Gardens, Ilford, Essex. (Bot., Orn., R.)
1934 Locket, G. H., M.A., M.Sc., 1 Mount Pleasant, Harrow, Mx. (Ecol., Ent.)
1944 Lockett, Lieut. J. H. (R.N.V.R.), 19 West Avenue, N.3. (Orn.)
1926 *Longfield, Miss C. E., F.R.G.S., F.R.E.S., F.Z.S., M.B.O.U., 11 Iverna Gardens, London, W.8. (Bot., Ecol., Ent., Orn., R.)
1936 Lousley, J. E., 7 Penistone Road, S.W.16. (Bot., Ecol., Orn.)
1930 *Low, G. Carmichael, M.A., M.D., F.R.C.P., F.Z.S., M.B.O.U., 7 Kent House, Kensington Court, W.8. (Orn., Zoo.)
1926 Lutwyche, Mrs A. N., 120 Mildred Avenue, Watford, Herts. (Orn., R.)

1928 MacAlister, Mrs E. c/o Natl. Prov. Bank, 18 Cromwell Pl., S.W.7. (Bot., Orn.)
1937 McClintock, Major D., M.A., A.C.A., c/o Park Grove, Withyam, Sussex. (Bot., Orn.)
1935 McCulloch, Capt. G. K., c/o 65 Chester Road, Northwood, Middlesex. (Orn.)
1933 MacDonald, Rt. Hon. Malcolm J., M.P., c/o Upper Frognal Lodge, N.W.3. (Orn.)
1935 McDowell, Miss C. M., 19 Cambridge Park Court, E. Twickenham, Mx. (Bot., Orn., R.)
1939 McEwen, Miss E., 230 Kensington Close, W.8. (Orn.)
1911 MacIntosh, Miss I. S., 3 Mayfield Road, E.4. (Arch., Bot.)
1911 MacIntosh, Miss J. D., 3 Mayfield Road, E.4. (Arch., Bot.)
1929 Mackay, Helen M. M., M.D., F.R.C.P., 7 Lyndhurst Gardens, N.W.3. (Orn.)

1932 Mackworth-Praed, C. W., F.R.G.S., F.Z.S., F.R.E.S., M.B O.U., Castletop, Burley, near Ringwood, Hants. (Ent., Orn.)
1941 McMillan, A., L.R.C.S., L.R.C.P., Ivy House, New Romney, Kent. (Orn.)
1923 *Macpherson, A. Holte, B.C.L., M.A., F.Z.S., 12 The Beacon, Exmouth, Devon. (Orn.)
1934 Mann, F. R., M.C., Noreena, Ham Common, Surrey. (Orn.)
1934 Manser, G. E., Flodden House, Theydon Bois, Essex. (Bot., Ecol., Orn.)
1936 Manson-Bahr, Sir Philip H., C.M.G., D.S.O., M.A., M.D., F.R.C.P., M.B.O.U., F.Z.S., 149 Harley Street, W.1. (Orn.)
1934 *Marchant, Miss R., 24 Longmeads, Rusthall, Tunbridge Wells, Kent. (Arch., Bot.)
1944 Mason, Mrs U. C., 63 King's Road, Richmond, Surrey. (Bot., Mycol.)
1938 Maund, Miss L. M. R., 142 Gordon Court, Wood Lane, W.12. (Orn.)
1943 Mears, R. G., 14 Hampton Road, E.4. (Ent.)
1940 Megaw, T. McE., M.Sc., A.M.I.C.E., Petty's Farm, Ludgershall, Aylesbury, Bucks. (Geol, Orn.)
1935 Melluish, W. D., c/o 56 Sunnyfield, N.W.7. (Ecol., Orn.)
1944 Mills, T. H. L., A.I.E.E., 82 Madrid Road, S.W.13. (Orn.)
1932 Mitchell, Miss M. I., 7 Penwerris Avenue, Osterley, Middlesex. (Bot., Orn.)
1938 Monk, J. F., c/o Kingsland House, Shrewsbury, Salop. (Orn.)
1937 Morton, Miss G. M., 7 Broomfield Road, Kew Gardens, Surrey. (Arch., Orn.)
1937 Mountfort, G. R., Lieut.-Col., M.B.O.U., c/o Vacuum Oil Co., Caxton House, Tothill Street, S.W.1. (Orn.)
1942 Mugele, G. F., 68 Connaught Avenue, E.4.
1938 Myers, Capt. A. F., c/o 43 Arkwright Road, N.W.3. (Orn.)
1936 Napper, Lt.-Col. R. P., R.A., c/o Lloyds Bank, Cox's & King's Branch, 6 Pall Mall, S.W.1. (Orn.)
1893 *Nicholson, Miss B., 49 Danecourt Road, Parkstone, Dorset. (Bot.)
1934 Nicholson, E. M., M.B.O.U., 13 Upper Cheyne Row, S.W.3. (Ecol., Orn.)
1928 Noel, Miss E. F., 37 Burnham Court, W.2. (Bot., Ent., Orn., Pl. G., R.)
1934 Norris, Major C. A., M.B.O.U., Grassholme, Stratford-on-Avon, Warwickshire. (Ecol., Orn.)
1940 Norsworthy, H. H., 15 Selwyn House, Manor Fields, S.W.15. (Orn.)
1937 Oldroyd, H., M.A., F.R.E.S., c/o British Museum (Natural History), S.W.7. (Ecol., Ent.)
1945 O'Neil, Mrs H. E., 32 Blomfield Road, W.9. (Orn.)
1937 Owen, C. E., 30 Hamilton Road, Harrow, Middlesex. (Orn.)
1938 Paddington Public Libraries (H. J. W. Wilson, A.L.A.), Porchester Road, W.2.
1929 Page, Miss M. M., 22 Barnett Wood Lane, Ashtead, Surrey. (Orn.)
1944 Panchen, A. L., 21 Rowan Road, S.W.16. (Ent., Rept.)
1925 *Parmenter, L., F.R.E.S., c/o 94 Fairlands Avenue, Thornton Heath, Surrey. (Bot., Ecol., Ent. (esp. Dipt.), Orn., Pl. G.)
1938 Parrinder, Mrs E. R., 27 Gwalior House, Chase Road, N.14. (Ecol., Orn., R.)
1938 Parrinder, E. R., 27 Gwalior House, Chase Road, N.14. (Ecol., Orn., R.)
1944 Pashley, Miss M., 30 West Kensington Mansions, W.14.
1933 Paulson, C. W. G., M.B.O.U., Woodside Cottage, Wheeler's Lane, Smallfield, Surrey. (Orn.)
1923 Payne, E. M., Tilgate, Long Lane, Hillingdon, Middlesex. (Bot., Orn.)
1923 Payne, L. G., F.Z.S., 22 Marksbury Avenue, Richmond, Surrey. (Bot., Ecol., Ent.)
1942 *Payne, R. M., c/o 22 Marksbury Avenue, Richmond, Surrey. (Ecol., Ent.)
1944 Payton, H. W., Lianda, Hill Close, Harrow, Mx. (Bot., Orn.)
1937 Pearce, E. W., 3 Berkeley House, Hampton, Mdx. (Orn.)
1932 Pedler, E. G., 78 Richmond Park Road, S.W.14. (Orn., R.)
1945 Pegram, D. C., 44 Combemartin Road, S.W.18. (Orn.)
1937 Peterken, J. H. G., 73 Forest Drive East, E.11. (Bot., Ecol., Orn.)
1944 Phillips, R., Osborne House, St Clears, Carmarthen, S. Wales. (Orn.)
1937 Philipson, W. R., 33 Park Avenue, Ruislip, Middlesex. (Orn.)
1942 Phillipson, Rev. C. Q. (Gone to India.) (Orn.)
1937 Piercy, K., Clifton Cottage, Clifton, Beds.

1943 Pilcher, Miss E. V., 65 Chester Road, Northwood, Mx. (Bot.)
1931 Pinniger, E. B., F.R.E.S., 5 Endlebury Road, E.4. (Ecol., Ent., Orn., R.)
1941 Pitt, Miss Frances, The Albynes, Bridgnorth, Salop. (Orn.)
1933 Popple, Miss W. N., Castle Rise, Castle Hill Avenue, Berkhamsted, Herts. (Ecol., Orn., P.L., R.)
1944 Potter, B. H., 9 The Island, Thames Ditton, Surrey. (Orn.)
1944 Prall, D. I. F., 11 Clarence Terrace, N.W.1. (Orn.)
1943 Priestley, Mrs J. B., B3 Albany, Piccadilly, W.1. (Orn.)

1943 Ralls, C. W., 2 Overdale, Dorking, Surrey. (Orn.)
1939 Rammell, Mrs E. M., 18 Fishpool Street, St Albans, Herts. (Orn.)
1939 Ratcliff, A. G., 39 Howard Road, Dorking, Surrey. (Orn.)
1934 Ratcliff, P. W., c/o 39 Howard Road, Dorking, Surrey. (Bot., Ecol., Orn.)
1938 Rawlence, D. A., Hill Top Cottage, Warboys Road, Kingston Hill, Surrey. (Orn.)
1934 *Ray, Miss T., 24 Longmeads, Rusthall, Tunbridge Wells. (Arch., Bot.)
1930 Reeve, Miss E. A., The Penn Club, 22 Bedford Place, W.C.1. (Bot., Ecol., Ent., Orn., R.)
1945 Reeves, C. A., 56 Ivanhoe Drive, Kenton, Middx. (Bot., Ent.)
1929 Rew, Miss M., Glencoinside, Ullswater, Penrith. (Orn.)
1943 Richards, B. A., 29b St John's Avenue, S.W.15. (Orn.)
1925 Richardson, A., 2 Manor Road, Wheathampstead, Herts. (Ent., Orn.)
1940 Richardson, R. A., Birling Corner, Ratton Village, Willingdon, Sussex. (Orn.)
1943 Richter, J. H., 32 Pretoria Road, E.4. (P.L.)
1943 Rivers, J. S., Medical School, Middlesex Hospital, W.1. (Orn.)
1941 Robbins, Rev. R. A., Marshwood Vicarage, Bridport, Dorset. (Arch., Bot.)
1934 Roberts, J. E., B.Sc., Homewood, Kelsall, Cheshire. (Ecol., Orn.)
1940 Robinson, T. R., Flat 10, Linton House, Holland Park Avenue, W.11. (Orn.)
1938 Rommel, Miss D., The Orchard House, Bickley, Kent. (Arch., Orn.)
1944 Rosenberg, R., Flat 103, Whitehall Court, S.W.1. (Mycol.)
1910 *Ross, J., 23 College Gardens, E.4. (Pl. G.)
1935 Rowan, J. D., 65 Haydn Avenue, Purley, Surrey. (Orn.)
1931 Rowberry, E. C. (address not known). (Ecol., Orn.)
1941 Rutherford, Mrs P., 82 Southgate Road, Potter's Bar, Middlesex. (Orn.)
1942 Ryall, R. H. M., 24 Stillcroft Gardens, Wembley, Middlesex. (Orn.)

1929 Sampson, E. S., 60 Alexandra Road, Epsom, Surrey. (Orn.)
1937 Scott, Miss E. M. P., 7 Broomfield Road, Kew Gardens, Surrey. (Arch., Orn.)
1937 Scott, G. B., c/o 6 Alan Road, S.W.19. (Geol., Orn.)
1937 Seth-Smith, D., F.Z.S., M.B.O.U., Brabourne, Poyle Road, Guildford, Surrey. (Orn.)
1935 Shill, W. A., Barberries, Greenhurst Lane, Oxted, Surrey. (Bot.)
1929 Short, G. R. A., 36 Parkside Drive, Edgware, Middlesex. (Bot., Ecol., Micr., Pharmacognosy.)
1943 Siebert, W. F., Lakeside, Appledram, Chichester, Sussex. (Orn.)
1892 Simes, J. A., O.B.E., F.R.E.S., 75 Queen's Road, Loughton, Essex. (Ent.)
1940 Sladen, W. J. L., Medical School, Middlesex Hospital, W.1. (Bot., Ecol., Ent., Orn.)
1935 Smith, Miss A. J., 55 West Avenue, N.3. (Orn.)
1892 Smith, C. B., 103 Wood Vale, N.10. (Lep.)
1944 Smith, D. C., 20 Carlton Avenue, Kenton, Middx. (Orn.)
1944 Smith, Miss E. E., 44 Glenloch Road, N.W.3. (Ecol. of Inland Waters.)
1943 Smith, I. B., U.C.H. Medical School, University Street, W.C.1. (Orn.)
1927 *Solly, Miss B. N., 167 Old Brompton Road, S.W.5. (Orn.)
1944 Southam, E. V., c/o 12 Cloncurry Street, S.W.6. (Orn.)
1944 Spencer, P. J., 12 The Pryors, E. Heath Road, N.W.3. (Orn.)
1922 Spooner, H., 21 Musgrave Crescent, S.W.6. (Arch., Bot., Ecol., Orn., R.)
1944 Spreadbury, W. H., 35 Acacia Grove, New Malden, Surrey. (Ecol.)
1944 Spurway, Miss H., Ph.D., Department of Biometry, University College, W.C.1. (Herpetology, Zoo.)
1920 *Stowell, H. S., L.R.I.B.A., Pirbright, Torland Road, Hartley, Plymouth. (Arch.)

1945 Stronge, R. J. T., 100 The Chase, Wallington, Surrey. (Ent., Mycol.)
1930 Swayne, F. G., M.A., M.B., M.B.O.U., Ivy Hall Hotel, Crowborough, Sussex. (Orn.)
1944 Syms, E. E., F.R.E.S., 22 Woodlands Avenue, E.11. (Ent.)

1945 Teagle, W. G., 20 Wendover Road, Harlesden, N.W.10. (Orn.)
1943 Tenison, Lt.-Col. W. P. C., D.S.O., F.L.S., F.Z.S., 2 Wool Road, S.W.20. (Zoo.)
1920 Thomas, Mrs G. E., 9 Talbot Road, Isleworth, Middlesex. (Orn., R.)
1944 Thrupp, Miss B., B.A., P.A.S.I., 39 Mitcham Park, Mitcham, Surrey. (Bot., Orn).
1945 Tickner, Miss G. E., 283 Halfway Street, Sidcup, Kent. (Bot., Orn.)
1945 Titmas, Miss M., 479 Kensington Close, Wrights Lane, W.8. (Orn.)
1932 Todd, Miss G. E., Grantleigh Hotel, Inverness Terrace, W.2. (Bot., Orn., R.)
1945 Toombs, H. A., British Museum (Natural History), Cromwell Road, S.W.7. (Bot., Geol., Orn.)
1892 Tremayne, L. J., F.Z.S., Grand Buildings, Trafalgar Square, W.C.2. (Arch., Bot., Lep., Orn., Pl. G., R.)
1940 Trouton, Miss E. M., 31 Albert Bridge Road, S.W.11. (Orn.)
1935 Tucker, D. G., Ph.D., 15 Gordon Avenue, Highams Park, E.4. (Ecol., Orn.)
1943 Tufnell, B., 14a Queensberry Place, S.W.7. (Orn.)
1944 Turner, D. H., 27 Patience Road, S.W.11. (Orn.)

1931 Underwood, R. A., Greenways, Shoreham Road, Otford, Kent. (Orn.)

1929 Venour, Miss D., Offley Place, Great Offley, Hitchin, Herts. (Ecol., Orn.)
1933 Vincent, W. G., 154 Winchester Road, Hale End, E.4. (Orn.)

1927 Waller, G., Taunton Dene, Sandyhurst Lane, Ashford, Kent. (Ecol., Ent., Orn.)
1944 Walshe, Miss B. M., M.Sc., 27 Sussex Place, N.W.1. (Bot. Fr. Water Ecol., Orn.)
1938 Warburg, G. O., 1 Woodside, Erskine Hill, N.W.11. (Orn.)
1943 Ward, Mrs A., 13 Chatham Road, E.17.
1943 Ward, Miss M., B.Sc., 13 Chatham Road, E.17.
1933 Ward, Miss M., M.B., Ch.B., Threeways, Jordans, Beaconsfield, Bucks. (Arch., Orn.)
1943 Ward, R. S., 35 Sunny Gardens Road, N.W.4. (Bot., Ecol., Orn.)
1941 Watson, R. L., 55 Redcliffe Gardens, S.W.10. (Bot., Orn.)
1936 Watt, E. C., 13 Park Road, N.W.1. (Orn.)
1925 *Watt, Mrs W. Boyd, M.B.O.U., 12 Campbell Road, Boscombe, Hants. (Arch., Ecol., Orn.)
1938 *Wattson, Miss A. E., 27 Woodhill Crescent, Kenton, Middx. (Ent., Orn.)
1939 Wattson, Mrs R. F., 27 Woodhill Crescent, Kenton, Middx.
1939 Wattson, R. F., 27 Woodhill Crescent, Kenton, Middx. (Ent.)
1945 Waymont, R., Tudor Croft, Lower Road, Fetcham, Surrey. (Arch.)
1928 Weeks, C., 7 Ashmount Road, N.19. (Ecol., Orn., R.)
1944 Welch, Mrs B., 49 Lichfield Court, Richmond, Surrey. (Bot.)
1939 Welford, Miss A. M., 13 Clifton Avenue, N.3. (Orn.)
1945 Weston, Miss S. M., 34 Broadmead Road, Woodford Green, Essex. (Ecol.)
1935 Whitaker, F. O., 51 Grosvenor Avenue, Carshalton. (Bot., Ecol., Pl. G., R.)
1944 Whitaker, Miss M. B., B.Sc., F.Z.S., 264 Grange Road, S.E.19. (Zoo.)
1932 Whitbread, Miss W. H. E., 6 Meadow Way, Weald Village, Harrow, Middlx.
1944 White, T. G., 76 Priory Avenue, E.4. (Bot., Orn.)
1938 Wigram, A. F. (address not known). (Orn.)
1938 Wigzell, J. A., 17 Wool Road, S.W.20. (Ecol., Orn.)
1942 Wilkinson, J. S., B.A., A.C.A., F.R.H.S., 26 Golders Rise, N.W.4. (Bot.)
1942 Wilson, D. S., 8a Beulah Hill, S.E.19. (Orn.)
1929 *Wilson, Mrs M. M., 15 The Avenue, Bickley, Kent. (Bot., Ecol., Ent., Geol., Orn., Pl. G., R.)
1938 Wilton, A. R., 262 Kingston Road, S.W.20. (Ecol., Orn., R.)
1938 Winsloe, Mrs C. M., c/o Lloyds Bank Ltd., 18 Wigmore Street, W.1. (Orn.)
1937 Winters, Miss E. D. M., 7 Broomfield Road, Kew Gardens, Surrey. (Arch., Orn.).

1942 Wood, B., Vincent's Shaw, Chipstead, Surrey. (Orn.)
1944 Woolner, H. C., 6 Cunningham Avenue, St Albans, Herts. (Orn.)
1937 Worthington, Miss L. F., 104 Goldhurst Terrace, N.W.6. (Arch.)
1922 Wright, W. A., 31 Beresford Road, E.4. (Orn.)
1942 Wyatt, Miss E. M., c/o Post Office Savings Bank, W.14. (Orn.)
1937 Yarrow, I. H. H., M.A., Ph.D., D I.C., F.R.E.S., Agricultural Advisory Offices, 7 Redlands Road, Reading, Berks. (Ecol., Ent.)
1942 Young, B. W., 15 St James's Mansions, N.W.6. (Bot., Orn.)

Affiliated Societies.

1936 Tiffin Boys' School Scientific Society (Natural Science Section) (D. T. Humphris), Tiffin Boys' School, Kingston-on-Thames, Surrey. (Ecol.)
1936 Westminster School N.H. Society (L. H. Burd), (see Register).

Branch Associates:

1943 Abbott, Miss E. J., 339 Hoe Street, E.17.
1945 Baker, C. E., 25 Spareleaze Hill, Loughton, Essex. (Orn.)
1945 Barton, Miss F. M., 3 Howard Road, E.17.
1937 Bayes, C. S., 50 Pembroke Road, E.17. (Orn.)
1943 Beavis, G. H. S., 14 Fairlight Avenue, E.4.
1943 Beavis, Mrs M. H. W., 14 Fairlight Avenue, E.4.
1943 Boatman, D. J., 7 Hurst Road, Buckhurst Hill, Essex. (Biol., Bot., Ecol., Ent., Orn.)
1930 Brightman, Miss A., 80 Woodland Road, Chingford, E.4.
1945 Butler, Miss G. D., 11 Muswell Hill Road, N.10.
1944 Chambers, G. T., 27 Normanton Park, E.4. (Orn.)
1938 Chingford Branch County Library (E. Leyland, Librarian), Hall Lane, E.4.
1943 Dossetter, L. J., 11 York Road, E.17. (Orn.)
1944 Downing, Miss M. G., 290 Blackhorse Lane, E.17.
1943 Gravell, Miss V. E. W., 122 Selwyn Avenue, Higham's Park, E.4. (Orn.)
1920 Hart, Miss H., 7 Park Hill Road, E.4.
1944 Hassell, Miss S. M., 75 Derby Road, E.18. (Bot.)
1933 Hayward, P. D., 2 King's Green, Loughton, Essex. (Orn.)
1937 Hiles, Miss I. E., 32 Gordon Road, E.4.
1943 Hindell, Mrs F., 17 Larkshall Road, E.4. (Orn.)
1943 Hindell, H. G., 17 Larkshall Road, E.4.
1944 Hosking, Miss D., 63 Weston Park, Crouch End, N.8. (Bot., Orn.)
1944 Humphries, R. W., 26 Connaught Avenue, Loughton, Essex. (Bot.)
1942 Mansbridge, J. W., 11 Westbury Lane, Buckhurst Hill, Essex. (Ecol.)
1911 Mathieson, Miss M. L., 7 Crescent Road, E.4. (Meteorology.)
1934 Nicholson, E. T., 21 Holly Drive, E.4. (Ecol., Orn.)
1945 Patterson, P. J., 7 Cecil Road, Walthamstow, E.17. (Ent.)
1930 Penwarden, Miss C., 39 The Avenue, E.4.
1927 Pettit, Mrs S., 2 Victoria Road, E.4.
1927 Pettit, S., 2 Victoria Road, E.4.
1943 Pinniger, Mrs L., 5 Endlebury Road, E.4.
1944 Rattenbury, D. C., 9 Ingatestone Road, Woodford Green, Essex. (Lep.)
1943 Richter, Mrs F. G., 32 Pretoria Road, E.4.
1943 Round, E. A., 63 Mayfield Road, E.4.
1942 Rumsey, P. F. C., Park Farm Nursery, Sewardstone Road, E.4. (Orn.)
1925 Saul, H. J. B., 12 Sandringham Court, Ipswich Road, Norwich.
1937 Smith, R. P., 22 Pelton Avenue, Belmont, Surrey. (Conch.)
1943 Spink, H. J., 26 Holly Drive, E.4.
1903 Stevenson, H. E., F.C.S., 24 Wilton Grove, S.W.19. (Chem.)
1942 Tucker, Mrs F., 31 Frederica Road, E.4.
1942 Tucker, J. F., B.Sc., 31 Frederica Road, E.4. (Bot.)
1942 Tucker, M. J., 31 Frederica Road, E.4. (Ecol.)
1942 Turner, Mrs L., 202 The Avenue, Higham's Park, E.4. (Orn.)
1944 Vere, D. W., 119 Grosvenor Gardens, Woodford Green, Essex. (Ent.)

1939 Verini, Miss E. M., M.A., 55a Palmerston Road, Buckhurst Hill, Essex. (Orn.)
1942 Walker, C. H., St Bartholomew's Hospital, W. Smithfield, E.C.1. (Orn.)
1944 Watson, Miss L. D., 9 Richmond Avenue, Highams Park, E.4.
1942 Wheeler, A. C., 17 Neven Drive, E.4.
1944 Wiles, H., Mapledene, Alderton Hill, Loughton, Essex.
1944 Williams, Miss M. D., 17 Beresford Road, E.4. (Bot.)

Country and School Associates:

1941 Adolph, P. A., The Lodge, Ashurst Place, Langton Green, Tunbridge Wells, Kent. (Orn.)
1944 Bain, Miss P. C., St Boswells, Dene Road, Northwood Mx. (Bot., Ecol., Ent., Mam., Orn.)
1941 Bale, D. W. D., Marsh Hill, Dulverton, Somerset. (Orn.)
1931 Benson, Mrs R. B., Dellfield, Featherbed Lane, Felden, Herts. (Bot., Orn., R.)
1939 Berry, P., M.D., 46 Magpie Hall Road, Chatham, Kent.
1943 Betteridge, H. W. G., 52 Newton Road, Tunbridge Wells, Kent.
1934 Biddlecombe, P. E., 30 Hill View Road, Orpington, Kent. (Arch.)
1908 Bostock, E. D., 8 Pelham Gardens, Folkestone, Kent. (Lep.)
1940 Breckin, Mrs E. M., 5 Linden Avenue, Blundell Sands, Liverpool, 23. (Arch., Ecol., Mycol.)
1937 Bunker, H. E., 27 Broad Oak Lane, Penwortham, Lancs.
1937 Clark, A. (address not known). (Orn.)
1935 Clerk-Rattray, Miss C. E., c/o Easter Drimmie, Blairgowrie, Perthshire. (Bot., Orn.)
1933 Collett, G. W., 174 Sheldon Road, Chippenham, Wilts. (Bot., Ecol., Orn., R.)
1924 Collins, Miss F., Martlets, Clapham, near Worthing, Sussex. (Orn.)
1936 Colyer, W. L., Heybrook, Connaught Road, Sidmouth, Devon. (Ecol., Orn.)
1938 Cowper, S. G., B.Sc., Ph.D., M.R.C.S., L.R.C.P., F.Z.S. (missing from B.E.F., 3/9/40). (Ecol., Ent., Orn.)
1938 Eardley-Wilmot, Mrs M., Avondale, New Chapel Road, Lingfield, Surrey. (Bot., Orn.)
1940 Fairbairn, D. C., M.C., M.B., B.Sc., L.R.C.P., M.R.C.S., c/o 48 Addison Avenue, W.11. (Bot.)
1933 Ferrier, Miss J. M., F.Z.S., M.B.O.U., A.A.O.U., Sea Gull Bungalow, Porth, near Newquay, Cornwall. (Ecol., Orn.)
1933 Gibson, Miss E. M., Ashcroft, Station Road, Petersfield, Hants. (Lep., Orn.)
1944 Gladstone, Sir H. S., Capenoch, Penpont, Dumfries. (Orn.)
1944 Hager, Miss P. D., Langdale, Ashlyns Road, Berkhamstead, Herts. (Orn.)
1944 Harrison, R., 202 Seal Road, Sevenoaks, Kent. (Mycol., Orn.)
1940 Harvey, A. A., Pilot Officer, 67 St Augustine's Avenue, Wembley Park, Middx. (Orn.)
1927 Harvey, J. H., Half Moon Cottage, Little Bookham, Surrey. (Bot.)
1915 Hopkins, Prof. Sir F. Gowland, O.M., M.A., M.D., F.R.S., F.R.C.P., 71 Grange Road, Cambridge. (Biochemistry.)
1936 Lewis, Miss M., Brincliffe, Osney Crescent, Paignton, S. Devon. (Arch., Bot., Ecol., Ent., Orn., R.)
1941 Lisney, A. A., M.A., M.D., F.R.E.S., The Red House, Narborough, Leicestershire. (Lep.)
1938 Lowe, Miss C. B. M., c/o Coutts & Co., 440 Strand, W.C.2. (Arch., Bot., Orn., R.)
1943 Lusty, E. J., c/o 83 Snakes Lane, Woodford Green, Essex. (Orn.)
1932 McKittrick, T. H., 7 Central Bahnstrasse, Basle, Switzerland. (Orn.)
1932 McKittrick, Mrs T. H., 7 Central Bahnstrasse, Basle, Switzerland. (Orn.)
1943 McNicol, G. F., 13 Crabtree Lane, Hemel Hempstead, Herts. (Bot., Orn.)
1943 McNicol, Mrs J. C., 13 Crabtree Lane, Hemel Hempstead, Herts. (Bot., Orn.)
1932 Mason, C. T., Mill Cottage, Gt. Shefford, Newbury, Berks. (Arch., Ent.)
1938 Mason, J. H., 134 Ryden's Way, Old Woking, Surrey. (Ent., Orn., R.)
1902 Miller, Miss M. E., The Croft, Rainsford Lane, Chelmsford. (Lep.)
1905 Moore, J. W., F.R.E.S., 151 Middleton Hall Road, King's Norton, Birmingham, 30. (Exotic Lep.)
1942 Moorhouse, S., Lyndale, Orchard Avenue, Bolton-le-Sands, Lancs. (Orn.)

1938 Muirhead, D., Malvern House, The Baulk, Worksop, Notts. (Ecol., Orn.)
1929 Perry, Mrs M. D., 37 MacAlister Street, Mackay, Queensland. (Orn., R.)
1897 Pike, Oliver G., F.Z.S., M.B.O.U., F.R.P.S., The Bungalow, Leighton Buzzard, Beds. (Orn.)
1927 Raikes, Miss D. T., Hên Ysgol, Bwlch, Breconshire. (Arch., Bot., Orn.)
1936 Shaw, G. A., c/o 12 Whitby Avenue, Hexham, Northumberland. (Bot.)
1943 Simmons, G. W., 21 Woodbridge Hill Gardens, Guildford, Surrey.
1928 Sparkes, Mrs F. M., 4 Loop Road, Kingfield, Woking, Surrey. (Arch., Bot.)
1943 Taylor, J. S., M.A., D.I.C., F.R.E.S., P.O. Box 45, Graaff Reinet, C.P., S. Africa. (Ent., Orn.)
1942 Wales, Mrs M., Great Garden, Dartington, Totnes, Devon.
1944 Willcox, Mrs I. G., Huntercombe Manor, near Taplow, Bucks. (Ent., Orn.)
1929 Willcox, P. H., M.A., M.B., B.S., M.R.C.P., (Major, R.A.M.C.), Huntercombe Manor, near Taplow, Bucks. (Bot., Ent.)

Register

of those at present unable to participate in the activities of the Society, to whom the *London Naturalist* is to be sent, but not the Syllabus.

1929 Acland, Miss C. M., M.B.O.U., Walwood, Banstead, Surrey. (Orn.)
1927 Barclay-Smith, Miss P., F.Z.S., M.B.O.U., 28 Belvedere, Bath. (Orn.)
1932 Binley, Sister E. M., T.A.N.S. P209810/1, 17th General (London) Hospital. c/o A.P.O. 1665. (Orn., R.)
1906 Bishop, E. B., Lindfield, Marshall Road, Godalming, Surrey. (Arch., Bot., Orn., Pl. G.)
1925 Boardman, S., 109 Monkham's Avenue, Woodford Green, Essex. (Mycol., Orn.)
1939 Boyd, B. C. L., 10 Mayfield Road, Dagenham, Essex. (Orn.)
1936 Burd, L. H., Westminster School N.H. Society, 5 Cruxwell Street, Bromyard, Herefordshire. (Ecol., Ent., Orn.)
1937 Butlin, Capt. J. H., c/o 90 East Sheen Avenue, S.W.14. (Orn.)
1938 Buxton, Miss L. R., Easneye, Ware, Herts. (Orn.)
1932 Caiger-Smith, Miss J., Denison House, Little Gaddesden, Berkhamsted, Herts. (Orn.)
1938 Calvert, G. W., 1 Milton Crescent, Cheadle, Cheshire. (Orn.)
1912 Capleton, A., Golfer's Club, 2a Whitehall Court, S.W.1. (Bot., Ecol., Mam., Orn., R.)
1939 Carter, N. W. J., 1 Wood Street, East Grinstead, Sussex. (Ecol., Ent.)
1927 Clanchy, Mrs B. L., Westminster Bank, Harrow-on-the-Hill, Mx. (Orn., R.)
1927 Clanchy, D. H., Westminster Bank, Harrow-on-the-Hill, Mx. (Ecol., Orn., R.)
1937 Cockburn, Major T. A., M.D., c/o Lloyds Bank, Barking, Essex. (Orn.)
1934 Collings, Mrs M., 36 Alfriston Road, S.W.11. (Ent., R.)
1928 Cox, Miss L. E., 201 Green Street, Atworth, near Melksham, Wilts. (Bot.)
1942 Cramp, S., 97 Clare Court, W.C.1. (Orn.)
1936 Daffarn, J. D., c/o 20 Woodside Avenue, N.6. (Orn.)
1933 Darashah, Mrs E. G., 108 Stephens Road, Tunbridge Wells. (Arch., Bot., R.)
1932 Davis, Miss R., c/o 118 College Road, S.E.21. (Orn., R.)
1939 De Bosdar, C. D., R.A.F. Station, Hemswell, Lincs.
1939 Devenish, L. R., 23 Grosvenor Road, East Grinstead, Sussex. (Ecol., Lep.)
1933 Doran, F. H., Toddsbrook, Great Parndon, Harlow, Essex. (P. L.)
1936 Ellington, Miss M. L., 1st London Motor Co., Cam House, Campden Hill, W.8. (Orn.)
1907 Eynon, L., B.Sc., F.I.C., 8 Hall Lane, Upminster, Essex. (Chem.)
1935 Farquharson, A., Le Play House, Albert Road, Malvern. (Ecol.)
1927 Fisher, Mrs G. L., 41 Milton Court, Ickenham, Middx. (Arch.)
1939 Fitter, Mrs M. S., 39 South Grove House, N.6. (Ecol., Orn.)
1939 Forty, E. W., 22 Medina Avenue, Hinchley Wood, Esher, Surrey. (Orn.)
1937 Fossey, H. B., c/o 39 Orchard Avenue, Cambridge. (Orn.)
1935 Foster, Mrs J. B., 12 Conway Road, S.W.20.
1931 Frederick, Miss L. M., M.Sc., F.Z.S., c/o Miss Wilkins, Cold Harbour, Sherborne, Dorset. (Ecol., Orn., P. L., R.)
1933 Gillham, E. H., Capt., c/o 19 Tennison Road, S.E.25. (Orn.)

1937 Gillingham, D. W., c/o 28 Roding Road, Loughton, Essex. (Orn.)
1930 Goodwin-Vanner, R. E. F., F.R.S.A., F.R.H.S., Essex Villa, Guildford, Surrey. (Arch.)
1937 Green, D. B., Church Cottage, Church Harborough, Oxon. (Orn.)
1939 Greenfield, H. F., Lt., R.A., c/o Beech Bank, Stuart Road, Warlingham, Surrey. (Orn.)
1928 Griffin, Miss M., Lanherne, Heathfield, Sussex. (Orn.)
1937 Guichard, K. M., c/o 10 Lyndhurst Gardens, N.W.3. (Bot., Ecol., Ent., R.)
1927 Hardiman, Miss A., Hyron's Cottage, Woodside Road, Amersham, Bucks. (R.)
1935 Harris, A. H., Silton, Loughborough Road, Ruddington, Notts. (Orn.)
1935 Hatch, R. S., c/o 66 Coston's Avenue, Greenford, Middx. (Orn.)
1930 Haworth, Miss F. M., B.Sc., F.Z.S., Lytton Lodge, Codicote, near Hitchin, Herts. (Bot., Zoo.)
1937 Hayward, H. H. S., 60 Ridge Crest, Enfield, Middlesex. (Orn.)
1936 Hilliard, R., c/o 5 Oakleigh Gardens, Edgware, Middx. (Ecol., Ent.)
1938 Hodge, Mrs E. M., 62 Roseneath Road, S.W.11. (Arch.)
1937 Hodge, G. A., 62 Roseneath Road, S.W.11. (Orn.)
1919 Horn, P. W., The Cottage, Bower's Lane, Riseley, Beds. (Aqua., Orn.)
1933 House, F. C., c/o 294 Footscray Road, S.E.9. (Ecol., Orn., R.)
1929 Johns, Miss F. E., 30 Mt. Stewart Avenue, Kenton, Middx. (Bot., Orn., R.)
1939 Jones, H. O., 49 Eaton Road, Sutton, Surrey. (Orn.)
1937 Keen, Mrs E. M., 15 Doughty Street, W.C.1. (Arch.)
1936 Lamont, Mrs E. H., 49a Netherhall Gardens, N.W.3. (Orn.)
1935 Leatherdale, D., c/o Tasli, Hawk's Hill, Leatherhead, Surrey. (Bot., Ent., Geol., Pl. G., R.)
1928 Lee, Miss M., Lanherne, Heathfield, Sussex. (Orn.)
1938 MacAlister, D. A., c/o Natl. Prov. Bank, 18 Cromwell Place, S.W.7. (Orn.)
1923 Mann, E., 10 Frankland Road, E.4. (Ecol., Orn., P. L.)
1939 Marsh, Miss B. M., 35 Castleview Gardens, Ilford, Essex. (Bot., Ecol., Ent., Orn.)
1940 Mayo, R. W., Inaspinney, Oaklands, Welwyn, Herts. (Orn.)
1934 Morgan, D. A. T., c/o 3 Upton Field, Southwell, Notts. (Ecol., Orn., R.)
1939 Morgan, Miss L., 10 Old Square, Lincolns Inn, W.C.2.
1938 Mulholland, Rt. Hon. H., M.P., Speaker's House, Stormont, Belfast. (Orn.)
1934 Munro, Miss M., Brown Clee, Hollybush Road, Cardiff. (Ecol., Orn.)
1937 Musselwhite, D. W., 7 Leacroft Avenue, S.W.12. (Orn.)
1942 Nevinson, Mrs (Miss Evelyn Sharp), 2/23 Young Street, W.8. (Orn.)
1926 Niblett, M., 10 Greenway, Wallington, Surrey. (Ent., Pl. G.)
1937 O'Farrell, A. F., B.Sc., A.R.C.S., F.R.E.S., 15 Fitzwilliam Avenue, Ormeau Road, Belfast. (Ecol., Ent.)
1933 Oke, E. E., Tweenways, The Mount, Leatherhead, Surrey. (Ent., Orn., R.)
1938 Park, W. D., c/o 34 White Horse Drive, Epsom, Surrey. (Ecol., Orn.)
1921 Parsons, Lt. Cdr. S. T. T., R.N.V.R., c/o Westminster Bank Ltd., 8 Borough High Street, S.E.1. (Orn.)
1937 Patterson, H. G., 15 Queen's Gate Gardens, S.W.7. (Orn.)
1935 Pearse, B. S. K., 74 Ashgrove Road, Goodmayes, Essex. (Bot., Ent., Orn.)
1941 Pinks, R. S., 25 Parkdale Crescent, Worcester Park, Surrey. (Orn.)
1927 Piper, Miss G. E. M., 29 Loulsa, Rhiwbina, Cardiff. (Orn.)
1940 Plumptre, Miss H. M., The Hindles, Atherton, Lancs. (Bot., Orn.)
1935 Pollard, Mrs H. B., The Limes Cottage, Pilgrims Way, S. Croydon, Surrey. (Ecol., Orn.)
1925 Poock, S. G., 65 Milton Road, Harpenden, Herts. (Ecol., Orn.)
1940 Poore, A. C. G., c/o 17 West Avenue, Wallington, Surrey. (Orn.)
1937 Rose, C. C., c/o Ellerslie Guest House, Fittleworth, Sussex. (Orn.)
1939 Russell-Smith, Miss J. M., Heathfield, Little Heath, Potter's Bar, Mdsx. (Bot., Orn.)
1939 Simon, M. H. H., Sharston House, Knutsford, Cheshire. (Ecol., Orn.)
1933 Skrimshire, E. H. N., F.R.A.I., F.Z.S., 5 Oldwell House, N.6. (Arch., Orn., R.)
1940 Smeed, J. A., 133 Cassiobury Park Avenue, Watford, Herts. (Orn.)
1937 Smith, M. A., M.R.C.S., Lane End, Putney Heath Lane, S.W.15. (Amph., Rep.)

1927 Southern, H. N., M.A., F.Z.S., 8 Sollershott Flats, Linkside Avenue, Oxford. (Ecol., Orn.)
1937 Spicer, A. H., M.C., M.R.C.S., L.R.C.P., Graffham, near Petworth, Sussex. (Orn.)
1935 Spinney, G. H., B.A., East Hill Cottage, Copthorne, Crawley, Sussex. (Arch., Bot., Ecol., R.)
1928 Talbot, G., F.R.E.S., 31 York Road, Woking, Surrey. (Lep.)
1931 Thomas, Mrs P. I., Nightingales, Cobham Road, E. Horsley, Surrey. (Ecol., Orn., R.)
1939 Thornton, J. O., 6 Arterberry Road, S.W.20. (Orn.)
1934 Tours, H., 7 Briar Road, Kenton, Middlesex.
1935 Tracy, N., M.B.O.U., The Black Cabin, South Wootton, King's Lynn, Norfolk. (Orn.)
1908 Tremayne, Mrs L. J., Grand Buildings, Trafalgar Square, W.C.2. (Arch., Bot., Orn., R.)
1940 Tucker, A. V., St Anne's, Bathurst Walk, Iver, Bucks. (Orn.)
1937 Upton, Mrs P. V., Eweland Hall, Margaretting, Essex. (Orn.)
1935 Van Oostveen, Miss M. S., c/o 11 Gloucester Walk, W.8. (Ecol., Ent., Orn.)
1938 Vesey-FitzGerald, B. S., F.L.S., F.G.S., Editor "The Field," 41 Southgate Street, Winchester, Hants. (Ecol., Orn., Zoo.)
1941 Wagge, Miss L. E., 3 Arthur Street, King's Lynn, Norfolk. (Biol.)
1925 Ward, B. T., 24 Long Deacon Road, E.4. (Bot., Ecol., Ent., Orn., Pl. G., R.)
1933 Ward, Miss I. W., Amaryllis, Hughenden Valley, High Wycombe, Bucks. (Icht., Orn.)
1937 White, C. A., 18 Townsend Road, Southall, Middx. (Orn.)
1933 White, E. I., D.Sc., Ph.D., F.G.S., 140 Westwood Road, Tilehurst, Reading, Berks. (Palaeontology, Orn.)
1937 Wiggins-Davies, W. W., c/o Bracebridge, Four Oaks, Warwickshire. (Orn.)
1934 Wightman, Lieut. S., R.N.V.R., H.M.S. Braithwaite, c/o G.P.O., London. (Orn.)
1936 Willcox, J. M. (Capt., R.A.M.C.), M.B., Ch.B., c/o The Moat House, Alvechurch, B'ham. (Orn.)
1932 Williams, A. R., Barclay's Bank, Haifa, Palestine. (Orn.)
1936 Wilson, J. M., M.B., B.S., R.A.M.C., Spinnerswood, Fawke Common, Sevenoaks, Kent. (Orn.)

The following abbreviations are used in the above list of members:—Api., Apiculture; Aqua., Aquaria; Arch., Archaeology; Ast., Astronomy; Biol., Biology; Bot., Botany; Chem., Chemistry; Col., Coleoptera; Conch., Conchology; Dipt., Diptera; Ecol., Ecology; Ent., Entomology; Ethn., Ethnology; Geol., Geology; Hem., Hemiptera; Hym., Hymenoptera; Icht., Ichthyology; Lep., Lepidoptera; Mam., Mammals; Micr., Microscopy; Mycol., Mycology; Neur., Neuroptera; Orn., Ornithology; Orth., Orthoptera; Ool., Oology; Pl. G., Plant Galls; P. L., Pond Life; R., Ramblers' Section; Rep., Reptilia; Zoo., Zoology.

* Signifies a Life Member.

PUBLICATIONS OF THE SOCIETY.

London Naturalist, 1921-24, 1931, each 3s; 1932, 1934-35, each 5s; 1936-44, each 3s 6d. **London Bird Report,** 1936-37, 1939-44, each 1s 6d. **Transactions of the London Natural History Society,** 1914-17, 1919-20, each 3s. **Transactions of the City of London Entomological and Natural History Society,** 1891-1911, each 2s; 1912-13 (1 vol.), 3s.

N.B. — Members may obtain any of the above at two-thirds of the published price from the General Secretary.

"LONDON NATURALIST" REPRINTS.

4.—The Thames as a Bird Migration Route: President's Address, 1928, by W. E. Glegg, 6d. **7.—The Birds of Middlesex since 1866:** President's Address, 1929, by W. E. Glegg, 1s. **9.—British Gall Mites,** by H. J. Burkill (1929), 6d. **10.—Some Diurnal Observations on the Nightjar,** by David Lack (1929), 6d. **19, 20, 21, 22, 23, 25, 30.—The Survey of Limpsfield Common: 1** (1937), 6d; **2** (1938) with map, 9d; **3** (1939), 6d; **4** (1940), 3d; **5** (1941), 6d; **6** (1942), 3d; **7** (1943), 2d. **24.—Randolph William Robbins, 1871-1941,** 6d. **29, 33.—The Survey of Bookham Common** (with maps). **2** (1943), 6d; **3** (1944), 9d. **27, 31, 34.—The Epping Forest Survey** (with map); **1** (1942), 3d; **2** (1943), 6d; **3** (1944), 9d. **28.—The Starling Roosts of the London Area,** by R. S. R. Fitter (1942), 6d. **32.—Check-List of the Birds of the London Area** by R. S. R. Fitter and E. R. Parrinder (1943), interleaved, 6d. **Map of the Society's Area,** 2d. **Life of A. W. Bacot,** by Prof. M. Greenwood, reprinted from *Journal of Hygiene* (1924), 6d.

Temporary Geological Sections.

THE South Eastern Union of Scientific Societies has requested the co-operation of natural history societies within its area in the work of recording temporary geological sections. It is earnestly hoped that all members of the London Natural History Society will assist in this work, whether interested in geology or not.

This does not mean that members are asked to burden themselves with a lot of work. All that is required is that they should send to the address given below particulars of any temporary geological sections which may come to their notice.

Temporary geological sections occur in various ways, the commonest being trenches for water-mains or sewer-pipes, excavations for the foundations of buildings, cuttings for new roads, etc. It is probable that many new sections of this kind will occur in the post-war reconstruction period, and it is important that they should be accurately recorded while they are still fresh and accessible.

When sending information about temporary sections the following details are particularly required: (a) Precise location of the site; (b) nature and thickness of the beds exposed; (c) the exact position of fossils or flint implements, should any be found.

If members find that they are unable to supply full details of a new section, a post-card giving notice of its existence would be better than nothing. It might be possible to arrange for someone to visit the site and make a full record.

Information should be sent to Mr E. F. Bunt, 34 Buckleigh Road, Streatham, S.W.16.

LONDON NATURAL HISTORY SOCIETY.

THE Society is an amalgamation of the City of London Entomological and Natural History Society, founded in 1858, and the North London Natural History Society, founded in 1892.

A meeting is held on the 1st and 3rd Tuesday evenings in each month in the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. The room is open from 6 p.m. to 9 p.m., and meetings begin punctually at 6.30 p.m. and end about 8.30 p.m., unless other arrangements are announced. The Library and Collections are available to members on these occasions.

The **Chingford Local Branch** meets at the Staff Recreation Room, Chingford Laundry, Chingford Green, at 2.45 p.m., on the first Saturday in each month during the winter months.

At all indoor meetings specimens of Natural History interest are exhibited, and papers on various subjects are read and discussed. Visitors may be introduced by members of the Society, and are cordially welcome. Frequent field meetings are held at week-ends; particulars may be had from sectional secretaries.

The minimum Annual Subscription for members is 12s 6d; if under 25 years of age the minimum is 7s 6d; for associates, 5s minimum. New members and associates pay an entrance fee of 2s 6d. Subscription renewals, which should be sent to the Treasurer, become due on January 1st. Members elected after October 1st pay no subscriptions for the current calendar year.

Each member and associate is entitled to one copy of *The London Naturalist* and *The London Bird Report* free; extra copies may be purchased by members, if supplies are available, at two-thirds of the published price.

Further information and syllabus may be obtained from the General Secretary:—**H. A. TOOMBS, Dept. of Geology, British Museum (Natural History), Cromwell Road, S.W.7.**

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