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**THE
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LONDON NATURAL HISTORY SOCIETY

No. 42 for 1962

PRICE THIRTEEN SHILLINGS AND SIXPENCE

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*Isn't
nature
marvellous?*



*There are tom-cats at the bottom of the garden;
Forty starlings have just landed on the lawn
Where a mole (sans 'by your leave' or pardon)
Has been building mole-hills ever since the dawn.*

*Caterpillars by the thousand throng the late greens —
Not a cabbage will there be that's fit to eat.
And the raspberries can only be called 'has-beens':
Yes — the blackbirds did enjoy their little treat.*

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No mouse is having bank-notes for his tea;
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THE LONDON NATURALIST

No. 42 for the year 1962

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Published July, 1963

Report of the Society for 1962

THE membership of our Society at the end of October 1962 stood at 1,515; this is a decrease of 15 on the corresponding figure for the previous year.

It is with deep regret that we announce the deaths of the following members: Joseph Ross, who joined the Society in 1910 and was an Honorary Vice President for many years, Mr. W. N. Lawfield, Miss J. Hodge, Mrs. V. Rusden and Miss G. E. Todd. An obituary notice of Mr. Ross appears on page 112.

It will be remembered that following the loss of our premises at Eccleston Square in 1961, our library and various collections were moved into store at Queen Mary College, Mile End. It was, however, made clear to us at the time that this facility would only be available for a limited period.

Early this year an offer was received from the Wandsworth Borough Librarian through our then Honorary Secretary, Mr. R. C. Vernon, to accommodate our library in the News Room of the Wandsworth Public Library. While negotiations were proceeding a further offer of help was received through our General Secretary, Mrs. L. M. P. Small, from Dr. F. A. Toufar, the reference Librarian of Ealing. After consideration of both these offers, your Council decided that our library should be installed in the buildings of the Ealing Borough Library. A written agreement is being concluded between us and the Ealing Borough Council with very generous terms for our Society, which will give us a permanent home for our library.

Unfortunately, we were unable to find a home for our collections and some parts of these have had to be disposed of. As the office of Curator has therefore lapsed, Mr. B. L. Sage has undertaken to compile, and keep up to date, a record of the whereabouts of the items in the Society's collections which are still in our possession.

The library was moved to Ealing on September 6, and under the new arrangements sectional librarians will no longer have any duties. Your Council therefore decided to appoint a Library Committee, consisting of members having between them a wide range of knowledge of natural history publications, to administer the library at Ealing.

The position of Honorary Librarian to our Society has been conferred on Dr. F. A. Toufar and your Council desires to place on record its grateful thanks to Dr. Toufar for his invaluable assistance in finding a permanent home for our library.

We have this year again received through the Royal Society a Parliamentary grant-in-aid of £150 towards the cost of our publications. We are also pleased to acknowledge a special grant from the Royal Society of £50 towards the cost of printing a catalogue of our library.

Several members of Council have expressed grave concern at the apparent apathy of many of our members and in particular the poor attendances at some of the Sectional indoor meetings. A committee of Council has been set up to consider this problem in relation to the present and future scope of the Society's activities. As a first step sectional secretaries were asked to prepare a summary of attendance records.

During this year the Society's film on the birds of the London area, now titled "London's Birds", was completed. Our original intention was to engage the services of a professional advisor who would make all the necessary arrangements on our behalf, for a showing of our film at

the Festival Hall. However, it became clear early this year that it would not be possible to book the Festival Hall until the end of 1964 or later. As several members of Council strongly advised against such a delay, our General Secretary made a survey of other suitable halls in the London area. Our final choice was the Assembly Rooms in St. Pancras Town Hall, and a Film Presentation Committee was appointed by Council to be responsible for the arrangements there.

At a General Meeting of the Society held on July 3, Mr. I. S. MacPhail, Campaigns Director of the World Wild Life Fund, gave a lecture on the aims and work of his organization. A collection in support of this fund taken after his lecture raised nearly £25.

There are already in this country about thirty active organizations known as County Naturalists' Trusts, whose principal aim is to protect sites of special scientific interest within their county boundaries. Reports from three of these Trusts appear on page 104 *et seq.* We are co-operating with the Hertfordshire Natural History Society and the Hertfordshire Society in an attempt to set up a Naturalists' Trust for Hertfordshire and Middlesex.

During July of this year, a group of Society members led by Mr. L. Manns laid an experimental Nature Trail on Esher Common. The route was followed by some thirty members, many of whom, although initially sceptical, were favourably impressed. As you may know, such trails are widely used in America and in some European countries as a method of instruction for students of all levels in field ecology. Council subsequently gave Mr. L. Manns authority to form a Committee to organize a nature trail on behalf of the Society for the National Nature Week in May 1963.

In June, the Archaeological Section was one of the parties to the formation of the Southwark Archaeological Excavations Committee, which is to organize and co-ordinate archaeological work in the area. Representatives of the Cuming Museum, Southwark, the Guildhall Museum, the Surrey Archaeological Society and the London and Middlesex Archaeological Society sit on the committee with D. J. Turner of this Section and P. R. V. Marsden of the Guildhall Museum as field staff. The first season's work was a three-week excavation at 199 Borough High Street, a site that had recently been cleared prior to redevelopment. It is hoped that a preliminary report will soon be available for publication in the *London Naturalist*.

Members of the Archaeology Section have also assisted in the excavation of a Late Bronze Age farmstead in Weston Wood near Albury in Surrey. The work is directed for the Surrey Archaeology Society by Miss Joan Harding, one of the Section's committee members. The finds from the site included a large storage jar with pinched-out base of a type found in Farnham, and a small bowl of harder ware. There is also a piece of a cake of bronze, a most unusual find from a habitation site.

In May Mr. D. J. Turner arranged a demonstration to the Section of a resistivity survey meter, an instrument which can reveal the presence of buried features. The site of Merton Priory was chosen for the demonstration and following it a trench was dug in accordance with the predictions of the instrument. A buried structure was duly uncovered and further excavations were continued at week-ends until August under the direction of Mr. Turner and in conjunction with the Merton and Morden

Historical Society. An account of these excavations appears on page 79, and it is hoped to continue the exploration of the site in 1963.

The Whitsun week-end expedition to Ilkley was the most ambitious field meeting so far arranged by the Botanical Section. This turned out to be a very successful meeting indeed and we are much indebted to the Wharfedale Naturalists' Society whose willing co-operation and generous hospitality made this outing a memorable occasion.

There has been a highly satisfactory response to the Section's survey of *Calystegia* in the London area; an encouraging number of records have already been submitted (see page 18).

Since the last annual report, a great deal of work has gone into the Society's Herbarium. Every sheet has been examined and either donated to the British Museum or retained to form part of the Society's reduced collection. This is now a representative collection of the British flora and a catalogue has been compiled by the Section's Curator.

One of our members was successful in obtaining permission from the Superintendent to visit the grounds of Woolwich Arsenal earlier this year. As a result a small party of botanists were able to examine an area which had hardly received any attention for many years.

The work at Bookham Common still largely depends upon the efforts of a small group of enthusiastic members, and the Ecology Section committee is concerned about the continued lack of support from the general membership. The Conservation Corps continued with scrub clearance this year. The National Trust Local Management Committee organized a public meeting, which was very well attended, to arouse interest among local residents in the natural history of Bookham Common and the problems of conservation.

Mr. W. Teagle, who has been the recorder of Mammals, Reptiles and Amphibians for many years is leaving the London area. In future there will be separate recorders for Mammals, for Reptiles and Amphibians, and for Fishes.

Although the library has now been accommodated at Ealing, it has not been possible to find a permanent home for the entomological collections. The Entomological Committee reluctantly came to the conclusion that the collections could not be put into store indefinitely. It was decided therefore to dispose of the collections with the exception of the 40-drawer cabinet which has been loaned to the Croydon Natural History Society.

Of the seven entomological field meetings held this year the outing to Mickleham Downs was particularly notable. On this occasion the larva of the Lobster Moth (*Stauropus fagi* L.) and several specimens of the long-horned grasshopper *Meconema thalassina* Degeer were found.

Following the publication of the results of the Stag Beetle survey in the *London Naturalist* No. 40 further records are still coming in. A second report, covering the whole of the country, is expected to be ready for publication in 1964.

The Epping Forest Field Section held 23 field meetings in the past year which catered for a wide range of natural history interests. These were all well attended, except on two occasions when the weather kept all but the hardiest members indoors.

The attendance at field meetings of the Geological Section was a little better than in 1961 and the number of new members attending was encouraging.

For the third successive year there was an exhibit at the annual reunion of the Geologists' Association. This was devoted mainly to specimens and included glacial erratics from Cromer, and an eel's skull from Sheppey.

The annual Easter field meeting was centred upon Weymouth. Under the guidance of Miss Samuels of the Dorchester County Museum, a day was spent on the coast east of Weymouth and features seen included the fossil forest at Lulworth. Another day was spent with Dr. House of Durham University inspecting the geology of the Weymouth anticline and exposures along the Fleet Lagoon including the famous exposure in the Boueti beds at Herbury Gore. Other items at the meeting included the Inferior Oolite at Burton Bradstock and the iron ore bed at Abbotsbury, the party being led by Mr. Underwood.

Among the shorter field meetings was a coach tour to the Vale of White Horse. The leaders, Mr. Butler and Miss Wheeler, took the members to see the very fossiliferous sponge gravels at Faringdon and the Corallian at Shellingford in addition to White Horse Hill itself. There was also a very fossiliferous collecting tour to the crag deposits of Suffolk and a well-attended meeting at Seaford.

The subjects covered at indoor meetings ranged from the geology of Jersey to cave research and fossil sea urchins. Several visits were held during the winter and included the Hampton works of the Metropolitan Water Board, the showrooms of Gregory Bottley & Co., and the Natural History Museum. Under the guidance of Mr. Moorman several members made a study of the Micraster zones of the Chalk in the pit at Coulsdon (see page 74). A very valuable addition to the sectional photograph album this year has been a series of photographs reproduced from negatives lent by Mr. G. MacDonald Davies, the author of several important books on the geology of S.E. England.

The South West Middlesex Group reports that they now have 84 members, an increase of 22 over the previous year. The field meetings have again been well attended this year and the Group Entomological Observer has had another successful year. The Essex Skipper was found again in the same area as last year and also seven species of Lepidoptera new to the area were taken. Of particular interest among these were: Rosy Minor (*Miana literosa* Haw), Triple Spotted Pug (*Eupithecia trisignaria* Herrick-Shaeffer), Rosy Footman (*Miltochrista miniata* Forster) and the Spruce Carpet (*Thera variata* Schiffermueller).

The Young Naturalists' Section is still carrying on, despite the difficulty of finding sectional officials who are able to hold office for more than one year. Towards the end of the year a group of five of its members recorded a short broadcast at Beddington Sewage Farm. Following an introductory talk by Mr. J. E. Lousley, the programme which consisted of an interview by John Ellison was included in the B.B.C. feature "Junior Time".

The indoor meetings of the Ornithological Section covered a very wide range of subjects this year, and included sound recordings, colour films, a symposium by members on bird watching holidays, identification of warblers, accounts of two Irish observatories, moon watching, bird movements on radar and wader migration. Nearly eighty field meetings were held, which is the largest number ever in one year. Excluding special cases such as coach trips and week-end meetings, the attendance at these meetings was usually between ten and thirty people.

A feature of the year was the holding of two week-end outings. The first, a wild goose chase to the Solway, was an outstanding success in every way and led to a demand for more ventures of this kind. The second, an expertly organized visit to Dorset, suffered from stormy weather at Portland but was much enjoyed in spite of some ornithological disappointment.

During this year over 1,100 birds have been ringed by the group working at Beddington. Once again, Swifts head the list both for numbers ringed and recoveries, and although there have been no foreign recoveries this year, there has been quite a wide scatter throughout South-East England. Work is at present under way on an analysis of the data obtained from Swift ringing over the last six years, during which time over 3,300 Swifts have been ringed at Beddington Sewage Farm.

Another London migration watch was carried out in the autumn and again held excitements for those who arose from their beds to man the early morning posts. For example, Crossbills were reported and this lends support to the theory that there was a second irruption of these birds. Unfortunately, the watches were often hampered by early morning mist which prevented the exercise from equalling the success of 1960.

Membership of the Ramblers Section increased by 18 during the year. Two indoor meetings were held, and a wide variety of excursions to places of interest in London and rambles in the countryside.

Botanical Records for 1962

Compiled by J. EDWARD LOUSLEY

LONDON'S weather in 1962 was a greater handicap to the growth of plants than to botanists searching for them. The year was remarkable for persistent low temperatures, though the total rainfall for the year (23.42 inches at Kensington) was below average. In January heavy snowstorms and cold weather were followed by a milder February, and then a colder March with unsettled weather in April. Spring flowers were therefore backward, and flowering times continued to be about a month late well into the summer. June was sunny and dry but cool, leading to an unsettled wet August with one of the coldest and wettest Bank Holidays on record. In September temperatures were again below average, and it was not until October that we enjoyed a spell of settled warm weather. By then it was too late, as even the alien species we usually look for at that time of the year had failed to make growth sufficiently earlier to mature before the cold weather set in at the end of the month.

While it is gratifying to report that the number of useful records contributed is yet again greater than in any previous year, they are a reflection of the increase in enthusiasts making a thorough search of parts of the Area, rather than of favourable conditions for plants. It is noteworthy that no good hauls of aliens were reported such as have been found in previous years. Useful progress has again been made in recording the flora of private grounds. Thanks to the initiative of Fl.-Lt. G. Halligey a small party was able to examine a very important area long closed to the public within the fences of Woolwich Arsenal. Mrs. B. Welch and Mrs. J. E. Smith gained access to parts of Hurst Park Racecourse now to be destroyed by development, and this interesting flora is the subject of a separate paper. Mrs. A. G. Side examined a private chalkpit near Stone and made the important discovery of a fine colony of a rare wintergreen, *Pyrola rotundifolia*, and Dr. F. Rose found a scarce helleborine, *Epipactis phyllanthes*, in the same pit. Dr. A. G. Spooner's record of Kent milkwort, *Polygala austriaca*, in a new locality is also from the same county.

This year about three quarters of the records contributed were from south of the Thames, and we have been even more fortunate than usual in the number of long and valuable lists contributed by enthusiastic members for Kent and Surrey. For the counties north of the Thames the coverage is less satisfactory, but there have been particularly welcome lists of additions for Essex and for our tiny piece of Bucks.

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

V.-c. 16, WEST KENT.

Mention has already been made of Dr. A. G. Spooner's discovery of *Polygala austriaca* in chalk grassland near Cudham (45). The new locality is only about 2,000 yards from the Surrey border and encourages the expectation that sustained search will result in its rediscovery in that

county. He has also sent specimens of two rare fumitories; *Fumaria micrantha* from Chelsfield (46) and *F. muralis* subsp. *boraei* from near Knockholt (45), and he and D. Stoyel saw Deptford Pink, *Dianthus armeria*, in a place near Chelsfield (46) found by C. A. Vink. The list contributed by K. White includes a single plant of columbine, *Aquilegia vulgaris*, seen near Pratt's Bottom (46), and a flourishing patch of green hellebore, *Helleborus viridis*, east of Downe (46).

On July 21 a small party including Fl.-Lt. G. Halligey, P. Holland and myself visited a large area in the grounds of Woolwich Arsenal (47) from which, except for a very few casual records made by people on duty there, no botanical observations were available for the present century. Before this was taken over by the government the marshy ground had produced a most interesting flora, including several rarities and our object was to make a preliminary survey to see if any of these survived. Much of the area has been greatly changed. The alien crucifer *Bunias orientalis*, and alien docks, *Rumex patientia* and *R. cristatus* occurred in abundance, and we also found the hybrid *Rumex crispus* × *R. cristatus*. Drainage ditches contained species found in brackish water such as *Potamogeton pectinatus*, *Zannichellia palustris* and *Callitriche obtusangula* but the most interesting area was a small saltmarsh on the bank of the Thames. Here there were English Scurvy-grass, *Cochlearia anglica*, Sea Spurrey, *Spergularia marina*, a Water Dropwort, *Oenanthe lachenalii*, Sea Milkwort, *Glaux maritima*, Sea Aster, *Aster tripolium*, Sea Arrowgrass, *Triglochin maritima*, and a rush *Juncus gerardi*—a good assemblage of seaside plants for so far up the river. On the embankment here were plants of Asparagus, *Asparagus officinalis*, which raise an interesting problem. This plant seems to be well distributed along the Thames in saltmarshes from Gravesend through Swanscombe and Stone on the south bank, and at Rainham and West Thurrock in Essex. There are old records which suggest that it is not a new arrival, but on the other hand from observations elsewhere there is no doubt that the species can be bird-distributed from cultivated plants. Records from ornithologists of the feeding on asparagus fruits of a bird likely to carry them along the Thames marshes would be welcome as likely to assist in explaining this distribution pattern.

Later the same day the same party visited a pit near Greenhithe (57) where *Vicia cassubica*, an alien vetch, has been established for 30 years (see *J. Bot.*, 70, 52, 1932). In spite of recent dumping of rubbish the plant is still flourishing, as is a stonecrop, *Sedum spurium*, while on the tipped area we found *Scolymus maculatus* L., sunflower, *Helianthus annuus* L., Coriander, *Coriandrum sativum*, and a goosefoot, *Chenopodium hybridum*. A week earlier Mrs. B. H. S. Russell sent me specimens of *Cephalaria syriaca* (L.) Schrad., *Spinacia oleracea* L., and *Vaccaria pyramidata* from the same pit. The brambles of Chislehurst Common (46) were studied on a B.S.B.I. field meeting, when D. McClintock collected specimens of a hawthorn, *Crataegus* × *lavalleyi* Herincq, which was no doubt originally planted, but looked wild.

Reference has already been made to the discovery by Mrs. A. G. Side of a Wintergreen, *Pyrola rotundifolia*, in a chalkpit near Stone (57). This was a fine colony with about 200 flowering spikes, and growing under very similar conditions to the one near Grays, almost opposite on the north side of the Thames, found by B. T. Ward in 1948. These are the only occurrences of the species in the London Area. What is equally remarkable is that Dr. Rose detected 12 plants of the orchid,

Epipactis phyllanthes in the same pit, and this is known at only one other place in our Area.

We are particularly fortunate this year in receiving three long and detailed lists covering records mainly from the north of Kent, and all three gave six figure National Grid references and useful comments. One was from H. M. Pratt, which continued the series he has supplied for a great many years. Another, in two instalments, from H. A. Sandford gave the most precise account of the distribution of some of the salt-marsh species we have yet received. One of his interesting observations was of an extensive colony of *Aster tripolium* at Swanscombe a mile inland from the Thames in a disused chalkpit. The third list from Mrs. J. K. McLean and Mrs. M. C. Foster was particularly useful for detailed distribution of *Ranunculus ficaria* subsp. *ficaria* and subsp. *bulbifer*—the former seems to be the commoner round Bexley Heath, and the latter round Stone and Greenhithe.

V.-c. 17, SURREY

It is strange how each year produces a sudden rush of records for particular species. In 1962 an uncommon sedge, *Carex strigosa*, was found by me in Rye Wood (35), and by R. Clarke in Titsey Plantation (35), and at Tenchleys, Limpsfield (45) within our Area, while a number of additional Surrey localities were found farther from London. Similarly, and also with no connection with the season, Tuberous Comfrey, *Symphytum tuberosum*, has been found in three new places this year. Mrs. J. E. Smith found it in a hedgerow at Upper Long Ditton (16), and R. Clarke near Nower Wood (15?) and with Dr. D. P. Young at the Rook's Nest (45). Their examination of this private estate also produced an uncommon Wintercress, *Barbarea intermedia*, Morella Cherry, *Prunus cerasus*, *Salix triandra* and *Montia perfoliata*.

Mr. Clarke found an interesting bank at Addington (36) with Soft Knotted Clover, *Trifolium striatum*, and Fenugreek, *Trifolium ornithopodioides*. In Kennel Wood, Addington (36) he recorded Marsh Violet *Viola palustris*, and by the railway on Tooting Bec Common (27) Zigzag Clover, *Trifolium medium*, and Bloody Cranesbill, *Geranium sanguineum*—the last no doubt an "escape". The long list he contributed is the product of far more hours of fieldwork than most of us can hope to achieve during a year, and the results amply justify the effort. It includes new stations for Man Orchid, *Aceras anthropophorum*, near Lumberdine, Chelsham (35) and at Titsey (45); Field Bur-parsley, *Torilis arvensis*, confirmed by Dr. D. P. Young, from near Chelsham Church (35); Field Woundwort, *Stachys arvensis*, from below Titsey Plantation (35); Weasel-snout, *Misopates orontium*, from Limpsfield Chart (45); Seaside Thistle, *Carduus tenuiflorus*, from north Godstone (35); and an alien Brome-grass, *Bromus carinatus*, previously known to us in Surrey only from near the Thames, from Chelsham, where specimens from a well established colony were determined by Dr. D. P. Young.

The examination of part of Hurst Park Race-Course (Moulsey Hurst) near the Thames (16) by Mrs B. Welch and Mrs. J. E. Smith showed that fine displays of many beautiful plants persisted in this habitat soon to be destroyed. An account appears elsewhere (see page 13), but mention must be made here of abundance of Autumn Squill, *Scilla autumnalis*, Clustered Bellflower, *Campanula glomerata*, Dropwort, *Filipendula vulgaris*, Meadow Cranesbill, *Geranium pratense*, and Sheep's

Bit, *Jasione montana*, many plants of Hoary Cinquefoil, *Potentilla argentea* and Field Mouse-ear Chickweed, *Cerastium arvense*, and in a gravel-pit the occurrence of Soft Trefoil, *Trifolium striatum*, and other nice plants. Near Weybridge (06) a party including Mrs. Welch, Mrs. Smith and myself observed *Prunus serotina* Ehrh., which resembles Bird Cherry, naturalized in private grounds and reproducing freely from seed, and *Stellaria neglecta* was found in wet woodland nearby. Other records contributed by Mrs. Smith include Smith's Cress, *Lepidium smithii*, from an embankment near Chessington (16), and *Petasites japonicus* established at Long Ditton (16).

Sheepsbit, *Jasione montana*, was found by Miss B. M. C. Morgan under pine trees in the grounds of Shagbrook, between Buckland and Reigate Heath (25), and she reported a peloric plant of the Bee Orchid, *Ophrys apifera*, from near Pebblecombe Hill (25). Deadly Nightshade, *Atropa belladonna*, turns up in scattered London gardens from time to time and may be bird-distributed. This year Mrs. J. Griffiths has reported it as persistent in her garden at Arthur Road, Wimbledon. (27). A comfrey, *Symphytum asperum*, was found established by D. McClintock at Nonsuch Park, Ewell (26), and a specimen of *Nicandra physalodes* from a building site at Putney (27) was exhibited by Miss J. M. Stoddart at one of our meetings. The discovery of an uncommon Broomrape, *Orobanche elatior*, near Great Bookham (15) by Mrs. K. Le Sueur is a considerable extension of the known range of this plant on the Surrey chalk. Two interesting finds have been made in Richmond Park (17?)—Pillwort, *Pilularia globulifera*, was found in one of the ponds by B. Dodds and the record communicated by P. F. Hunt. and *Elodea callitrichoides* was found by Miss M. McCallum Webster in flower in December 1961.

V.-c. 18, SOUTH ESSEX

We are grateful to S. T. Jermyn for contributing a long list of Essex records which have helped to fill many gaps in distribution. These include Soft Clover, *Trifolium striatum*, found by E. Saunders near Sewardstone (39), *Crepis biennis* near West Thurrock Church and in Grays Chalkpit (both 57), and *Hieracium aurantiacum* in plenty in an old chalkpit at Thurrock (57). On the L.N.H.S. visit to Grays Chalkpit in June Fuller's Teasel, *Dipsacus sativus*, was found for the second year running.

V.-c. 19, NORTH ESSEX

Mr. Jermyn's additions have also been a great help with this part of our Area. In addition, Tansy, *Chrysanthemum vulgare* is recorded from Waltham Abbey (30) by D. H. Kent, J. G. and C. M. Dony, and Mrs. B. H. S. Russell, and a garlic, *Allium paradoxum*, from just outside our Area near Chipping Ongar (50) by Mrs. L. M. P. Small.

V.-c. 20, HERTS.

Again we have few records for this county. Various aliens were found near Arnos Grove by B. Wurzell including a small patch of Slender Speedwell, *Veronica filiformis*.

V.-c. 21, MIDDLESEX

In Inner London the outstanding feature of 1962 was the rather rich flora which developed in Hyde Park on ground disturbed for new roads.

Near Hyde Park Corner (27) Lady Anne Brewis reported *Verbascum virgatum* and an Evening Primrose, *Oenothera parviflora*, while by the Serpentine she collected *Poa palustris*. From Hyde Park (28) D. McClintock sent me specimens of *Carex muricata* (= *C. pairaei*). I was particularly impressed by the extraordinary abundance of seedlings of London Plane, *Platanus × hybrida*, and especially near Hyde Park Corner (27), which were in far greater numbers than I have ever seen them elsewhere. The City bombed sites are rapidly disappearing but a few plants are still to be found. At Ropemaker Street (38) I collected two hawkweeds which have been determined by Dr. C. West as *H. vagum* and *H. calcari-cola*. Another hawkweed was collected by Miss R. Ronaason at 3 Chesham Place, S.W.—this was handed to me by D. McClintock and confirmed as *H. umbellatum* by Dr. West.

The Botanical Section meeting to Whitewebbs Park, Enfield (39) produced several interesting records. One plant of Maidenhair Fern, *Adiantum capillus veneris*, determined by A. C. Jermy, was found on the brick margin of the lake, Martagon Lily, *Lilium martagon*, and a cultivated blackberry, *Rubus laciniatus*, were found established, and the continued existence of Purple Helleborine, *Epipactis purpurata*, confirmed. From a garden in Pitshanger Lane, Ealing (18), Mrs. Small reports *Galeopsis speciosa*, while about 40 plants of the Common Helleborine, *Epipactis helleborine*, were found by G. J. Davidge in thickets at Ickenham (08). B. Wurzell, amongst other records, has drawn attention to the abundance of Winter Heliotrope, *Petasites fragrans*, on railway banks near Stamford Hill Station (38), and A. W. Rudiger found a number of interesting plants on bombed sites at Hackney (38) including Gold of Pleasure, *Camelina sativa*, and a Hare's-ear, *Bupleurum lancifolium*. D. H. Kent reports London Pride, *Saxifraga umbrosa*, as well established and spreading on Watts Common, Harefield (09), and N. Y. Sandwith has sent us a record of *Lepidium perfoliatum*, found by Dr. D. N. Harrison on waste ground by A.1 at Mill Hill Circus (29).

V.-c. 24, BUCKS.

A very welcome list of plants growing in a gravel pit at Langley was contributed by R. S. R. Fitter. Goatsrue, *Galega officinalis* was abundant, and the following species were also new to this part of our Area:—*Epilobium adnatum*, *Lactuca scariola*, *Melilotus officinalis*, *Salix purpurea*, and *Sisymbrium orientale*.

We are grateful to the following for contributing records during 1962, those who have sent lengthy lists being marked with an asterisk:—

Lady Anne Brewis, *R. Clarke, G. J. Davidge, B. Dodds, Mrs. C. M. Dony, Dr. J. G. Dony, R. S. R. Fitter, *Mrs. M. C. Foster, Mrs. J. Griffiths, *Ft.-Lt. G. Halligey, Dr. D. N. Harrison, *P. Holland, P. F. Hunt, Miss E. M. C. Isherwood, A. C. Jermy, *S. T. Jermyn, Miss L. J. Johns, *D. H. Kent, Mrs. K. Le Sueur, D. McClintock, *Mrs. J. K. McLean, N. Martin, Miss B. M. C. Morgān, *A. F. Mussellwhite, J. R. Palmer, *H. M. Pratt, Miss R. Ronaason, Dr. F. Rose, A. W. Rudiger, Mrs. B. H. S. Russell, *H. A. Sandford, N. Y. Sandwith, E. Saunders, Mrs. A. G. Side, Mrs. L. M. P. Small, *Mrs. J. E. Smith, Dr. A. G. Spooner, Miss J. M. Stoddart, D. Stoyel, F. Swain, C. A. Vink, Miss M. McCallum Webster, *Mrs. B. Welch, Dr. C. West, *K. White, *B. Wurzell, Dr. D. P. Young.

Plants of Hurst Park Race-Course, Surrey

By J. E. SMITH and B. WELCH

THIS account is very superficial and incomplete, being the result of only three visits in 1962 (on July 3 and 18 and on September 18), a total of about eight hours. Further observation may not be possible as racing ended in October 1962, and the property is to be developed and partly built over. It had not been realized that a fine expanse of native vegetation was being preserved behind the wall beside the tow-path.

Hurst Park Race-Course was on the Surrey side of the Thames, upstream of Hampton Court Bridge. In shape it was a long oval with the grandstand at the western end. In the eastern half of the area enclosed by the actual race courses, conditions have probably not changed much in the last hundred years. Towards the middle (which is south of Hampton (Middx.) Church) the soil is gravelly (Flood Plain Gravel) with short, often sparse vegetation, while the slightly lower ground to the east, parts of which were occasionally flooded, was mowed as a hay meadow.

In the 1863 *Flora of Surrey* there is evidence that this was a haunt of that great botanist, H. C. Watson, who lived nearby. A hundred years ago the area was called Moulsey Hurst, and the race course was originally shorter and not enclosed. The road to the Hampton Ferry, across the Hurst, was flanked by gravel pits around which Watson recorded well over a dozen species of locally uncommon plants, some of which still flourished there in 1962, but only one gravel pit remained. Near it were patches of broom and gorse. Over the wider gravelly area Sheep's-bit (*Jasione montana*) was abundant and fine, with magnificent plants of Hoary Cinquefoil. In September hundreds of Autumnal Squills were flowering and fruiting in a patch some 50 yards by 20 yards. On July 3 the most spectacular plants in bloom in the grassy mead were hundreds of spikes of Clustered Bellflowers, on stems up to 18 ins. tall, and a profusion of Dropwort (*Filipendula vulgaris*). Cowslip plants were locally plentiful, and along the drier edge Musk Mallow (*Malva moschata*), Dark Mullein (*Verbascum nigrum*) and Greater Knapweed (*Centaurea scabiosa*). Other plants of these two habitats are listed below. The nomenclature and sequence follow J. E. Dandy's *List of British Vascular Plants* (1958) and the initials "H. C. W." indicate species mentioned by Watson as growing on Moulsey Hurst.

ON THE DRIER GRAVEL AREA

- Lepidium heterophyllum* (= *L. smithii*), Smith's Cress, locally frequent.
Cerastium arvense, Field Mouse-ear Chickweed, locally frequent. H.C.W.
Spergularia rubra, Sand Spurrey.
Geranium pusillum, Small-flowered Crane's-bill.
Erodium cicutarium, Stork's-bill.
Ulex europaeus, Gorse.
Sarothamnus scoparius, Broom.
Trifolium arvense, Hare's-foot Clover.
T. striatum, Knotted Clover, (also abundant on lawn by grandstand.)
H.C.W.
Ornithopus perpusillus, Bird's foot.
Potentilla argentea, Hoary Cinquefoil, locally abundant. H.C.W.

Poterium sanguisorba, Salad Burnet. H.C.W.
Pimpinella saxifraga, Burnet Saxifrage.
Rumex acetosella, Sheep's Sorrel.
R. tenuifolius (a segregate of *R. acetosella*).
Thymus pulegioides, Wild Thyme, scarce.
Plantago coronopus, Buck's-horn Plantain, abundant.
Campanula rotundifolia, Harebell, frequent.
Jasione montana, Sheep's-bit, locally abundant.
Galium verum, Ladies' Bedstraw.
Scabiosa columbaria, Small Scabious. H.C.W.
Hieracium pilosella, Mouse-ear Hawkweed.
Scilla autumnalis, Autumnal Squill. H.C.W.
Allium vineale, Crow Garlic. H.C.W.
Sieglingia decumbens, Heath Grass.
Festuca rubra, Red Fescue.
F. tenuifolia, Fine-leaved Sheep's-Fescue.
Vulpia bromoides, Squirrel-tail Fescue
Poa angustifolia, Narrow-leaved Meadow-grass.
Koeleria cristata, Crested Hair-grass. H.C.W.
Aira praecox, Early Hair-grass.
Agrostis tenuis, Common Bent.

IN THE HAY MEADOW

Lychnis flos-cuculi, Ragged Robin, rare.
Stellaria graminea, Lesser Stitchwort.
Geranium pratense, Meadow Crane's-bill. H.C.W.
Trifolium pratense, Red Clover.
T. repens, White Clover.
Lotus corniculatus, Common Bird's-foot Trefoil.
Vicia hirsuta, Hairy Tare.
Filipendula vulgaris, Dropwort, abundant. H.C.W.
Poterium sanguisorba, Salad Burnet. H.C.W.
Pimpinella saxifraga, Burnet Saxifrage.
Silaum silaus, Pepper Saxifrage.
Daucus carota, Wild Carrot.
Primula veris, Cowslip.
Plantago lanceolata, Ribwort.
Campanula glomerata, Clustered Bellflower, plentiful. H.C.W.
Galium verum, Ladies' Bedstraw.
Knautia arvensis, Field Scabious.
Scabiosa columbaria, Small Scabious, abundant. H.C.W.
Achillea millefolium, Yarrow.
Chrysanthemum leucanthemum, Ox-eye Daisy, frequent.
Centaurea nigra, Knapweed.
Hypochoeris radicata, Cat's-ear.
Leontodon autumnalis, Autumnal Hawkbit.
Allium vineale, Crow Garlic, frequent. H.C.W.
Briza media, Quaking Grass.
Arrhenatherum elatius, False Oat-grass.
Holcus lanatus, Yorkshire Fog.
Deschampsia cespitosa, Tufted Hair-grass.
Agrostis tenuis, Common Bent.
Anthoxanthum odoratum, Sweet Vernal-grass, abundant.

IN HOLLOWES

Filipendula ulmaria, Meadow-sweet.

Rumex crispus, Curled Dock.

Chrysanthemum vulgare, Tansy.

The turf of the Courses was kept short, but the mower missed the few inches under the rails, and judging from samples of this, the most frequent constituents were Red Fescue (*Festuca rubra*) and Crested Hair-grass (*Koeleria cristata*) with Smaller Cat's tail (*Phleum bertolonii*) and Black Bent (*Agrostis gigantea*) and some Ladies' Bedstraw, Yarrow, Rough Hawkbit (*Leontodon hispidus*), Mouse-ear Hawkweed (*Hieracium pilosella*), Small Scabious and odd plants of Tufted Vetch (*Vicia cracca*), Meadow Vetchling (*Lathyrus pratensis*) and even Clustered Bellflower. Small railed-off areas just inside the Ferry Gate were unmowed. These are probably on damp alluvial soil and plants included Hoary Plantain (*Plantago media*) and Hairy Sedge (*Carex hirta*). Against the inside of the wall nearby are a few species which also occur outside, between the wall and the towpath, including Common Horsetail (*Equisetum arvense*), Bulbous buttercup (*Ranunculus*), Smooth Hawk's-beard (*Crepis capillaris*), Comfrey (*Symphytum officinale*) and Prickly Sedge (*Carex spicata*). The alien lettuce (*Lactuca virosa*) is well established. In 1953 Parsley-piert (*Aphanes microcarpa*) and Cut-leaved Dead-nettle (*Lamium hybridum*) were noted both outside the Race-Course wall and just inside the Ferry Gate. Along the wire separating the Race-Course from Molesey Cricket Ground was another sedge, *Carex muricata* (= *C. pairaei*).

From the western end of the Cricket Ground, between the towpath and the Race-Course wall, is a grassy strip with small water-filled pits, behind a broken hedge with Cathartic Buckthorn, Wild Berberis and trees of Field Maple. A note-worthy plant here is Strawberry Clover (*Trifolium fragiferum*), probably in the place described by Watson as "in wet ground alongside the Thames towing-path, where it enters on Moulsey Hurst". Meadow Barley (*Hordeum secalinum*), also known to Watson, still grows here, as does Tall Fescue (*Festuca arundinacea*) which might be the plant recorded by him as *F. elatior*.

More intensive search might have discovered some of the other plants known to Watson on Moulsey Hurst: Shepherd's Cress (*Teesdalia nudicaulis*), Dwarf Chickweed (*Moenchia erecta*), Fringed Pearlwort (*Sagina ciliata*)—though this was a weed in flower beds near the Grandstand—Burrowing Clover (*Trifolium subterraneum*), Wild Vetch (*Vicia angustifolia*), Chamomile (*Chamaemelum nobile*), Musk Thistle (*Carduus nutans*), Stemless Thistle (*Cirsium acaulon*) and Downy Oat-grass (*Helictotrichon pubescens*). The Marsh Stitchwort (*Stellaria palustris*), Tubular Water Dropwort (*Oenanthe fistulosa*), Flowering Rush (*Butomus umbellatus*) and Brown Sedge (*Carex disticha*) must have been lost with their habitat "small pits or splashes of water in the old disused gravel-pits".

Some Plants of East Sheen Common

By B. WELCH

EAST SHEEN COMMON (53 acres) is on the northern side of Richmond Park, Nat. Grid 51/1974. Sloping down to the north it is mostly between the 75 ft. and 50 ft. contours, on gravel of the "Taplow Terrace" of the Thames. Over a small area of the highest part, at the south-west corner near the gate to the park, London Clay is at the surface.

It was given to the National Trust in 1908 by the East Sheen Common Preservation Society. In 1920 the Common was described as "a real little piece of Surrey Heathland, aglow with golden gorse, May trees a mass of bloom, great patches of white bedstraw, with bracken and grasses, and later a carpet of purple heather". In the dry summer of 1921 the Common was devastated by fire. The eastern end is now a sports ground, and increasing growth of birch and oak trees has made a large part into woodland.

However, in spite of occasional fires a considerable open area of heather (*Calluna vulgaris*) remains, with many tall gorse bushes (*Ulex europaeus*) on the higher ground on the western side. This is being encroached upon by birch and oak, among which several bushes of Alder Buckthorn (*Frangula alnus*) survive. There are still patches of white Heath Bedstraw (*Galium saxatile*) and Lesser Stitchwort (*Stellaria graminea*) and, mainly on grassy paths, a few Harebells (*Campanula rotundifolia*), Tormentil (*Potentilla erecta*), Mouse-ear Hawkweed (*Hieracium pilosella*), Field Woodrush (*Luzula campestris*), Clustered Woodrush (*L. multiflora*) and Pill Sedge (*Carex pilulifera*). The commonest grasses are Wavy Hair-grass (*Deschampsia flexuosa*) and Common Bent (*Agrostis tenuis*).

In trodden places are Sheep's Sorrel (*Rumex acetosella*), Sand Spurrey (*Spergularia rubra*), Buckshorn Plantain (*Plantago coronopus*), Squirrel tail Fescue (*Vulpia bromoides*) and Early Hair-grass (*Aira praecox*). In the damper spots are Oval Sedge (*Carex ovalis*), Heath Rush (*Juncus squarrosus*), Heath Grass (*Sieglingia decumbens*) and Velvet Bent (*Agrostis canina*). Mat Grass (*Nardus stricta*) is scarce. When I first visited the Common in 1942 there were several patches of Creeping Willow (*Salix repens*), now mostly lost, but some Aspens survive towards the northern corner in a hollow with Lesser Spearwort (*Ranunculus flammula*) and Carnation Sedge (*Carex panicea*). Nearby is Marsh Horsetail (*Equisetum palustre*).

This is a mediocre list compared with Ham Common (see *Lond. Nat.*, 41, 1962). A few other species were recorded in the 1931 *Flora of Surrey*: Hairy Violet (*Viola hirta*), Trailing St. John's Wort (*Hypericum humifusum*) and *Carex fulva* by G. Nicholson (but one suspects some mistake about the *Carex* species though the fresh plant is said to have been confirmed by J. G. Baker, but the specimen not kept); Sundew (*Drosera rotundifolia*) by C. E. Britton and Bog St. John's Wort (*Hypericum elodes*) by T. R. Sim. In the *Hand List of Plants of the London Area* the Bog St. John's Wort is recorded by C. Avery in 1933 and Common Yellow Sedge (*Carex demissa*) by E. Nelmes in 1925.

The big gravel pit near the middle of the Common used to have a boggy patch in its deeper part. Dr. Turrill said that the Sphagnum and Sundew survived almost to 1940. Now there is only Marsh Pennywort

(*Hydrocotyle vulgaris*) and Common Sedge (*Carex nigra*) on the site, and much of the pit is overgrown with Water Horsetail (*Equisetum fluviatile*) and Sallows (*Salix atrocineria* with a few *S. caprea*). Further north in the pit are clumps of Yellow Loosestrife (*Lysimachia vulgaris*) and usually a small patch of Adder's Tongue Fern (*Ophioglossum vulgatum*), and sometimes Meadow Vetchling (*Lathyrus pratensis*) and Quaking Grass (*Briza media*). A ditch runs northward to a swamp in which grow Marsh Pennywort, Great Hairy Willow-herb (*Epilobium hirsutum*), Marsh Thistle (*Cirsium palustre*), Comfrey (*Symphytum officinale*), Amphibious Bistort (*Polygonum amphibium*), Greater Bird's-foot Trefoil (*Lotus uliginosus*) and Lady's Smock (*Cardamine pratensis*). Below this, by a little iron-stained stream beside the path, there were a few plants of Lesser Skull-cap (*Scutellaria minor*) up to 1943, and nearby Small-flowered Willow-herb (*Epilobium parviflorum*), Tufted Vetch (*Vicia cracca*), Creeping Jenny (*Lysimachia nummularia*) and Meadow Fescue (*Festuca pratensis*).

Further north-west along this path is a small pond with Nodding and Trifid Bur-marigolds (*Bidens cernua* and *B. tripartita*), Water Plantain (*Alisma plantago-aquatica*), Floating Sweet-grass (*Glyceria fluitans*) and a fine patch of Round-fruited Rush (*Juncus compressus*). The lowest part is now oakwood with little ground vegetation, but along ditches on the northern and western sides of the Common Male Ferns and Broad Buckler-ferns (*Dryopteris filix-mas* and *D. dilatata*) seem to be increasing.

Eastward of the gravel-pit the trees are mainly Silver Birch (*Betula pendula*) with a few Downy Birch (*B. pubescens*). They are shading out the heather, but Purple Moor-grass (*Molinia caerulea*) survives beneath them. Bracken and Wood-sage (*Teucrium scorodonia*) occur here. Hawthorn is locally abundant on the Common and there are two big clumps of Blackthorn (*Prunus spinosa*).

Along the woodland path near the Park wall the soil is no doubt deeper and richer in humus. In these cooler damper conditions grow Bluebells (*Endymion non-scriptus*), Greater Stitchwort (*Stellaria holostea*), Dog Violets (*Viola riviniana*), Three-nerved Sandwort (*Moehringia trinervia*), Wild Strawberry (*Fragaria vesca*), Barren Strawberry (*Potentilla sterilis*), Pignut (*Conopodium majus*), Germander Speedwell (*Veronica chamaedrys*), Ground Ivy (*Glechoma hederacea*) and the grasses Slender False-brome (*Brachypodium sylvaticum*) and Giant Fescue (*Festuca gigantea*). Close to the wall is a good deal of Wall Lettuce (*Mycelis muralis*) and some Honeysuckle, Black Bryony and Dog Roses. The old trees are elms, and there are many seedling hollies, sycamores, ash and elder with a few yew. The Hornbeams near the Park gate were, no doubt, planted and the older Rowans may have been.

By 1942 the alien Slender Rush (*Juncus tenuis*) was well established along one path and has since spread. One plant of Drooping Sedge (*Carex pendula*) was growing near the edge of the gravel pit in 1943 and still survives. It is of garden origin, for large clumps have been seen dumped over a garden fence on several occasions. There are several Crab-apple trees, a garden Blackberry (*Rubus laciniatus*) and a Vine of considerable age, overtopping hawthorn trees. The Cockspur Grass (*Echinochloa crus-galli*) on the edge of the pond from 1950 to 1952, must have arrived by human agency, and somehow Floating Pondweed (*Potamogeton natans*) got into the wartime "Emergency Water Supply"

tank in 1943. This was a new concrete tank standing on the ground, near the football pitch.

Carex divisa recorded by H. W. Kew in *Rep. B.E.C.* for 1928 (page 764) may have been an alien variety which was known in Richmond Park at that period.

A Survey of *Calystegia* in the London Area

Progress Report 1962

THE first year of this survey has shown a promising start. An enthusiastic nucleus of members has been at work measuring flowers from colonies of *Calystegia* all over our area and just over 300 record cards have been returned. When an adequate coverage has been achieved, an attempt will be made to determine the distribution of the two species, *C. sepium* (L.) R. Br. and *C. silvatica* (Kit.) Griseb. Simple statistical methods are to be employed to separate the two species and the degree and extent of hybridization will also be ascertained. It might ultimately prove possible to correlate the distribution of the species, if they differ significantly, with habitat preferences.

For West Kent (V.-c. 16) 125 colonies have been recorded, mainly around Woolwich and in the area from Erith Marshes south and westward to Bexleyheath, Dartford and South Darenth.

Middlesex (V.-c. 21) has done almost as well with 101 records. These were concentrated in Tottenham and Chiswick, and widely scattered around Ealing.

Cards have been completed for 58 colonies in Surrey (V.-c. 17), mostly from Richmond and Kew, and the area from Wimbledon Common through Mitcham and Morden to Beddington.

South Essex (V.-c. 18) has records from 23 rather scattered colonies, four of them at Theydon Bois, the others stretching from Walthamstow through Woodford and Wanstead to Chadwell Heath.

For Herts. (V.-c. 20) we have only had a single record from Turnford, and no records have been submitted so far for North Essex (V.-c. 19) or for Bucks. (V.-c. 24), both of which vice-counties are on the edge of our area and seem to suffer from a lack of recorders at all times.

Not all the records received have been mentioned in this brief review, since a number of them are isolated from the main concentrations. They will of course be of value when the intervening spaces have been covered. It is surprising that N.W. and S.E. London, as well as the whole of Inner London, should have received practically no attention. We have one record from Hampstead, one from Kensington and two from the Strand. Here is a vast segment of the Society's area, which must be dotted with Bindweeds and all on the doorsteps of hundreds of our members. It is hoped that some of these members, as well as those in the many other areas not yet covered, will send in records and so help to ensure the success of the scheme, which is dependent on the participation of many helpers.

The organizers of the scheme would also be glad to hear from any member who would be interested in helping with the simple statistical analysis of the record cards.

P.C.H.

Botanical Field Work in a School Garden

By BETTY BAYLISS, M.Sc., Ilford County High School for Girls

THE following brief account of field work carried out in our suburban school garden (Nat. Grid 432882) by my first year sixth-form botany class may be of interest to others, as it indicates that ecological studies can be fruitful in conditions which seem at first sight most unpromising, and may perhaps encourage them to try similar work.

In the summer of 1962 we studied the vegetation of three selected areas of the school grounds, identifying the species and comparing the frequency of their occurrence by valence analysis (R. C. McLean and W. R. Ivimey Cook, 1946, *Practical Field Ecology*). The three regions chosen for comparison were a small plot which had been cleared the previous autumn in connection with a new building and had, at our special request, been left alone to become colonized by plants (Area I); a region where the younger children have small individual gardens which are alternately neglected as their interest wanes and, as new owners take over, scratched bare at the surface for replanting (Area II); a quadrangle lawn which has received hardly any attention beyond mowing during the thirty years or so since it was made (Area III). Area I was also used to study colonization by mapping a quadrat at intervals and to map a belt transect chosen to show the selective effect of trampling, where girls cut across the plot, in favouring low-growing plants.

So that the girls, who were all beginners, could identify the plants fairly quickly some guidance as to family was given and they were then able to make a correct identification of the species, using the keys and descriptions in their floras; grasses were identified by their vegetative characters (McLean and Cook, *op. cit.* and C. E. Hubbard, 1954, *Grasses*).

The species found in the three areas are given in the following lists. Nomenclature follows J. E. Dandy, 1958, *List of British Vascular Plants*.

AREA I

Co-dominants: *Capsella bursa-pastoris*, *Poa annua*.

Other species: *Ranunculus repens*, *Papaver somniferum*, *Fumaria officinalis*, *Stellaria media*, *Chenopodium album*, *Atriplex patula*, *A. hastata*, *Epilobium hirsutum*, *Euphorbia peplus*, *Polygonum aviculare*, *P. persicaria*, *P. convolvulus*, *Urtica urens*, *Buddleja davidii*, *Calystegia silvatica*, *Solanum nigrum*, *Veronica hederifolia*, *V. polita*, *Lamium purpureum*, *Senecio squalidus*, *S. viscosus*, *S. vulgaris*, *Matricaria recutita*, *Sonchus oleraceus*, *S. asper*.

AREA II

No dominants.

Other species: *Ranunculus repens*, *Papaver somniferum*, *Stellaria media*, *Potentilla anserina*, *Epilobium montanum*, *E. adenocaulon*, *Anthriscus sylvestris*, *Aegopodium podagraria*, *Euphorbia peplus*, *Rumex obtusifolius*, *Anagallis arvensis*, *Prunella vulgaris*, *Plantago major*, *Sambucus nigra*, *Senecio vulgaris*, *Cirsium arvense*, *Chrysanthemum parthenium*, *Lapsana communis*, *Sonchus oleraceus*, *S. asper*, *Poa annua*, *Agropyron repens*, *Agrostis canina*, *A. stolonifera*.

AREA III

Co-dominants: *Sagina procumbens*, *Agrostis canina*, *A. stolonifera*.

Other species: *Ranunculus repens*, *Trifolium repens*, *Lotus corniculatus*,

Potentilla anserina, *P. reptans*, *Prunella vulgaris*, *Plantago major*, *Bellis perennis*, *Achillea millefolium*, *Hypochoeris radicata*, *Hieracium pilosella*, *Taraxacum officinale*, *Poa annua*, *Dactylis glomerata*, *Holcus lanatus*.

The bare ground of Area I was colonized by quick-growing annuals producing, as we found by sample counts, vast numbers of seeds with a variety of dispersal mechanisms. Some of these species were also growing in Area II, but here inefficient cultivation has permitted the establishment of perennial plants also, especially those which propagate freely by vegetative methods or regenerate from tap roots. The turf in Area III is made up of perennial plants which have their buds close to the surface of the soil and many of these plants also reproduce vegetatively. These garden weeds are, as we found, highly specialized and show great diversity in their methods of adaptation to the particular conditions of their man-made habitats; in a built-up district such as Ilford they represent almost the last surviving natural vegetation and are extremely interesting plants, just as worthy of study as those in more rural areas.

Entomological Notes

The Striped Hawk Moth (*Celerio livornica* Esp.)

Since 1900 there have been only eight records of this moth being found within the London area, six in Surrey and two in Kent (C. G. M. de Worms, 1954, *L.N.*, 33; 1959, *L.N.*, 38.)

On June 28, 1962, at Sarratt, Hertfordshire my nephew, John Mosedale, found a female moth at rest on some tall grass. I received the moth in the evening of the same day in perfect condition and still alive.

Sarratt is just 20 miles from St. Paul's Cathedral.

B. L. J. BYERLEY.

Notes on Plant Galls of North-West Kent

By ARMAND E. LE GROS

BRAMBLE GALLS

Eleven kinds of gall, listed in the following annotated key, have been described from brambles in Great Britain, and most of these have been seen in Vice-county 16 (West Kent) in the last five years.

The genus *Rubus* L. is a large and rapidly evolving genus with possibly up to 500 British species (Eedes, 1959) and because of the difficulty of identification of brambles few collectors of galls have in the past been able to study host specificity. Botanists who are interested in *Rubus* could make a useful contribution to our knowledge by noting the species on which galls are seen, and it is hoped the gall key will be of some assistance.

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| 1. Root and stem galls | 2 |
| Leaf galls | 4 |
| Flower galls—buds closed and swollen | 6 |
| 2. Rough, warty, irregular woody non-cellular swellings on roots and at base of stem (crown gall), and similar side swellings higher up the stems. January-December. When galls are cut in an early stage a white surface is exposed, later a brown. | |

Bacterium *Agrobacterium tumefaciens* (Smith and Townsend) Conn. Reddish fissured patches on the stems around which form rough bark callouses. Stem canker. January-December. (The *Coniothyrium fuckeli* of Swanton and others.)

Fungus *Leptophaenia conythyrium* (Fuckel) Sacc.

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| Fusiform or rounded swellings. | 3 |
| 3. Irregular woody spindle-shaped swellings toward the terminal of the stem; smooth or with small rounded elevations; green, reddish purple then brown from 2 to 15 cm. long and 1 cm. width containing many oval-shaped larval cells. The stem is often bent into an S by the gall, which appears June-July and persists. The number of larvae may exceed fifty (Connold, 1909 says "up to 250"); pupation is in the gall, with the gall wasp emerging May-June of the second year. | |

Cynipid *Diastrophus rubi* Bouché

Rough hard walnut-shaped elongated side-swellings, occasionally surrounding the stem, green then reddish brown, up to 8 cm. long and 2 cm. thick, appearing in August and persisting. Irregular cavities in the gall contain numbers (up to 30) of orange larvae, which pupate in the gall. The adult midges emerge April-May-June of the second year. The Blackberry Stem Gall Midge.

Cecidomyiid *Lasioptera rubi* Heeger

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| 4. Leaves, shoots etc. covered with a felt of grey-white to yellow-brown pointed cylindrical hairs. | |
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Gall mite *Eriophyes gibbosus* (Nalepa)

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|--|---|
| Leaves without a hairy felt. | 5 |
| 5. Leaves poorly developed, crumpled and mottled with small yellowish spots. | |

Gall mite *Phyllocoptes gracilis* (Nalepa)

Leaf folded and crinkled, main vein sometimes swollen, becoming

blackened. White larvae June-July-August pupate in soil. There are several overlapping generations of midges which emerge July-August of the same year. Blackberry Leaf Midge.

Cecidomyiid *Dasyneura plicatrix* (H. Loew)

Leaf discoloured, thickened with margin rolled inward. The roll shelters large green aphids May-June.

Aphid *Amphorophora rubi* Kalt

Small tubercles up to 2 mm. wide on both sides of the leaf with small openings on the opposite side. Hairs inside the tubercle cylindrical or club-shaped.

Gall mite *Eriophyes silvicola* Can.

6. Bud contains numerous (up to 30) white jumping larvae which pupate in soil, emerging as adults in June-July of the second year. Blackberry Flower Midge.

Cecidomyiid *Contarinia rubicola* Rubsaamen

Bud contains solitary white beetle larva. Strawberry blossom weevil. Curculionid *Anthonomus rubi* (Herbst)

Some authorities have thought that two species are responsible for the bacterium galls—*Agrobacterium tumae-faciens* for the root and crown galls and *A. rubi* for the galls on aerial shoots. One investigator, W. E. McKeen, according to C. Stapp (1961), finds it difficult to draw a reliable distinction between them. *Tumae-faciens* is probably the most widespread disease of plants, many families, scores of genera and hundreds of species being attacked, usually with the formation of the typical crown gall.

Diastrophus rubi galls are local and scarce. Niblett (1958) did not record it from Kent and I have found it only at Farningham and Trotts-cliff. Parasites are always present and although a number of species have been recorded from the galls I have found only two Chalcids consistently, *Torymus macropterus* Walker and *Eurytoma mayri* Ashmead.

Galls of the midge *Lasioptera rubi* are more frequently met with though nevertheless uncommon. There is an old record (1927) for Abbey Wood in H. J. Burkill's notebooks and I have collected the galls from Farningham Wood, Hayes Common, West Wickham and Trotts-cliff. The late Dr. H. F. Barnes told me he had found two species of *Torymus* as ectoparasites of the larvae and I have found *T. macropterus* in most galls. It is interesting to note that *macropterus* is one of those Chalcids which do not restrict themselves to one genus or species of host insect but to galls on a particular location of the host plant—in this case bramble stems. Dr. R. R. Askew, whom I must thank for the identification of most of the Chalcids mentioned here, has pointed out (1961) that the position of the gall is an important factor in host gall selection and instances a group of *Torymus* spp. which only attack galls growing on oak boles or roots. From a gall collected December 24, 1959 from Hayes Common I cut out in March 1960 a number of a Platygastriid, so far unidentified, which had parasitized all but one of the Cecid larvae in the gall. Another Platygastriid, *Inostemma spinulosum* Kieffer, which is known on the Continent as a parasite of *L. rubi* eggs, was reported a British insect by W. D. Hincks (1956).

Of the other Cecid galls I have only found *Dasyneura plicatrix* at Keston and Shoreham. Burkill listed this species from Abbey Wood.

The beetle *Anthonomus rubi* is a common species in the area but I have found only a few galls on brambles at Chislehurst and Keston.

Although not reported from Kent by Niblett (1959) the mite *Eriophyes gibbosus* is not uncommon in North West Kent. W. R. C. Watson (1958) obviously refers to this gall when he writes of the felt disease as "The most prevalent and most troublesome disease . . . found on brambles". *E. silvicola* has been reported from Scotland and *Phyllocoptes gracilis* from the North of England. The latter is often a great pest of raspberry cultivation on the Continent.

GALLS ON PRIVET.

Unopened, slightly swollen flower buds attributed to the Cecidomyiid *Placochela ligustri* (Rubsamen) are the only galls known to occur on privet in this country. Dr. Barnes (1954) described another species *Trotteria ligustri* from unopened flower buds collected in Norfolk by Mr. S. A. Manning. The larva is distinguished from that of the *Placochela* by the presence on the anal segment of four long setae and the absence of anal hooks. He also suggested that an undescribed *Asphondyllia* sp. whose larva has a quadridentate sternal spatula or breastbone in contrast to the bidentate breastbone of the other two species may be found to cause similar galls.

A slide prepared by H. J. Burkill labelled "From *Ligustre vulgare*—Shoreham Kent August 24, 1929", which is in the Society's possession, contains four larvae. Three are distorted but the fourth clearly fits Barnes' description of the larva of *T. ligustri* based on specimens from Norfolk and Wye, Kent. Burkill's field notebook has the following entry under the date August 25, 1929 "Buds unopened green, purplish or white tinted with purple. Midge grubs unilarval. Four larvae from five buds".

Unopened privet buds collected from Chislehurst and Beckenham in 1960-61 were found to contain larvae of *Placochela ligustri* but the *Trotteria* was found only once in buds from near Eynsford: I was unable to rear it to the adult stage. Colour of the larvae is not a reliable character for identification of Cecids and the colour range of the *Placochela* was found to be from white to deep reddish orange. The *Trotteria* is most likely a predator.

OAK-APPLE GALLS

Niblett (1958) records the Cynipid *Biorhiza pallida* Oliver galls from only four localities (Bostall Heath, Hayes Common, West Wickham Wood and Abbey Wood) in North West Kent but it is common in most years throughout the vice-county. Records for the earlier part of the century show very wide fluctuations from year to year and from locality to locality. The year 1930 was an "abundant year" yet Niblett failed to find it that year at Abbey Wood. D. Leatherdale (1956, 1957) has studied the incidence of the gall in South Oxfordshire and states that after an abundant year in 1955 there was a drop of 70% in 1956, but it was again abundant in 1957. My own observations in the Home Counties began in 1958 since when I have found it reasonably plentiful. Important factors have been parasitism and climate, the latter perhaps affecting the alternating generation, the form *aptera* Bosc, rather than *pallida* itself. In wet years large numbers of larvae die from fungal attack, which to a lesser degree affects parasitic larvae. Years when parasitism has been very high have not necessarily been followed by poor years.

The insect population of the galls is higher in species than any other oak gall and also higher in number of individuals. From one Hayes Common gall collected in early May, 1961, I reared 210 Cynipids and 16 Chalcids. From another collected a month later from the same locality I reared 131 Cynipids and 40 Chalcids. Dr. R. R. Askew (1961) has charted the remarkable inter-relationship, the food web, in *pallida* galls. In addition to the gall causer and its inquiline *Synergus gallae-pomiformis* Fonsc. he lists nineteen Chalcids of which seven appear to be specific. From oak apples collected 1960-1962 in Hayes Common, Chislehurst Common, Petts Wood and Farningham Wood I have reared the following Chalcids in great numbers: *Olynx skianeuros* (Ratz), *Eupelmus urozonus* Dalm, *Hobbya stenonota* (Ratz), *Torymus nigricornis* Boh, *T.auratus* (Fourc) and *Syntomaspis apicalis* (Walker). The last two species were also abundant in galls collected by Mr. G. H. Harvey from Wimbledon Common, Surrey in 1961. In much fewer numbers I have found *Megastigmus dorsalis* (F.), *Eurytoma brunniventris* and *Mesopolobus tibialis* (West).

By August most of the Cynipids have left the galls but a large number of Chalcid larvae remain to pupate and emerge the following spring. By late November the galls are invaded by a green mould and scavengers in the shape of small grey springtails. At the same time numbers of at least two species of gall midge larvae appear in the gall. The majority of the larvae are red and belong to the species *Clinodiplosis biorhizae* Kieffer and feed on the gall tissue. Some five per cent of the larvae are larger, of red colour mottled with white and are probably predators, but adults have not yet been reared.

Many invertebrates use the vacated larval cells for pupation or hibernation. The most frequent hibernators I have found to be young spiders (especially *Clubiona* spp.), the Psocid *Ectopsocus briggsi* McL. and the predatory bug *Anthocoris nemorum* (L.). Niblett used to rear from these galls the weevil *Balaninus villosus* F. on many occasions and I have reared two species of lacewings (*Hemerobius atrifrons* McL. and *Coniopteryx tineiformis* Curt.) from Enfield, (Middlesex) and Chislehurst galls.

In summer one often finds the ground under oaks littered with fragments of the galls broken up by squirrels in search of grubs. The final disintegration of the galls is hastened in winter by birds who are also in search of the larvae.

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Some Flies (Diptera) Breeding in Wounds on Elm Trees in Hyde Park

By R. W. J. UFFEN

WALKING at lunch-time in Hyde Park in 1957 I noticed wounds on most of the elm trees of the South Carriage Road and of The Ring. Prolonged periods of hot weather in June and July 1959 permanently dried and sealed these wounds, although a few inaccessible wounds higher up the trees remain with much reduced sap-flow. It is thought of interest to record what insects were found between 1957 and 1959.

The trees were nearly all wounded between 4 ft. and 6 ft. from the ground, usually on the side facing away from the road. The wounds were wet and encrusted with putrid sap over an area averaging 3 in. wide and 8 in. down the fissured bark. It was not possible to see, without thoroughly cleaning up the patches, how large was the area of origin of the sap, nor to see the nature of the wound itself. No frass or tunnels of wood-boring insects were to be seen. The consistent position of these wounds suggests human damage, possibly from careless pruning of the regularly occurring small lateral shoots or from nailing up notices.

In the spring of 1958 these wounds were found to be wriggling with maggots when the dry crust was removed. Later, pupae worked their way to the surface by the score and the fly *Mycetobia pallipes* Meig. (Anisopodidae) emerged, apparently in the early morning as they had nearly all dispersed by lunchtime each day. In early summer columns of small parasitic Hymenoptera paraded the trunks like ants. It was never established that they had any connection with the *Mycetobia* pupae.

I was curious to know, in view of the density of the population of *Mycetobia*, whether any other larvae occurred in the wounds, but without force-washing equipment it would have been difficult to extract them from the bark. I therefore watched the trees for emerging insects. Some hoverflies, *Brachyopa insensilis* Collin, were seen drifting up and down in front of the tree trunks and settling on them. They do not at all resemble typical hoverflies and may easily be overlooked. Only females were seen and they disappeared by mid-June, after laying eggs in the wounds. This species was not described until 1939, despite its occurrence within half a mile of the Natural History Museum.

The minute *Aulacigaster leucopeza* (Meig.) was also seen on the trunks. This fly is placed in a family all on its own. It has an orange frons with transverse silver stripes which extend right across the eyes. The larva has curious long excrescences. In mid-July 1959 a single *Phaonia cincta* Zett. (Muscidae), kindly determined for me by Mr. E. A. Fonseca, was seen ovipositing in a wound in a tree in the East Carriage Road.

Two trees in the South Carriage Road should be mentioned separately. These bore wounds of about 12 in. diameter, possibly where bosses had been. Here the sap was pinkish, gelatinous and coated with a white material, possibly a fungus. I never found any insects associated with these wounds. They, too, disappeared in 1959.

Some Observations on Bats in East Surrey and Recent Records for the London Area

By B. D. HANCOCK

INTRODUCTION

Relatively little has been written about the observation of British bats in the field, and I have therefore thought it worthwhile committing to paper my own experiences in the hope that they will be of value to others attempting a similar study. Most of my field work has been carried out in the neighbourhood of the Surrey villages of Bletchingley and Godstone, in which district I have lived intermittently since 1955. It should perhaps be mentioned that my time in this district has been limited to school and university vacations; regular bat-watching has therefore not been possible, and my records are less complete than I should like them to be.

The paper which follows describes the more interesting observations I have made on this southernmost fringe of the L.N.H.S. Area and includes records of bats received by the Recorder of Mammals over the period 1956-1961.

STUDY TECHNIQUES

It is not as difficult as is generally thought to get a good view of a bat in flight, especially the high fliers. Bats stand out well against a clear western sky just after sunset but at the other extreme it is virtually impossible to make out any characteristics against the dark outline of trees. Catching bats can range from very easy to almost impossible. I have had considerable success in restricted areas catching them in flight with a large net. This net consists of a square of light 1" mesh strawberry netting 4' × 4' slung between two 7-foot bamboo canes. By holding the ends of the canes one has 16 square feet of very manoeuvrable netting at the other end and any bat within range can be caught, rather like catching butterflies on a large scale. But one has more misses than catches as bats are very adept at avoiding the net. This method can only be used in the few places where there are several bats flying at close range. These conditions are satisfied at the two ponds at Godstone and at the Rectory Pond behind the church where I have caught over 100 bats, mostly Pipistrelles, but also Whiskered and Daubenton's and a Long-eared Bat. Catching-time is very limited, as it soon becomes too dark to see them, so my average catch at these ponds is two or three per evening.

The period of twilight at dawn can be used just as well as that at dusk and I have caught as many as six in twenty minutes at dawn in Godstone. However, my most successful catch with this net was fifteen Pipistrelles in three-quarters of an hour at a mere in Cheshire. Water is a great attraction to bats anywhere, and many large ponds in the London area probably have enough bats around them to make this method of catching them worthwhile. I can confirm that this is so at the Earlswood Lake at Redhill, the millpond at Oxted and the pond in Montreal Park, Riverhead, Kent. Except for the two large species, the Serotine and Noctule, I have rarely seen more than one or two bats at once away from these ponds. But the small bats have a habit of flying up and down a favourite stretch of path or hedgerow at head height, and I have been able to catch single bats in the net in this way.

The alternative is to find their daytime roosts in summer or hibernacula in winter. Both these tasks have proved very difficult. I have found a large Serotine and a separate Pipistrelle roost by watching at dusk to see from which direction the bats first appear, and then on successive nights waiting further and further in this direction until I could see them coming out of their roost. The Pipistrelle roost in Godstone only took me two evenings to find, and it was only 200 yards away from the place where I had first seen the bats. The Serotines took longer. It was a full week before I found the attic in an old house in the village, about 600 yards from the field in which I had first seen them flying at dusk. Other smaller roosts I have come across by chance, by seeing bats leave them at dusk or return at dawn. I have found random searching of attics and old buildings very disappointing and have consequently done little of this. Similarly, I have drawn a blank searching behind bark and in cracks in trees. In winter I have been up the bell tower of Tandridge and Godstone churches and others without finding any bats. Caves and underground workings are much more fruitful. In the London area there are few natural caves and the one I know near Dorking did not have any in it when I searched it. Since then the entrance has fallen in. However, along the southern fringe of our area there are a number of extensive mine tunnels in the Greensand. At the Godstone mines many bats have been recorded in winter, but over the last few years this area has been used as a dump for the waste products from Croydon power station. Thus the entrance to the mine, originally at ground level, could be reached only by going down a vertical concrete shaft through the rubbish. The number of bats rapidly declined and now the top of the shaft has been permanently closed.

A series of mines at Westerham still houses bats in winter and I have recently found a mine tunnel at Reigate but I have not yet had a chance to explore it fully. All the Pipistrelle roosts I have found have been under the tiles of a roof and have been quite inaccessible there, but in one house I was able to lean out of a window and catch them as they came out, in a butterfly net on the end of a long bamboo cane. The two Serotine roosts have been in roof spaces and I have been able to catch the bats inside. So far the summer roosts of the Whiskered, Daubenton's and Noctule, all of which are quite common in this area, have completely evaded me.

SPECIES OBSERVED

THE PIPISTRELLE *Pipistrellus pipistrellus* (Schreber)

Around Godstone and Bletchingley I have found this by far the most common species. I have seen it in flight almost everywhere, in woodland, fields, downs, heath and villages, but only plentifully over the Godstone ponds. Also I have seen Pipistrelles in such barren places as the rocky Dorset coast, and over the tracts of shingle at Dungeness, Kent. At Godstone the number of bats is rather inconstant from year to year. In the summers of 1956 and 1957 up to a dozen could be seen at any one time at the ponds and the total number must have been near the hundred mark. Until July there were similar numbers in 1958 but after that there was a complete dearth of all species at both the ponds. I only caught one in the whole of August. The summer of that year was rather wet, but by contrast the late summer of 1959 was fine and dry but there were again very few Pipistrelles at the ponds. The summers of 1960 and 1961 were rather similar, in that on most nights there were plenty but the numbers were subject to unpredictable fluctuations. On one fine night in August

1961 I caught a record number of nine Pipistrelles at the Rectory Pond. Away from the pond the numbers seem unchanged from year to year. Thus in my garden in Bletchingley I have been able to see one or two Pipistrelles every evening I cared to spend there.

Because the Pipistrelle is so common and the other small species rather local nearly every small bat seen is likely to be of this species. It is the smallest species, having a wing span of about 8". Its flight is characteristically fast and erratic and at a variable height. I have noticed that it tends to fly higher earlier in the evening soon after sunset, even above 50 feet, but it comes down to catching level later on, but not before it is too dark. On moonlit nights I have seen them throughout the night in flight and they regularly fly at dawn until it is quite light. A slight shower of rain does not appear to worry them but a heavy shower will send them back, and they do not seem unduly sensitive to cold or wind. In most years I have seen a few out in late March and the numbers increase as the weather becomes warmer in April. They do not begin to decline in numbers until the end of September, and by the end of October there is only the occasional one flying. The bat flying season is by no means rigid as it depends very much on the weather at the time. Local people have often seen small bats flying in the winter months and I myself have seen a single Pipistrelle in December on two occasions at Godstone.

Of the two larger roosts I have found in Godstone the one nearest the Clayton Pond (the large pond bordering the path from the village to the church) was under the tiles of an old shed. There was most activity during April when I counted up to 18 bats leaving one evening, but when I returned to the area in August and September there were only one or two using it. The bats always emerged from the same crack, and having done so, invariably flew straight towards the pond. The exit of the bats was preceded by much chirruping and squeaking and their departure occurred quite irregularly—often with long gaps and then sudden rushes. Their behaviour on returning to the roost was quite different. One by one they arrived at the roost and flew round, often dipping down and later settling on the roof just by their crack for a moment, before taking off and rejoining the others in the air. This went on till all the bats in the colony had arrived, so the air was thick with them just around the building. Then one by one they alighted on the tiles and scuttled into the darkness of their roost. From the time the first bat arrived at the roost to the time the last entered was between twenty and thirty minutes on the half dozen occasions I have watched them. I cannot explain this habit nor have I seen it described anywhere. Perhaps it is a way of "cooling off" in preparation for the semi-torpor of their daytime rest. I have noticed the Pipistrelles doing the same thing when returning to their roost in the Priory during a heavy shower of rain which had suddenly started in the evening just after they had emerged. This characteristic behaviour enabled me to find a small roost under the tiles of an old cottage in the New Forest while I was sheltering close by during a sudden shower. There must be some restlessness during the day as I have sometimes heard them scuttling around and squeaking as I have stood nearby. The other roost was in the Priory—alas recently demolished to make way for new houses—about half a mile away from the Clayton Pond. The maximum number I counted here was thirty, returning one morning at the end of August. Here too they lived under the tiles but I was able to catch some in a

butterfly net as they emerged. Their behaviour on emerging and returning was exactly the same as at the other Godstone roost.

Since 1956 I have been ringing all the Pipistrelles I have caught in the Godstone-Bletchingley area, and have found a marked preponderance of females, 89 compared with 50 males. Over these years I have tried some simple homing experiments. Of 23 Pipistrelles taken from their place of capture at the Clayton or Rectory Ponds to my home $1\frac{1}{2}$ miles away to the west in Bletchingley I have caught three of them again subsequently back at the ponds. More spectacular, however, are my results in Cheshire where two Pipistrelles have "homed" back $10\frac{1}{2}$ miles to the exact place where I first caught them, and both of these recaptures were within a week of their release. The majority of recoveries have been made by myself at the initial place of ringing after an interval ranging from a few days to the longest I know yet— $4\frac{1}{4}$ years. Of the dozen Pipistrelles I ringed emerging from the Priory roost I have caught one a week later at the Clayton Pond half a mile away. This is what I expected, as most of the Pipistrelles from this roost fly across the village green to the pond. I also caught one emerging from the roost which I had ringed a fortnight previously at the Rectory Pond about a mile away. On this occasion it was the sixteenth to emerge and I caught it again two days later when it was coming out the fourth. One Pipistrelle ringed at the Clayton Pond was recovered ten months later at the Church Pond half a mile away. The only relatively long distance recovery is of one I ringed at the Clayton Pond and found impaled on the radio mast of a car in the early hours of a morning in June 1959 after it had completed its journey from Maidenhead, Berkshire to Reigate, Surrey, so it may have been picked up anywhere along that route. It was a male and had been ringed in April two months previously. This is a very interesting record. It is the first time I have heard of a bat being impaled on a car radio mast.

These recoveries suggest that although Pipistrelles keep to one extremely restricted area year by year, the neighbourhood of the same pond for example, they must at times travel much longer distances.

For some time in the porch of our house I have noticed the remains of several moths. It seems likely that these may have been eaten by a bat while hanging in the top corner of the porch. I have never seen one enter or leave the porch, but one or two Pipistrelles are around the house most of the night and I assume that if they catch a moth too large to eat in flight they bring it into the porch and hang up in the corner to eat it, letting the wings fall to the ground. During 1959 I identified the wings of the following species, all of them large and fat-bodied moths.

Common Wainscot, two, *Leucania pallens* (L.)

Heart and Dart, five, *Agrotis exclamatoris* (L.)

Marbled Minor, *Procyon strigilis* (Clerck)

Common Rustic, *Celaena secalis* (L.)

Dark Arches, four, *Xylophasia monoglypha* (Hufn.)

Copper Underwing, *Amphipyra pyramidea* (L.)

Common Ear, *Hydraecia oculea* (L.)

Dark Spectacle, *Abrostola triplasia* (L.)

Large Yellow Underwing, *Triphaena pronuba* (L.)

Lesser Broad-Bordered Yellow Underwing, *Triphaena janthina*
(Schiff.)

Silver Y, two, *Plusia gamma* (L.)

Mouse, *Amphipyra tragopoginis* (L.)

Lesser Yellow Underwing, *Triphaena comes* (Hübner.)

Cabbage, *Mamestra brassicae* (L.)

Large Ranunculus, *Antitype flavicincta* (Schiff.)

It is widely thought that the female bat carries her young everywhere for the first fortnight or more of its life, (Harrison Matthews, 1952), but of fifty female Pipistrelles I have caught over the last six years between mid-May and mid-July (the period in which young would be expected) not one was carrying offspring.

THE NOCTULE *Nyctalus noctula* (Schreber)

This is one of the easier bats to identify on the wing as it is large, a high flier, and appears early in the evening. At a distance Noctules look very like Swifts and these often fly together for a short time. Their flight is very powerful and agile, the bats constantly dashing from side to side. Characteristic also is the noise they make, a rather high-pitched clicking sound, which I can always hear if they pass overhead. Rather infrequently I have heard a much higher very loud continuous outburst of squeaks lasting a few seconds. Sometimes this has enabled me to identify them when it was too dark to see them. Usually they fly quite high, at about 100 feet, and not infrequently much higher. On occasions they descend almost to ground level, and sometimes break the surface of water, presumably to drink.

Almost without exception Noctules are the first out at dusk and the last in at dawn. In midsummer they are out as much as half an hour before the main body of other species. My observations suggest they are not affected by rain so much as the smaller species and will continue flying in a heavy downpour. The time spent in hibernation depends on the weather—as with other species. Usually there are a few flying at Godstone in late March and early October if the evenings are not too cold.

The favourite hunting ground of the Noctule in Godstone is in the vicinity of the Clayton Pond. On most evenings a few Noctules can be seen high over the water or nearby fields, but the number is subject to much variation. On several occasions I have observed single Noctules flying in a direct and purposeful manner in the direction of the pond from other parts of Godstone and from as far away as Bletchingley. This indicates that Noctules come from a wide area to feed at the pond on favourable nights. I have spent several evenings trying to follow them back to their roost. The main body of Noctules arrived at the pond from the direction of the church, but as they were coming from such a wide angle, I was not able to follow them far. However, there is probably a roost somewhere in the wooded area to the east of Godstone. In view of this difficulty I have never been able to find a roost, especially as there is such a large area in which it could be. They never come low enough for my net so I have never been able to examine this bat in the hand.

Throughout the summer months of 1955, 1956 and 1957 there were several to be seen every evening at the Godstone ponds, but in 1958 there were several fine evenings when there were none at all at the ponds, and none appeared on any evening in September, even although conditions seemed to me to be ideal. However, I did notice that during this period there were Noctules hunting in places where I had previously only seen them flying directly to the ponds—for example over my garden and over the sewage farm in Bletchingley and over Tilburstow Hill just south of Godstone. It would be reasonable to assume that the prey which was

normally in abundance over the ponds earlier in the summer was not there later in the season, and they were forced to hunt over a much wider area. The same happened in 1959 though there were some over the ponds in the first half of the year. This was a generally fine summer and it was very strange on endless fine evenings to see none at all. This fine weather extended to the middle of October and in that month I was interested to see that the bats did return to the pond but confined themselves to the field just to the southwest of it and were flying low down, rarely above 30 feet all the time, which I thought was distinctly unusual. During 1960 they were back at the ponds in good though rather unpredictable numbers. The same was true in 1961, except that in that year there were three exceptional nights. The first was on July 23, when I saw more than I have ever seen there before—as many as 15 in the air at once. The same number was present on July 30, but they were mostly congregated over the reeds at the south east end, not flying above 40 feet and constantly diving down to the top of the reeds. I had never seen them doing this before. On August 28, after one of the hottest days of the summer, there was an enormous number over the pond. I counted over 30 in the air at once so there must have been well over a hundred altogether over the Clayton Pond and surrounding fields. On subsequent evenings there were just the usual half dozen or so flying above the water.

It is interesting to note that over the six years 1956-1961 the abundance or scarcity of *Noctules* parallels the number of *Pipistrelles* also there.

THE SEROTINE *Eptesicus serotinus* (Schreber)

This for me has been the most interesting species I have found, and, since I discovered an accessible breeding colony, I have been able to watch them more completely than any other species. There are features in their habits which I have not observed in other bats and which I do not think have been recorded before.

Excepting the qualifications I shall make later, it is comparatively easy to identify a Serotine on the wing, given average conditions. Because of its large size it could only be confused with a Noctule. Although the wing span is about $13\frac{1}{2}$ " , 1" less than the Noctule, it appears larger because its wings are quite noticeably broader. The flight of the Serotine appears slow, heavy and steady, usually below 30 ft. from which height it makes characteristic spirals to ground level. To my ear it is silent, though on one occasion I have heard a single high pitched squeak. Its flight is quite different from the high dashing flight of the Noctule. The Serotine is not particularly attracted to water. In the early evening it is gregarious and a dozen or more can be seen flying over the same field night after night. After about ten minutes the group breaks up and they go off to hunt on their own. In late evening I have on many occasions encountered individual Serotines, still flying in their characteristic laboured way with broad rounded wings and rather heavy-looking head and body. In the Godstone-Bletchingley area I have found four separate groups of Serotines flying at dusk and have found the roosts of two groups quite close to their favourite field over which they first congregate. There is most probably a roost near the other two groups and also near a group I have seen at Oxted.

I have made all these observations in the months of August and September. The few Serotines I had seen in April tended to fly rather higher and in not such close groups. Then in 1960 and 1961 I had the opportunity to watch Serotines here in late June and all July. Their

behaviour in these months was quite different from that in August and September. They do not fly straight from their roost to their usual field but go off immediately on their own in all directions. They fly much higher, often up to 100 ft. This was quite confusing at first, but since the Serotines do not dash about the sky so much and since their wings are quite noticeably broader, it is still possible to distinguish between Serotine and Noctule. Also they are silent. During these months I often saw them flying high, around the top of elm trees, frequently close enough to brush into the leaves. This is something I have never seen a Noctule do. Also during these two months on a few occasions I saw single Serotines flying very high up—over 200 ft., in a straight purposeful manner, looking exactly like Noctules except for the broader, rounded wings. Towards the end of July the change of habits to those I first described happens imperceptibly and is complete by early August.

The Serotine does not seem so hardy as the Noctule and Pipistrelle. Only in 1961 have I seen them out before the middle of April, on April 6. They were flying in the first week of October in 1959 when the weather was quite fine and they regularly fly at the end of September.

The roost in Bletchingley was in the roof space of an old house and accessible through a small trap door. My first visit was made in the afternoon of the day after I had first seen them emerging from under the eaves of the apex of the roof space. All subsequent visits were made about 15 minutes before the time I estimated they would come out if left undisturbed. Since these visits were so rewarding it is worth describing each of them.

August 20, 1957. On my first visit during the afternoon I found the floor of the roof space covered with droppings and there was a characteristic pungent smell. After a few minutes one bat emerged from between one of the laths and tiles, but flew off when I tried to catch it into the crevice between the wall and the apex of the roof, which corresponds to the place of exit outside. There was some squeaking coming from this area but I could not see any more so I returned in the evening at dusk, when I found 15 hanging upside down in a tight bunch from the apex of the laths. I was able to shine my torch on the cluster without disturbing them. They were just out of arm's reach, so I tried to catch them in a net, but at this the group immediately broke up. Some went out through the exit and others flew around the space. I caught one of each sex and took them home in the evening to examine.

August 22, 1957. There were several flying around the roof space when I arrived and there was only a loose cluster at the same spot as before. It broke up as I shone my torch on it and I caught three.

August 28, 1957. I watched them emerging from outside. In all, 15 came out in 20 minutes at irregular intervals, two or three often in rapid succession. They all took the same course and flew low down, straight to their usual field. After the last had emerged I walked to the field and could see half a dozen of them flying, but within five minutes they had all gone their separate ways. This appears to be the usual pattern of behaviour in all the colonies I have observed in autumn.

September 7, 1957. This evening there was no sign of them in the roof space, and none flying around the field; nor were there any flying over the field on this or on two later dates in September.

April 17, 1958. There were Serotines leaving the roost and I returned about 10 p.m. to watch outside, as it was a clear night. I was interested



A Serotine in the Bletchingley roost.

Photo by Jane Burton



Serotines clustering at the Bletchingley roost.

Photo by Jane Burton

to see Serotines both leaving and returning to their roost, on average one returning and one leaving every 10 minutes. I have repeated this observation in July and August at various times in the night and found the same happening on each occasion.

April 24, 1958. I visited the roost for the first time this year with Jane Burton to try and take some photographs but there was no sign of them inside, though Dr. Maurice Burton who was outside saw two emerging in the usual manner.

August 22, 1958. A loose cluster present in the usual place. I caught five as they were flying round.

August 26, 1958. Returned again with the Burtons and found a small compact cluster as on my first visit in the evening. They remained like that while Jane Burton took several photographs. The best of these, facing page 33, shows them clustering very well. Four of them are wearing rings all of which I had put on four days previously. As I had ringed five that day it is interesting that one is missing. This time I had brought a small step ladder so I was able to catch the complete cluster and ring the remaining three. On releasing them one conveniently posed on the wall and his photograph is also reproduced here (facing page 32).

September 6, 1958. Only one emerged from the roost and during this month I saw very few in Bletchingley.

July 27, 1959. There were only three clustering—an adult male, a female and a young one. This was not much smaller than the adults but its fur was a much darker brown and its teeth very small. It could fly perfectly well.

August 9, 1959. I was outside and counted 29 emerging—the largest number yet.

August 10, 1959. I found a cluster of about 20 but this soon broke up and I was only able to catch eight.

June 30, 1960. This was the first occasion I had entered the roost in this month. There were about 10 clustering as usual and I caught five. There were two adults and three young. The latter did not seem able to fly. They were only half the size of the adults and covered in a thin coat of dark brown fur. Both the adults were females, and one, to my excitement, was carrying a young one, which was clinging to her ventral surface, looking very grotesque with its large gargoyle-like head and skinny, almost furless body. In the other end of the roof space among the brickwork of the chimney stack there were about half a dozen young Serotines. Judging from the two I was able to extract they were a little smaller than the three clustering with the adults and were either reluctant or unable to fly.

July 29, 1960. Three clustering—two were juveniles.

July 6, 1961. I found none in the roof space but heard much squeaking from outside. After I had come down I waited outside and on shining a powerful torch up under the eaves I could see a group hanging there. In the next ten minutes twelve had flown out.

August 9, 1961. I went up into the roof space as I had seen at least a dozen emerge the previous evening, but to my surprise there was only one young one hanging up in the usual clustering place, and there was no sound of any outside. None came out while I was watching from outside five minutes later, and I only saw one flying in their usual field.

June 26, 1962. Again there were none in the roof space but there was much squeaking from outside, and having come down I was able to watch

16 emerging. Just under the eaves there was a fair scattering of droppings which I have noticed in late June and July of other years, but not in August or September. The area is regularly swept.

It is a pity that through force of circumstances I have only been able to make rather random visits, so that it is difficult to get a clear picture of what goes on throughout the year. By trying to piece together my observations it would seem that up to the end of July they live under the eaves just outside the roof space, at least just before they emerge if not all day. In September they seem to leave the roost completely. During the daytime they may hang out of sight under the eaves or between the two layers of brick which make up the wall. The clustering place is worn very smooth, probably through many years of use and there is a large pile of droppings at the opposite end, by the chimney stack. Perhaps the young ones which I found here in the brickwork are responsible. This roof space had been undisturbed since the house was built 50 years ago.

Anyone who has found a bat in the daytime or in hibernation will have noticed that their general activity is profoundly depressed and it takes them a quarter of an hour or longer to "warm up" sufficiently to be able to fly. I have thought that the necessity to do this each evening may explain their habit of clustering. While they are doing this they will have the benefit of each other's body heat, so warm up more quickly than if they were on their own. In support of this would be the fact that on some evenings the cluster has been quite reluctant to break up, for example on the evening when the photographs were taken. Conversely on other evenings the cluster has flown or crawled off before I could even shine my torch on it. In the first case I would assume that they had just started clustering and were still relatively torpid, and in the second that they must have been clustering some time and were almost ready to emerge.

The other roost I found in Godstone was in the Priory where *Pipistrelles* also reside. I discovered this and the *Pipistrelle* roost on the same morning when I saw them returning to it in August 1959. In all, about half a dozen *Serotines* entered at various points under the eaves. They flew around, diving at the eaves as the *Pipistrelles* do, but not in nearly such a characteristic and compact manner. Both species were returning at dawn and a *Serotine* would sometimes fly straight through the dense crowd of *Pipistrelles* without disturbing them. The *Serotines* were always the first to enter the roost but in the evenings both species came out together. On the following evening at sunset I entered the roof space of the Priory. There was no characteristic smell and only a very light scattering of droppings. At one end I found a single male *Serotine* and on the following evening another, different male. My next visit produced a single female, but as several *Serotines* were leaving the eaves at dusk, I assume that they must have been roosting there out of my reach. Ever since 1957 I have noticed that the number of *Serotines* flying around the fields near the Priory and in the vicinity of the Clayton Pond has increased several fold each September. As far as I can judge the time of this increase corresponds with the disappearance of *Serotines* from around the Bletchingley roost. I went up again into the Priory roost in September 1959 and several times in July, August and September 1960 and 1961 but never found any *Serotines*. There were still some flying around the Priory during these years but I did not see any enter it.

Since 1957 I have ringed 38 *Serotines*, all but three in the Bletchingley roost, and except for the four in the photograph I have made no recoveries

at all. This indicates that there must be a continual change of the residents. Certainly it has been clear that the numbers vary considerably even from night to night. The few high-flying Serotines that I have seen would fit into this picture of regular travelling.

In numbers this species is probably second only to the Pipistrelles, and I imagine it is common everywhere in the southern fringe of our area, as my other records suggest.

THE WHISKERED BAT *Myotis mystacinus* (Kuhl)

I have included all my own records with the others at the end of this article. I do not think it is possible to identify this species on the wing with certainty, so all my definite records are of Whiskered I have caught. The three I found in the Godstone mines in 1959 were hanging from the wall and quite conspicuous. The others were all caught on the wing at the Godstone Ponds. I have always found it flying intermingled with Pipistrelles. Quite often I have spotted one which I thought was a Whiskered and then a moment or two later caught it and confirmed its identification. Its flight is slower and steadier and its body darker and heavier-looking than the Pipistrelle. Even so I have often not recognised a bat as a Whiskered until I took it out of my net. In the hand the most reliable method of distinguishing the Whiskered from the Pipistrelle is by comparing the size of the tragus with that of the ear. In the Whiskered the tragus is pointed and is half the length of the ear, while in the Pipistrelle it is rounded and less than halfway up the ear. The Whiskered is a darker brown, the hairs are not uniformly coloured along their length and are longer and encroach more on its face than in the Pipistrelle. Hence its name. Brian Vesey-Fitzgerald (1949) notes that it is easy to distinguish these two species on the wing as the Whiskered is always silent and the Pipistrelle is the reverse. This may be so. I quite often hear Pipistrelles making easily audible squeaks in flight but to my ear they are often completely silent, so this has been of no use to me.

The dates of my captures are given in the records at the end of the article, and the following are comparisons of the numbers of Pipistrelles and Whiskered respectively at the four principal places where I have caught bats.

The Rectory Pond 80:7 (1956-61)

The Clayton Pond, Godstone 62:2 (1957-60)

Rostherne Mere, Cheshire 27:1 (1961)

Raby Mere, Wirral, Cheshire 13:6 (1957-59)

With the exception of four I caught at the Rectory Pond in 1956 I have ringed them all and taken some of them varying distances away before releasing them. The only recovery I have made was one which "homed" three miles back to its place of capture at Raby Mere, Cheshire.

DAUBENTON'S BAT *Myotis daubentoni* (Kuhl)

On most evenings it is possible to see a number of small bats constantly flying just above the surface of the Clayton and Rectory Ponds. I have on four occasions been able to catch one in my net while it was doing this and confirm its identification. In the hand it is very like a Whiskered. The surest way of identifying it is by comparing foot to leg (tibia) ratio. In Daubenton's the foot is more than half the length of the leg and in the Whiskered it is half or less than half the length of the leg. An additional point is that the calcar is longer than the free edge of the interfemoral

membrane in Daubenton's and these are the same length in the Whiskered. I have also noticed that Daubenton's fur is a more greyish brown than the Whiskered's which is a rich dark brown.

On almost every occasion when I have been watching bats by the edge of the Godstone Ponds I have been able to watch this species skimming over the water surface. They constantly fly within six inches of the water and rarely in my experience come within five feet of the edge. This is why I have had such difficulty catching them. There is no mistaking such a characteristic flight, as I have never seen other species dip down to the water surface for anything more than a moment. I therefore consider that it is quite reasonable to identify Daubenton's in flight by this means. Its flight is distinctive too, being fast with shallow wing beats and always smooth, unlike the erratic flight of the Pipistrelle.

I caught the four Daubenton's mentioned above by netting them as they skimmed over the water surface. I have done all my successful bat-catching standing over the edge or within a few yards of the edge of the ponds at Godstone and the meres in Cheshire, among bats that have been flying around at head height. I have never caught a Daubenton's in this position, even though one or two have been visible over the surface of the water. This is sufficient evidence for me to suggest they must rarely if ever leave the water surface in the normal course of events. They must however fly to and from the pond every day, or for all I know they may fly regularly away from the water out of range of my net. On Godstone Green there is a small pond in one corner and I have been surprised to see one or two Daubenton's there, considering it is so small. It was here that I was able to see their flight away from water for a moment. It was still quite light when I saw a bat flying from the direction of the Clayton Pond which I recognised as a Daubenton's as soon as it started to fly over the water in its characteristic manner. Five minutes later I was able to watch it leave the pond and return in the direction from which it had come. On both occasions its flight was in a straight line, about 20 feet above the ground, while in size it looked a little larger than a Pipistrelle. Pipistrelles which I have watched flying straight across the Green have a characteristic zig-zag flight, rather like a Snipe. Even allowing for this slight difference in flight it would still be difficult to differentiate between the two species when in direct flight.

Daubenton's Bat seems the hardiest species I have seen. In the last few years during April there has been quite a lot of cold weather, yet Daubenton's were the only species to be seen on the Godstone Ponds. During the past few years both those ponds have been tending to dry up. Sometimes the ponds are covered with duckweed, during dry spells, and then the Daubenton's desert them. However a gusty wind will blow the duckweed into one corner and then the Daubenton's will return in their original numbers. So they must have been hunting away from the water meanwhile but I have been unable to identify them elsewhere. The species usually appears a little later in the evening than the Pipistrelle, sometimes as much as 15 minutes after the main body of Pipistrelles. I have only once seen a Daubenton's flying at dawn, whereas Pipistrelles were regularly seen.

NATTERER'S BAT *Myotis nattereri* (Kuhl)

Nearly all the London records of this species are from the Godstone and Westerham mine tunnels where a number have been found each

winter. The only one I have handled was taken from a wide wall crevice in the Godstone mine and I was able to confirm its identification by its grey-brown fur, whitish underparts, sharply pointed tragus well over half the length of its ear, and the stiff little fringe of hairs along the free border of the interfemoral membrane. W. G. Teagle (personal communication) who has examined many Natterer's in these tunnels and in similar places in Leicestershire and Buckinghamshire has been impressed by the pinkish colouration of the muzzle, a feature which was not mentioned in any books he has consulted, although George Lodge's excellent illustration of the species in Millais' work (1904) shows it very well. The muzzles of Whiskered Bats he has handled have been blackish where the skin was visible.

I have on several occasions seen a bat in flight which I believe was a Natterer's. The flight of those I have seen was very distinctive, so much so that the first time I saw one I was immediately aware that it was a species new to me. The description of the Natterer's flight in various books is very inadequate but would fit the bats I have seen. Both Barrett-Hamilton (1911) and Harrison Matthews (1952) say that it is slow and steady while Millais (1904) describes it as slow and even.

The flight of these putative Natterer's is certainly very slow and steady, much more so than of the Pipistrelle or Whiskered bat, and an additional point is that the wingbeats look very rapid and shallow. These characteristics are readily recognisable, especially its slowness which makes it look almost stationary compared with other species. Those that I have seen have been flying early in the evening, not too close to trees and quite high, so that excellent views of them were obtained for up to ten minutes at a time. They have all been flying between twenty and forty feet, except for one much higher at about one hundred feet, so I have never been able to catch one in the net to confirm the identification. Only on the three occasions that I have seen them over water did they make any sudden movements and these were infrequent, consisting of a short drop to a lower level. In size they look a little larger than the Pipistrelle. In an area north of Bletchingley where I have seen this presumed species on a few occasions, one once settled on the tiles of a small cottage, but flew off after a few moments. I wondered if this was a pointer to its roosting place but I did not see it there on the following dawn or on subsequent evenings. In late September 1962 one was flying over my garden at Bletchingley for about ten minutes at early dusk every evening I looked for it. I was able to get some splendid views but could not find where its roosting place was.

Details of all putative Natterer's I have seen in flight are given with the other records at the end of this paper.

THE LONG-EARED BAT *Plecotus auritus* (L.)

I cannot substantiate the view expressed by practically all the books and articles I have read, that this is one of the most common of British species. I have only encountered two in the London area, one found hanging in the roof space of the Priory at Godstone (where the Serotines and Pipistrelles were also found) and the other caught flying at the Rectory Pond. This one flew from behind me almost straight into the net, so it was an easy catch, though I had no idea that it was a Long-eared until it was taken from the net. Apart from this one, I have never seen one in flight either at Godstone or at the many other places in the country

where I have been bat-watching and so have no idea of its flight characteristics. It should be easy to recognise in flight by its enormous ears. If this species is not so uncommon as my records show then perhaps it tends to fly in places unfavourable for observation, such as woody sheltered places, or later in the evening when it is past twilight. It was almost too dark to do any more catching when I caught the one at the pond in July, and the one at the Priory in September was quite torpid, although the first Pipistrelles were emerging from the same roosts.

RECENT RECORDS FOR THE LONDON AREA

Records of bats for the years 1900 to 1956 have appeared in earlier numbers of the *London Naturalist* (Fitter, 1949, 1950 and 1960 and Rigden, 1955). The following records are mainly for the years 1957 to 1961, but some previously unpublished material for 1951, 1955 and 1956 is also given. All the author's records are of bats identified in flight unless otherwise stated. The *Myotis* spp. and Long-eared Bats found in winter at Godstone by WHB, AE, LWE, BDH, REP, GCP and WGT and at Westerham by JAB, AH, WGT, PCT *et al.* were hibernating in hearthstone workings.

The initials E, H, K, M and S are used to indicate the counties Essex, Herts, Kent, Middlesex and Surrey respectively.

GREATER HORSESHOE BAT *Rhinolophus ferrum-equinum* (Schreber).

Fitter (1949) quotes a few certain records for this century. The only recent occurrences are of one found in the Godstone hearthstone workings in the winter of 1951 (DLH), and of one at Oxleas Woods, Shooters Hill, Kent in November, 1953 (Rigden, 1955).

LESSER HORSESHOE BAT *Rhinolophus hipposideros* (Bechstein).

A few early records for the Chislehurst caves and later records for the London parks are given by Fitter (1949). It was recorded in the Godstone workings up to 1935, but not since; nor are there any records since 1939 from anywhere else in the Area.

WHISKERED BAT *Myotis mystacinus* (Kuhl).

K Westerham, three on January 3, two on February 28 and one on March 1, 1960; one on January 8, one on February 19 and one on December 10, 1961.

S Godstone, two on November 4, one on December 25 and three on December 29, 1957; four on February 15, 1958; two on March 5, 1960, one carrying mites of the sp. *Spinturnis vespertilionis* (Kolenati). The following dates refer to captures in flight at the Rectory Pond, Godstone:—four, August-September, 1956; one on August 2, 1957; one on April 27, 1958; one on July 4, 1960; one on August 31, 1961. One was caught in flight at the Clayton Pond, Godstone on May 25, 1958, and one on April 22, 1959 (BDH).

Old records suggest that this species is widely distributed throughout the London Area, but recent records are for Kent and Surrey only.

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

K Westerham, a female on January 3, and a male on January 10, 1960.

S Godstone, two on December 29, 1957; one on January 3 and three on February 19, 1958. The following bats were seen in flight by BDH and considered to be of the present species on the evidence given above: one at Clayton Pond, Godstone on April 17, 19 and 29, 1957; one at Rectory Pond, Godstone on August 8, 1957; excellent views obtained

of one flying very slowly in a straight line, at about 30 feet along the length of Clayton Pond, Godstone, outlined against the western sky early on the warm, fine evening of October 2, 1959; one at Pendell Court, north of Bletchingley on August 2, 6 and 20, 1960, and one at Warwick Wold, north of Bletchingley on August 9 and 12, 1960. One was seen on several evenings over the garden of Long Acre, Godstone Road, Bletchingley during the latter half of September, 1962 (BDH).

Apart from the occurrence of hibernating bats found in recent years at Godstone and Westerham (see also Fitter, 1960) and noted in flight by BDH, there are, according to Fitter (1949) only some rather vague records published at the beginning of this century.

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

K Westerham, three on January 3, 1960, one on January 5, one on January 8, four on February 19 and two on December 10, 1961.

S Godstone, one on December 29, 1957; one on February 15, 1958; one on March 5, 1960. Single bats caught in flight at the Rectory Pond, Godstone in August, 1956, April 14, 1957, July 9 and 18, 1960. Sight records from both ponds at Godstone, where they are quite numerous, and Oxted Mill Pond (BDH).

Fitter (1949) records this species as "locally distributed near water throughout the Area; Rigden (1955) mentions one from Mottingham Tarn, Kent in 1953.

SEROTINE *Eptesicus serotinus* (Schreber).

S Caterham, two on April 18, 1958. Croydon, one at Whitgift School on October 6, 1959. Gatton Park, one on August 28, 1960. Godstone and Bletchingley, common and evenly distributed; for further detail see preceding pages. Limpsfield Common, one on August 8, 1958. Oxted, a few in September, 1957 (BDH). Weybridge, a colony using a hollow *Robinia* was disturbed on August 29, 1960, and one bat was accidentally killed; a full description has been received. One found under the eaves of a garden shed on April 21, 1961, was possibly a member of the old colony (GHG).

In the past this species has been recorded from several places in the Kentish sector of the London Area, from Mill Hill in Middlesex, from near Welwyn, Herts., and from a few localities in Essex. There have only been three previous records from Surrey (Fitter, 1949 and 1950).

LEISLER'S BAT *Nyctalus leisleri* (Kuhl).

The only record of this species for the Area is of one found in 1953 at Abbey Wood, Kent (Rigden, 1955). A specimen was obtained near Sevenoaks, Kent, just outside the Society's Area, on September 22, 1957 (Harrison, 1958), and another was taken at Wendens Ambo, Essex, about 17 miles beyond the Area's boundary in the north-east (Harrison, 1953). As this species is only a little smaller than the Noctule, and is said to have the same flight characteristics, it is probably quite impossible to be sure of its identity when in flight. In support of this D. L. Harrison has obtained an adult Noctule with a wing span of 12 inches (personal communication), only a little larger than the average Leisler's. It is therefore difficult to assess the status of this species in the London Area.

NOCTULE *Nyctalus noctula* (Schreber).

S Bletchingley and Godstone, common but much local fluctuation in numbers, 1955-1962 (BDH). Esher, of 22 seen emerging from the

hollow branch of a tree in a private garden on September 12, 1960, twelve were caught and photographed (PAM, MO, RW, DWY). Old Oxted, in flight on several occasions, 1957 and 1958. Wimbledon Park, two in flight on August 28, 1958 (BDH).

- K Riverhead, one in flight at Montreal Park on September 1, 1958 (BDH). Fitter (1949) considered this species to be distributed throughout the Area, including the Inner London parks, but could quote no records from the Kentish sector since 1920. Rigden (1955) mentions more recent occurrences, however, in the Woolwich area and surrounding district.

PIPISTRELLE *Pipistrellus pipistrellus* (Schreber).

- E Epping Forest, one found dead on the road near the Wake Arms on October 15, 1961 (PAM, DWY).
 H Boreham Wood, one found in a railway tunnel in October, 1961 died in captivity (AMt). Skull in L.N.H.S. collection.
 K North Cray, a male found under flight of external stairs at Loring Hall (University of London) on November 20, 1959 was brought indoors by someone who did not realise that it was hibernating. It died on November 22 (DB, WGT).
 S Very common around Bletchingley and Godstone. Also recorded from Caterham, Chaldon, Chipstead, Kingswood, Limpsfield, Merstham, Nutfield, Oxted, Redhill, Reigate and Walton Heath (BDH).

LONG-EARED BAT *Plecotus auritus* (L.).

- K Nr. Swanley Village, two found in a dene hole on December 13, 1959 (WTA, WGT, PCT, HJV *et al.*). Westerham, four on December 10, 1961 (JAB).
 M Enfield, one found dead on August 17, 1960 (LJJ).
 S Coulsdon, one found dead on July 31, 1960 (LP, PAP, WGT). Godstone, one on February 15, 1958 (see introductory paragraph); one caught in flight at Rectory Pond on July 29, 1957; one roosting in the roof space of the Priory on September 16, 1959 (BDH). Nutfield, one picked up dying on September 13, 1958 (BAK).

BATS (spp.).

Several records of unidentified bats were submitted to the Recorder of Mammals. Only Inner London records and those for late autumn and winter are given.

- E Walthamstow Res., a large bat in daylight on November 12, 1960 (RHK).
 K Westerham, four over mill pond and two in Squerrye's Park on February 28, 1960 (DK, WGT, PCT, AT).
 M Bloomsbury, a small bat flying round Montagu Place at 1700 hours. G.M.T., at *c.* 25-30 feet, coming down to *c.* 12 feet, on September 7, 1960 (sc). Holland Park, one on April 24 and two on November 26, 1960; one flying over small woodland pond on December 9, 1961 (EPB). (A Pipistrelle was found dead in this park in 1962). Hyde Park, a small bat over the Serpentine on August 25, 1960 (RHK). Kensington Gardens, one over ponds at head of Long Water on April 8, 1960 (EPB). Westminster, a small bat with dark wings and what appeared to be a black ventral surface, in low fluttering flight close to walls in Dean's Yard on December 12, 1961 (GHG).

ACKNOWLEDGMENTS

I am most grateful to W. G. Teagle for allowing me to have all the records he has collected over the last few years, as Recorder of Mammals for the London Area, and for the encouragement and advice he has given to enable me to write this paper. I am very grateful to Michael Blackmore for his helpful suggestions and comments, and to Jane Burton for allowing me to reproduce two of the excellent photographs taken of the Bletchingley Serotine roost. The mites obtained from the Whiskered Bat found at Godstone in March, 1960 were kindly identified by A. Eve.

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Mammals in the London Area

A Report for 1960
with some records for the years 1957-1959

By W. G. TEAGLE

THERE has been a welcome revival in interest in British mammals over the past few years, greatly stimulated by the Mammal Society of the British Isles, and regular mammal reports now appear in the annual journals of several local natural history societies. Thanks to the co-operation of a number of dependable enthusiasts the volume of records now being submitted to the L.N.H.S. has greatly increased, but the Society is not yet as mammal-conscious as it might be, and it is a remarkable fact that 44 per cent of the observers who forwarded notes during 1960 were non-members! Whereas the Ornithology Section receives a flood of dated, localized records every year, often accompanied by field descriptions, the Recorder of Mammals is not always told the precise locality of an observation or the date, and is very rarely given any information about the habitat. Common or locally common species like the Rabbit, Grey Squirrel and Hedgehog are frequently ignored. Distribution maps are being made for these and other common species, and precise information is wanted to ensure accurate plotting—the name of the road if in a built-up area or a six-figure National Grid reference if in a rural area or large open space. At present there is an encouraging amount of material coming in from Kent, Surrey and part of Middlesex, but there is still a deplorable lack of information from Essex and Hertfordshire.

The last report (Fitter, 1960) dealt with records up to the year 1956. The bulk of those submitted for the years 1957-1959 is unfortunately not at present in the Society's possession, and no satisfactory summary can be published at present. What information is available is given below.

The initials which appear in the margin of the systematic list stand for the counties within the Society's Area: B = Bucks., E = Essex, H = Herts., K = Kent, M = Middlesex, and S = Surrey. The County of London is not recognized for recording purposes. Other abbreviations used are:—G.C. = Golf Course, G.P. = Gravel Pit, m.o. = many observers, R = River, Res. = Reservoir, and S.F. = Sewage Farm. Observers' initials are given in brackets.

The check list numbers and scientific names used are taken from Corbet (in press), and I am grateful to Dr. Corbet for his helpfulness and advice. I wish to record my sincere thanks to all those members of the Society who have given me information, either voluntarily or as a result of my persistent bullying, and I should like to acknowledge the help given to me by Bryan Pickess of the Ruislip N.H.S., D. M. Edwards of the Sidcup N.H.S., Ken White and Peter Tinning of the Lewisham N.H.S., the student-naturalists of Morley College, the Infestation Control Division of the Ministry of Agriculture, Fisheries and Food, and the children of Warren Road County Primary School, Orpington. To the Estates Governors of Alleyn's College of God's Gift I wish to express my gratitude for permission to visit Dulwich Woods during 1960.

A very special word of thanks is deserved by Derek Yalden, Patrick Morris and Geoffrey Gush for their very thorough, accurate and detailed field work in the Esher, Hersham and Weybridge districts. May their

example inspire someone north of the Thames to report on the *terra incognita* that lies to the north and east of Middlesex !

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SYSTEMATIC LIST

INSECTIVORA

1. HEDGEHOG. *Erinaceus europaeus* L.

Most of the records received were for suburban rather than for rural areas, possibly a truer indication of the distribution of observers than of Hedgehogs ! The species is numerous enough in some open spaces in Inner London, e.g. Battersea Park and Regent's Park, to suggest that a truly wild population exists here, and that the animals seen are not all

escaped or released pets. During 1960 there were 62 reports of Hedgehogs killed by motor traffic, and members are requested to send in records of any of these animals found dead on the roads. Autumn records of wakeful Hedgehogs were numerous (29 for the period October 1 to December 11, 1960), and one animal was seen on January 26 of that year.

Reported from the following localities:—

1957-1959

- E Forest Gate, Manor Park and Romford (EB, DJE, CLCS).
- K Blackheath, Brockley, Bromley, Catford, Chelsfield, Forest Hill, Greenwich Park, Knockholt, Lee, Orpington, Pett's Wood, St. Paul's Cray and Sidcup (m.o.).
- M Hendon, Mill Hill and Regent's Park (SMG, JGHy, REP, AT, JBT, WGT). Holland Park, Kensington, "recorded up to and including 1958" and one found dead in 1959 (EPB).
- S Battersea Park, Dulwich, Esher, Gipsy Hill, Streatham, Wandsworth and West Ewell (GB, RD, IWH, JFH, JGH, DK, DAR).

1960

- E No records !
- H Barnet, Borehamwood, Elstree and nr. Radlett (AMt, JBT).
- K Blackheath, Bromley, Catford, Chelsfield, Downham, Dunton Green, Greenwich Park, Leaves Green, Orpington, Otford, Pett's Wood, Shoreham, and Sundridge (m.o.).
- M Acton, Charlton (nr. Sunbury), Ealing, East Bedfont, Hounslow, Isleworth, Mill Hill, Ruislip, Shepperton, Southgate, Staines, Teddington, Twickenham, Upper Halliford and West Hampstead (m.o.).
- S Beddington S.F., Chessington, Dulwich, East Molesey, Epsom, Esher, Hersham, Mitcham, Oxshott, Putney, Shirley, South Croydon, Streatham, Surbiton, Thames Ditton, Waddon, Walton-upon-Thames, Weybridge, Wimbledon and Worcester Park (m.o.).

2. MOLE. *Talpa europaea* L.

Numerous occurrences in woodland areas as well as in the open. Moles are seen comparatively infrequently above ground, and most records are based on the presence of molehills. (Care should be taken to distinguish these from ant-hills, which are usually larger, covered with vegetation, and are often used by Rabbits as latrines).

1959

- E Molehills found at Havering-atte-Bower (MEP).
- K Molehills at Farningham Wood, Joyden's Wood, Keston, North Cray and Swanley Village. A surface run seen in Joyden's Wood (DB, PCT, WGT, HJV, KW). A Mole seen on surface at Loring Hall, North Cray by groundsman, R. Baker, on June 10 (DB).
- M Molehills at Mill Hill (Scratch Wood) and Stanmore (JGHy, AM, WGT). A dead one seen by AM at Stanmore.
- S Molehills at Chertsey, Claygate and Thorpe (DB, WGT). Bookham Common, the remains of eight animals found in Tawny Owl pellets obtained in July and October (GB).

1960

- K Molehills found at Chelsfield, Cudham, Dunton Green, Eynsford, Green Street Green (Orpington), Keston, Knockholt, Lullingstone Park, Otford, Pratt's Bottom, Shoreham and Westerham (m.o.).
- M Molehills found at Mill Hill (Mote Mount Park and Scratch Wood G.C.) and Staines Moor (JAB, AMH, MAP, JBT, WGT). CWP investigated a

number of open spaces in Isleworth, finding evidence of Moles in one locality only, at Osterley Park on December 3. Negative reports were made for Syon Park (from where they were said to have been absent for 20 years), Mogden Sewage Works and the grounds of South Middlesex Hospital.

- S Molehills found at Bookham Common, Coulsdon, Hersham, Selsdon, South Croydon and Whiteley Village (m.o.). Dead Moles found at Addlestone and Weybridge (GHG). Bookham Common, skull found on February 14; remains of one in Tawny Owl pellet on June 12 and a boar found dead on August 14 (GB, CPC).

3. COMMON SHREW. *Sorex araneus* L.

1957-1959

- E Havering-atte-Bower, one found dead on August 30, 1958 (MEP).
 K Bexley, one, believed to have been of this species, heard in churchyard on April 2, 1957 (DME). Chelsfield, one dead at Goddington on October 11, 1959. Knockholt, one dead in road at Fairtrough on August 30, 1959 (VG). North Cray, one brought into Loring Hall by cat on June 10, 1959, and another on June 15; one caught in Longworth trap in grounds of Loring Hall on October 25, 1959 (DB). Sidcup, one found dead on Kemnal Estate on June 23, 1959 (DME).
 M All records for 1959. Harefield, Knightscode Farm, one seen on February 17 and one found dead on February 25 (BPP). Isleworth, one found dead in August at Mogden Sewage Works (CWP). Northwood, one caught in Longworth trap near Battle of Britain House on June 18 (EC).
 S Bookham Common, remains found in Tawny Owl pellets obtained in February, July, August and October, 1959; 80 caught in Longworth traps during six trapping surveys made between September 24, 1958 and January 2, 1960, 75 per cent in open grassland (Lord, 1961). Esher, a nest with three young found inside an old settee on Westend Common on May 20, 1959. Hersham, three caught under sheets of corrugated iron in June and July, 1959 (PAM, DWY). Kenley, one caught in Longworth trap on August 22, 1959 (KE).

1960

- E Ilford G.C., one in August (BEB).
 H Brookman's Park, nine caught in Longworth traps in Gobion's Wood, near the Middlesex boundary, during period October to December (PJF, PAJ).
 K Chelsfield, three records of single animals on May 17 and 28 and on October 12 (VG). Cudham, one dead on September 10 (PA, AM, WGT). Dunton Green, one dead on July 17 (VG).
 M Mill Hill, remains of at least 15 found in Barn Owl pellets from Scratch Wood G.C. (JBT, WGT). Northwood, one caught in Longworth trap near Battle of Britain House on June 11 (EC).
 S Numerous records, many the result of looking under sheets of corrugated iron and other discarded material on waste land. Records from Beddington S.F., Bookham Common, Coulsdon, East Molesey, Esher, Hersham, Oxshott, Selsdon and Weybridge (m.o.). Skulls found in Barn Owl pellets collected at Bookham Common (GB), Cobham and East Molesey (PAM, DWY).

4. PYGMY SHREW. *Sorex minutus* L.

1957-1959

S Bookham Common, one found dead on April 21, 1957 (WGT); nine caught during six trapping surveys made between September 24, 1958 and January 2, 1960 (Lord, 1961).

1960

M Mill Hill, remains of at least four found in Barn Owl pellets from Scratch Wood G.C. (JBT, WGT). Ruislip, one found dead in lane near Reservoir Road on October 7 (BPP).

S Bookham Common, one on January 24 (WGT); remains of two found in Barn Owl pellets on April 10 (GB); eight caught in Longworth traps over four days in December (JCL). Cobham and East Molesey, skull found in Barn Owl pellets (PAM, DWY). Oxshott, one on April 3 and one on August 2 (PD, PAM).

5. WATER SHREW. *Neomys fodiens* Schreber

1959

S Bookham Common, two caught in Longworth traps on January 4 (JCL).

1960

K Otford, one on May 1 (DK).

S Beddington S.F., one under corrugated iron sheet on December 27 (AMH). Bookham Common, remains in Barn Owl pellet on March 13 (GB).

CHIROPTERA

Of all groups of British mammals the bats are probably the hardest to identify, and only naturalists with considerable experience of these animals are qualified to recognize even a few of our species when in flight. There is a tendency to assume that large bats are Noctules and small ones are Pipistrelles, and in the absence of any supplementary field notes reports of such can only be entered in the Society's records under the heading of "Bats, spp. unidentified". Records are welcome, however, even when the species cannot be determined, especially for the built-up area, and any roosts, hibernacula or breeding colonies should certainly be reported to the Society.

Recent records of bats in the London Area are given in a special paper by B. D. Hancock, which appears on p. 26.

CARNIVORA

23. FOX. *Vulpes vulpes* (L.)

A special enquiry into the distribution and behaviour of Foxes in the London Area was started towards the end of 1959, and a paper will be published in due course. Records received show that the Fox is well established as a breeding species in the London suburbs, especially on the south side of the Thames, and a few wanderers have even been seen in Inner London. Reports of London suburban Foxes often appear in local and national newspapers, and the Recorder would welcome any press cuttings mentioning their occurrence.

26. STOAT. *Mustela erminea* L.

1959

H West Hyde, one at Pynesfield G.P. on March 30 (MRT).

S Bookham Common, one on September 13 (GB).

1960

S Addlestone, one on Ham Moor on July 17 (GHG).

27. WEASEL. *Mustela nivalis* L.

1957-1959

- H Moor Park, one at Hamper Mill on January 24, 1959 (MTFC).
 M Hampton, one at Grand Junction Res. on December 13, 1959 (EPB, EMG). Harefield, one at Knightscode Farm on February 12, 1959 (BPP). Mill Hill, one at Scratch Wood on May 3 and 10, 1958; three on March 12 and one on May 12, 1959 (JBT).
 S Bookham Common, one on April 21, 1957 (WGT). Nutfield, one crossing Coopers Hill Road on Aug. 24, 1959 (BAK). Old Oxted, one in August, 1957 (BDH). Wimbledon Common, one on April 5, 1959 (RHK).

1960

- H Nr. Oxhey Woods, a road casualty on December 3 (DC).
 K Lullingstone Park, one on December 4 carrying a small mammal (MS_m); one seen in car park on December 24 appeared to be carrying prey (VG). Sidcup, one at Ruxley Corner on January 5 (EMH).
 M Brent Res., two on July 21 (JBT). Bushy Park, one in April (PGB). Northwood, two caught by cat near Battle of Britain House during the year (vs). Osterley Park, one reported to CWP but no date given. Whitewebbs Park, one on November 20 (LJJ).
 S Beddington S.F., one on January 3 (PJG). Bletchingley, one in Pound Hill Wood in August (BDH). Chelsham, skin of one with Dept. of Zoology, University College, London, shot in March (DWY). Esher, one on April 9 (RM). Hook, a road casualty on April 6 (PAM). Nutfield, one seen chasing two Nuthatches up trunk of an oak on March 24; a road casualty on May 26 (BAK).

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

An enquiry into the distribution of the Badger in the London Area was started late in 1959, and this work now forms part of the National Badger Survey, a scientific investigation organized by the Mammal Society of the British Isles.

A paper will be published in a future *London Naturalist* summarizing the results of the L.N.H.S. enquiry up to the end of 1963. This should reveal the gaps in our present knowledge and perhaps inspire further research. From the work carried out so far it appears that the Badger is fairly plentiful south of the Thames, in woodland on the Chalk or on sand, and that it even occurs within the suburbs. It is rather scarce in Middlesex, and very little is known of its distribution in those parts of Hertfordshire and Buckinghamshire which lie within the Society's boundaries. Scott (1960) has given an account of its occurrence in Essex.

Badgers still suffer needless persecution at the hands of the prejudiced and the ignorant, and information which might reveal the precise location of occupied sets will therefore be withheld from publication. Such detail is, of course, required by the Recorder for analysis, and will be preserved in the Society's archives. Members wishing to assist the enquiry should turn to p. 57 where they will find more about the National Survey. Sight records of Badgers and reports of Badgers killed on the roads are also requested.

34. COMMON SEAL. *Phoca vitulina* L.

1958-1959

- M/S A seal, presumably of this species, frequented the Thames in the Richmond-Twickenham area in 1958 and again in 1959, but no dated

records of these occurrences are at present in the Recorder's possession. Any information would be welcomed.

ARTIODACTYLA

DEER

At least three species of deer, Fallow Deer *Dama dama* (L.), Roe *Capreolus capreolus* (L.), and a species of muntjac, *Muntiacus muntjak* (Zimmerman) or *M. reevesi* (Ogilby), are known to be living wild in the wooded parts of the Society's Area, but it is impossible at present to make any comment on their distribution which would be of any value. The record of Roe given below is the only one submitted for the years under review which is supported by field notes or for which a precise date is quoted. Observers reporting the presence of deer are asked to supply a field description. A note should be made of the animal's size, the form of the antlers, if any, and the colour of the pelage, particularly that of the rump when seen from the rear, and, in the case of small deer suspected of being muntjac, the colour of the neck.

43. FALLOW DEER. *Dama dama* (L.). 1957-1959

E Epping Forest, the annual reports submitted to the City of London Corporation by the Epping Forest Committee state the number of deer counted on December 31 on each of these three years, *viz.*:— 92 in 1957, c. 90 in 1958 and 98 in 1959.

1960

E Epping Forest, 78 counted on December 31 (AQ).

44. ROE DEER. *Capreolus capreolus* (L.) 1960

S St. George's Hill, three near Silvermere on October 9 (GHG). The animals were described as being two feet high at the shoulder, "patchy reddish brown and grey brown, with no antlers", white-rumped and with "a suspicion of white on the chest, white to dirty white inside the ears, a little white on the muzzle and a black nose".

LAGOMORPHA

52. BROWN HARE. *Lepus capensis* L. (*L. europaeus* Pallas) 1957-1959

H Old Parkbury G.P., three on June 28, 1958. Shenley, one on February 1, 1959 (JBT).

K Abbey Wood Marshes, reported by allotment holders in 1957 (Burton, 1962). Brasted, two at Hogtrough Hill on April 19 and one on May 31, 1959 (Lew., WGT). Dunton Green, two near R. Darent on March 15, 1959 (Lew.). Leaves Green, one on May 18 and three on May 19, 1959 (DB, WGT).

M Hampstead Heath, one at close quarters at about 0400 hours during the summer of 1958 (JBT). London Airport, 12 seen from aircraft while landing, and a thirteenth seen from airport bus, June 20, 1957 (REP, WGT).

S Nutfield, one flushed from its form on September 15, 1957 (BAK). Richmond Park, two near Leg of Mutton Pond on June 25, 1959 (DB, JJ, AES).

1960

- E Brentwood, one near S.F. on May 21 (RBW). Waltham Abbey, two on August 27 (LMPS).
- K Chelsfield, one on March 6 and one on September 18 (VG, ATG). Eynsford, one on May 14 (DK). Knockholt, one on September 3 (VG). Lullingstone Park, one on edge of small wood on May 22 (WTA, BB, WGT, PCT); one in car park on June 19 (VG). Sevenoaks, one near Bat and Ball station on April 2 (JBT). Sundridge, one on October 16 (VG, PCT).
- M Hampstead Heath, two by Ladies' Bathing Pool on August 27 (MF); and a dead leveret found (date not recorded) (NAM). Headstone Lane, one seen dead in the spring (LMB). Pinner Park, one on February 20, March 8 and July 30 (PAM_v). Potter's Bar (nr.), one on August 1 (AFM).
- S Hersham S.F., one on July 30 (GHG). Richmond Park, two early on morning of June 26, one rolling on its back on a sandy path (WGT). Thames Ditton, one on September 29 (MO).

54. RABBIT. *Oryctolagus cuniculus* (L.)

Very few records are at present accessible for the years 1957 and 1958, and the summary given below is principally concerned with the years 1959 and 1960 for which there is more information. Notes received suggest that this animal is on the increase in many parts of the Area, but may be checked locally by fresh outbreaks of myxomatosis. The disease was affecting Rabbits at Nutfield, Surrey in August, 1958 (BAK) and in Richmond Park in the same county in October, 1959 (DB, WGT). In Middlesex it broke out at Kempton Park early in the latter year and diseased Rabbits were observed in May, 1959 in Bushy Park, which escaped the 1954 epidemic (PBL, PAM, RW, DWY). There were no doubt other outbreaks which were not reported.

All records of this species are wanted, but of special interest are those of its occurrence in the suburbs (e.g. on Hampstead Heath), its behaviour during hard weather, and of deaths through myxomatosis or motor traffic.

The following localities are those in which Rabbits were seen or droppings found.

1959

- K Beckenham Place Park, Chislehurst, Cudham, Dunton Green, Erith Marshes, Farningham Wood, Joyden's Wood, Leaves Green, St. Paul's Cray, Shoreham, and near Swanley Village (m.o.).
- M Bushy Park, Isleworth (Mogden Sewage Works), Kempton Park, Mill Hill (Scratch Wood) and Perivale (Selborne Society's sanctuary) (m.o.).
- S Headley Heath, Richmond Park, Tolworth and Wimbledon Common (m.o.). JAB reported that Rabbits, presumed to be of wild origin, were living in the grounds of St. Joseph's College, Beulah Hill.

1960

- E Epping Forest (Yardley Hill) and Ingrave (LMPS). Great Warley and Upminster (RBW).
- K Beckenham, Bexley, Chelsfield, Cudham, Eltham, Eynsford, Farningham, Keston, Kingsdown, Knockholt, Lett's Green, Pratt's Bottom, Shoreham, Sidcup, Sundridge, Swanley, Well Hill and Westerham (m.o.).
- M Ashford, Bushy Park, Hampton Court Park, Mill Hill (Mote Mount Park and Scratch Wood), Ruislip and Staines (m.o.).

S Addlestone, Beddington S.F., Bookham Common, Chessington, Claygate, Epsom Downs, Esher, Farleigh, Fetcham, Hersham S.F., Long Ditton, Lower Green, Mitcham Common, Nutfield, Oxshott, Surbiton, Thames Ditton, Walton-upon-Thames and Weybridge (m.o.).

RODENTIA

56. GREY SQUIRREL. *Sciurus carolinensis* Gmelin

In 1956 the Ecological Section of the London Natural History Society completed a three-year enquiry into the distribution of the Grey Squirrel in the London Area, the report on which was published by Beven (1957). Since 1956 it is evident that the species has made an advance towards the centre of London, regaining some of the ground it lost as a result of the national campaign started in 1930. Records from some suburban parks and residential districts suggest that it has increased in numbers. Shorten (1954) was informed in 1945 that the Grey Squirrel had been absent from Greenwich Park since 1943, but squirrels were observed there in 1950 (WGT) and Burton (1962) lists a number of occurrences between 1951 and 1958. By 1958, in fact, squirrels were well established, and in the course of 67 visits made to the Park by WGT in that year, up to four were recorded on 38 occasions. Up to seven were seen regularly in 1959 and up to ten in 1960, since when there has been a further increase. For the period under review there were only two reports from Inner London both for 1958; one of a squirrel seen in a garden in Campden Hill on February 15 (MSt) and one in near-by Holland Park on December 21 (EPB). It is not possible to say whether these records relate to a genuine immigrant (or immigrants) or whether the squirrel(s) had had what the ornithologists call an "assisted passage". It is a fact that a number of people keep Grey Squirrels as pets, although this is unlawful under the Grey Squirrels (Prohibition of Importation and Keeping) Order, 1937. At the time of writing (1963), however, Grey Squirrels are present again in Regent's Park after an absence of something like 30 years. As pointed out by Beven (1957) squirrels can make use of gardens in residential areas to move from one open space to another and it would appear that infiltration into Regent's Park has taken place from Hampstead Heath. At present, however, there are no records which can be quoted as supporting evidence of this, and any information on the presence or absence of squirrels from the St. John's Wood, Belsize Park and Frognal districts would be welcome.

Records are also needed for the Bucks., Herts. and Essex sectors of the London Area (in Essex there is a complete lack of information for the land between Romford and Grays Thurrock), for Kent east of the River Darent, for Surrey between Mickleham and Limpsfield, and in Middlesex for the Colne Valley and localities west of Osterley Park.

Even before 1960 some suburban squirrels had become bold enough to make overtures towards the public. One in Dulwich Park took food from the hand in April, 1958 (WGT), as did others in Greenwich Park and Kelsey Park, Beckenham in 1959 (EWCH, HT, PCT, WGT). On July 31, 1960 JGH watched a squirrel moving amongst occupied tables at the tearoom at The Rookery, Streatham. Now (1963) a litter of peanut shells on the ground in a suburban park can often be accepted as evidence of the presence of tame squirrels! In 1960 GB found a squirrel taking food from a trap set in his Esher garden with the object of catching birds for ringing. In Kent, breeding took place in a kerbside tree in a residential part of Beckenham in

1959 (SDB), and a squirrel was seen on the roof of a house in Sundridge Park in 1960 (MD).

There were reports of white squirrels from Beddington, where one was present throughout 1960 (JAB), and from Bromley Common where from one to three animals were seen near Trinity Church between June, 1959 and May, 1960 (WB, VG).

Six observers found Grey Squirrels which had been killed on the roads; during 1960 PAM and DWY found 12 traffic victims in the Esher district alone.

Little information is at present available on the Grey Squirrel's distribution in 1957 and 1958. The species was reported from the following localities in 1959 and 1960:—

1959

- E Epping Forest (Bury Wood) and Ilford (Valentine's Park) (LMPS).
- K Beckenham, Bromley, Charlton (Maryon Wilson Park), Chelsfield, Chislehurst, Farnborough, Greenwich Park, Keston, Knockholt, St. Paul's Cray Common, Sidcup and Westerham Hill (m.o.).
- M Mill Hill (Scratch Wood) (JGH_y, WGT).
- S Beddington Park, Bookham Common, Claygate, Dulwich, Esher, Hersham, Norbury, Richmond Park, Roehampton, Shirley, South Croydon, Streatham (Norwood Grove Recreation Ground, Streatham Common and The Rookery), and Tooting Bec Common (m.o.).

1960

- B Langley Park, at least on April 7 (LMPS).
- E Brentwood S.F., Buckhurst Hill, Great Warley, Havering-atte-Bower, Ilford (Valentine's Park), and South Weald (JFS, LMPS, RBW).
- H Aldenham, Broxbourne and Cuffley (LMPS).
- K Beckenham, Brasted, Bromley, Chislehurst, Cudham, Eltham (Oxleas Wood and Shepherdsleas Wood), Eynsford, Farnborough, Farningham Wood, Forest Hill, Greenwich Park, Pratt's Bottom, Shoreham, Sundridge Park and Westerham (m.o.).
- M Bushy Park, Ealing, East Finchley, Enfield, Gunnersbury Park, Hampstead, Harrow Weald Park, Highgate Wood, Hounslow, Mill Hill, Laleham, Northwood, Potters Bar, Ruislip, Stanmore, Syon Park, Teddington and Twickenham (m.o.).
- S Arbrog Common, Barnes Common, Beddington, Bookham Common, Cheam, Cobham, Croydon, Esher, Ewell, Farleigh, Headley, Hersham, Hinchley Wood, Morden, Norbiton, Nutfield, Oxshott, Putney, Richmond Park, Sanderstead, Shirley, Streatham (as in 1959), Surbiton, Thames Ditton, Tooting Graveney Common, Wallington, Walton-upon-Thames, Whiteley Village and Wimbledon Common (m.o.).

[INDIAN GIANT SQUIRREL. *Ratufa indica* (Erxleben)

1959-1960

- K Blackheath, one which lived for about seven weeks in a garden in Lee Park built a large drey in a beech at over 60 feet. It was caught on January 9, 1960 at the onset of severe weather, but died on the 16th of coccidiosis. The squirrel was, of course, an escape, but no-one had reported its loss to the local police (JGH_s, WGT.)

SMALL RODENTS

Many records of mice and voles have been obtained by live trapping with Longworth small mammal traps and by looking under sheets of corrugated iron, asbestos and other discarded material. Three profitable

hunting grounds in Surrey explored by PAM and DWY were pieces of waste ground littered with such rubbish, one in Haver's Avenue, Hersham, another on the Palace Estate, Thames Ditton and a third near the Oxshott claypit. The same two observers have also found that remains of small mammals can also be found occasionally in discarded bottles which have come to rest in an oblique position, neck uppermost, on banks or in hedgerows.

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

This species, once feared to have become extinct in the London Area (Fitter, 1949), has since been found in over a dozen localities. Records received since 1958 show that sewage farms often provide it with a suitable habitat. A special report on this species is being prepared, and the Recorder would be grateful for any notes of its occurrence together with a description of the habitat. Old records would also be welcome.

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

Reported from the following localities:—

1957-1959

K Farningham Wood, Hayes Common, North Cray and St. Paul's Cray in 1959 (WTA, DB, SEAD, WGT, PCT, DV, HJV).

M Harefield, one at Scarletts Wood, Knightscode Farm on May 18, 1959 (MRT). Highgate, trapped in a garden in 1959 (PAJ). Holland Park, Kensington, remains found in Tawny Owl pellets in November, 1957 and July, 1959 (Brown, 1963). Northwood, six trapped near Battle of Britain House between June 17 and 19, 1959 (MGC). Pinner Hill, hazel nuts removed by Wood Mice from chardonneret trap set in garden in summer of 1959 (TG, RJ). Ruislip, single mice on May 4 and 17, and July 22, 1959 in Broadwood Avenue (MRT).

S Bletchingley, Bookham Common (remains found in Tawny Owl pellets), Claygate (trapped at Lower Wood), and Esher (GB, BDH, WDP, WGT).

1960

E Havering-atte-Bower (MEP).

H Brookman's Park, total of 62 trapped in Gobion's Wood, near Middlesex boundary, October to December (PJF, PAJ), and in grounds of Merchant Taylors' School, Moor Park (IM).

K Brasted, Chelsfield, Chislehurst and Keston (VG, AH, CL, PCT).

M Botany Bay, Heston, Highgate (as in 1959), Mill Hill, Northwood, and Pinner Hill (DC, EC, PAJ, PJ, IM, JS, SWg).

S Beddington S.F., Bookham Common (remains in Tawny Owl pellets), Claygate, Cobham, Dulwich Woods, East Molesey, Hersham, Kenley, Lower Green and Thames Ditton (m.o.).

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

1957

S Bletchingley, one trapped alive in mid-September (BDH).

1960

H Brookman's Park, two trapped alive in Gobion's Wood, near Middlesex boundary, in autumn (PJF, PAJ).

S Kenley, one trapped alive on January 30 and another on February 13 in Old Lodge Lane; one trapped alive on Kenley Common in the spring (KE). Oxshott, one accidentally killed at claypits on June 6 (PAM).

61/62. *Apodemus* sp.

1960

M Mill Hill, remains of at least seven mice of this genus found in Barn Owl pellets from roost on Scratch Wood G.C. (JBT, WGT).

64. SHIP RAT (OR BLACK RAT). *Rattus rattus* (L.)

Bentley (1959), in comparing the distribution of this species in the United Kingdom in the years 1951 and 1956, makes special reference to its occurrence in the London Area. Although even the latter year is outside the period considered by this report, a brief summary of Bentley's findings might not be out of place.

The Ship Rat appears to be losing ground in and around London, as elsewhere. One of the factors considered responsible is a reduction in the number of rats carried by sea-going vessels. More overseas ports now have facilities for dealing with infested ships, and more ships are now being designed with the object of minimizing the possibility of rat harbourage. Consequently there has been a reduction since 1951 in the number of rats arriving at British ports which might have reinforced shore-based populations. To check the movement of rats from one British port to another, vessels engaged in coastal traffic are also subject to inspection, and, where necessary, treatment, and in recent years efforts have been made to reduce rat infestation in lighters, which at one time may be said to have provided a "rat-ferry service". On shore, local authorities and port health authorities have adopted more efficient control methods, and there has been an improvement in the design of dockside warehouses.

In places situated at some distance from London River improved control measures have apparently been principally responsible for a drop in population, and in such localities the species may sometimes experience some difficulty in extending its range, unless inadvertently assisted by Man. In Britain the Ship Rat is essentially an indoor animal, presumably on account of our climatic conditions, and it shows a marked reluctance to spread in built-up areas in which semi-detached buildings are an important feature, or which are broken up by open spaces or even by wide streets.

The following London Area localities are mentioned by Bentley in his account of the animal's status in 1956:—

E East Ham, only "five or less" infestations in 1951 and apparently free in 1956. West Ham, included amongst boroughs in which there had been a reduction since 1951 in the number of infestations but little or no change in distribution. The rats were mainly confined to buildings on the river- or canal-side.

K Dartford, present in 1951 but absent in 1956. Erith, reported as "always present somewhere" in 1951, but absent in 1956. (But see below). Greenwich, fewer infestations, but little or no change in distribution. Woolwich, a reduction in both range and numbers since 1951 and confined to riverside property.

M Bethnal Green, City of London, Holborn, Poplar, Stepney and Westminster, few infestations, but little or no change in distribution. Brentford and Chiswick, present in 1951, but absent by 1956. Enfield, reported as "always present somewhere" in 1951, but now absent. The rats are thought to have reached here from the London docks by barges using the R. Lea. Finsbury, "appeared to be both slightly more numerous and more widespread, but this impression may have been merely the result of more inspections". Fulham, reported as

“always present somewhere” in 1951, and no change noted by 1956. Islington, St. Marylebone and St. Pancras, reduced in numbers and in range, and, in the case of St. Marylebone, described as “no longer ‘always present’.” In St. Pancras, the formerly infested area to the north-west of Euston had been cleared by 1956. Shoreditch, range increased but numbers seemed to have declined.

S Battersea, reported as “always present somewhere” in 1951, and position unchanged in 1956. Bermondsey, a reduction in both numbers and range reported, and by 1956, restricted to the riverside. Camberwell, Lambeth and Southwark, fewer infestations, but little or no change in distribution. In Camberwell *R. rattus* was mainly found near the Surrey Canal, and in Southwark, only to the north of the Elephant and Castle. Wandsworth, both range and numbers reduced.

The docks of the Port of London, which include those at Tilbury, are situated in the Middlesex, Essex and Surrey sectors of the Society's Area. Here infestations were reported to be fewer, with their distribution more or less unchanged in 1956. In that year 1,123 bodies of *R. rattus* were recovered on shore after treatment as compared with 3,220 found in 1951 (Bentley, *op. cit.*).

Records since 1956:—

The remarks which follow are mainly concerned with the Port of London and the City of London, and are not, of course, intended to be regarded as a review of the status of *R. rattus* in the London Area up to 1960.

In the Port the numbers of bodies of Ship Rat recovered on shore for the four years after 1956 were as follows: 1,759 in 1957, 1,432 in 1958, 1,814 in 1959 and 1,285 in 1960 (Wilson, 1958, 1959, 1960 and 1961).

In the City of London rat infestations were described as “principally of Ship (Black) rat character” (90 per cent) up to and including 1958, but in 1959 a change in the mammal's status was noted, and of 53 rat infestations dealt with only 21 were of *R. rattus* character, and in each instance the infestation was considered minor. The same trend was evident in 1960, when of 68 infestations, 25 were of *R. rattus* and 43 of the Common (or Brown) Rat *R. norvegicus* (Erxleben). In 1948, when 698 rat infestations were treated, only 30 were of Common Rat (Wilson, 1958a, 1959a, 1960a and 1961a).

In August, 1960, a female Ship Rat was trapped in a factory at Erith, Kent (MN).

66. BANK VOLE. *Clethrionomys glareolus* Schreber
1959

K Chislehurst, one seen in Park Wood on November 15 (HJV). North Cray, one in Gatton's Plantation under metal sheet on March 26 (WGT); four caught in Longworth traps in grounds of Loring Hall between October 16 and 26 (DB). Shoreham, one to two seen near Shoreham Castle Farm (Lew.).

M Mill Hill, three in dense hawthorn scrub, Scratch Wood, on April 2 (JGHy, WGT). Northwood, three trapped near Battle of Britain House between June 17 and 19 (MGC).

S Bookham Common, remains found in Tawny Owl pellets in February, June, July and October (GB). Wimbledon, two by Beverley Brook on April 5 (RHK).

1960

H Brookman's Park, six caught in Longworth traps in Gobion's Wood,

- near Middlesex boundary, between October and December (PJF, PAJ).
- K Chislehurst, one in Pond Wood on November 1 (LWE). Cudham, two caught in Longworth traps on night of September 10/11 (PA, FED, AM, WGT). One of these was still living in captivity in March, 1963. Farningham Wood, two in Longworth traps on night of May 28/29 (PCT, HJV); one seen on June 19 (DTu).
- M Botany Bay, seven caught in Longworth traps on February 7 (JS). Mill Hill, remains of at least 24 from Barn Owl pellets found on Scratch Wood G.C. (JBT, WGT). Northwood, one killed by a cat, near Battle of Britain House on August 7 and another found dead on October 4 (BPP). Pinner Hill, one brought in by cat in mid-October (DC).
- S Bookham Common, remains of two from Barn Owl pellets on each of the following dates: February 14, March 13 and April 10, and of two from Tawny Owl pellet on June 12 (GB). Cobham, two skulls from Barn Owl pellets collected on October 1 (PAM, DWY). Esher, five records of this species caught in garden in Wolsey Road between August and November, and one caught in Longworth trap on Westend Common on December 18. Hersham, single animals seen or caught on October 23, November 19 and 27, and two caught on December 16. Lower Green, skull found in Barn Owl pellet collected near Island Barn Res. on September 7. Walton-upon-Thames, six caught near Burhill on December 10 and 11 (PAM, DWY).

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

1957-1959

- K All records for 1959. Otford, one in R. Darent on January 25; one on banks of tributary of the Darent on March 14. Shoreham, two on March 8, and one on March 15, on tributary of R. Darent. Westerham, one in foul-smelling ditch and another in R. Darent on May 10 (DK).

- S Bletchingley S.F., two on April 10, 1957 (BDH).

1960

- K Bexley, one in R. Cray on June 17 (AFM). Chislehurst, one in stream on edge of Camden Park G.C. on April 3 (AMH). Eynsford, one in R. Darent on May 22 (WGT, PCT, KW).

- S East Molesey, a moribund sub-adult male caught 200 yards from banks of R. Mole on July 28 (LWE, RLE). Esher, one in R. Ember on July 1, and one dead on Westend Common on September 4 (PAM). Hersham, one in R. Mole on August 26 (DWY). Leatherhead, a very tame animal photographed by BEN at watercress beds (MJC, BEN). Lower Green, one in R. Mole on September 24 (PAM).

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

1958-1959

- K Chelsfield, a female with three young in a nest under a sack on August 30, 1959. Cudham, one under metal sheet on April 19, 1959. Knockholt, one on March 27, 1959 (VG).

- M Northwood, one trapped near Battle of Britain House on night of June 17/18, 1959 (MGC).

- S Bookham Common, remains found in Tawny Owl pellets in February, March, July and October, 1959. Esher, one found dead in residential area on September 23, 1959 (GB). Thames Ditton, three under metal sheet on January 25, 1958 (RW).

1960

- H Brookman's Park, one caught in Longworth trap in Gobion's Wood, near the Middlesex boundary, during period October to December (PJF, PAJ).
- K Chelsfield, one killed by a cat on May 5 (VG). Ruxley G.P., one found dead on January 30 (EMH).
- M Harrow, two killed by cat in garden adjoining sports ground in December (EMCp). Mill Hill, remains of at least 48 found in Barn Owl pellets from Scratch Wood G.C. (JBT, WGT). Northwood, one killed by a cat at Battle of Britain House on August 7. Ruislip, one brought in by cat, Pembroke Road, on September 30 (BPP).
- S Beddington S.F., found "all over the Farm" (AMH). Bookham Common, two on January 24 (DK); remains found in Barn Owl pellets collected in February, March and April (GB). Esher, one caught on November 6 and one on November 24. Hersham, one to six seen or caught on nine occasions on waste land in Haver's Avenue. Lower Green, remains found in Barn Owl pellets from near Island Barn Res. Oxshott, one to four seen or caught on seven occasions on waste ground near clay pit. Thames Ditton, one to three seen or caught on four occasions on Palace Estate (PAM, MO, DWY).

[71. COYPU. *Myocastor coypus* Molina

1960

- E Collier Row, Romford, a "giant rat", said to have been "identified as a coypu" was reported in the *Romford and Brentwood Review* of 20.iv.60 to have attacked three children on April 26. The animal's behaviour as described in that journal (it "sprang from" and "ran back up" an oak tree), suggested that it was not of this species, and the Rodent Operative who investigated the incident was quite certain that the attacker was in fact a squirrel. The Medical Officer of Health states that "to his knowledge a Coypu has never been killed in the Borough".]

CETACEA

88. BOTTLE-NOSED DOLPHIN. *Tursiops truncatus* (Montagu)

1958

- M East India Dock, one stranded on April 29 (BMNH).

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The Badger Survey

SINCE the end of 1959 the L.N.H.S. has been investigating the distribution of Badger sets in the London Area, and this work now forms part of the National Badger Survey organized by the Mammal Society of the British Isles. The present L.N.H.S. Recorder of Mammals acts as the Mammal Society's "County" Recorder, although his recording area overlaps those of the County Recorders for Surrey, Kent, Herts. and Essex. Members wishing to take part in the National Survey as Local Recorders should get in touch with W. G. Teagle, c/o the General Secretary, 13 Woodfield Crescent, W.5, and they will be sent instruction sheets and recording forms.

Records of sets found outside the L.N.H.S. boundary should be sent to the following County Recorders: for *Essex*, D. R. Scott, 110 Forest Edge, Buckhurst Hill, Essex; for *Herts.*, Miss P. D. Hagar, Langdale, 4 Upper Ashlyns Road, Berkhamsted, Herts.; for *Kent*, Dr. J. F. D. Frazer, Warren Farm, Boxley, Maidstone, Kent; and for *Surrey*, R. Redfern, 11 Eastmont Road, Hinchley Wood, Esher, Surrey.

Members who are unable to undertake a systematic search for Badger sets, but who may wish to report any that they discover during the course of a natural history ramble, could help by letting the Recorder know the *precise* location of the site, quoting a six-figure National Grid reference or an easily identifiable point on a specified O.S. map, a description of the habitat and the size of the set.

If there is time for a more detailed examination the following should be noted:—

- (a) The actual feature of the land occupied by the set, the configuration of the ground, and the relation of the site to adjacent features, e.g. "slope in narrow wooded belt behind row of suburban gardens", or "slight slope between edge of woodland and golf course".
- (b) The soil, whether sand, chalk, or clay, etc.
- (c) The vegetation, giving tree, shrub, and herb layers, e.g., Maple, Hazel and Dog's Mercury.
- (d) The nearest water supply. (On the Chalk there may not be *any* within an easy distance of the set).
- (e) The number of entrances, and whether (1) occupied, (2) not occupied, but apparently in recent or occasional use, or (3) disused. The L.N.H.S. Recorder has put in category (1) those entrances outside which there is evidence of recent digging or fresh bedding, and where the tunnel is clear of fallen leaves, twigs, etc. Entrance tunnels which are still usable but have a layer of leaves, etc., on the floor have been placed in category (2), and collapsed tunnels or those choked with leaves or effectively obstructed by some other means have been classified under (3).

Observers should look for Badger hairs near the entrances. Body hairs from the dorsal region are easily recognized, being coarse, wiry, fairly long as a rule, and coloured white at the base and tip and black in the middle. The presence of recently used dung pits near the set, and claw-scratched trees, which are usually Elders, should be reported.

The Recorder would also be interested to hear of sets being used by Rabbit or Fox. Rabbit or Fox droppings may be found at the entrances;

Fox hair can sometimes be discovered and the remains of Fox prey, e.g. wings or feathers of poultry. If Foxes are, or have been recently in occupation, their unmistakable odour should be noticed !

The date of the observation should, of course, be given, and the Mammal Society is also interested in the previous history of sets, Badger damage, if any, in the neighbourhood, and any control measures which may have been taken.

Negative evidence is also needed in order that the survey can be as complete as possible, and the Recorder would be interested to hear of localities (outside the built-up area) from which Badgers appear to be absent.

W.G.T.

The Ecology Section's Collection: Appeal for Specimens

Two years ago a collection of skins and skeletons of the smaller British mammals was begun for the Ecology Section. It is hoped to build up a collection of associated skins and skeletons of mammals up to and including the size of Fox and Badger. The object of the collection is to provide a reference series to help members working on mammals and also ornithologists investigating bird pellet remains.

The collection is slowly growing, mainly through the efforts of only a few members, and much more material is needed, even of the commonest mammals, and members are strongly urged to assist in the formation of the collection. Fresh or not so fresh corpses, or remains in *any* condition, should be sealed in polythene bags and sent to me (address in programme). Any British mammal up to the size of Fox and Badger can be dealt with.

The collection already contains a few bird skulls and it is hoped that a good collection can be made of these: ornithologists, please note!

In addition to the above, the Section has a small collection representing species of land and freshwater Mollusca recorded for the London area, but the specimens are unlocalized. Localized London specimens would be most welcome, to make the collection of much greater reference value to members taking up the study of this group. There is little available information on the present distribution of the Mollusca in our area and the Recorder for Mollusca would also be pleased to see specimens and to receive records.

Miscellaneous material such as plaster casts of footprints, twigs, bones and nuts gnawed by various mammals, photographs, and any similar objects, would make the collection of more general interest, for we must remember that it is an ecology collection.

JOHN COOPER, *Curator.*

Analysis of Barn Owl Pellets from Claremont, Esher, Surrey

By W. G. TEAGLE

INTRODUCTION

Many small mammals are hard to observe in the field and their presence may easily go undetected. Small mammal populations may be investigated with the use of traps as has been done at Bookham Common, Surrey by Harrison (1956) and Lord (1961), and much information can also be obtained from the examination of owl pellets as has been demonstrated for Bookham by Beven (1959 and 1961). The present paper is concerned with the analysis of pellets of the Barn Owl *Tyto alba* from another part of Surrey.

Twenty-five Barn Owl pellets were given to me by D. W. Yalden and P. A. Morris who had taken them, during March 1961, from a site near Claremont, Esher (National Grid reference TQ 145632). Further material consisting of twelve unbroken Barn Owl pellets and a loose mass of pellet remains, was collected from the same site on April 4 and June 11, 1961, and analysed by D. W. Yalden.

HABITAT

Claremont is situated south of Esher. The house, now a school, stands in parkland. To the south-east are fields of rough grass (mainly *Dactylis glomerata*), and beyond these a line of houses on the northern borders of Esher Common. The pellets were found in the grass in one of the fields, around an old elm which was used as a roost. The fields and parkland, constituting typical Barn Owl (and Short-tailed Vole *Microtus agrestis*) habitat, are practically surrounded by woodland. To the west lie Claremont Woods, a National Trust property, and Westend Common. Esher Common lies to the south and extends an arm to Arbrook Common in the east. These commons are areas of sandy heathland colonised by trees, mainly Silver Birch *Betula pendula*, Scots Pine *Pinus sylvestris* and Common Oak *Quercus robur*. There are large ponds and small streams in the vicinity.

The varied nature of Claremont's surroundings would lead one to expect a fair number of small mammal species. Pellet analysis revealed the presence of eight.

SIZE OF PELLETS

Before each pellet of the first sample was broken up it was measured at its longest and widest points. The average size was 43.28×26.2 mm., with the largest pellet measuring 60×27 mm. and the smallest 27×25 mm.

ANALYSIS

Only skulls and dentaries (lower jaw bones) found in the pellets were considered when estimating the numbers of prey animals taken. Dentaries were sorted into two groups, those of the right side and those of the left. Although it is usual to find both dentaries with a skull and often more or less in a "natural" position, there are times when only one of the pair may be present and occasions when the skull itself may be missing. A dentary absent from one pellet might well be contained in another (perhaps not even collected), and two dentaries found in a pellet, although a right

and a left, might in fact be from two different individuals. Mammal (and bird) remains are apt to become very mixed before being ejected in pellet form, and it is not unusual to find the skull of one small species (e.g. a shrew) wedged through the orbit of a larger one.

No mammal can have *more* than one skull or two dentaries, however! Final figures have therefore been based on the separate totals of skulls, right dentaries and left dentaries, treating the sample as a whole. The largest number recorded for any one of these groups has been taken as the *minimum* number of examples of the species concerned.

In identifying the material, use was made of the booklet published by the British Museum (Morrison-Scott, 1952) and the author's collection of small mammal skulls.

The mammals found in the prey sample are shown in Table I. Since they are by no means all of the same body weight, use has been made of "conversion factors" to create a more realistic picture of the percentage of the total prey each species represents. This method of correcting for differences in size, taking a 20 gr. rodent as a standard, was suggested by Southern (1954) and has been followed by Beven (1959 and 1961) in his analyses of pellets from Bookham Common.

Southern gives no conversion factor for the Harvest Mouse *Micromys minutus* since this species was evidently not recorded at Wytham. Harrison Matthews (1952) gives the weight of a Harvest Mouse as between 5 and 6 gr., and Southwick (1956), who examined 182 animals of this species taken near Oxford, found that bucks ranged from 5.0 to 7.8 gr., with an average of 6.04 gr., and does from 4.3 to 8.2 gr., with an average of 5.97. Rowe (1958) examined 137 Harvest Mice from Hampshire corn ricks, and found the bucks averaged 6.07 gr. (range 4.2 to 8.2 gr.) and the does 6.05 gr. (range 4.4 to an exceptional 10.2 gr.). It would seem reasonable to accept 6 gr. as a standard weight, and the conversion factor as 0.3.

TABLE I
ANALYSIS OF PELLETS COLLECTED IN MARCH 1961

Species	Skulls	Dentaries		Min. no. of animals	Conver- sion factor	Prey units	%age
		L	R				
Short-tailed Vole <i>Microtus agrestis</i> (L.)	44	46	45	46	× 1.0	46.0	62.46
Bank Vole <i>Clethrionomys glareolus</i> Schreber	2	2	1	2	× 1.0	2.0	2.72
<i>Apodemus</i> sp.*	9	10	9	10	× 1.0	10.0	13.51
House Mouse <i>Mus musculus</i> (L.)	10	10	9	10	× 1.0	10.0	13.51
Harvest Mouse <i>Micromys minutus</i> (Pallas)	1	1	1	1	× 0.3	0.3	0.41
Common Shrew <i>Sorex araneus</i> (L.)	6	5	6	6	× 0.5	3.0	4.07
Pygmy Shrew <i>Sorex minutus</i> (L.)	8	6	6	8	× 0.2	1.6	2.17
Water Shrew <i>Neomys fodiens</i> Schreber	1	1	1	1	× 0.75	0.75	1.01
Totals				84		73.65	99.86

* Both the Wood Mouse *A. sylvaticus* (L.) and the Yellow-necked Mouse *A. flavicollis* (Melchior) occur in the neighbourhood, and the skulls cannot always be separated with certainty.

ANALYSIS OF MATERIAL COLLECTED IN APRIL AND JUNE 1961

The dentaries found in the pellets and loose fragments collected in April and June, 1961 were not sorted into "lefts" and "rights", and the minimum number of prey animals involved cannot be estimated by the

method employed when dealing with the other sample. The totals for skulls and dentaries are given in Table II.

TABLE II
ANALYSIS OF PELLETS ETC. COLLECTED IN APRIL AND JUNE 1961

Species	Skulls	Dentaries	Min. no. of animals	Conver- sion factor	Prey units	%age
<i>Microtus agrestis</i>	36	71	36	× 1.0	36.0	57.19
<i>Clethrionomys glareolus</i>	7	10	7	× 1.0	7.0	11.12
<i>Apodemus</i> sp.*	13	27	14	× 1.0	14.0	22.24
<i>Mus musculus</i>	—	4	2	× 1.0	2.0	3.17
<i>Sorex araneus</i>	6	12	6	× 0.5	3.0	4.76
<i>S. minutus</i>	1	2	1	× 0.2	0.2	0.32
<i>Neomys fodiens</i>	1	1	1	× 0.75	0.75	1.19
	Totals		67		62.95	99.99

* Both the Wood Mouse *A. sylvaticus* (L.) and the Yellow-necked Mouse *A. flavicollis* (Melchior) occur in the neighbourhood, and the skulls cannot always be separated with certainty.

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A Supplement to "The Fishes of the London Area"

By DAVID MARLBOROUGH, B.Sc.

INTRODUCTION

Since A. C. Wheeler's *The Fishes of the London Area* was published in 1958, a good deal of fresh information has been collected or has appeared in print. This can be augmented by information which was not used in 1958. The present paper attempts to bring Wheeler's original lists up to date, and to provoke further records. Similar supplements should become regular items in *The London Naturalist*, and be used to build up a checklist of the fish in the L.N.H.S. area.

SOURCES

Mr. Wheeler very kindly gave me the records accruing after his 1958 paper. In addition I have used my personal knowledge and that of friends and correspondents.

One useful book which Wheeler did not employ in 1957 was Venables' *Guide to Angling Waters* (1954), which has been used considerably in this paper. It gives a great deal of information corroborating that given by Sutton in *Fishing for Londoners* (no date)—used extensively by Wheeler—as well as many additional records. The only fault is a tendency to state "all the usual coarse fish" rather than listing species.

A book of note which has appeared since 1957 is Burrett's *Fishing Famous Rivers—Lower Thames* (no date), which has also been consulted. This work is a mine of corroboration and general comment.

It was considered that Wheeler had covered the historical ground thoroughly, so that research into older volumes was not necessary. This supplement aims to use Wheeler's paper as he wished, as "a basis for further observations". This paper is open to the same objections as his, as the sources used are similar. This will remain true until greater interest is shown in London's fish by observers other than anglers, who though numerous and attentive tend to be very selective and poor at identifying critical species.

METHOD OF COMPILATION

A list was made of all waters and species *specifically* mentioned in the sources above. Those records also mentioned in Wheeler were eliminated for reasons of brevity, though they are valuable (but not essential) corroboration. All duplications within this reduced list were also eliminated, and the localities checked as far as possible to see that they may not be alternative names for those in Wheeler's list. Then, on the advice of Mr. Reeves and Mr. Castell, records which were over half a mile outside the L.N.H.S. area were excluded. This would also exclude some of the Wheeler localities, such as Tring and Datchet. The half-mile allowance gives a certain margin for error in placing waters from the information given.

Wheeler's general layout, and the order of the species list, were retained for easy comparison. The counties and river systems listed by Wheeler for each species were given a constant order as before to preserve continuity; though counties without fresh records were left out. This county system works excellently except near Central London: a grid basis would

be preferable, but such an innovation would destroy the nature of a supplement such as this.

The main sources are indicated and acknowledged by the following abbreviations:—

BV — Venables

LT — Burrett

DM — Personal notes and records

DMC — Personal correspondents

OP — O. Polunin

PWC — P. W. E. Currie } among notes given by Wheeler

DG — D. Goodwin }

ACW — assorted notes given to me by Wheeler, from the following informants:

John Burton, A. Counter, P. C. Tinning, D. Keeley.

Note: in the following species list, "Wheeler" refers to the Wheeler 1958 paper, "ACW" refers to the notes collected subsequently and given to me.

SPECIES LIST

LAMPERN. *Lampetra fluviatilis* (L.)?

SURREY. One seen about 6" long among stones in the R. Bourne about 1938 (DG). This was probably the Lampern, though not identified closely; it may have been the form *L. planeri* which occurs in gravelly brooks. Very doubtful if it was migratory.

HUCHEN. *Salmo hucho* L.

Pearson (1961), in a book written with Burrett, devotes a chapter to the story of the introduction of the Huchen (a non-migratory freshwater Danubian salmon) into the Thames. They were released outside the L.N.H.S. area (except for one batch at Teddington) in the early years of this century; since then there have been a few reports of specimens being caught up to 1933. Pearson believes that some Thames "trout" may in fact be Huchen—to a layman, they closely resemble each other. A "sea-trout" was reported from Eel Pie Island (Hitchcock, 1962) recently; as they took care to differentiate it from an ordinary Thames trout, it might be in fact a Huchen (Marlborough, 1962). It would be interesting to know the fate of this addition to the Thames fauna.

TROUT. *Salmo trutta* L.

THAMES and LEA. New records confirm Wheeler; established at scattered localities, especially weir pools (due to the higher oxygen concentration there?), e.g. Sunbury (LT, ACW), Shepperton and Chertsey. Single unusual specimen from Chiswick Mall in the 1930s (OP). Fishery in the Lea at Rye House—a few (BV).

KENT. Sevenoaks sandpits (BV); R. Darent from Otford to Shoreham (ACW) and Westerham (BV). Wheeler says the Darent has been restocked after a decline.

SURREY. R. Bourne at Newham stocked (BV).

HERTS. New River at Ware—a few (BV); R. Colne at Rickmansworth—a few (BV).

PIKE. *Esox lucius* L.

Some of the records below are new localities on the same continuous river or canal; a well-distributed fish.

THAMES and LEA. R. Lea at Rye House and Enfield Lock (BV)—as with Wheeler, continuously distributed down to Ponders End,

KENT. R. Cray at Crayford; Brooklands Lake, Dartford (BV).

SURREY. Tooting Bec, 1959 (ACW); R. Mole, Molesey (ACW); Eagle Pond, Clapham Common (BV); R. Mole at Dorking (BV).

MIDDX and BUCKS. Moat Mount Lake, Mill Hill; Grove Pond, Stanmore; Spring Ponds, Stanmore (DM); Parliament Hill; Osterley Park Lake; Harefield Lake; Denham; Denham Gravel Pits; Woodland Lake; Iver Heath; Poyle Lake, Staines (BV).

HERTS. Colney Heath Gravel Pits; R. Chess, Rickmansworth; Grand Union Canal (some); (BV).

ESSEX. R. Roding at Ilford; Weald Park Lake, South Weald (BV).

COMMON CARP. *Cyprinus carpio* L.

All records just stating "carp" are given here; this species is usually meant, and often the Crucian is present also. Its popularity for restocking has grown greatly, and many small waters previously unfished may now hold heads of carp.

THAMES and LEA. R. Lea at Rye House (BV); most famous carp stretch of the Thames is Canbury Gardens, Kingston (LT).

KENT. Dunton Green Pits (ACW); Cliffe Clay Pits; Brooklands Lake, and Elliman's Pond, Dartford; Sutton-at-Home Gravel Pits; Swanley Gravel Pit; Holwood Park Lake, Keston (BV).

SURREY. Stew Ponds, Epsom Common; Headley Heath Pond (PWC); Tooting Bec 1959; Beddington Park Lake, 1957 (ACW); Eagle Pond, Clapham Common; R. Mole at Dorking (BV). Also very common in semi-ornamental waters, e.g. Kew Gardens (DM).

MIDDX and BUCKS. Moat Mount Lake, Mill Hill; Riverdene Park Lake, Edgware (stocked); Brookmans Park Lake, Potters Bar; Hampstead Heath Ponds ("Red Arches") (DM); Harefield Lake, Denham; Iver Heath—Woodlands Lake (BV).

HERTS. London Colney Gravel Pits; Verulam Pit, London Colney; Totteridge Long Pond; Aldenham Reservoir—a few (DM); Colney Heath Pits (BV).

ESSEX. Weald Park Lake, South Weald (BV). Common in most small ponds of Epping area, besides those given by Wheeler.

CRUCIAN CARP. *Carassius carassius* (L.)

Not often recorded because it is not often sought for or recognized. Introduced into the area by at least the 18th century. The *typical* inhabitant of small ponds in Essex, North Middx, South Herts. and Surrey.

THAMES and LEA. Hampton Court and Twickenham—occasionally (DMC); R. Lea near Broxbourne (DMC).

KENT. Known as introduction in places outside the L.N.H.S. area (e.g. Wadhurst and Royal Military Canal) but no records yet (DMC).

SURREY. Tooting Bec, 1957 (ACW); Crystal Palace Lake; Stew Ponds, Epsom Common (DMC). Common in many small Surrey ponds on fringe of area.

MIDDX and BUCKS. Moat Mount Lake, Mill Hill; Riverdene Lake, Edgware—introduced by D.M.; Pond at Potters Bar; Pear Tree Lake, Stanmore; several small farm ponds in Mill Hill (DM); Grimsdyke Hospital Pond; Girlington Gravel Pit, Feltham (DMC).

HERTS. Aldenham Reservoir 1913 (?)—stuffed specimen in a nearby inn purporting to have been caught in this reservoir (DM); Colney Heath; London Colney; Grand Union Canal near Rickmansworth (DMC).

ESSEX. Ponds at Dagenham and South Ockenden (DMC); the typical fish of *nearly all* Essex ponds within and without the L.N.H.S. area.

GOLDFISH. *Carassius auratus* (L.)

Many escapes and some in small ornamental waters. Where they exist they form small separate shoals and revert to feral coloration. Probably such small shoals in ponds in Mill Hill, not yet fully identified (DM). It is not desirable to list ornamental waters such as garden ponds, where they are in fact in captivity.

BARBEL. *Barbus barbus* (L.)

Almost completely riverine; still common in Thames and Lea, but much less sought for nowadays.

THAMES and LEA. Recorded by both LT and BV from Richmond to Staines; recent localities agree with Wheeler.

MIDDX and BUCKS. R. Northumberland (tributary of R. Colne) introduced 1959 by W. Howes (LT).

GUDGEON. *Gobio gobio* (L.)

Very common in most still and running waters in the area, thanks to widespread introductions due to its popularity as an anglers' livebait. Although not sought after, it is well recorded by anglers both for this reason and for its nuisance value when after larger species. Where it occurs, it occurs in substantial numbers. These are only a selection of the probable habitats.

KENT. Keston Common Pond; R. Darent from Otford to Shoreham (ACW); R. Cray at Crayford (BV).

SURREY. Tooting Bec, 1959; R. Mole at Molesey, Hersham, Mickleham, Dorking and Esher (ACW and BV).

MIDDX and BUCKS. R. Colne, West Drayton (ACW); Moat Mount Lake, Mill Hill (DM); Grand Union Canal, Southall, and Uxbridge; Little Britain Lake, West Drayton; Harefield Lake, Denham; Woodlands Lake, Iver Heath (BV).

HERTS. R. Colne, London Colney (DM); Grand Union Canal, Hunton Bridge (BV and DM), Croxley Green, Rickmansworth (BV)—very common along entire length (DM); New River, Ware; Colney Heath Pit (BV).

TENCH. *Tinca tinca* (L.)

Although Wheeler referred to this as a "rather uncommon species" I have found it to be one of the commonest denizens of still or sluggish waters in the area. It is a typical member of the ecosystem of such waters, and the majority of ponds and canals over a metre deep probably hold a stock. It is rarely seen even when present, due to its retiring habits: it probably exists in many ephemeral waters, as it tolerates low oxygen tensions and aestivates in the mud should the water dry up.

THAMES and LEA. Occasional below Teddington, but a noted locality is Twickenham (LT). In the Lea, at Rye House (BV).

KENT. R. Cray at Crayford; Sutton-at-Home Gravel Pits; Swanley Gravel Pit; Brooklands Lake, Dartford; Sevenoaks Gravel Pits (BV); Dunton Green Pits (ACW).

SURREY. Stew Ponds, Epsom Common (PWC); doubtful record in Sheepbell Pond, Bookham (PWC); R. Bourne at Thorpe—two only, 1935-1937 (DG); Tooting Bec 1959 (ACW).

MIDDX and BUCKS. Moat Mount Lake, Mill Hill—introduced ca. 1954?; Lake at Potters Bar; Grove Pond, Stanmore; Spring Ponds,

Stanmore (DM); Osterley Park Lake; Poyle Park Lake; Staines; Grand Union Canal, Southall and Uxbridge; Wraysbury Gravel Pit; Harefield Lake, Denham; Denham Gravel Pit (BV); Staines Moor Pond (DG).

HERTS. Aldenham Reservoir; Verulam Pit, London Colney (DM); Colney Heath Pits; Grand Union Canal, Croxley Green and Rickmansworth (BV).

MINNOW. *Phoxinus phoxinus* (L.)

Found in *clean* running water; tends to be displaced by stickleback with pollution. Still poorly recorded, but a fairly common livebait, so it may have spread.

KENT. R. Darent at Shoreham and Westerham (ACW and BV).

SURREY. Ditch running into R. Bourne at Thorpe Green 1934-1936 (DG); Tooting Bec, 1959 (ACW).

CHUB. *Squalius cephalus* (L.)

Mainly a riverine fish of patchy distribution, but known to invade lakes successfully.

KENT. R. Darent at Otford and Dunton Green (ACW); Swanley Gravel Pit (BV).

SURREY. Widely distributed in the R. Mole (ACW and BV).

MIDDX and BUCKS. "Odd chub" in R. Crane (LT); Wraysbury Gravel Pit; Poyle Mill Stream (BV). The last two may be covered by some of Wheeler's records.

HERTS. New River fishery at Ware; found in small streams outside the area (BV).

ESSEX. R. Roding at Ilford and Ongar (BV).

DACE. *Leuciscus leuciscus* (L.)

Very common fish in streams and perhaps in some lakes. Most new records confirm Wheeler, especially in Thames and Lea. Young Chub and Dace are easily confused; perhaps some records of still-water Dace are really Chub, as the latter species has invaded lakes and gravel pits all over the country.

SURREY. Tooting Bec, 1959 (ACW); common throughout the R. Mole (ACW and BV), besides Dorking (Wheeler).

MIDDX and BUCKS. Poyle Mill Stream, Colnebrook; Little Britain Lake; Wraysbury Gravel Pit (BV).

ESSEX. R. Roding at Ilford and Ongar (BV).

ROACH. *Rutilus rutilus* L.

KENT. Keston Common Pond; R. Darent, Otford to Dunton Green (ACW) and Westerham (BV)—more than a "few", cf. Wheeler; R. Cray, Crayford; Cliffe Clay Pits and Brooklands Lake, Dartford; Sutton-at-Home Gravel Pits; Swanley Gravel Pits; Holwood Park, Keston; Sevenoaks sandpits (BV).

SURREY. Tooting Bec, 1959 (ACW); Eagle Pond, Clapham Common (BV).

MIDDX and BUCKS. Walton Reservoir (ACW); Potters Bar Lakes; Moat Mount Lake, Mill Hill; Grove Pond, Stanmore; Spring Ponds, Stanmore Common; a single specimen seen floating dead in City Road Basin, Islington, 1959; scattered shoals in Brent Reservoir, restricted to certain sides because of pollution (DM); Pear Tree Lake, Stanmore; Harefield Lake, Denham; Denham Gravel Pit; Poyle Park Lake, Staines and

Poyle Mill Stream; Wraysbury Gravel Pit; Upper Halliford near Shepperton; Woodlands Lake, Iver Heath; Grand Union Canal, Uxbridge to Southall (BV). Some of these may be synonymous with Wheeler records, especially round Wraysbury and Iver.

HERTS. R. Colne at London Colney; R. Colne at Rickmansworth; Radlett Sand Pits (DM); New River, Ware; R. Chess at Rickmansworth; Grand Union Canal along entire length (BV and DM).

ESSEX. R. Roding, Ilford to Ongar; Weald Park, South Weald (BV). Undoubtedly the Roach occurs in all waters except the smallest.

ROACH × BREAM HYBRID

One reported at Ham Green Pits, Surrey in 1959 (ACW). This particular hybrid must be much more common than the records indicate, especially in gravel pits where the parent species are frequently co-dominant.

RUDD. *Scardinius erythrophthalmus* (L.)

Usually confused with the Roach; it is quite a popular livebait and sometimes used for garden pools, as it surface-feeds a great deal. It is probably much more common (by accidental introduction) in the London area than indicated by Wheeler, but it is best to forego judgement until records are verified. It produces a great biomass of small individuals, except in unusual circumstances and large waters.

KENT. Cliffe Clay Pits; Sutton-at-Home Gravel Pit; Sevenoaks Sandpits; Holwood Park, Keston (BV).

SURREY. Recorded outside the L.N.H.S. areas in ornamental waters and escapes therefrom (DG and DM); Thorpe Gravel Pit (BV).

MIDDX and BUCKS. Moat Mount Lake, Mill Hill; Lakes at Potters Bar; tanks and small cattle ponds round Stanmore; Spring Ponds, Stanmore Common (DM); Harefield Lake, Denham (BV).

HERTS. Radlett Sand Pits; London Colney Gravel Pit (DM)—noted in the field, not verified afterwards.

SILVER BREAM. *Blicca bjoerkna* (L.)

This is usually confused with young Bronze Bream, and as Wheeler suggests, may be absent from the area. The noted Silver Bream of Aldenham reservoir seem to be mostly immature Bronze Bream, but a full examination has not yet been made.

SURREY. Tooting Bec, 1959 (ACW).

MIDDX and BUCKS. R. Colne at West Drayton (ACW).

Neither of these records are verified, but the latter one has a ring of truth, as reports are heard of true Silver Bream in other parts of the Colne.

BRONZE BREAM. *Abramis brama* (L.)

A common and popular species; tends to be found in the larger lakes, canals, and sluggish rivers.

KENT. R. Cray, Crayford; Brooklands Lake, Dartford; Swanley Gravel Pit (BV).

SURREY. Stew Ponds, Epsom Common (PWC); Crystal Palace Lake; Tooting Bec, 1959 (ACW); Eagle Pond, Clapham Common (BV).

MIDDX and BUCKS. Pear Tree Lake, Stanmore; Parliament Hill; Victoria Park; R. Colne at West Drayton; Harefield Lake, Denham; Wraysbury Gravel Pit; Woodlands Lake, Iver Heath; Upper Halliford Lake; Grand Union Canal, Southall (BV and ACW).

HERTS. Colney Heath Pits; Red Spinners' Lake, Cheshunt; R. Chess, Rickmansworth; Grand Union Canal at Croxley Green and Rickmansworth (BV).

BLEAK. *Alburnus alburnus* (L.)

THAMES and LEA. Its major habitat—abundant above Hampton Court (ACW); Wheeler was unsure of its present status in the lower reaches and this still remains doubtful, but there is a probable record at Chiswick Mall in the 1930s (OP).

SURREY. R. Mole at Esher and Hersham (ACW).

STONE LOACH. *Nemacheilus barbatula* (L.)

Still poorly recorded.

KENT. Small tributaries of the Darent at Otford and Shoreham (ACW).

SURREY. Very common in fast-flowing parts of R. Bourne 1933-1939 (DG).

EEL. *Anguilla anguilla* (L.)

It is widespread in the area, but in my personal experience decidedly patchy. It does not seem to occur in the suburbs, except where these are extensively pierced by streams and culverts. It is virtually absent from many waters in the N.W. Green Belt (DM). This is despite the large number of covered and open watercourses in the London area, and this problem deserves careful investigation.

KENT. Sevenoaks sandpits (BV).

HERTS. Reports of isolated captures in Aldenham Reservoir, but apparently very infrequent. (DM).

PERCH. *Perca fluviatilis* L.

THAMES and LEA. Corroboration of Wheeler, but his list stops at Richmond. Record from Chiswick Mall (OP) in 1930s.

KENT. Dunton Green Gravel Pits (ACW); Brooklands Lake, Dartford; Sevenoaks Sandpits; R. Cray at Crayford; Cliffe Clay Pits; Swanley Gravel Pit; Holwood Park Lake, Keston (BV).

SURREY. Stew Ponds, Epsom Common (PWC); Tooting Bec 1959—is this synonymous with Wheeler's "Tooting Common"? (ACW); R. Bourne (DG); Ham Pits, Richmond; Lambeth Reservoirs, West Molesey (BV).

MIDDX and BUCKS. Walton Reservoir (ACW); Moat Mount Lake, Mill Hill, introduced; Potters Bar Lakes; Grove Pond, Stanmore (DM); Pear Tree Lake, Stanmore; Osterley Park Lake; Harefield Lake, Denham; Woodlands Lake, Iver Heath; Denham Pit; Poyle Park Lake, and Poyle Mill Stream, near Staines; Wraysbury Gravel Pit; Staines Reservoirs North and South; Queen Mary Reservoir; Upper Halliford Lake; Grand Union Canal; Victoria Park Lake (BV).

HERTS. Radlett Sand Pits (DM); Grand Union Canal throughout its length—see above (DM and BV); New River, Ware; Colney Heath Pit; R. Chess, Rickmansworth (BV).

ESSEX. Weald Park Lake, South Weald; R. Roding from Ilford to Ongar (BV).

RUFFE OR POPE. *Acerina cernua* (L.)

Well established and frequent in the Thames system, especially above the tidal reaches. It often does well in reservoirs (e.g. Barn Elms). It is not fished for on its own account, and because of its spinous fins not used as

a livebait. Therefore it is rarely introduced into fresh localities. However, it has enough nuisance value to the angler to be noticed, and occurs in large numbers of small individuals where present. Well worth investigating.

KENT. R. Darent, no date or place (ACW)—Wheeler has a single reference to this river at Eynsford.

SURREY. R. Bourne, 1936 (DG); Tooting Bec, 1959; R. Mole at Esher and Molesey (ACW)—Wheeler refers to this river by a reference of 1749.

BULLHEAD. *Cottus gobio* L.

KENT. Tributary of R. Darent at Otford (ACW).

SURREY. R. Bourne (DG); Beddington Park, 1957 (ACW)—Wheeler refers to their presence in the Wandle at Beddington in 1940.

STICKLEBACK. *Gasterosteus aculeatus* L.

Abundant and can undoubtedly stand a great deal of pollution. The typical species of stagnant small ponds, ditches and partly-polluted streams.

THAMES and LEA. Much more common than records can indicate, as it is usually not caught. Chiswick Mall (OP).

KENT. R. Darent, Otford to Shoreham (ACW).

SURREY. Ditch in Richmond Park, 1957 (DG)—Wheeler records it in the Pen Ponds; Beddington Park 1957 (ACW); unidentified record from Tooting Bec 1959 (ACW).

MIDDX and BUCKS. Probable species in the Cripplegate bomb site ponds and the tanks in the H.A.C. Grounds (PWC); fairly numerous in the heavily-polluted City Road Basin, Islington (DM); probably present in most of London's waterways; common in all streams and small ponds in N.W. London (DM); ubiquitous along the entire length of the Silk Stream to the Brent Reservoir at Hendon, despite industrial, domestic and sewage effluents, and in all lakes fed by it and its tributaries—e.g. Mill Hill Golf Course, Riverdene Park, etc. (DM).

"TEN-SPINED" STICKLEBACK. *Pygosteus pungitius* L.

Not often critically identified or even noticed.

SURREY. Abundant in roadside ditches between Egham and Thorpe 1929-1937 (DG); Ditch in Richmond Park with the previous species, 1957 (DG).

POSSIBLE ERRATA

Besides the sources of error listed earlier, specific mistakes may have entered the list. Thorpe, Surrey, is listed in some records as in Surrey, in others, as "near Staines". Thus it may inadvertently appear in the Middx and Bucks sections as well. There may be errors in the latter sections due to the profusion of waters around Wraysbury and Colnbrook. I would be glad if any were pointed out.

DISCUSSION

No conclusions can be offered from such an incomplete work as this. However, a few general remarks and a suggestion of possible future studies may not be inappropriate.

The deficiencies of both Wheeler's and the present papers are admitted; they are most evident in dealing with

(a) small species

(b) species easily confused with others

(c) waters not generally fished.

These all arise from having to use anglers' records—but their evidence is extensive for species or waters not in those categories.

It was suggested earlier that the county system could advantageously be replaced by a grid. This was apparent in dealing with

(a) the vagaries of the Herts/Middx border

(b) Central London

(c) migratory species

(d) long rivers and canals running through several counties.

Such a grid would be based upon the Ordnance Survey maps, using their ordinates for place references (as is already done by the botanists). Four- or six-digital references would eliminate the confusion that can arise from places with the same names in different parts of the area, and of course if this basis were used work done here could be correlated with work done outside the L.N.H.S. area.

ACKNOWLEDGEMENTS

I must again thank those who have helped me in this supplement, and the many people who have sent records to be used. Thanks must particularly go to Mr. A. C. Wheeler, Mr. F. C. Reeves and Mr. C. P. Castell.

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Notes on the Bird Life of Chislehurst Common

By E. M. HILLMAN

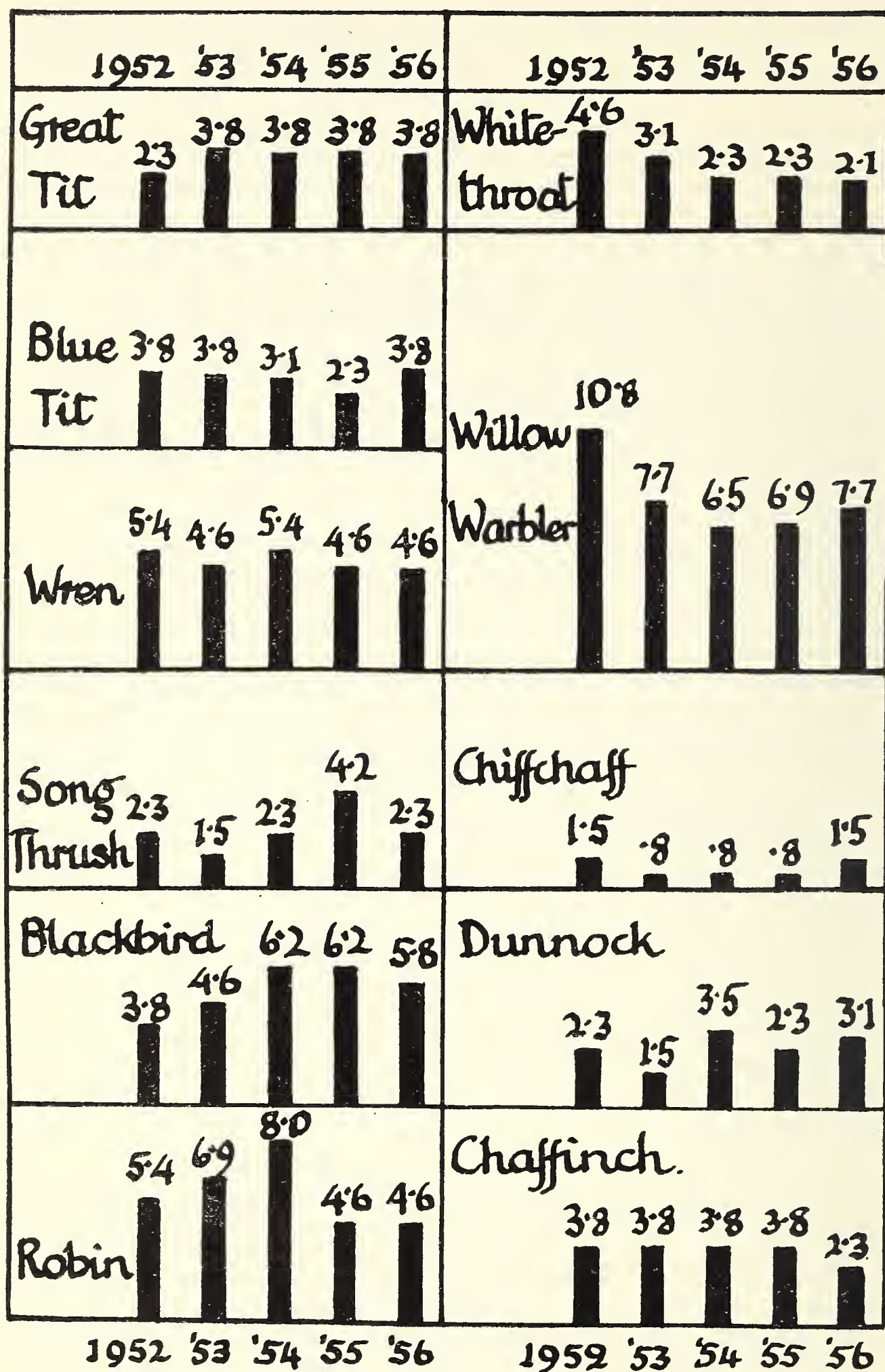
IN the *London Naturalist*, No. 37, under the heading "Devilsden Wood Survey", in comparing the bird populations of three areas, I referred to some counts of territories of singing males on Chislehurst Common, Kent. The area studied at Chislehurst I had previously thought too small to yield any useful results, but when the figures for the three areas were compared, the similarity of the composition of the populations in the relative numbers of common species was revealed, and I thought it worth while to put it on record.

In that account, I merely gave the highest and lowest numbers of territories, per ten acres for comparison, occurring in the period 1952-6. By further comparison with the results for Bookham Common, it has been noticed that certain fluctuations of territory numbers in one area are reflected in the other, and also in other parts of the country. These changes will be discussed in a future account of Bookham Common by Dr. G. Beven, and I therefore think that it may be useful to record the detailed changes for Chislehurst. I emphasize that the area studied was only a part of the Common, 13 acres, but it may be that this small sample not only gives a fair indication of the composition of the populations of similar habitats at a given time, but may even be a pointer to increases and decreases which are not merely local. Of course, one must always bear in mind changes which take place in the area studied; the decline of the Whitethroat numbers may well have been caused by the partial destruction of gorse patches which were a feature of the less wooded parts; otherwise during the period 1952-6 there were no marked changes in the habitat.

Although no deductions are possible from one small sample as to more general changes in bird numbers, the possible value of many such samples is indicated, and might encourage those who can give up only a little time, to undertake census work in a small area which can be covered in a half to one hour's work per week; and collaboration so that similar habitats are studied would be especially valuable. The monotony of the work is often relieved by some unexpected and at times exciting incidents, the most unusual in the author's experience being the picking up of a fledgling Hawfinch from a bramble twig as easily as plucking a flower.

The table speaks for itself and I make no further comment except to say that Chiffchaffs are no more numerous than several other species listed below and are merely given here for comparison with Willow Warbler numbers.

In addition to the 11 species for which figures are given, the following were recorded in each of the years 1952-6 with sufficient frequency to indicate that they had territories wholly or partly within the area of 13 acres, but, as a rule, only one per species: Carrion Crow, Jay, Longtailed Tit, Blackcap, Lesser Whitethroat, Bullfinch and Yellowhammer. The following, recorded in three or four of the five years, were thought to be regularly holding territory on adjacent parts of the Common when not actually within the study area: Wood Pigeon, Turtle Dove, Cuckoo, Green Woodpecker, Great Spotted Woodpecker, Magpie, Coal Tit, Marsh Tit, Treecreeper, Mistle Thrush, Garden Warbler, Spotted Flycatcher, Hawfinch and Greenfinch.



The figure shows the density of bird territories per 10 acres on a part of Chislehurst Common, Kent, for 11 common species, for the years 1952-6.

Starlings and House Sparrows were often present, and Swifts hawking over the area were seen more frequently than Swallows, who seemed to prefer the vicinity of ponds beyond the boundary. Jackdaws, Nuthatches, Goldfinches and Linnets were only occasional visitors to this particular part in the summer.

The area consisted of oakwood with mixed shrub layer and contained an open space of grassland with some gorse bushes, the whole bounded by busy roads and large quiet gardens. Within the last three years the shrub layer, except for one or two holly bushes, has been removed from half the area, so that not only is there less cover for the birds, but also there is none for the watcher.

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Some Notes on the Chalk at Coulsdon, Surrey

By R. F. MOORMAN, F.G.S.

DURING 1952 and for the next three years the Geological Section carried out an intensive investigation of the London Clay at Oxshott, and the results were published in the *London Naturalist*, Nos. 33 and 34. Further work became impossible when the pit was abandoned and became flooded.

In the autumn of 1961 the Section decided to investigate a large active quarry at the Coulsdon Lime Works (formerly known as the Stoats Nest Quarry) situated in Marlpit Lane, Coulsdon, $\frac{1}{4}$ mile due east of Coulsdon South Station, Grid Ref. TQ(51)303591. Permission was obtained for not more than three members of the Section to visit the site at week-ends, when the men were not working, and the first visit was made in September.

The quarry is very extensive, having been worked by Messrs. Hall and Co. Ltd., for more than a century, and before that there was certainly a chalk pit at this spot. The recent chalk face, on the dip slope and on the side of a steep valley, is in the shape of a huge arc, almost a semi-circle open to the north. The height of the top of the pit is about 425 feet O.D. on the south-east side where 130 feet of chalk is exposed; about 80 feet of chalk is recorded on the west side, where the slope of the valley reduces the height of the top of the pit to 350 feet O.D.

Two kilns are used for burning the chalk, but these are very wasteful, as the lumps have to be of a more or less standard size and all small chalk is excluded together with masses of flint. As there was very little sale for the small chalk, the waste pile had accumulated to such an extent that it was approximately 70 feet high, 200 yards long and about 30 feet wide.

The beds are nearly horizontal, there being a slight dip to the NNE which can be clearly seen in the flint bands. These bands are very numerous and in places are less than a foot apart. Also there are many scattered flints in between the bands.

Blasting was carried out only in the bottom 30 feet, the chalk being quite hard and blocky at the base. The borings for inserting the charges had often to be done more than once whenever scattered flints were struck.

All the excavation work was done by pick and shovel and in recent years nine bays had been cut into the chalk face along the line of the previously mentioned arc. Owing to labour shortage not more than five bays were being worked in the autumn of 1961. For recording purposes, we decided to number all the bays from east to west.

Several visits were made to the quarry at week-ends, before the bad weather set in, when we called a halt as the floor of the quarry was then inches deep in chalk sludge.

On visiting it again in early February 1962 we found that Messrs. Hall and Co. had ceased operations, as the works were running at a considerable financial loss and it was proposed to dispose of the site, after all equipment had been dismantled.

The cessation of work and the clearing of all the hewn chalk made collecting *in situ* much easier than before in the bottom reaches. Examination of the higher levels was not so easy as all the ropes were among the first items to be removed after the works had closed down.

A rough road for lorries had been constructed which terminated on a wide ledge some 30 feet from the top on the southern side of the quarry.

Several visits to the ledge showed that fossils were very scarce, as apart from a few sponges only one damaged *Micraster coranguinum* and an *Orbirhynchia* were found.

This large exposure of Upper or Senonian chalk has been visited by geologists for many years. W. Hill (1904) recorded a section of about 80 feet of chalk and recognized the presence of the two zones of *Micraster cortestudinarium* and *M. coranguinum*. The junction was considered to be at 44 feet above the base of the pit.

In the details of the Cortestudinarium Zone no fossils were recorded in the top 25 feet of firm chalk. *Micraster* sp. was found in a band of softer chalk 6 feet thick, the top of which was 19 feet 6 inches from the base. As nearly the whole of the old section on the west side is now completely obscured by the huge pile of waste material, it was impossible to re-examine the section recorded by Hill, none of the details of which could be correlated with anything in the section at present visible.

The pit is referred to again by G. W. Young (1905), A. G. Davis (1926, 1928 with a list of fossils) and by H. G. Dines and F. H. Edmunds (1933) but the division between the two zones remained doubtful. We hoped to establish this division by a careful study of the specimens of *Micraster* collected *in situ* and also to collect and record as many species of fossils as possible from both zones.

The list of all the fossils we have collected is as follows:—

	ZONE
PORIFERA (SPONGES)	
<i>Coscinopora infundibuliformis</i> Goldfuss	Corang
<i>Porosphaera globularis</i> (Phillips)	Corang
<i>Ventriculites</i> sp.	Corang
CRINOIDEA AND ASTEROIDEA (SEA-LILIES AND STAR-FISH)	
<i>Bourgueticrinus ellipticus</i> (Miller)	Cortest
<i>Crateraster quinqueloba</i> (Goldfuss)	Cortest
ECHINOIDEA (SEA-URCHINS)	
<i>Cidaris hirudo</i> Sorignet (Spine)	Cortest
<i>Cidaris</i> sp. (Part of Test)	Cortest
<i>Echinocorys scutata</i> (Leske)	Cortest and Corang
<i>Micraster coranguinum</i> (Leske)	Corang
<i>Micraster coranguinum</i> transition to <i>Isomicraster senonensis</i> (Lambert)	Corang
<i>Micraster cortestudinarium</i> (Goldfuss)	Cortest
<i>Micraster cortestudinarium</i> transition to <i>Micraster coranguinum</i>	Cortest
POLYZOA	
<i>Berenicea papillosa</i> (Reuss)	Cortest
<i>Berenicea</i> sp.	Cortest
ANNELIDA	
<i>Terebella lewesensis</i> (Mantell)	Cortest
BRACHIOPODA	
<i>Ancistrocrania</i> sp.	Cortest

<i>Orbirhynchia</i> sp.	Cortest and Corang
<i>Terebratulina striatula</i> (J. de C. Sowerby)	Cortest

BILVALVIA (LAMELLIBRANCHIA)

<i>Atreta nilssoni</i> (Hagenow)	Cortest
<i>Inoceramus lamarcki</i> Parkinson	Cortest
<i>Inoceramus</i> sp.	Corang
<i>Pycnodonte vesicularis</i> (Lamarck)	Cortest and Corang
<i>Pycnodonte</i> sp.	Cortest
<i>Spondylus latus</i> (J. Sowerby)	Cortest
<i>Spondylus</i> sp.	Cortest

PISCES

? <i>Anacorax falcatus</i> (Agassiz) (Tooth)	} Not found in situ
Lamnid Shark (3 Imperfect teeth)	
<i>Scapanorhynchus</i> sp. (Tooth)	
Bones and Scales of medium-size Bony Fish	

The sponges were found on or just above the top ledge already mentioned at a height of from 80-100 feet from the floor of the quarry.

Besides segments of *Bourguetecrinus*, a very well preserved root of a crinoid with branching stems was found in bay 6 at a height of about 6 feet.

An ossicle of the star-fish *Crateraster* was found in the same bay and at approximately the same height.

Sea-urchins were obtained *in situ* by diligent searching in the bottom six feet of the blocky chalk at the base of the pit. These were all identified as *Micraster cortestudinarium* and came from bays 5-9 inclusive, the highest yield coming from bays 5 and 6.

Further search at higher levels produced two transitional forms, one in bay 5 at a height of 15 feet and another from bay 6 at about 14 feet.

So far the only specimens of *Micraster coranguinum* obtained were from fallen blocks, the original height of which was not known; the one exception being a damaged specimen found *in situ* about 5 feet above the high ledge.

Finally in April 1962 a *Micraster* was found *in situ* at a height of 25 feet above bay 6, the specimen satisfying most of the requirements for identifying it as *M. coranguinum*.

On this evidence it would appear that the division between the two zones should be placed at about 20 feet from the base of the quarry. This would mean that most of the pit is in the Coranguinum Zone and only the bottom 20 feet are in the Cortestudinarium Zone.

One other *Micraster*, a high backed variety, was identified as *M. coranguinum* transition to *Isomicraster senonensis*.

The broken test of *Cidaris* sp. was found in bay 7 at a height of 6 feet and spines were obtained from bay 6 at about 3 feet.

Several specimens of the worm-tube *Terebellã lewesensis* were obtained from the Cortestudinarium Zone. One large tube measured $4\frac{1}{2}'' \times \frac{3}{4}''$ (diam.). As is usual in this species, the tubes were heavily encrusted with bones and scales of fish, which may have had a protective camouflage value.

A number of fossils were found adhering to the sea-urchins; of these, juvenile *Pycnodonte* were very common.

The fish remains were given to us by men working in the pit and we have no reliable evidence of the height at which they were found. They comprise 5 teeth and a slab with bones and scales of a medium-sized bony fish, which unfortunately was not determinable.

A field meeting was arranged at the pit in June and the party was split up and asked to collect in the various bays, all finds being recorded, and the heights noted. As a result, several new species were added to the list, thanks to the enthusiastic collecting of several members who kindly added their finds to the general collection. A selection of the specimens will be presented to the British Museum (Natural History).

My thanks are due to Mr. R. E. Butler and Mr. and Mrs. Underwood who helped with the collecting and also to a number of the staff of the British Museum (Natural History) for identifying the fossils. In particular, I should like to thank Dr. R. P. S. Jefferies who has devoted much time to the sea-urchins and to the fossils attached to them. I also wish to thank Mr. C. P. Castell for some very helpful suggestions and for editing the script.

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An Exposure in the Flood Plain Terrace Gravels at the Elephant and Castle

By R. E. BUTLER

THE major redevelopments that are taking place at the Elephant and Castle have led to several temporary exposures in the Flood Plain Terrace gravels of the River Thames. One very large exposure was opened up during 1962 in the area bounded by Newington Butts on the west, the Southern Region railway line on the east and the New Kent Road on the north. Sections in the gravel were accessible on both the northern and eastern sides but those on the western side were on the edge of a deeper excavation and could not be examined in any detail.

The following measurements were noted in the north-eastern corner and can be taken as being typical, but it must be stressed that none of the various beds is of constant thickness:—

Soil, made and disturbed ground	..	about 8 ft.
Sand	.. .. .	1 ft. 6 ins.
Gravel	.. .. .	3 ft.
Sand	.. .. .	1 ft.
Gravel	.. .. .	4 ft.
Sand	.. .. .	2 ft.
Gravel and Sand	.. .. .	3 ft.

The deeper excavations on the western side had passed into the London Clay. The junction between the Terrace gravel and the London Clay

was estimated as being about two feet below the section examined. The London Clay showed its typical features of a stiff dark grey-blue clay but lacked evidence of fossils.

Features of the gravel bands:—These consisted mostly of flint fragments. Rounded flint pebbles seemed to be well mixed into a mass of angular and subangular fragments. Flints of a long spindle-like shape were present. Some of the angular flints seemed to have suffered very little water action and a few were jasperised. Small quantities of rounded pebbles of red quartzite, fragments of gritty sandstone, vein quartz pebbles and small chalk fragments were also present. The gravels in places contained lenticles of coarse sand.

Features of the sand bands:—The sand was generally of a buff to pale brown colour. It effervesced strongly when treated with dilute hydrochloric acid giving off carbon dioxide. This indicated a fairly high concentration of calcium carbonate, probably chalk. A more detailed examination showed considerable quantities of small white fragments, many of which were no doubt of chalk. The sand grains showed much evidence of rounding and consisted of both clear and iron stained quartz. The sand was full of dark irregular fragments; samples of these gave a distinct phosphate reaction after prolonged heating with nitric acid and ammonium molybdate. It seems most likely that these dark fragments are coprolite and so could be of organic origin. There were rare black fragments which were well rounded and appeared to be of a volcanic rock. They have been reserved for a detailed examination. Occasional crystals of apatite and topaz were also noted.

The alternating bands of sand and gravel no doubt represent fluctuations in the volumes of the water that laid down the deposits, the gravels representing periods of torrential floods. Cross bedding was, however, not well shown but did appear occasionally at the bases of some of the gravel bands. Iron panning, probably a recent development, was noticed in the higher parts of the sequence.

The variable nature of these deposits is illustrated in the accompanying photograph which depicts part of the northern face of the exposure close to the section measured. These deposits are part of the Lower Flood Plain Terrace gravels of the Thames laid down about 50,000 years ago during the last stages of the Ice Age.

Most information on the detailed geology of Elephant and Castle district is based on well records, since exposures, such as this one, rarely appear owing to the area being mainly built over.

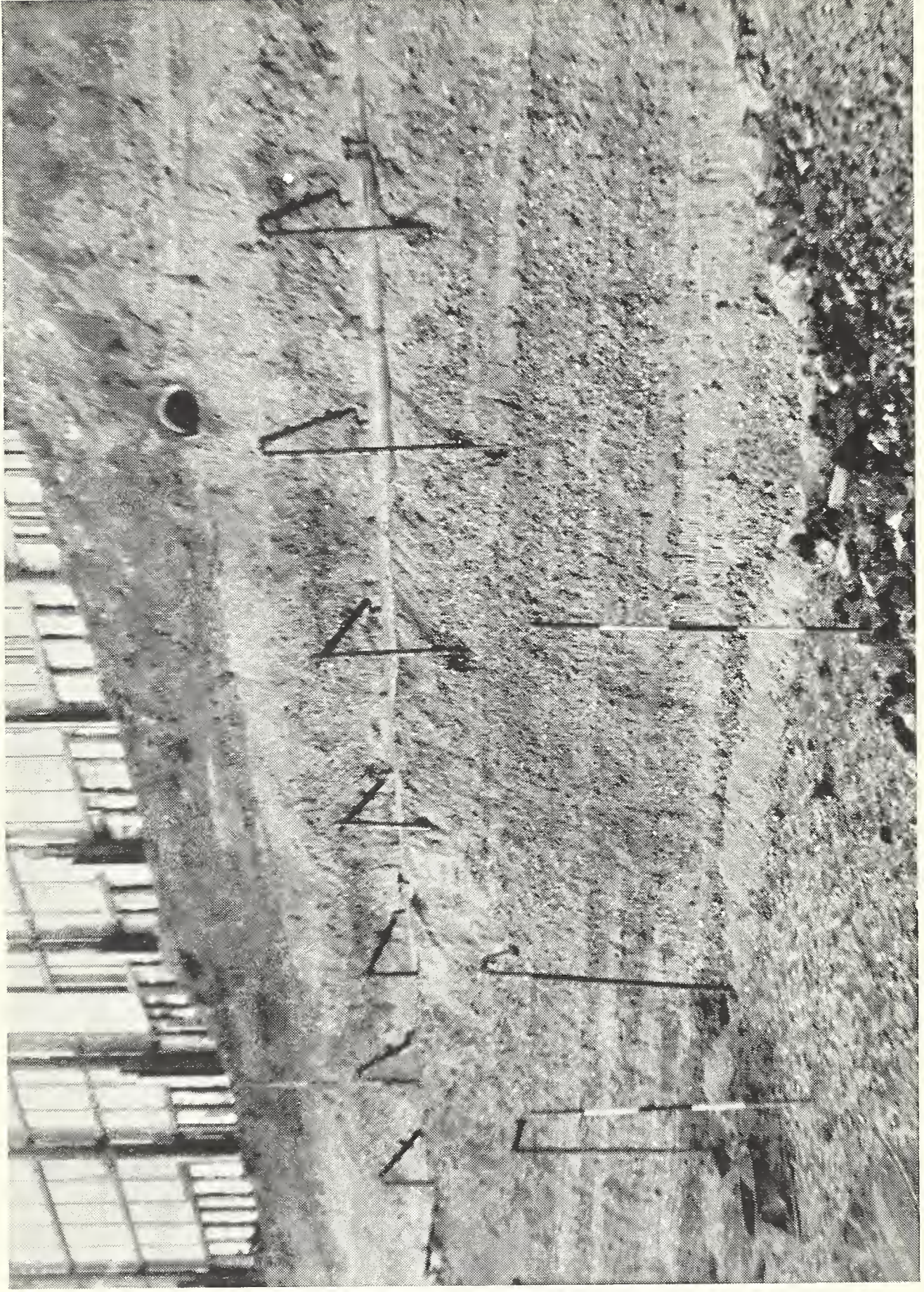


Photo by R. E. Butler

The Flood Plain Terrace Gravel, Elephant and Castle, November 1962

Excavations at Merton Priory, Merton, Surrey

First Interim Report

BY D. J. TURNER

EXCAVATIONS were carried out during nine week-ends in the summer of 1962, following a resistivity survey, on behalf of the London Natural History Society and the Merton and Morden Historical Society. Permission for the work was generously granted by the owners of the site, Messrs. Liberty & Co. The resident Works Manager, Mr. A. Slinger, and his wife gave the excavators every assistance throughout and considerable gratitude needs to be expressed for their kind help.

THE SITE

The site of the Augustinian Priory of St. Mary, Merton, is now largely covered by road, railway and factory. Excavations in 1921-2 (Bidder, 1929) disclosed the plan of the church, chapter house and cloisters, much of which lie beneath Station Road and the adjacent railway. Between the factories surrounding the church site are a number of small areas of waste land and one plot of allotments. (Fig. 1).

The allotments occupy an irregular strip of land, of rather less than half an acre, between the site of the cellarers range of the Priory and the known position of some mediaeval buildings. Until the middle of the nineteenth century a channel of the River Wandle followed the western boundary of the plot, and a curving brick wall still delineates its western bank (incorrectly marked "Priory Wall" on O.S. plan). To the east is a goods yard, to the south and west are factories, to the north is the railway. (Grid. Ref.: TQ/264698).

HISTORY OF MERTON PRIORY

The majority of the documentary evidence relating to Merton Priory has been exhaustively transcribed and published by Heales (1898). These documents refer largely to the legal life of the priory and relate in considerable detail much of the litigation involved in administering the Priory's many properties scattered throughout England and also the juridical activities of the Prior as Lord of the Manor. The documents are sadly lacking in detail as to the history of the Priory buildings and even our knowledge of the founding in 1114 or 1117 rests on a fourteenth century account. However, there are occasional items of structural information, or suggestions and these may be listed here (apart from those relating to the founding).

1161	Infirmery Chapel dedicated (Heales).
1174 Feb. 24	Altar of St. John the Baptist dedicated (Heales).
1194 Nov. 6	Altar of St. Stephen and St. Nicholas dedicated (Heales).
1196 Oct. 31	Altar of the Holy Cross dedicated (Heales).
1222 Dec.	Tower blown down (Annals of Dunstable Priory).
1241	Priory permitted to possess his own quarry in peace (Heales).
1258 Dec. 1	The King's mason commanded to repair the King's chamber and the King's Chancellor's chamber (Heales).

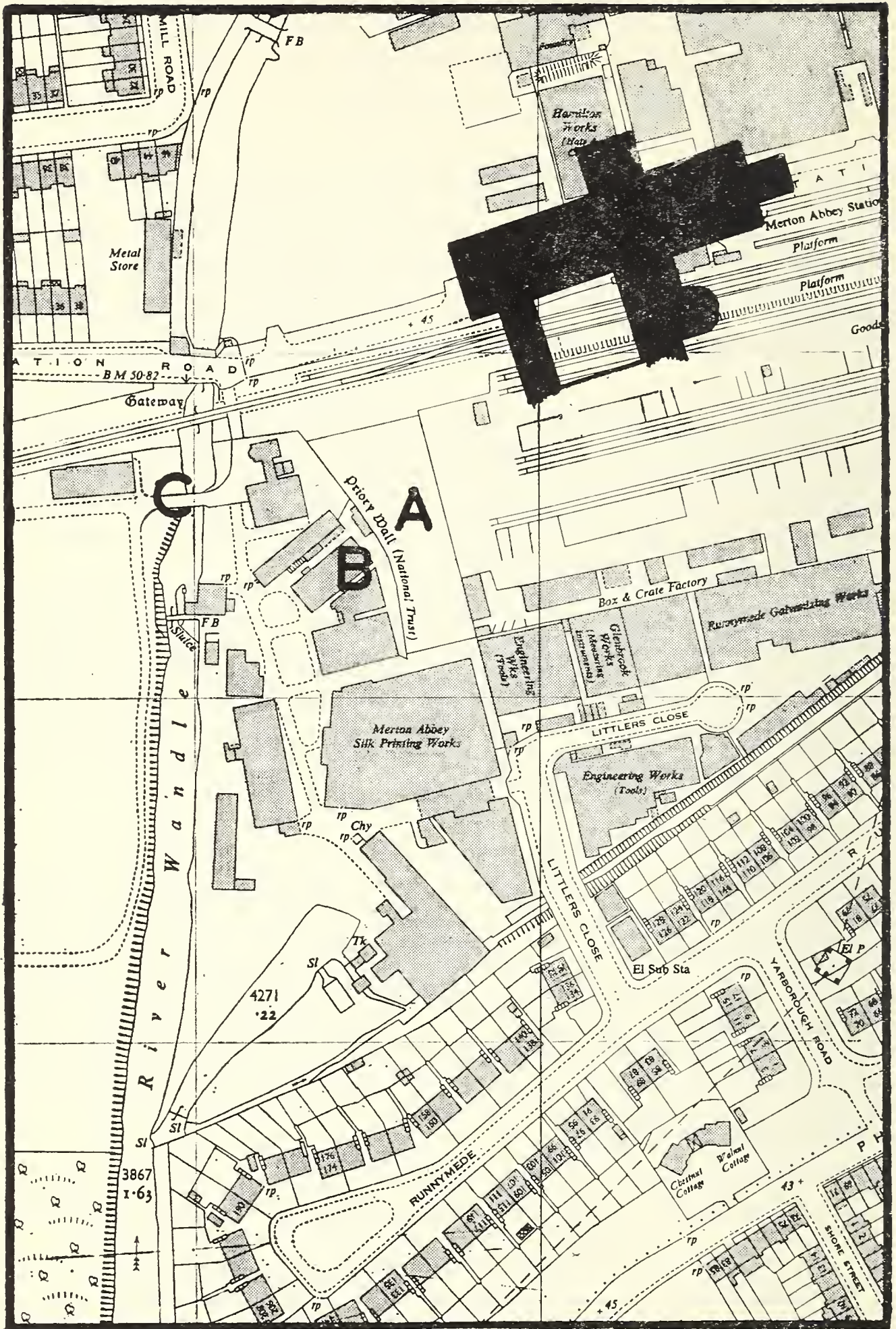


FIG. 1. Plan showing site of Merton Priory. (Scale 25" to 1 mile).

A—Allotments.

B—Approximate site of chapel, possibly infirmery chapel.

C—Site of Norman arch discovered 1913.

Crown copyright reserved.

- 1262 (prior to) The new chapel of St. Mary was built in the reign of Henry III (Lambarde, 1730, p. 212).
- 1382 Three altars plus two smaller altars dedicated (Heales).
- 1387 Sept. 27 Parts of the Priory noted as being in disrepair (Heales).
- 1393 April Chapel of Blessed Mary in the church and also the nave in a decayed and ruinous state (Heales).
- 1437 Henry VI crowned at Merton (Heales).

This record is scanty but may be supplemented by the results of Col. Bidder's excavations. He was able to distinguish two periods of building. The earlier represents the first stone church (which may have been preceded by a timber church on the same site although there is little real evidence about this), while the second phase may have been associated with reconstruction following the fall of the tower in 1222. This reconstruction may have included the building of the Lady Chapel. It is interesting that besides the Lady Chapel in the Priory there were at least two other chapels dedicated to St. Mary in the vicinity (Heales, 1898). One of them is now the Parish Church of Merton which was built in the twelfth century, but the other has disappeared. The date of the building of the Lady Chapel is an important factor in the interpretation of the east end of the church and in comparing it with St. Augustine's Abbey, Bristol, but this matter is controversial and cannot be discussed fully here.

The record of the ruinous state of the church and some of its associated buildings in the late fourteenth century, contrasted with the fact that the church was in good enough condition by 1437 for the coronation of Henry VI to take place there, may provide evidence of revived building and constructional activity in the first half of the fifteenth century. The excavations carried out in 1962 may indicate that there was also activity towards the close of the fifteenth century.

THE RESISTIVITY SURVEY

Twenty traverses were made on an east-west alignment, spaced, where possible, at eight-foot intervals. The length and spacing of the traverses were dictated by the positions of the allotments under cultivation. Four-foot probe spacings were used throughout. The survey showed two main features:—

- (a) A belt of low resistivity along the west side of the site. This was expected and represented the filled-in channel of the Wandle.
- (b) A strip of high resistivity ten or fifteen feet wide running diagonally across the N.E. corner of the site. This became the subject of later excavations.

The result of the survey is shown as an isopsephograph, or "resistivity contour plan", of the site (Fig. 2). The technique of resistivity surveying has been shown to produce results that are a function not only of hidden variation in the substrata but also of the angle between the traverses and any change in the substrata (Palmer, 1960), and an isopsephograph on unidirectional traverses should be treated with circumspection. In this case the principle features noted intersect the traverses at large angles and so can be accepted in position and nature. A high resistivity feature may usually be interpreted as a region where the soil is dryer than average and may cover, for example, a buried wall or floor. A low resistivity feature indicates damp soil such as may be found in a filled-in ditch or water-course.

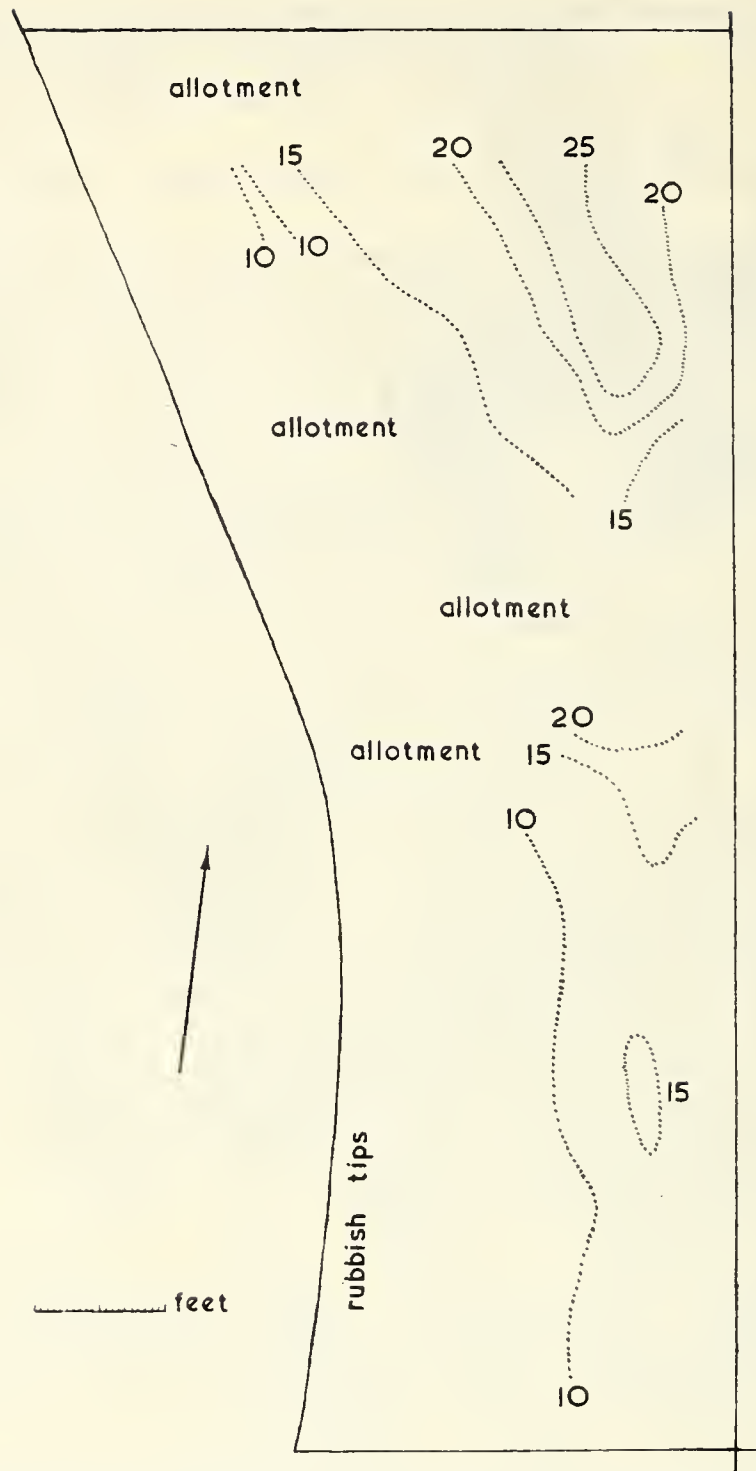


FIG. 2. Isopsephograph (resistivity "contour plan") of allotment area. Units of resistivity—arbitrary.

THE EXCAVATIONS

A grid was laid out to cover the high resistivity feature and four twelve-foot squares were worked. A flint-cobble roadway approximately ten feet wide was uncovered (Fig. 3). It had a low bank covered by small flints adjacent to its western edge. At the south-east end of the excavated area the road was truncated by a depression that may be a ditch running N.E.-S.W. This depression was sealed by a layer of clay through which a circle of post holes, approximately eight feet in diameter, had been cut. The roadway was partially sectioned and was found to have a foundation of orange gravel, set in a trench cut through a layer of brown loam, into the black loam below (Fig. 4). The brown loam, where sealed by the bank to the west of the road, contained a few sherds of pottery, possibly of fifteenth century date. The rim of a thirteenth century vessel was

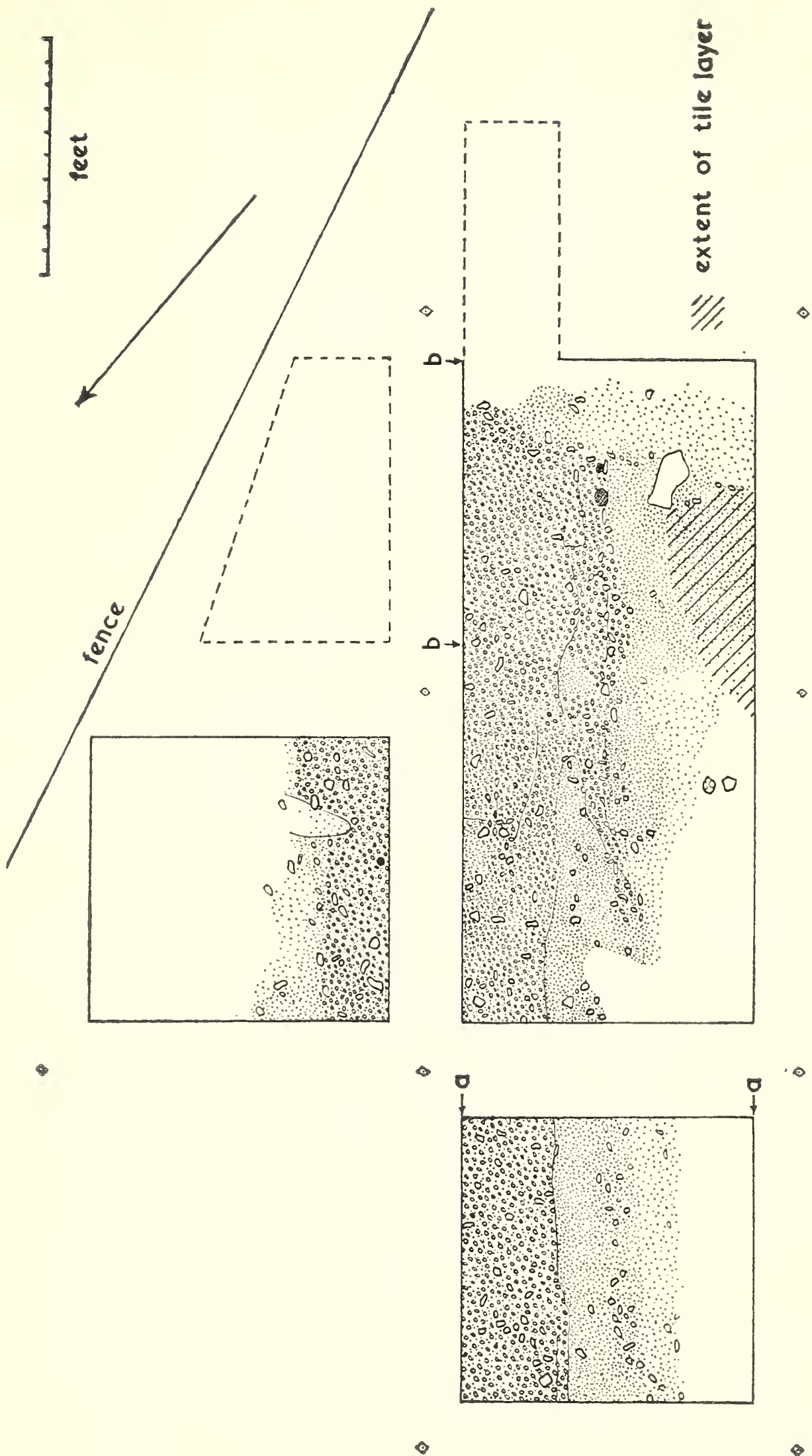


FIG. 3. Plan of excavations 1962
 Uncompleted excavations outlined by broken line. The most north-easterly reference peg shown is 26' 3" from the north-east corner of the allotment area.

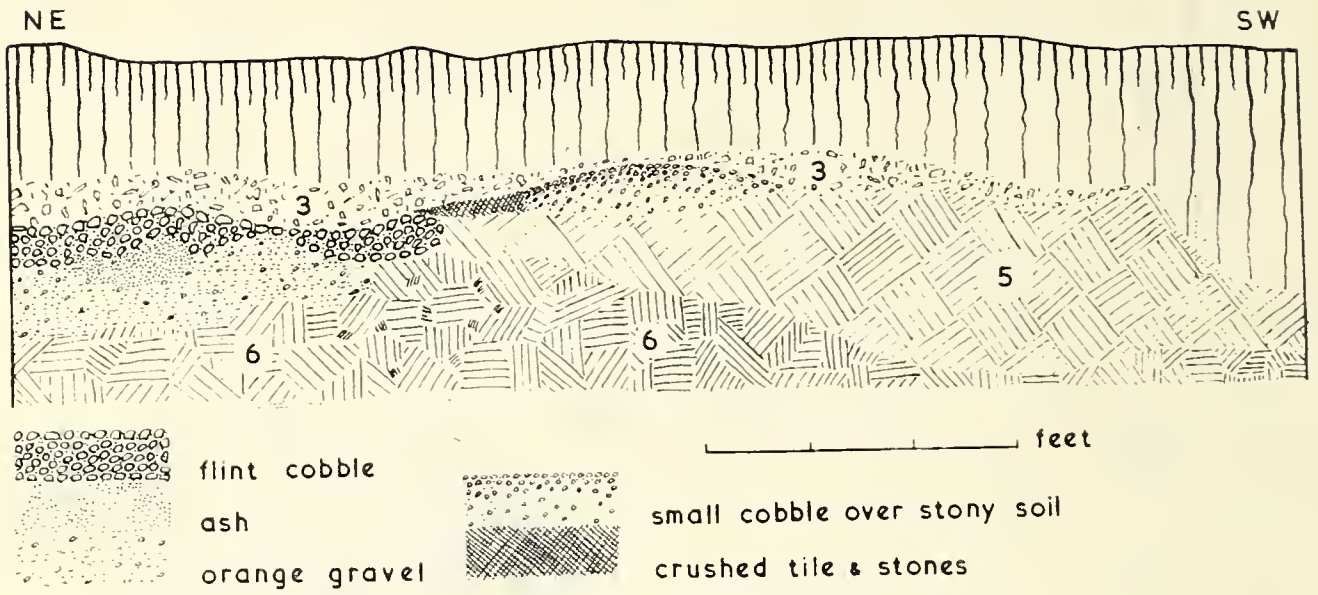


FIG. 4. Partial section of road (a-a).

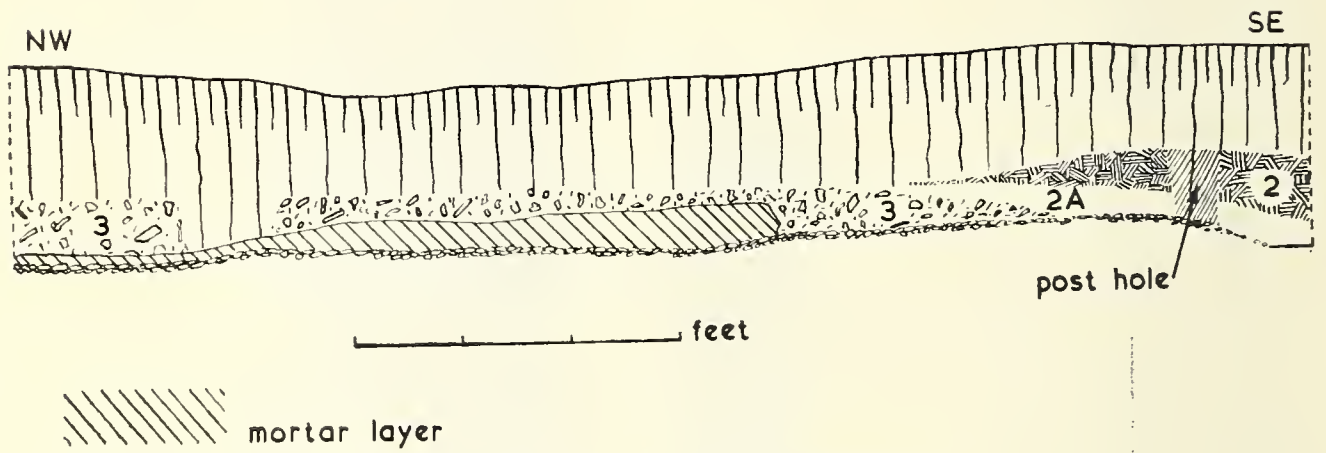


FIG. 5. Section (b-b) above road.

found in the black loam. The stratification was as follows.—(Figs. 4 and 5):

- Layer 1 Top Soil. Black, quick drying dusty soil.
- Layer 2 Clay. Sealing a depression at the south end of the excavated area.
- Layer 2A Black dusty soil sealed by layer 2 but merging with layer 1 at the north extremity of layer 2. This layer contained pottery down to c. 1800 A.D.
- Layer 3 Black soil containing a considerable quantity of refuse from the demolition of the Priory, e.g. broken floor and roof tiles, fragments of building stone etc. Within this layer were concentrations of mortar two to six inches thick covering several square feet. Mixed in the layer were a large number of broken meat bones and oyster shells and also some highly fragmentary pottery.
- Layer 3A Broken roofing tiles lying roughly horizontally. This layer occupied a restricted area to the west of the road and overlay the layer of small stones which covers the western bank and which, at this point, spreads further westwards from the road (Fig. 3).
- Layer 4 The cobble roadway and western bank.
- Layer 5 Brown loam sealed by the western bank but cut through by the roadway.
- Layer 6 Black loam. Where the road foundations were cut into this layer there were a few pieces of broken roof tile in the lower levels of the orange gravel and in the upper levels of the black loam.

Some interpretation of this stratification can, at this stage, be attempted but the significance of the clay layer (layer 2), and the tile layer (layer 3A), may be clearer after next season's work.

Layer 3 appears to be derived from the demolition of the Priory and so may be dated to 1538 or soon after. Much of the pottery found in it appears earlier in date and may derive, along with the bones and oyster shells, from a kitchen midden disturbed at the time of the demolition. At no point was the transition from layer 1 to layer 3 clear as the digging of allotment holders had penetrated unevenly. The cultivation had also caused the infiltration of some later material (mainly pot sherds) into layer 3. The mortar deposits within this layer may have been produced by chipping mortar from building stone that was being salvaged. Such a methodical approach is most likely to have taken place between 1538 and 1544 when the Priory was being systematically demolished to provide building stone for Nonsuch Palace (Biddle, 1961).

The brown loam cut through to make the roadway may be plough or garden soil and the pottery found within it may be taken as evidence for a late fifteenth century date for the roadway, but the evidence is at present scanty. The bank to the west of the roadway may be a raised footpath.

At the most north-easterly point of the excavations traces of possible chalk foundations were found running parallel to the roadway. These will be investigated further during the second season.

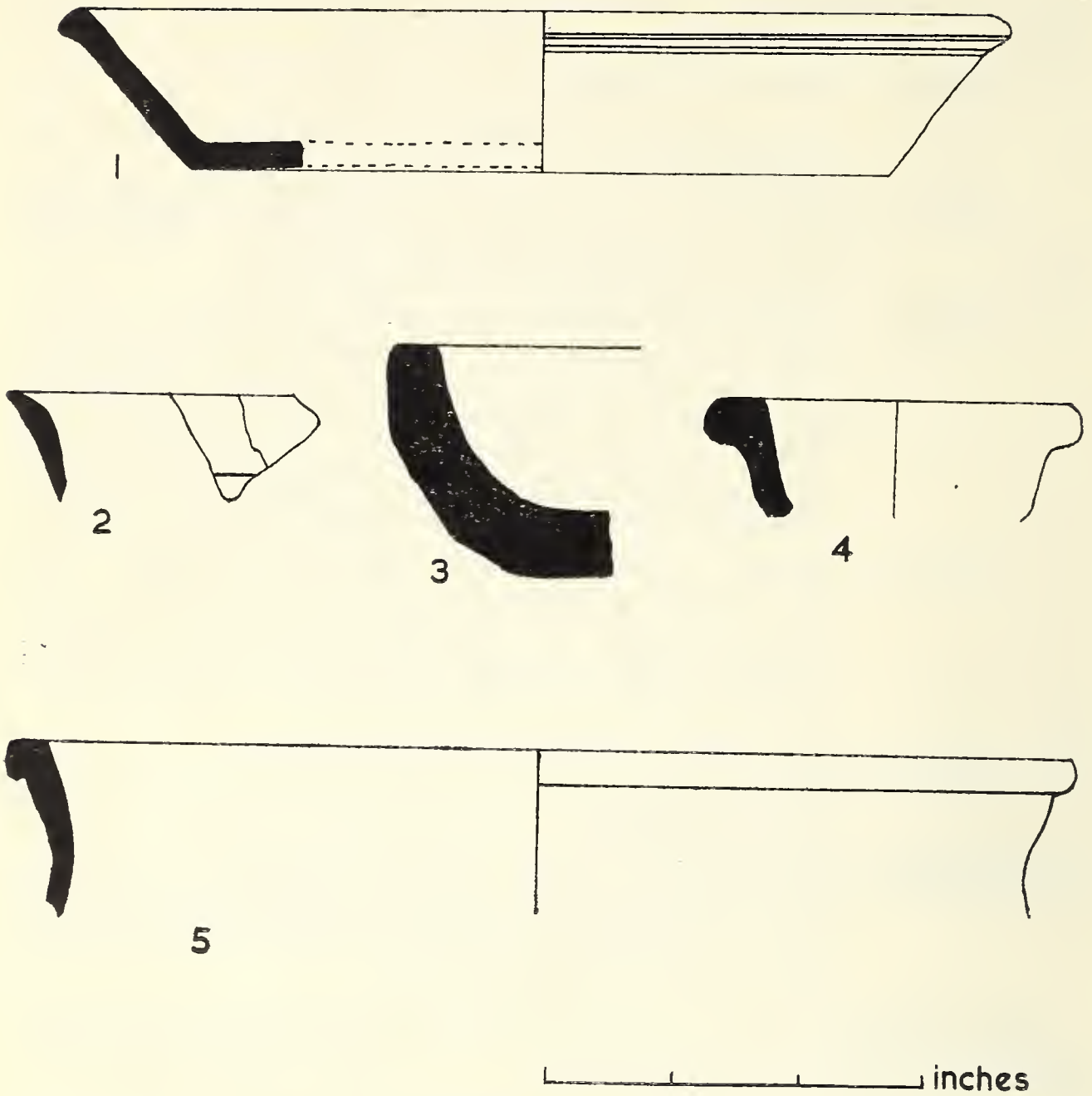


FIG. 6. Pottery.

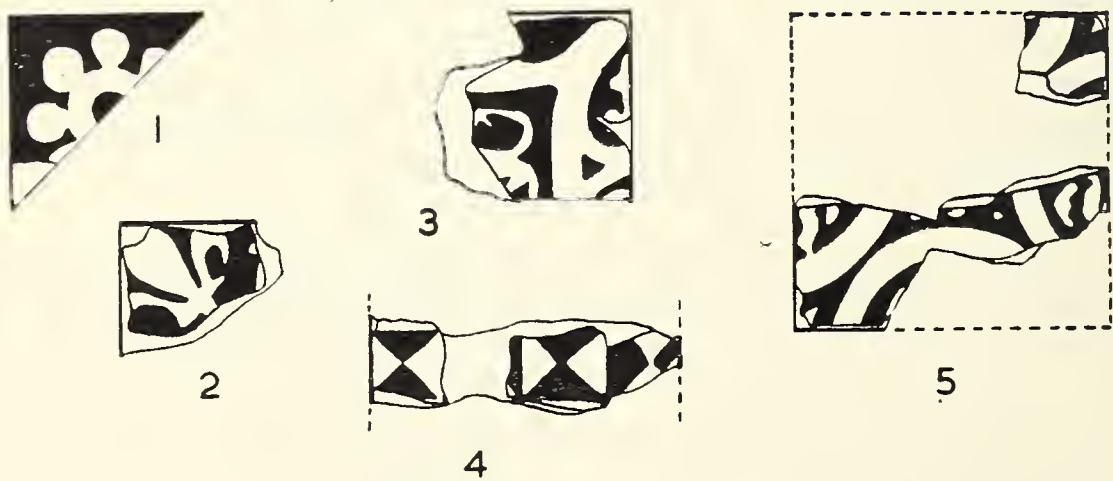


FIG. 7. Floor tile patterns (Scale $\frac{1}{4}$).

THE FINDS

Pottery

Most of the pottery recovered was from the debris layer (layer 3), and consideration of this is to be deferred until the completion of the excavations. A few sherds from other layers are of importance as dating evidence and are published here.

From layer 2A:

- Fig. 6, No. 1 Shallow dish of grey stoneware with oatmeal glaze internally and light brown glaze externally. Early to mid eighteenth century.
- Fig. 6, No. 2 Rim of coarse red ware with heavy brown glaze. Two horizontally incised lines run externally, $\frac{5}{8}$ " below the rim. Possibly c. 1800.
- Unillustrated Rim of saucer or shallow dish of delicate porcelain with hand-painted blue underglaze pattern. Late eighteenth century.
- Unillustrated Base of flower-pot shaped vessel of coarse red ware with light brown glaze internally all over and externally on walls.
- Unillustrated Base of cup or mug of yellow glazed buff ware. Possibly late seventeenth century.

From upper layer of cobbled roadway:

- Fig. 6, No. 3 Large flat dish of uncertain size and shape, of coarse red ware with an irregular thick brown glaze internally. The wall thickness is large (approximately $\frac{1}{2}$ ") and oxidation has not been uniform.
- Unillustrated Shard of the wall of a vessel of red fabric with thick dark brown glaze internally. Possibly fourteenth or fifteenth century.

From layer 5:

- Fig. 6, No. 4 Rim of hard grey ware fired buff inside with green slip, flecked with brown, on outside. May be from a jug with sharply expanding neck or from a shallow dish.
- Unillustrated. Base of large pitcher or ewer. Flat base of hard grey ware fired buff with deep mottled green glaze on outside of base. Thumb-impressed ornament round edge of base protruding to below level of base. Probably fifteenth century.

From layer 6:

- Fig. 6, No. 5 Rim of cooking pot of grey shell-grit ware fired to light red-brown on inside and black to light red-brown on outside. Late thirteenth or early fourteenth century.

Acknowledgement is due to Mr. Brian Spencer, of the London Museum and Mr. F. J. Collins who have examined and commented on the pottery here published.

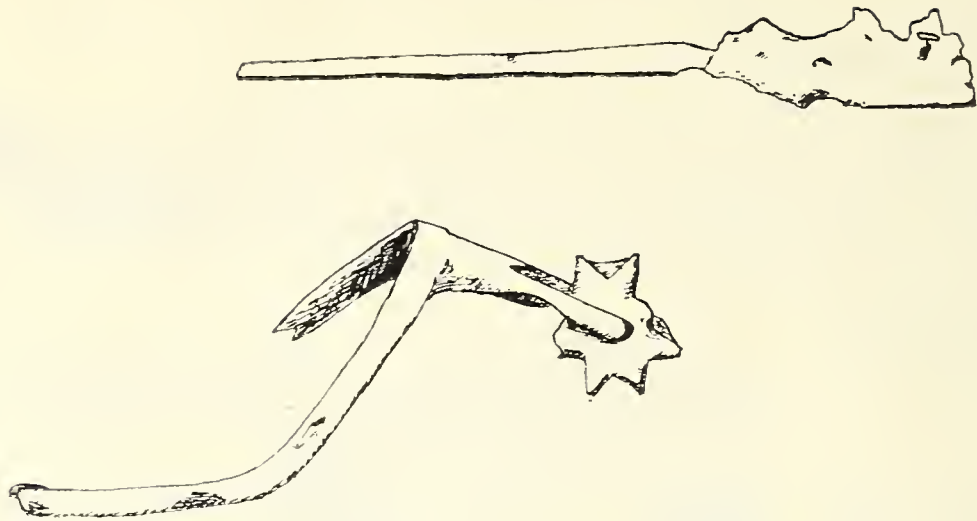


FIG. 8. Spur and knife from layer 3 (Scale $\frac{1}{2}$)

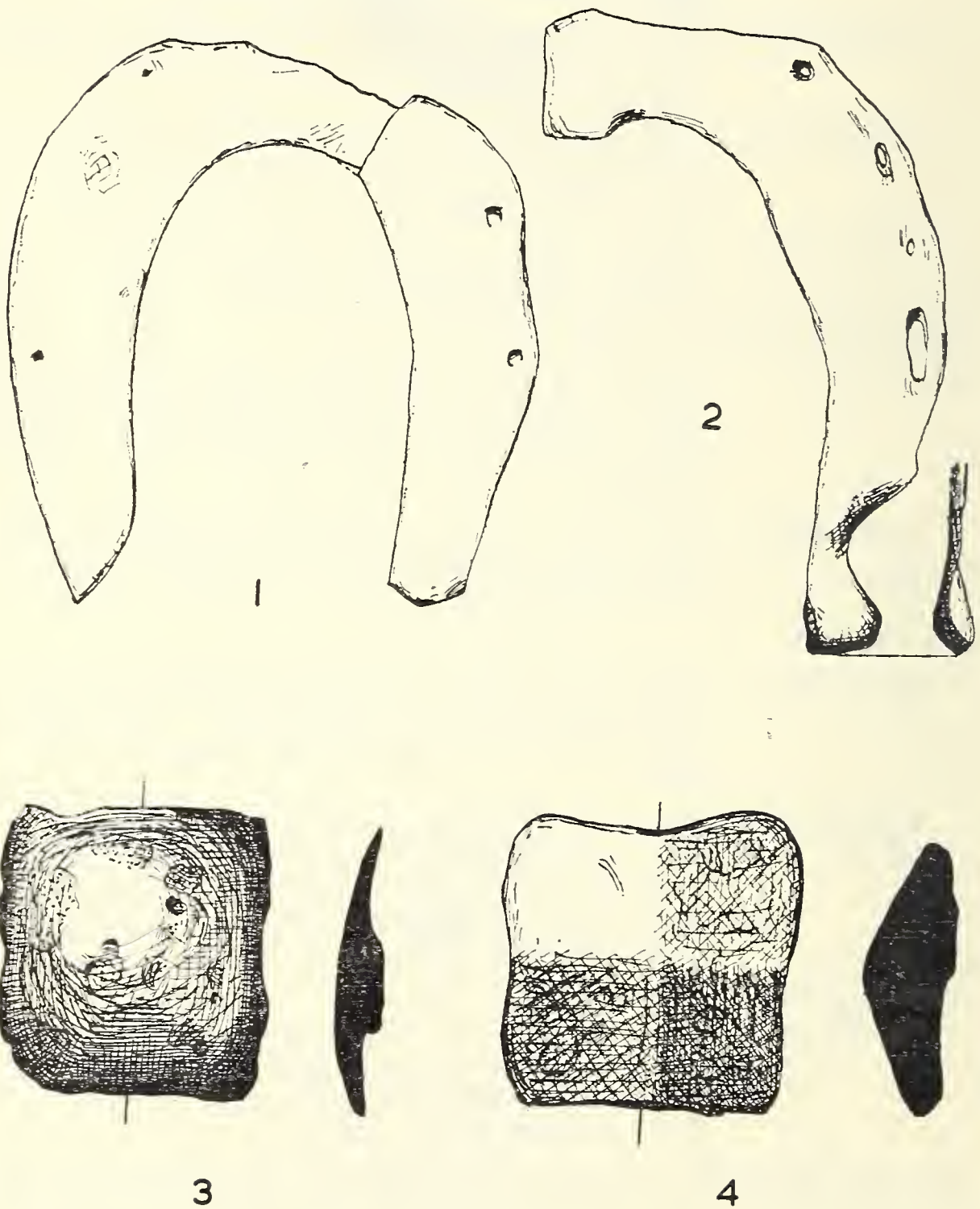


FIG. 9. Horse shoes and nail heads from the top of the cobbled road (Scale $\frac{1}{2}$).

Jetton

Size 7:

Obv. A conventional single masted vessel at sea with a flag and a streamer fore and aft; above the yard is a G.

Leg.: An open crown VOLGUE LA GALLEE (DE FRANCE).

Rev. A lozenge of France-ancient (shown as four lys) within a granulated inner circle; in each spandrel a trefoil between two annulets.

Leg.: (VIVE LE BON ROY (DE FRANCE).

Jettons of this type were struck at Nuremburg in great numbers in the 16th century. The obverse and reverse combined suggest the arms of Paris and the legend intimates that they were originally intended for use in France. They spread widely and are common in England. An almost identical jetton, but of size 8, is illustrated by Barnard (1916 pl. XXIX no. 8. See also Barnard, 1913 no. 10). The meaning (if any) of the word "Volgue" is obscure.

Roof Tiles

A large number of fragments of roof tile were found. They appear to be all red rectangular tiles with two fixing holes. One complete specimen was found having dimensions $10\frac{3}{4}'' \times 6\frac{1}{8}'' \times \frac{5}{8}''$ and the broken tiles would seem to fit similar dimensions. An Act of Parliament of 1477 standardized roof tiles to $10\frac{1}{2}'' \times 6\frac{1}{4}''$ with a thickness of at least $\frac{5}{8}''$ (Salzmann, 1952). Most of the fixing holes were round but a substantial number were square. Most tiles had patches of poor yellow to brown glaze on one side of the lower half. One fragment of heavy tile 1" thick, with a circular hole, was found.

Several fragments of plain ridge tile were found. They were suited to a roof pitch of approximately 35° and were $\frac{5}{8}''$ thick, and apparently 8" wide by at least 12" long. The 1477 Act laid down the standard size of ridge tiles as $13\frac{1}{2}'' \times 6\frac{1}{2}''$.

Wall Tiles

A number of fragments of thick, well made, red tiles with large circular depressions on their rear face were found. They were mostly between 1" and $1\frac{1}{2}''$ thick and approximately 8" square. They may be wall tiles, the circular depressions being to provide suction for keying, but in most cases there was no trace of mortar adhering within the depression. One fragment had the obverse face burnished black; one or two fragments had patchy yellow to brown glaze similar to that found on the roof tiles. One fragment had mortar adhering to all faces and had apparently been used in a rubble wall or something similar.

Floor Tiles

One whole plain glazed floor tile of dark blue-green colour, 4" square, was found. Several fragments of plain or mottled glazed floor tiles were also found of various colours, as were a number of fragments of printed floor tile (London Museum, 1954).

Fig. 7, No. 1 Small triangular tile with rosette pattern. This tile clearly indicates the method of manufacture of tiles of this size. A standard printed pattern was applied to a larger unit which was subdivided before firing into the required smaller units by cutting

two-thirds of the way through with thick wire. After firing the tile was broken into sections. In this case the incision for a further subdivision was made and never utilized (Newstead and Droop, 1936).

- Fig. 7, No. 2 Corner of a tile with pattern identical with London Museum No. 49, yellow on brown.
- Fig. 7, No. 3 Corner of tile with pattern identical with London Museum No. 2. Part of a second tile with the same pattern was found. Both tiles had a yellow pattern with light green patches on a brown background.
- Fig. 7, No. 4 Saltire pattern, yellow on brown, c.f. London Museum No. 43. A similar tile was found to this, apparently unglazed.
- Fig. 7, No. 5 Three fragments of tile with pattern unrecorded in the London Museum series. Yellow on brown.
- Unillustrated Fragments of tile with pattern resembling debased versions of London Museum Nos. 37 and 70. Several fragments of tile were also found in which the pattern was too worn, fragmentary or debased for determination.

Metal Objects

Iron

From debris layer, layer 3:

- Fig. 8, No. 1 Single-edged knife. A common mediaeval form. (London Museum, 1954).
- Fig. 8, No. 2 Rowel-spur with eight point rowel on a short shank. This simple type of spur is difficult to date precisely, especially in the absence of the arm terminals. (London Museum, 1954).
- Unillustrated Part of a horse-shoe.
- From the top of the cobble roadway.
- Fig. 9, No. 1 Horse-shoe (found in two separate pieces).
- Fig. 9, No. 2 Part of a horse-shoe with prominent calkin.
- Fig. 9, No. 3 Large domed doornail head.
- Fig. 9, No. 4 Large faceted doornail head.
- Unillustrated End of strap hinge or strengthening strut, 6" × 1¼", with two nail holes.

Several iron objects from the 1962 excavations are still under-going preservative treatment by Mr. P. Humphries at the time of writing and are not available for publication.

Bronze

From Layer 3:

Seven tassel ends or laee tags. These objects are frequently found in mediaeval sites, e.g. The Manor of the More, Rickmansworth. (Biddle, 1959).

Threading needle made of a ribbon of bronze twisted on itself with a loop at one end and pointed at the other. The loop has worn very thin.

Tack or shoe nail.

Cleat-like object.
Pin from brooch.
Loop of thick wire with ends knotted.

Pins

132 unbroken spherical headed bronze pins were found and fragments of approximately 50 more. The shortest complete pin was $3\frac{1}{32}$ " long, the longest $1\frac{5}{8}$ ". All but three of the pins were between $1\frac{3}{16}$ " and $1\frac{3}{8}$ " long. Twenty-four unbroken pins and seven fragments came from layer 3, the remainder came from layer 2A or from the indistinct boundary between layers 1 and 3.

Lead

Many fragments of lead were found, mainly in layer 3. Most of the fragments were in the form of shapeless lumps apparently waste from melting down the lead salvaged from the Priory. Similar pieces have been found at the current excavations at Newminster Abbey, Northumberland (Unpublished, information from Miss Harbottle). One or two fragments were recognizable as parts of glazing bars.

Bone

A small die of approximately $7/32$ " cube was found in layer 3. The markings are in the form of small pits approximately $1/32$ " diameter surrounded by incised circles $1/16$ " diameter. The die has apparently been in a fire.

Mollusca

The Mollusca, apart from the numerous oyster shells which are to be treated separately, have been examined by Mr. C. P. Castell of the British Museum (Natural History). The following species were found to be present.

Layer 2 (including post holes):

<i>Buccinum undatum</i> Linné* (whelk).	} Edible marine gastropod.
<i>Helix aspersa</i> Müller, numerous	
<i>Helix nemoralis</i> Linné, several	} Land gastropods.
<i>Discus rotundatus</i> (Müller)	
<i>Ena obscura</i> (Müller)*	
<i>Cecilioides acicula</i> (Müller)*	
<i>Arianta arbustorum</i> (Linné)*	
<i>Retinella nitidula</i> (Draparnaud)*	

Layer 3:

<i>Buccinum undatum</i> Linné (whelk), numerous	} Edible marine gastropods.
<i>Littorina littorea</i> (Linné) (winkle)	
<i>Nucella lapillus</i> (Linné)*	
<i>Mytilus edulis</i> Linné (mussel)	} Edible marine bivalves.
<i>Cardium edule</i> Linné (cockle)	
<i>Bithynia tentaculata</i> (Linné)*	} Aquatic gastropods and bi- valves.
<i>Planorbis planorbis</i> (Linné)*	
<i>Pisidium</i> sp.*	

<i>Hygromia striolata</i> (C. Pfeiffer), numerous	}	Land gastropods.
<i>Arianta arbustorum</i> (Linné), numerous		
<i>Helix nemoralis</i> Linné		
<i>Helix aspersa</i> Müller		
<i>Carychium minimum</i> (Müller)*		

Layer 4:

<i>Buccinum undatum</i> Linné (whelk)	}	Edible marine gastropods.
<i>Neptunea antiqua</i> (Linné) (buckie)		

Layer 6:

Hygromia striolata (C. Pfeiffer). Land gastropods.
*denotes single specimen.

Mr. Castell writes that the presence of *Ena obscura*, *Arianta arbustorum*, *Hygromia striolata*, *Discus rotundatus*, and *Retinella nitidula* suggests damp woodland with plenty of herbage such as nettles.

Other Material

This account does not exhaust the material found during the excavations. Artefacts etc., found in the 1962 season, which await study include:

Building stone and architectural fragments.

Glass

Faunal remains.

Charcoal.

Oyster shells.

It is hoped to include accounts of these in a subsequent interim report or in the final report.

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The Survey of Bookham Common

TWENTY-FIRST YEAR

Progress Report for 1962

GENERAL (C. P. Castell)

Close co-operation continues with the National Trust local management committee. Many of the ditches were cleared and some thinning and clearing of undergrowth in the southern part of Eastern Wood (67/1-3, 5-6) took place. As a continuation of this might invalidate the results of the bird-census work, which the ornithological team are undertaking in the next two or three years, the local committee agreed to transfer operations from this wood to another woodland area. Oil pollution, the result of discharge from a local factory, continued and the matter was taken up with the Leatherhead U.D.C. and the firm concerned by the local committee; it is hoped that there will be no further trouble.

The local management committee organized a Public Meeting in Bookham in October 1962, not only to recruit more subscribers but to arouse interest among local residents in their Common, in its management problems and in its natural history.

VEGETATION (C. P. Castell)

Mr. F. C. Reeves is resurveying the distribution of Bracken on the plains for comparison with the results obtained in 1951. Otherwise no interest has been taken by members (except the writer) in botanical work on the Common.

It was interesting to note the damage to vegetation in Central Plain by frost in early June. All bracken shoots and all oak shoots up to a height of about 15 feet were destroyed. On the other hand, there was little visible damage to either oak or bracken a few yards away in the adjacent woodland areas.

CRATER POND (544). Plate 1

A short account of the vegetation of this pond, up to 1951, has already been given (*L.N.*, 34, 18-19, 1955), when Reedmace (*Typha latifolia*) was the dominant plant in the centre with young Willows (*Salix caprea* and *S. cinerea*) in the water and on the margin. By 1960, *Typha* was still dominant, but two of the three willows were now about 12 feet high and the pond was completely shaded. In June 1962 this small pond, only about 10 feet in diameter with a shelving margin some three feet wide, was supporting three willows, about 15, 12 and 6 ft. high and four large clumps of Reedmace, leaving little water. The pond was now so overgrown that it was decided to ask the Conservation Corps to clear it. Of the aquatic species previously recorded, *Alisma plantago-aquatica* was still present, but there were no signs of *Potamogeton natans* and *Myriophyllum alternifolium*, the latter abundant in 1958. *Glyceria fluitans* was, however, seen for the first time. Most of the species of the damp margin were still present, but *Bidens cernua*, *Juncus conglomeratus* and *Carex ovalis* were not observed, whilst *Angelica sylvestris* was new. Most of the vegetation was cleared by the Conservation Corps in August, except for a small piece of *Typha*, which was overlooked. The sloping margin was left almost untouched.

Bryophytes, collected at intervals since 1950, were re-examined and one re-determined. *Drepanocladus aduncus*, collected twice in 1956 and

in 1962 and locally abundant in 1951, was the only aquatic moss, but misidentified as *D. fluitans* in the account of 1955. The following were colonizing the clay margin: *Acrocladium cuspidatum*, the most abundant species, 1951, 1956; the remaining species were occasional or rare:—*Fissidens taxifolius*, 1951; *Pleuridium acuminatum*, fruiting, May 1950; *Dicranella heteromalla*, 1951; *Bryum pseudotriquetrum*, 1956; *Brachythecium albicans*, 1951; *Eurhynchium praelongum*, 1962; *Pseudoscleropodium purum*, 1950-1.

SCRUB CLEARANCE IN CENTRAL PLAIN. Plate 2

The Conservation Corps started work early in 1960 on the clearance of Hawthorn and Blackthorn scrub from Central Plain (856-867), leaving only a few of the larger shrubs and trees. In March 1961, the Nature Conservancy used chemicals to prevent regeneration of the cut hawthorn in a part of the cleared area which had been very dense thorn scrub, with very poor ground or herb layer vegetation. The stumps were treated with 2-4-5-T (2, 4, 5-trichlorophenoxyacetic acid), a selective herbicide for woody perennials. In August 1961 a Conservancy team noted 24 species flowering in the treated plot and many more in a vegetative state—a large increase, including many plants of open grassland. Later visits showed also a big increase in the bryophyte population (*L.N.*, 41, 1962, 74-5). Further clearance took place in the winter of 1961-2. The following observations of the cleared area were made by the writer in 1961 and 1962.

VEGETATION UNDER DENSE HAWTHORN

Penetration was made a little way into some dense hawthorn awaiting clearance in March and July 1962. The diameter of adjacent cut stumps of hawthorn ranged from 8 to 12 inches. The lower few feet of the hawthorn branches were dead, apparently killed by canopy shading and the ground was almost bare except for an occasional *Viola* sp., *Cirsium* cf. *palustre* seedlings, *Veronica* cf. *chamaedrys*, one small *Dryopteris filix-mas* and a few bryophytes, one of which, *Brachythecium velutinum*, was growing on the bark of an old hawthorn. The following bryophytes were found sparsely on the ground and nowhere in abundance: the liverwort *Lophocolea* cf. *bidentata* (L.) Dum. (sterile) and the mosses *Atrichum undulatum*, *Fissidens bryoides* (fruiting), *F. taxifolius*, *Dicranella heteromalla*, *Brachythecium rutabulum*, *B. velutinum* (fruiting) and *Eurhynchium praelongum*.

VEGETATION OF CLEARED AREA, STUMPS UNTREATED, July 1961

Hawthorns showed vigorous suckering. *Holcus lanatus* d; *Deschampsia cespitosa*, sd; *Lotus uliginosus* ld; *Pteridium aquilinum* d on higher ground at edge of area; *Chamaenerion angustifolium* occ. but ld on higher ground; *Epilobium adenocaulon* ld on areas formerly under dense shade; *Galium uliginosum* la; *Potentilla erecta* la; *Agrostis* sp. lf. Occasional species: *Ranunculus acris*, *Stellaria graminea*, *Rubus fruticosus*, *Rosa* sp., *Rumex acetosa*, *Quercus robur*, *Ajuga reptans*, *Cirsium arvense*, *Juncus conglomeratus*, *J. inflexus* and *Arrhenatherum elatius*.

VEGETATION OF TREATED AREA

The treated area was visited in August 1961 and in July and September 1962.

Shrubs: *Quercus robur*, several with seedlings (1961-2); *Crataegus monogyna* occ. (1961), seedlings f-la, otherwise occ., no regeneration of

cut stems (1962); *Lonicera periclymenum* occ. (1961-2); *Betula* sp. seedlings occ. (1962); *Prunus spinosus* r; (1961), f-la (62); *Rosa* sp. f.(61), occ. (62); Commoner Herbs: *Pteridium aquilinum*, d at edge on higher ground; *Holcus lanatus* a-ld (61-2); *Deschampsia cespitosa* a-ld (61-2); *Galium uliginosum* f (61), a-ld (62); *Epilobium adenocaulon* ld (61), lf (62); *Pulicaria dysenterica* occ.-ld (61-2); *Potentilla erecta* f-la (61-2); *Stellaria graminea* r-occ. (61), f-la (62); *Agrostis canina* and *A. tenuis* occ. (61), f-la (62); *Succisa pratensis* r-occ. (61), lf (62).

The following were all considered f in 1961 but occ. in 1962: *Ranunculus repens*, *Silaum silaus*, *Solanum dulcamara*, *Cirsium arvense*, *Juncus inflexus*.

Rare to occasional herbs: seen in 1961 but not in 1962:— *Ranunculus acris*, *Rumex sanguineus*, *Solanum nigrum*, *Sonchus oleraceus*, *Sieglingia decumbens*; *Hypericum humifusum*, *Tripleurospermum maritimum* and *Galeopsis bifida* were recorded by the Nature Conservancy team in 1961.

Seen in 1961 and 1962:— *Viola* sp., *Lotus uliginosus*, *Potentilla anserina*, *Agrimonia eupatoria*, *Epilobium hirsutum*, *Chamaenerion angustifolium*, *Rumex acetosa*, *Prunella vulgaris*, *Senecio erucifolius*, *S. sylvaticus*, *Tussilago farfara*, *Achillea ptarmica*, *Cirsium vulgare*, *C. palustre*, *Sonchus arvensis*, *Juncus conglomeratus*, *Molinia caerulea*, *Arrhenatherum elatius*, *Alopecurus pratensis*.

Seen in 1962 only:— *Cerastium holosteoides*, *Trifolium repens*, *Angelica sylvestris*, young, *Rumex conglomeratus*, *Odontites verna*, *Betonica officinalis*, *Plantago major*, *Juncus bufonius*, *Anthoxanthum odoratum*.

In 1962 rabbit droppings were present and there was obvious grazing of *Deschampsia cespitosa* and *Juncus bufonius*. The major and more obvious changes in the vegetation appear to have been an increase in *Crataegus* seedlings, *Prunus spinosus*, *Stellaria graminea*, *Galium uliginosum*, *Succisa pratensis* and *Agrostis* spp. and a reduction in *Epilobium adenocaulon*.

SITES OF BONFIRES IN CLEARED AREA

Casual observations made on four sites showed that the most abundant colonizer was *Cirsium arvense*, which spread rapidly by means of its extensive, if shallow, lateral root system which threw up numerous shoots; *Potentilla anserina*, on the other hand, spread by runners. Other conspicuous species were *Epilobium hirsutum*, *Vicia tetrasperma*, *Galium uliginosum*, *Carex hirta*, *Holcus lanatus*, the moss *Funaria hygrometrica* and in one case an abundance of the liverwort *Marchantia polymorpha* L. with both gemma cups and fruiting bodies. Except *Conyza canadensis*, a new record for the Common, all these and the other less frequent invading species were those known to occur in other parts of Central Plain. Colonization was both by seed, e.g. *Cirsium arvense* and *Epilobium hirsutum* and vegetatively from adjacent plants, e.g. *Potentilla anserina* and *Carex hirta*.

In the above account, the following abbreviations have been used:— d, dominant; a, abundant; f, frequent; occ., occasional; r, rare; l, locally. The nomenclature of J. E. Dandy, 1958, *List of British Vascular Plants* has been adopted for vascular plants and of P. W. Richards & E. C. Wallace, 1950, *Annotated List of British Mosses* for mosses.

BIRDS (G. Beven)

The spring census of birds in the sample of dense oakwood (Eastern Wood) was repeated in 1962. The figures for the numbers of territories

in the 40 acres were: Robin 32, Wren 12, Blue Tit $16\frac{1}{2}$, Great Tit 11, Blackbird 8, Chaffinch 7, Willow Warbler $1\frac{1}{2}$, Chiffchaff $1\frac{1}{2}$, Song Thrush 5, Hedge Sparrow $4\frac{1}{2}$. Looking back over the census which has been repeated almost annually since 1946 it now becomes apparent that the most important factor affecting the size of the spring population of Robins, Wrens and Blackbirds is the severity of the preceding winter. The numbers of these birds were usually reduced in the spring following a cold winter, the Wren being perhaps most vulnerable in this respect. The recovery in numbers has been rapid, all three species returning to normal strength in one or two years. Although half or more of the Robins leave the dense oakwood in winter, it appears that most of the Wrens and Blackbirds remain there during the coldest months. In spite of changes in small areas of the wood from time to time due to felling and clearing of scrub, the wood as a whole has probably changed very little during this period.

Since 1946 the Chaffinch population seems to have increased to a maximum of $12\frac{1}{2}$ in 1951 and then decreased slowly to a minimum of 2 in 1959. Since then the numbers have begun to increase again. The cause of this waxing and waning is obscure. As most Chaffinches leave the woods and spend much of their time on farmland in winter, it is tempting to associate the overall decrease in recent years with the widespread use of toxic chemicals, but there is no proof of this. The census of Great Tits since 1949 indicates relative stability of the population there, apart from the drastic decrease in 1958 already discussed (*L.N.*, 38, 58, 1959). Recovery was complete by 1959 and the numbers have since remained steady. The Blue Tit figures show more annual variation, and that these variations may have general significance is indicated by the fact that a decrease in population in 1955 followed by recovery in 1956 at Bookham was reflected in similar decreases in 1955 at Chislehurst (Hillman, E. M. *infra* p. 71) and in several woods in Southern England (Lack, D., *Ardea*, 46, 91-124, 1958). Willow warblers remain scarce in the woodland.

A full analysis of the results of the oakwood breeding season census for the period 1946-62 is shortly to be published in *British Birds*. It is intended, however, to include a detailed report in the *London Naturalist* within the next two or three years. The effects of the severe winter 1962-3 may then be examined in relation to the previous results.

Work has also been continued on the feeding niches of birds on the plains of grassland with scrub. It is hoped to publish a report on this quite soon.

The hawthorn and sloe crop was very good in 1962 and several hundreds of thrushes chiefly Redwings, but also Fieldfares, Blackbirds, Song Thrushes and Mistle Thrushes were observed feeding on the berries in the autumn. The Grasshopper Warbler, which was scarce in 1961, showed a marked recovery, at least five singing males being located.

MAMMALS (G. Beven)

John Lord has continued with his work on small mammals. In 1962 the population of mice and voles remained at the low level established in autumn 1960. As in previous years he has set his grids of Longworth traps within the area of Central Plain cleared by the Conservation Corps. By doing this he hopes to be able to follow the parallel regeneration of a grassland habitat and a grassland type of small mammal community. During these investigations five Water Shrews (*Neomys fodiens*) were



PLATE 1. Crater Pond, Bookham Common

Top: Pond in May 1950 showing Reedmace (*Typha latifolia*) and young Willows (*Salix*)

Middle: Pond in June 1957. *Typha* in centre, with *Salix* left and right.

Bottom: Pond in June 1962. *Salix* completely dominating both pond and *Typha*



PLATE 2

Above: Central Plain, looking N. from footbridge at Railway Station, showing spread of scrub and rapid growth of *Salix fragilis* (extreme right), October 1955. (Compare photograph taken May 1949 in *L.N.*, 33, 28, 1954). Below: Same view, June 1962 showing further increase of scrub in left half and its reduction by

caught on Central Plain on the following dates: April 9, 1961, July 6, 1961, December 26, 1961, December 27, 1961 and March 21, 1962. He also caught at least 4 and probably 5 different individuals of Harvest Mice (*Micromys minutus*) on Central Plain between March 18 and 25, 1962. Three empty nests of Harvest Mice were found by W. G. Teagle on April 8, 1962 on Central Plain ref. 867: (i) measured $3\frac{1}{2} \times 3 \times 2\frac{1}{2}$ inches and was placed among old stems of the grass *Deschampsia cespitosa* and small hawthorn shoots 19 inches above ground, (ii) measured $3 \times 3 \times 2\frac{1}{2}$ inches and was placed $23\frac{1}{2}$ inches above ground in among *Deschampsia* and hawthorn stems, (iii) remains of a third nest.

Rabbits have become widespread on the plains, but were most often seen on Central Plain.

AMPHIBIA (G. Beven)

The breeding of Toads and Frogs on the Common

On April 8, 1962, numerous Common Toads *Bufo bufo* were observed in the deeper waters of the Isle of Wight pond, 64 being counted near the embankment. They were pairing and croaking. Masses of tadpoles were noted on June 3 and some small toads were present on July 8.

Toads have bred in the Isle of Wight pond in many previous years but it is not known if they do so annually. Certainly they have assembled there in March for pairing and egg-laying in 1942, 1948, 1950, 1957 and 1961 and Panchen (1951) reports regular breeding in very large numbers. In 1948 they were recorded as being present in "hundreds" and in 1957 there were "several hundreds" and some of the females were noted as having as many as 5 males clasped to them. Breeding has also been recorded in other ponds on the common, such as Upper Eastern pond regularly in large numbers up to 1950 (Panchen, 1951) and in gun pit on Eastern Plain in 1944 and 1953.

Frogs *Rana temporaria* are known to have bred in the Isle of Wight pond every year from 1942 to 1950 (Panchen, 1951) and also in 1954 and 1962. C. J. F. Bensley reported frog spawn there in mid-January 1954. According to Malcolm Smith (1951, *British Amphibians and Reptiles*) this is an unusually early date and may perhaps have been due to the mildness of the weather up to that time. Sometimes the numbers of tadpoles were so great that there was gross overcrowding and considerable mortality. For instance in 1946 large masses of frog spawn were noted just under the ice on March 10, and tadpoles became so abundant that on April 19 they seriously interfered "with Mollusca collecting". By April 22 the water at the deep end of the pond was very foul presumably because of the "huge masses of frog spawn and considerable number of dead frogs". Thousands of dead tadpoles with much decaying spawn were noted on May 12. Again on April 13, 1947 large quantities of frog spawn and dead frogs were seen so that by May 11, 1947 there were thousands of dead tadpoles and some were starting to decay. Frogs have also bred on other ponds on the common such as Lower-eastern and South-eastern pond in 1942 and 1943, and Upper-eastern pond in 1946, 1948 and 1949.

This summary has been compiled chiefly from the note books of the late C. J. F. Bensley with some additional records from Miss E. M. Hillman, G. Beven and C. P. Castell. Reference has also been made to Panchen, A. L. (1951, Notes on the Reptiles and Amphibians of Bookham Common, *L.N.*, 30, 42-4).

Some Additions and Amendments to the Check-list of Birds of Bookham Common

By GEOFFREY BEVEN

A LIST of birds of the Common was published in 1944 based on the results of two years of observations, supplemented by a few records made in the previous ten years (Carrington, L. I. *et al.*, 1944). Since 1944 a number of additional species have been observed there and the status of several has changed. A list of these is given below, the new additions being marked with an asterisk. The number preceding the name of the bird is that used in the systematic list in the Handbook (Witherby *et al.*, 1938-41) as that list was also used in the original paper mentioned above and cross reference will be facilitated.

- 14 *Starling*. These are still perhaps "not so abundant as would be expected". The use of woodpecker holes as nesting sites had not been observed up to 1944. They have however nested regularly in South-East Wood on the outskirts of the woodland on the Common, two nests being found in 1956 and two again in 1958, at least one being in a Green Woodpecker's hole in both years. In addition in 1962, for the first time since the survey began, the Starling was recorded as nesting well inside Eastern Wood. One pair nested in a Green Woodpecker's hole in an oak (ref. 6131) and another pair probably nested just to the west of Eastern Wood (ref. 531). Every year Starlings bring their young into the wood in late May or early June to feed on the caterpillars on the oaks, but they now seem to be penetrating more deeply into the dense oakwood for nesting purposes as well.
- 25 *Lesser Redpoll*. This species was recorded as very scarce in 1942-3 but is now not uncommon in small numbers feeding on the plains in autumn and winter in most years. More numerous than usual in 1962, and on January 13, 1963, 35 birds were seen feeding on the birches.
- * 62 *Tree Sparrow*. One seen July 13, 1958, ref. 443 (W. D. Melliush).
- 70 *Skylark*. In 1943 probably three pairs nested on Bayfield and Western Plains but now the species no longer breeds on the Common and is usually only recorded flying over.
- 75 *Tree Pipit*. Has not been recorded as nesting on the Common since 1954 although it nested annually until that year. Two males were present in 1957. As many as 9 song posts were observed in 1943.
- * 89 *Grey Wagtail*. Occasional winter visitor to the Common and adjacent sewage farm.
- 108 *Willow Tit*. Present throughout the year in small numbers. Known to have nested on several occasions including 1961.
- 119 *Redbacked Shrike*. No longer nests on the Common. The last year when a pair was recorded was 1955. At least 3 pairs nested in 1942 and 1943 when the species was restricted to the wet grassy plains to the west of the Common.
- *120 *Waxwing*. A flock of up to 20 was present between January and April 1959 (*Lond. Nat.*, 39, 65, 1960; *Lond. Bird Report*, 54, 1961).
- 127 *Goldcrest*. A common winter visitor in recent years. Also occurs sparingly in summer. In June 1959 a pair nested in a cedar in the

- grounds of the Bookham Grange Hotel about 15 feet up (G.B.). The only record of the nesting of this species on the Common appears to be that of W. H. Spreadbury (*Lond. Nat.*, 36, 56, 1957).
- 135 *Wood Warbler*. Remains very scarce. From one to three singing birds noted in 1944, 1948, 1949, 1951, 1953 and 1956.
- 145 *Grasshopper Warbler*. In 1944 it was stated that this species "appears now to be an erratic and decreasing visitor" and only one male was recorded in 1943. However, although there is considerable annual variation in numbers several birds have been present in most years since then and at least 5 singing males were observed in 1962.
- *149 *Reed Warbler*. One on May 8, 1955, ref. 498 (D. A. White).
- 153 *Sedge Warbler*. Occurs irregularly on spring migration. May 9, 1954 one Isle of Wight pond (Miss D. A. Rook), May 8, 1955 one ref. 811 and another ref. 498 (G. B., B. Evans, W.D.M., D.A.W.), April 21, 1962 one Isle of Wight pond (G.B., Miss E. M. Hillman).
- *173 *Fieldfare*. These arrive in winter to feed on the hawthorn crop. Although much less numerous than the Redwing, 102 were counted on November 8, 1959.
- 178 *Redwing*. Regular winter visitor to the hawthorn shrub, sometimes in hundreds.
- *234 *Kingfisher*. Occasional visitor in late summer and winter. (*Lond. Nat.*, 41, 73, 1962).
- 249 *Little Owl*. Still occurs near or just outside the north west boundary of the Common but there are no recent records elsewhere on the Common. Appears to be decreasing.
- *251 *Short-eared Owl*. November 12, 1950, one hunting over Western Plain, and December 13, 1953 one flying over Central Plain (G.B.)
- *253 *Tawny Owl*. A common resident in the dense oakwood.
- 254 *Barn Owl*. One hunting over Western Plain in December 1949 and in January and April 1950, and two hunting there in June 1953 (G.B.). Between February and April 1960 two roosted regularly in the scrub on Bayfield and Western Plains (P. Harland, F. C. Reeves).
- *261 *Hobby*. May 12, 1946 one flying into Hill House Wood (A. R. Wilton). June 24, 1946 one flying across Central Plain (G.B.)
- *268/
269 *Buzzard*. One seen flying high over the Common on March 5, 1961 (F. C. Reeves). The exact species could not be determined.
- *302 *Mute Swan*. Single immature birds present on Isle of Wight pond on December 9, 1956, February 10, 1957 and November 9, 1958 (G.B., E.M.H.).
- 375 *Little Grebe*. At least one pair present on Isle of Wight group of ponds every Spring since 1949. They nested successfully in 1959 and 1961.
- *393 *Woodcock*. Now a regular winter visitor and breeding species in small numbers (*Lond. Nat.*, 37, 56, 1958).
- *398 *Jack Snipe*. Occasional winter visitor (*Lond. Nat.*, 41, 73, 1962).
- *424 *Green Sandpiper*. One August 13, 1961 (G.B.).
- *456 *Stone Curlew*. April 11, 1948. One flushed from Western Plain (P. W. E. Currie).
- *509 *Water Rail*. One seen Isle of Wight Plain (W.D.M.) March 13, 1955. One heard Isle of Wight pond (G.B., Miss N. Goom *et al.*). October 14, 1962.

- 511 *Coot.* Nested on Isle of Wight pond in 1954, 1958, 1960, 1961 and 1962.

ACKNOWLEDGMENTS

It is a pleasure to thank all of the many members of the Society who have contributed the records on which this list is based, and to thank especially C. P. Castell, Miss E. M. Hillman and W. D. Melliush for reading this paper and for many helpful suggestions.

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Nature Conservation in the London Area in 1962

THE Conservation Committee for 1963 has been enlarged and strengthened by the appointment of a new secretary, additional county representatives for Middlesex, Hertfordshire, Kent and Surrey, a representative for Geology and one for the Conservation Corps of the Council for Nature. It is hoped to co-opt a member of the council of each of the County Naturalists' Trusts and to secure informal representation of the Nature Conservancy.

The year 1963 should also see the inauguration of the Hertfordshire and Middlesex Naturalists' Trust, the most urgently needed of the county trusts within the Society's area.

The Nature Conservancy is preparing a list of all Sites of Special Scientific Interest in the Society's area and notes of the information available for each. The Committee will be compiling a list of members of the Society who are familiar with the natural history of these sites and who would be available for consultation and assistance.

It will be seen that, as in the past few years, most of the activities recorded in the rest of this report are those of the County Trusts, but it is to be hoped that the formation of the new committee will ensure that the Society takes a prominent part in the future in collaborating with the Trusts in conservation matters.

To turn to the counties: Mrs. W. M. McMullen reports that there is to be an overall plan for the extraction of gravel for the whole of S. W. MIDDLESEX, which will be more satisfactory than the present piecemeal policy that makes discovery of proposals difficult. It is disappointing to hear that the Minister has rejected the Cranford Park Committee's proposal to incorporate ten acres of adjoining land into the park to compensate for the ten acres lost by the building of the motorway.

The Society was consulted by the Nature Conservancy on two occasions about Brent Reservoir, when it was considered that no objection could be raised to a proposed small building in Cool Oak Lane and a pavilion in W. Hendon Playing Fields.

There is nothing to report from our part of HERTFORDSHIRE.

Miss D. E. Woods reports from ESSEX that the Corporation of London's proposal, referred to in last year's report, to prohibit the grazing of untethered cattle on common land in Epping Forest, was defeated. The destruction of wild life on the roads in Epping Forest is a problem under consideration by the Essex Naturalists' Trust. The threat to wild life—including the herd of Fallow Deer—should be reduced once the Norwich Motorway is constructed; this will take much of the fast traffic out of the forest roads. The specially constructed enclosed "reserve" for the deer, with access "leaps", is already beginning to be successful, with some fawns being born within its safety. Eventually it is hoped that a large proportion of the fawns will be born inside. The "leaps" are too wide to permit anything younger than a year-old fawn to use them, so the fawns will be old enough to look after themselves before they can leave the sanctuary.

The problem of illegal shooting in and around Metropolitan Water Board reservoirs is causing concern. The Board have assured the Essex Trust that extra dog and handler teams have been drafted to such areas as the Walthamstow Reservoir where during the summer the heronry was interfered with. A long list of protected birds has been compiled. The

important disused gravel pits in the Lea Valley are under consideration, and it is possible that some of them may eventually become recreational open spaces with (in special cases) areas reserved for wild life. The Essex Trust has been asked to survey these pits and to highlight those of importance to naturalists. Any assistance from specialists who "work" this area would be valuable in order to save time and duplication of effort.

The owners of the Grays Chalk Pit are being approached with the suggestion that all or part of this 120-acre site be preserved under the management of the Trust. It possesses an interesting chalk flora including some rare species, but is now being used as a dumping ground for soil and waste from works. The Essex Farmers' Union are being approached in an endeavour to reduce the amount of hedge clearance in Essex. Several members of the Society have been appointed members of a S.W. Regional Committee of the Essex Trust.

Mrs. A. G. Side reports that very little correspondence has been received from members in KENT during the year. One letter, unsigned, was received from an unknown member regarding roadside spraying, an activity which needs careful watching.

The Kent Naturalists' Trust has done valuable work in the Society's area in three different ways. Darwin's Orchid Bank at Downe was purchased, with the aid of a loan from the Society for the Promotion of Nature Reserves. The site was originally scheduled by the Nature Conservancy as a Site of Special Scientific Interest (TQ/46/2) at the request of our Society. Charles Darwin, who lived at Downe for about forty years, carried out here some of his classic studies on orchid pollination. The bank is an area of eleven acres of chalk down, scrub and beechwood, with an extremely rich orchid flora and chalk herbs and shrubs. As the Trust now owns Downe Bank, it is, of course, involved in the full responsibility of maintenance; replacing derelict fencing, which could only partly be carried out by voluntary unpaid labour, has for instance proved a relatively costly matter. A second mode of procedure has been adopted at Ruxley Gravel Pit; here conservation measures are undertaken by agreement between the Trust, the Kent River Board which owns the site, and the Orpington Angling Association which is the tenant. This arrangement has worked remarkably well. The Trust is represented on the Committee of the Angling Association and has also formed a scientific committee (of which the Society's County Representative is a member) to organize the study of the fauna and flora. The third approach that has been successfully adopted is that of making representations to local councils. As a result of such representations, and in close consultation with the Trust, the Borough of Bromley is carrying out conservation measures at Keston Bog. These involve the thinning out of sapling pine trees, to prevent a further fall in the water table, and the diversion of a footpath, which was leading to excessive trampling in the vicinity of the colony of Sundew plants. The Orpington Urban District Council has also been most co-operative and has adopted conservation measures suggested by the Trust on the High Elms estate, which is the property of the Council. Access to Downe Bank, which is of botanical and historical interest, and to Ruxley Pit, where the interest is mainly ornithological, may be obtained on application to the Trust's Area Representatives.

In SURREY, a letter was received from a member complaining of the burning of railway banks in mid-summer and the consequent destruction

of late-nesting warblers and the relics of the native flora; his complaint was forwarded to the Council for Nature.

The Society was consulted by the Nature Conservancy over a threat to Bookham Common by the proposed South Orbital Road, which would cut off some of the best parts of the woodland at the north end, with the risk of opening up that part to trippers. The Society pressed for the retention of the route shown on Abercrombie's original Greater London Plan; this skirted the north margin. If a road has to be made through the Common, it was urged that it should be fenced, as it was considered that there is already sufficient access to the Common by road.

Work on the Fetcham Mill Pond by the East Surrey Water Co. appears to be nearing completion. The famous spring pits are now enclosed in concrete and that part of the pond filled in. A temporary dam was constructed dividing the pond into two sections, one of which was drained and the banks sealed with bituminous sheets. The banks were then covered with earth to make a gradually shelving earth bank which should eventually provide a site for natural vegetation. Two small islands have been made in this part of the pond and the original wooded island still remains. Part of the pond has remained undisturbed and it is to be hoped that aquatic vegetation will spread to the rest of the pond. Mallard, Coot, Moorhen and Swans appear to have bred, as young of these birds have been seen.

The Surrey Trust have suggested to the Surrey Education Committee that the woodland and some other parts of the Brooklands estate at Weybridge should become an educational nature reserve.

A nature reserve and bird sanctuary, surrounded by a natural thicket, is included in the plans for a new riverside park between Teddington Lock and Ham.

The Conservation Corps has increased its activities in the London area and the Council for Nature has appointed an additional Assistant Organizer to assist with and expand the week-end activities. Most of the work involves the clearance of hawthorn and other scrub from grassland areas, the removal of sallow from ponds and the clearance of Rhododendron. Visits were made to Chorley Wood and Bricket Wood in Hertfordshire, to Perivale Wood in Middlesex, to Epping Forest in Essex, to Keston Bog and Ruxley Gravel Pit in Kent and to Brooklands, Box Hill and Bookham Common in Surrey.

As Mrs. Side points out, the need for vigilance is very great in these days of rapid industrial expansion. Members might, perhaps, be able to save something by listing places of special interest, because of rare plants or animals to be found there, watching for any threat to their existence and notifying the county representative.

The Conservation Secretary would welcome offers from members to act as local Area Reporters, particularly on those sites recommended by the Society as of scientific interest, undertaking to send reports periodically on the aspects of natural history in which they are interested and especially to watch for and report on any threats to the site and its fauna and flora. The Conservation Secretary or the County Representative would be pleased to advise members on suitable sites.

The first meeting of the new Committee was held on December 20, 1962. At this meeting, it was felt necessary to convince members still further of the urgent need for active participation in conservation, both in the Society and through the County Naturalists' Trusts. The Representa-

tives of the Trusts were therefore asked to contribute, for publication in the *London Naturalist*, reports on the activities and problems of the Trusts, with particular reference to the Society's area. All three Trusts have wholeheartedly co-operated and their reports appear below. Once again, members are urged to join and to take an active part in their appropriate County Naturalists' Trust, for which there is a uniform minimum annual subscription of 10s.

C. P. CASTELL, *Conservation Secretary*.

The Kent Naturalists' Trust

THE KENT NATURALISTS' TRUST was inaugurated at a public meeting held in Maidstone in May 1958, which was attended by over three hundred people from widely different walks of life and was notable for the great enthusiasm shown by everyone present. For five years the Trust has been pursuing with increasing momentum the aims outlined at this first meeting. On the one hand it has been initiating and supporting measures for the conservation of the rich and varied interest and beauty of the Kent countryside in all parts of the county, and on the other striving to extend its influence in creating an informed public opinion aware of the pressing need for nature conservation and alert to the necessity of continual vigilance in anticipating threats to wild life. The extent to which these efforts have been successful can be gauged from the fact that there are now twenty reserves and protected sites in Kent, and that membership of the Trust exceeds one thousand. From the beginning the Trust has pursued a policy of encouraging as wide a co-operation between differing interests as possible. Its inauguration was sponsored by members of the National Farmers' Union, the Wildfowlers' Association, county and local ornithological societies and field clubs, and other organizations. The reserves for which it is now responsible have been set up by negotiation with landowners, and in only one case so far has purchase been resorted to, and this was for special reasons. Not only have relations with private interests been good, but those with public authorities have been cordial also; liaison with the County Planning Officer has been close throughout, and the Trust is most grateful for the co-operative attitude of local councils and their officials.

Much has been done, but the need for further efforts is great. Kent is an average size county, but in variety of scenery and wealth of wild plants and animals it is far from average. It has a long and varied coastline, ranging from the estuaries of the Thames and the Medway with their salt marsh plants and birds, through shell beaches, cliffs and dunes to the great accumulation of shingle at Dungeness which is a feature unique in Europe. The woodlands and grasslands on the chalk downs are extensive and varied, and the complex pattern of sandy and clayey soils in the Weald has produced a mosaic of fascinating wild life habitats. Because of its proximity to the continent, the county lies on the migration routes of many birds and also insects; the conservation of alighting refuges is thus of importance to Britain as a whole. The invertebrate fauna is very rich and includes many species with a continental distribution. There are 1,200 species of native or established vascular plants; only Hampshire and Sussex have more. This total includes thirty species of

orchids (only Oxfordshire and Hampshire have as many) and eight of the ten British broomrapes. At the same time the pressure of increasing population is as great in Kent as anywhere in the country. The legitimate claims of housing, industry and recreation make ever increasing demands on the countryside; it is the task of the Trust to see that the equally legitimate claims of conservation are heard, and to work in co-operation with others towards a rational system of land use.

The only reserve so far to be entirely owned and managed by the Kent Naturalists' Trust is Darwin's Orchid Bank at Downe, which lies within the London Natural History Society's area. Here Charles Darwin carried out the field studies later described in his classic work *On the Fertilisation of Orchids*. The reserve thus has historic as well as natural history interest; but apart from this, the occurrence there so near to London of a typical chalk downland flora including ten species of orchids, juniper, and several interesting bryophytes and lichens, the Roman snail and an uncommon slug, a rich insect fauna and many birds fully justifies conservation of the site. The educational value of the reserve is considerable as well, and with certain safeguards access is freely granted to organized parties of students from schools and colleges. The other main reserve in the L.N.H.S. area is Ruxley Gravel Pit, Sidcup, of importance chiefly for its waterfowl, but harbouring also some interesting plants. Metropolitan Kent is fortunate in possessing a small area of bog on Keston Common which is in the care of Bromley Corporation and an area of mixed woodland on the High Elms Estate, formerly the seat of Lord Avebury, now the property of Orpington Council. Both these local authorities have adopted conservation measures at these sites at the request of the Kent Naturalists' Trust.

In the future, the Trust hopes to double the number of reserves in its care. At the same time of course maintenance work has to be carried out continuously at the reserves already in existence. It is hoped also to increase the membership to double the present figure at least. Experience has shown that increases in funds available unfortunately do not keep pace with increasing membership or with increasing commitments. In order to ease the burden of administration to some extent, and also to promote efficiency in dealing with local threats to wild life as soon as they arise, a recent development in Trust organization has been the division of the county into seventeen areas and the appointment of a representative for each.* Even so, the employment of a paid secretary will shortly become necessary if the Trust is to achieve its aims. It is with this in mind that the present campaign for donations and legacies with which to establish a capital reserve, as well as new members whose subscriptions, it is hoped, will be sufficient to cover day-to-day running expenses, is being conducted.

F. H. BRIGHTMAN

* Members of the L.N.H.S. are invited to communicate information of threats to wild life, requests for access to reserves, or comments on any matters relevant to the Kent Naturalists' Trust to the following area representatives:

North Metropolitan Kent (Chislehurst and Sidcup, Bexley, Erith, Crayford, Woolwich, Greenwich, Deptford, Lewisham): Mr. F. J. Holroyde, 5 Henville Road, Bromley, Kent.
 South Metropolitan Kent (Penge, Beckenham, Bromley, Orpington): Mr. F. H. Brightman, 2 Red Oak Close, Orpington, Kent.
 Thames-side (including Dartford and Swanscombe): Mrs. A. G. Side, 107 London Road, Stone, Dartford, Kent.

The Work of an Extra-Metropolitan County Trust—Essex

THE ESSEX NATURALISTS' TRUST was incorporated on October 2, 1959, as a Company Limited by Guarantee and not having a Share Capital—in common with the structure of other County Trusts. Its inception was prompted and sponsored by the Essex Field Club—itsself a very old-established naturalists' body founded in January 1880—and from the outset it was embroiled in the complexities of a “home county” organization.

Although the new Trust had the benefit of the advice of older County Trusts, it soon became apparent that the problems it had to deal with were, in many ways, more complicated, more frequent and often quite different from those facing many of the other County Trusts. In Essex much of the Trust's work is concerned with the rapid expansion of the county, the increasing pressure from population spread and migration, and the nearness of its attractive coastline for the Metropolitan day and holiday visitor. Beach chalet and bungalow growth increases daily and land ownership changes hands very frequently. Each present a problem for a County Naturalists' Trust—a problem which, if it is to do its duty, cannot be shelved. Some threats may involve areas of Special Scientific Interest, some may have to be judged on a wider issue, but a recommendation on each has to be given and often given quickly.

At all times consideration must be given to every aspect concerning the threat, for nothing is more damaging to a Naturalists' Trust than to gain the reputation of being a “do good” body. When a County Trust says “Thou shalt not” it must both mean what it says and have practical reasons for saying it. Only in this way can it expect co-operation and consideration from those whose duty it is to negotiate and handle the machinery of County administration at all levels, a difficult and often invidious task which should evoke sympathy and understanding.

A specific part of a County Trust's activity concerns the conservation of wild life. This to-day is not, in itself, enough—it must go hand-in-hand with the preservation of land on and in which wild life may live. This can only be achieved by securing, either by purchase or lease (or gift or endowment), certain areas of specific interest to form Nature Reserves. Ideally such areas should form a representative collection of every type of habitat which the county offers. In actual practice it often happens that there is some duplication of habitat. The problems of securing land for Reserves are many and varied, and of these finance is perhaps the one most frequently encountered. This particular problem may put a young Trust in a cleft stick: without a Reserve it may be judged as not doing its job (from the publicity angle), and it probably has no money to secure one unless it is extremely fortunate.

The Essex Trust was offered, at Fingringhoe, in 1960, a site of good mixed interest (with a coastal frontage of saltings and shingle), comprising the partially worked-out area of a gravel company. Much of the 100 acres was untouched and contained mature scrub, woodland and sparsely bushed land with a mixed field layer. Bramble had colonized a considerable area but the terrain included a small fresh marsh fed by a stream, two large stands of *Phragmites* and some heathland of gorse and broom. Many freshwater pools, varying in size and character, dotted the site.

The offer included a well-built farmhouse and numerous ancillary buildings connected with the past agricultural use of the land. With no finance to secure this attractive site the Trust had to stand aside until, in late 1961, a decision was taken to purchase, with the generous help of guarantors behind a sizable overdraft negotiated with an equally generous and co-operative bank manager. Early in 1962 a large-scale Appeal was made to the Essex public and this resulted in almost half the amount needed being raised before the end of the year. An interest-free loan of £250 from the Society for the Promotion of Nature Reserves was later converted by this Society into a Grant, and at the end of 1962 a further loan of £2,000—interest-free—was granted by the S.P.N.R. in order to liquidate the rest of the overdraft and to save bank charges. The second stage of the Appeal has been launched and it is hoped will result in the loan being repaid quickly, to benefit some other Trust in need.

Apart from financial help the Trust has had much assistance in kind. During its first year of planning and conversion on the Reserve willing hands have manned spades and shovels, cut bramble, built and pulled down and taken part in innumerable other jobs as part of the final plan for the Reserve.

Just prior to the successful completion of the Fingringhoe negotiations the Trust was fortunate to be granted, by the County Borough of Southend, a concession on Two Tree Island in the Thames estuary; and subsequently a further concession has been given to the Trust of an area of very different character, a miniature "fen" in the central part of the county. This Concession holds a variety of marsh and fen plants and a large and varied bird population. Negotiations are proceeding with the owners of the Grays Chalk Quarry for a section of this unique—in this part of the county—pit with its interesting flora characteristic of the chalk.

Negotiations are also in progress for part, or parts, of the many gravel pits in the Lea Valley area. The Trust played a not inconsiderable part in the Naze Links Estate (Walton-on-Naze) threat, and it is satisfying to record that this unique headland of Red Crag has been purchased by the County, and Frinton and Walton Councils, as a Public Open Space free from any further threat. The Trust, from its slender resources, voted £250 toward its acquisition—a small enough sum but of value as a token of the Trust's beliefs. A proportion of the many development threats in the county have been contested and the Trust has been represented at several Public Enquiries to give specialist evidence.

A review of the existing areas of Special Scientific Interest throughout the county is being undertaken, assisted by five Regional Committees which have been formed. Recently a representative from the Trust Council has been appointed to the London Natural History Society's Conservation Committee, and several members of this Society are members of one or other of the Regional Committees in the south of the county. This increasing co-operation between the Trust and the London Natural History Society, which has members on the Trust Council, must result in better understanding and increased strength in connection with matters which concern both bodies. The London Natural History Society, founded in 1858, can be of great help to the comparatively young Trust and the Trust can, in turn, weigh in with its organization when help is needed within the area of the London Society. Interchange of knowledge of the present status of the S.S.S.I.s—and of their reviews—cannot be of anything but benefit to both organizations, and much time-wasting effort

saved by pooling what knowledge is possessed by either. This information is of vital importance whenever a threat concerns an S.S.S.I. and a practical and informed opinion has to be given—usually at very short notice. County Trusts are not, at present, statutorily empowered to have notice of a considerable proportion of development applications, and these come via the Nature Conservancy which, itself, has only fourteen days in which to act. Although such matters are dealt with by the Trust Council—or in emergency by the Executive—it acts directly or indirectly on information already garnered by its Regional Committees, and consults its “Regionals” on these matters. In the same way, co-operation with these Regional Committees by Societies which operate within each Regional area must be of immense value.

The Essex boundary of the London Natural History Society's working area comes within only one Trust Regional territory, that of the South-West, whose Hon. Secretary is Mr. S. T. Jermyn, F.L.S., “Peren”, 2 Chestnuts, Hutton Mount, Brentwood—telephone: Brentwood 3619. Although just outside the boundary of the London Natural History Society “circle”, the South East Regional Committee is also available for help and consultation. Its Hon. Secretary is Mr. D. A. J. Hunford, B.Sc., 105 Hamstel Road, Southend-on-Sea—telephone: Southend 68310. Mr. Hunford is also Hon. Warden of the Two Tree Island Concession. Both these Regional Committees will welcome, as members, London Natural History Society members who would be willing to join the Trust and join in the hard work ahead: The Hon. Membership Secretary is E. Welham, Colliers Farm, Wivenhoe, Colchester.

It is a platitude to state, to-day, perhaps as never before, that to conserve only what we still have left of our natural history and wild life is, at the present time, in the hands of the relatively few; to try to regain some of what has been lost is the future hard labour of many. There is no “peck order” in the organizations for the preservation and conservation of our wild life; each plays its part and each is, or should be, truly complementary to the others.

K. R. CRAWSHAW.

The Surrey Naturalists' Trust Ltd.

“AS a result of informal discussions between naturalists mostly centred on the Haslemere Educational Museum, it was decided to hold an inaugural meeting to launch a Trust at County Hall, Kingston-on-Thames, under the chairmanship of Alderman Sir Cyril W. Black, M.P., D.L., the chairman of Surrey County Council, on March 21, 1959. The Trust was incorporated as a company limited by guarantee on December 22 of the same year. In the preliminary planning, the officers were fortunate in having the advice of Capt. Cyril Diver, C.B., C.B.E., the first Director-General of the Nature Conservancy, a Surrey resident and now President of the Trust.”

The birth of the Surrey Naturalists' Trust is described above in the words of Mr. John Clegg, its first Honorary Secretary. It added one more link to the British conservation network growing up within a land-hungry community, that has in the past been largely indifferent to the welfare of wild life. Surrey naturalists, disturbed to see local wild life and wild places suffering from neglect and misuse, are at last realising the urgency of the problems and the need for scientific management and efficient organization. Surrey had no organization to bring together local naturalists, landowners, the public, planners and national conservation bodies. Consequently, the few conservation-minded land-managers were discouraged by a lack of ecological knowledge; while naturalists, who should guide public opinion and the administration towards conservation, had little say in land management. Natural History societies, concerned mainly with the advancement of science and the entertainment of members, generally left active conservation to national bodies and these are pre-occupied with places of national importance. The Nature Conservancy, for example, has not declared a National Nature Reserve in Surrey, nor is it yet in a position to turn its attention to the many places of lesser status in the county. The primary object of the Surrey Naturalists' Trust is to fill gaps in the network of local conservation.

The Trust has to contend with three problems arising from the youthfulness of the conservation movement: a paucity of relevant scientific data and management technology; shortage of human and financial resources; and a lack of public and government understanding. Firstly, not enough is known about species distribution and the ecological factors such as climatic fluctuations, grazing, fire and human trampling which affect them, or the best ways to control such changes as post-myxomatosis spread of scrub; or again the ecology of many rare species, which need habitats tailored for them. Secondly, there is not so much an absolute shortage of ecological man-power, as a lack of organisation for pooling data, devising and experimenting with management methods, and publicizing conservation. It is doubtful whether the Trust yet represents the voice of Surrey naturalists as strongly as it should. Considering all these factors, it is not surprising that the majority of the public, and even local government officers, know neither the meaning of conservation, nor its urgency.

The means adopted by the Trust to overcome these problems are three-fold: the collection of information; the theory and practice of site management; and education. Ideally, even before threats arise, data from every locality of any scientific value, whether geological, physiographical or biological, should be assimilated in the form of site records.

These should document much besides the usual run of scientific data; they should include recent ecological changes and rates of change, economic and aesthetic values, and present management and plans for development. So far, in practice, the Trust has few adequate records. S.S.S.I. reports have not always been kept up to date. It was discovered that Frillinghurst Wood, near Haslemere, for example, in 1960 after wartime felling and Forestry Commission replanting, no longer represented its former type of habitat, viz. wet woodland on Weald Clay, for which it had been scheduled. Mr. John Sankey, the Warden of Juniper Hall Field Centre, is recording disused quarries and aquatic habitats including farm and village ponds. Mr. L. J. Raynsford has contributed some estimates of rates of ecological change on Witley Common. Finally, there are records of sites where the Trust has been active in the last three years, an example in the London area being Ashted Common where, at the request of the Nature Conservancy, members assessed its scientific value.

L.N.H.S. members can help to develop the information service by contacting their own Nature Conservation Committee, or regional secretaries of the Trust, whose names and addresses are given below.* They can find out which sites are being recorded, send in contributions and maintain vigilance for "threats". Mr. Sankey would welcome further information about ponds, particularly those which appear to be deteriorating rapidly. In view of the legislation shortly to be introduced by Parliament to implement the recommendations of the Royal Commission on Common Land, data to support proposals for conservation on certain Commons, such as Walton Heath, is urgently needed by the Trust.

Comprehensive recording of sites is envisaged as a basis for drafting a county priority system and management plans for valuable sites. The Trust cannot fight for every threatened site, it must concentrate on the best. By comparing site records it is possible to find the best examples of characteristic local communities and rarities worth preserving, and those sites with the best chance of surviving future development. The Trust has not yet worked out a priority system on this basis, but it does recognize several sites of high priority.

In drafting management plans, the first step is to define for each site the objects of conservation. Naturalists, faced with alternatives, sometimes incompatible, will not always see eye to eye about choosing whether, for example, to maintain a habitat type with the greatest possible variety of species; to try experimental management; to provide refuges for species of special scientific or aesthetic value; or to exploit the educational possibilities. So far, the Trust has made management suggestions for relatively few sites, particularly those threatened by development. In practice, as at Petersham Common, Fetcham Mill-pond and Nore Hill, many plans have to compromise between scientific and other, usually economic, aims. In each of these cases, although the scientific value has been reduced, much has been saved, after the combined intervention of the Trust and the London Natural History Society. The chance of applying scientific management soon to many sites is small, but there is a variety of approaches to this end. The first method is consultation on future policy with such land-users as the War Department. The second is to offer advice, as in the proposed development of Ham Fields, or to arrange work-parties. Several landowners in the London area have agreed to scrub-clearance by Conservation Corps from the Council for Nature, in order to prevent habitats and species from being overwhelmed. Younger

L.N.H.S. members might like to offer their services in this practical way. Thirdly, the Trust, more strongly than individual naturalists, can oppose developments threatening scientific interests, such as the proposed by-pass route across Esher Common. This case shows how naturalists, united, can influence decisions taken by the Surrey County Council Planning Department and the Ministry of Housing and Local Government in exercising their statutory powers over land use. Fourthly, the Trust is in a position to supply management committees for local nature reserves. So far there is only one such reserve: a Chalk quarry at Seale near Farnham, an S.S.S.I. valuable for its Chalk flora and an interesting geological exposure. Surrey County Council have accepted ownership and responsibilities for fencing, public liability and similar matters and granted a long peppercorn lease to the Trust for management purposes. The acquisition of other reserves on similar lines is under negotiation. As a last resort, the Trust, being a limited company, could buy land as a reserve.

The educational function of the Trust has been forecast by the Chairman, Mr. Oleg Polunin: "The work of the Trust may well become closely linked with education, both for adults and for the youth of the county. London University, County Technical Colleges, agricultural and horticultural institutes and many schools use the wild lands of Surrey to further the study of nature and, we sincerely hope, the love of wild life. The work carried out at Juniper Hall Field Centre and at the Haslemere Educational Museum are particular examples of the great value that the study of living organisms *in the field* has in education". The further task is to demonstrate that conservation is essential for the future welfare of local wild life, local naturalists and ultimately the local public. To quote Mr. Polunin again: "In Surrey there is no doubt that we have very special responsibilities. With our proximity to the metropolis, from which hundreds and thousands of week-enders come for relaxation and recreation, the pressure on our wild areas is perhaps greater and more continuous than in almost any other part of Britain. The problem of keeping these breathing spaces open for both animals and plants, and for mankind in particular, is of paramount importance". We need a generation of sympathetic people and far-sighted landowners and administrators, which can only be achieved via the schools. Therefore, the main target at present is imaginative field-education for children, to teach them not only to love and respect wild life but to recognize its inter-dependence with soil and landscape; and to realize the potency of the human factor soon to be wielded by their generation. The proposed Brooklands Educational Centre is an example of the result of the Trust's work in this direction in metropolitan Surrey.

Meanwhile, L.N.H.S. members can co-operate, even if they have no contacts with schools. For example, an invaluable extension to regular site-recording is to make friends with the landowner and try to convince him that conservation is a good thing. He is often unaware of the special biological features of the land. But members must first convince themselves. Having cultivated an ecological approach to natural history, complementary to sectional interests, they should consider developments likely in metropolitan England in, say, the next 40 years. The damage in any one year may be small but the cumulative effect is not likely to leave very much unspoilt countryside around London by the year 2000. For the sake of future generations of L.N.H.S. members it is surely worth

making an effort now to ensure that at least the most valuable sites remain unimpaired.

D. A. WHITE.

* The Hon. Membership Secretary, Mrs. G. Gibbons, Wayside, Grosvenor Road., Godalming, would welcome enquiries from L.N.H.S. members and would be pleased to send them a brochure, the News Letter and forms of application for membership. The following are the Trust's Regional Representatives for areas within or adjacent to that of the L.N.H.S.

Claygate: Major K. P. Keywood, York Cottage, Foley Road, Claygate.

Croydon: Dr. D. P. Young, Green Woods, Essenden Road, Sanderstead.

Dorking: J. P. Sankey, B.Sc., Juniper Hall, Dorking.

Headley: H. W. Mackworth-Praed, Tunbarr, Headley near Epsom.

Petersham: E. Milne-Redhead, 7 Ashley Gardens, Petersham, Richmond.

Warlingham: R. Clarke, 37 Warren Park, Warlingham.

Obituary

JOSEPH ROSS
(1873-1962)

WITH the passing of Joseph Ross in November 1962 the Society has lost an Honorary Vice-President of some eminence. He joined the North London Natural History Society as a life member in 1910 and undertook the duties of joint secretary in 1913. With the amalgamation of the Societies to form the London Natural History Society he retained this position and continued as joint secretary during the entire period of the First World War. On the grounds of business pressure and indifferent health he resigned this post early in 1919. One of his treasured possessions was a silver cigarette case presented to him by the Society in 1919 which bore a suitable inscription expressing their appreciation of his services.

Throughout his connection with the Society he always took a keen and lively part in its activities, carrying out duties variously as Syllabus Secretary, a member of Council, Minuting Secretary, Chairman of Chingford branch, Chairman of the Plant Galls Section (1928-1946), and as Honorary Vice-President (1928-1962). It was however for his work as a field naturalist that he was best known, and he had a detailed knowledge of Epping Forest which no one can surpass. In the Forest he was a well-known figure, usually wearing gum-boots and carrying either a vasculum or a pair of binoculars. His natural history interests were both wide and varied, and a glance at the accompanying list of his published papers will show his versatility which ranged through the Myxomycetes and Plant Galls—his chief studies—to flowering plants, mosses, liverworts, ornithology and archaeology. His profound knowledge of the Mycetozoa which was fostered by the late Miss G. Lister, a monographer of the group, enabled him to increase the number of known species occurring in Epping Forest from about 80 to 109 including one species viz. *Didymium laxifila* G. Lister and J. Ross, new to science. He was one of the team of three members of the Plant Galls Section who established from their researches into the life histories of the gall flies the true alternate generations of two species of gall causers. In a paper to the Society for British Entomology he established that what had hitherto been regarded as seven different species of *Synergi* were in fact only three species with four seasonal varieties. A later worker on the *Synergi* wrote

“ The work of Ross revolutionized our understanding of the group of species he studied. The study was based on a large amount of breeding work, extending over many years, and the results could not have been achieved in any other way ”.

He was fortunate in having extremely good eyesight, and, whilst he used glasses for reading he would always raise these to his forehead in order to examine a specimen! Not only could he detect slight differences in form but also those minute colour variations which in the Mycetozoa assist in providing a clue to the identity. He was conversant with the ramifications of many well-known families and he often surprised the writer with his deep knowledge of the inter-relationships of persons and families. After he retired from active business life he was able to indulge another absorbing interest—that of art—and he found opportunity to visit most of the art exhibitions held in London.

Joseph Ross was of Scottish descent, his father coming from Edinburgh, his mother from Cupar, Fife. He was born May 8, 1873 at Banbury, Oxfordshire, where his father was chief reporter on the *Banbury Guardian*. His mother died in his childhood and he was brought up for many years by his aunt at Cupar. He started his journalistic career on the *Banbury Guardian*, going thence to Oxford, on to Cambridge where he worked on the *Cambridge Daily News*, then back to Oxford, finally settling in London in about 1908 on the editorial staff of the *Investors Guardian* with an old colleague of his Cambridge days. His colleague introduced him to the Wood family of Chingford with whom he remained as a paying guest, first with the mother and then with the son and daughter-in-law, for 54 years.

A few years after he came to London he joined his father and sister on a holiday in North Wales and on their insistence he saw a doctor who diagnosed T.B. He was sent to an open-air clinic—in Gloucestershire—it was at the time the nature cure for T.B. had been opened up in Switzerland. He stayed there three months and greatly benefited from the treatment, but whilst convalescing at home at Banbury he got pneumonia and was very ill. Altogether he was away from business for about 12 months. It was from his experience in Gloucestershire that he became a devotee of the open-air life. He retired from active business to relieve the staff situation in the early 1930's and was then able to indulge to the full his flair for natural history. Soon after his retirement he took over the Curatorship of the Epping Forest Museum in Queen Elizabeth's Hunting Lodge, Chingford, a task which he carried out with loving care throughout the Second World War. In 1948 he asked to be relieved of this duty but continued to provide the wild-flower exhibit until 1958 when a recurrence of pneumonia caused him to restrict his activities considerably. His extensive collections of gall flies, bryophytes and Mycetozoa were recently donated to the Museum with which he was associated for so many years, and where they will be treasured as a fitting memorial to his painstaking attention to detail and his great love for the Forest.

B.T.W.

PAPERS ETC. PUBLISHED BY JOSEPH ROSS

YEAR	TITLE	JOURNAL
1918	<i>Ptilidium pulcherrimum</i> (Web.) Hampe in Epping Forest	Essex Naturalist
1918	Mycetozoa in the Chingford District of Epping Forest in August and September 1915 and 1916	Essex Naturalist
1920	Attachment of the Greater Spotted Woodpecker to its nesting site	Essex Naturalist
1925	Hepatics found in Epping Forest	London Naturalist
1926	The Greater Spotted Woodpecker	London Naturalist
1929	An albinistic chaffinch at Chingford	Essex Naturalist
1931	The Gall of <i>Andricus seminationis</i>	London Naturalist
1931	Behaviour of Woodpeckers at Nesting sites, Epping Forest (with two others)	London Naturalist
1932	Gall-causing <i>Cynipidae</i> in Britain (with M. Niblett and H. J. Burkill)	Entomologist
1933	Occurrence of <i>Colloderma oculatum</i> (Lipp.) G. Lister in Epping Forest	Essex Naturalist
1934	<i>Andricus furunculus</i> (Beyer.) Kieff. and its Gall	London Naturalist
1939	The Mycetozoa of Limpsfield Common	London Naturalist
1939	<i>Neuroterus schlechtendali</i> Mayr.	London Naturalist
1940	Mycetozoa found in Epping Forest, 1939	Essex Naturalist
1941	Mycetozoa from near Loughton in the winter of 1940/41	Essex Naturalist
1942	Some interesting plants of Epping Forest	Essex Naturalist
1945	Sections on Mycetozoa and Galls in "Cuckoo Pits Survey"	London Naturalist
1946	Mycetozoa in Epping Forest	London Naturalist
1946	Cynipid Flies and Galls on Oak	London Naturalist
1947	Mycetozoa records for Epping Forest 1941-1946	Essex Naturalist
1947	<i>Trichia floriformis</i> in Epping Forest	Essex Naturalist
1947	Oak Galls in Epping Forest	Essex Naturalist
1947	Woodlarks in South-west Essex	Essex Naturalist
1948	Plant Galls in Epping Forest Survey of Ludgate Plain 1946-1947	London Naturalist
1948	Mycetozoa in Epping Forest in 1946-47	Essex Naturalist
1948	<i>Orthodontium gracile</i> in Epping Forest	Essex Naturalist
1948	Pied Flycatcher at Chingford	Essex Naturalist
1948	Mandarin Duck in Epping Forest	Essex Naturalist
1948	Epping Forest Plants	Essex Naturalist
1949	Mycetozoa in Epping Forest in 1947-8	Essex Naturalist
1950	Obituary of Miss G. Lister	London Naturalist
1950	Mycetozoa in Epping Forest in 1948-9	Essex Naturalist
1951	A study of some British species of <i>Synergus</i>	Trans. Society for British Entomology
1951	Mycetozoa in Epping Forest in 1949-50	Essex Naturalist
1952	Mycetozoa in Epping Forest in 1950-1	Essex Naturalist
1952	An unusual occurrence at Chingford	Essex Naturalist
1953	Mycetozoa in Epping Forest in 1951-2	Essex Naturalist
1954	Mycetozoa in Epping Forest in 1952-3	Essex Naturalist
1955	Obituary of F. G. Dell	London Naturalist
1957	Part Obituary of H. J. Burkill	London Naturalist
1957	<i>Diderma simplex</i> (Schroet.) Lister. A Mycetozoan new to Epping Forest	Essex Naturalist

Books

The Observer's Book of Lichens, by K. L. Alvin and K. A. Kershaw. 126 pages, 64 plates, 9 text-figures. Frederick Warne & Co. Ltd. 1963. 5s.

In 1856 Lindsay recommended lichenology as a beneficial subject for study by "the invalid from our large towns, . . . the summer loungee at our sea-coasts, . . . the *habitué* of our fashionable watering-places, . . . the tourist, . . . the Art student . . . and the fair denizen of our urban drawing-rooms." Evidently Lindsay's words fell on deaf ears, for one hundred years later the number of persons actively engaged in lichenology was scarcely greater than in 1856. With the formation of the British Lichen Society in 1958, the interest in lichens has grown considerably, and the publication of this popular book should lead to a further increase in the number of persons interested.

The book begins with an introduction to the biology of lichens, followed by a workable generic key. The descriptive part includes all the most common conspicuous lichens, describing in all 178 of the *c.* 1400 species occurring in the British Isles. The names are in Latin throughout, since few lichens have common names and, indeed, only eight of these are mentioned, of which Dog Lichen and Rock Tripe are erroneously omitted from the Index. A merit of this book is that the generic nomenclature follows, apart from the maintenance of *Aspicilia*, *Diploicia*, *Psora* and *Squamaria*, that in use on the Continent. Unfortunately the Orders adopted are obsolete by modern standards now that lichens are classified amongst the Fungi. It is stated that there is only one British species of *Candelariella*, but really there are six, and three of these are common in the London Area. Another London species, *Icmadophila ericetorum*, is erroneously described as being C+red. The book gives little general information about the ecology of lichens; many species and even some genera are nitrophilous, and are therefore almost confined to habitats affected by the proximity of animal excreta, such as farmyard roofs and walls and tree boles along roadsides and in meadows, yet this is scarcely mentioned.

Of the 178 species, 150 are illustrated with black and white photographs or coloured drawings. The latter depict the lichen in the wet state, with an inset to show the colour when dry for species which change when moist; perhaps the authors are being pessimistic about our summers, and the reverse might have proved more useful. Some of the drawings themselves could have been better and some, such as plate 13, are poor as regards colour reproduction.

On the whole the book is attractive, fairly accurate and up to date, and good value for money. It is ideal for those who wish to take up the study of lichens.

J.R.L.

The Biology of Cilia and Flagella, by W. A. Sleight. Pergamon Press. 70s.

From the mass of material published every year in every branch of science it is difficult to select those books and papers which must be read if one is to keep abreast of current work.

Invertebrate zoologists will be familiar with ciliary action, both as a part of a feeding mechanism or as a means of propulsion in a liquid medium. Flame cells will be also familiar, although I shrewdly suspect

that actual observation of the flagella is sometimes open to doubt. All too often references to ciliary movement are, en passant, likened to wind-waves over a cornfield without much reference to structure and physiology.

Here, in the international series of monographs on pure and applied biology, is a book which should be read by every zoologist and must be on the shelves of every protozoologist. It is a book which could only have been written within comparatively recent years, as much of the information is based on observation using the techniques of electron microscopy. Indeed the qualifying phrases "observation by light microscope" and "light microscopists" are, one realizes, necessary in such a book as this.

In his preface, Dr. Sleight says that his purpose is to review advances in the structure and physiology of cilia since the publication of Gray's *Ciliary Movement* in 1928.

How thoroughly he has done this is evidenced by the references to the literature on the subject set out in 22 pages which is a valuable source of information to workers in this field, especially as in the text the gist of many of the papers is given in a crisp manner particularly refreshing in a work on so technical a subject.

The photographs, collected together at the end of the book, are in many cases as clear as the line drawings which illustrate the text, and as well as being apposite to the subject are beautiful examples of the technique of electron microscopy.

The price (70s.) is not unduly high in view of the content and illustration, and should not be allowed to influence any protozoologist who, without Dr. Sleight's book, will be ill-equipped for his work.

R.C.V.

British Mesozoic Fossils. 205 pages, 72 plates. British Museum (Natural History), London, 1962. 12s. 6d.

This is the second of a series of three handbooks on British fossils, the first dealing with the Caenozoic having been published in 1960. Once more much of the preparation has been in the capable hands of Mr. C. P. Castell, assisted by a team of artists whose carefully prepared drawings continue the high standards set in the preparation of the first handbook. Some 365 species have been illustrated and, where necessary, more than one illustration of a particular fossil is given. A notable point is the disappearance of the familiar term "Lamellibranch" in favour of "Bivalve". Moreover any confusion that may have arisen in the past with regard to changes in the names of some Mesozoic fossils is avoided by the inclusion of former names in italics. For the beginner the handbook contains a useful summary of Mesozoic stratigraphy. Apart from using the illustrations as a direct method of identification of specimens collected, the book can easily be used in conjunction with a local geological guide book which may indicate fossils by name only. By reference to the geological distribution of species given in this volume, one will find the appropriate plate numbers at once and so can turn straight to the required illustrations without being obliged to make a tedious search.

This volume should be on the bookshelf of every person interested in geology, and in field work it will be invaluable.

R.E.B

The following books were received too late for review in this issue:—
 International Series of Monographs on Pure and Applied Biology:
 Vol. 15. *The Physiology of Earthworms*, by M. S. Laverack Price.
 Pergamon Press. 45s.
 Vol. 13. *Electron-microscopic Structure of Protozoa*, by D. R.
 Pitelka. Pergamon Press. 84s.
 Vol. 14. *The Control of Chromatophores*, by M. Fingerman.
 Pergamon Press. 50s.
Animal Life in Fresh Water, by Helen Mellanby. Methuen and Co. Ltd.
 25s.

ADDITIONS TO THE LIBRARY

Although the runs of journals and periodicals taken by the Society continued to be fully augmented by purchase or exchange, uncertainty regarding the library's future during the greater part of the year resulted in additions of other publications being kept to a minimum. However, the following books were bought:—

- Butcher, R. W., *A New Illustrated British Flora*, Volume II (1961);
 Kenyon, Kathleen M., *Excavations in Southwark*. [Research Papers of the
 Surrey Archaeological Society, No. 5] (1959);
 Matthews, L. Harrison [editor], *Animals of Britain*:
 No. 1 — Neal, Ernest G., *Badgers* (1962);
 No. 2 — Hooper, John H. D., *Horseshoe Bats* (1962);
 No. 3 — Knight, Maxwell, *Hedgehogs* (1962);
 No. 4 — Ryder, Stéphanie Roden, *Water Voles* (1962);
 No. 5 — Shorten, Monica, *Grey Squirrels* (1962);
 No. 6 — Shorten, Monica, *Red Squirrels* (1962);
 No. 7 — Hewer, H. R., *Grey Seals* (1962);
 No. 8 — Neal, Ernest G., *Otters* (1962);
 No. 9 — Hurrell, H. G., *Foxes* (1962);
 No. 10 — Hurrell, Elaine, *Dormice* (1962);
 No. 11 — Page, F. J. Taylor, *Fallow Deer* (1962);
 No. 12 — Page, F. J. Taylor, *Roe Deer* (1962);
 No. 13 — Page, F. J. Taylor, *Red Deer* (1962);
 No. 14 — Linn, Ian, *Weasels* (1962);
 No. 15 — Godfrey, Gillian, *Moles* (1962);
 No. 16 — Matheson, Colin, *Brown Rats* (1962).

Perring, F. H., and S. M. Walters [editors], *Atlas of the British Flora* (1962).

Now that the library once again has a settled home, it is anticipated that the number of purchases will show a marked increase on the last two years; and it is hoped that this will be borne out by next year's list of additions.

Statement of Accounts for the

GENERAL

1962

£ s. d.

£ s. d.

1961		Receipts		1962	
£	s. d.			£	s. d.
1,727	16 6	Subscriptions Current	...	1,758	12 4
14	5 0	Subscriptions Arrears	...	56	19 6
38	17 6	Subscriptions Advance	...	27	10 0
44	15 0	Entrance Fees	...	42	5 0
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1,825	14 0			1,885	6 10
189	14 6	Donations	...	21	18 6
2	12 6	Interest £75—3½% War Stock	...	2	12 6
		Interest £180—3½% Savings Bonds 1960/	...		
5	8 0	70...	...	5	8 0
37	3 6	Interest Deposit Account...	...	56	2 0
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		Sale of Specimen Cases	...	64	2 6
86	14 7	Sale of Books, Bookcases and Christmas Party	...	50	0 0
18	11 9	Balance in hand 31 October, 1961	...	27	3 2

£2,165 18 10£2,048 11 0

PUBLICATIONS

102	7 11	Sale of Publications	...	79	15 0
150	0 0	Grant from Royal Society	...	150	0 0
15	10 0	Advertisements	...	11	16 0
		L.B.R. No. 25 Reserve	...	450	0 0
		Less L.B.R. No. 25 cost	...	328	4 5
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1,103	19 5	Grant from General Account	...	121	15 7
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£1,371	17 4			814	10 6
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				£1,177	17 1

" LONDON'S BIRDS "

		Reserve for hire of Hall	...	75	0 0
15	15 0	B.B.C. performing fee	...	2	2 0
15	0 0	B.B.C. for damaged film	...		
62	3 8	Transferred from " Birds of London Area " account	...		
		Interest on do.	...	2	8 2
82	4 7	Grant from General Account	...	180	16 1
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£175	3 3			£260	6 3

LIBRARY

		Balance 31.10.61 including Royal Society Grant for binding periodicals £100	...	137	15 8
		Royal Society Grant for catalogues	...	50	0 0
		General Account Grant for catalogues	...	100	0 0
<hr/>				<hr/>	
				£287	15 8

RESERVE

		Balance 31.10.61	...	400	0 0
		Transferred from General Account	...	300	0 0
<hr/>				<hr/>	
				£700	0 0

LIFE COMPOSITION

		Balance 31.10.61	...	£400	0 0
--	--	------------------	-----	------	-----

Audited and found correct

15 May, 1963

Year Ended October 31, 1962



ACCOUNT

1961			Payments	1962		
£	s.	d.		£	s.	d.
220	14	6	Hire of Rooms and Halls	168	16	3
46	0	10	25 Eccleston Sq. Rent etc.	—	—	—
34	4	6	New bookcases	—	—	—
34	11	0	Library, cost of move	34	4	6
70	17	1	Printing and Stationery	47	12	6
150	0	0	General Secretary's Honorarium	150	0	0
30	4	9	General Secretary's Telephone	30	6	9
44	4	9	General Secretary's etc. Postages	47	7	3
21	8	0	Subs. to other Societies	25	5	6
118	10	4	Sectional and Group Grants and Expenses	81	12	9
5	8	9	Insurance	2	16	3
18	8	4	Sundries	7	12	10
32	18	10	Slide Projector	—	—	—
82	4	7	Grant to Bird Film Account	180	16	1
—	—	—	Grant to Library Account	100	0	0
1,103	19	5	Grant to Publications Account	814	10	6
125	0	0	Trans. to Reserve Account	300	0	0
27	3	2	Balance in hand 31 October, 1962	57	9	10
<hr/>				<hr/>		
£2,165 18 10				£2,048 11 0		

ACCOUNT

130	15	0	Programme 1962	125	14	0
542	6	0	London Naturalist No. 41	442	14	7
139	9	9	London Bird Report No. 24 less Reserve	—	—	—
450	0	0	London Bird Report No. 26 Reserve	500	0	0
43	16	2	Addressing and Wrapping	35	18	6
65	10	5	Postages	73	10	0
<hr/>				<hr/>		
£1,371 17 4				£1,177 17 1		

FILM ACCOUNT

100	3	3	Cost of film and copying for year ending 31.10.62	37	1	3
75	0	0	Reserve for hire of "Festival Hall"	—	—	—
—	—	—	Deposit for hall and cost of tickets	73	5	0
—	—	—	Reserve for Advertising	150	0	0
<hr/>				<hr/>		
£175 3 3				£260 6 3		

ACCOUNT

			Purchase of books, etc. 1962	9	19	9
			Balance 31.10.62	277	15	11
<hr/>				<hr/>		
				£287 15 8		

ACCOUNT

			Balance 31.10.62	700	0	0
<hr/>				<hr/>		
				£700 0 0		

ACCOUNT

			Balance 31.10.62	£400	0	0
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