The LONDON NATURALIST

The Journal of THE LONDON NATURAL HISTORY SOCIETY

FOR THE YEAR
1937.

PRICE THREE SHILLINGS AND SIXPENCE.

PUBLISHED BY THE
LONDON NATURAL HISTORY SOCIETY,
THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE,
KEPPEL STREET, GOWER STREET, LONDON, W.C.1.

DATE OF PUBLICATION, MAY 1938.

London Natural History Society.

Founded 1858.

Officers for 1937.

Offices in the Society and its Sections are Honorary.

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The Society is affiliated to the British Association for the Advancement of Science; the South-Eastern Union of Scientific Societies; the Commons, Open Spaces, and Footpaths Preservation Society; and the Federation of Rambling Clubs.


BRITISH MUSEUM

HERB PARIS.

(Photo. by J. E. S. Dallas.)

A woodland plant of the Lily order recorded from over half-a-dozen localities in the Society's area.

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T. Buncle & Co. Ltd., Arbroath.

1938.

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Editorial Notes.

THE year 1937 has been remarkable not only for a considerable increase in membership of our Society but also for the number of papers submitted to the Editor for publication. We are glad to be able to publish so much evidence of the work of the Entomological Section. The Ecologists' "Survey of Limpsfield Common" is a remarkable example of scientific team work and shows a considerable advance in the work being done by our members.

We have the privilege of publishing Sir Malcolm Watson's Bacot Memorial paper, "Entomology in Relation to the Prevention of Malaria," and for allowing us to do so we should like to take this opportunity of thanking him.

The Annual Exhibition, held on February 2nd, also conforms with the general growth. Attendance amounted to 340, an increase of 139 on last year. Exhibits numbered 68 as against 42, 49, and 36 for the three preceding years. We offer our thanks and congratulations to Mr C. L. Collenette, whose energy produced so successful a result.

We would again remind contributors that all papers must be submitted in the first place to the respective Sectional Secretaries. Secretaries are responsible for approving the papers before submitting them to the Editor.

STATEMENT OF ACCOUNTS 1937: GENERAL ACCOUNT.

Balance, 1st November 1936					£54 13 2
Interest on Post Office Account					0 19 0
Interest on £75 3½ per cent. Conversion Loan					2 12 6
Interest on National Building Society Shares					0 18 0
Sale of Library Books					3 10 0
Subscriptions and Entrance Fees					238 15 6
					£301 8 2

Rent					£40 7 6
Syllabus Expenses (Printing and Postages)					12 6 8
General Printing and Stationery					9 17 9
Postages (Secretary)					7 0 0
Postages (Treasurer)					1 17 5
Insurance					1 11 0
Gratuities					2 5 0
Subscriptions—Federation of Rambling Clubs			£0	7 6	
South Eastern Union of Scientific Societies			0	7 6	
Commons, Open Spaces and Footpaths Preservation Society			0	10 0	
British Trust for Ornithology			0	10 0	
Entomologists' Monthly Magazine			0	15 0	
Pedestrians' Association			0	5 0	
					2 15 0
Sectional Expenses—Ramblers			£2	10 0	
Entomology			2	2 6	
Plant Galls			1	5 0	
Ornithology			8	0 0	
Botany			3	0 0	
Archaeology			3	0 0	
Ecology			2	0 0	
					21 17 6
Expenses of Cinematograph Displays					3 10 0
Expenses of Lecture					0 10 0
Annual Exhibition Expenses					1 10 2
Secretary's Honorarium					35 0 0
Chingford Branch Expenses					5 17 0
Binding					4 6 9
Sundry Expenses					0 13 11
Transfer to *London Naturalist* Account					63 5 6
Transfer to Reserve Account					25 0 0
					£239 11 2
Balance at Bank, 31st October 1937,					61 17 0
					£301 8 2

LONDON NATURALIST ACCOUNT.

Donations	£0	2	6	Printing	£66	3	6
Sales of *London Naturalist*	2	13	4	Blocks	2	13	8
Sales of *London Bird Report*	2	7	6	Postage	6	14	0
Reprints and Maps	2	19	6	*London Bird Report*, Advertising, etc.	0	17	2
Advertisements	5	0	0				
Transfer from General Account	63	5	6				
	£76	8	4		£76	8	4

LIFE COMPOSITION ACCOUNT.

Balance, 1st November 1936	£130	0	0	Balance, 31st October 1937—			
				£75 3½ per cent. Conversion Loan	£75	0	0
				National Building Society	55	0	0
					£130	0	0
	£130	0	0		£130	0	0

RESERVE ACCOUNT.

Balance, 1st November 1936	£50	0	0	Balance, 31st October 1937—			
Transfer from General Account	25	0	0	At Post Office	£75	0	0
	£75	0	0		£75	0	0

Audited and found correct, 3rd December 1937.

LEWIS EYNON,
C. L. COLLENETTE, *Auditors.*

F. G. DELL, *Treasurer.*

Council's Report, 1937.

ONCE more a year of progress is to be recorded. The number in the Society has risen to 574, thus showing a nett increase of 74 during the twelve months, the gross increase having been 104, all of which figures are fresh records for the Society. We are well over half way towards attaining our first thousand, but even this will be a very small number when we consider the huge population resident in our area, so it behoves every member to make special individual efforts to help reach and pass it.

The Chingford Branch has shown a most gratifying increase both in numbers and activity, while the Country Associates have more than maintained their numbers also.

The Syllabus has, as usual, been a strong one and attracted big attendances, the average being 83. The Library has continued to increase in volume and in use under the abundant care of Messrs Pethen and Mann; the latter, unfortunately, finds himself unable to continue the work owing to pressure of his business hours, but Mr Pethen has kindly consented to carry on for another year.

The London Naturalist is well up to its usual high standard, and appears in a new guise, being divided into two parts, the smaller of which is devoted to the *London Bird Report*. The financial position continues good, as may be seen from the Treasurer's Report.

The interests of Geology have been recognised officially for the first time by the formation of a Geological Committee, which we hope to see grow and flourish. The Ecological Section continues to attract fresh adherents, and all the various Sections are in a most healthy condition and conducting valuable research.

The Annual Exhibition beat its own previous record of last year both in exhibits and attendance. We see faces at this fixture which do not seem to appear at any other time. It forms a very pleasant Reunion, and opportunity for fresh contacts.

Records have come in well, but our Recorders are still avid for more. An appeal by the President in the outside Press for help in this direction brought forth a good response, and it is hoped that all members will remember to send in their own records in good time, and to obtain as many to help in this respect as they can.

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

Librarians' Report, 1937.

THE Library continues to maintain its usefulness for, since our last Annual Report, we have issued a total of 321 books, manuscripts and other publications, to 70 individual members of the Society. This

shows a gratifying increase in the number of members making use of the Library, for our previous highest record was for the year 1933, when 63 members borrowed books from our shelves. The books, etc., issued during the present year deal with various branches of Natural History, as follows:—Ornithology, 129; Entomology, 61; Reports and Transactions of Kindred Societies, 52; General Natural History, 44; Botany, 25; Ecology, 4; Archaeology, 3; and Biography, 3.

In 1936 the total additions to the Library amounted to 163 books and other publications. This year we have received 261 books, magazines and journals, including many useful books presented by members and friends of the Society, and 84 Reports and Publications of kindred Societies, many of these being received in exchange for *The London Naturalist*.

Since our last Annual Report the following journals have been bound:—*Antiquity* (2 vols.); *British Birds* (1 vol.); *Essex Naturalist* (1 vol.); *Entomologist* (2 vols.); *Entomologists' Monthly Magazine* (2 vols.); *The London Naturalist* (1 vol.); *Proceedings of the South London Entomological and Natural History Society* (3 vols.); *The South Eastern Naturalist* (2 vols.); and *The Vasculum* (1 vol.).

There is a typewritten catalogue in the Library, and we cordially invite enquiries from members as to the available books on any branch of Natural History in which they may be interested.

ROBT. W. PETHEN,
EDWARD MANN,
Honorary Librarians.

Archæological Section.

REPORT FOR 1937.

THE present membership of the Section is 88, the average attendance at the excursions was 15 and at the indoor meetings 30. Ten excursions were arranged during the year to churches and other places of archaeological interest, the visit to Darwin's House arranged for May being transferred to July, owing to the 'bus strike.

The churches selected for record were Chaldon, Surrey, and St Dunstan's, Stepney. In each case, complete records were compiled by our indefatigable Recorder, Mr G. J. B. Fox, to whom we are so continually indebted. Our growing collection of *Records* is a work of the greatest interest and value, and confers distinction not only upon the Section but also upon the Society.

Several other churches were visited during the year, including St Margaret, Lothbury; St Stephen, Walbrook; Charlton, Greensted, Ongar and East Ham. Mr F. H. Mansford acted as guide to the two City churches, which were visited in the same afternoon. St Margaret's is noteworthy for its fine woodwork and St Stephen's enjoys the reputation of being one of Wren's masterpieces.

Greensted and Ongar churches were visited under the guidance of Mr G. J. B. Fox, also in one afternoon. They are both of exceptional interest, and Greensted may claim to be unique, having its original Saxon walls of cleft oak trunks.

At East Ham, we had the benefit of the guidance of the genial Vicar, the Rev. Morris O. Hodson, and it proved an exceptionally interesting visit. Mr Hodson, having first officiated at a pretty little wedding, where our members played the rôle of interested onlookers, devoted the rest of the afternoon to us. The church is a small Norman building, preserving its original plan, and it is certainly surprising to find such an archaeological treasure amid the houses and factories of East Ham.

Perhaps the most ambitious excursion of the year was that arranged by Mr A. J. Nunn to various sites in London associated with Dr Johnson. Unfortunately, Mr Nunn was prevented by illness from leading it, but Mr Fox kindly deputised. After visits to S. Clement Danes and the Temple Church, the party took tea in Johnson's House and were entertained afterwards with a vivacious address by Mrs Rowell, the custodian.

Visits were also paid to the V. and A. Museum, under the leadership of the Chairman, and to Bethnal Green Museum, where a numerous party had the advantage of the guidance of Miss H. Murphy, who devoted her remarks appropriately to the silk weaving industry which formerly flourished in the neighbourhood.

Finally, mention must be made of the excursions to Darwin's House at Down, under the leadership of the Chairman, and to Charlton, where Mr Dalton Sharp, the well-known authority on the locality, took charge of the party.

The lectures held under the auspices of the Section were:—"Ely Cathedral," by W. Gordon Gould; "English Church Fonts"; "The Growth of the English Parish Church," by H. L. Mann.

Lectures given at Sectional meetings were:—"Across the United States to the Indians of the South West," by Miss M. S. Johnston, F.G.S.; "The Order of St John of Jerusalem in the Past and Present," by H. W. Fincham, Kt.J., F.S.A.

The Chairman and Secretary and several members of the Section attended the Congress of the S.E.U.S.S. held at Hastings in June.

W. C. Cocksedge, *Chairman.*
Celia D. Cocksedge, *Secretary.*

Botanical Section.

REPORT FOR 1937.

TWO general meetings of botanical interest were arranged by the Section. The first was addressed by Dr E. Marion Delf, M.A., F.L.S., on the subject of "Plants of the Seashore"; the second was

a lecture by Mr C. V. B. Marquand, M.A., F.L.S., of Kew, upon "Some Aspects of the Flora of the Hebrides." Both papers were illustrated by means of lantern slides. Mr R. W. Robbins gave a lecturette at the Annual Exhibition, entitled "Insect Eating Plants."

Of the three ordinary sectional meetings held during the year, the first and second included illustrated papers by Mr J. Ross upon "Mosses and Liverworts," and by Mr G. H. Spinney, B.A., entitled "The British Clovers." The third was a talk by Mr J. E. Lousley, his subject being "Some Famous Botanical Centres Revisited."

The excursion syllabus included nine outdoor rambles and two visits to Kew Gardens. On May 9th a most successful excursion was led to Loddon Valley, where *Leucojum aestivum* was found in abundance.

The average attendance at the excursions has been 12, and at indoor meetings 27. The Section now has a membership of 153, which shows an increase of 10 over last year's figure.

A number of additions to the Herbarium from Mr H. J. Burkill, the Rev. P. H. Cooke, Mr and Mrs J. E. S. Dallas, and Mr R. W. Robbins are hereby gratefully acknowledged.

Mr R. W. Robbins reports the following District Records for the year: *Lepidium latifolium* L., Rickmansworth; *Epilobium lanceolatum* Seb. & Maur., Fox Lane, Keston, and at Joyden's Wood; *Cuscuta Epithymum* Murr., on *Ulex minor* Roth and *Erica cinerea* L., Limpsfield Common; *Lathraea Squamaria* L. on *Ilex*, *Acer*, *Crataegus* and *Prunus avium*, as well as the more usual hosts, Cudham district; *Mentha pubescens* Willd., Dartford; *Stachys ambigua* Sm., Westerham; *Wolffia arrhiza* Wimm., plentiful in ponds at Burgh Heath; *Zannichellia pedunculata* Reichb., Erith Marshes (previously Rainham only). *Cynodon Dactylon* Pers., discovered in 1934 near the Royal Albert Docks, persists, but has not flowered this year.

HERMAN SPOONER, *Chairman.*
G. R. A. SHORT, *Honorary Secretary.*

Ecological Section.

REPORT FOR 1937.

THE experiment of a study of a defined and limited area is proving a success. The need for excursions for detailed studies with short distances to be covered has been answered by the Section's programme. The survey at Limpsfield is enabling specialists to work individually and yet keep in touch with others throughout the day for consultation. The beginner has been able to assist his more experienced fellow-member and at the same time to increase his own knowledge.

The study of Limpsfield Common will continue and it is hoped that as many members of the Society as possible will endeavour to visit the

common. Although assistance in the field, in naming specimens of insects, etc., and with the many problems arising, is wanted, visitors are welcome to wander over the common after their own particular interests. The secretary has a lengthy list of suggestions for studies for anyone wishing to tackle a problem and thereby add to our knowledge of the life history of our flora and fauna. For the excellent map which appeared in *The London Naturalist* for 1936 the Section is indebted to Mr C. H. R. Thomas, who drew it, and to Mr L. Parmenter, who financed its production. The map is essential as a basis of the survey of the common and every member working on the survey should obtain a supply. They may be had from the Secretary, on white or transparent paper.

The co-operation of other Sections of the Society is gratefully acknowledged. The ecological studies shown by the papers read to the Sections and the recent formation of a Geological Committee demonstrate the growing popularity of the ecological point of view in its widest sense.

The Section fosters those branches of natural history not already catered for by other sections. The most notable group in this connection is composed of those interested in mammals, reptiles and batrachians. It is pleasing to find over twenty observers sending in notes on distribution, etc., to the recorder, Mr R. S. R. Fitter, whose report is published elsewhere in this journal.

The membership of the Section has increased from 61 to 90. The average attendance at the indoor meetings was 45.5. At these meetings papers were read on "Ecological Surveys" by Capt. C. Diver, F.L.S., and on "The Ecology of a River Estuary" by Mr E. C. Brown, M.Sc. At the general meetings of the Society, lectures on "The Environment of Fossil Animals" by Dr H. D. Thomas, F.G.S., and on "Man as a Biotic Factor" by Mr R. S. R. Fitter, F.Z.S., were given. One sectional meeting was devoted to a discussion on the survey work undertaken by members, especially that at Limpsfield Common.

A very interesting excursion was made to Wimbledon Common, where Mr C. P. Castell and members of the Wimbledon Natural History Society conducted us over the common and indicated the various points of ecological interest, finishing with a visit to their Museum where their survey records were exhibited.

Fifty-eight members and friends have visited Limpsfield Common and the average attendance has been 13.7. In addition the Common has been visited many times by members on other days. At the annual exhibition among the items of an ecological nature were exhibits illustrating the Limpsfield Common survey, plant habitats, fauna of the Pine, Land Utilisation Survey maps and survey and vegetation charts of the Institute of Sociology.

Several members attended the annual meeting and soiree of the British Ecological Society held at University College, London, on January 8th and 9th.

The Journal of Animal Ecology was circulated to 15 members and the Journal of Ecology to 9 members, and details of these reading circles may be obtained from the Secretary.

R. W. Robbins, *Chairman.*
L. Parmenter, *Honorary Secretary.*

Entomological Section.

REPORT FOR 1937.

During this year six evening meetings were allotted to the Section as follows:—"Entomology in Relation to the Prevention of Malaria," Sir Malcolm Watson, M.D., LL.D. (Bacot Memorial Evening); "British Woodlice," E. Popple; "British Dragonflies," Miss C. E. Longfield; "Roads of Africa," J. D. Gillett; "Lepidoptera of Swinley Forest," C. E. S. Hick; "Habits of our Social Wasps," G. E. J. Nixon.

The average attendance at sectional meetings was 38.

Six excursions were arranged—to Balcombe Forest, Black Pond, Esher, Lullingstone Silk Farm, Benfleet, Eynsford, and Rothamsted Experimental Station. The average attendance at these excursions was 14.3, as compared with 13.5 last year.

At the Annual Exhibition on February 2nd Entomology occupied one-and-a-half tables, and twenty members staged exhibits: a considerable advance on last year.

The study of the invertebrate fauna of Hyde Park and Kensington Gardens has progressed, and various notes and specimens have been received. However, the quartering of troops for the Coronation prevented the entrance of entomologists for several weeks. Printed data labels for these areas may be had on application.

This year, active members of the Section have given aid to the ecologists on Limpsfield Common, and a more general interest has been shown in the lesser known orders of Diptera, Hemiptera, and Hymenoptera. Messrs Waller and Parmenter have started for the Society a small reference collection of British Diptera; this at present consists of neatly arranged and labelled Syrphidae.

During June, four members of this Section and one of the Botanical cruised the Norfolk Broads, and an amount of time was devoted to Entomology in different localities. It has been suggested that further co-operation of this kind might be repeated next year.

The lack of a largely increased membership has been fully compensated for by the keenness of those who have taken a regular part in the sectional activities. At the same time, we would like to make the acquaintance of those members who for various reasons have not been very much in evidence.

K. M. Guichard, *Honorary Secretary.*

Ornithological Section.

REPORT FOR 1937.

DURING the year the Section provided lecturers at three general meetings of the Society and at the Annual Exhibition. At the general meetings Dr P. H. Manson-Bahr talked most entertainingly about the early days of bird-photography, Mr B. W. Tucker was at his best on the Birds of South Spain and Mr F. B. Kirkman described his most interesting researches into the mentality of black-headed gulls. At the Annual Exhibition Messrs E. M. Nicholson and Ludwig Koch gave us an audition and running commentary on their excellent gramophone records of bird-song.

There were also five sectional meetings, two of which were devoted to discussions, a popular type of meeting, which has evidently come to stay. In February Miss E. P. Leach gave us a most interesting description of the *British Birds* ringing scheme, which has since been taken over by the British Trust for Ornithology; in June a thought-provoking paper on the influence of housing development on bird-life was read and discussed in the unavoidable absence of its author, Mr E. C. Rowberry; and in November Mr J. M. Fisher told a large audience some of his experiences bird-watching on Fair Isle and counting gannets on Noss. The two discussion meetings were the annual one on the work of the Section, held in August, and an innovation, a dialogue on "How to Observe Birds," between Messrs J. E. Roberts and D. A. T. Morgan in July, which proved so popular that it has been decided to have a series of such dialogues dealing with particular groups of species

At the Annual Exhibition on February 2 the Ornithological Section was again allowed to fill Hall 32. There were 15 exhibitors, a considerable increase on 1936, and the high standard of the exhibits was maintained. Among the principal exhibitors were Dr Karl Jordan, F.R.S., who brought some skins of rare birds from Lord Rothschild's Museum at Tring; Mr Cecil Blackburne of the Haslemere Educational Museum, who showed a map illustrating the Stork Migration experiment of 1936, Dr Michael Pease and Mr M. J. D. White of Cambridge, who gave a most interesting demonstration of sex-linking in poultry, and Miss A. Hibbert-Ware, who showed some further results of her researches into the Little Owl problem. The photographs this year were of a particularly high standard, being kindly provided by Mr Eric Hosking, F.R.P.S., whose loss of one of his eyes while photographing an owl we have heard with the deepest regret, and by Mr J. E. Roberts. Other exhibitors included Messrs Stuart Boardman, C. L. Collenette, R. W. Hale, R. C. Homes and J. M. Wilson, and the Curator showed a number of skins from the Society's own collection. Four organisations, the Association of Bird Watchers and Wardens, the British Trust for Ornithology, the Plumage Act Group and the Royal Society for the Protection of Birds had propaganda exhibits.

At the beginning of the year the Committee of the Section had the misfortune to lose, for various reasons, the services of Messrs D. H. Clanchy and E. L. King, and Mr C. Weeks, the Recorder for the South. In addition Messrs C. L. Collenette and S. Austin had to resign from the Committee on their election to the offices of President of the Society and D.S.O. respectively, but fortunately are still able to attend meetings *ex officio*. Messrs G. W. Collett, G. E. Manser and J. E. Roberts came on to the Committee, and the recording system was reorganised with Mr R. C. Homes as sole recorder. In August the Chairman, Miss C. E. Longfield, tendered her resignation on her departure for Africa, but the Committee refused to accept it, Mr L. Parmenter being invited to act as Deputy Chairman during her absence until the end of the year. The resignation of Miss P. I. Wallis, the Field Meeting Secretary, was accepted with regret, and Mr D. A. T. Morgan consented to fill the post until the end of the year.

The most notable event of 1937 was the publication of the ornithological records separately from *The London Naturalist* in the *London Bird Report*, compiled by Mr R. C. Homes with the assistance of the Records Committee. The report sold 45 copies during the year.

The membership of the Section increased rapidly until on December 31st there were 374 members of the Society on the sectional roll, including 26 country associates and 8 branch associates. This represents an increase of 57 on the total at the end of 1936, an accession of 71 new members having been offset by an attrition of 15 by death, resignation or otherwise.

READING CIRCLES.

There are still eight reading circles for *British Birds*, with 56 members and eight vacancies, and one circle for the *Scottish Naturalist*. Subscriptions are 2/6 per annum for *British Birds* and 1/- for the *Scottish Naturalist*. Members are invited to fill the vacancies on the *British Birds* circles, and another *Scottish Naturalist* circle will be started if there is enough support. The Reading Circles Secretary, Mrs D. H. Clanchy, will be glad to receive applications.

FIELD MEETINGS, 1937.

Twenty-eight field meetings were held during the year, with an average attendance of 18, the extremes being 36 and 6. Among the 122 species identified were snow-bunting, Dartford warbler, Manx shearwater, Slavonian, red-necked and black-necked grebes and great northern diver. The districts visited included the Thames estuary at High Halstow and the Isle of Grain; Tring, Staines and Walthamstow reservoirs; and the sewage farms at Beddington and Slough. Special meetings were arranged to hear the nightjar and the dawn chorus.

BIRD RINGING, 1937.

This has been a record year for the Society's ringing activities, 16 ringers having ringed 1976 birds, compared with 12 ringers and 354

birds in 1936. The 1937 figures included 937 Manx shearwaters. The full ringing report will be found in the *London Bird Report.*

L. Parmenter, *Deputy Chairman.*
R. S. R. Fitter, *Hon. Secretary.*

CURATOR'S REPORT.

During the past year five new skins have been added to the collection, a little Grebe and Magpie skinned and presented by Mr Chandler, a Water Rail presented by Mr Cawkell, a Common Tern presented by Mr Currie and a Red-throated Diver skinned and presented by myself.

Thirty-four photographs have been presented to date, Mrs Rait Kerr giving 17, Miss Hose 7, and Mr Dallas 10. The high standard of the Society's collection has thus been maintained by the above excellent photographs.

A clutch of Stone Curlew's eggs found deserted was presented by Mr Morgan.

The work of sorting, tabulating and additional cataloguing has been in progress and is almost completed. The new system incorporates a quicker reference to the collections, thus facilitating easier handling of the skins. It might also be added here that the collections of skins, photographs and eggs are being used to greater advantage than previously.

G. E. Manser, *Hon. Curator.*

Plant Galls Section.

REPORT FOR 1937.

THE Section had two dates allotted to it for sectional meetings, which were utilised for papers as follows:—22nd March, on "A Small Catkin Gall," by Mr J. Ross, and 28th September, on "*Diplolepis folii* L. and its allied species," by Mr Burkill. The attendance at these meetings averaged 11.5.

Nine Outings were planned and carried out with an average attendance of 4.2. We visited Effingham on 24th April; Abbey Wood, 22nd May; Headley, 12th June; Claygate, 26th June; Walton Heath, 24th July; Woldingham, 7th August; Denbies, 21st August; Walton Heath, 4th September; and Limpsfield, 5th September.

The drought of the summer was prejudicial to the vegetation and many of the usual species of galls were not recorded, but a good deal of useful work was accomplished, and further notes will be submitted for publication in *The London Naturalist.*

The collection of pressed specimens has been added to during the year and maintained in good condition.

J. Ross, *Chairman.*
H. J. Burkill, *Secretary.*

Geological Committee.

REPORT FOR 1937.

ON 6th May 1937 the Council sanctioned the formation of the Geological Committee, and at this early date (19th October 1937) it is evident that the Committee will receive increasing support. Up to the present time, nearly thirty members and associates have recorded their interest in the new group, or are known to have geological sympathies.

Two meetings have been organised by the Committee, both in conjunction with the Ramblers' Section. They consisted of one indoor and one outdoor meeting and were well supported. It is hoped that further meetings of a geological nature will be arranged in the near future and will benefit the members of all Sections of the Society. As has been previously pointed out, the study of geology is fundamental to all branches of the Society's activity. In this connection, correspondence has taken place with the secretaries of the Sections, and favourable replies have been received from most of these.

JOHN F. HAYWARD, *Acting Secretary.*

Ramblers Section.

REPORT FOR 1937.

TEN Rambles were held and these had an average attendance of 6 members.

The districts visited have varied and have included Nazeing, Dukes Warren, Clandon, Ashdown Forest, Knole Park, Epping Forest, Warlingham and Hainault Forest. A walking week-end was arranged from E. Grinstead—Balcombe—Lingfield and those who attended it were lucky with the weather as it was a glorious week-end.

The Geological Committee arranged a walk in the Betchworth-Tadworth district which was found very interesting. This Committee were also responsible for a lecture at Headquarters, "Geology and Scenery in South-East England," by Mr J. F. Hayward, B.Sc.

Three other sectional meetings have been held, "A Ramble in Dorset," by Mr J. B. Foster; "Shipping in the Middle Ages," by Miss M. Hickmore; "Legal London," by Mr T. N. Lockyer, LL.B.

The Section was also responsible for two lectures at General Meetings, "The Birds of Hampstead Heath," by Miss Douglas-Smith, and "Shakespeare's London," by G. W. Edwards.

J. E. BURGHAM, *Secretary.*

Chingford Branch.

REPORT FOR 1937.

THE Branch maintained its useful status during the past year, both as a centre for local naturalists, and for furthering the interests of the Central Society.

Through the efforts of various members, 10 new names were added to the register, whilst four members resigned from the Branch, one of them advancing to full membership of the L.N.H.S.

The programme of lectures was successfully carried out, and our grateful thanks are due to those who provided such necessary entertainment for the success of the meetings. The average attendance at these meetings was twenty-four.

It is endeavoured to provide lectures of interest to *all* students of Nature and an idea of the variety of subjects covered this year may be gleaned from the following list:—"Local Natural History with a Camera" (General), W. G. Vincent; "Bird Song," B. T. Ward; "Hill Tribes of Burma," Rev. P. H. Cooke, M.A.; "A Visit to the Argentine" (Botany, etc.), W. C. Cocksedge; "The Grey Squirrel in Epping Forest," F. J. Johnston; "The Lake District," E. B. Pinniger; "The Vosges Mountains of France," D. G. Tucker, B.Sc., "The Norfolk Broads" (General), W. J. H. Earl; "Notes on Some Sea Birds," J. E. S. Dallas; "Mountain Climbing in Switzerland," W. E. Stopps.

The weather report from Miss Mathieson is an interesting feature of each Meeting.

An attempt to carry out monthly field meetings in Epping Forest district met with little success as the attendances were poor. This may be due to the proximity of the Central Society and the greater interest attached to its rambles.

At the Annual General Meeting of the Branch in November it was announced that the Chairman, Mr J. F. Hayward, found it difficult to carry on, owing to the pressure of other business and Mr B. T. Ward was elected Chairman for 1938. The grateful thanks of the Branch were accorded Mr Hayward for several years of faithful service to the Branch as both Secretary and Chairman. Mr W. E. Stopps was elected Vice-Chairman and some changes were made in the Branch Council.

E. T. Nicholson, *Branch Secretary.*

Referees.

THE following have kindly consented to act as Referees on questions of identification and for advice in various branches of Natural History.

It should be clearly understood that Referees cannot undertake work of an onerous nature, such as the determination of collections.

Postage for reply should always be enclosed and a request inserted for the return of the specimens if desired.

BOTANY.

General.—R. W. Robbins, Bullens Lee, Pains Hill, Limpsfield, Surrey.

Genus *Rosa*.—E. B. Bishop, Lindfield, Marshall Road, Godalming, Surrey.

Umbelliferae.—L. G. Payne, 22 Marksbury Avenue, Richmond, Surrey.

Rushes and Sedges.—E. B. Bishop, Lindfield, Marshall Road, Godalming, Surrey.

Grasses.—R. W. Robbins, Bullens Lee, Pains Hill, Limpsfield, Surrey.

Ferns and Horsetails.—L. G. Payne, 22 Marksbury Avenue, Richmond, Surrey.

Mosses and Liverworts. J. Ross, 23 College Gardens, Chingford, E.4.

Lichens.—I. M. Lamb, B.Sc., F.L.S., British Museum (Natural History), S. Kensington, S.W.7.

Fungi.—J. Ramsbottom, O.B.E., M.A., British Museum (Natural History), S. Kensington, S.W.7.

Mycetozoa.—J. Ross, 23 College Gardens, Chingford, E.4.

Medicinal Plants.—G. R. A. Short, 36 Parkside Drive, Edgware, Middlesex.

Aquatic Plants.—H. J. Jeffery, A.R.C.S., F.L.S., 14 Coppetts Road. Muswell Hill, N.10.

Algae (including Seaweeds).—A. D. Cotton, O.B.E., F.L.S., Royal Botanic Gardens, Kew, Surrey.

GEOLOGY.

John F. Hayward, B.Sc., 17 Heathcote Grove, Chingford, E.4.

MINERALOGY.

F. A. Bannister, M.A., 34 Monahan Avenue, Purley, Surrey.

PALAEONTOLOGY.

E. I. White, Ph.D.. F.G.S., British Museum (Natural History), S. Kensington, S.W.7.

INVERTEBRATA.

Mollusca.—J. R. le B. Tomlin, M.A., F.R.E.S., 23 Boscobel Road, St Leonards-on-Sea, Sussex.

Protozoa, Porifera (Sponges), Coelenterata (Jelly-fish, Sea-anemones and Corals), Vermes, Polyzoa, Brachiopoda, Echinodermata.—M. Burton, M.Sc., F.Z.S., British Museum (Natural History), S. Kensington. S.W.7.

Crustacea.—Miss Isabella Gordon, D.Sc., Ph.D., British Museum (Natural History), S. Kensington, S.W.7.

Myriapoda (Centipedes and Millipedes).—Rev. S. G. Brade-Birks, M.Sc. (Manch.), D.Sc. (Lond.), F.Z.S., S.E. Agricultural College, Wye, Kent.

Insecta:—General.—C. L. Collenette, F.R.E.S., 107 Church Road, Richmond, Surrey.

Thysanura (Bristle-tails) and Collembola (Spring-tails).—J. M. Brown, B.Sc., F.R.E.S., 176 Carterknowle Road, Sheffield, 7.

Orthoptera (Earwigs, Cockroaches, Locusts, Crickets, etc.).—K. H. Chapman. B.A., British Museum (Natural History), S. Kensington, S.W.7.

Plecoptera (Stone-flies) (*Specimens in fluid only*).—M. E. Mosely, 43 Lansdowne Crescent, W.11.

Psocoptera (Book-lice, etc.).—D. E. Kimmins, 16 Montrave Road, Penge, S.E.20.

Ephemeroptera (May-flies).—D. E. Kimmins, 16 Montrave Road, Penge, S.E.20.

Odonata (Dragon-flies).—E. B. Pinniger, 19 Endlebury Road, Chingford, E.4.

Thysanoptera (Thrips).—Edward R. Speyer, M.A., Experimental and Research Station, Cheshunt, Herts.

Hemiptera (Bugs, Cicadas. Leaf-hoppers, etc.).—W. E. China, M.A., British Museum (Natural History), S. Kensington, S.W.7.

Neuroptera (Lace-wings, Ant-lions, Alder and Scorpion-flies, etc.). —D. E. Kimmins, 16 Montrave Road, Penge, S.E.20.

Trichoptera (Caddis-flies) (*Specimens expanded only*). M. E. Mosely, 43 Lansdowne Crescent, W.11.

Lepidoptera (Butterflies and Moths).—R. W. Robbins, Bullens Lee, Pains Hill, Limpsfield, Surrey.

Coleoptera (Beetles).—K. G. Blair, D.Sc., F.R.E.S.. 120 Sunningfields Road, Hendon, N.W.4.

Hymenoptera (Ants, Bees, Wasps, etc.).—R. B. Benson, M.A., F.R.E.S., British Museum (Natural History), S. Kensington, S.W.7.

Diptera (Flies, Gnats and Midges).—L. Parmenter, F.R.E.S., 94 Fairlands Avenue, Thorton Heath, Surrey.

Arachnida (Spiders, Scorpions, Harvesters, Mites, etc.).—E. A. Robins, F.L.S., 19 Cassiobury Park Avenue, Watford, Herts.

VERTEBRATA.

Fishes.—J. R. Norman, F.Z.S., British Museum (Natural History), S. Kensington, S.W.7.

Amphibians and Reptiles.—L. G. Payne, 22 Marksbury Avenue, Richmond, Surrey.

Birds:—Distribution and Identification. For the Society's Area, N. of Thames.—The Recorder, R. C. Homes, 17 Park Lawn Avenue, Epsom, Surrey.

Outside Society's Local Area.—The Hon. Secretary of Records Committee, R. C. Homes, address as above.

British Trust for Ornithology.—The Society's Representative, R. C. Homes, address as above.

Anatomy.—G. Carmichael Low, M.A., M.D., F.R.C.P., F.Z.S., M.B.O.U., 86 Brook Street, Grosvenor Square, W.1.

Nests and Eggs.—J. E. Roberts, B.Sc., 24 Warren Drive, Surbiton, Surrey.

Mammals.—M. A. C. Hinton, F.R.S., British Museum (Natural History), S. Kensington. S.W.7.

PLANT GALLS.

H. J. Burkill, M.A., F.R.G.S., 3 Newman's Court, Cornhill, E.C.3.

ECOLOGY.

L. Parmenter, F.R.E.S., 94 Fairlands Avenue, Thornton Heath, Surrey.

CHEMISTRY.

L. Eynon, B.Sc., F.I.C., Fernleigh, Hall Lane, Upminster, Essex.

RIGHTS OF WAY, FIELD PATHS, Etc.

Sir Lawrence Chubb. 71 Eccleston Square, Westminster, S.W.1.

Papers Read to the Society.

WE wish to offer our grateful thanks to those visitors who, by coming to lecture to us, have added so much to our enjoyment.

Jan. 5—"Pioneer Bird Photography,"
P. Manson-Bahr, D.S.O., M.A., M.D., F.R.C.P., F.Z.S.

,, 19—"Plants of the Seashore"...Dr E. Marion Delf, M.A., F.L.S.

Feb. 2—Annual Exhibition.
Lecturettes in the Large Lecture Theatre.
"Insect Eating Plants," ..... R. W. Robbins.
"Songs of Wild Birds,"
E. M. Nicholson, M.B.O.U., and Ludwig Koch.

,. 16—"Talk on the Hampstead Heath Birds,"
Miss K. Douglas-Smith.

Mar. 2—"The Environment of Fossil Animals,"
H. D. Thomas, M.A., Ph.D., F.G.S.

,, 16—Mr G. L. Hawkins' Film, "The Life of the House Martin."

April 6—Bacot Memorial Evening.
"Entomology in Relation to the Prevention of Malaria,"
Sir Malcolm Watson, M.D., LL.D. (Director, Ross Institute of Tropical Hygiene).
,, 20—"Ely Cathedral," ..... W. Gordon Gould.
May 4—"A Bird-watching Trip in South Spain,"
B. W. Tucker, M.B.O.U.
June 1—"Shakespeare's London," ..... G. W. Edwards.
,, 15—"English Church Fonts," ..... H. L. Mann.
July 13—"Roads of Africa," ..... J. D. Gillett, F.R.E.S.
Sept. 7—"The Mentality of Birds," ..... F. B. Kirkman.
,, 21—"Man as a Biotic Factor," ..... R. S. R. Fitter, F.Z.S.
Oct. 9—"Some Aspects of the Flora of the Hebrides,"
C. V. B. Marquand, M.A., F.L.S. (of Kew).
Nov. 2—Cinematograph Films.
(a) "The Nesting of the Hobby," ..... G. Crawford.
(b) "The Private Life of the Gannets."
,, 16—"Habits of our Social Wasps," ..... G. E. J. Nixon, B.A.
Dec. 7—Annual General Meeting.
President's Address: "The History of Richmond Park."
,, 21—"The Growth of the English Parish Church," ... H. L. Mann.

PAPERS READ AT SECTIONAL MEETINGS.

Jan. 12—Ecology. "Ecological Surveys," ..... Capt. C. Diver, F.L.S.
,, 26—Archaeology. "Across the United States to the Indians of the South West,"
Miss M. S. Johnston, F.G.S., F.R.G.S., F.Z.S.
Feb. 9—Botany. "Mosses and Liverworts," ..... J. Ross.
,, 23—Ornithology. "Bird Migration Charts." ... Miss E. P. Leach.
Mar. 9—Ramblers. "A Ramble in Dorset," ..... J. B. Foster, B.A.
,, 23—Plant Galls. "A Small Gall on the Oak Catkin," ... J. Ross.
April 13—Botany. "The British Clovers," ..... G. H. Spinney, B.A.
,, 27—Entomology. "British Woodlice," ..... E. Popple.
May 25—Ecology. Notes on the Section's Work at Limpsfield.
June 8—Ornithology. "The Influence of Housing Development on Bird Life," ..... E. C. Rowberry.
,, 22—Entomology. "Our British Dragonflies,"
Miss C. E. Longfield, F.R.G.S., F.R.E.S., F.Z.S., M.B.O.U.
,. 29—Ramblers. "Shipping in the Middle Ages,"
Miss M. Hickmore.
July 20—Ornithology. "How to Observe Birds."
A dialogue between two members.
Aug. 10—Ornithology. "Discussion on the Work of the Section."
Sept. 14—Geology and Ramblers. "Geology and Scenery in South-East England," ..... J. F. Hayward, B.Sc.
,, 28—Plant Galls. "*Diplolepis folii* and Allied Species,"
H. J. Burkill, M.A., F.R.G.S.

Oct. 12—Archaeology. "The Order of St John of Jerusalem in the Past and Present," ..... H. W. Fincham, Kt.J., F.S.A.
,, 26—Entomology. "The Lepidoptera of Swinley Forest," C. E. S. Hicks.
Nov. 9—Botany. "Some Famous Botanical Centres Revisited," J. E. Lousley.
,, 23—Ornithology. "The Birds of Fair Isle," ..... J. M. Fisher.
,, 30—Ecology. "The Ecology of a River Estuary," E. C. Brown, M.Sc.
Dec. 14—Ramblers. "Legal London," ..... T. N. Lockyer, LL.B.

Obituary.

JOHN OLDHAM BRAITHWAITE.

By the death, after much suffering bravely endured, of John Oldham Braithwaite on the 20th November, 1937, the Society has lost an old and much-valued member. "J. O. B.," as he was familiarly known to his many and varied friends, was a good man and a loyal friend.

He enjoyed life and made it fully worth living. To a happy disposition there was added a fund of quiet, attractive humour which he retained almost to his last days. From his boyhood he was an enthusiastic student of Nature.

He was a distinguished student at the Pharmaceutical Society of Great Britain, where he studied Chemistry and Pharmacy and passed his major examination at the minimum age. On leaving, he chose industrial chemistry as a career. In this he was eminently successful and earned a well-deserved reputation for his analytical and practical work. This was rewarded by his final appointment as head of the distillery and galenical departments of a large and important chemical works at Hackney. For many years and until his death he was an abstractor for the Pharmaceutical Journal. In 1901 he was appointed editor of the Year-Book of Pharmacy. His literary merit was further recognised by his assistance in guiding an edition of the British Pharmacopeia through the Press.

He was also responsible for the compilation of the Pharmaceutical Formulary and edition of several pharmaceutical publications useful to commerce. On retirement in 1932 he devoted most of his leisure to the furtherance of Nature Study. He was an excellent, practical entomologist and botanist. Pond life had a particular attraction for him. Unfortunately with increasing years came a painful arthritis which crippled and prevented him from field work, but he continued his research with microscope and aquaria in his study. He was a delightful companion whether at home or in the field, and he was always happy in helping generously those who sought instruction from his widespread experience. Severely handicapped for many years by deafness, he preserved his cheerful outlook on life to the end.

His earthly labours are finished, but their fruits remain as an inspiration and example to us all. W. G. A.

F. J. HANBURY, F.L.S., F.R.E.S.

By the death of Frederick Janson Hanbury on March 1st, 1938, within a few weeks of his 87th birthday, the Society loses its oldest member, one who in his young days knew Charles Darwin and Sir Joseph Hooker, and botanised with the first Lord Avebury. When the youthful North London Society, one of our constituent bodies, was first making its way in the early 'nineties, Hanbury was living in our midst at Clapton Common. A botanist and lepidopterist of established reputation, and moreover in comfortable circumstances, his kindly encouragement was of great value to a body of young naturalists. He had a house on the Terrace, Clapton Common, adjoining his residence, devoted to his collections, and here he entertained the members in three successive years to an exhibition of his treasures. The writer remembers a magnificent specimen of the Great Fen Ragwort (*Senecio paludosus*), now extinct in Britain, five feet or more high, mounted and framed on the wall. Again, at Stainforth House, he gave an evening with his rich botanical and entomological collections. After his removal to East Grinstead, members were invited on two or three occasions to Brockhurst, where they received from Mr and Mrs Hanbury the kindest hospitality, and were shown the beautiful gardens, orchid houses, observatory, and the famous rock garden both in its early and perfected state.

Hanbury held the office of Vice-President of the old Society in 1893 and 1894, and served on the Council in 1896. He presented to the Society the Hanbury-King botanical collection, now incorporated with the general collection. In 1914 he accepted a Vice-Presidency of the London N.H.S., and held it to the time of his death, the last ten years as Honorary Vice-President.

He was a man of many interests, a staunch Churchman, a lover of music and a famous gardener—he held the Victoria Medal of Honour of the R.H.S. His botanical writings include a "Monograph of the British Hieracia," the editorship of several editions of "The London Catalogue of British Plants," and (with the Rev. E. S. Marshall) a "Flora of Kent."

Hanbury came of a long-lived Quaker stock. Yet although he lived to a ripe old age he did not approach his grandmother, who died in 1901, aged 108 years.

R. W. R.

Atypus affinis Eichw. in the London District.

By J. E. S. Dallas.

THE so-called British Trap-door Spider is the sole representative in this country of the sub-order Mygalomorphae. It is distinguished

from all other spiders in Britain in that its chelicerae or fangs work up and down, *i.e.*, parallel with the axis of the spider instead of across it.

The full-grown female of *Atypus affinis* Eichw. is about 1.5 cm. long. Its mode of life is to excavate a burrow in the soil and to line it with silken web, the tube so formed thus becoming its permanent abode. The tube varies in length and diameter with the size of the spider, which takes several years to reach maturity. A small part of the tube is built above ground and lies on the surface like a piece of tubular tape. This exposed part is covered with grains of the soil on which it lies, and is consequently not easy to detect. When the fly or other small creature which forms the spider's prey passes over this exposed tube, the sensitive threads carry the news to the spider below. The latter climbs up inside the tube and, piercing the external part with its fangs, draws its victim down into the lower part. It is for this operation that the peculiar structure of the jaws is so well adapted.

Atypus appears to be better known in the South of England than in other parts, the type of locality favoured being the sandy heath country of which we have a fair quantity in the Society's area, and particularly South of the Thames.

I was first introduced to the species in Epping Forest, where it has several colonies, and have since found it on Oxshott Common, Wisley Common, Addington Woods, Croham Hurst, Shirley Hills in Surrey, and West Wickham Common in Kent. All have been examined since 1920, but probably some have now succumbed to the " wear and tear " due to the increased tramping over the localities in recent years; one at least has suffered from the encroachment of bracken upon the heather area. *Atypus* has also been recorded from Wimbledon Common (Surrey) and Hampstead Heath (Middlesex). These colonies vary in size from a few individuals to groups of 35-40.

The spider usually prefers loose sand with young heather hanging loosely over it, and fairly free from moss and other close vegetation. I have never found it under old heather with hard woody stems and a thick deposit of decaying plants below. A single tube which I found on the grass turf of the chalk hills above Betchworth (Surrey) was quite exceptional as to the type of soil and covering vegetation.

On Limpsfield Common, where the Ecological Section is carrying out its Survey, there are several places in Areas A, B, E, K and R which seem suitable for *Atypus*, but so far I have only discovered a small and very much torn tube in Area K (a). Further search may reveal the presence of an established colony, and then the determination of the prey preferred by the spider might prove an interesting though perhaps not easy field for investigation.

Entomology in Relation to the Prevention of Malaria.

By Sir Malcolm Watson, LL.D., M.D., C.M., D.P.H., F.R.F.P.S., L.M.S.

Arthur William Bacot, whose life and death we commemorate, was not a member of the medical profession. Yet it is fit and proper that from time to time your Society should invite a medical man to deliver this Memorial Lecture. For although Bacot was an entomologist, his associations with the medical profession were close and his work of far-reaching importance in the understanding and prevention of disease.

After referring briefly to Bacot's researches, the lecturer continued:

RESEARCHES ON MALARIA.

When I was honoured by the invitation of your Society to deliver the Bacot Memorial Lecture, I thought I could best discharge that duty, not by attempting to describe the work done on plague, trench fever or typhus fever since Bacot died, but by speaking on that aspect of entomology with which I have been especially associated, namely, its relation to the prevention of malaria.

I have already said that Ross's discovery stimulated the researches which caught Bacot in their meshes; it also stimulated further research on malaria. So I propose to-night to describe, necessarily briefly, the further entomological researches for which Ross's work opened the way. Neither Ross nor Manson, nor anyone else, saw where the path was leading; one step led to another, and looking back to-night we shall see that we have travelled far.

It is true that in 1899 Ross said: "Before practical results can be looked for, we must find precisely what species of Indian mosquitoes do and do not carry human malaria, and what are the habits of the dangerous varieties." He also said that "We do not yet know all the dangerous species of mosquitoes, nor do we even possess an exhaustive knowledge of the haunts and habits of any one variety." Ross thought "it will no longer present any scientific difficulties, as only the methods already successfully adopted will be required, results obtained will be quite unequivocal and definite." Shortly before the discovery, to encourage Ross, Manson wrote: "When things are hopeless and you are ready to throw it up, the light may be just at hand; you are sure to throw a beam or two on many dark places, even if the theory is not proved—but I think it will be. The rest is plain sailing and may be left to other men."

In reality it proved anything but plain sailing; indeed, it proved a task of such difficulty that in few places in Asia, Africa, Europe or America was the necessary work even attempted. One reason for the

failure to utilise Ross's discovery was that the research required was a different technique from that of Ross. Ross was a master in devising a laboratory technique, without which his discoveries would have been impossible; he had to make the road by which he travelled. Exquisite delicacy of touch in handling the infinitely small, endless patience, the eye of genius seeing the things which might so easily have been missed, were characteristics alike of Bacot and Ross. Experiments in laboratories that were repeated over and over again in the course of a period measured by weeks gave them success. But in the next stage of malaria work Ross's own technique was, in fact, to darken the way rather than to illuminate it. He said, "We must find what species do and do not carry human malaria"; but in the laboratory it was shown that every species of anopheles which bit a malaria patient became infected. So men concluded, wrongly as it turned out, that all species carried malaria in nature; they also concluded, again wrongly, that this made the prevention of malaria by the control of anopheles an impossible task.

Looking back we now see clearly that what was required was research on a much wider scale than could be enclosed in the four walls of a laboratory. The entomologist had to become a full partner with the medical man in this research, and both had to call in the engineer to carry out many of their experiments. Not a little to his astonishment, the medical man found that the commercial man, who found the money for the experiments, became deeply interested in the entomology of the scheme. Some of the most successful anti-malarial work has been carried out by men who were neither entomologists nor engineers nor medical men by training, but who had learned something of the insect which was victimising their labour forces. These men often showed great ability and ingenuity in carrying out the experiments.

Finally the new technique involved experiments on a large scale—the siting of houses, the removal of people, the felling of large blocks of jungle, or its preservation, etc., etc., work for which both the entomologist and medical man were ill equipped; and before conclusions could be safely reached months and even years had to elapse. All this was a very different technique from that of Ross. You may call it tropical hygiene, or anti-malarial work, or applied entomology; but, at least in its early stages, it was fundamentally entomological research. Such being the nature of the researches required, we can now understand why the medical men failed so signally to use Ross's discovery for so many years.

POOL-BREEDING ANOPHELES.

Ten years after Ross's discovery successful attempts to reduce or prevent malaria had been made in only a few places in the whole world, beginning in Malaya in 1901, in Ismailia in 1902, in Panama in 1904. In all these places, as we realise to-day, we were dealing with species of anopheles which live in stagnant pools. They were *Anopheles ludlowi* breeding in mangrove swamps in Malaya, *Anopheles umbrosus* breeding in jungle-covered fresh water swamps in Malaya, *Anopheles*

pharoensis in pools in the sands of Egypt, and *Anopheles albimanus* breeding in pools and swamps in sunshine in Panama. Drainage, which in the past had so often been associated with the disappearance of malaria, was the chief method employed against each of these mosquitoes, except in Panama, where drainage was not always possible. There, oiling was a subsidiary method, as was also the mosquito-proofing of some of the houses. Drainage eliminated them because, whether breeding in the jungle or in the open, they were adapted only to still and stagnant water and had no power to maintain themselves in a fast-running stream.

STREAM-BREEDING ANOPHELES.

No sooner, however, did we appear to have mastered the malaria problem than we realised that there was yet another malaria problem—and an unexpected one. Malaria had always been associated with stagnant water and flat land. We were now faced with the problem of malaria where there were no swamps, where there was no stagnant water. It was malaria in hill land, where the streams ran fast and sparkled in the sunshine, as they flowed down the hillside along the valleys. In such places malaria was of the most appalling description. It was due to *Anopheles maculatus*, a mosquito which had acquired the habit of living in running water and sunshine. It anchored itself to the side of the streams by a special collection of hooks on its tail, and it fed on the bacteria and vegetable life brought by the natural currents of the water. This involved a research in Malaya which lasted for four years (1905-1909) before the final and conclusive answer was obtained. Our first method of solving this problem was an engineering one. Later it was discovered that it was possible to eliminate this mosquito by oiling with a specially toxic oil.

NEW METHOD OF CONTROL.

We were not content, however, with these crude methods. A study of the various species of anopheles had shown how fastidious each was in its choice of breeding place. Research showed that each species had a preference for a certain type of breeding place; to the naked eye there were such differences that even before collecting the larvae it was possible to hazard something more than a rough guess of what species would be found. We also discovered that by making changes in and around the breeding place, and particularly in the chemical composition of the water, one species could be driven out and replaced by another. So much so that by 1909 I wrote in the first edition of my "Prevention of Malaria in the Federated Malay States" a chapter entitled "On the possibility of Altering the Composition of Water and the Anophelines breeding in it"; and in 1910 I delivered a public lecture and used the words: "I believe that in this way a great anti-malarial method will be evolved, and I can look to the time when we will be able to play with species of anophelines saying to some 'Go' and to others 'Come' and abolish malaria at great ease, perhaps at hardly any expense. Drainage schemes may become

a lesson of the past; future generations will smile to think how their ancestors, who thought they were so clever, burned their house to cook the pig." And so what is now called "Species Sanitation" was born, perhaps one of the most important contributions to our knowledge of the prevention of Malaria since Ross's discovery, as we shall see later, for it opened the way to the control of rural malaria. We also found malaria controlled by nature in rice fields in many lands; the cultivation of the land changing dangerous to harmless species.

An example of species sanitation was evolved in Malaya from a study of the epidemiology of the disease and the entomology of the vector, namely, that *Anopheles umbrosus* was limited to certain jungle areas and that in other jungle areas *Anopheles umbrosus* did not exist, nor was there any other malaria carrier. This led us to preserve jungle in these areas in Malaya, because by doing so we prevented *Anopheles maculatus*, the dangerous hill carrier of malaria, from obtaining access to the streams. Where jungle had been felled in Malaya, we encouraged its re-growth; and in India, where jungle grows more slowly, large areas have been reclaimed from malaria by growing shade and so blotting out *Anopheles minimus*, which was so pestilential a carrier in many parts of that country.

You will probably all be surprised to hear that flooding the land is another method used in certain places to eliminate malaria. In Bengal much of the land became not merely malarial, but depopulated by embanking the rivers and preventing floods; the reason being that in the land protected from floods the malaria carrier, *Anopheles philippinensis*, is no longer swept away by the floods, but flourishes and produces intense malaria.

I spoke to you of the possibility of changing the chemical composition of the water and so preventing malaria. In Java there were ponds in which fish were reared for market. But in addition to supplying food, these ponds produced intense malaria, for in them lived *Anopheles ludlowi* var. *sundaicus*. The anopheles fed on algae floating on the surface; by drying off ponds and raising the salinity of the water the floating algae were killed, the anopheles larvae were destroyed, and people freed from malaria without detriment to the food supply; for the fish now fed on a species of alga growing on the bottom of the pond instead of one floating on the surface of the water.

In Albania a large swamp which produced severe malaria at Durazzo was rendered harmless by admitting salt water and raising the salinity of the swamp. In less than one year the anopheles disappeared and with them the malaria.

In Holland it is expected that a reverse process will free the country from malaria. As a result of the brilliant researches of Swellengrebel, Hackett, Missiroli and others in Holland, Italy and elsewhere in Europe, it is now known that *Anopheles maculipennis* of Europe is not a homogeneous species. Differences among the individuals of this species exist in the egg, larval and adult stages, in their genetics, in their feeding and in their wintering habits. Whether

these characteristics amount to racial or specific differentiation has not yet been decided, but from a practical point of view we have a control of malaria based on "races," just as control of malaria in many tropical countries is based on "species." In Holland malaria occurs where the water is brackish, namely, on the margins of the Zuider Zee. The Zuider Zee has now been closed, and it is anticipated that the water of the River Ijssel (Yssel) will ultimately convert the Zuider Zee into a fresh-water lake, which will in time eliminate all the breeding places of *Anopheles maculipennis* var. *atroparvus*.

Time will not allow me to give you details of the researches which have shown us with great accuracy the feeding habits of anophelines. We now can take the blood from the stomach of the mosquito and determine whether that blood came from man or beast, from horse, dog, pig or bird. We know enough now to realise that some mosquitoes have a definite preference for human blood, and that such blood-suckers are a special danger to man.

Such are the lines along which progress has been made in the past forty years; slow at first—very slow indeed—but now more rapid. But you will have seen how entomological research is the foundation on which we have built. Entomological research was the ruling passion of Bacot's life. To his memory we lay this record of research in the prevention of malaria.

Where did Cæsar cross the Thames?

By Walter Johnson, F.G.S.

THERE are about a dozen answers concerning the ford to which the fleeing Cassivellaunus led Cæsar in 54 B.C. One conclusion is so confidently definite that a granite pillar has been erected at Brentford as a memorial. First, let us be clear that we are now dealing with 54 B.C., not the invasion of Aulus Plautius, nearly a century later. This rules out the controversy about the date of the earliest London Bridge. That a timber bridge existed in mid-Roman times is very probable, though the evidence is inferential. There is the analogy of Roman custom, and the bridge of the early 11th century, if original, was not likely to have been built by Danes or Saxons. Coins have been found in the river bed, and possible approaches uncovered. The Romans fixed on the site of Londinium—though whether a British settlement had already been established is hotly disputed—because there were good, hard, gravel landing-places on each bank, and because it was reached by the tide, this, too, at the lowest spot where the river could be conveniently bridged. Perhaps, also, British trackways converged here. When Southwark became settled, a bridge was necessary, even coercive. Just before Roman days, the passage must have been made by a ferry.

Although Mr Reginald Smith thinks that the Thames was bridged at Westminster (Thorney) in A.D. 43, and that Watling Street at that date had not been diverted to catch "London Bridge," it is cardinal to note the date. Mr F. W. Reader supposes that there was a ferry, and Codrington assumes a ford. We notice that a ferry would provide poor transport for Cæsar's troops on a forced march.

For two generations the controversy about the crossing has been vitiated by false premises. Dr Guest and Sir Laurence Gomme believed that, in Roman times, the Thames borderland was dominated by a "lagoon," or at least by an impassable morass. The theory was successively supported by J. R. Green, W. J. Loftie, Sir Walter Besant, and Sir Montagu Sharpe. Were the theory sound, there could have been no fords within the London area proper.

A corollary to the swamp theory is that the Romans were compelled to build vast embankments, but any such works would be late, if not post-Roman. Mr F. C. J. Spurrell, in a valuable paper, never seriously impugned on vital points, contended that, below Purfleet, only very slight banks, if any, would be needed, and that no examples exist which are earlier than the 13th century. A Latin manuscript, quoted by Lucas, gives 1293 as the date for the earliest walls. Mr S. Hazzledine Warren, on the contrary, asserts that walls can be traced back to 1090, and thinks it not improbable that their constructors were the Romans.

In 1917 the present writer ventured to argue that, so far from the swamp theory being correct, it was a myth, and that the Roman ter-

rain stood about 10-12 feet higher than the present. (Trans. Lond. and M'sex. Archaeol. Soc., N.S., III, pp. 402-46.) This implied that the tides did not reach so far upstream, and that the Thames could be forded at places now impracticable. In the light of further research, the question may be again reviewed. We must first detail some pertinent facts.

At Tilbury, circular huts belonging to a small Romano-British settlement of the 1st and 2nd centuries, were uncovered 13 ft. below H.W.M. At Crossness, the Roman floor was 9 feet below the present surface. Upstream, at Brentford, a pile dwelling was found below the modern low-tide level. This plainly denotes subsidence of the land, or encroachment by the sea. The story holds good for London. Westminster Abbey, on Thorney island, stands over a Roman surface which was only 5 feet, or even 4 feet, above the present O.D. Here the tides now reach 13 feet O.D., so that, were the river unembanked, and the land at the present level, the spot would be overwhelmed at ordinary high spring tides by 8-9 feet of water. Again, at Southwark, Roman pottery was found just about the O.D. line. Here the peat bed represents the uppermost layer of the Essex series, and was the last to sink. At Guy's Hospital, Roman refuse was found at a depth of about 2½ feet in peaty soil which had never been covered with tidal mud. Now, the Romans did not build on mud foundations; in unsuitable spots piles were driven in. One last example: the road by which the Romans crossed the Medway at Rochester is now about 8 feet below the level of mean tides.

The geological testimony tells of a gradual sinking of the area since Neolithic times, in the main steady, but with intermittent pauses. In Roman days the site of London was comfortably habitable, but there was a somewhat sudden drop about the close of the 2nd century, and apparently a gentle subsidence thereafter. By careful levellings Capt. T. E. Longfield has shown that the Roman floor in the Thames Valley has sunk from 12 to 15 feet since the Roman occupation. Some slight discrepancies, either way, may be allowed for inaccurate levellings as recorded in the old Ordnance maps, and it is also assumed, perhaps unjustifiably, that the movement has been regular. The chief matter is its totality. Longfield's 12-15 feet is not all due to tectonic changes. Something must be accounted for by shrinkage of the peat, especially in Essex, and a little for leaching of the loamy matrix of gravel beds. The cumulative additions of alluvium, and the weight of buildings have caused compression. Drainage has assisted, as well as the lowering of the water-table by artesian wells. The last factor would diminish the support yielded by upward hydrostatic pressure. But all these are causes, not results; the marsh theory disappears by the logic of facts.

What was the lateral extent of the pre-Roman waterway? Against the steeper gradient must be placed the moister "sub-Atlantic" climate. The woodlands maintained a spongy soil, and there was no artificial drainage. There were no bridges, locks, weirs, wharves, or landing-stages to obstruct the flow, but neither was there dredging to remove any shoals and scour the channel. There would be freer access to

the flowing tide, succeeded by a lower, though somewhat retarded ebb. But the tides would not come so far upstream, apparently only to London Bridge, with perhaps a feeble creep to Westminster or Vauxhall. The present fall of the channel from Teddington to London Bridge is fairly uniform, and averages about one foot per mile. One concludes that, in the non-tidal reaches, the actual waterway was narrower and shallower, though subject to spreading during floods and the indirect effect of the retarded ebb. The muddy foreshore, largely due to continued silting, was not so wide—an overlapping fringe has been added—and the firm banks and earthland foot in places above London Bridge were nearer the actual stream. Far upstream, as at Coway stakes, the river has changed its course in the historic period. Summed up, these factors mean one thing: the existence of more fords. Hence, arguments based on the names Brentford and Halleyford, as if these were the only fords, are misleading, moreover these names are much later.

We turn to Cæsar's account of the pursuit. Cassivellaunus was making for his *oppidum*, an earthwork camp protected by woods and marshes (*silvis paludibus munitum*), North of the Thames, and apparently West of the Lea. This oppidum has been located at Cassiobury and Verulamium, but the most probable site is at Wheathampstead, North-west of Verulamium. Cæsar was told, by prisoners or deserters (*captivis perfugisque*), that the river could be forded at one place only, and that with difficulty. The words are unequivocal (*uno omnino loco*). The informers may have been dishonest, but we may take the statement to mean simply that there was, within reasonable reach, only one practical ford; there were more, but one alone available for a short pursuit. That it was 80 Roman miles from the sea is a subject of fruitless discussion. The Northern bank of the ford had been fortified by sharpened stakes of wood, and similar stakes had been concealed in the river, to hinder the enemy. In crossing, the legions were immersed up to their shoulders (*cum capite solo ex aqua exstarent*).

Space will allow only a synopsis of the rival claims to represent the genuine ford, and our notes must be brief.

I. *London Bridge.* The predecessor of Watling Street may or may not have touched the bridge; whether there was a British settlement is controversial. The fatal objection seems to be that the river was here tidal. The river might indeed be fordable at times, but Cæsar could not select hours and seasons.

II. *Westminster.* Convenient for Watling Street, if this was its terminus; Stane Street, with a subsidiary route from Merton, probable. Evidently an eyot existed here (Thorney). A ford possible. Sir Montagu Sharpe asserts that it was called "*locus terribilis*" in Saxon times. Early 19th century maps, large scale, give a river width of 1300 feet, as against 950 feet at Battersea. A ferry would be too slow, unless a fleet of boats were in readiness. A good road by Hyde Park Corner and Edgware Road towards Wheathampstead. Tides apparently absent.

III. *Battersea* (near Chelsea Bridge). Wm. Maitland, in the early 18th century, sounded the Thames from Wandsworth to London Bridge,

expressly to find Cæsar's ford. The greatest recorded depth was 3 ft. 7 ins. to 4 ft. 7 ins. at this spot (deepest part at several neap tides). Still very shallow, despite dredging. Sir Richard Phillips in 1820, found, at low water, " a shoal of gravel, not three feet deep, and broad enough for ten men to walk abreast," also traces of a causeway. The spot was near that examined by Maitland. Approach, probably by one of Cæsar's *semitae* (byways), route by Chelsea Barracks to Hyde Park Corner. Abundance of relics (Bronze, Early Iron, Roman) in river bed, denoting a passage-way. No tides. That the site of Battersea Park, to the West, was artificially raised (1847-57) several feet, does not affect the ford theory.

IV. *Wandsworth.* Quantities of relics, chiefly Palaeolithic, Neolithic, and Bronze Age. Possibly a ford, with suggestion of age-long fighting. Alternatively, a back-wash of objects.

V. *Putney.* Good approaches. Spurious tradition connected with " Cæsar's Camp," Wimbledon, but probably an old crossing, with good access.

VI. *Brentford.* Doubtless fordable hereabout. Quantities of remains found lower down, at Kew Bridge. Several eyots; probability that river has changed its course. Lines of stakes uncovered; no antecedent improbability that these are Roman, but they were driven into the foreshore and arranged obliquely in double rows downstream from bank to bank. This arrangement seems to indicate protection of a passage-way, with camp-sheathing on the banks, rather than a plan to impede foes. The Corporation of London ordered rows of piles to be driven in at Richmond in 1774, and at Teddington in 1775; Sharpe says that no traces are left. Some of the stakes were interlaced, like wattle-work, thus differing from Cæsar's hidden stakes fixed outward (*sub aqua defixae sudes flumine tegebantur*). Groynes are suggested. Main objection: no need for Cæsar to march so far upstream.

VII. *Richmond, Petersham, Kingston, Sunbury, Shepperton, i.e. Halliford* or *Coway Stakes.* The last-named has been much favoured. Possible, but needlessly out of range. Tradition of Coway Stakes at Halliford. Suffix *-ford.* Belief seemingly not older than Camden's *Britannia.* Rice Holmes, indeed, believes that Camden " invented " the tradition. Rather was it Camden's attempt to identify a spot referred to by Bede, who said stakes were still to be seen at some unspecified ford. Daines Barrington was shown " the line along which the stakes had been planted "—at right angles to the river bank. If trustworthy, the account would better harmonise with a cattle-way or primitive weir. A ford is indicated, but scarcely the same ford continuously, for we note that the river has markedly altered its course here since Cæsar's day. Such stakes, as at Brentford, would become dilapidated and need constant renewal.

IX. *Great Marlow.* Not seriously urged at the present day.

Remembering the master-fact about Roman levels, and assuming that Cæsar would take the nearest safe ford, I am inclined to place the claims in this order: (1) Westminster and Battersea, equal in merit, the for-

mer for accessibility, the latter as being more practicable. (2) Brentford. (3) Richmond, for fordability. (4) Kingston and places beyond rather necessitate a somewhat roundabout route, and London Bridge seems to involve trouble with tides.

Red and White Clover.

By G. H. Spinney.

AS a genus the clovers fully uphold the family traditions of the Leguminosae, in respect of their willingness to serve man, and to make use of the artificial conditions he provides. But, in doing so, they do not allow themselves to be exploited so as to pander to his grosser appetites, like cabbages and cauliflowers and other cruciferous monstrosities. They never appear in the Honours lists of the Royal Horticultural Society, nor do they parade among the sweet pea débutantes at Chelsea, in the grossly extravagant " creations " that the plant hybridist designs.

Clovers have more solid claims to man's respect, based on years of faithful service before plant hybridists were ever thought of. Such merit has not gone unrewarded. No other plant can boast the high distinction of being used to mark a suit at cards—it is only in England that its identity is concealed under the term " Clubs." Those puritans among us who regard cards as an invention of the Devil, may, perhaps, be reassured by turning to Ireland, where clover, under its Celtic name " Shamrock," breathes the very odour of sanctity, and has come as near to beatification as a plant can ever get.

However, the real measure of the esteem in which a plant is held can always be found in folklore, in which clover holds a high place, not only in England, but all over Europe.

The anthropologist would say that this is due to its leaflets being grouped so obviously in mystical threes. But there are many plants with triple leaflets, and not all have earned the reputation of clover. A plant must first attract attention by the services it renders before it is recognised as divine. That is what must have happened with clover. Primitive man first found it to be valuable food for cattle and horses, and then realised that the trefoil leaf was simply God's way of putting his divine seal of approval upon the plant.

Apart from the St Patrick legend, of which I shall have something to say presently, the majority of superstitions connected with clover refer to the four-leaved form. Clovers—particularly white clover—occasionally indulge in petulant protests against the formality of their make-up by producing freaks of various kinds, for example, by substituting leaves for petals or stamens, or by the familiar hen-and-chicks monstrosity. But their favourite way of letting themselves go is to multiply the number of leaflets on each stalk. Forms have been found in which as many as ten leaflets are crowded on to a single stalk, instead of the normal three, but these are very rare: it is only the four-

leaved form which is at all common. The occurrence of such variations in a plant which goes to such pains to stress its trinity, would soon leap to the eye of the rustic observer; and by their comparative rarity, such freaks were, perhaps, supposed to possess in quintessence the magical qualities that tradition had assigned to the ordinary three-leaved form.

Whatever the origin of the superstition connected with four-leaved clover, it is widespread in Europe, and takes many forms.

The primary virtue attributed to clover is its power as a talisman, to keep away evil. Even in Pliny we find a trace of this superstition, for he says that no snake will touch it. In the middle ages it must have been invaluable as a protection against witchcraft. The wiser folk kept their four-leaved clover inside a Mass-book, thus securing a second line of defence. According to these verses quoted by Anne Pratt, the source of which I cannot find, even Saint Clair did not disdain to avail herself of it.

"Woe, woe to the wight,
Who meets the Green Knight
Save on his faulchion arm
Spell-proof he bear,
Like the brave St Clair,
The Holy trefoil's charm."

Those careless folk who left their four-leaved clover at home, and became deservedly afflicted with aches and pains at the hands of the local witch, had still some remedy, according to a Breton superstition. They must rub the affected part with four-leaved clover between eleven and twelve o'clock at night, uttering the words: "Maü saübatze, maü auratyi, sor me de quiou de la pars dou boun Dieu" (Mal sauvage, mal sorcier, sors de là de la part du bon Dieu).

The second sphere of usefulness of four-leaved clover concerned chiefly the fair sex. It must have simplified things considerably for them; for to find a four-leaved clover not only guaranteed the maiden a husband during the same year, but gave her complete freedom of choice. She merely had to persuade her prospective victim to join her in eating some. This could not have been very easy in the days before vegetarianism became popular; and no doubt many preferred to have their clover made up into a potion which they could pour surreptitiously into a glass of sack.

Girls in Bohemia put it in their lover's shoe, when he went on a journey, to keep him faithful; a pessimism over the constancy of lovers which throws some light on the reputation of Bohemians.

These more romantic superstitions linger on in rural fastnesses. As a town-dweller I had to be content, in my youth, with the rather colourless superstition that a four-leaved clover "brings luck." This, too, is old. We are told in Melton's "Astrologaster" that "If a man walking in the fields find any four-leaved grass, he shall, in a short while after, find some good thing." In Ireland they say that if you dip Shamrock in the last glass of whisky drunk on the night following St Patrick's day, you will be lucky for the rest of the year.

Finally, a rather puzzling one, which I found in an encyclopædia of folk-lore. "Clover, if gathered from heathen shrines, ancient graves, or ruins, on St John's Eve"—so far it has the authentic ring—"will make beer exceedingly good if thrown into it."

As I have twice mentioned Shamrock in a paper on clovers, I feel it necessary to say something in my defence.

The Shamrock question falls into two distinct parts.

The first: what is the plant which the Irish wear on St Patrick's day. The second: what is the plant which historical evidence allows us to connect with the Saint.

In the Journal of the Royal Society of Antiquaries of Ireland for 1894, a writer gave the result of a count he made of 49 shamrocks brought in by native Irishmen.

Of these, 24 were *Trifolium repens* (white clover), 21 *Trifolium minus* (yellow suckling clover), 2 *Trifolium pratense* (red clover), and 2 *Medicago lupulina* (black medick). In addition *Lotus corniculatus* (bird's-foot trefoil) and *Oxalis Acetosella* (wood sorrel) are undoubtedly worn as shamrock in some places.

As there is no reason to suppose that these divided loyalties have been reconciled since 1894 we must be content with saying that shamrock to-day means generally some form of clover.

The second question, what is the true shamrock, is not so easy to answer. Tradition says that Saint Patrick, when he landed at Wicklow in 433 A.D., at the beginning of his evangelical mission to Ireland, held up a leaf of shamrock to illustrate the doctrine of the Trinity, saying "Is it not as possible for the Father, Son and Holy Ghost to be one, as for these three leaves to grow upon a single stalk?" But this incident is not recorded in any of the early Lives of the Saint, and it first appears at the end of the 14th century, nearly a thousand years after the event.

This makes it very difficult to accept as a historical fact, particularly as we can find other grounds to account for the origin of the legend.

As Saint Patrick was the favourite Saint to appeal to for protection against evil; and clover was regarded as a holy protective plant, abhorred by serpents, there is a prima-facie reason for supposing that shamrock was fathered on to Saint Patrick at some date after his death, and that the story was subsequently invented, say, by an ingenious monk, to give more point to the connection. It has been shown that a form of the French fleur-de-lys closely resembling a clover leaf appeared on Henry IV's coins between 1399 and 1413, and was in common use as an ornament in the Middle Ages.

This may provide a middle link in the sanctification of the pagan clover—or it may simply be that a clover leaf with its stalk is roughly shaped like a crucifix. Etymology gives no clue, for "seamrog" was used in the 16th century to denote a large number of plants, not all of them with trefoil leaves.

The Englishman of the time used to regard it not so much as a

national emblem, but as a national food, of the Irish. Fynes Morison, an English lawyer, who had travelled widely in Europe, went to Ireland in 1600 to serve under Charles Blount in crushing the Earl of Tyrone's rebellion. He wrote an Itinerary which has been preserved, and of shamrock he says " The Wilde Irish willingly eate the herbe shamrock, being of a sharp taste, which as they run and are chased to and fro, they snatche like beastes out of the ditches." Fynes Morison evidently enjoyed chasing the Irish peasants to and fro, having no great admiration for them, as he makes abundantly clear in his book. " The wilde, and, as I may say, meere Irish, inhabiting many and large provinces, are barbarous and most filthy in their diet." " Many of these wilde Irish," he says, " eate no fleshe but that which dyes of disease or otherwise of itself."

Spenser in " A View of the State of Ireland " says that the Irish " flocked to a plot of watercresses, or shamrocks, as to a feast," and Wither, in his " Abuses stript and whipt " has the following couplet:

" And for my cloathing in a mantle goe,
And feed on shamroots, as the Irish doe."

The passage in Fynes Morison in which he describes shamrock as having a sharp taste and growing in ditches led an ingenious 19th century writer, Edward Bicheno, to suggest that wood-sorrel was the plant known to the Irish in the Middle Ages as Shamrock, at the time when the St Patrick legend sprang up.

As further evidence he points out that on March 17th, St Patrick's day, clover is only waking reluctantly from its winter sleep, while wood-sorrel, an early riser, is both abundant and conspicuous at that time of the year. Expert opinion was called for, with the usual result; for one botanist said that wood sorrel was only a recent introduction to Ireland, and another said the same thing about white clover.

The wood-sorrel explanation, to my mind, is a typical 19th century product of the " Goat and Compasses " = " God encompasseth us " type. Wood-sorrel is a so much more elegant plant than clover, and droops in the hot sun like a Pre-Raphaelite maiden. But all this controversy seems rather wasted when we reflect that the " Wilde Irish " must have been at least as bad botanists as the English were at the time, and consequently quite unable to distinguish between the various plants which bear trefoil leaves. So that there can never have been any one plant to which the term applied precisely—assuming, of course, that we reject the St Patrick legend.

The practice of eating clover is not confined to the Irish. They share it with the Apache Indians of Arizona, the Digger Indians of California, the Lapps, and other primitive tribes. The Irish no longer eat the raw leaves, so far as I am aware, but certainly as late as the last century they mixed in the powdered flowers of *pratense* and *repens* to eke out their flour when making bread. This was also done in parts of Scotland, according to Lightfoot, and Linnaeus has the same account to tell of the Lapps in his " Flora Lapponica." The Digger Indians cook red clover by placing moistened layers of the young leaves between

hot stones, and the Apaches boil them with young grass, dandelions and pigweed to make a kind of vegetable soup.

Hegi says that during the war, when green stuff was scarce, many Germans used to boil young clover plants instead of spinach, and found them an excellent substitute, if not cooked too long.

In the herbals the clovers—principally red and white clover—were valued for their cooling and binding qualities. Dodonaeus, according to Parkinson, held them " good to ease the griping pains of the guts." The juice was drunk and applied in cases of adder bite; and the leaves used in poultices to reduce swellings.

Parkinson, writing of the four-leaved purple blotched form of white clover, which he calls *Quadrifolium fuscum*, or Purple-Grass, says " I never saw this but in gardens where women keep it in confidence to be good for the purples in children and others." I have not yet discovered what the " purples " were, but this seems a clear case of sympathetic magic.

The friendliness of the clovers to the human race is also apparent in their distribution. Like civilised man clovers would appear to have had their origin on the Iranian plateau, and to have spread round the shores of the Black Sea and the Mediterranean. At the present day the concentration of species is at its highest in Italy and Asia Minor, and distribution maps usually take the form of ellipses drawn with these two countries as focal points. There is, of course, no direct connection between the rise of civilised man and the rise of the clovers; for the latter were already highly differentiated in the middle Tertiary epoch, at the time of the Great Ice Ages, when man was still very ape-like. The connection is indirect, and consists in the fact that both civilised man and the clovers disliked steppe and tundra, forest and jungle and desert, and liked the equable climate of the great inland seas.

White clover and red clover are by far the commonest species. Their natural distribution takes them north to the Arctic ocean and east as far as Lake Baikal and Tibet; but owing to their agricultural importance they have been introduced into practically all countries in the temperate zones of the world.

Clovers are divided into two classes; Trifoliastrum and Lagopus, the chief criterion being the presence or absence of a hairy ring in the mouth of the calyx. White clover belongs to the first of these, and red clover to the second.

White clover is first clearly mentioned in the 16th century herbals, Brunfels giving the first illustration in 1540 where he calls it " weyssz Fleyschblum " or " *Trifolium album.*" In the next century, when almost all clovers were described as forms of *pratense*, white clover is called by C. Bauhin, " *Trifolium pratense flore albo minus et foemina glabrum.*" In England it has had many vernacular names:—White clover, Dutch clover, trefoil, white honeysuckle, bubby roses and quillet.

It has the widest distribution of all clovers. The chief reason for its success is its adaptability to almost any soil. The main root goes deep where this is possible; and where it is not, the shallow rooting stolons

come into their own; so that it makes the best of both worlds. The stolons are fleshy and can stand considerable drought, and have the power of persisting in a dormant condition, producing only tiny leaves wherever the soil conditions are unfavourable. This fact gave rise to the widespread belief that white clover springs up spontaneously wherever lime or basic slag is thrown. In fact the lime merely counteracts the high acidity which had been keeping the stolons almost dormant, and enables them to send up visible leaves, and to appear in a miraculous way where there was no sign before. This, at any rate is one explanation of the undoubted fact. Others point to its power of producing what are known as " hard " seeds. These amount to about 17% of normal samples. Their epidermis is so hard and impervious that, unless it is scratched, moisture cannot get in to start the germination process. In nature such seeds have been known to remain for as long as 30 years in a dormant condition, and then to germinate when the soil is disturbed. This was demonstrated by A. Peter, who took some soil from the heart of a small pine wood, which had been planted thirty years before on pasture land, and succeeded in germinating white clover seeds found in the sample. By producing a small proportion of hard seeds of this kind *T. repens*, in effect, casts its bread upon the waters, and ensures its survival through long periods of adverse conditions.

The seeds have the power of passing unharmed through the alimentary canal of animals. Stebler and Schroeter found 5370 seeds in 1 lb. of dried residue from a liquid manure barrel, of which 62% germinated successfully. As stock animals are so fond of white clover, a fair proportion of plants must get distributed in this way.

Miss Erith in her monograph on white clover, lists six sub-species: *sylvestre*, *purpureum*, *grandiflorum*, *rubescens*, *Biasoletti* and *ochranthum*. Babington speaks of a pink form which he found in the Scilly Isles and named *Townsendi*. This is probably Miss Erith's *rubescens*. *Grandiflorum* is a dwarf form with long (1½ cm.) flowers, reported by Druce from the Shetlands. *Purpureum* I have already mentioned. It is described charmingly in Parkinson " The Purple-Grasse spreadeth on the ground. The leaves are in some, 3, in others 4 or 5, on a stalk, of a sad green colour, with a shadow of dark purple cast over them."

All the forms found wild or used agriculturally in England belong to the sub-species here called *sylvestre*. Of this a vast number of agricultural forms exist, but they may be grouped into three classes: *sylvestre* proper (or wild white clover), *sylvestre Hollandicum* (Dutch clover) and *sylvestre giganteum* (Lodi clover). There is no morphological distinction between these forms. They differ only in their relative size, wild white clover being very prostrate, small-leaved, with short internodes; Dutch clover rather larger, with more flowers per head; and Lodi clover, a giant form which does not root so freely at the nodes, and has leaflets sometimes as much as 1½ inches long.

As it is of some importance to farmers to be able to know that the seed they are buying is of the kind they require, a way of testing samples has been devised which will distinguish those of the wild form

(which has become very popular of late years) from the other two. The whole plant of the wild form, seeds included, possesses what is known as cyanophoric glucoside, a compound containing the poisonous principle of prussic acid. This is rarely present in dangerous degree, but many cases have been known, particularly in hot climates such as India and Carolina, where cattle have eaten abundantly of a luxurious crop and subsequently suffered from salivation and other symptoms of cyanide poisoning.

Dutch and Lodi clovers are, in most cases, free from cyanophoric glucoside, so that seed analysis is of some help in deciding whether the seeds are properly described.

Lodi clover is named after a district in N. Italy where the form first appeared, and where it has been cultivated extensively for a considerable time.

Dutch clover is so called because it was first introduced as a cultivated form from Holland.

The numerous references to clover culture which occur in 17th century books on husbandry refer to *pratense*, the red clover, which was also introduced from the Netherlands, and I shall deal with them when I reach this species. Dutch clover appears to have been introduced from Holland or Flanders round about 1700, but strangely enough there is no printed reference, as far as I can find, to the circumstances in which it was introduced. It reached Germany at about the same period, and France a little later, also without leaving any trace of the pioneers. No doubt a prolonged search among early newspapers and agricultural journals would enable us to date its arrival with more precision; but it seems unlikely that we owe it to any one individual as is the case with red clover, but rather to the enterprise of a number of seed importers.

From the beginning of the 19th century until to-day agricultural stations in most countries have been studying and comparing the merits of various strains of white clover; the chief centre in Great Britain being at Aberystwyth.

The conclusions reached are strikingly similar. For permanent pastures each country discovered that seeds from a native wild form were the best. Clover seed coming from a warmer land always gives a far larger crop the first year, but fails quickly and dies out in the second and third years. On the other hand, seed from a colder climate produces plants which, although long lasting, cannot compete in size and luxuriance with the rest.

English farmers have found that New Zealand seed is excellent for quick results, being not so tender as the Italian Lodi clover and more persistent than Dutch. It does not, however, last indefinitely and for this reason English Wild White is preferred when laying down permanent pastures.

The greater part of the English white clover crop is harvested in Essex. It is a singularly difficult crop to harvest and is usually cut with a mowing machine trailing a sheet of sackcloth or zinc.

White clover is, of course, an important source of honey for bees. The honey flow occurs in May, and although very abundant, is quickly over. Bees are not so active at this early season and consequently do not take full advantage of the supply. The Danes characteristically endeavour to overcome this by taking the lazy bees out in a bag and releasing them in the clover fields.

That honey bees visit white clover and not red clover has long been well known. It was Darwin who showed the reason—that the proboscis of the honey bee is not long enough to reach the nectar in red clover. In Werdenberg in Switzerland the fact is explained by a legend that God, being displeased that bees did not rest on the Sabbath day, ordered them to make a choice, either to rest on that day or to give up visiting red clover, their favourite source of nectar. They preferred the latter alternative, and since then have only visited white clover. At the present day the scientist is trying to breed bees with longer tongues and red clovers with shorter tubes, hoping eventually to get them to fit. He has not made much headway, as proboscis length is not a good inheritance factor. Nevertheless quite a large proportion of honey is obtained from red clover, as some bees have learned the trick of biting a hole in the nectar tube.

Trifolium pratense, or red clover, has to-day a distribution as world wide as that of *repens*. There has never been any difficulty over its name, for, as far back as in 1562, Turner calls it "The Common Trifoly that groweth in Myddoes." The Latin name "pratense" was used almost unanimously by the early botanists before Linnaeus established it by his authority in the "Species of Plants." It is a highly variable species and a vast number of forms, varieties and ecotypes have been distinguished and separately named for the farmer's benefit, unfortunately without any attempt at standardisation. There are, however, two principal races, the first containing moderate sized plants with scattered, adpressed hairs; the second stronger and taller plants with patent hairs. To the first race belong the common perennial wild forms grouped by Hegi under the name *spontaneum*; and also most of the cultivated central European forms under the name *sativum*. The *sativum* forms are usually biennial, although there are exceptions, such as that known in England as Cow Grass, which are perennial. The second race contains the varieties extensively cultivated in America, and called, therefore, *americanum*. They are not strictly American forms, as they originally came from Bohemia and Austria, where they are still to be found wild; but they have, I suppose, as much claim to American nationality as any citizen of the United States.

There is a rather beautiful sub-alpine form with white flowers that belongs here, known as *frigidum*. For the farmer, the choice is between an early- or a late-flowering form. The early-flowerers come mainly from the warm temperate regions of Europe and America, the late-flowerers from the colder north, in particular Scandinavia and Russia.

In the last century, Cow-grass—which is often confused with *T. medium*, the zig-zag clover—was very popular owing to its permanence,

but farmers nowadays have come to realise that it is cheaper to get two good annual crops, and sow again in the third year, rather than a small and continually decreasing crop for five or more years, as with cow-grass.

Red clover is the principal agricultural clover. The introduction of the practice of sowing it as fodder for livestock marked the beginning of a new agricultural epoch, for until then intensive cattle farming was impossible. German authorities say that red clover cultivation was brought from ancient Persia to Greece and Rome; lingered on in Italy and Spain on the break-up of the Roman Empire; from there was introduced to the Netherlands when this was a Spanish possession; and finally from the Netherlands was disseminated in the 17th and 18th centuries to Europe in general. The first part of this history appears to be purely guesswork, based on the analogy of lucerne, and, on the whole, is rather unlikely. There is no Sanskrit word for clover, which we should expect had it been cultivated by Iranian tribes, nor is the practice of sowing it mentioned in any Greek, Roman or Moorish agricultural work that has survived. Its culture is first mentioned in the 12th century A.D. by Albertus Magnus, who spent the greater part of his life in Italy, and it seems very probable that it originated there, although in isolated cases farmers in Spain, Germany or France might have discovered the trick of saving clover seed and scattering it on a new pasture. At any rate, as the need for special fodder is greater in South Europe, where the summer sun scorches up the meadows prematurely, it is more likely that clover husbandry started there, rather than in the north.

After Albertus Magnus, there is a complete silence in literature on this point, until the end of the 16th century, when it is mentioned by several writers. Dodonaeus recorded its culture in the Netherlands, Colerius said that it was sown with barley at Wittenberg, while both Gallo and Tarello pressed its claims strongly on the Venetian Senate. There is no doubt that these two Italians deserve the credit of being called the literary pioneers of clover. Tarello, in particular, wrote a book (*Ricordo d'Agricoltura*, 1567) which is full of ideas far in advance of those of his contemporaries. He advocated a rotational system of farming and came very near to discovering the significance of the nodules on the roots of leguminous plants. Haller suggests that Tarello by "trifoglio" meant lucerne, but the fact that he recommends that it should be ploughed up after two years makes this very unlikely, as lucerne must stay three years to reach full productivity.

Most authorities say so definitely that the culture in the Netherlands was introduced from Spain that we must accept it, but I have been able to find no evidence on which to base this statement. Its spread from the Netherlands to the rest of Europe is, however, well documented. Sir Richard Weston, who had estates at Sutton, Surrey, was responsible for bringing it to England. He visited Flanders in 1633 and was struck by the successful use of red clover there to redeem barren land. On his return to England he brought back seed and dis-

tributed it. On the outbreak of the civil war he was exiled, being a Royalist and a Catholic, and his estates were sequestrated. In the confusion, a manuscript of his, addressed to his sons, and concerning clover culture, was apparently mislaid and subsequently reached the hands of Samuel Hartlib, a prolific publisher on agricultural matters. Hartlib published it anonymously in 1645—while Weston was in exile in Flanders—under the title "A Discours of Husbandry used in Brabant and Flanders." He subsequently claimed to have been ignorant of the true author of the book; but Weston never forgave him for it. The book contains an account of the Flemish method of dealing with poor and heathy land, which was burnt, limed, ploughed, and sown with flax and turnips the first year, and with clover and oats the second year. In the third and fourth years the clover was allowed to stand as the sole crop. After lapse of time, we are told, "it turns commonly from a red honeysuckle to a white"—which apparently means that the red clover was ousted by *T. repens*, the white.

Hartlib was one of the first publishers to print advertisements for other commodities than books. The "Discours of Husbandry," already referred to, contained the following advertisement: "If any desire to have the great clover of Flanders or the best sort of hemp or flax seeds of those parts, let them enquire at Mr James Long's shop at Billingsgate, and they shall, on timely notice, have them procured new and very good from Flanders at reasonable rates." The general impression, however, was that they were neither very good, nor at reasonable rates. Andrew Yarranton says, in the second edition of his booklet called "The Great Improvement of Land by Clover," published in 1663: "I am apt to think that one of the greatest discredits this husbandry hath met with, hath been from the seed: it were too long to tell you what envious base arts were used in Flanders and other parts to prevent our having good seed, lest we should get the art of clover as well as they, so that much of the seed, being bad, never came up, and being dear, the loss was great, and the disappointment no less; and in this case, the country had no remedy, not knowing good seed from bad, but must take such they could get, or none; which made many after few trials, disuse it, rather than run the hazard of such chargeable adventure."

The same point is made in a more rueful way in a letter from an anonymous Irish gentleman which appears in the third edition of "Hartlib's Legacy." "I was at the charge for sending for a hundred weight of clover grasse seed, on purpose to encourage the chief of our friends here to undertake the husbandry of it, and when it came, I sowed some in my own garden, some I sent to Col. J, some to Col. H, some to Capt. V, and to other colonels and officers of the army. Lately I furnished some of it to two gentlemen in the country that were excellent husbandmen. And thus I dispersed it, giving away some parcels and selling some others and sowing the most part of it with others in partnership. But though I used the care I did to procure good seed, and though I am as confident of Mr M, my friend's, care, who had it where you directed him, and staid for it while the merchant told him

he had new come over; yet none of all these parcels I speak of, so much as came up, save one handful of it which I sowed in my garden. And my friends here have sufficiently abused me for it. Pray Sir, present my humble service to honest Sir Charles Culpepper when you write to him, and my thanks for his so free communications of his clover-grasses husbandry."

In spite of the enthusiastic advocacy of some of the wealthier amateur farmers, red clover culture made very slow progress among the farmers in general. Even in the next century Jethro Tull says that "Farmers, if advised to sow clover, would certainly reply, Gentlemen might sow it if they pleased but they (the farmers) must take care to pay their rents."

Towards the end of the 18th century, however, two factors turned the scale in its favour: the production of home-grown seed, and the consequent improvement in price and quality, and the rise of agricultural societies which spread the knowledge won by experience to a wider public. To-day as much as 600 tons of seed are used yearly in Great Britain, coming from almost every country in Europe, as well as Canada, U.S.A., New Zealand and Chili.

It was of red clover that Darwin propounded his paradoxical example of syllogistic reasoning. The more cats, the less field mice; the less field mice, the more humble bees; the more humble bees, the more red clover; ergo the more cats, the more red clover.

There are two other minor ways in which it is of direct service to man. The dried flowers, digested in water, produce a yellow dye, which is usually mixed with indigo, or, according to another author, copper sulphate, to make a green dye, and is used for woollen fabrics, particularly in Sweden and Germany.

The tough stems of the cultivated form are also used in Germany to make string, which is said to be of better quality than that made from cotton.

I cannot leave red clover without mentioning the baffling "clover sickness." The undoubted fact is that if red clover is grown on the same land for five or six years in succession there comes a winter in which almost the whole crop dies off for no apparent reason. After this, it is fatal to sow clover on the same land until four years have elapsed. Various theories have been put forward to account for this such as humus deficiency; deficiency of potash, lime or phosphorus; decline of the nitrogen bacteria; attacks by fungus diseases, such as that known as anthracnose; or by stem-boring pests; but, much to the scientist's perplexity, whenever experiments are tried, either the control plot fails to develop the sickness, or the particular remedy that is being tried has very little effect in preventing or ameliorating it. The vague official view in England is that it is due to a combination of causes, chief of which is a soil deficiency of some sort. The plant dieticians of the future will probably find that it is the case of vitamin X starvation. The annoying thing is that they don't suffer from it very much in America, and experts there look upon the disease as only another instance of English incompetency.

The Survey of Limpsfield Common.

THE intensive study of a small area has many advantages over the usual ramble attended by members of the Society. It has enabled members of the various sections to meet on common ground to the mutual advantage of all concerned. Such joint excursions of the Section as have been held and as planned cannot but have beneficial results to the whole Society and deserve enthusiastic support.

At Limpsfield, specialists and those with wide interests can study in useful co-operation. Here, the problems of distribution, the interwoven lives of the animals and plants and their interesting habits can be better studied. Already rare and little known animals and plants have been found. But it is on the everyday life and distribution of the commoner species that the ecologist is chiefly concerned rather than with casual visitors whose influence on the normal flora and fauna may be negligible. The interesting habits of the common animals and plants can only be studied when close attention is given to a small area.

The survey of Limpsfield Common aims at a knowledge, as complete as possible, of the fauna and flora of the area, its numbers of individuals, their fluctuations and the causes, their inter-relations, and their habits as influenced by the area and its conditions.

The basis of such a study must be correctly identified plants and animals to enable past, present and future knowledge to be correlated. The introductory studies attempted therefore have been to list the species present and describe the major conditions ruling on the Common. The first lists are presented herewith. They are of a preliminary nature only but should be of assistance to visitors other than specialists in the group concerned.

During 1938 it is proposed to continue work on these lines, with special emphasis on the vegetation survey, which must be the basis of any ecological study. All are asked to pay special attention to Areas A, Nb, Rb, and W, as these are each confined to one of the four geological beds present. A panel of recorders has been formed to assist the sub-committee organising the survey (C. P. Castell, P. W. E. Currie, J. E. Lousley, and L. Parmenter) in compiling lists and in the organisation of ecological work later. Members are asked to assist by reporting direct to the recorders as regularly as possible so that up-to-date lists can be kept of the species IN SYSTEMATIC ORDER with areas of occurrence, and lists of species IN EACH AREA with notes on habitats and abundance. The recorders are:—

BOTANY.

Flowering Plants, Grasses and Ferns, J. E. Lousley.
Mosses and Liverworts, C. P. Castell.
Fungi, ... J. E. Lousley.
Mycetozoa, ... J. Ross.
Lichens, ... A. H. Norkett.
Micro-fauna and -flora, E. C. Brown.

ZOOLOGY.

Mammals, Reptiles, and Amphibians, R. S. R. Fitter.
Birds, ... P. W. E. Currie.
Mollusca, ... C. P. Castell.
Hymenoptera (Bees and Wasps)—
Aculeates, ... K. M. Guichard.
Sawflies, ... P. W. E. Currie.
Parasitic, ... Miss M. M. Hose.
Diptera, ... L. Parmenter.
Lepidoptera, ... R. W. Robbins.
Coleoptera, ... K. M. Guichard.
(Staphs.), ... W. O. Steel.
Odonata, ... P. W. E. Currie.
Hemiptera-Heteroptera, Miss M. M. Hose.
Orthoptera, ... J. L. Harrison.
Arachnida, ... C. H. R. Thomas.
Myriapoda and Crustacea (Woodlice, etc.), ... W. O. Steel.
Plant Galls, ... H. J. Burkill.

Photographs recording the phases and seasons for the various areas and habitats will always be welcome. Our thanks are due to Miss C. E. Longfield for a series of 12, duly mapped, presented to the Section in 1937.

The boundaries of the various areas into which the Common has been divided were defined in the *London Naturalist*, 1936, pp. 46-48, together with a map of the Common. Further copies of the map on opaque or transparent paper may be obtained from the Hon. Sectional Secretary, price 1d each or 12 for 6d (postage extra).

The official sectional visits to the Common take place on the first Sunday in each month. Details of trains and subjects of special study appear in the Society's syllabus.

L. Parmenter, *Hon. Sectional Secretary.*

PRELIMINARY OBSERVATIONS ON THE TOPOGRAPHY, GEOLOGY, CLIMATE, UTILIZATION AND MANAGEMENT, AND VEGETATION OF LIMPSFIELD COMMON.

By R. W. Robbins.

TOPOGRAPHY.

Limpsfield Common lies along a ridge of high ground, running east and west parallel with and about two miles south of the ridge of the North Downs, which here reach their highest point (882 feet above sea level). The Common is about nineteen miles south from the centre of London, the longitude of Greenwich passing a few yards outside its western extremity. The ridge is quite narrow at the western end but broadens rapidly eastward, giving the Common an outline roughly triangular, with N.W., N.E. and S. sides. Below to the north lies the village of Limpsfield, and to the west Oxted, the two places being practically continuous with the railway station in the midst. Their united population, now about 7000, is increasing rapidly, but not phenomenally, and the district is still essentially rural. Immediately around the Common are residences with extensive gardens and grounds; on the steep N.W. slope below sections A, B, and E there are dry oak-birch woods, and on the N.E. boundaries of sections T. and W., open fields and woods.

The Common is crossed by a valley running east and west known locally as Happy valley. It begins as a depression on the eastern

boundary (Uc) and falling with a steady gradient, separates sections Na and Nb, Ka and Kb, leaving the Common at a point where it is 70 or 80 feet below the surrounding levels. It is normally quite dry, though one or two pools form at times in the upper part. Lower down it is narrow and steep sided.

The general elevation is about 500 feet. The lowest point, where the valley leaves the Common between Ka and Kb, is just above the 400 foot contour. The high ground of West Heath (*i.e.*, sections A to E) and of sections La, V, W. X and Z is over the 500 foot line. At the cross roads by Central Heath the elevation is 471 feet. The ground then rises to the south east and soon reaches the 500 foot contour again, the highest level being on the southern border of section T, about 525 feet.

GEOLOGY.

Geologically the Common lies wholly upon the outcrop of the porous members of the Lower Greensand series, and the soil is consequently dry. The steep northern slope is Folkestone Sands, cut away by the valley of the Oxted brook. The strata dip to the north at a small angle, 5° or 6°, so one looks across the Gault and Upper Greensand in the valley to the chalk escarpment two miles away. The Folkestone Sands consist here of an infertile ferruginous sand, with bands of ironstone. They occupy the whole surface in sections A, D, G, Lb, X, Y and Z and parts of B, E, Ka, La, M and Na. The quarry (Y) at the top of the village street shows them well, with a heavy band of ironstone.

Along the southern side of the Common we find the Hythe Beds, the hardest of the series, a cherty sandstone weathering into a rather more retentive soil. Eastward, in Kent, this bed is more of a limestone, forming the well-known Kentish Rag. Here it contains little or no lime. It forms the southern escarpment of the Greensand, overlying the Atherfield Clay, so that on this slope are wet woods and many springs, unfortunately beyond the Common boundary. On the Common the Hythe Beds occupy the lower part of section C and the greater part of H and Kb, the whole of Rb, S and T, and the southern angles of Ra and Ub.

Between the Folkestone Sands and the Hythe Beds lies a strip of rather silty sand, which is considered to represent the Sandgate Beds. It is about 100 yards wide from the S.W. boundary of section C, up the Happy Valley to Central Copse (Q). Here its southern edge bends south and then east to Links Cottage and across to the N.W. corner of section S. The northern edge turns due east over the cross-roads to the outer boundary. The whole of sections F, Q, Nb and P are included, and parts of B, E, H, K, Na, Ra and Ub.

The high ground in the northern angle of the Common is overlaid with a drift bed of old plateau gravel. It appears to be a river gravel formed of flints from the chalk and material from the greensand. It covers the higher part of sections La, M, Na (down to the cross-roads) and the whole of sections Ua, Uc, V and W. In the last named it has been extensively dug. Gravel apparently similar occurs on the slopes of the Happy Valley in sections Ka and Kb, but is not shown on the

geological map enlarged by Mr C. P. Castell from the inch to the mile survey. The boundaries of the formations need examination.

CLIMATE.

The climate of the district is in general mild and sunny, with few fogs, but, on account of the elevation, rain is more frequent than in London and snow is sometimes very heavy. On March 5th and 6th, 1937, great damage was done to tall gorse on the Common by a fall of wet snow which produced .97 of an inch of water in the gauge, equivalent to about 10 inches of snow. Spring flowers are on the whole a week or ten days later than at lower elevations east and west, such as the Darent valley about Sevenoaks, but there is much difference in north and south slopes. The rainfall is about 30% greater than in London, the annual average exceeding 30 inches. A rain gauge in Oxted about half a mile from the Common has recorded 30.83 inches between January 1st and October 31st, 1937, the London figure being 23.70 inches. In the abnormally wet first quarter when the London rainfall was 10.24 inches, at Oxted 14.82 inches fell. No sunshine records are available, but from observation over many years it can be stated with confidence that they approximate closely to the figures for Tunbridge Wells, which is similarly situated about 13 miles S.E., and where the annual average is 1632 hours—London (Kensington) 1309 hours.

UTILISATION AND MANAGEMENT.

The exercise of common rights has almost ceased on that part of the Common with which we are concerned. Motor traffic has made grazing unsafe. A little firewood is cut, chiefly birch. Bracken is cut for litter in certain areas, of which a chart has been kept. Sand is still taken in small quantities from the ancient quarry (Y) which has in the past supplied much of the ironstone to be seen in walls and footpaths about the village. Material is not now taken from West Heath Sandpit (D), the gravel pits in section W, or Links Pit (P), which supplied brick earth. Other small excavations in sections A, C, H have been used as depositories for garden rubbish.

A clump of young birch trees on Wildshaw Heath (B) marks the site of the emplacement of an anti-aircraft gun which was mounted here during the War. The emplacement was dismantled and broken up in 1920 and the trees have grown since. In the same year the new road was made across the Common from the top of Wolfes Hill (G) to the Westerham road opposite Limpsfield school.

A nine hole golf course (no Sunday play) occupies the open parts of sections R, S, U, V and Wa. Section V also contains the cricket ground of the Limpsfield Cricket Club and the playground of the school. The Common is used freely by residents in the neighbourhood, including children from at least three boarding-schools. There is a certain amount of horse-riding, and efforts are being made to persuade riders to keep to certain tracks and areas. At week-ends, especially from May to September, the Common is much used by visitors, who chiefly patronise the neighbourhood of the Westerham and Edenbridge roads.

With the approval of the Lord of the Manor and the co-operation of his Agent, a Limpsfield Common Committee of local residents is undertaking the care of the Common and the preservation of its amenities. The Committee has put up litter boxes, parking and other notices and directions to horse riders, and employs a ranger. One aim of the Committee is to check the growth and spread of bracken and encourage the heather. Operations were begun in 1935 on the West Heath in sections A, B and E by scything three times in the season. This year, 1937, a " bracken breaker " has also been used and the area has been extended. Other activities of the Committee include some burning, in strips, of worn out heather and clearing limited areas of all gorse and undergrowth, including some small trees, chiefly birch. Charts of these operations are being kept by the Ecological Section.

VEGETATION.

The general types of vegetation in each of the sections defined on the map published in the *London Naturalist*, 1936, are given below:—

A. Andrews Heath. Heather (*Calluna*) with some gorse and bracken. Birch on the west side and dry oak wood along the northern side.

B. Wildshaw Heath. On the ridge, hair grass (*Deschampsia flexuosa* Trin.) is dominant where bracken has been checked. Heather and gorse below and oak wood on the northern edge. Birch clump and scattered birches. Bare sand and sandy paths fringed with purple heath (*Erica cinerea* L.).

C. South Border Wood. High mixed wood of pine, oak, birch, etc., with bramble or mixed undergrowth.

D. West Heath Sand-pit. Thickets of gorse (*Ulex europaeus* L.) interspersed with almost bare spaces and sandbanks. Oak scrub, heather and purple heath.

E. St Michael's Heath. Similar to B., but less *Deschampsia* and more heather and gorse. Large hollies and bracken.

Ea. North Border Wood. Oak and birch, almost scrub.

F. Sallow Pool Wood. Oak, holly, birch and hawthorn. Shallow pool with some sallows. Undergrowth in this section was cleared in November 1937.

G. Triple Wood. Small mixed wood of oak, hawthorn, etc., round the road junction. Strong clump of clematis and a blackthorn thicket.

H. Wolfes Hill Wood. High mixed wood round an open area of bracken and gorse. Oak dominant on the eastern slope. Thickets of thorn and rose.

Ka. Happy Valley North. Bracken and heather (*Calluna*) on the steep part of the slope with large hollies. Strip of oak wood above. Gorse, bracken and scattered birches.

Kb. Happy Valley South. Heather dominant along the slope mixed with dwarf gorse (*Ulex minor* Roth). Above, at the west end, a grove of old birches merging into a mixed wood. The rest of the high ground is bracken with remnants of heather, large solitary hawthorns and fragments of woodland.

The valley bottom is grassy and contains some representatives of a chalk flora such as stemless thistle (*Cnicus acaulis* Willd.) and burnet saxifrage (*Pimpinella Saxifraga* L.).

L. Lovelands Heath. Open turf alongside the new road and a strip of oak wood. Above, gorse, heather and bracken with areas of short close turf containing dry turf flora. Some clearances of small growth, 1936-37.

M. Pebble Hill. Steep broken slopes of gorse and bracken with close mixed wood at the foot, and in the upper angle a grove of large hollies and oaks. The pool is practically silted up with road washings. Some rowan and birch.

N. Central Heath. A strip of open wood of oak, birch and holly follows the path from the north to the south angle. At the southern end a thicket of cherry (*Prunus avium* L.). Central depression grassy and damp. The rest of the area is bracken, gorse and heather with much *Ulex minor* Roth.

P. Links Pit. An excavation for brick earth. Western half a thicket of oak, hawthorn, sallow, cherry, etc.; the rest is open grassy, with gorse and heather. The open pool is more or less permanent, and contains water buttercup and other plants.

Q. Central Copse. A small wood of birches (*Betula alba* L. and some *B. pubescens* Ehrh.) said to be no more than 25 years old. Most of the undergrowth cleared and three short rides cut by the Committee.

R. Links Heath. Open oak wood along the western edge and at the S.E. angle. A thicket north of Links Cottage has been made into sections by cutting rides. A belt of gorse follows the half-mile footpath. The golf course occupies the open ground. The fairway is mainly fiorin grass (*Agrostis*) and fescue (*Festuca ovina* L. and *F. rubra* L.) with heath bedstraw and patches of short heather. There is heather but not much bracken round the golf course. Turf and old hawthorns on southern edge.

S. Ballards Heath. Part of the golf course (see above, Sec. R.). A small group of aspens on the northern side. Hollies and hawthorns.

T. Ridlands Wood. About 19 acres of natural woodland, varying in character. Chiefly oak (*Quercus Robur* L.) with a sprinkling of birch and beech and much holly. Heather and bilberry (*Vaccinium Myrtillus* L.) in the undergrowth near the western end, giving place to bramble. Beyond the middle of the wood beeches increase, and become dominant at the eastern end, with almost bare floor except for a few hollies.

U. Golf Course. See Section R. A thicket follows the eastern edge of Ua., becoming a damp oak wood (Uc.) in the centre, and more open in Ub. There are some shallow grassy excavations near the cross roads, with the adder's tongue (*Ophioglossum*) and one or two sedges. Clumps of blackthorn.

V. Playing Fields. Turf and short heather.

W. Hookwood Heath. Thickets of gorse, bramble, sallow and mixed small wood with one or two small pools. Open grassy and gravelly areas enlarged in 1937 by clearing. Some pines and at the north end a close wood of oaks and sycamores.

X. North Wood. Upper part of slope is a close wood of old pines and birches with almost bare floor. Below open birch and bracken, rowan (*Pyrus aucuparia*) and some bilberry (*Vaccinium Myrtillus* L.). A shallow pool (Legion Pool) almost dry in summer at the upper east end.

Y. The Quarry. Sandy slopes, too loose and disturbed to carry a regular sand flora. Gorse, brambles and the sheep's-bit (*Jasione montana* L.).

Z. Quarry Heath. The upper part is turf with oak, birch, gorse and bramble thicket. Below, steep slopes with elm thickets and some rough turf. There are old stone walls.

SOIL ACIDITY.

By C. P. Castell.

The apparatus used was the B.D.H. Soil Testing Outfit. This is designed for use in the field and comprises a dropping bottle containing the Soil Indicator and a porcelain "boat" which is divided transversely by a partition into two unequal parts. One end of the boat is used for holding the sample of soil and the smaller end for the reception of the coloured liquid which is drained off from the soil after the addition of the indicator.

The Soil Indicator is a liquid the normal colour of which is green, but when mixed with an acid or sour soil it becomes yellow. If the

soil is strongly acid, the liquid becomes red, if an abundance of lime is present it turns blue. Acidity is indicated by a number known as the pH value which increases as the acidity diminishes, *e.g.*, 7 is neutral, 6 acid and 8 alkaline.

The acidity of the soil is estimated by comparison with a colour chart showing the various colours produced by the indicator between pH 4.0 and 8.0 in steps of 0.5. Although this method gives only approximate readings, the outfit has the great advantages of cheapness, portability and simplicity.

The soils on Limpsfield Common consist mainly of gravels and sands and, as might be expected, yield an acid reaction, most of the readings ranging from 4.5 to 5.5. Conditions are not excessively acid, as the Bog Mosses, *Sphagnum*, seem to be absent, and in K (a) several calciphile plants appear, apparently on the Sandgate Beds. On the other hand, physical conditions, rather than acidity, may be the important factors.

About twenty readings were taken on four visits from June to December 1937 in soils derived from all the four geological horizons present on the Common.

Note.—5.5+ indicates a reading greater than 5.5 but nearer to it than to 6.0; depths below the surface of the soil are given.

GRAVELS.

Area W. Pit in northern part, at 1 in.—4.5+.
V. Centre of area at 1.5 ins.—5.0.
Ua. (E. edge). 1 ft. W. of footpath at 0.5 ins.—6.5–.
Same, but 5 ft. away among clover.—7.0.

FOLKESTONE BEDS.

Area D. (Sand pit). At surface, among humus.—5.5–.
3 ft below surface.—5.5–.
4 ft. below surface.—5.0–.
Leached sand on floor.—4.5–.
K(a). Among bracken, at top of slope, surface.—4.5+.
Same, at 4 ins.—5.0.

SANDGATE BEDS.

Area K(a). By path, near patch of *Cnicus acaulis*, at 3 ins.—5.5.
Same, nest of ant (*Acanthomyops flavus*), surface.—6.0.
Same, nest of ant (*Acanthomyops flavus*), at 4 ins.—5.5+.

HYTHE BEDS.

Area K(b). Among bracken, at 4-5 ins.—4.5+.
T. Oak wood, in humus, at 1 in.—5.0–.
Oak wood, in sand, at 3 ins.—5.5.

LINKS PIT POOL.

Area P. Water and surface mud.—7.0–.
Surface soil, 2 ft. from edge of pool.—6.0.–
Surface soil, 8 ft. from edge of pool.—5.5–.

BRACKEN ON LIMPSFIELD COMMON.

By R. W. Robbins.

Bracken (*Pteris aquilina* L.) is dominant over the greater part of the Common and in recent years has increased considerably, invading and choking out heather and other low plants. The Limpsfield Common Committee of local residents are endeavouring to check this in certain areas. They began operations in 1935 by scything the bracken three times in the season on parts of West Heath (area B, upper part) and extended them next year to parts of sections A and E, Happy Valley (K), and Lovelands Heath (L). In 1937 they purchased a "bracken breaker," and this was used chiefly on the lower parts of B and E, along the lower slopes of the Happy Valley and on the open high ground in K(b).

After three years the upper part of B has become covered with a dense growth of the grass *Deschampsia flexuosa* Trin., with weak and scattered growth of bracken and a few poor tufts of heather. In Andrews Heath (A) bracken is reduced and a good many heather seedlings are to be found in places, particularly where sand has blown on to the bare surface.

June 6, 1937.—A count was made in area A of bracken stems on 9 square yards of ground where bracken had been cut in 1936 and heather burnt early in 1937. There was an average of 30 to the square yard, average height 13 inches. (This was cut again later.)

June 8, 1937.—Counts were made in K(b) in the bracken area on the open high ground.

Ground undisturbed: two typical square yards gave 24 and 14 stems, average height 2 feet.

On the site of the 1936 fire, three separate square yards were counted:—

Average area, 23 stems.
Thick area, 36 stems.
Sparse area, 12 stems.

The average height here was 3ft. 3ins., the tallest stems 4ft. 6ins.

It looked as if the burning, which was accidental and pretty thorough, stimulated the bracken, but it may be that the fire, by burning off the debris of the old bracken bed, enabled the spring warmth to penetrate the soil and stimulate early growth.

In support of this view was the condition in Central Heath South (Nb), where bracken makes a very strong growth and was quite undisturbed. Many strong stems were coming up, but the average height was 12 to 15 inches only. It should be stated that this area has a gentle slope to the North.

BRYOPHYTA.

By C. P. Castell.

The following preliminary list has been compiled from observations made by Mr J. Ross and myself from October 1937 to January 1938.

Each area has been visited, but none has been intensively worked and most have been merely glanced at in the short time at our disposal.

The Common is rather dry and the soil types do not show much variation, so that a rich bryophyte flora cannot be expected.

Forty-nine species of mosses and six liverworts are listed with the areas in which they occur.

Until each area has been more thoroughly investigated, notes on habitats and relative abundance cannot safely be added to the list.

I have merely listed the species of liverworts, as, so far, I have been unable to work on them myself and have relied almost entirely on a few records given me by Mr Ross.

I am much indebted to Mr W. R. Sherrin, A.L.S., for his assistance in the identification of specimens.

Note.—Records marked W include those from both W and Wa. The following abbreviations are used: *c.fr.*—with fruit, and *c.g.*—with gemmae.

MOSSES.

Tetraphis pellucida Hedw. (*c.g.*)	T.
Catharinea undulata Web. & Mohr. (*c.fr.*)	A, C, F, G, H, Ra, T, Ub, W, Zb.
Polytrichum aloides Hedw. (*c.fr.*)	Y.
P. piliferum Schreb. (*c.fr.*)	A, B, D, E, La, Lb, P, Q, Ub, V, W.
P. juniperinum Willd. (*c.fr.*)	A, B, D, E, P, Q.
P. formosum Hedw.	G, H, Ka, T, W, X.
Ceratodon purpureus Brid. (*c.fr.*)	A, B, H, Ka, Kb, La, Lb, M, Na, Nb, Q, Ra, S, Ua, V, W, X, Za, Zb.
Dicranella heteromalla Schp. (*c.fr.*)	A, B, C, D, F, G, H, Ka, Kb, La, Lb, Na, P, Q, Rb, T, Ta, Ub, Uc, W, X, Za.
Dicranoweisia cirrata Lindb. (*c.fr.*)	A, C, H, Ka, La, M, T, Ta, Ub, W.
Campylopus pyriformis Brid. (*c.fr.*)	A, B, F, H, Ka, Kb, Lb, M, Na, Nb, Q, T, X, Za.
C. flexuosus Brid.	A.
Dicranum scoparium Hedw.	A, B, D, E, Ea, F, H, Ka, Kb, La, Lb, M, Na, Nb, Q, Ra, S, T, Ua, Ub, Uc, W, X, Za.
Fissidens bryoides Hedw. (*c.fr.*)	C, F, H, Ta, W.
F. taxifolius Hedw. (*c.fr.*)	F, H.
Grimmia pulvinata Smith (*c.fr.*)	Zb.
Pottia truncatula Lindb. (*c.fr.*)	Rb.
Tortula muralis Hedw. (*c.fr.*)	A, La, M, Zb.
Barbula convoluta Hedw., var. *sardoa* B. & S.	La.
B. unguiculata Hedw.	Ea.
Funaria hygrometrica Sibth. (*c.fr.*)	A, B, E, H, Ka, Lb, M, Q, W, Za.
Aulacomnium androgynum Schwaeg. (*c.g.*)	A, F, H, Ka, Kb, La, Lb, M, T, Ub, W, X.
Webera nutans Hedw. (*c.fr.*)	A, D, F, H, Ka, Kb, La, Na, T, Za, Zb.
Bryum caespiticium L. (*c.fr.*)	La.
B. capillare L. (*c.fr.*)	A, Ea, Zb.
B. erythrocarpum Schwaeg.	A, H, Lb.
B. atropurpureum W. & M.	A.
B. argenteum L.	H, Lb, M, S, V, W, Zb.
Mnium rostratum Schrad.	Ea, G.
M. hornum L.	A, C, Ea, G, H, Ka, La, M, T, Ta, Ub, W, X, Zb.
Thuidium tamariscinum B. & S.	H.
Camptothecium sericeum Kindb.	Zb.

Brachythecium glareosum B. & S.	Rb.
B. albicans B. & S.	B, Ea, Ka, La, S, V.
B. rutabulum B. & S. (*c.fr.*)	A, Ea, F, H, Ka, Kb, La, M, Ra, Rb, T, Uc, W, X, Zb.
B. velutinum B. & S. (*c.fr.*)	A, T.
B. purum Dixon	A, B, D, E, H, Ka, La, Lb, M, Na, Nb, P, Q, Ra, Rb, S, T, Ua, X, Za.
Eurhynchium praelongum Hobk. (*c.fr.*)	A, C, D, Ea, F, G, H, Ka, La, Lb, M, P, Ra, Rb, T, Ub, W, X, Zb.
E. tenellum Milde (*c.fr.*)	T.
E. Myosuroides Schp.	T.
E. confertum Milde	A, Q, Zb.
Plagiothecium elegans Sull.	G, H, T, W.
P denticulatum B. & S. (*c.fr.*)	A, Ea, F, G, H, T, Ub, W, X, Zb.
P. silvaticum B. & S.	H, M, Ta, Ub, X.
Amblystegium serpens B. & S.	La.
Hypnum aduncum Hedw.	
Var. *polycarpon* Bland.	P.
Var. *intermedium* Schp.	P.
H. cupressiforme L.	A, B, C, D, E, Ea, F, H, Ka, La, Lb, M, Na, Nb, P, Q, Ra, Rb, S, T, Ta, Ub, Uc, V, W, X.
Var. *resupinatum* Schp.	Na, T.
Var. *ericetorum* B. & S.	X, Za, Zb.
H. Schreberi Willd.	A, B, E, Ea, F, G, Kb, Lb, Ra, S, T, Ua, Ub, W.
H. cuspidatum L.	H.
Hylocomium squarrosum B. & S.	A, B, E, F, Ka, Lb, M, P, Q, S, T, Ua, Ub, V, W, X.

LIVERWORTS.

Lunularia cruciata (L.).	*Lophocolea cuspidata* Limpr.
Aneura multifida (L.).	*L. heterophylla* (Schrad.).
Gymnocolea inflata (Huds.).	*Diplophyllum albicans* (L.).

A PRELIMINARY LIST OF THE FUNGI OF LIMPSFIELD COMMON.

By J. Edward Lousley.

The Fungus Flora of Limpsfield Common is clearly a fairly rich one, as shown by the collection of no less than 131 species in a single day (November 7th, 1937). The present list is admittedly very incomplete both as regards species and their distribution, and it is impossible to draw any ecological conclusions until the work on both Fungi and Flowering Plants has reached a more advanced stage.

It may be pointed out, however, that the distribution of Fungi is largely a reflection of the distribution of the Phanerogams on which they are parasitic or saprophytic. For example, the frequency of *Mycena epipterygia* and *Collybia velutipes* follows the distribution of the Bracken and Gorse respectively, which act as hosts. Habitat notes of most of the records have been preserved, but it seems inadvisable to lengthen the present list by their inclusion.

The writer does not pretend to be a mycologist, and the preparation of the present list would have been impossible without the great help of Messrs W. H. Spreadbury, W. Watson, W. J. Finnigan, R. E.

Brinton and C. P. Castell and the ready assistance given by the authorities at the British Museum (Natural History) and Kew in the identification of specimens. The sequence of the Basiodiomycetes is based on W. G. Smith's "Synopsis of the British Basidiomycetes," but the nomenclature is generally that given by the Referees.

BASIDIOMYCETES.

HYMENOMYCETES.

AGARICACEAE.

Amanita mappa Quél. E(a), U(b); *muscaria* Pers. B, E(a), K(a); *rubescens* Pers. A, T.

Lepiota gracilenta Quél. B; *granulosa* Quél. R(a); *amianthina* Karst. W; *haematosperma* (Bull.) Boud. (*Inocybe echinata* Roth). H.

Armillaria mellea Quél. E(a), T.

Tricholoma flavo-brunneum Quél. T; *rutilans* Quél. H; *nudum* Quél. C, E(a), R(a).

Clitocybe nebularis Quél. W; *clavipes* Quél. A, C, E(a), L(b), R(a), U(b); *odora* Quél. U(c), Z(b); *candicans* Quél. T; *maxima* Quél. H; *flaccida* Quél. T; *cyathiformis* Quél. E(a); *expallens* Quél. A; *brumalis* Quél. E, N(a), Q, R(a), T; *ditopus* Fr. A, L(b), Q.

Clitocybe (*Laccaria*) *laccata* Quél. A, B, E(a), H, N(a), Q, W, X, var. *amethystina* (Bolt). C, E(a), S, U(c).

Collybia maculata (Quél.). A, B, C, L(b), R(a); *butyracea* (Quél.). A, C, K(b), N(a), R(a), S; *velutipes* (Quél.). A, B, E(a), G, H, N(a), Q, W; *tuberosa* (Quél.). A, T; *ambusta* Fr. E.

Mycena galericulata Quél. E(a), L(b), T, W; *polygramma* Quél. C, T, X; *flavipes* Quél. E; *vitilis* Quél. U(c); *galopus* (Pers.) Fr. X, var. *niger* Fl. Dan. A, X; *leucogala* Sacc. T; *epipterygia* Quél. A, B, C, E(a), H, K(a), N(a), Q, R(a), T; *ammoniaca* Quél. L(b); *rubromarginata* Gill.? A.

Omphalia fibula Quél. C.

Pleurotus ostreatus (Jacq.) Fr. W.

Nolanea pascua Quél. R(a).

Claudopus variabilis Gill. A, H, T.

Inocybe sp. E(a), U(b), W.

Flammula sp. A, C; *sapinea* Fr.? X.

Naucoria semiorbicularis Quél. T; *melinoides* Quél. K(a).

Galera hypnorum (Schrenk) Fr. A, E, H, S, T, U(b), W, X.

Stropharia aeruginosa Quél. T; *semiglobata* Quél. T.

Hypholoma sublateritium Quél. E(a), T; *fasciculare* Quél. E(a), T; *appendiculatum* Quél. Q, T; *hydrophilum* Quél. E, E(a).

Psilocybe semi-lanceata Quél. R, S.

Psathyra corrugis (Pers.) Fr. H; *fibrillosa* Quél. L(b).

Paneolus sp. N(a).

Coprinus comatus Fr. H.

Cortinarius tabularis Fr.? U(c); *sanguineus* Fr.; *hemitrichus* Fr. Z(b).

Paxillus involutus Fr. A, E, N(a), W, Z.

Hygrophorus discoideus (Pers.) Fr. A; *hypothejus* Fr. C, X; *pratensis* Fr. K(a); *virgineus* Fr. L(b); *niveus* Fr. K(a); *coccineus* Fr. R, S, U(b); *conicus* Fr. U; *chlorophanus* Fr. L(b); *psittacinus* Fr. S, U.

Lactarius turpis Fr. A, B, C, E(a), H, Q, T, X; *quietus* Fr. C, E(a), T, U(c), X; *rufus* Fr. A, B, C, E(a), H, N(a), Q, W; *glyciosmus* Fr. Q; *serifluus* Fr. A, C, T; *subdulcis* Fr. E(a), T.

Russula nigricans Fr. T; *adusta* Fr. H; *furcata* Fr. A, T; *atropurpurea* Maire (*rubra* Cooke). E(a); *azurea* Bres. E(a); *emetica* Fr. N(a), Q; *ochroleuca* Fr. A, E(a), T, U(c); *fragilis* Fr. N(a).

Cantharellus aurantiacus Fr. A, B, C, P, U(b), W; *cibarius* Fr. T.

Marasmius peronatus Fr. E(a); *oreades* Fr. W; *rameales* Fr. T; *epiphylloides* (Rea). E(a), W.

POLYPORACEAE.

Boletus bovinus L. B; *piperatus* Bull. E(a); *badius* Fr. K(b); *chrysenteron* With. A; *versicolor* Rostk. E(a); *luridus* Schaeff. T.
Polyporus adustus Fr. A, H, T; *caesius* Fr. F, Z(b); *betulinus* Fr. E(a).
Polystictus versicolor Fr. A, H, T, W.
Trametes rubescens Fr. F.
Daedalea quercina Pers. T.
Poria vulgaris Fr. E(a).

HYDNACEAE.

Acia uda (Fr.) Bourd. & Galz. (*Hydnum udum* Fries). T.
Irpex obliquus (Schrad.) Fr. F, H, T, W.
Phlebia merismoides Fr. T, W.

THELEPHORACEAE.

Thelephora laciniata Pers. (*terrestris* Pers.). E(a).
Sebacina incrustans Tul. T.
Stereum hirsutum Pers. A, B, T, X, W; *purpureum* Pers. A, B, E(a), H, N(a), Q, X, W; *sanguinolentum* Fr. H, T; *spadiceum* Fr. T.
Corticium sp. A.
Peniophora incarnata (Pers.) Cooke. W.

CLAVARIACEAE.

Clavaria inaequalis Mull. A, R, S (some of these may be *dissipabilis* Britz); *argillacea* Pers. A, D.
Calocera stricta Fr. T.
Pistillaria puberula Berk. T.

TREMELLINACEAE.

Tremella mesenterica Retz. N(a), T.
Hirneola Auricula-Judae Berk. A, H, R(a).
Exidia intumescens (Sm.) Rea (*Tremella intumescens* Sm.). A.
Dacromyces deliquescens Duby. T.

GASTEROMYCETES.

PHALLOIDACEAE.

Phallus impudicus Pers. T.

LYCOPERDACEAE.

Lycoperdon gemmatum Batsch. E(a); *depressum* Bon. D, W.
Bovista nigrescens Pers. E(a).

SCLERODERMACEAE.

Scleroderma vulgare Hornem. A, E(a).

NIDULARIACEAE.

Crucibulum vulgare Tul. E(a).
Sphaerobolus stellatus Tode. A, E(a).

ASCOMYCETES.

DISCOMYCETES.

Rhytisma acerinum (Persoon) Fries. L(a), L(b), W, X, Z(a), Z(b).
Helvella crispa Fr. C; *lacunosa* Afz. E(a).
Peziza rutilans Fries. W; *badia* Pers. N(a).
Aleuria ampliata (Pers). ? P.
Phialea firma (Pers.) Gill. (*Hymenoscypha firma* (Pers.)). A.
Cudonieila acicularis (Pers.) (*Helotium aciculare* Pers.). T.
Coryne sarcoides (Jacq.) Tul. L(a), W, X.

PYRENOMYCETES.

Nectria cinnabarina (Tode) Fr. A, W.
Xylaria hypoxylon Grev. A, B, C, E(a), H, R(b), T, W, X.

FUNGI IMPERFECTI.

TUBERCULARIACEAE.

Aegerita torulosa (Berk.) Sacc. F.

LICHENS COLLECTED ON LIMPSFIELD COMMON, 1937.

By A. H. Norkett.

Calicium hyperellum Ach. X (sycamore).

Lecanora conizaeoides Cromb. A (oak, birch, *Calluna*, gorse). B (oak, birch, *Calluna*), C (oak, pine, birch, gorse), D (gorse), Ea (beech, oak), F (sallows), G (oak), H (oak, beech, birch, gorse, pine), Ka and Kb (oak, birch, *Calluna*, gorse), Na (oak), Q (oak), Rb (gorse), S (hawthorn), T and Ta (oak, beech), W (oak), Wa (pine), X (beech).

? *Lecanora varia* Ach. A and B (on palings).

Lecanora subfusca Ach., var. *chlarona* Ach. Ea (ash), W (old oak), X (beech).

Lecanora muralis Schaer. La (walls).

Parmelia physodes Ach. A (oak, gorse, *Calluna*), B (birch, *Calluna*), C (oak, gorse), D (gorse), Ea (beech, oak), F (sallows), H (oak, birch), Ka and Kb (oak), T (oak), W (oak), X (beech, oak, birch).

Parmelia fuliginosa Nyl., var. *laetevirens* Nyl. B (birch), C (oak), F (sallows), Ka (oak).

Parmelia perlata Ach. A (oak), B (oak), T (oak).

Parmelia sulcata Tayl. A (oak), B (oak), Ea (beech, oak), F (sallows), Ka and Kb (oak), T (oak), Ta (oak, beech).

Evernia prunastri Ach. A (old oak), B (oak stump), Ea (elm), H (oak), Ka (oak), T (oak).

Icmadophila ericetorum A. Zahlbr. D (sandy soil), P (sandy bank).

Buellia myriocarpa Mudd. B (oak stump), X (beech).

Lecidea (Biatora) uliginosa Ach. D (on sandy soil).

Lecidea (Biatora) coarctata Nyl. La (walls), D (sandstone), Za (walls).

Lecidea (Eulecidea) parasema Ach. W (old oak).

Lecidea (Psora) ostreata Schaer. Wa (pine).

Bilimbia chlorococca Graewe. B (on stems of *Calluna*; a rare plant in a very unusual habitat), D (on stems of gorse; another unusual habitat).

Bilimbia sabuletorum Br. & Rost. Za (old wall, on earth in cracks).

Cladonia macilenta Hoffm. B (oak stump), C (banks), D (sandy soil), Ea (oak stump), H (old stump), P (sand bank).

Cladonia pyxidata Hoffm. B (oak stump), C (banks), D (sandy soil), H (roots of oak), P (sandy bank).

Cladonia pyxidata Hoffm., var. *pocillum* Fr. La (walls).

Cladonia pyxidata Hoffm., var. *chlorophaea* Floerke. Q (on earth).

Cladonia fimbriata Fr. La (walls), H (old stump).

Cladonia fimbriata Fr., subsp. *fibula* Nyl. D (on earth).

Cladonia sylvatica Hoffm. W (amongst mosses).

Cladonia furcata Schrad. D (amongst grass).

Cladonia bacillaris Nyl. D (sandy banks).

Candelariella vitellina Muell. Arg. La (Wall.), W (old oak), Za (Wall.).

Peltigera canina Willd. P (on earth amongst grass), W (on soil).

Physcia hispida Tuck. W (old oak).

Physcia pulverulenta Nyl. X (beech, sycamore).

Pertusaria pertusa Dal. Tor. & Sarnth. W (old oak), X (sycamore).

Pertusaria Wulfenii DC. X (bark of large beech tree).

Thanks are due to Mr I. Mackenzie Lamb, B.Sc. [Cryptogamic Herbarium Nat. Hist. Mus.], for assistance with the more difficult determinations.

MAMMALS, REPTILES AND AMPHIBIANS, 1937.

By R. S. R. Fitter, F.Z.S.

MAMMALIA.

INSECTIVORA.

Mole (*Talpa europaea* L.) : five molehills in sand in B, October 3 and December 5 (L.P.).

Common Shrew (*Sorex araneus castaneus* Jenyns) : one dead in N(b) on July 4.

CARNIVORA.

Fox (*Vulpes crucigera* (Bech.)) : one earth reported to have been identified by hairs, ? area.

RODENTIA.

Rabbit (*Oryctolagus cuniculus* (L.)) : seen in K(b), T; holes in B, D, E, K(b), N(a), Q, T, W; droppings in A, B, D, K(b), N(a), Q, R(a), T, and W (R.S.R.F., L.P., and others).

Hare (*Lepus europaeus occidentalis* de Winton) : one in T on November 7 K.R.C. and R.C.H.).

Dormouse (*Muscardinus avellanarius* (L.)) : one seen by D.A.T.M. in T on June 6.

Long-tailed Field-Mouse (*Apodemus s. sylvaticus* (L.)) : two dead in B on May 2 (L.P.).

Brown Rat (*Rattus norvegicus* (Erxleben)) : one dead (run over) on edge of road in R(a), November 7.

Grey Squirrel (*Sciurus carolinensis* Gmelin) : always to be seen in T : max. 4 squirrels and 6 dreys counted (L.P.).

REPTILIA.

SQUAMATA.

Common Lizard (*Lacerta vivipara* Jacquin) : several seen, May-August (M.H., L.P. and R.W.R.).

Slow-worm (*Anguis fragilis* L.) : one 15 ins. long on October 17 (R.W.R.).

AMPHIBIA.

SALIENTA.

Common Frog (*Rana t. temporaria* L.) : spawn in pool of W. in March; adult seen in *Juncus* of pool in P in October and in Bracken area in T in July (L.P.).

All records by R.S.R.F., except where otherwise stated.

PRELIMINARY LIST OF THE BIRDS OF LIMPSFIELD COMMON, WITH SOME NOTES ON THEIR STATUS.

By P. W. E. Currie.

Carrion Crow. Occasional only.

Rook. Breeds just off the Common, but only occasionally visits the Common to feed, especially on the golf course, Na, Ua, Ub.

Jackdaw. Occasionally only.

Magpie. Only twice, Lb, T.

Jay. Common, especially in T. At least 3 pairs bred.

Starling. Frequently feeds in the area Large numbers visited T to feed on the oaks, in June and July. (Tortrix larvae ?).

Hawfinch. Seen regularly January-June. Two nests found, but no young reared from either.

Greenfinch. Only recorded in autumn and winter.

Goldfinch. Several, May-September, E, F, R, T, W, X, Y.

Lesser Redpoll. Not uncommon. Several seen on most visits. Probably breeds in gardens, not on the Common. West Heath, K, Lb, N, Q, W, X, Y, Z.

Linnet. Chiefly found in the breeding season. Breeds commonly in D, E.
Bullfinch. Several pairs, present throughout year, C, G, K, N, P, R, U, W.
Chaffinch. Fairly common, less so in autumn and winter.
Brambling. Seen in December 1936 in T. None seen 1937.
House Sparrow. Occasional at the edges of the common, where houses adjoin.
Yellow Hammer. Not uncommon in spring and summer. A few pairs bred in the West Heath and Happy Valley areas. Uncommon in autumn and winter.
Skylark. Only two records, Ub, where probably bred.
Tree Pipit. A few pairs, Happy Valley and West Heath.
Meadow Pipit. In flocks during the winter, K, N, U.
Pied Wagtail. Occasional only, A, B, U, V.
Tree Creeper. One or two seen, C, H, T.
Nuthatch. Occasionally seen on West Heath, more often in wooded gardens adjoining.
Great Tit. Fairly common, T, W, X, less so elsewhere.
Blue Tit. Common and generally distributed.
Cole Tit. Not uncommon. C, K, N, T, W, X.
Marsh Tit. Not uncommon. K, T, U.
Willow Tit. Not recorded June-October. In winter recorded N, T, U, W.
Long-tailed Tit. One or two pairs bred. Flocks in winter, T, W.
Goldcrest. Not uncommon in winter, K, N, T, W.
Red-backed Shrike. Probably two pairs bred, N, U, W.
Spotted Flycatcher. Odd records, A, E, Y. Possibly bred, T.
Chiffchaff. Fairly common, C, G, K, M, N, T, X.
Willow Warbler. Generally distributed and common.
Wood Warbler. At least two pairs in T. One each in W, X.
Garden Warbler. Probably about 6 to 8 pairs, F, K, T, X.
Black Cap. Approximately similar numbers, C, T, W.
Whitethroat. Recorded only from West Heath, U, X.
Lesser Whitethroat. Only one record in May and June, P.
Fieldfare. Only recorded flying over.
Mistle Thrush. Common, especially U, T. Also A, K, P, R. Less common in winter.
Song Thrush. Very common breeding. Less numerous in winter.
Redwing. Few records. West Heath, K, Y.
Blackbird. Very common breeding, perhaps more so than Song Thrush. Does not appear to leave the Common in winter.
Stonechat. Two or three, November-December, Kb, P.
Redstart. One record, September, A.
Nightingale. One pair, Lb.
Robin. Very common, ubiquitous.
Dunnock. Only fairly common. Recorded only West Heath, K, T, W.
Wren. Common, especially in bracken areas. West Heath, K, L, N, P, T, U, X.
Swallow. Occasionally seen hawking over the Common.
House Martin. As above, but less common.
Sand Martin. A small nesting colony, about five pairs, Y.
Swift. Only recorded flying over B, July.
Nightjar. One pair breeds.
Green Woodpecker. Not uncommon. Abortive nesting hole found Q. Recorded K, N, Q, R, T, W.
Great Spotted Woodpecker. Occasional only, B, K, T.
Wryneck. Seen several times at the edge of the Common, West Heath, K, R.
Cuckoo. Only one record, May.
Brown Owl. One record, 2/1/38, W. Mobbed by one pair of bullfinches, one hawfinch, several blackbirds, one dunnock, several great tits and one willow tit.
Kestrel. Occasional only, over K, N.
Wood Pigeon. Common, several bred C, T. Large flocks in winter in T.
Turtle Dove. One or two pairs, May-July, C, K, T.
Lapwing. Only flying over.
Common Snipe. One flying over, October. Possibly rose from Kb.

Black-headed Gull. Only flying over.
Common Partridge. Traces found, Ua, Ub.

The recorder wishes to thank the following for their assistance :—Miss M. M. Hose, Miss M. Munro, Messrs K. R. Chandler, R. S. R. Fitter, O. Höhn, R. C. Homes, R. Manser, D. A. T. Morgan, L. Parmenter, and J. E. Roberts.

DIPTERA.

By L. Parmenter, F.R.E.S.

The following preliminary list consists of roughly 100 species which have been identified so far from the collections made or as seen in the field. It has not been possible to visit each of the sections every month. Those sections which were not visited during the summer months are therefore poorly represented in the following list. It has not been found possible to give any habitat data other than the place where each species was seen or taken. The habit of flies to "sun" themselves is well shown by the number recorded on bracken or bramble leaves. Probably at least 500-1000 species occur on the Common. With further assistance, population and other ecological problems should receive attention.

CECIDOMYIDAE.	Section.	Where found.	Time.
Oligotrophus bursarius Brem.	H, T.	Galls of larvae. On Ground Ivy leaves.	November. (Galls).

For other species see "Plant Galls" by H. J. Burkill, p. 64.

BIBIONIDAE.			
Bibio reticulatus Lw.	Ka, P, S, Ub.	On Gorse, Juncus, Umbellifers.	May.
LIMNOBIDAE.			
Limnobia nubeculosa Mg.	D.	On trunk of Oak.	November.
Trichocera hiemalis Dg.	La.	In clouds by Gorse and Bramble bushes and trees.	November.
TABANIDAE.			
Haematopota pluvialis L.	T.	♀ attacking man at fringe of wood.	July.
RHAGIONIDAE.			
Chrysopilus aureus Mg.	T.	On leaves of undergrowth.	July.
Rhagio lineola F.	H, Kb, T, X.	Bracken.	July.
R. scolopacea L.	D.	—	June.
R. tringaria L.	Kb, X.	Bracken.	July.
STRATIOMYIDAE.			
Beris Morrisii Dale.	A, T, X.	On Bramble leaves, also ♂♂ hovering under Sycamore, see also *Ent.*, September 1937.	June, July.
B. vallata Forst.	H.	Bracken.	July.
Microchrysa flavicornis Mg.	H.	Bracken.	July.
M. polita L.	A.	*Calluna.*	July.
Pachygaster atra Mg.	X.	Bracken.	July.

ASILIDAE.

Dioctria Baumhaueri Mg.	Kb, Uc.	Bracken.	July.
Epitriptus cingulatus F.	E, La.	Bracken, on grass turf.	July, Sept.
Machimus atricapillus Fln.	G, Ka, Kb.	Bracken, on grass turf, on grass verge of road.	Aug., Sept.
Neoitamus cyanurus Lw.	T.	—	July.

DOLICHOPODIDAE.

Dolichopus griseipennis Stann.	T, X.	Bracken.	July.
D. nubilus Mg.	W.	At Pool.	June.
D. plumipes Scop.	P, X.	At Pool, on Bracken.	July.
D. trivialis Hal.	A, H, Kb, T, X.	Bracken, Bramble leaves.	June, July.
D. ungulatus L.	F, P, X.	Bramble leaves, on vegetation of Pool.	June, July.
D. virgultorum Walk.	C, Uc, X.	Bracken.	July, Sept.
D. Wahlbergi Zt.	A, X.	Bramble leaves, Bracken.	July.
Poecilobothrus nobilitatus L.	F, P.	Bramble leaves, at Pool.	July.
Psilopus platypterus F.	A, T.	Bramble leaves.	July.

EMPIDIDAE.

Empis livida L.	Ua.	Bracken.	July.
E. tessellata F.	Ka.	Bracken.	July.
Hybos culiciformis F.	Kb, Na.	Bracken, Bramble leaves.	July.

SYRPHIDAE.

Catabomba pyrastri L.	A, Ka.	*Calluna* fl., Bracken.	July, Sept.
Chilosia praecox Zt.	P, T.	On Dandelion fl., and Wood Anemone fl.	May.
C. pulchripes Lw.	F, Kb, Uc.	Bracken, Bramble leaves.	July, Sept.
Chrysotoxum octomaculatum Curt.	E.	Bracken.	July.
Eristalis arbustorum L.	A, Ea, Lb, Rb, S.	On leaves of Bramble and Beech, flowers of *Calluna*, Ragwort, and Umbellifers.	May, July Sept.
Eristalis pertinax Scop.	A, Ka, Kb, Nb, S, T, Ua.	On bare path, Bramble leaves, and large Umbellifer.	May, July.
E. tenax L.	A, E, Ka, Kb, Lb, T.	On *Calluna*, Bracken, Ragwort, and Bramble leaves.	July.
Helophilus pendulus L.	T.	On leaves of Holly.	June, Aug.
Melanostoma mellinum L.	A, Kb, Ra.	On *Calluna* and Hawkbit flowers and leaves of Oak.	July, Aug. Oct.
M. scalare F.	E, T, X.	Bracken.	July, Aug.
Myiatropa florea L.	D, Ea.	Bracken, Umbellifer head.	July.
Neoascia podagrica F.	X.	On grass of Pool.	June.
Orthoneura nobilis Fln.	Kb.	Bramble leaves.	July.
Platychirus albimanus F.	A, C, E, Ka, Kb, T.	On *Calluna* and Wood Anemone flowers, Bracken and Bramble leaves.	May-Sept.
P. peltatus Mg.	X.	Bracken.	July.
P. scutatus Mg.	X.	Bracken.	July.
Syritta pipiens L.	A, D, E, Ea, S.	On bare sand, *Calluna* and Umbellifer.	July-Sept.
Syrphus auricollis Mg., var. *maculicornis* Zt.	A, T, Uc.	On *Calluna* flowers and Bramble leaves.	July, Aug.

S. balteatus Dg.	A, C, T, Ua, Z.	On leaves of Hazel, Bramble, Sycamore, Bracken and flowers of *Calluna* and Bramble.	June-Sept.
S. bifasciatus F.	W.	—	June.
S. cinctellus Zt.	T.	—	July.
S. corollae F.	E, T.	On *Erica cinerea.*	July-Aug.
S. punctulatus Verr.	Ka.	On Hawthorn leaves.	May.
S. ribesii L.	C, H, Kb, T.	On Bracken and on bare ground in Wood.	July-Sept.
S. torvus O.S.	H, Kb.	Bracken.	July.
S. vitripennis Mg.	A, P, T.	On flowers of *Calluna* and Gorse.	May, July, Aug.
Volucella pellucens L.	T.	On large Umbellifer.	July.
Xanthogramma ornatum Mg.	Kb.	——	July.
Xylota segnis L.	C, T, Uc.	Bracken and on Bramble leaves.	June. July, Sept.
CONOPIDAE.			
Conops quadrifasciata Dg.	Kb.	Bracken.	Sept.
MUSCIDAE.			
Alloeostylus diaphanus Wied.	D, T.	On Oak trunk.	June, Nov.
Anthomyia pluvialis L.	Ua.	Bramble leaves.	July.
Cryptolucilia caesarion Mg.	T.	On Stinkhorn fungus.	Nov.
Dasyphora cyanella Mg.	P.	On Hawthorn leaf.	May.
Graphomyia maculata Scop.	Kb.	On large Umbellifer.	Sept.
Hylemyia strigosa F.	D.	Oak trunk.	Nov.
Mesembrina meridiana L.	D.	Oak trunk.	Nov.
Morellia aenescens R.D.	S.	On Umbellifer.	July.
M. hortorum Fln.	F.	Bramble leaves.	July.
M. simplex Lw.	Ka.	Bracken.	Sept.
Musca autumnalis Dg.	A, C, D, E, Ka, Lb, Rb, T, Ua, Uc.	On bare sand, litter box, Bracken and leaves of Bramble and Oak.	July-Sept.
Muscina pabulorum F.	T.	——	June.
Ophyra leucostoma Wied.	W.	Hovering under Oak.	June.
Phaonia pallida F.	H, T.	Bracken and on Bramble leaves.	July, Aug.
Polietes albolineata Fln.	T.	—	June, July.
P. lardaria F.	C, D, Ea, H, Rb, T.	On Oak trunk, Umbellifer head, Bracken, leaves of Bramble and Pine.	June, July, Sept.-Oct.
TACHINIDAE.			
Bucentes cristata F.	A.	On *Calluna.*	Aug.
Calliphora erythrocephala Mg.	P.	On Hawthorn leaf.	May.
C. vomitoria L.	T.	On Stinkhorn fungus.	Nov.
Dexiosoma caninum F.	T.	Bracken, leaves of Beech and Bramble.	July, Aug.
Echinomyia fera L.	A.	On *Calluna.*	Sept.
CORDYLURIDAE.			
Scatophaga stercoraria L.	A, C, H, Ka, Lb, Na, S, T, Ua, Ub.	On grass stems, Bracken, Ragwort, *Calluna*, Umbellifer, and Bramble leaves.	May-July, Sept.
S. maculipes Zt.	Ka, P.	Gorse, *Juncus.*	May.

BORBORIDAE.			
Borborus equina Fln.	Uc.	On horse dung.	March.
B. nitida Mg.	S, T.	On leaves of ground in Wood and on horse dung.	May, Nov.
B. similis Collin.	P, S, Uc.	On horse dung, swept from *Juncus*.	Mar., May, Nov.
Leptocera silvatica Mg.	T.	On tree stump.	Jan.
TRYPETIDAE.			
Euaresta conjuncta Lw.	A, Ka, Kb, Na.	*Calluna*, Gorse, Bracken.	Jan., July-Sept.
Myolia caesio Harris =*Acidia lychnidis* F.	E.	Bracken.	July.
Tephritis vespertina Lw.	A, Ka, Kb, Na.	Bracken, Gorse.	May, July, Sept.
Euribia jaceana Hering.	Kb.	Bred from galled head of *Centaurea nigra*.	Col. 3-1-37. Emer. 2-6-37.
SEPSIDAE.			
Sepsis cynipsea L.	P.	*Juncus*.	May.
LAUXANIDAE.			
Peplomyza litura Mg.	Kb, T, Uc, X.	Grass verge of road, Bracken.	July-Sept.
Lauxania cylindricornis F.	D.	On flowers of Broom.	June.
DRYOMYZIDAE.			
Neuroctena anilis Rond.	Ra, T.	On fresh dog dung.	July, Oct.
Dryomyza flaveola F., var. *Zawadskii* Schum.	A, T.	On Stinkhorn fungus and on *Calluna*.	Nov.
NEOTTIOPHILIDAE.			
Neottiophilum praeustum Mg.	Zb.	Bred from old Blackbird's nest.	Col. 3-1-37. Emer. 15-2-37.
SCIOMYZIDAE.			
Elgiva albiseta Scop.	P.	*Juncus*.	June, July, Oct.
Tetanocera punctata F.	H.	Bracken.	July.

PLANT GALLS OF LIMPSFIELD COMMON.

Species noted during 1937 by H. J. Burkill.

	Section.	Date.
Acer pseudo-platanus L.		
Eriophyes macrorrhynchus Nal. [Acar.]	F.	5/9.
Ulex minor Roth. (*nanus* Forster).		
Apion scutellare Kirby (J. E. S. Dallas). [Col. Curc.]	B.	5/9.
Rubus sp.		
Lasioptera rubi Heeger. [Dipt. Cec.]	T.	3/1.
Perrisia plicatrix H. Loew. [Dipt. Cec.]	Rb.	5/9.
Potentilla erecta Hampe.		
Xestophanes brevitarsis Thoms. [Hym. Cyn.]	Ka.	3/1. 2/5.
	Q.	8/8.
P. reptans L.		
X. potentillae Retz. [Hym. Cyn.]	Ub.	7/11.

Centaurea nigra L.

Euribia jaccana [Dipt. Try.]	Kb.	3/1.
	E.	5/9.
	Ub.	7/11.

Campanula rotundifolia L.

Miarus campanulae L. [Col. Curc.]	Rb.	5/9.

Fraxinus excelsior L.

Eriophyes fraxini Karp. [Acar.]	E.	5/12.

Urtica dioica L.

Perrisia urticae Perris. [Dipt. Cec.]	T.	6/6.

Betula alba L. (*verrucosa* Ehrh.).

Eriophyes rudis Can. [Dipt. Cec.]	H.	4/4.

B. pubescens Ehrh.

Eriophyes rudis Can. [Dipt. Cec.]	Q.	4/4.
	W.	4/4.

Quercus Robur L.

Cynips kollari Htg. [Hym. Cyn.]	A.	3/1. 4/4. 5/9.
	Ka.	8/8.
C. corruptrix Schl. [Hym. Cyn.]	A.	5/9.
Biorrhiza pallida Oliv. [Hym. Cyn.]	A.	3/1. 6/6. 7/11.
	B.	7/11.
B. aptera Fabr. [Hym. Cyn.]	A.	5/12.
Diplolepis folii L. [Hym. Cyn.]	A.	7/11.
Andricus radicis Fabr. [Hym. Cyn.]	A.	2/5. 6/6.
A. corticis Htg. [Hym. Cyn.]	H.	3/1.
	W.	4/4. Abundant.
	E.	2/5.
A. sieboldi Htg. [Hym. Cyn.]	E.	2/5.
A. inflator Htg. [Hym. Cyn.]	A.	3/1.
	W.	4/4.
	B.	7/11.
A. globuli Htg. [Hym. Cyn.]	Ka.	5/9.
	A.	7/11.
A. curvator Htg. [Hym. Cyn.]	T.	3/1. 7/11.
	A.	4/4.
	W.	4/4. 5/9.
	B.	2/5.
	Ub.	6/6.
A. pilosus Adler. [Hym. Cyn.]	Ka.	6/6.
A. fecundatrix Htg. [Hym. Cyn.]	H.	3/1.
	Ka.	8/8. 7/11. Very abundant.
	A.	5/9.
A. callidoma Giraud. [Hym. Cyn.]	T.	6/6.
	W.	5/9.
A. seminationis Adler. [Hym. Cyn.]	A.	6/6.
	Ub.	6/6.
A. quadrilineatus Htg. [Hym. Cyn.]	Ka.	6/6.
	Ub.	6/6.
A. solitarius Fonsc. [Hym. Cyn.]	B.	2/5.
	Ka.	" 3."
	T.	7/11.
A. ostreus Giraud. [Hym. Cyn.]	F.	3/1.
	A.	8/8. 5/9.
	B.	7/11.
A. ramuli L. [Hym. Cyn.]	Ka.	6/6.
Neuroterus laeviusculus Schenck. [Hym. Cyn.]	Ka.	8/8. 5/9. 7/11.
	B.	7/11.
N. baccarum L. [Hym. Cyn.]	A.	6/6.
	Ub.	6/6.

N. lenticularis Oliv. [Hym. Cyn.]	A.	8/8.	5/9. 7/11.
	B.	7/11.	
N. vesicatrix Schl. [Hym. Cyn.]	Q.	8/8.	
	A.	5/9.	
N. numismatis Oliv. [Hym. Cyn.]	A.	8/8.	5/9. 7/11.
	B.	7/11.	
N. aprilinus Giraud. [Hym. Cyn.]	B.	2/5.	
? Unidentified small red Cynipid [Hym.] gall. Similar to No. 74, as listed on page 275, *Entomologist*, December 1932	D.	5/12.	
Larger specimens of an unknown bark gall containing Cynipid larvae. [Hym.]	T.	3/1.	
Macrodiplosis dryobia F. Loew. [Dipt. Cec.]	Ka.	6/6.	
M. volvens Kieff. [Dipt. Cec.]	T.	6/6.	
Quercus sessiliflora Salisb.			
Neuroterus vesicatrix Schl. [Hym. Cyn.]	Q.	8/8.	
Cecidomyid gall in lamina. [Dipt.]	Q.	8/8.	
Corylus avellana L.			
Eriophyes avellanae Nal. [Acar.]	Rb.	3/1.	
	Ua.	4/4.	
Fagus sylvatica L.			
Phyllaphis fagi L. [Hom.]	T.	6/6.	
Hartigiola annulipes Htg. [Dipt. Cec.]	Q.	8/8.	
	W.	5/9.	
Salix caprea L.			
Euura venusta Zadd. [Hym. Tenth.]	F.	5/9.	
Iteomyia capreae Winn. [Dipt. Cec.]	F.	5/9.	
Salix caprea L. and on *Salix cinerea* L.			
Old Sawfly bud galls due to either *E. saliceti* or *E. ater*. [Hym. Tenth.]	F.	3/1.	
	Ra.	7/11.	
Pteris aquilina L.			
Tortricid larvae galling stems. [Lep.]	Kb.	6/6.	
Perrisia filicina Kieff. [Dipt. Cec.]	Rb.	5/9.	

Entomological Notes and Records.

NOTES ON THE COURTSHIP OF FLIES.

By L. Parmenter, F.R.E.S.

THE courtship, or rather epigamic display of flies, has not received much attention from entomologists. This is especially so in the case of the family of Dolichopodidae despite the fact that many of these long-headed and generally shining, green, long-bodied flies are ornamented on the legs or wings in the male sex. These ornamentations are particularly exhibited during the display.

At Pamber Forest, Berks., on 11th July 1937, there were many *Dolichopus popularis* Wied. on the leaves of low bushes in the damp woodland. A male alighted on a leaf and walked close to the rear of a female. This approach was made with wings held horizontally at an angle of about 45° from the body. With the dainty steps of his kind he went nearer. He stopped and lifted his middle pair of legs and slowly waved them up and down. The black feathered tarsi, which ornament only this middle pair, were very noticeable. The abdomen was then bent downwards and the genitalia were extended beneath the body towards the tip of the female's abdomen and were then withdrawn. This was repeated two or three times. However, no coupling took place, as the female stepped ahead and soon flew off, followed by the male, who did not alight on the same leaf as the female and did not continue his display. A very fine rain was falling at the time.

At Benfleet, Essex, on 18th July, and at Limpsfield, Surrey, on 25th July, another species of the same family, *Poecilobothrus nobilitatus* L., was displaying. This dipteron has the wings of the male ornamented with a dark transverse band and a silvery tip. Again, the displays took place where large numbers of these species were gathered, on damp mud at the edge of ponds. Although the flies were also scattered about on the surrounding plants and on the surface of the water, display was confined to those on the mud. The males walked quickly and sometimes ran about with waving wings, the silvery tips flashing in the sunshine. Several times a male was seen to approach a stationary female. The male would take his stand about one and a half to two inches from the side of the female and then jump over her from side to side, hovering for a little while during some of the jumps. Each time he would alight about one and a half inches from her and wave his wings up and down at roughly right angles to the body. No coupling was observed, and the females either flew off or walked away, after which the display ceased.

INSECT LIFE IN A DYING WILLOW.

By W. O. Steel.

This Edmonton tree, which was cut down in October last stood with five other willows within twenty yards of the junction of the Great Cambridge Road and the North Circular Road in the middle of a residential and factory area.

I think the first insect to attack this particular willow was the Goat Moth, *Cossus ligniperda* Fab. The trunk was riddled with its borings, and when I went to collect the larvae it was impossible to extract a specimen without crushing at least one other. These larvae usually spend the whole of their life in the tree where they are born, but in the late summer I saw fully-grown specimens crawling across the brook along a sewer pipe. This pipe, which is surrounded by a frame of iron girders, was also a favourite resting place for the emerged Goat Moths. Where the larvae had caused the sap to flow from the tree the little Nitidulid Beetle, *Soronia punctatissima* Ill. was often very common.

The next most abundant insect was the lesser Stag Beetle, *Dorcus parallelopipedus* Linn. In the daytime these had to be dug out of the wood, but at night they came out on to the trunk and frequently half a dozen or more could be seen at the same time. I never succeeded in finding the larvae of this species, although there must have been a fair number of them present.

The larvae of the Musk Beetle, *Aromia moschata* Linn., were common, and during late summer the musk-like odour of the perfect insect could be detected as far as four or five yards from the tree. I was unsuccessful in digging out any of the imagines; my specimens were taken after they had emerged from the trunk. The only other locality near here from which I have taken this insect is about three miles away, in the Lea valley.

Last July I noticed a number of bees flying around the willow, and saw some of them entering the old emergence holes of the *Aromia*. I gave specimens of two species to Mr K. M. Guichard, who identified them as a male Leaf-cutter Bee, *Megachile ligniseca* Kby., and a female *Coelioxys inermis* Kby. The genus *Coelioxys* is parasitic on the Megachiles, and the Leaf-cutter Bees frequently make use of old insect burrows for their nesting purposes.

Other inhabitants beneath the bark of the tree included large numbers of the woodlouse, *Oniscus asellus*, centipedes, various spiders, an unknown species of lepidopterous larva, an occasional larva of the Dermestid Beetle, *Ctesias serra* Fab., and one or two specimens of the other species of *Soronia*, *S. grisea* Linn. In the winter of 1935 I found a colony of about two dozen hibernating Ladybirds (*Adalia bipunctata* Linn.) and one specimen of the Carabid Beetle, *Dromius 4-maculatus* Linn.

I think this is rather an interesting record for a tree situated in an area which has been built up for some years, all the above insects having been found after August 1935. Prior to this date the Musk

Beetle was much commoner, and I have seen a specimen of the Stag Beetle, *Lucanus cervus* Linn., taken near this tree in 1930. This insect often breeds in willow trees, but I think this particular specimen had flown from Winchmore Hill or Southgate, where it used to be very common.

The other five trees were all fairly healthy, and I could only find a few *Cossus* larvae at the base of the trunks at or slightly below ground level. It seems that the Goat Moth larva commences its attack at the bottom of the tree, and these willows were evidently only recent victims.

The trees were of a good age, and I presume they must have been survivals of the days when, as Charles Lamb observes in one of his essays, Edmonton was a region of green fields.

A RARE ICHNEUMON FROM LIMPSFIELD.

By P. W. E. Currie.

On September 5th, 1937, while sweeping small birch saplings on the south side of Happy Valley (area Kb), on Limpsfield Common, Surrey, I found a female *Polyblastus cothurnatus* Grav.

The specimen was determined by Mr Perkins (Natural History Museum) who stated that it was a parasite of sawflies. The numerous eggs are large for an Ichneumonid, and are carried on the ovipositor by a stalk arising from the end of the egg. When the *Polyblastus* deposits an egg it strikes the ovipositor into the larval host, inserting the " egg stalk " through the cuticle.

The parasitic larva eventually passes into the blood of the host and lives internally. This procedure is characteristic of the Tryphonini, Polyblastini, and Ctexisani, which form the true Tryphonini, represented in Britain by about one hundred species.

The Limpsfield specimen is now in the National Collection at South Kensington, where *P. cothurnatus* was previously represented by only a single specimen.

THE VARIATION OF ENALLAGMA CYATHIGERUM CHARP. IN KERRY.

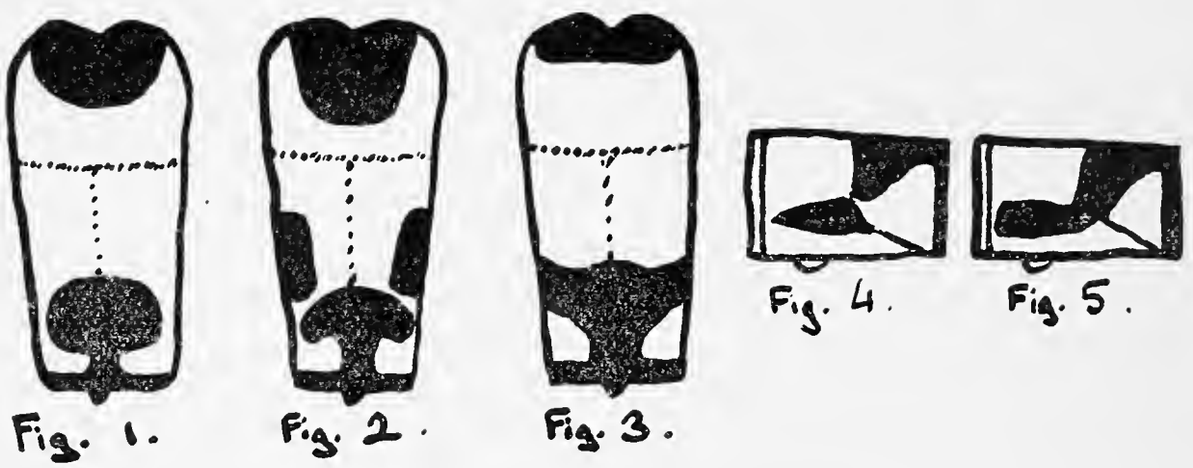
By A. F. O'Farrell.

During the first half of August, 1937, while collecting at random along the banks of Caragh Lake, Co. Kerry, I came across large numbers of Agrionids, which were examined in the hope of finding one or two good species. The majority, however, proved to be *Enallagma cyathigerum* Charp., but the males showed an interesting form of variation in the black markings on the second abdominal segment, quite unlike anything I had noticed in England. The normal marking is shown in Fig. I. In the more extreme varieties, the club-shaped black mark changes to the form shown in Figs. III and V; the " stem "

connecting it to the posterior margin of the segment being broadened, and the edges of the club extending laterally and somewhat forward. On the sides of the segment the anterior black markings, which in the normal form are small lines, expand to meet the lateral prolongations of the dorsal marking, giving the appearance as illustrated. The intermediate forms, of which one is shown in Fig. IV, may at times superficially resemble *Agrion hastulatum* Charp.

It is interesting to note that the Enallagma population, so far as I could ascertain, consisted of very few normal specimens and about 20-30% of the extreme form; the remainder were various intermediate forms.

I have examined all the specimens carefully, and am reasonably satisfied that they are all *E. cyathigerum*.



EXPLANATION OF FIGURES.

Figs. I-III.—Dorsal view of first two abdominal segments of male Agrionids.
Fig. I.—*E. cyathigerum* Charp., normal form found in S.E. England.
Fig. II.—*Agrion hastulatum* Charp. (after Lucas).
Fig. III.—*E. cyathigerum* Charp., Kerry variety.
Figs. IV-V.—Lateral view of the left side of the second abdominal segment of intermediate and extreme forms of the Kerry variety of *E. cyathigerum*, ♂.
Fig. IV.—Intermediate form.
Fig. V.—Extreme form.

CONCERNING THE ALPINE RACE OF PIERIS NAPI (THE GREEN-VEINED WHITE BUTTERFLY).

By J. A. Simes, O.B.E., F.R.E.S.

On 3rd July 1936 I took a *Pieris napi f.* ♀ *bryoniae* at Pertisau, on the Achensee, Austria, and carried it home to England alive. It deposited 19 eggs on *Erysimum alliaria*, and died on 12th July. The larvae fed rapidly, and eventually I got 15 pupae which did not produce butterflies until May 1937. There were eleven ♂♂, all indistinguishable from lowland forms, and four ♀♀, all of the form *bryoniae*. About 3½ days before emergence the ♀ pupae developed brilliant orange wings devoid of all marking, and this position continued for about two days. Then the orange took on a suffusion which

progressively darkened; and for about 24 hours before emergence the pupal wings appeared to be almost black. This was the history of all the ♀ pupae; and the ♂ pupae never showed orange.

If it be the case, as we are told, that pupal form and development to some extent epitomises the evolutionary history of a form, must we not conclude that the f. ♀ *bryoniae*—always believed to be an archaic form capable of survival only in mountain areas—has descended to us from a remote ancestor which was of an orange colour, perhaps as brilliant as a latter-day *Colias*?

One other interesting point. On the underside this brood showed a tendency to dimorphism, (a) thirteen butterflies having the hind wings and the tip of the forewings of a bright lemon yellow, and (b) two butterflies being of a uniform dead-white ground colour. Now *P. napi* is a species which habitually chooses its roost very carefully and deliberately; and in my garden it regularly searches out a white flower (such as a rocket) or a glaucous leaf on which it may feel reasonably secure for the night. At Pertisau I could find no white-flowered Crucifer in its haunts. The butterfly feeds on, and habitually roosts on, the yellow-flowered Crucifer, *Biscutella laevigata*. Is the preponderance of the form with a yellow underside related to the fact that the available roosting sites are predominantly yellow?

ACULEATES ON THE NORFOLK COAST.

By K. M. Guichard.

On June 21st, 1937, while collecting on the Waxham sandhills near Horsey Mere, Norfolk, I noticed a peculiar habit of the wasp *Pompilus plumbeus* Fab. On the sand, there was a congregation of about fifteen males; they were rushing about swiftly in a compact little group, and each wasp pursued a zigzag course, darting this way and that, but never more than a few inches from its neighbour. I watched this performance for about five minutes, and when I approached for a closer view, the insects began to disperse. I then threw my net over the remainder, but these males were so small (4 mm.) that I only succeeded in capturing two; the rest escaped by wriggling through the fine mesh of the net. I noticed other gatherings, but the numbers were smaller than in the case just mentioned.

The females of *P. plumbeus* were much scarcer, but equally difficult to capture; they ran over the ground at a tremendous speed, and, just prior to a final descent with the net, they flew ahead in a most tantalising manner.

I can offer no explanation for this extraordinary behaviour of the males, unless it was a communal form of expending surplus energy.

The Waxham and Winterton sandhills appeared to be an excellent locality for Aculeates. The area comprised a stretch of some three miles of lonely dunes facing the sea. The outstanding vegetation consisted of Marram Grass, isolated patches of Ling and Cross-leaved

Heath, Thistles, yellow Composites, and Bird's-foot Trefoil. During roughly two days of collecting the following twenty-seven species of Aculeates were taken:—

Halictus leucozonius (Schr.), ♀; *Osmia rufa* (Lin.), ♀; *O. coerulescens* (Lin.), ♀♀, from Winterton Village; *Megachile willughbiella* (Kirb.), ♂♂, ♀♀; *M. maritima* (Kirb.), ♂♂, ♀♀; *Coelioxys elongata* Lep., 4 ♂♂, 3 ♀♀; *Nomada lineola* Panz., ♂; *Podalonia viatica* (Lin.), ♀♀; *P. affinis* (Kirb.), 6 ♂♂; *Ammophila sabulosa* (Lin), ♀; *Anoplius infuscatus* (V. d. L.), ♀♀, ♂; *Pompilus plumbeus* Fab., ♂♂, ♀♀; *Tachysphex nitidus* (Spin.), ♂♂, ♀♀, very common around a rabbit warren; *Myrmosa atra* Panz., ♀; *Hoplisus quadrifasciatus* (Fab.), ♂; *Nysson spinosus* (Forst.), ♂; *Cemonus lethifer* Shuck., ♂; *Oxybelus uniglumis* (Lin.), ♂♂, ♀♀; *Ancistrocerus pictus* (Curt.), ♀, flying round a brick wall in Winterton; *Clytochrysus chrysostomus* Lap., ♂♂; *Crabro cribrarius* (Lin.), ♂♂; *Crossocerus anxius* (Wes.), ♀; *C. palmipes* (Lin.), ♂; *Ablepharipus podagricus* (V. d. L.), 3 ♂♂; *Hedychridium ardens* (Lat. in Coq.), ♂; *Tachysphex pompiliformis* (Panz.), ♀; and *Gonotopus sepsoides* West., ♀♀ (this last was kindly determined by Dr O. W. Richards).

COLEOPTERA AND HEMIPTERA FROM SUSSEX.

By K. M. Guichard.

The following species of Coleoptera and Hemiptera were collected from Worth and Tilgate Forests, during an Entomological excursion on May 23rd, 1937. The locality was an excellent one, but not much time was devoted to collecting as the party kept on the move continually. I wish to thank Miss Hose for letting me have her records of Hemiptera.

HEMIPTERA—HETEROPTERA.

Acanthosoma interstinctum L., *A. haemorrhoidale* L., both on Hawthorn. *Harpocera thoracica* Fall., on Oak. *Stenodema laevigatum* L., *Cymus glandicolor* Hhn., by sweeping herbage on the edge of a lake. *Velia currens* Fab., six in stream.

COLEOPTERA.

Out of thirty-two species of Coleoptera the following seem worth recording:—*Cicindella campestris* L., *Pyrochroa coccinea* L., *Timarcha coriaria* Lh., *Aphthona venustula* Kt., *Hister striola* Sahlb., *H. carbonarius* Ill., *Necrophorus vespillo* L., *Denticollis linearis* L., *Hylobius abietis* L., *Balaninus venosus* Gr., *Erirrhinus nereis* Pk., *Rhynchites aequatus* L., *Orchestes pilosus* Fab., *Malthodes marginatus* Latr., *Elater balteatus* L., *Cassida vittata* Vl., and one *Melolontha vulgaris* Fab., beaten from Hawthorn.

A single specimen of *Osmylus fulvicephalus* Scop. (Neuroptera) was caught fluttering along a bank close to a small stream.

DIPTERA IN WORTH AND TILGATE FORESTS, SUSSEX.

By Gurth Waller.

The Entomological Section of the Society visited this area on the 23rd of May 1937, and these notes record principally the captures of that day. The writer, accompanied on one occasion by Mr L. Parmenter, was in the locality in April and June of the same year, and records then obtained have also been included.

The district lies to the South of Three Bridges in Sussex, just over the Surrey border. The nature of the country varies considerably, and there is open parkland, old established woodland, new plantations of larch and other conifers, swampy ground with beds of *Juncus* sp., and an extensive lake. Verrall appears to have known the district well, as there are many references to Worth and Three Bridges in his works.

On the occasion of each visit the weather has been warm and sunny. On May the 23rd there was a strong cool wind in the early morning which dropped to a considerable extent later, making the day ideal for insect study.

The area has proved rich in many interesting species, and from the comparatively short times spent in collecting it is obvious that with more study the locality will yield many more species. The difficulty in naming insects in this order has of necessity forced me to omit many which have yet to be worked out or confirmed. It is hoped that this list will be enlarged at a future date, and these notes must only be taken as of a preliminary nature, based on casual netting and observation rather than systematic study.

I am indebted to Mr L. Parmenter, F.R.E.S., who has assisted me in naming a large proportion of the insects on the list.

CHIRONOMIDAE.

Tanytarsus fuscus Mg. 1 ♂, 11/4.

Kindly determined by Dr F. W. Edwards, of the British Museum. This species is usually associated with the peat bogs of Northern England and has not, it is understood, been previously recorded from this part of the country.

SIMULIDAE.

Simulium latipes Mg. 11/4.

BIBIONIDAE.

Bibio reticulatus Lw. 1 ♂, 11/4.

STRATIOMYIDAE.

Beris chalybeata Forster. 23/5.

BOMBYLIDAE.

Bombylius major L. 23/5.

Several were taken early in the evening hovering round the flowers of the common bluebell (*E. nonscriptum*) on a sunny slope near Balcombe.

TABANIDAE.

Haematopota pluvialis L. 22/6.
Tabanus maculicornis Zett. 23/5.
Therioplectes tropicus Mg. (var. *besignatus* Jaen.). 1 ♀, 22/6.

EMPIDIDAE.

Empis tessellata F. 23/5.
Hilara pilosa Zett. 23/5.

DOLICHOPODIDAE.

Argyra diaphana F. 22/6.
Campsicnemus curvipes F. 11/4.
Dolichopus simplex Mg. 23/5.
Poecilobothrus nobilitatus L. 22/6.
Porphyrops spinicoxa Lw. 23/5.
Xiphandrium appendiculatum Zett. 23/5.

The small early Dolichopodid *C. curvipes* was obtained by sweeping *Juncus* sp., where it was quite abundant. *P. nobilitatus* was also in considerable numbers in June, and was found resting on muddy patches in the path through the woods. *A. diaphana* was similarly found on mud but by no means so common.

LONCHOPTERIDAE.

Lonchoptera lutea Panz. 11/4.

SYRPHIDAE.

Ascia podagrica F. 23/5.
Baccha clongata F. 23/5.
Chilosia albipila Mg.
C. albitarsis Mg. 23/5.
C. proxima Zett. 23/5.
C. variabilis Panz. 23/5.
Chrysogaster hirtella Loew. 23/5.
Criorrhina asilica Fln. 23/5.
C. berberina F. 23/5.
C. oxyacanthæ Mg. 23/5.
C. ranunculi Panz. 11/4, 19/4 & 23/5.
Eristalis horticola De Geer. 23/5.
E. nemorum L. 23/5.
E. pertinax Scop. 11/4 & 23/5.
E. tenax L. 23/5.
Helophilus pendulus L. 23/5.
Leucozona lucorum L. 23/5.
Melangyna quadrimaculata Verr. 11/4.
Melanostoma scalare F. 23/5.
Myiatropa florea L. 23/5.
Pipiza noctiluca L. 23/5.
Platychirus albimanus F. 11/4 & 23/5.
Pyrophaena rosarum F. 23/5.
Rhingia campestris Mg. 23/5.
Syritta pipiens L. 19/4.
Syrphus bifasciatus F. 23/5.
S. cinctellus Zett. 23/5.
S. lasiopthalmus Zett. 11/4 & 23/5.
S. punctulatus Verr. 23/5.
S. ribesii L. 23/5.
S. torvus O.S. 11/4 & 23/5.
S. venustus Mg. 23/5.
Volucella pellucens L. 22/6.
Xylota florum F. 23/5.
X. segnis L. 22/6.
X. sylvarum L. 22/6.

On the 11th of April the catkins of Sallow (*Salix* sp.), then in full bloom, attracted a number of early species, including *C. ranunculi*, which generally hovered near the upper branches and rarely came low enough to be netted, *S. torvus*, *S. lasiophthalmus*, *P. albimanus* and *M. quadrimaculata*. It is of interest to note that of the latter species only females were found. A week later no single specimen was captured or observed although the same bushes where it had previously been taken were carefully examined. This would appear to confirm Verrall's observation on the short flight of this insect, although the absence of males is a little peculiar. An isolated male of *C. ranunculi* was taken on the 23rd of May on Hawthorn blossom, which habitat provided the other three species of *Criorrhina*. *V. pellucens* was in considerable numbers in June, hovering in its characteristic attitude 6 or 7 feet from the ground in the forest glades and drives.

DOLICHOPODIDAE.

Dolichopus ungulatus L.
Hygroceleuthus diadema Hal.
Machaerium maritimae Hal.
Poecilobothrus nobilitatus L.

MUSCIDAE.

Mesembrina meridiana L.
Morellia hortorum Fln.
Musca corvina F.

ANTHOMYIDAE.

Anthomyia pluvialis L.
Coenosia tigrina F.
Hylemyia strigosa F.

CORDYLURIDAE.

Scatophaga stercoraria L.

SCIOMYZIDAE.

Limnia marginata F.
Tetanocera elata F.

TACHINIDAE.

Eriothrix rufomaculata Deg.
Lucilia Richardsii Collin.
Pollenia rudis F.

ORTALIDAE.

Melieria omissus Mg.
M. picta Mg.

TRYPETIDAE.

Euribia cardui L.
Orellia ruficauda F.
O. tussilaginis F.

SEPSIDAE.

Sepsis cynipsea L.

CHLOROPIDAE.

Platycephala planifrons F.

SOME DIPTERA RECORDS.

The following list of captures by various members of the Society seem worth recording, and I am indebted to these collectors and others who have allowed me to examine their specimens. To those who have also permitted me to retain their captures my thanks are doubly due.

L. Parmenter.

STRATIOMYIDAE.

Stratiomys potamida Mg. ♀, found at the foot of grass on an uncut lawn at Richmond, Surrey, 21/8/36. C. L. Collenette.

DOLICHOPODIDAE.

Dolichopus andalusiacus Strobl. ♂, at Hayle Towans, Cornwall, 19/8/37. L. Parmenter.

CYRTIDAE.

Acrocera globulus Panz. ♀, Hogs Back, Surrey, 8/8/36. H. J. Burkill.
Oncodes pallipes Latr. ♂, in bracken area, Hayes, Kent, 11/7/36. G. Manser.

PLATYPEZIDAE.

Platypeza picta Mg. 2 ♀♀, Ragleth Wood, Church Stretton, Shrop., early October, 1936. H. J. Burkill.

SYRPHIDAE.

Chilosia albipila Mg. ♂, Ruislip, Middlesex. 24/4/37. K. M. Guichard.
Eristalis aeneus Scop. One on window pane in New Street, Westminster, 10/11/36. L. H. Burd.
Ischyrosyrphus laternarius Mull. ♂, Oxshott, Surrey, 25/7/37. ♀, Mill Hill, Middlesex, 1937. K. M. Guichard.
Callicera aenea F. ♀, Oxshott, Surrey, 25/7/37. K. M. Guichard.
Neoascia geniculata Mg. Several ♂♂♀♀, at Marazion Marshes, Cornwall, 1935 and 1937. L. Parmenter. This has not previously been recorded for the county, vide A. Thornley in *Trans. Soc. Brit. Ent.*, Vol. 2, Pt. 1, 1935.

TACHINIDAE.

Pollenia rudis F. 11/4.
P. vespillo F. 11/4.
Servillia ursina Mg. 11/4.

S. ursina was found on swampy ground. It was seen repeatedly chasing bees (*Bombus* sp.), which flew anywhere near, frequently following them to a considerable height.

CONOPIDAE.

Conops vesicularis L. 23/5.

MUSCIDAE.

Dasyphora cyanella Mg. 11/4.
Morellia hortorum Fln. 23/5.
Musca corvina F. 11/4 and 23/5.

ANTHOMYIDAE.

Anthomia pluvialis L. 23/5.
Polietes lardaria F. 23/5.

CORDYLURIDAE.

Parallelomma albipes Fln. 23/5.
Scatophaga stercoraria L. 11/4.

HELOMYZIDAE.

Heteromyza atricornis Mg. 11/4.

TRYPETIDAE.

Philophylla heraclei L., f. *centaureae* Fab. 23/5.
P. heraclei L., f. *onorpordinis* Fab. 23/5.
Tephritis vespertina Lw. 11/4.

CYPSELIDAE.

Cypsela hirtipes R.D. 11/4.

DIPTERA AT BENFLEET, ESSEX.

Being a list of species seen or taken on the Entomological Section's excursions to the Thames marshes in July of 1936 and 1937.

By L. Parmenter, F.R.E.S.

The area visited included railway embankments, salt-marshes, hedges and a small pond.

STRATIOMYIDAE.

Nemotelus notatus Zt.
Stratiomys furcata F.

RHAGIONIDAE.

Rhagio lineola F.

TABANIDAE.

Haematopota pluvialis L.
Tabanus autumnalis L.
T. bromius L.

THEREVIDAE.

Thereva nobilitata F.

ASILIDAE.

Dioctria atricapilla Mg.
Leptogaster cylindrica Deg.

EMPIDIDAE.

Empis livida L.

SYRPHIDAE.

Chrysotoxum bicinctum L.
C. octomaculatum Curt.
Cnemodon vitripennis Mg.
Eristalis aeneus Scop.
E. arbustorum L.
E. nemorum L.
E. pertinax Scop.
E. sepulchralis L.
E. tenax L.
Helophilus hybridus Lw.
H. pendulus L.
Melanostoma mellinum L.
M. scalare F.
Myiatropa florea L.
Orthoneura nobilis Fln.
Pipizella virens F.
Platychirus angustatus Zt.
Rhingia campestris L.
Sphaerophoria scripta L.
Syritta pipiens L.
Syrphus balteatus Deg.
S. latifasciatus Macq.
Volucella pellucens L.

Mallota cimbiciformis F. ♂, Watford, Herts, 6/6/35. K. M. Guichard.
Criorrhina floccosa Mg. ♂. Mill Hill, Middlesex, 10/5/37. K. M. Guichard.
C. oxycanthe Mg. ♀, Mill Hill, Middlesex, 29/5/37. K. M. Guichard.
C. asilica Fln. ♂, at Holly, Brickett Wood, Herts, 29/5/37. K. M. Guichard.

TACHINIDAE.

Zophomyia temula Scop. ♂, in rough grass of fields edging the Downs, Patcham, Sussex, 24/5/36. L. Parmenter. This is new to the county, vide C. J. Wainwright in *Trans. Ent. Soc. Lond.*, 80, Pt. 3, 1932

NOTES ON DRAGONFLIES, 1937.

By E. B. Pinniger.

Conditions during the year 1937 seem generally to have been more favourable to dragonfly life than in 1936; in consequence, more insects, several of them of more than usual interest, were recorded. I wish to offer my grateful thanks to three observers—Messrs L. Parmenter, K. M. Guichard and A. F. O'Farrell—for their co-operation in enabling me to extend the scope and interest of this report. All records of Dragonfly occurrences are welcome, and especially notes from districts not well worked by entomologists.

The first species seen was *Pyrrhosoma nymphula* Sulz., a teneral specimen found at a pond in Epping Forest on the 9th May. The insect was clinging to the bark of an oak tree some eight feet above water level and the empty naiad skin was only an inch or so away. From the 14th to the 17th of May I visited the New Forest, Hampshire. *P. nymphula* was very abundant but I saw no other species. At Tilgate, Worth Forest, Sussex, on the 25th May, *Cordulia aenea* L., *Agrion virgo* L., *Coenagrion puella* L., and *P. nymphula* were seen. *C. puella* was also seen on Mitcham Common, Surrey, on the 30th May (L.P.).

On June the 6th I saw *C. aenea*, *Agrion splendens* Harr., *C. puella*, *Ischnura elegans* Van der Lind. in Epping Forest, and at the Black Pond, Esher, Surrey, on the 13th, *Libellula quadrimaculata* L. and *Enallagma cyathigerum* Charp. were added to the list. At Limpsfield Common, Surrey, on June 6th, one ♂ *P. nymphula* and one ♀ and one pair of *Libellula depressa* L. were seen at a pool in area W, one ♂ and two ♀♀ were seen at a pool in area P (L.P.).

The Norfolk waterways were worked from the 13th to 26th of June. The first species noted were seen on the River Yare, near Reedham, and the River Chet on the 13th, and were *Brachytron pratense* Müll., *Orthetrum cancellatum* L., *A. splendens*, *C. puella*, *Coenagrion pulchellum* Van der Lind., and *I. elegans*. Near Langley on the 14th, *L. quadrimaculata*, *Erythromma najas* Hans., *P. nymphula* and *E. cyathigerum* were also seen, and on the district between South Walsham Broad and Horsey Mere *Libellula fulva* Müll., *Aeshna isosceles* Müll., and *Sympetrum striolatum* Charp. one teneral female, were seen in addition to the species already noted (L.P. and K.G.).

At Wroxham on the 19th of June I joined the party working in Norfolk and we proceeded up river to Coltishall. Here on the 20th *A. splendens* and *L. fulva* were on the wing in fair numbers and a soli-

tary example of *L. depressa* ♀ was taken. Along the river towards Horning on the 21st *L. fulva* was abundant, together with *B. pratense* and *A. splendens*. Near Ranworth *A. isosceles* was to be seen in small numbers, *L. fulva* and *O. cancellatum* were both very abundant. *L. fulva* seemed to delight in taking short rapid flights over the long grass near the water's edge, frequently alighting to sun itself. It was so common that netting three or more individuals with one sweep of the net was relatively easy. The Swallow-tail Butterfly, *Papilio machaon* L., was first seen here. *A. isosceles* was found in great numbers near Barton Broad on the 21st and 22nd; it was easy to net as it flew low over the surface of the water, and was frequently found settled on bracken leaves. At Horsey Mere on the 22nd, 23rd, and 24th of June *L. fulva* and *A. isosceles* were again seen in good numbers; *B. pratense* was still active and in fair numbers, and the Swallow-tail butterfly quite common. An excursion was made to the coastal sand hills in the neighbourhood of Winterton; the only species of dragonflies seen were *I. elegans* and *E. cyathigerum*, found in a damp hollow containing grass and sedges and situated quite near to the sea. *L. quadrimaculata* was in great numbers in the marshy land just inside the sand belt and one unidentified *Aeshna* was seen, the butterfly *Argynnis aglaia* L., the Dark Green Fritillary also occurred.

Reedham was again visited on June the 25th. *O. cancellatum* and *L. quadrimaculata* were still common, and at Langley one ♀ *A. isosceles* was seen. During these two weeks fourteen species were definitely identified and two species are in doubt. The chief points of interest are the remarkable and widespread abundance of *L. fulva* and *A. isosceles*, the variation exhibited by *I. elegans*, and a specimen of *P. nymphula* ♀ taken with prey, which was *Dolichopus nubilus* Mg. Diptera.

At Beddington, Surrey, on June the 27th, one ♂ *O. cancellatum*, a few *C. puella*, and many *I. elegans* were seen. One ♂ *Anax imperator* Leach was flying over Mitcham Common (L.P.). On July the 11th *C. aenea*, *L. quadrimaculata*, *A. imperator*, *Aeshna grandis* L., *Lestes sponsa* Hans., *P. nymphula*, *E. najas*, *C. puella*, *I. elegans*, and *E. cyathigerum* were flying in Epping Forest. Benfleet was visited on July the 18th and *Lestes dryas* Kirby seen in fair numbers; *Sympetrum sanguineum* Müll., *A. imperator*, and *L. depressa* were also seen. At Oxshott, Surrey, on the 25th July, *A. imperator*, *S. striolatum*, one *Aeshna cyanea* Müll. ♀, and at the Black Pond *Sympetrum danae* Sulz. and *L. sponsa* were noted. On August 1st to 3rd *S. sanguineum*, *S. striolatum*, *L. sponsa* were seen over the Military Canal between Rye and Appledore and on adjacent waters (K.G.). On the 1st of August I saw *Aeshna mixta* Latr. flying together with *A. imperator*, *A. grandis*, *A. cyanea*, *S. sanguineum*, and *S. striolatum* in Epping Forest. On August the 8th at the Basingstoke Canal near Woking, Surrey, *L. sponsa*, *A. grandis*, and *S. striolatum* were seen (K.G.).

The following notes were made during the period 1st to 14th of August in the Glencar district, Co. Kerry, Ireland, by Mr A. F. O'Farrell. The list is of more than usual interest as it contains what appear

to be the first records of *A. imperator* for Ireland and *S. danae* for the district of Kerry:—

Aeshna juncea L. Extraordinarily common in the hot wooded valleys about Caragh Lake and Glencar. Not seen on open bog or above 700 feet.

Anax imperator L. Only one seen, a large ♂ hawking over a bog pool, about 1300 feet up near Coomasahan Lake.

Orthetrum coerulescens Fab. Extremely local, but plentiful if present, round pools in open bog.

S. striolatum. Very abundant everywhere up to about 1000 feet. Not seen above 1500 feet.

S. danae. Only one seen, on open bog, a ♂ of rather abnormal facies.

A. virgo. A few, all ♂♂, seen in the woods near the Caragh River.

L. sponsa. Plentiful locally in certain backwaters of the Caragh River and Lake.

I. elegans. Fairly plentiful along the banks of the Upper Caragh.

P. nymphula. In small numbers in the valleys, particularly on the banks of Caragh Lake, and round certain bog pools.

E. cyathigerum. In enormous numbers, particularly on the banks of Upper Caragh Lake; progressively scarcer at higher levels and away from the more or less wooded country. Many interesting varieties of this species were seen and a brief sketch of them will be found elsewhere.

At Hayle, Cornwall, on the 15th August, one ♂ *A. imperator* was seen, and on the 18th at St Erth *I. elegans* and *E. cyathigerum* were noted (L. P.). In Cumberland, from the 14th to 21st August, I made the following notes:—*A. juncea* was seen at Lodore Falls, Borrowdale, and Aira Force, Ullswater, flying just above the water as it plunged down the falls, and again hawking over the pools at the foot of the falls. *S. danae* was common on marshland near Derwentwater. *Leucorrhinia dubia* Van der Lind: one ♂ was seen over a bog in Borrowdale; the date is very late for the species. *E. cyathigerum*: one ♂ flying over reeds at the edge of Derwentwater. In Epping Forest on August the 22nd *A. mixta*, *A. cyanea*, and *A. grandis* were common (K.G.). On September the 5th at Limpsfield Common a specimen of *S. striolatum* was seen settled on bracken in area C; also specimens of an undetermined *Aeshna* were flying (L.P.). At Mill Hill on September 26th two *A. mixta* and very many *S. striolatum* were seen. *O. cancellatum* had been taken in this area earlier in the year (K.G.). About the second week in October *S. striolatum* was seen in Epping Forest, and this was the last dragonfly seen there; this example was very sluggish and it is unlikely that it survived much longer.

BRITISH BUTTERFLIES IN 1937.

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

It seems as if one was fated to write pessimistically when reviewing the status of our Rhopalocera year by year, as the downward trend of

the two previous seasons has been apparently continued over most of the areas from which I have received reports. My enquiries have been replied to by a larger number of observers this year, and Dr F. C. Garrett has sent me records from several of his friends in Durham and Northumberland for comparison with those sent in from the L.N.H.S. own district. Among the correspondents to whom I am indebted are Miss E. M. Gibson, Mrs Hodgkin, Miss E. Miller, and Messrs O. A. Alexander, S. Austin, Dr K. G. Blair, P. Buckman, W. Carter, F. Clegg, Dr E. A. Cockayne, J. D. Couper, R. Craigs, G. S. Crockett, G. F. Crowther, R. Cyriax, J. E. S. Dallas, Major J. C. Eales White, Dr W. J. Fordham, Dr F. C. Garrett, W. E. Gaze, C. J. Gent, K. M. Guichard, G. H. Heath, C. E. S. Hick, T. W. Jefferson, Dr N. H. Joy, W. J. Kaye, K. P. Keywood, D. Leatherdale, J. Newton, J. E. Nowers, C. Nicholson, L. Parmenter, J. H. G. Peterken, G. Richardson, J. P. Robson, R. W. Robbins, G. Talbot, J. W. Thompson, L. J. Tremayne, Brig.-Gen. B. Tulloch, D. G. Underhill, E. H. Wattson, and Dr P. H. Willcox.

To all these I tender my thanks. There are no notes from Ireland this year owing to Miss Longfield's absence in Africa.

Many of these correspondents declare that 1937 was the worst season they have ever experienced. The weather since the big frost of May 1935 has not been such as to enable the different species to make up for the heavy destruction that must have taken place then. It has handicapped many of them in various ways each succeeding summer. Here and there some species were locally abundant but, generally speaking, the average numbers seen were well below what we expect to meet with.

There was little evidence of migration except where mentioned below. One interesting note came from Mr Mellows, who saw *Vanessa cardui* swarming in the spring in Dalmatia. Can we hope that the descendants of these swarms will spread sufficiently northward to give us a *cardui* year in the near future?

The order and scientific names in these notes are those given in the Royal Entomological Society's list, published four years ago, while the English names are taken from Mr Frohawk's *British Butterflies* (1934).

Pararge aegeria L. (Speckled Wood) recorded as fairly common to abundant in places in the South. Seen 3rd August, Stapleton Park, Yorks. (C. A. Cheetham, per W.J.F.). No records from Durham or Northumberland (F.C.G.). *P. megaera* L. (Wall), seen plentifully in the South and East Anglia, but conspicuously absent in Hampshire and very few in Monmouth. *Erebia aethiops* Esp. (Scotch Argus), not seen (F.C.G.). *Satyrus galathea* L. (Marbled White), very plentiful in a few localities, but somewhat unaccountably missed by several of my correspondents. *Eumenis semele* L. (Grayling), rather scarce. *Maniola tithonus* L. (Hedge Brown), generally fairly common to abundant. *M. jurtina* L. (Meadow Brown), generally plentiful but only a few in some areas. *Coenonympha pamphilus* L. (Small Heath), common to abundant, mostly, but " below normal " (F.C.G.) and " none seeen " (B.T.). *C. tullia* Müller (Large Heath), seemed more abundant than usual on

the Northumberland mosses. Not reported from Durham (F.C.G.). *Aphantopus hyperanthus* L. (Ringlet), fairly common. F.C.G. reports it as being found in a fresh locality in the Cheviots this year by Rev. J. E. Hull.

Argynnis selene Schiff. (Small Pearl Bordered Fritillary), only reported by a few correspondents. *A. euphrosyne* L. (Pearl Bordered F.), abundant in places but not general. *A. aglaia* L. (Dark Green F.), below normal numbers. Early in July in Shropshire I saw a number freshly emerged travelling rapidly over the hills before a strong S.W. wind. *A. cydippe* L. (High Brown F.), less than usual. Mr Gaze reports three seen in Aberdeenshire and one in Argyllshire. Dr Garrett says below normal in Northumberland. *A. paphia* L. (Silver Washed F.), seems to be holding its own in the South but not many seen in the West. *Euphydryas aurinia* Rott. (Marsh F.), Miss Gibson found them plentiful in one spot in Wilts, but my other correspondents do not mention them. *Melitaea cinxia* L. (Glanville F.), very few seen. *M. athalia* Rott. (Heath F.), plentiful, but worn, 15th July, Leigh-on-Sea (K.G.B.).

Vanessa atalanta L. (Red Admiral), generally scarce. General Tulloch met with no hibernated specimens, but I saw one in our garden at Fetcham on a sunny day in the early spring. Mr G. L. Drury on Tynemouth Pier on 3rd October in two hours saw between 20 and 30 fly in from over the sea, evidently migrants from the Continent. *V. cardui* L. (Painted Lady), odd specimens seen in various places. Slightly more than usual (C.N.). Reported up to 10th October (B.T.). Five seen in bred condition, Hall Sands, S. Devon, September (E.A.C.). *Aglais urticae* L. (Small Tortoiseshell). After the increase in 1936 this species has slipped back again to comparative scarcity and was apparently only seen irregularly in any numbers. *Nymphalis polychloros* L. (Large Tortoiseshell), one in Essex (W.E.G.), and one reported near Newport, Mon. (G.F.C.). *N. io* L. (Peacock), possibly more often noticed than the other Vanessids. Dr Garrett says that there had only been two records in 30 years in his area, but this season five specimens were reported between Sunderland and Wark-on-Tyne. Near London specimens were seen hibernating in houses up to the end of November. *N. antiopa* L. (Camberwell Beauty). On 26th August Messrs G. Richardson, L. Roberts and W. I. Bristo watched a rather worn specimen at Wych Cross, Ashdown Forest, feeding on flowers in the garden of the hotel there. It was accompanied by other Vanessids. *Polygonia c-album* L. (Comma), generally fewer than in 1935, but plenty seen in some districts. Records show that it has spread in Essex, and is getting further north in the Midlands. *Apatura iris* L. (Purple Emperor), two records only (L.P. and E.M.G.). *Limenitis camilla* L. (White Admiral), reduced numbers except in the New Forest.

Hamearis lucina L. (Duke of Burgundy), few records.

Cupido minimus Fuessl. (Small Blue), a few to common in places. *Plebejus argus* L. (Silver Studded Blue), common in some spots in the South. *Aricia agestis* Schiff. (Brown Argus), common in Bucks (G.S.C.), but only a few seen elsewhere. *Polyommatus icarus* Rott. (Common

Blue), very common in some places but in reduced numbers in other districts. In Shropshire I stalked for twenty minutes among Bracken on a wind-swept hillside a black butterfly that I believed was this species. I got close to it more than once but had no net with me, and as soon as I got the KCN bottle near, the insect was off again. As I made my last attempt two other similar ones went past me, and all the three were out of sight immediately. *Lysandra coridon* Poda. (Chalk Hill Blue), common in some and scarce in others of its usual haunts. *L. bellargus* Rott. (Adonis Blue), only seen by a few correspondents, two of whom found the species abundant in Hants and Sussex respectively. *Maculinea arion* L. (Large Blue), reported from Gloucestershire (E.M.G.). *Lycaenopsis argiolus* L. (Holly Blue), plentiful in S. Devon, April (K.G.B.). Both broods scarce elsewhere. *Lycaena phlaeas* L. (Small Copper), seems to have been seen plentifully as a rule, but in some places was hardly noticed. *L. dispar* Haworth, ab. *batavus* Ob. (Large Copper), affected by last winter's floods, but was reported from Wicken (J.D.C.).

Callophrys rubi L. (Green Hair-streak), much scarcer in the South, but reported from two new localities in Weardale this season (F.C.G.). *Thecla betulae* L. (Brown Hair-streak), larvae seen two Surrey localities (J.D.C. and G.S.C.). Larvae at Swinley mostly stung (C.E.S.H.). Two imagines seen near Peterboro' (P.H.W.). *T. quercus* L. (Purple Hair-streak), several specimens taken (P.H.W.). Very few seen at Swinley (C.E.S.H.). Not reported this year, Northumberland or Durham (F.C.G.). *Strymon w-album* Knoch. (White Letter Hair-streak), Essex (R.W.R., O.A.O., and L.P.). Miss Miller has reported a darker local form which she is observing. *S. pruni* L. (Black Hair-streak), no records.

Leptidea sinapis L. (Wood White), taken in Surrey (J.D.C. and G.S.C.). Reduced numbers and late in appearing (C.E.S.H.). *Aporia crataegi* L. (Black-veined White), "The Field" reported one seen (P.H.W.). *Pieris brassicae* L. (Large White), very variable, abundant in places and much below the average elsewhere. About 200 captured in garden at Fetcham, where they were also taken by House Sparrows (D.L.), but some 300 yards away I was not troubled by them. Second brood was much in evidence in some districts. Dr Garrett says the species was unusually abundant and on the Northumberland coast was seen coming in from the sea. Major J. C. Eales White noted large numbers of this and the next species by the railway banks between Brondesbury and Willesden on 8th June, but none were to be seen the next day or for weeks after. Evidently a wave of local dispersal spreading in the London area. *P. rapae* L. (Small White), about usual numbers in the South, but below the average elsewhere. *P. napi* L. (Green-veined White), rather below the usual numbers. *Pontia daplidice* L. (Bath White), reported taken at Folkestone (C.E.S.H.). *Euchloe cardamines* L. (Orange Tip), generally below the average; later in places, being seen up till September (D.L.). Rather more plentiful in Co. Durham, but very scarce in Northumberland (F.C.G.). *Colias hyale* L.

(Pale Clouded Yellow), one seen near Dartford (L.P.). *C. croceus* Foucroy (Clouded Yellow), reported from Sussex, Surrey, Hants, Devon and Cornwall, lasting on to the middle of October. *Gonepteryx rhamni* L. (Brimstone), generally plentiful, but more so in the spring than in the summer. There was a striking prevalence of females in the spring (D.L.). Dr Garrett remarks that it does not occur in his district, but Mr Gaze reports this wanderer as seen in Banffshire in the first week in August. He had a good chance to identify it as it flew slowly along the road. *Papilio machaon* L. (Swallow-tail), several in various places in Norfolk (L.P.). At Wicken Fen the ova were found deposited on Wild Carrot in preference to Fennel (J.D.C.).

Erynnis tages L. (Dingy Skipper), fairly plentiful to abundant. *Syrichtus malvae* L. (Grizzled Skipper), fairly plentiful. *Adopaea sylvestris* Poda. (Small Skipper), common. *A. lineola* Ochs. (Essex Skipper), Benfleet, plentiful. *Hesperia comma* L. (Silver-spotted Skipper), in fair numbers. *Ochlodes venata* Bremer & Gray (Large Skipper), common.

Plant Gall Records for 1937.

Compiled by H. J. Burkill, M.A., F.R.G.S.

THOUGH the year supplied us with fewer species than usual, I consider that the results have been as full of interest as in any of the previous years. Original investigation has led to discoveries which are being followed up in the hope of further elucidation of some of the problems. Sundry species of galls have been recorded that seem to be fresh to the British lists or of only local occurrence. The list that follows gives the more important.

CYNIPIDAE.

In the spring several of the less noticeable species were obtained from which the flies were bred. Some of these insects were sleeved on Oak (*Quercus Robur* L.), and from a number of flies of *Andricus amenti* Giraud given to me by Mr Ross I obtained galls of *A. glandulae* Schenck in the autumn, thus establishing another coupling in the table of Alternating Generations. Four other controlled experiments failed to produce the desired galls, but uncontrolled experiments where the galls were placed on the ground under the trees produced quantities of the alternate generations.

Mr Ross has paid considerable attention to *Neuroterus schlechtendali* Mayr as errors seem to have crept into the illustrations made by those who attempted to copy the drawings purporting to be based on Mayr's original figures. He explained the position to the Section in a paper on 23rd March.

Biorrhiza pallida Oliv. was once more bred out in some numbers and all the imagines were fully winged. *Cynips corruptrix* Schl. was found

on Walton Heath. Three of the Spangle galls were very plentiful but *Neuroterus fumipennis* Htg. appeared to be scarce in some areas, possibly because the galls of *N. tricolor* Htg. were severely parasitized. Galls of *Andricus occultus* Tschck. were found at Horsley, Surrey, at Abbey Wood, Kent, and at Limpsfield Common, Surrey.

Some unidentified galls were obtained which do not correspond to any species of Oak galls known to us, but the numbers were so small that there seems little prospect of breeding out the flies. Mr Ross drew attention to some cells in the woody bases of the galls of *Andricus fecundatrix* Htg. shaped somewhat like the cells of *A. furunculus* Bjck. but occurring in the autumn. I had already seen similar specimens, and on two occasions I found in similar situations gall cells with inner cells resembling *A. curvator* Htg., and a specimen of what seemed to be *A. collaris* Htg. developed among the bracts of the *fecundatrix* gall whose normal cell had grown properly without hindrance from the superimposition of this other species. One specimen of No. 74 in our list of the Gall-causing Cynipidae in Britain (*Entomologist*, LXV, p. 275) was found on Limpsfield Common at the base of an Oak in December. Its diameter was 2.5 mm. with a chamber 2 mm. containing a white Cynipid larva 1.5 mm. long. These species are mentioned in the hope that some one may be able to afford further information about them.

Galls of the genus *Diplolepis* in the past two years have been more plentiful in the neighbourhood of London than for some seasons and we were able to secure a good series of *D. taschenbergi* Schl. and *D. similis* Adler at Effingham. *D. folii* L. was plentiful in Surrey and Shropshire. *D. divisa* Htg. was abundant in the latter county with smaller quantities of *D. agama* Htg. and *D. disticha* Htg. *D. longiventris* Htg., however, was scarce.

Aulacidea pigeoti Kieff. was found in several places, and *A. tragopogonis* Thoms. once in some numbers near Bookham, both species on *Tragopogon pratensis* L.

TENTHREDINIDAE.

Sawflies apparently had a good season. The species rolling the margins of the leaves of *Salix purpurea* L. which I found at Church Stretton in 1936 has been identified by Mr R. B. Benson as *Pontania purpureae* Cam., a new species to the British list. Galls of *Euura venusta* Zadd. were frequent on *Salix cinerea* L. and *S. caprea* L., as were the bud galls of *E. ater* Jur. or *E. saliceti* Fall. on the same two host plants. As the larvae had gone it was impossible to determine the exact species.

COLEOPTERA.

Many plants of *Gentiana amarella* L. were noted with the Weevil galls on the main stems but no one succeeded in breeding out the insect. Mr Niblett pointed out to the Section galls of *Apion loti* Kirby on *Lotus corniculatus* L. on Walton Heath, where the insect was evidently present in some numbers. *Miarus campanulae* L. was seen on *Campanula rotundifolia* L. on Limpsfield Common.

LEPIDOPTERA.

Grapholitha servilleana Dup. was found in *Salix cinerea* L. on Bookham Common and elsewhere. *Nepticula argyropeza* Zell. was seen on *Populus tremula* L. in Walcot Park, Shropshire. The Tortricid larvae in Bracken stems were found in some numbers in Surrey but we failed to rear the imagines. Old galls were seen later on in Shropshire.

CECIDOMYIDAE.

Tilia vulgaris Hayne. Flower buds considerably swollen, and remaining closed. Galled by white larvae of a midge. Shropshire.

T. cordata Mill. *Oligotrophus reamurianus* Rubs. Sent to me by Mrs C. L. Wilde from Northamptonshire. An interesting find as this is a fresh locality on our lists, the gall having previously been reported only from Gloucestershire and Monmouth.

Acer campestre L. (1) Margins of leaves twisted and puckered into an irregular mass in the hollows of which were many white Cecidomyid larvae. Shropshire. (2) *Atrichosema aceris* Kieff. Only once seen though looked for frequently.

Pyrus malus L. Leaf margins rolled tightly upwards, the rolls containing white Cecidomyid larvae. Epsom Common.

Pimpinella saxifraga L. *Lasioptera carophila* F. Low. Only once seen. All galls on Umbelliferae seem to have been very scarce.

Cornus succica L. Some dried leaves were sent to me by Mr H. Britten of Whitby. The lamina were marked by brown circular spots with darker rings on the outside. In the centre were slight concavities similar in appearance to the galls induced by various species of Midge larvae, but there were no larvae in these hollows when the leaves reached me, and further investigation is required.

Sambucus nigra L. (1) *Schizomyia nigripes* F. Low. Fetcham Downs, Surrey, and Shropshire. (2) *Contarinia lonicerearum* F. Low. Shropshire.

Picris hieracioides L. Elongated swellings up the mid rib containing yellow Cecidomyid larvae. Unilarval. Near Dorking.

Tragopogon pratense L. *Contarinia tragopogonis* Kieff. Found by Miss Hose on the Hog's Back, Guildford.

Ligustrum vulgare L. Flower buds swollen and unopened. Contain orange coloured larvae of a Midge. Hog's Back.

Scrophularia nodosa L. Flower buds much swollen, unopened, massed close together, discoloured. *Asphondylia* sp. (*Houard* 5062). Sent to me by Mr H. Britten of Whitby. Found in Mulgrave Woods.

Thymus serpyllum L. *Janietiella thymicola* Kieff. Walton Heath and Shropshire.

Juniperus communis L. Leaflets metamorphosed into a tubular gall with three points at the top. Light green in colour. Length 15 to 18 mm. Breadth 3 to 4 mm. *Oligotrophus* sp. (*Houard* 127). Limpsfield.

MUSCIDAE.

Achillea millefolium L. *Trypeta guttularis* Meign. Fetcham.

Cnicus eriophorus Roth. Flower heads containing hard galls at the base of the pappus in September. Shropshire.

Brachypodium sylvaticum Roem. & Schult. *Poomyia helwigi* Rubs. Plentiful at Fetcham after being missed for some years.

Pteris aquilina L. Heavily attacked by *Anthomyia signata* Brischke in Surrey and elsewhere.

Athyrium filix-foemina Roth. A specimen sent to me from North Wales by Mr L. J. Tremayne.

PSYLLIDAE.

Salix cinerea L. A bush was found near Crompton, Surrey, with many leaves heavily twisted, contorted and crinkled, with the mid ribs shortened. The cavities were occupied by pale green Psyllids.

APHIDIDAE.

Ulmus nitens Moench. *Eriosoma ulmosedens* Marchal, and *E. ulmi* L. were both noticed on this host plant as well as on *U. campestris* L. and *U. montana* Stokes in Shropshire.

ERIOPYIDAE.

Ornithopus perpusillus L. *Eriophyes* sp. The host plant had suffered badly from the drought on its exposed hillside and a close search was necessary before any galls were to be seen. A few were found in July in Shropshire in the old locality, but none could be discovered in places a few miles away where the plant grew more vigorously.

Pyrus communis L. *Eriophyes pyri* Pagnst. Fetcham.

P. malus L. The *Eriophyes* sp. recorded previously from Shropshire in two localities was found to be holding its own there, and was also found abundantly in new places, a few miles away. Mrs C. L. Wilde sent me some well-galled leaves from Witley, Surrey, so a second district for this mite has to be listed for Britain.

Lonicera periclymenum L. *Eriophyes xylostei* Can. Found in fresh places in Shropshire, but not noticed in Surrey this year.

Campanula glomerata L. *E. schmardae* Nal. and *E. campanulae* Lindroth. The galled heads were plentiful on Hackhurst Downs, Surrey.

Gentiana amarella L. *E. kerneri* Nal. Wenlock Edge, Shropshire. A fresh district for this gall, hitherto only known to us from Bagnall's and Harrison's list (*Ent. Rec.*, 1917) for the north and our own records from Surrey.

Ulmus nitens Moench. Mr Dallas showed some of this plant from Hampshire at a meeting of the Society, and Mr Ross noticed galls of *E. ulmi* Nal. on the leaves.

Populus tremula L. *E. dispar* Nal. Near Leatherhead. A keen search for it in its former locality near Claygate was unsuccessful.

Salix repens L. *E. triradiatus* Nal. Wimbledon Common.

NEMATODA.

Holcus mollis L. *Tylenchus devastatrix* Kuhn. Gomshall.

H. lanatus L. *T. devastatrix* Kuhn. Walton Heath.

Notes on the Association of Thrushes and Hawfinches.

By P. W. E. Currie.

THE following notes on the association of thrushes and hawfinches are the result of observations made at Mickleham Downs and Whitehill, Surrey, on October 24th and 31st and November 14th and 28th. This area consists of steeply undulating chalk downs, partly open, but with patches of beech wood and yew trees, and thickets of privet, elder, spindle trees and dogwood, together with other trees and shrubs in smaller numbers. Large flocks of thrushes generally frequent the yews and privets during the autumn and winter; and this year exceptionally large numbers of mistle thrushes have been present. It is difficult to estimate their numbers, since the birds move about a great deal, but there were probably at least eight hundred in the area. In addition, redwings have been present in some numbers since October 10th, and fieldfares since November 14th. Blackbirds were also present, but principally among the privets, where also the few song thrushes were usually to be found.

During this period there could be seen, scattered over the ground or adhering to the branches of the tall beech trees, in which the birds rested in the intervals of feeding, many little pink masses, each consisting of the remains of six to twelve yew berries. These berries seemed to be relatively little affected by the digestive processes to which they had been subjected. The greater part of the pulp seemed to be there, and the hard kernels were quite unaffected; only the containing skin had disappeared. Presumably these masses were rejected by way of the mouth after the digestible portions of the berries had been separated in the gizzard. Collinge (*Food of Some British Wild Birds*, p. 332) records as exceptional the fact that a blackbird "swallowed the fruits of the yew without afterwards relieving its crop of the stony seeds." He says of the song thrush that "the seeds of fleshy fruits which were greedily devoured were thrown out of the crop if the stones which they enclosed measured as much as 3 mm."

On each of the occasions on which the area was visited, one or more hawfinches were observed. They were usually first seen perched on the topmost twigs of the beech trees, from which they then passed down into the lower branches, where they appeared to be finding some food. As the beech mast, which has in any case been very scarce this year, had already fallen, it was not clear what this food could be. The problem was solved only on November 14th. On this date a flock of some eighty mistle thrushes, accompanied by four hawfinches, was seen flying in the direction of the Mole valley. They were followed to a small patch of beech trees, in which there was a congregation of mistle

thrushes, fieldfares and redwings. Here a hawfinch was observed hopping and sidling about the lower branches of a beech tree. It was possible to see that it was picking out the seeds from the patches of yew berries adhering to the branches, and cracking them. For three quarters of an hour this and another bird were kept under observation with 12X glasses, at ranges of twenty to thirty-five yards. They appeared to be definitely working over the branches, searching for the patches of berries, and feeding steadily all the time. Numbers of greenfinches also visited the trees, but apparently only in order to drink at a small pool of water collected in the fork of one beech tree. They were never actually observed feeding on the rejected berries, though they were frequently seen eating berries *in situ* on the yew trees, as well as privet berries.

When the area was revisited on November 28th, the thrushes had practically deserted Whitehill, having nearly exhausted the yew berries there, and were collected in the thicker areas of yew trees on Mickleham Downs and Box Hill. The hawfinches, however, were still present in the same clump of trees. There were at least four individuals there, but they seemed to be resorting to the trees principally in order to drink, and were only twice seen to take a seed from one of the few remaining and now much faded patches of yew berries. Two birds were seen feeding in yew trees, but whether on growing or rejected berries it was impossible to determine. On subsequent visits one or more birds have always been seen in this group of beech trees, their presence there indicating the importance of pools of water in tree forks in chalk districts where there is usually little surface water.

The explanation of the habit of feeding upon these rejected berries may possibly be found in the mucilaginous nature of the fleshy part of the berry. When rejected by the thrushes, the berries seem to be in a relatively fluid state, with the result that they spread out into a patch of about one to one-and-a-half inches in diameter, with the seeds exposed on the surface. The hawfinch is thus able to obtain the seeds clean and free of the gummy flesh, instead of having to rid them of the flesh for itself. The habit would be readily acquired, since the berries are conspicuous objects on the trees which the hawfinches frequent. Whether there is any further significance in the tendency which they revealed on several occasions to follow the flocks of thrushes from one group of trees to another remains to be discovered. Perhaps there is some advantage in getting freshly rejected berries.

Observations on a Colony of House Martins, 1929-1935.

By Cynthia Longfield.

OBSERVATIONS made on a cliff colony of House Martins (*Delichon urbica urbica*) on the coast of County Cork, Ireland, for seven years, have yielded some results worth recording.*

Situation.—The colony was on the face of a limestone cliff. The nests were fastened under the slightly overhanging top of the cliff, about 20 feet down and 40 feet above the rocks below. Just beneath the nests opened the mouth of a large and narrow cave, so that nothing could get to them except birds. The rocks below and the entrance to the cave were covered with every high tide. The available positions for the nests were limited. Most of them faced south-west, some due south or west and a few due north. This north face of the cliff was sheltered from the north winds by a higher wall of cliff only 25 feet away.

Orientation of Nest Openings.—All the nests facing south opened to the south, but were screened on that side by the opposite wall of cliff. Some of the nests with a northern aspect opened on that side, others had the opening facing west. Those nests facing south-west mostly had the opening on that side, but a few opened to the north.

Building.—All nests were repaired each year, and where the old foundations survived the winter they were built upon. When winter gales from the south-west (always particularly severe on that coast) swept every vestige of the old nests away, then the Martins rebuilt completely, often in exactly the same positions, with an occasional experiment of a slightly different site. Only in one year (1934) was a nest built away from the colony, about 50 feet off, and that followed a year when the nests had been at the maximum number and were rather badly overcrowded.

The method of building was watched and timed. The mud was brought from a damp " puddle " where water was seeping under a wall on the top of the cliff, 50 yards back from the edge and about another 50 from the colony. The Martins alighted and flew off from the level ground with the greatest ease, keeping the tail raised the while out of the wet. They collected the mud in their beaks with a few quick pecks. When the nest was more than half completed, both birds helped equally with the building, coming with and going for the mud in 30 seconds each visit. The pellets were very quickly glued in their places from the outside. When a nest was built from the foundations I could not be sure whether both birds actually did the building, although both

Note.– I was unable to be in Ireland in 1936, so the sequence of observations ceased.

certainly brought the mud. However, only one bird built at a time from inside the saucer and later the cup, I believe the same bird, but it was possible a change over was made, as their movements were too quick to be sure. In the early stages the mud took a long time to arrange and shape, while a great deal of saliva was applied.

Arrivals.—The Martins arrived at the colony in two parties already paired, except possibly in 1929 and probably in 1935, when only one party seems to have come at all. House Martins are quite scarce in the neighbourhood, and they do not seem to fancy the farm houses or cottages as nesting sites. This is probably due to the practice of white-washing the entire walls during the spring or summer. The nearest House Martin colony is ten miles inland in a small town. Swallows are very common on all the farms of the countryside, arriving to nest earlier and leaving later than my cliff colony of Martins.

Dates.—The earliest known date for building was in 1932, when five pairs had already commenced by May 4th. The second party had arrived and were building by May 16th, so that there was not less than ten days between the arrival of the two parties. Much the same time must have passed between the coming of the two parties in 1930, when seven pairs had finished and feathered their nests by June 7th, while nine pairs had only begun to build on that day. That year they were very late nesting, but in contrast had been early the year before (1929), when there were young in the nests on May 24th. The latest date on which I saw young birds being fed in the nests was August 30th 1932, and the latest I saw young birds flying in and out of the nests was September 12th 1933, the adults having already gone.

Number of Nests.—In 1929 when I first discovered the colony, the number of nests was 9, with 9 pairs of Martins. In 1930 there were 16 nests, with 16 pairs of birds. In 1931 there were 15 nests, but one, which was probably unsafe, was not occupied, while the pairs of birds had dropped to 12. In 1932 the number had dropped to 9 pairs again, although 11 new nests were built and occupied during the year. In 1933, 17 nests were built and the pairs had considerably increased, but I was not able to estimate the number accurately, and some of the nests were undoubtedly for second broods. There were 13 nests built by 10 pairs of birds in 1934, yet by the following year the colony had vanished. Every nest had been totally destroyed during the winter and only 2 pairs returned to build new ones, a sad little remnant indeed.

Weather.—The winter of 1928-29 was a very cold one, and perhaps my Martins suffered because of it. In 1932 the numbers dropped to 9 pairs (from 12); this followed the migration catastrophe of 1931 in Central and South Europe, and it almost seems as if my Martins were caught in that. The same disaster cannot, however, have caused the last drop in 1935, as the winter before was a mild one in Europe.

Broods.—Second broods were undoubtedly usual, but third broods, I think, were rare or non-existent, as there could hardly have been time in most years. For some of the second broods a new nest was

built, certainly in 1931, 1932 and 1934, probably in 1929 and 1933. Also the first nest, in many cases, was used again for the second brood, as proved by the young still being fed in these nests in August. I was quite unable to estimate the number of young successfully reared in any year.

Habits.—The habit of using the nest for many days after the first flight, and after the parent birds had left, seemed a common one with the young House Martins. When feeding the very young nestlings, one parent bird often arrived at the nest while the other was still inside. The former bird always seemed impatient at being kept waiting and chattered incessantly, and also more than once pushed its way inside in spite of obvious remonstrance on the part of its mate. When the young are nearly fledged, they sit, one at a time, in the mouth of the nest calling frequently, and the food brought is rammed hastily down their throats by their parents, who do not pause more than a second at the nest.

Feeding Area.—The feeding area could not be definitely ascertained, as it was impossible to mark down any special bird. When the nestlings were small the visits to them were very frequent, the area scoured seeming to be just over the grass and gorse at the top of the cliff and round about the nearby farm-yard, a distance of about 500 yards each way. But when the young were bigger, the parent birds took flights above the beach and across the little bay to the cliffs and cornfields opposite, three-quarters of a mile away. They then only visited the nest at about quarter-hour intervals. It was impossible for me to watch the colony for long at a time, as it could only be kept in view for a little more than an hour at low tide.

SUMMARY.

The cliff site faced south-west and was protected on the east and north, from which any cold comes during the spring or summer.

The number of breeding pairs rose from 9 to 16 in one year, stayed almost the same for the third year, and dropped to 9 again in the fourth year. It rose again to at least 10 pairs during the next two years and fell to 2 pairs in the seventh year.

It seems as if the disaster to the *Hirundinidae* in Europe in 1931 may have accounted, at least, for the second drop in numbers, but no such disaster is known to account for the last.

The Martins usually arrived at the colony in two distinct parties, with some days between each, in one year the interval being at least ten days.

Both birds helped in the building equally, when the nest was more than half finished, but it is uncertain that more than one actually did the first shaping of the nest.

The birds preferred the nest-opening to face west, when the only other choice was north or south.

All old nests were repaired and used again, when any remained after the winter gales, but new nests were built on the same sites if nothing was left.

Mammal, etc., Recording in 1937.

By R. S. R. Fitter, F.Z.S.

THE recording of the mammals, reptiles and amphibians of the London area has had a good start, but much more information will have to be accumulated before we have anything like a complete picture of the status of most species. A full account of the status of the grey squirrel, the first-fruits of the scheme, has had to be held over until next year for reasons of space.

This year, then, I do not feel justified in publishing more than a list of species known to have occurred in the London area, within 20 miles of St Paul's Cathedral, since 1900, without any indication as to their status. Next year I hope to be able to publish some of the more interesting actual records which I have received. The list is as follows:—

MAMMALIA.

INSECTIVORA.

Mole. *Talpa europaea* L.
Common Shrew. *Sorex araneus castaneus* Jenyns.
Pigmy Shrew. *Sorex minutus* L.
*Water Shrew. *Neomys fodiens* Schreber.
Hedgehog. *Erinaceus europaeus* L.

CHIROPTERA.

*Greater Horseshoe Bat. *Rhinolophus ferrum-equinum insulans* Barr. Ham.
*Lesser Horseshoe Bat. *Rhinolophus hipposideros minutus* (Montagu).
*Daubenton's Bat. *Myotis daubentonii* (Kuhl).
*Whiskered Bat. *Myotis mystacinus* (Kuhl).
*Natterer's Bat. *Myotis nattereri* (Kuhl).
Pipistrelle. *Pipistrellus pipistrellus* (Schreber).
*Serotine. *Eptesicus serotinus* (Schreber).
*Leisler's Bat. *Nyctalus leisleri* (Kuhl).
Noctule. *Nyctalus noctula* (Schreber).
*Long-eared Bat. *Plecotus aurilus* (L.).
*Barbastelle. *Barbastella barbastellus* (Schreber).

CARNIVORA.

Fox. *Vulpes vulpes crucigera* (Bechstein).
Badger. *Meles meles meles* (L.).
Otter. *Lutra lutra* (L.).
Stoat. *Mustela erminea stabilis* Barr. Ham.
Weasel. *Mustela nivalis nivalis* L.
Common Seal. *Phoca vitulina* L.

RODENTIA.

Rabbit. *Oryctolagus cuniculus* (L.).
Brown Hare. *Lepus europaeus occidentalis* de Winton.
Dormouse. *Muscardinus avellanarius* (L.).
Bank Vole. *Clethrionomys glareolus britannicus* (Miller).
Field Vole (Short-tailed Field Mouse). *Microtus agrestis hirtus* (Bellamy).
Yellow-necked Mouse. *Apodemus flavicollis wintoni* (Barr. Ham.).
Water Vole. *Arvicola amphibius amphibius* (L.).

Long-tailed Field Mouse (Wood Mouse). *Apodemus sylvaticus sylvaticus* (L.).
*Harvest Mouse. *Micromys minutus soricinus* (Hermann).
Brown Rat. *Rattus norvegicus* (Erxleben).
Black Rat. *Rattus rattus* (L.).
House Mouse. *Mus musculus* L.
Red Squirrel. *Sciurus vulgaris leucourus* Kerr.
Grey Squirrel. *Sciurus carolinensis* Gmelin.

UNGULATA.

Fallow Deer. *Dama dama* (L.).
†Red Deer. *Cervus elaphus scoticus* Lönnberg.
*Roe Deer. *Capreolus capreolus thotti* Lönnberg.

CETACEA.

Common Porpoise. *Phocaena phocaena* (L.).
Bottle-nosed Dolphin. *Tursiops truncatus* (Montagu).
Common Dolphin. *Delphinus delphis* L.

REPTILIA.

SQUAMATA.

Sand Lizard. *Lacerta agilis agilis* L.
Common Lizard. *Lacerta vivipara* Jacquin.
Slow-worm. *Anguis fragilis* L.
Grass Snake. *Natrix natrix natrix* (L.).
Viper (Adder). *Vipera berus berus* (L.).

AMPHIBIA.

SALIENTIA.

Common Frog. *Rana temporaria temporaria* L.
*Natterjack Toad. *Bufo calamita* Laurenti.
Common Toad. *Bufo bufo bufo* (L.).

CAUDATA.

Crested Newt. *Triturus palustris palustris* (L.).
*Palmate Newt. *Triturus helveticus helveticus* (Raz.).
Common Newt. *Triturus vulgaris vulgaris* (L.).

†Not truly wild. *No record since 1920.

This is a total of 42 mammals, 5 reptiles and 6 amphibians, of which all except twelve mammals and two amphibians have been recorded since 1920.

I should like to thank the following 29 persons who have given me records during the year, and to ask all members of the Society to co-operate in this work in 1938. To Mr C. L. Collenette my especial thanks are due for scanning the *Zoologist* and the *Field* for mammal records since 1900:—S. Austin, P. Buckman, H. J. Burkill, C. P. Castell, K. R. Chandler, C. L. Collenette, W. L. Colyer, J. E. S. Dallas, K. M. Guichard, P. J. Hanson, J. L. Harrison, P. A. D. Hollom, R. C. Homes, G. Hopkins, A. B. Hornblower, W. Johnson, J. E. Lousley, G. E. Manser, D. A. T. Morgan, Miss M. Morrison, Miss M. Munro, E. M. Nicholson, C. A. Norris, L. Parmenter, R. W. Pethen, Miss W. N. Popple, R. W. Robbins, J. E. Roberts, J. Ross.

The Grey Squirrel in Epping Forest.

By F. J. Johnston.

THE Grey Squirrel (*Sciurus carolinensis*) is commonly found throughout the Central and Eastern States of the United States and South-eastern Canada. It is larger than our Red Squirrel, having an average weight of 21 ozs. as against 12 ozs., and length from nose to tip of tail of 20-21 ins. as against 15 ins. Its normal habitat is hardwood forests, Oak, Hickory, Chestnut and Maple. Egg eating and destruction of young birds never seems to have raised much discussion in America, which is quite contrary to our experience here. On the other hand, their depredations of corn and wheatfields of the pioneers assumed ruinous proportions and records going back to 1840 mention a week's bag to twelve guns as 9780. Earlier still, bounties were paid which involved the killing of 640,000 squirrels.

At these times vast hordes of Grey Squirrels would migrate *en masse* from one part of the country to another, crossing mountains and broad rivers, ravaging crops and laying waste the countryside much as the locusts do in Africa. Nowadays such migrations are rare: the advance of civilisation and the destruction of forests have apparently exercised a controlling influence on their rate of increase.

The British Isles is not the only scene of an unwanted colonisation by Grey Squirrels. Introduced to Cape Town previous to 1920 by Mr Cecil Rhodes, they have overrun the Cape Peninsula and become a great pest in gardens and orchards.

I cannot think that the coming of the Grey Squirrel to Epping Forest caused any surprise. The only element of surprise in the event was that it was so much belated. Its appearance was due many years ago. Epping Forest for some years past has been like a castle of sand surrounded by the incoming tide, with a sequel just as inevitable. Each year found the sanctuary still intact, but for those who had eyes to see, the tide crept ever nearer to the boundary. Discussing this subject with interested parties, this immunity seems to have been due to the geographical barrier of the Lea Valley with its reservoirs, marshes and waterways on the West and the built-up area on the South. Eventually the invading tide crept Northwards to Easney and Roydon in 1933, and the breach would seem to have occurred through the Copt Hall sector about two years ago, possibly the autumn of 1935.

At this point it is relevant to enquire what the probable consequences of its invasion would be. For myself, I knew of its reputation as a destroyer of trees, as an enemy of the fruit farmer on the vegetarian side and of the gamekeeper and ornithologist on the other. If his reputation as a destroyer of eggs and killer of young birds was half as bad as it was painted the consequences would be sufficiently serious. Other aspects, such as damage to trees, did not concern me so intimately.

The aspect that caused me alarm was the impression I had gathered from diverse sources and direct observation of its effect on the status of our native Red Squirrel. The conclusion could not be avoided that between the Grey and the Red there could be no compromise. The coming of the Grey meant the finish of the Red. It seemed to me then that to keep our own Epping Forest as a sanctuary for the Red Squirrel would be a worthy object and that the Grey should be outlawed and exterminated by every available means.

I first became aware that Grey Squirrels had entered the Forest in December 1935 when I saw the first of a pair which were located in Bury Wood quite near to the road. It was reported to the Superintendent's Office within 15 minutes. I saw the same pair on subsequent occasions and although I know steps were taken to destroy them they were unsuccessful.

The summer passes, we come to the autumn of last year (1936). Visibility is fast coming back to the woodland and in the Hawk Wood sector, which I patrol fairly regularly, I observe that at least two pairs of Greys have quarters there and with a little patience I am able to watch them and to report their presence to the Forest Office. Some weeks elapse and the Greys are still to be seen. I 'phone the Superintendent and learn that necessary action has not been overlookd. The Ranger has spent quite a lot of time on the job and has accounted for two Greys. I have a talk with the Ranger and discuss his difficulties. It is eventually arranged that a Ranger should be at my disposal on certain days. We alter our technique, based on my experience of the habits of our quarry, and succeed in getting 4 on the first occasion, 2 on the second, and within a month we have accounted for a total of 10, 8 of which are from Hawk Wood and 2 from Bury Wood. So far this was satisfactory, but I had a feeling that the pests were well distributed through the Forest and I set out to discover if this were true. This entailed a lot of early morning work, but as a result I found Grey Squirrels wherever I went, and on no single occasion did I fail to find one or more on these early morning forays.

Soon I had proved the presence of Greys successively through Bury Wood and Round Thicket to the South side of High Beech and I was becoming increasingly alarmed, as the information accumulated, at the extent of the area to which they had penetrated and their manifest numbers.

I knew then that nothing less than a well organised plan of action backed by vigour and persistence could save the Red from extermination, and that it would have to be put into effect immediately, before spring leafage provided sanctuary and refuge from attack.

Arising out of a meeting with Mr McKenzie, the Forest Superintendent, I was invited to make a report to be placed before the Forest Committee, who would have to sanction the necessary measures.

Reaching out for supporting evidence led via " The Field " offices to the Secretary of the National Anti-Grey Squirrel Campaign, from whom I received literature which formed an exhaustive indictment of

crimes of which the Grey Squirrel is guilty in this country, but strange to say no mention was contained of its menace to the Red. Enquiries on this point brought a letter from the Secretary saying:— "We have no *proof* that the Grey kills the Red, but if you can decide the point, it will be most valuable and interesting."

"We must bear in mind (1) That the Reds are decreasing rapidly in areas where there are no Greys; (2) No one so far has seen a Grey killing a Red. I am constantly getting letters on this subject and should like to know that the Grey kills the Red, but in the absence of proof one cannot condemn him. He is quite bad enough on other counts."

Stranger than fiction was the sequel. Almost at the outset Ranger Atkinson struck a trail which produced a witness of such an encounter in which only eleventh-hour intervention of the witnesses prevented an actual killing, so the necessary link in the chain of evidence was supplied. Further corroboration of the story was forthcoming from two other persons who were present. Here is the statement:—

"On 29th December I was riding in Epping Forest in company with two of my pupils along the ride leading from Grimston's Oak to the Catacomb Corner when we became aware of a commotion in the tree tops. It was a large Grey Squirrel chasing a Red, and we saw the Grey overtake it and a scuffle ensued in which the Red was quickly in difficulties. The Grey had the Red by the throat and the latter was soon overpowered. They were now immediately overhead. The Red was hanging perpendicularly from the jaws of the Grey, kicking feebly. We made all the noise we could and with frantic gestures tried to intervene. The Grey, still holding to its victim, retreated along a branch giving access to another tree, the branch collapsed, and they fell to the ground no more than a few yards away from us. Even then the Grey did not relax its grip on the Red and continued shaking and tearing away at the throat, which was covered with blood. We hastened to the rescue, the Grey was driven off and the Red crawled weakly away into the briars."

During the Spring and Summer of 1936 three freshly killed bodies of adult Reds were found in Hawk Wood, and it is much to be regretted that post mortem examinations were not made to establish the cause of death. In each instance the bodies were said to be lacerated and congealed blood was noted around the neck and throat.

Hawk Wood is a sector of the Forest with which I am most familiar and which I have regularly patrolled for a number of years, particularly during the Winter when Red Squirrels are more stationary in their habits and their status can be determined within a very close degree of accuracy. The trees are mostly Oak and Hornbeam and much favoured as a winter habitat of the Reds. Four or five pairs are the average Red population in the Winter. On many suitable days during this Winter I have spent the whole forenoon on Squirrel observation and have found but one pair and one solitary Red in the sector. The frequency of the occasions on which the three have been observed

leaves little doubt in my own mind that this comprises the whole popution of Reds in that sector.

During December and January, ten Grey Squirrels were located and destroyed in Hawk Wood, in which it is certain they bred during the Summer for the first time. Circumstantial evidence points strongly to the Greys as the killers of the three Reds.

This direct evidence was contained in my report, backed by the statement of the greatest authority on the subject, Professor A. D. Middleton, who, in his book, " The Grey Squirrel," states " In areas where the Grey has become established, such as Burnham Beeches, Wychwood Forest and Ashridge Park, the occurrence of a single Red Squirrel would have a rarity value equal to that of the Osprey."

On January 7th I submitted this report to the Forest Superintendent to be placed before the Forest Committee, together with recommendations for a campaign against the Grey Squirrel, and a plan of action based upon these recommendations was shortly put into effect. Meanwhile I had arranged with Mr McKenzie an early morning expedition which resulted in 5 Greys destroyed in Round Thicket and later the same day upon his own initiative a further 3 from Lords Bushes.

All Rangers were instructed to report on whereabouts of Grey Squirrel dreys and colonies on their sectors and one of the Rangers was taken off his beat to devote the whole of his time to the work of their destruction. Up to the end of February over 60 of the Greys had been destroyed. The rate slowed down progressively as the survivors became more furtive.

It is relevant to enquire how the experience in Epping Forest coincides with Mr Middleton's theory that any enmity between the Grey and the Red is occasioned by food competition normally at the end of the Winter when the food supplies are becoming scarce.

We have reliable witnesses of a sanguinary encounter in December which would have resulted in the killing of the Red but for their interference. We have also the three Reds found during the Summer for which there is a strong assumption the Greys were responsible. It is definitely out of the question that scarcity of food was a factor in the death of the Reds in the Summer and very improbable during December, for acorn, beech mast and hornbeam seeds were then abundant and it was only since January came in and pigeon hordes had been attracted that a condition of scarcity was reasonably possible.

Whether the enmity which has resulted in the wholesale decimation of the Red species is a seasonal impulse to do with the mating or food competition or both are matters for elucidation. It is said that the two species do not interbreed and that there is no single authentic record of such. This fact would not necessarily rule out the possibility of antagonism between the two species during the breeding season which may be caused by territorial or sexual rivalry.

Nests or Dreys. The presence of Grey Squirrels in the woodland is made manifest by their nests and dreys, which are usually situated in the fork of a tree and differ from the nests and dreys of the Red by

their leafy appearance, the branches used having been chosen in full leafage, whereas the Reds' building is not so specialised and the structures are of the bare sticks and of a less commodious type.

Usually the Grey has two or three dreys of smaller size, forming a little colony in nearby trees. This distinguishing feature is conclusive evidence in identifying the builders as Greys, though the Reds may occasionally be found in occupation.

The intelligence of the Grey Squirrel is noteworthy; they are much more alert and suspicious of intruders than the Red, but quickly react to their environment and become tame and confiding in habitats where they are encouraged, notably in parks and public places where they are fed, but very much the reverse under persecution.

In Epping Forest, with a few rare exceptions, their natural caution has been well exercised to avoid publicity. Like the Woodpecker, they understand the uses of tree boles and limbs, and never fail to find the blind side and to remain doggo until the intruder has vanished. Whenever it has been a trial of patience, I have always been the first to tire of the ordeal.

The last pair to survive in Hawk Wood had their quarters near the Pole Hill boundary. I had a glimpse of them one Sunday morning in February, and although I paid many subsequent visits and remained for long periods on the watch, they never showed themselves. Suspecting them of early morning habits, I put my theory to the test and found them busy taking sticks up to the nest and at dawn next day they were accounted for.

The campaign against the Grey Squirrel, before the coming of the Spring leafage, was prosecuted intensively by the Forest Superintendent, Mr McKenzie. All rangers had strict orders to locate and report all occurrences within their sectors and one keeper was exclusively engaged to deal with them. Results week by week were at first prolific, became steady, and by the end of March had become negligible. Apparently the survivors were few.

It was then necessary to resort to sterner measures, which could only be justified in view of the urgent need to preserve the Red.

With the aid of a jointed bamboo pole the Forest was combed, and every nest and drey subjected to the following procedure: first a gentle tap at the nest, which, if occupied, brought out the tenants at once. If a Red, the party passed on; if a Grey, it was shot and the nest and young destroyed. All empty nests which were definitely identified as Greys' were removed to facilitate future observance in the event of new ones making their appearance. By this means no less than 60 adults and young ones were accounted for and the total brought up to 150.

The following observations have been kindly supplied by the ranger engaged on this work:—

> "On several occasions I have observed a Grey Squirrel chasing a Red. In every instance the Grey has proved to be a male."

"On one occasion both a Grey and a Red came out from the same nest."

"Four young were the maximum number in any one litter, three more usual and exceptionally two."

"The sexes were very evenly balanced. In almost every nest where the litter contained four, the sexes were also even. Litters of two, always a male and female."

"Nests containing young were invariably built in holly or a deciduous tree covered with ivy."

"The earliest litter recorded during the season concerned three young killed on 27th March which were sufficiently well grown to get about on their own."

Thanks to a fortunate combination of circumstances—early warning and recognition of the menace and the prompt and vigorous action of the Conservators—the threat to the Red Squirrel has passed its most critical stage and its status has not been noticeably reduced by the invasion, for most sectors are well tenanted and this year's litters should make good the numbers of casualties sustained.

The killer, however, is still present and with any relaxation of the campaign the menace would in a single season become again critical.

In conclusion, members of the London Natural History Society residing in the locality can do much to assist the campaign by constant vigilance to detect survivors and by reporting to the Forest Office (Telephone, Loughton 90) with accurate description of locality where encountered.

The task itself is a pleasant one and if we can insure for our own beloved Red Squirrel in Epping Forest the sanctuary which seems to be denied to him elsewhere, we shall surely be richly rewarded.

Book Reviews.

A Moth-Hunter's Gossip. By P. B. M. Allan. (London: Philip Allan & Co. Ltd.; 7/6.)

The author of this book disclaims any idea that it is a serious or scientific treatise on Entomology. He says it is to be looked upon as tittle-tattle about some moths which interest him; but he opines, nevertheless, that the reader may pass a pleasant hour or two in its perusal. He is right. The reader will be hard to please if this volume does not afford him many pleasant—even hilarious—hours; and he must indeed have attained self-sufficiency as a field naturalist if he fails to derive not a little profit. For this is the work of a keen entomologist who, finding vastly more interest in living insects than in dead ones, here offers us the fruits of personal observations extending over many years. If your sugaring has been unprofitable of recent years you may here discover the reason, and the way to restore its

effectiveness. You may learn the essentials of success with light, gather hints on the treatment of larvae notoriously reluctant to become healthy pupae; and, from a wealth of other useful ideas, you may glean infallible tests for the separation of *Notodonta dictaea* (*tremula*) from *N. dictaeoides* (*gnoma*); and *Xylina rhizolitha* from *X. lambda*—should you be so fortunate as to be faced with that problem! And withal the book exhales that perennial freshness, zest, and joy in life, which constitute the priceless heritage of the naturalist. If you have ever known that thrill of which Gilbert White speaks—

" a pleasing kind of pain
steals o'er the cheek and thrills each creeping vein "—

your enthusiasm will inevitably be rekindled—if it has ever waned—by Mr Allan's description of his progress to his sugaring ground through the deepening twilight of a summer evening, culminating in the thrilling moment when the time arrives to commence the rounds. And so the lantern is lighted, the work-a-day world forgotten, and the senses are lulled by night's soft harmonies—the " creeping murmur and the poring dark."

As I turned the last page I thought what a companion Mr Allan must be on a mothing foray! But though I may not have his company in person I can at least ensure that his " gossip " is ever available for my entertainment. By my bedside I keep a small bookcase wherein are housed a few—a very few—special friends of whose company I never tire. It is a very select company; and " A Moth-Hunter's Gossip " is hereby admitted a fellow thereof.

J. A. S.

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The Dragonflies of the British Isles. By Cynthia Longfield. (Frederick Warne & Co., Ltd.; 7/6.)

Once again the Wayside and Woodland series has grown and the newcomer is an excellent addition. Miss Longfield has given the expert and the beginner a valuable aid to their studies. For every British dragonfly we have sections on chief characters, a good description of adults and nymph, habits, time of appearance and distribution in the British Isles and abroad. The book is illustrated by very good drawings of head, body, wings and anal segments of every species and photographs by Mr Tams of each species as adult and of most, in the nymphal stage. In addition the reader is presented with the latest check-list, a fine workable key, table of times of first appearance, chapters on classification, on life history of the dragonfly and on methods of collecting and preserving dragonflies. There is a useful glossary and the beginner is shown how to pronounce each scientific name. Even English names are provided, a boon to school-teachers and others who are guiding children in nature study. Much remains to be studied on the ecology, migration and general habits of the species and this book should be a great help to the field naturalist and result in additions to the knowledge of our dragonflies. As is pointed out practically all the species are identifiable alive and the collecting of specimens is scarcely needed. It

is a pity the publishers could not provide coloured pictures in their usual generous way, but the quality of the black and white illustrations is extremely high. In the next edition perhaps the non-classical scholar might be given the derivation of the scientific names.

L. P.

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A List of the Lepidoptera of Hertfordshire. By Dr Arthur H. Foster, F.R.E.S. (Stephen Austin & Sons, Hertford, 1937, 123 pp.; price 5/-.)

This full list of the recorded lepidoptera of Hertfordshire, which forms Vol. XX, Part 4, of the *Transactions of the Hertfordshire Natural History Society and Field Club*, is a valuable piece of work, and Dr Foster is to be congratulated upon bringing to fruition what must have been a very lengthly and laborious task. The last complete list was that of A. E. Gibbs published in the *Victoria County History* in 1902, and consisted of 1136 species. The present list brings the total up to 1259, of which 587 are "macrolepidoptera" and 672 "micros," being nearly 60% of the species recorded in Britain. A few of the new records must be regarded as purely accidental, such as *Syrichtus alveus* (quoted as *Hesperia alveus*), a new butterfly to Britain apart from a very dubious Norfolk record, *Callimorpha hera* and *Catocala electa*, but the great majority are good additions to the fauna. In addition to the large number of individual recorders, whose names are attached to their records, other lists and published works are quoted. One wonders how much value there may be in vague old records never repeated. In critical cases vagueness is fatal, and such a record as the Rannoch Looper (*Semiothisa brunneata*), a very local Highland species, quoted as found in "Herts.," is completely worthless. The dated records of the Comma (*Polygonia c-album*) and the White Admiral, showing their spread since 1919 and 1933 respectively, are particularly interesting. Stephens' early record of the former species "before 1933" is, of course, a misprint for 1833. One regrets to learn that *Lysandra coridon* has become most unaccountably scarce at Royston since 1925, and the special forms found there are now practically non-existent.

The arrangement adopted is that of Meyrick's Handbook. The butterflies are somewhere in the middle. The Sphinges, Bombyces and their allies are scattered here and there. The Clearwings are among the Tineae. The Zygaenids and Hepialids have to be searched for. This arguable order, based on neuration and a desire to be original, may gratify the laboratory worker but is simply exasperating to the ordinary lepidopterist in search of a reference. A page index added to the final summary would have helped.

Criticism of the method of presentation, however, must not obscure the fact that the material is all there, and lepidopterists have reason to be grateful to Dr Foster and the Hertfordshire Natural History Society for making it accessible.

R. W. R.

More Songs of Wild Birds. By E. M. Nicholson and Ludwig Koch. (Witherby; with three gramophone records; 15/-.)

The three double-sided records deal with the songs or call-notes of some twenty-five or thirty different species of birds. Not all the renderings are of equal merit, but beginner or expert cannot fail to derive much knowledge from a careful study of them. The records should be bought and not borrowed, as it is by playing over the phrases of each bird again and again at intervals that their character may be really grasped and stored up until such time as they may be heard in the field.

The notes of the wood-lark, willow tit, wood warbler and stock dove will be new to many listeners, while the distinction between garden and blackcap warbler, carrion crow and rook, mistle thrush and blackbird, is well brought out. Others, such as the jay, chiff-chaff, cuckoo and green woodpecker, will need no reference to the chart by the beginner, but can be studied carefully and their exact delivery appreciated. Two species, the curlew and heron, are given with almost the complete range of their notes and will conjure up memories in many an ornithologist.

In the accompanying book we are told about the difficult work of obtaining the records, with a heavy van, several technicians and hundreds of yards of cable. The greatest enemies of recording are the wind and extraneous noises, the microphones being so delicate that they will register sounds which would be quite unnoticed without their aid. Some interesting and amusing stories are told of the way in which the voices of the various species were captured. The writer of this notice, who was present when some of the records were obtained, can testify to the discomfort of arriving at the rendezvous before dawn, the excitement of hearing the required species commencing to come through on the instrument, the patience required when a distant barking dog or crowing cock, rain-drops pattering on leaves, an insistent blue-tit, or even the "clip-clopping" of a horse pulling the early morning milk-cart on a distant road, has interrupted the recording, and finally the feeling of achievement when, at long last, the voice of the quarry has been secured clear and uninterrupted.

Excellent photographs are included of the recording apparatus and of most of the species mentioned, those of a pair of mistle-thrushes and a woodlark at their nests being especially good.

In one of the chapters very useful and informative notes are given concerning the birds whose voices are dealt with, including identification, habits, haunts and language. Another very interesting feature is a table of the frequency in cycles per second of the bird-notes recorded, showing surprising ranges for some of the species, and unexpected positions in the table for others.

The book and records are cheap at the price and can be strongly recommended.

C. L. C.

A History of Richmond Park, with an Account of its Birds and Animals. By C. L. Collenette, F.R.G.S., F.R.Ent.S. (Sidgwick & Jackson, Ltd.; 7/6.)

A book by one of our members is always welcome, this one by the President doubly so.

The History covers the entire period from the foundation by Charles I. to the present time, and brings out well the changing attitude of the Crown towards the public with regard to the Park. The Bibliography of 246 items shows how thorough have been the author's researches.

Besides the history, every aspect is discussed, the Rangers and Keepers, the Gates and Lodges, the Plantations and Ponds, while the Birds, Mammals, Reptiles and Batrachians are fully dealt with under species. Mr Collenette's notes regarding certain of the mammals emphasise the need for the recording of this group now being done by our Ecological Section.

A book of the greatest interest throughout; we hope that in due course further editions will appear.

J. E. S. D.

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The Lore of the Lyre Bird. By Ambrose Pratt. (5/-.)
The Call of the Koala. By Ambrose Pratt. (6/-.)
Koala. By Charles Barrett, C.M.Z.S. (2/-.)

These three delightful books published by Robertson & Mullens, of Melbourne, bring to us careful and detailed descriptions of two of Australia's most fascinating inhabitants. The writers in each case know not only how to observe but also how to describe their observations. The books are bountifully illustrated with photographs, and we can recommend all three as valuable and entertaining reading.

BOOK RECEIVED:—

Wonders of the Sea: Shells." By Arnold Malarey and Paul A. Robert. (B. T. Batsford, Ltd.; 5/6.)

List of Members.

(Corrected up to 8th April 1938.)

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

Honorary President:

Prof. Sir Frederick Gowland Hopkins, O.M., M.A., M.D., F.R.C.P., F.R.S.

Honorary Vice-Presidents:

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Honorary Members:

1933 Bryce, E. J., Nelson Road, Killara, Sydney, N.S.W. (Zoo.)
1927 Le Souef, A. S., C.M.Z.S., R.A.O.U., Taronga Zoological Park Trust, Sydney, Australia.
1899 Massey, Herbert, M.B.O.U., F.R.E.S., Ivy Lea, Burnage, Didsbury, Manchester. (Lep., Orn., Ool.)

Members:

1927 Aldred, Miss K. V., 5 Ladbroke Court, Ladbroke Gardens, Notting Hill, W.11. (Arch., Orn.)
1922 Aldred, Miss M., Flat 5, 21 Ladbroke Gardens, Notting Hill, W.11. (Orn.)
1928 Alexander, O. A., 35 Ellington Road, Hounslow, Middlesex. (Ent.)
1937 Alston, A. H. G., B.A., F.L.S., British Museum (Natural History), Cromwell Road, S.W.7. (Bot.)
1932 Angell, Miss K. W., at 104 Broxholm Road, West Norwood, S.E.27. (Orn., Ent., R., Ecol., Bot., Pl. G.)
1932 Arbon, Mrs J. A., Brookside, Eversley Park Road, Winchmore Hill, N.21. (Arch.)
1925 Archbould, R. S., Forest Way, Loughton, Essex. (Orn.)
1915 Aris, E. A., F.Z.S., 9 Oak Avenue, Priory Road, Hornsey, N.8. (Lep.)
1932 Arnold, Miss W., 43 The Quadrant, Wimbledon, S.W.19. (Orn.)
1937 Austin, H. W., 19 Bell Moor, Hampstead, N.W.3. (Orn.)
1892 Austin, S., F.Z.S., 43 Darenth Road, Stamford Hill, N.16. (Orn., Arch., R., Ecol., Bot.)
1931 Axford, W. G., Surgeon Rear Admiral, C.B., F.L.S., 5 King Edward Mansions, 212a Shaftesbury Avenue, W.C.2. (Bot.)
1931 Back, Dr Marjorie, 16 Daisy Lane, Fulham, S.W.6. (Bot., Orn.)
1929 Baggallay, Miss J., 55 Ridgway Place, Wimbledon, S.W.19. (Orn.)

1929 *Bagnall, R. S., D.Sc., F.R.S.E., 9 York Place, Edinburgh. (Pl. G., Ent., Bot.)

1927 Baily, Miss A. R., F.Z.S., Cressex Lodge, Binfield, Berks. (Arch., Bot., Orn., Ent., Pl. G., R.)

1924 *Baker, E. C. Stuart, J.P., O.B.E., F.Z.S., F.L.S., M.B.O.U., H.F.A.O.U., 6 Harold Road, Upper Norwood, S.E.19. (Orn.)

1934 Banks, H., 172 Cromwell Road, Hounslow, Middlesex. (Bot., Orn.)

1927 Barclay-Smith, Miss P., F.Z.S., M.B.O.U., Park Lodge, Hervey Road, Blackheath, S.E.3. (Orn.)

1926 Barnes, Mrs E. C., M.B.O.U., Hungerdown, Seagry, Wilts. (Orn., Bot., Ecol.)

1936 Barnett, Mrs L. L., 30 Bark Place, W.2. (Ent., Pl. G.)

1937 Barnett, R. L., 30 Hans Road, S.W.3. (Bot., Orn.)

1933 Bastian, Miss S., 83 Gower Street, W.C.1.

1903 *Battley, Mrs, 47 Gordon Road, Ealing, W.5.

1932 Bayliss, C. V., 34 Golders Gardens, N.W.11. (Arch.)

1915 Bayne, Charles S., Room 303, Salisbury House, Salisbury Square, E.C.4. (Orn., Ecol.)

1936 Beckwith, Major W. M., D.S.O., 59 Albert Hall Mansions, S.W.7. (Orn.)

1926 Benn, Miss A., 68 South Esk Road, Forest Gate, E.7. (Orn., Ent., Pl. G., Ecol.)

1929 *Benson, R. B., M.A., F.L.S., F.R.E.S., British Museum (Natural History), South Kensington, S.W.7. (Bot., Orn., Ent., esp. Sawflies, Ecol., R., Pl. G.)

1932 Bentham, C. H., Eothen, Epsom Lane, Tadworth, Surrey. (Orn.)

1937 Best, Miss Margaret G., M.R.C.S. (Eng.), L.R.C.P. (Lond.), 115 Widmore Road, Bromley, Kent. (Orn.)

1932 Binley, Miss E. M., 197 Camberwell Grove, Camberwell, S.E.5. (Orn., R.)

1935 Birnie, Miss V. M. O., 23 Hillway, Highgate, N.6. (Orn., R.)

1937 Blackett, Miss F. R. F., Royal Empire Society, Northumberland Avenue, W.C.2. (Orn.)

1932 Blackmore, A., 6 Doughty Street, W.C.1. (Bot.)

1930 Blair, K. G., D.Sc., F.R.E.S., 120 Sunningfields Road, Hendon, N.W.4. (Ent.)

1937 Blake, F. W., 16 Lindsey Road, Worcester Park, Surrey. (Orn.)

1933 Bomford, Miss N., 13 Theobald's Road, W.C.1. (Orn., R.)

1933 Bonus, Miss A., 28a Nevern Place, Earl's Court, S.W.5. (Orn.)

1933 Booth, H. P., B.A., 5 Snow Hill, E.C.1. (Orn.)

1937 Boss, Miss E. F. M., 15 Orford Road, Walthamstow, E.17. (Orn., Bot.)

1933 Bowtell, J. J., Tudor House, Lynton Road, Thorpe Bay, Essex.

1934 Boys, M. V., Stafford House, Kenwood Close, Hampstead, N.W.3. (Orn.)

1904 Bradley, S. W., 1 Luckton's Avenue, Buckhurst Hill, Essex. (Bot., Ent., Orn.)

1932 Braithwaite, Miss D. M., 18 Warren Road, Chingford, E.4. (Orn.)
1910 Braithwaite, Miss N. A., 18 Warren Road, Chingford, E.4.
1933 Brazil, Miss F., Penby, Marshalswick Lane, St Albans, Herts. (Orn.)
1930 Brend, Wm. A., M.A., M.D., B.Sc., 14 Bolingbroke Grove, Battersea, S.W.11. (Arch., Orn., R.)
1937 Brightwell, L. R., F.Z.S., White Cottage, Chalk Lane, East Horsley, Surrey. (Marine Life.)
1937 Brinton, R. E. B., 68 Woodstock Avenue, Golder's Green, N.W. 11. (Orn., Bot., Icht.)
1933 Bromley, Miss B., 18 John Street, W.C.1. (Orn., R.)
1937 Broome, Miss E. B., 15 Orford Road, Walthamstow, E.17. (Bot., Orn.)
1916 Brown, A., F.Z.S., 44 Ravensdale Road, Stamford Hill, N.16. (Orn., Arch., Geol., R.)
1937 Brown, Miss B. E., 11 Earl's Terrace, Kensington, W.8.
1936 Brown, E. C., M.Sc. (Lond.), 120 Durlston Road, Kingston-on-Thames, Surrey. (Bot., Ecol.)
1933 Brown, Miss M. M., 51 Berkeley Gardens, N.21. (Orn., Ent., Bot.)
1926 Browne, Miss C. H., 219 Harlesden Road, N.W.10. (R., Arch., Bot.)
1936 Buchan, J. F., 1 Gordon Street, W.C.1. (Bot., Orn.)
1930 Burgham, Miss J. E., 4 Regent Square, W.C.1. (Orn., Geol., R.)
1915 Burkill, H. J., M.A., F.R.G.S., 3 Newman's Court, Cornhill, E.C.3. (Pl. G., Lep., Bot., Geol., Orn., R., Ecol.)
1933 Burton, M., M.Sc., F.Z.S., 55 Pope's Grove, Twickenham, Middlesex. (Porifera, Orn.)
1937 Butlin, J. H., 90 East Sheen Avenue, Mortlake, S.W.14. (Orn.)
1935 Butterworth, Miss M. H., Dyer's Lane, Putney, S.W.15. (Orn., Bot., Ecol.)
1932 Caiger-Smith, Miss J., 23 Hornton Street, Kensington, W.8. (Orn.)
1928 *Campbell, J. M. H., M.D., 47 Arkwright Road, Hampstead, N.W.3. (Orn., R.)
1912 Capleton, A., The Hawthorns, Monkham's Drive, Woodford Green, Essex. (Mam., Orn., R., Bot.)
1926 Carr, Miss A. N., 7 Cambridge Road, Watford, Herts. (Orn., R.)
1936 Carrington, L. I., The Grey Cottage, Chipstead, Surrey. (Orn.)
1933 Carter, J. S., Ph.D., M.Sc., F.I.C., 26 St John's Road, Golders Green, N.W.11. (Orn.)
1932 Castell, C. P., 52 Graham Road, Wimbledon, S.W.19. (Bot., Geol., Ecol.)
1936 Cawkell, E. M., 135 George Lane, Lewisham, S.E.13. (Orn.)
1936 Chandler, K. R., 33 Granville Road, Limpsfield, Surrey. (Orn., Ecol.)
1930 Chandler, S. E., D.Sc., F.L.S., 59 Anerley Park, Penge, S.E.20. (Bot.)
1931 Chubb, Sir Lawrence, 71 Eccleston Square, S.W.1. (R.)

1927 Clanchy, Mrs B. L., Trebah, 12 Cranbourne Drive, Pinner, Middlesex. (R., Orn.)
1927 Clanchy, D. H., Trebah, 12 Cranbourne Drive, Pinner, Middlesex. (R., Orn., Ecol.)
1934 Clark, J. T., Five Oaks, Ninham's Wood, Farnborough, Kent. (Orn.)
1934 Clarke, Mrs M. A., 49 King's Road, Chingford, E.4. (Orn.)
1935 Clerk-Rattray, Miss E., 45 Westbourne Gardens, W.2. (Bot., Orn.)
1929 Coates, Miss N. H., Woodhouse, Beaumont Road, Wimbledon Park, S.W.19. (Orn., Bot.)
1904 Cockayne, E. A., M.A., D.M., F.R.C.P., F.R.E.S., 16 Westbourne Street, W.2. (Lep., Biol.)
1937 Cockburn, T.A., M.D., North-Eastern Hospital, St Anne's Road, N.15 (Orn.)
1925 Cocksedge, W. C., 6 Aldersmead Road, Beckenham, Kent. (Orn., Arch., Bot., Ecol.)
1929 Cocksedge, Mrs, 6 Aldersmead Road, Beckenham, Kent. (Arch., Bot., Ecol.)
1907 Collenette, C. L., F.R.G.S., F.R.E.S., 107 Church Road, Richmond, Surrey. (Ent., Orn., Bot., Ecol.)
1932 Collenette, Mrs C. L., 107 Church Road, Richmond, Surrey. (Orn.)
1933 Collett, G. W., 84 Jermyn Street, S.W.1. (Orn., Ecol., R., Bot.)
1936 Collett, R. L., 12 Hereford Mansions, W.2. (Orn.)
1934 Collings, Mrs M., 36 Alfriston Road, Battersea, S.W.11. (Ent., R.)
1936 Colyer, W. L., 8 The Mount, New Malden, Surrey. (Orn.)
1914 Connoll, Miss E., 68a High Road, S. Woodford, E.18. (Orn.)
1937 Cooke, H. O. P., Lamorna, Redruth, Cornwall. (Ent., Orn.)
1904 Cooke, Rev. P. H., B.A., 19 Hainthorpe Road, West Norwood, S.E.27. (Bot., Arch.)
1934 Coon, F. A. H., 7 Grenville Mansions, Hunter Street, W.C.1. (Orn.)
1938 Cooper, J. M., Fairview, Higher Drive, Purley, Surrey. (Orn.)
1937 Cornwallis. R. K., 26 Bramham Gardens, Earl's Court, S.W.5. (Orn.)
1928 Cox, Miss L. E., 72 Corringham Road, Golders Green, N.W.11. (Bot.)
1932 Creighton, Miss M. B., 78 Highview Avenue, Edgware, Middlesex. (Bot., Biol., Pl. G.)
1937 Crispin, G. H., Meadowcroft, Abbot's Langley, Herts.
1936 Crompton, Miss C. E., Pioneer Club, 12 Cavendish Place, W.1. (Arch., Orn.)
1931 Crook, W. M., F.R.G.S., F.Z.S., 6 St Andrew's Place, Regent's Park, N.W.1. (Orn.)
1927 Cross-Rose, F., Kenmore, 20 Woolstone Road, Forest Hill, S.E.23. (Orn.)
1892 Culpin, Millais, M.D., F.R.C.S., 12 Park Village East, N.W.1. (Biol.)

1930 Cunningham, J., M.B.O.U., Drinagh, Kensington Road, Knocke, Belfast. (Orn.)
1936 Currie, P. W. E., 102 Burdon Lane, Belmont, Sutton, Surrey. (Orn., Ecol.)
1892 Cyriax, R. C., 23 Aberdare Gardens, West Hampstead, N.W.6. (Arch., Aryan question, Indo-European languages.)
1936 Daffarn, J. D., 20 Woodside Avenue, Highgate, N.6. (Orn.)
1934 Dale, Miss G. R., 33 Cartwright Gardens, W.C.1. (Orn., R.)
1920 *Dallas, J. E. S., 83 Belsize Lane, Hampstead, N.W.3. (Orn., Bot., Arch., Ecol., R., Pl. G.)
1925 *Dallas, Mrs Rosa F., 83 Belsize Lane, Hampstead, N.W.3. (Arch., Bot., Geol., Orn., Ecol., R.)
1933 Davies, Miss E. B., Graffham, Petworth, Sussex. (Orn., Ent.)
1935 Davies, Miss R. E., 14 Purley Bury Avenue, Sanderstead, Surrey. (Bot., Orn., Ecol., R.)
1937 Davis, A., 188 Nether Street, Finchley, N.3.
1932 Davis, Miss R., 118 College Road, Dulwich, S.E.21. (Orn., R.)
1926 Deane, Miss M. B. H., c/o Westminster Bank Ltd., Tangier, Morocco. (Orn.)
1910 Dell, F. G., 55 Russell Road, Buckhurst Hill, Essex. (P. L., Micr., Orn., R.)
1932 Denham, R., M.B.O.U., 12 Weymouth Court, 1 Weymouth Street, W.1. (Orn., Ent.)
1937 Donnelly, R. P., B.A., B.Sc. (Oxon.), 7 Rothesay Avenue, Richmond, Surrey. (Orn.)
1933 Doran, F. H., Toddsbrook, Gt. Parndon, Harlow, Essex. (P. L.)
1936 Douglas, Miss M., 30 The Alders, Winchmore Hill, N.21. (Orn., R., Bot.)
1928 Douglas-Smith, Miss K., 19 Thurlow Road, Hampstead, N.W.3. (Arch., Orn., Bot.)
1927 Druce, F., M.A., F.L.S., 60 Burton Court, Chelsea, S.W.3. (Bot.)
1927 Dunkerley, Rev. C. L., M.A., M.C., Great Milton Manor, Oxford. (Arch., Orn.)
1934 Dunkin, W. H., 95 Park Road, West Dulwich, S.E.21. (Orn., R.)
1935 Dunsdon, Miss M., 7a The Parade, Carshalton, Surrey. (Orn.)
1934 Eales-White, Major J. C., T.D., F.R.E.S., F.Z.S., 88 Mount Ararat Road, Richmond, Surrey. (Orn., Ent., Arch.)
1938 Eardley-Wilmot, Mrs M., 24 Thurloe Square, South Kensington, S.W.7. (Bot., Orn.)
1936 Elcome, G. D., 29 Alleyn Park, West Dulwich, S.E.21. (Orn.)
1936 Elcome, J. W., 29 Alleyn Park, West Dulwich, S.E.21. (Orn.)
1936 Ellington, Miss M. L., 3 The Terrace, Richmond Hill, Surrey. (Orn.)
1936 Ellis, W. G., 49 Lordship Road, Stoke Newington, N.16. (Orn.)
1928 Emberson, L. M., African and Eastern (Near East) Ld., P.O. Box No. 17, Baghdad, Iraq. (Orn., Ecol.)
1927 English, Miss F., 8 Dorville Crescent, Ravenscourt Park, Hammersmith, W.6. (Orn., Bot., Arch., R.)
1937 Ennis, L. H., 16 Ernle Road, Wimbledon, S.W.20. (Ent.)

1907 Eynon, Lewis, B.Sc., F.I.C., Fernleigh, 8 Hall Lane, Upminster, Essex. (Chem.)
1935 Farquharson, A., Le Play House, 35 Gordon Square, W.C.1. (Ecol.)
1937 Fernberg, Mrs B., 29 Steele's Road, Hampstead, N.W.3. (Orn.)
1927 Fisher, Mrs G. L., 80 Richmond Avenue, Hillingdon, Middlesex. (Arch.)
1937 Fisher, J. M. McC., Zoological Society of London, Regent's Park. N.W.8. (Ecol., Orn.)
1934 Fitter, R. S. R., F.Z.S., 81 Ridgmount Gardens, W.C.1. (Orn., Ecol., Ent.)
1937 Fossey, H. B., 9 Kinfauns Road, Goodmayes, Essex. (Orn.)
1924 Foster, J. B., B.A., 12 Conway Road, Wimbledon, S.W.20. (Orn.)
1935 Foster, Mrs J. B., 12 Conway Road, Wimbledon, S.W.20.
1928 Fox, G. J. B., 45 Stanwick Mansions, West Kensington, W.14. (Arch.)
1932 Franklin, A. W. L., 47 Bedford Gardens, Campden Hill, W.8. (Orn.)
1938 Franks, Miss H., 21 Queen Square House, Guilford Street, W.C.1. (Arch., Bot., Ecol., Orn., R.)
1931 Frederick, Miss L. M., M.Sc., F.Z.S., Whitelands College, West Hill, Putney, S.W.15. (Orn., P. L., Ecol., R.)
1937 Freeman, P., 8 Sebastion Avenue, Shenfield, Essex. (Ecol., Ent.)
1935 French, W. A., Hill Cottage, Loughton, Essex. (Orn., Bot.)
1936 Gardner, D. H. W., Merchant Taylors' School, Sandy Lodge, Northwood, Middlesex. (Orn.)
1936 Garnett, T. R., 14 Barton Street, S.W.1. (Orn.)
1932 Garrido, A. S., 102 Clonmell Road, Tottenham, N.17. (Bot.)
1933 Gaster, H., 26a Lunham Road, Upper Norwood, S.E.19. (Bot., Orn.)
1934 Gawthorne, A. H., 29 Nicoll Road, Harlesden, N.W.10. (Orn.)
1910 Gaze, W. E., 10 The Avenue, Highams Park, Chingford, E.4. (Lep., Bot., Chem.)
1936 Gillespie, T. L., Ornan Court, Haverstock Hill, N.W.3. (R., Arch.)
1931 Gillett, J. D., F.R.E.S., 1 Beulah Road, Walthamstow, E.17. (Ent., Rept.)
1933 Gillham, E. H., Dilkusha, Coulsdon Road, Nr. Stoneyfield Road, Coulsdon, Surrey. (Orn.)
1937 Gillingham, D. W., 28 Roding Road, Loughton, Essex. (Orn.)
1910 Glegg, W. E., F.Z.S., M.B.O.U., 2 Burlington House, King's Road, Richmond, Surrey. (Orn.)
1934 Godwin, C., 20 Canonbury Park North, N.1. (Orn.)
1934 Godwin, Mrs M. L., 20 Canonbury Park North, N.1. (Orn.)
1929 Goodfellow, Miss L., Flat 3, 28 John Street, Gray's Inn, W.C.1. (Orn.)
1930 Goodwin-Vanner, R. E., F.R.S.A., F.R.H.S., Essex Villa, Guildford, Surrey. (Arch.)
1937 Gosnell, V., Farm Cottage, Boxlane, Boxmoor, Herts. (Orn.)

1937 Gough, Miss C. A., 51 Earl's Court Square, S.W.5. (Orn., R.)
1934 Gray, Miss J. W., 10 Canford Road, Clapham Common, S.W.11. (R., Bot.)
1937 Green. D. B., 20 Fitzjohn's Avenue, Hampstead, N.W.3. (Orn.)
1937 Green, Mrs E. M., Gordon House, Gloucester Road, New Barnet, Herts. (Bot., Ecol.)
1927 Green, Roland, F.Z.S., Ruskin Studio, 7 New Court, Lincoln's Inn, W.C.2. (Orn.)
1936 Greenwell, W. N., 12 Highbury, Newcastle-upon-Tyne. (Orn.)
1899 *Greenwood, Prof. M., D.Sc., F.R.S., F.R.C.P., Hillcrest, Church Hill, Loughton, Essex. (Arch., Biol.)
1937 Grice, Mrs F. G., 66 Lefevre Road, Bow, E.3. (Arch.)
1928 Griffin, Miss M., 22 Addison Way, Golders Green, N.W.11. (Orn.)
1920 Grinling, C. H., B.A., 71 Rectory Place, Woolwich, S.E.18. (Bot.)
1937 Guichard, K. M., 10 Lyndhurst Gardens, N.W.3. (Ent., Ecol., Bot., Orn.)
1933 Gunton, L., Lahlglyn, Cross Path, Radlett, Herts. (Orn.)
1932 Hadfield, J., Denecroft, Heath Way, Effingham, Surrey. (Orn., R.)
1926 Hadfield, Mrs M. H., Denecroft, Heath Way, Effingham, Surrey. (Orn., Bot., R.)
1927 Hale, R. W., 6 Grendon Gardens, Barn Hill, Wembley Park, Middlesex. (Orn.)
1936 Hall, J. B., Nakuru, Bridle Lane, Loudwater, Rickmansworth, Herts. (Orn.)
1903 Hanbury, F. Capel, Westfield, Hoddesdon, Herts. (Lep.)
1897 *Hanson, P. J., Burcroft, Village Road, Bush Hill Park, Enfield, Middlesex. (Orn., Arch., R.)
1927 Hardiman, Miss A., Hyron's Cottage, Woodside Road, Amersham, Bucks. (R.)
1921 Hardiman, J. P., C.B.E., B.A., Hyron's Cottage, Woodside Road, Amersham, Bucks. (Orn., R.)
1935 Harris, A. H., 47 Lynette Avenue, South Side, Clapham, S.W.4. (Orn.)
1933 Harrison, Miss E. E., 44 Alexandra Road, St John's Wood, N.W.8. (Orn., R.)
1937 Harrison, H. G., 38 Richmond Road, Barnsbury, N.1. (Orn., Arch.)
1937 Harvie, Miss D. E., 35 Abercorn Place, N.W.8. (Bot., Orn., Freshwater Biol., Ecol.)
1935 Hatch, R. S., 66 Coston's Avenue, Greenford, Middlesex. (Orn.)
1938 Haviland, Miss G. M. B., 226 St James' Court, Buckingham Gate, S.W.1. (Orn.)
1930 Haworth, Miss F. M., B.Sc., F.Z.S., 9 Carmalt Gardens, Putney, S.W.15. (Zoo., Bot.)
1937 Hayward, H. H. S., 9a Florence Drive, Enfield, Middlesex. (Orn.)
1937 Hayward, Mrs H. H. S., 9a Florence Drive, Enfield, Middlesex. (Bot., Orn.)

1927 Hayward, Jno. F., B.Sc., 29 Mount Echo Drive, Chingford, E.4. (Geol., Zoo.)

1935 Hearn, Miss D. B., 56 Meadvale Road, Ealing, W.5. (Orn., Bot., Arch., R.)

1902 Heath, G. H., M.A., 3 Bolney Court, Portsmouth Road, Surbiton, Surrey. (Lep.)

1935 Henderson, Miss F. E., 70 King's Road, Wimbledon, S.W.19. (Orn.)

1934 Henderson, G. A., 12 Chepstow Crescent, Notting Hill, W.11. (Orn.)

1937 Hett, E. Leccombe, F.R.C.S., F.R.G.S., F.Z.S., 86 Brook Street, W.1. (Orn., Mam., Icht.)

1936 Hilliard, R., The Moorings, 5 Oakleigh Gardens, Edgware, Middlesex. (Ent., Ecol.)

1938 Hodge, Mrs E. M., 62 Roseneath Road, S.W.11. (Arch.)

1937 Hodge, G A., 62 Roseneath Road, S.W.11. (Orn.)

1937 Höhn, E. O., 12 Merrick Square, S.E.1. (Orn., Ecol.)

1932 Homes, R. C., 17 Park Lawn Avenue, Epsom, Surrey. (Orn., Ecol., R.)

1930 Hopkins, Graham, The Byron Studios, Ltd., 8 Farringdon Avenue, E.C.4. (Orn., Ecol.)

1919 Horn, P. W., Stepney Borough Museum, 77 Whitechapel High Street, E.1. (Orn., Aqua.)

1905 Hornblower, A. B., 91 Queen's Road, Buckhurst Hill, Essex. (Api., Arch., Orn., R., Ecol.)

1931 *Hose, Miss M. M., 22 The Avenue, Bickley, Kent. (Orn., Bot., Ent., Pl. G., Ecol., R.)

1933 House, F. C., 36 Becmead Avenue, Kenton, Middlesex. (Orn., R., Ecol., Bot.)

1910 Howard, D. Lloyd, J.P., F.I.C., F.C.S., Pettitts Hall, Chigwell, Essex. (Chem.)

1938 Hudson, Miss B. F., 8 Ferncroft Avenue, Eastcote, Ruislip, Middlesex. (Orn.)

1936 Hunt, Miss C. D. F., 52 St Helen's Gardens, North Kensington, W.10. (Arch., Bot., Geol., Orn.)

1938 Hurcomb, Sir Cyril, K.B.E., C.B., 12 Campden Hill Court, W.8. (Orn.)

1937 Hussey, S. V., 40 Flanchford Road, Shepherd's Bush, W.12. (Bot., Orn., R.)

1930 Hutton, Miss R. E., 34 Thorneyhedge Road, Gunnersbury, W.4. (Bot., Zoo.)

1934 Jackson, Miss N., 43 Casselden Road, Harlesden, N.W.10. (Biol.)

1927 Jeffery, H. J., A.R.C.S., F.L.S., 14 Coppetts Road, Muswell Hill, N.10. (Bot.)

1926 Jehan, Kenneth C., Westminster Bank, 133 Baker Street, W.1. (Bot., Arch.)

1929 Johns, Miss F. E., 30 Mount Stewart Avenue, Kenton, Harrow, Middlesex. (Orn., R., Bot.)

1933 Johns, Miss L. J., 87 Morley Hill, Enfield, Middlesex. (Arch., Bot., Orn., R., Ecol.)
1931 Johnston, F. J., 19 Connaught Avenue, Chingford, E.4. (Orn.)
1937 Jones, Mrs E. G., Little Collier's Farm, Whelpley Hill, near Chesham, Bucks. (Orn.)
1932 Jones, Rodney R. M., Tros-yr-Afon, Penmon, Anglesey. (Orn.)
1899 *Kaye, W. J., F.R.E.S., Chantrey Lodge, Longdown, Guildford, Surrey. (Lep.)
1937 Keen, Mrs E. M., 15 Doughty Street, W.C.1. (Arch.)
1937 Keith-Johnston, C., Spring Cottage, Sarratt, Nr. Rickmansworth, Herts. (Orn., Ent.)
1934 Kerr, Mrs H. M., Rait-, 22 Elm Tree Road, St John's Wood, N.W.8. (Orn., Arch.)
1936 Keywood, K. P., Croft Cottage, Hare Lane, Claygate, Surrey. (Orn., Ent.)
1930 King, Miss C. A., M.D., 8 Lancaster Drive, Hampstead, N.W.3. (Orn., Arch., R.)
1929 King, E. L., Holkham, 11 Downs View, Isleworth, Middlesex. (Orn., Bot., R.)
1932 King, Mrs E. L., 11 Downs View, Isleworth, Middlesex. (Orn., Bot., R.)
1932 Kirkness, Miss D. S., F.Z.S., 6 Mill Lane, West Hampstead, N.W.6. (Zoo., Bot., Arch.)
1928 Lack, H. L., M.D., F.R.C.S., 71 Marlborough Place, St John's Wood, N.W.8. (Orn.)
1936 Lamont, Mrs E. H., 49a Netherhall Gardens, Hampstead, N.W.3. (Orn.)
1927 Lane, J. H., 571/3 Commercial Road, E.1. (Chem.)
1932 La Touche, J. N. Digues, M.Inst.C.E., Woodcroft, Baldwin's Hill, Loughton, Essex.
1932 Le Cocq, L., 17 Highbury Hill, N.5. (R., Orn.)
1930 Ledlie, R. C. B., M.B., B.Sc., F.R.C.S., 64 Harley Street, W.1. (Bot.)
1928 Lee, Miss M., 22 Addison Way, Golders Green, N.W.11. (Orn.)
1928 Leech, T., 52 Park Avenue, Bush Hill Park, Enfield, Middlesex. (Bot., Orn.)
1922 Lemon, Mrs M. L., M.B.E., J.P., F.Z.S., M.B.O.U., Hillcrest, Redhill, Surrey. (Orn.)
1937 Lewer, F. A., 10 Oakhill Road, Putney, S.W.15. (Orn.)
1936 Lewis, Miss M., Oaklea, Whitehall Lane, Buckhurst Hill, Essex. (Orn., Bot., Ent., R., Arch.)
1919 Leyton Public Libraries, per the Librarian (E. Sydney, F.L.A.), Central Library, Leyton, E.10.
1927 Lister, Miss G., F.L.S., 871 High Road, Leytonstone, E.11. (Orn., Bot.)
1926 *Littlejohn, H. A., 2 Brooklands Gardens, Roding Lane, Ilford, Essex. (Orn., Bot., R.)
1934 Locket, G. H., M.A., M.Sc., 36 Gayton Road, Harrow, Middlesex. (Ent., Ecol.)

1933 Lockyer, T. Norman, LL.B. (Lond.), 14 Parkway, Rickmansworth, Herts. (Arch., Orn., R.)
1926 *Longfield, Miss C. E., F.R.G.S., F.R.E.S., F.Z.S., M.B.O.U., 20 Pont Street, S.W.1. (Orn., Ent., Bot., Ecol., R.)
1936 Lousley, J. E., 7 Penistone Road, Streatham Common, S.W.16. (Bot., Ecol., Orn.)
1930 *Low, G. Carmichael, M.A., M.D., F.R.C.P., F.Z.S., M.B.O.U., 7 Kent House. Kensington Court, W.8. (Orn., Zoo.)
1938 Lowe, Miss C. B. M., 14 Ross Court, Putney Heath, S.W.15. (Arch., Bot., Orn., R.)
1938 MacAlister, D. A., 10 St Albans Grove, Kensington, W.8. (Orn.)
1928 MacAlister, Mrs E., 10 St Albans Grove, Kensington, W.8. (Orn., Bot.)
1937 McClintock, D., B.A., Hayes Rectory, Bromley, Kent. (Bot., Orn.)
1935 McCulloch, G. K., 65 Chester Road, Northwood, Middlesex. (Orn.)
1933 MacDonald, Right Honourable Malcolm J., P.C., M.P., Lossiemouth, Morayshire, N.B. (Orn.)
1935 McDowell, Miss C. M., 43 Montague Road, Richmond, Surrey. (Bot., Orn.)
1932 McInnes, Miss J., 5 Longton Avenue, Sydenham, S.E.26. (Orn., Bot.)
1911 MacIntosh, Miss I. S., 3 Mayfield Road, Chingford, E.4. (Bot.)
1911 MacIntosh, Miss J. D., 3 Mayfield Road, Chingford, E.4. (Bot.)
1929 Mackay, Helen M. M., M.D., F.R.C.P., 28 John Street, Bedford Row, W.C.1. (Orn.)
1931 McKittrick, Thos. H., Jun., M.B.O.U., Coombe Place, East Grinstead, Sussex. (Orn.)
1932 McKittrick, Mrs T. H., Jun., Coombe Place, East Grinstead, Sussex. (Orn.)
1932 Mackworth-Praed, C. W., F.R.G.S., F.Z.S., F.R.E.S., M.B.O.U., 51 Onslow Gardens, South Kensington, S.W.7. (Orn., Ent.)
1937 McLaren, Miss K., Grove House, Roehampton Lane, Putney, S.W.15. (Orn.)
1923 *Macpherson, A. Holte, B.C.L., M.A., F.Z.S., 21 Campden Hill Square, W.8. (Orn.)
1929 Maltby, Miss J., Duncliffe, 157 Copers Cope Road, Beckenham, Kent. (Orn., Bot., P. L.)
1936 Mann, C. A., 26 Mount Avenue, Westcliff-on-Sea, Essex. (Ent., Arch.)
1923 Mann, E., 10 Frankland Road, S. Chingford, E.4. (P. L., Orn., Ecol.)
1934 Mann, F. R., M.C., Noreena, Ham Common, Surrey. (Orn.)
1934 Manser, G. E., 51 Barnmead Road, Beckenham, Kent. (Orn., Bot., Ecol.)
1936 Manson-Bahr, P. H., D.S.O., M.A., M.D., F.R.C.P., M.B.O.U., F.Z.S., 149 Harley Street, W.1. (Orn.)
1934 *Marchant, Miss R., 76 Witley Court, Woburn Place, W.C.1. (Bot., Arch.)

1932 Mason, C. T., 144 Wembley Hill Road, Wembley, Middlesex. (Ent., Arch.)

1938 Mason, J. H., 67 Thurlow Park Road, Dulwich, S.E.21. (Ent., Orn., R.)

1937 Maud, Miss B. J., St Catherine's, Windhill, Bishop's Stortford, Herts. (Arch., Bot., Orn., R.)

1938 Maund, Miss L., 57 Gordon Court, Du Cane Road, Hammersmith, W.12. (Orn.)

1935 Melluish, W. D., 56 Sunnyfield, Mill Hill, N.W.7. (Orn.)

1931 Millburn, Miss F. C., Calderfield, St George's Avenue, Northampton. (Orn.)

1926 Mitchell, Miss E. A., 196a Northolt Road, S. Harrow, Middlesex. (Bot., Orn.)

1932 Mitchell, Miss M. I., 7 Penwerris Avenue, Osterley, Middlesex. (Bot., Orn.)

1936 Mitford, Capt. Hon. J., 3 Granville Chambers, Granville Place, Orchard Street, W.1. (Orn.)

1938 Monk, J. F., 5 Gayton Crescent, Hampstead, N.W.3. (Orn.)

1937 Moreton, Miss M., 7 Abbey View Road, St Albans, Herts. (Orn.)

1934 Morgan, D. A. T., 46 Fordnook Avenue, Ealing Common, W.5. (Orn., R., Ecol.)

1937 Morton, Miss G. M., 7 Broomfield Road, Kew, Surrey. (Orn., Arch.)

1938 Moss, Miss I. P., Albert House, Great Wakering, Essex. (Arch.)

1937 Mountfort, G. R., Wildings, Green Lane, Stanmore, Middlesex. (Orn.)

1938 Muirhead, D., 12a Glenloch Court, Hampstead, N.W.3. (Ecol., Orn.)

1934 Munro, Miss M., Furzedown Training College, Welham Road, Tooting, S.W.17. (Orn., Ecol.)

1937 Munro, Miss P. C., 12 The Close, Southgate, N.14. (Orn.)

1928 Murphy, Miss H., L.L.A., 43 Stafford Row, Bow, E.3. (Bot., Orn., Ent., Arch.)

1937 Musselwhite, D. W., 59 Mayford Road, Wandsworth Common, S.W.12. (Orn.)

1936 Napper, R. P., 20 Norland Square, Holland Park, W.11. (Orn.)

1934 Newcombe, Miss P. M., 52 Northway, Golders Green, N.W.11. (Orn., Bot., R.)

1926 Niblett, Montague, 10 Greenway, Wallington, Surrey. (Ent., Pl. G.)

1893 *Nicholson, Miss B., Rotherwood, 49 Danecourt Road, Parkstone, Dorset. (Bot.)

1934 Nicholson, E. M., M.B.O.U., 13 Upper Cheyne Row, S.W.3. (Orn., Ecol.)

1934 Nicholson, E. T., 321 Brettenham Road, Walthamstow, E.17. (Orn.)

1932 Nicholson, G., Homeland, Basildon Road, Laindon, Essex. (Orn.)

1928 Noel, Miss E. F., 37 Burnham Court, W.2. (Bot., Orn., R., Ent., Pl. G.)
1934 Norris, C. A., M.B.O.U., Grassholme, Stratford-on-Avon, Warwickshire. (Orn., Ecol.)
1937 O'Farrell, A. F. L., Imperial College of Science, South Kensington, S.W.7. (Ecol., Ent.)
1933 Oke, E. E., Tweenways, The Mount, Leatherhead, Surrey. (Orn., Ent., R.)
1926 *Oldham, Charles, F.L.S., F.Z.S., M.B.O.U., Oxfield, Shootersway, Berkhamsted, Herts. (Bot., Orn., Conch., Ecol.)
1937 Oldroyd, H., British Museum (Natural History), Cromwell Road, S.W.7. (Ecol., Ent., esp. Dipt.)
1937 Owen, C. E., 30 Hamilton Road, Harrow, Middlesex. (Orn.)
1929 Page, Miss M. M., 19 Hainthorpe Road, West Norwood, S.E.27. (Orn.)
1925 *Parmenter, L., 94 Fairlands Avenue, Thornton Heath, Surrey. (Ecol., Bot., Ent. (esp. Dipt.), Orn., Pl. G.)
1938 Parrinder, Mrs E. D., 27 Gwalior House, Chase Road, Southgate, N.14. (Orn.)
1938 Parrinder, E. R., 27 Gwalior House, Chase Road, Southgate, N.14. (Orn.)
1938 Parry-Okeden, Miss M. M. C., Hanworth Rectory, Feltham, Middlesex. (Orn.)
1921 Parsons, S. T. T., 89 Holland Park, Notting Hill, W.11. (Orn.)
1937 Patterson, H. G., 15 Queen's Gate Gardens, S.W.7. (Orn.)
1933 Paulson, C. W. G., M.B.O.U., c/o John Harkness & Co., Ltd., 69 Great Queen Street, Kingsway, W.C.2. (Orn.)
1922 Payne, C. H., 13 Kidderpore Gardens, Hampstead, N.W.3. (Orn., Arch.)
1930 Payne, E. D. B., 32 Friern Watch Avenue, North Finchley, N.12. (Orn.)
1923 Payne, E. M., Tilgate, Long Lane, Hillingdon, Middlesex. (Bot., Orn.)
1923 Payne, L. G., 22 Marksbury Avenue, Richmond, Surrey. (Bot., Ecol.)
1937 Pearce, Miss A. H., B.Sc., White Gables, Clarence Road, St Albans, Herts. (Orn., Freshwater Biol., Ecol.)
1935 Pearce, B. S. K., 74 Ashgrove Road, Goodmayes, Ilford, Essex, (Orn., Bot., Ent.)
1937 Pearce, E. W., 18 Seymour Road, Hampton Wick, Kingston-on-Thames. (Orn.)
1934 Pearson, Miss D. M., St Gabriel's College, Cormont Road, Camberwell, S.E.5. (Orn., P. L., Bot., Pl. G.)
1932 Pedler, E. G., 78 Richmond Park Road, East Sheen, S.W.14. (Orn., R.)
1937 Peterken, J. H. G., 73 Forest Drive East, Leytonstone, E.11. (Orn., Bot.)
1922 Pethen, R. W., 108 Northwold Road, Upper Clapton, E.5. (Orn., Ent., Ecol.)

1931 Pethen, Miss Rita W., 108 Northwold Road, Upper Clapton, E.5. (Orn., Rept.)

1929 Phelan, T. C. E., 5 Ladbroke Square, W.11. (Orn., Bot.)

1937 Philipson, W. R., Melbrake, Park Avenue, Ruislip, Middlesex. (Orn.)

1932 Phillips, Mrs F. M., 9 Sylvan Hill, Upper Norwood, S.E.19. (Orn.)

1932 Phillips, H. H., M.R.C.S., L.R.C.P., 9 Sylvan Hill, Upper Norwood, S.E.19. (Orn.)

1937 Piercy, K., 106 St Edmund's Terrace, N.W.8.

1931 Pinniger, E. B., 19 Endlebury Road, Chingford, E.4. (Ent., Orn.)

1927 Piper, Miss G. E. M., 12 Elms Road, Clapham, S.W.4. (Orn.)

1925 Poock, S. G., 17 Green Moor Link, Winchmore Hill, N.21. (Orn., Ecol.)

1935 Pollard, Mrs H. B., " Greenacre," Stanhope Road, East Croydon, Surrey. (Orn.)

1928 Poole, A. C., 42 The Mall, Ealing, W.5. (Orn., Bot.)

1933 Popple, Miss W. N., 11 Pemberton Gardens, Upper Holloway, N.19. (Orn., R., P. L., Ecol.)

1937 Powell, A. M., 35 West End Avenue, Pinner, Middlesex. (Orn.)

1910 Pratt, W. B., 10 Lion Gate Gardens, Richmond, Surrey. (Lep.)

1892 Prout, L. B., F.R.E.S., 84 Albert Road, Dalston, E.8. (Lep., Biol.)

1929 Purey-Cust, Miss Peggy, 49 West Hill, Highgate, N.6.

1926 Rankin, The Hon. Lady, Royal Court Hotel, Sloane Square, S.W.1. (Orn.)

1934 Ratcliff, P. W., 12 Barnmead Road, Beckenham, Kent. (Orn., Bot., Ecol.)

1934 *Ray, Miss T., 76 Witley Court, Woburn Place, W.C.1. (Bot., Arch.)

1936 Redgrave, G., 57 Ranelagh Gardens Mansions, Hurlingham, S.W.6. (Orn., R.)

1935 Redpath, K., Glanton, Manor Road, Hazlemere, High Wycombe, Bucks. (Orn.)

1929 Reed, Miss J. B., 29 Thornton Hill, Wimbledon, S.W.19. (Orn.)

1930 Reeve, Miss E. A., The Penn Club, 9 Tavistock Square, W.C.1. (Bot., Orn., Ent., R.)

1929 Rew, Miss M., 23 Chester Terrace, Regents Park, N.W.1. (Orn.)

1925 Richardson, Arthur, The Lodge, Chantry Lane, London Colney, Herts. (Orn., Ent.)

1928 Richardson, G., 75 Woodbourne Avenue, Streatham, S.W.16. (Bot.)

1892 Robbins, R. W., Bullens Lee, Pains Hill, Limpsfield, Surrey. (Bot., Lep., Orn., Arch., Pl. G., Ecol.)

1934 Roberts, J. E., B.Sc., 24 Warren Drive, Surbiton, Surrey. (Orn., Ecol.)

1933 Robinson, G. F. B., Shenley, Manor Green Road, Epsom, Surrey. (Orn., R.)

1933 Robinson, Mrs M. L., Shenley, Manor Green Road, Epsom, Surrey. (Bot., R.)
1937 Rose, C. C., 18 Draycott Avenue, Kenton, Middlesex. (Orn.)
1910 *Ross, J., 23 College Gardens, Chingford, E.4. (Pl. G.)
1935 Rowan, J. D., 65 Haydn Avenue, Purley, Surrey. (Orn.)
1931 Rowberry, E. C., Sabon Gida, Golf Road, Radcliffe-on-Trent, Notts. (Orn., Ecol.)
1932 Ryan, A. P., 19 Barnsall Street, Chelsea, S.W.3. (Orn.)
1929 Sampson, E. S., 60 Alexandra Road, Epsom, Surrey. (Orn.)
1937 Scott, Miss E. M. P., 7 Broomfield Road, Kew, Surrey. (Orn., Arch.)
1937 Scott, G. B., 6 Alan Road, Wimbledon, S.W.19. (Geol., Orn.)
1930 Scudamore, Miss M., 23 Marchmont Road, Richmond Hill, Surrey.
1937 Seth-Smith, D., F.Z.S., M.B.O.U., Curator's House, Zoological Gardens, Regent's Park, N.W.8. (Orn.)
1932 Seton, Sir Malcolm C. C., K.C.B., M.B.O.U., 26 Upper Park Road, Hampstead, N.W.3. (Orn.)
1937 Sheppard, R., 10 Sylvan Avenue, Mill Hill. N.W.7. (Orn., Zoo.)
1935 Shill, W. A., 41 Douglas Avenue, Walthamstow, E.17. (Bot.)
1929 Short, G. R. A., 36 Parkside Drive, Edgware, Middlesex. (Bot., Micr., Pharmacognosy, Ecol.)
1936 Silva, Miss A. M. T., Stone Street Farm, Sevenoaks, Kent. (Orn.)
1936 Silva, Miss E. T. T., Stone Street Farm, Sevenoaks, Kent. (Orn.)
1892 Simes, J. A., O.B.E., F.R.E.S., Kingsley Cottage, 75 Queen's Road, Loughton, Essex. (Ent.)
1934 Skilton, H. W., 9 Stillness Road, Forest Hill, S.E.23. (Orn.)
1933 Skrimshire, E. H. N., F.R.A.I., F.Z.S., 5 The Old Well House, The Grove, Highgate, N.6. (Orn., Arch., R.)
1936 Smart, J., B.Sc., Ph.D., F.R.E.S., British Museum (Natural History), Cromwell Road, S.W.7. (Ent., Orn.)
1892 Smith, A. C., F.R.E.S., 18 Mornington Road, Woodford Green, Essex. (Ent.)
1935 Smith, Miss A. J., 26 Newman Street, W.1. (Orn.)
1892 Smith, C. B., 103 Wood Vale, N.10. (Lep.)
1929 Smith, Mrs H. K., 103 Wood Vale, N.10.
1936 Smith, Miss J., 15 Thornlaw Road, West Norwood, S.E.27. (Orn.)
1933 Smith, Miss L., 17 Highcliffe Gardens, Ilford, Essex. (Arch.)
1937 Smith, M. A., M.R.C.S., Lane End, Putney Heath Lane, S.W.15. (Rep. and Amph.)
1934 Smith, R. McKenzie, 124 King's Avenue, Woodford Green, Essex. (Orn.)
1927 Solly, Miss B. N., 12 Moreton Gardens, Old Brompton Road, Earl's Court, S.W.5. (Orn.)
1938 Solomon, S. G., B.Sc., Ph.D., F.Z.S., 46 Corringham Road, Golder's Green, N.W.11. (Ecol., Ent., Orn.)
1927 Southern, H. N., 67 Holden Road, North Finchley, N.12. (Orn.)
1936 Spencer, M. D., Long Orchard, Cobham, Surrey. (Orn.)

1937 Spicer, A. H., M.C., M.R.C.S., L.R.C.P., 29 Campden Grove, Kensington, W.8. (Orn.)
1935 Spinney, G. H., B.A., 4 Overhill Gardens, East Dulwich, S.E.22. (Bot., Arch., Ecol., R.)
1922 Spooner, Herman, 21 Musgrave Crescent, Walham Green, S.W.6. (Bot., Orn., Arch., R., Ecol.)
1936 Springall, R. S., 30 Connaught Avenue, Chingford, E.4. (Orn.)
1934 Statham, Miss M. R., The Willesden General Hospital, N.W.1. (Arch., R.)
1934 Steel, W. O., 16 Upsdell Avenue, Palmers Green, N.13. (Ent., Pl. G., Ecol.)
1937 Stirling, Lt.-Col. J. A., The Wick, Richmond Hill, Surrey. (Orn.)
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NOTE.—The following abbreviations are used in the above lists:—Api., Apiculture; Aqua., Aquaria; Arch., Archaeology; Ast., Astronomy; Biol., Biology; Bot., Botany; Chem., Chemistry; Col., Coleoptera; Conch., Conchology; Dipt., Diptera; Ecol., Ecology; Ent., Entomology; Ethn., Ethnology; Geol., Geology; Hem., Hemiptera; Hym., Hymenoptera; Icht., Ichthyology; Lep., Lepidoptera; Mam., Mammalogy; Micr., Microscopy; Neur., Neuroptera; Orn., Ornithology; Orth., Orthoptera; Ool., Oology; Pl. G., Plant Galls; P. L., Pond Life; R., Ramblers' Section; Rep., Reptilia; Zoo., Zoology.

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At these meetings specimens of Natural History interest are exhibited, and papers on various subjects are read and discussed. Visitors may be introduced by members of the Society, and are cordially welcome.

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PRINTED BY T. BUNCLE AND CO. LTD., ARBROATH.

Supplement to The London Naturalist.

LONDON BIRD REPORT

FOR

1937

Being an Annual Report on Bird-Life within Twenty miles of St Paul's Cathedral.

COMPILED BY

R. C. HOMES,

Assisted by the Recording Committee of the Ornithological Section,

C. S. BAYNE (Chairman). P. W. E. CURRIE.
D. A. T. MORGAN. L. PARMENTER.
C. W. G. PAULSON, M.B.O.U.

Price, 1s 6d.

PUBLISHED BY THE
LONDON NATURAL HISTORY SOCIETY,
THE LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE,
KEPPEL STREET, GOWER STREET, LONDON, W.C.1.

DATE OF PUBLICATION, MAY 1938.

Birds in the London Area, 1937.

REPORT ON BIRD-LIFE WITHIN TWENTY MILES OF ST PAUL'S CATHEDRAL.

INTRODUCTION.

IN introducing the second issue of the bird report as a separate publication we are glad to be able to say that over fifty copies of the first report have been sold in addition to those distributed free to members. In view of the ever-increasing interest in bird-life we feel, however, that this number could be greatly increased, and we shall, therefore, be grateful if members will take every opportunity of introducing the report to friends who are not members of the Society. Extra copies can be obtained for 1/6.

In addition to the usual features we include an article on a Pied Wagtail roost in Richmond Park and an account of the census of ducks, great-crested grebes and coots which was undertaken on 18th December.

Notes on the special species for 1937 will be found in a separate article. The species selected for 1938 are *Reed Warbler*, *Tufted Duck* and *Turtle Dove*, and members are asked for separate notes on these species in accordance with the questions detailed in the circular sent out early in January. Further copies of this circular are available on request.

By virtue of its affiliation to the British Trust for Ornithology the Society received a copy of the report on the Little Owl enquiry. It seems pertinent to mention in connection with our affiliation that of the ten members of the present Council of the Trust six are members of this Society. While the Trust is making good progress and has already been responsible for several very valuable reports, it is badly handicapped by lack of funds, and we feel that there must be many members who would like to know more of its activities. Particulars can be obtained from the Honorary Secretary, c/o Zoological Society of London, Regent's Park, N.W.8, or from the Society's Recorder.

Probably the most interesting event of the year was the remarkable influx of grebes and divers on 31st January. So many were reported on this date that it is probable that others first seen in the early days of February actually arrived at the same time. The weather conditions preceding the movement have been summarised in *British Birds*, May 1937. Strong east and north-east winds were prevalent in the North Sea and in the region of Denmark in the last few days of January, while temperature in the Baltic was down to 7° Fahr. on the 30th. By that date, however, the wind off the east coast of England had dropped considerably, although the influx does not appear to have been prominent until the 31st. As most observations are made at the week-end it should be borne in mind that the 31st was a Sunday, and that, therefore, birds arriving during the previous week might not have been noticed until that date.

In the London area the three species chiefly involved were the Slavonian and Red-necked Grebes and the Black-throated Diver. A Black-necked Grebe was reported at Ruislip and at Staines, a Red-throated Diver was found dead at Littleton, and a Red-breasted Merganser was seen at Staines, but no Great Northern Diver was concerned unless the one first seen at Walthamstow Reservoirs on 23rd January may be included. A Razorbill found dead at King George V Reservoir on 6th February may have also taken part in the movement, while later in February Shags were reported from several localities, recalling a similar occurrence in this month in 1935. A Slavonian Grebe stayed at Mitcham until 26th March and a Black-throated Diver remained on the Thames until June. The presence of both Slavonian and Red-necked Grebe in Kensington Gardens at the same time is yet another instance of the attractions of London's lakes for passing birds.

Richmond Park has provided several interesting records with a Cirl Bunting in May, a Great Grey Shrike and a Dartford Warbler in December, Pintail in April and November, and Stone Curlew in April for the third successive year. Siskins and Bramblings were exceptionally numerous in March and early April, the latter species, however, being scarce in the early months of the winter 1937-8. After the Crossbill invasion of 1935 there have been only two records for the winter 1936-7.

Shovelers were plentiful in the autumn but still do not seem to have become regular breeders. Long-tailed Ducks arrived at Staines earlier than in any previous year and were at first much less wary than in the past. With regard to the *limicolae* fewer species were seen than in 1936, but Oyster-catcher, Wood Sandpiper and Spotted Redshank were additions in 1937. A Turnstone was seen at Barn Elms in spring, and at Brent Reservoir in autumn. The appearance of a Long-tailed Skua at Easneye in September near the border of the area is worthy of note.

Several new members have contributed very valuable notes, and we take this opportunity of thanking them and others who have sent in records for their co-operation. We also have to thank Mrs Paulson and Messrs Fitter and Wightman for their kind assistance in entering and checking the records.

All records are for 1937 except in the report on the special species or where otherwise stated. Observers responsible for the published notes are indicated by initials, as are the counties. Abbreviations are as follows:—*B.B.*=*British Birds* Magazine, *L.B.R.*=*London Bird Report*, Res.=Reservoir. A map of the area was published in the Report for 1936, a few copies of which are still available.

The following is a list of members who have sent in observations:—

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G. Beven.
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A. Simms, per C.L.C.
R. McKenzie Smith.
A. R. Sumerfield.
Dr W. W. Thomson, per R.C.H.
Miss M. Van Oostveen.
R. Vaughan Johnson, per C.L.C.
Miss H. Watkins.
Mrs W. Boyd Watt.
Miss E. M. Wheeler.
C. A. White.
J. S. Wightman.
J. A. Wigzell, per C.L.C.
R. E. Windsor, per C.L.C.
W. A. Wright.

Hooded Crow. *Corvus c. cornix* L.

E. Loughton, one on 7th March (P.D.H.). Walthamstow Res., one on 16th January (R.W.P., and others) and on 18th December (R.W.P.).
K. Elmers End Sewage Farm, one on 17th October (G.E.M.).
S. Richmond Park, one from 15th to 21st February (A.H.M., C.L.C.).

Hawfinch. *Coccothraustes c. coccothraustes* (L.).

E. Epping Forest, a nest seen on 18th May (W.A.W.).
H. Cuffley, four on 2nd July (A.R.S.).
K. Beckenham, two on 27th July (P.W.R.). Keston Common, two in pines on 25th April (M.M.H.).
M. Northwood, one on 20th March (G.H.). Ruislip, one on 5th and 19th December (W.R.P.). White Webbs Park, a pair in the breeding season (A.R.S.).

S. Ashtead, seen on many occasions throughout the year. One pair probably bred in an orchard (J.S.W.). Godstone, one on 14th February (H.B.). Limpsfield, at least two pairs bred (K. R. Chandler). On 25th October one was seen in a yew tree apparently taking berries (R.W.R.). Mickleham, one to five seen October to December (P.W.E.C.). Petersham Park, ten on 24th February (E.G.P.). Reigate Park, noted in February, April and May, there being four pairs on the 8th May (H.B.). Richmond Park, in small numbers from January to March, increasing in April, largest number noted being about 20 on the 28th (W.E.G.); one pair thought to have nested (C.L.C.). Noted in Tadworth and Kingswood district in March, April, June and July (H.B.). Wimbledon Common, noted on three dates during May (J.B., R.E.W.), and up to 12th June (R.E.W.).

Goldfinch. *Carduelis carduelis.*

Although flocks are frequently seen in the area the following numbers seem to be exceptionally large:—

M. Bushy Park, about 150 feeding on knapweed on 4th and over 500 on 16th October (J.E.R.).

Siskin. *Carduelis spinus* (L.).

There appears to have been a pronounced influx of this species in March, when large flocks were reported from many localities.

E. Epping Forest, reported at High Beach in late March by several observers, and up to 19th April by P.D.H. There were about 30 on 1st April. Highams Park and Wanstead Park, up to 20 seen in January and early February (S.A., E.T.N., J.H.G.P., W.A.W.).

K. Beckenham, 25-50 up to the middle of March, and one on the 20th and 26th (P.W.R.).

M. Bushy Park, about 50 on 16th February, and over 20 on 9th and 21st March (J.E.R.). Golders Green, five on 15th and two on 18th March (R.E.B.). Hampstead Heath, a flock of about 60 was first seen on 24th March, some staying until 12th April (K.D.S., and others). Harefield, seven on 21st February (W.R.P.). Ruislip, four or five on 28th March (G.H.). Stanmore, about six on 21st February (W.D.M.).

S. Beddington, three on 3rd January (G.B.) and four or five on 24th October (G.D.E.). Island Barn Res., Molesey, 16 on 18th December (P.W.E.C.). Reigate Park, about 20 on 6th November, two on 25th December, and about 15, some of which were singing, on Reigate Heath on the same date (H.B.). Richmond Park, in small numbers from 5th January to 7th April (C.L.C.); but 70-100 on 5th March, there being no other species in the flock (W.E.G.), and over 20 on the 7th April (A.H.M.); one on 29th November and 1st December (W.E.G.). Wimbledon Common, one on 7th and five on 13th January (J.B.). A small flock was present during March (W.W.T., A.H.M.) and was last seen on 3rd April (R.E.W.). Weybridge, three on alders on 28th December (G.B.). Cobham Mill, one on 9th

March (P.W.E.C.). Esher Common, about six on 27th and 31st March (K.P.K.). Selsdon, about six on 13th March (R.S.R.F.).

LESSER REDPOLL. *Carduelis flammea cabaret* (P. L. S. Müll.).

B. Black Park, about 12 on 19th February (C.E.L.).

E. Recorded as usual in Epping Forest and Knighton Wood. Four at Chigwell Sewage Farm on 28th November were feeding on nettle seeds (W.A.W.). North Weald, one on 28th November feeding on willow-herb (R.S.R.F., R.C.H.).

K. Beckenham, from 15 to 30 winter 1936-7, one in July (P.W.R.), 12 on 31st October, about six on 28th November, none seen in December (A.J.R.). Hayes, 20-30 during the winter, numbers decreasing in April. Several birds remained throughout the summer and probably bred. A late nest found on 14th July had young on 6th August (P.W.R., G.D.E., M.M.H., G.E.M.). Chislehurst, one on 9th May (M.M.H.).

M. Hampstead Heath, three pairs on 7th May (H.M.R.K.); present throughout the year (K.D.S.). Ruislip, small flocks in the early months of the year, and six still there on the 23rd April (G.H., W.R.P.). Also reported in winter from Bushy Park, Harefield and Stanmore.

S. Ashstead district, present throughout the winter 1936-7 in small numbers. With the severer weather from the end of January to March the birds left the district and were found in flocks on the neighbouring commons and along streams. Birds returned to the district at the beginning of April and, although there was no definite proof of nesting, their presence throughout the breeding season in suitable areas suggests it (J.S.W.). Barn Elms, two feeding on seeds of mugwort on 28th October (E.G.P.). Beddington district, two in the park on 10th January (L.P.); several feeding on seeds of *Epilobium hirsutum* on 17th October, and three feeding on fruits of *Urtica dioica* at Watermeads on 13th November (G.B.). Belmont, four pairs seen during the breeding season, and birds noted up to end of November; frequently seen feeding on seeds of evening primrose and golden rod. In the summer they were noted feeding on aphids on fruit trees (P.W.E.C.). Epsom Common, a flock of about 40 in a birch wood on 20th March; some still present on 16th April but none after that date (R.C.H.). Limpsfield, seen throughout the year, one pair at least probably nested (R.C.H., and others). Reigate Park, three on 3rd April and a pair on 8th May on Reigate Heath (H.B.). Richmond Park, no reports in the breeding season (C.L.C.). Tadworth, one or two pairs nested (H.B.). Wimbledon Common, last winter birds on 25th February (R.E.W.), two on 27th March (W.W.T.), about six on 26th May and 5th June (O.H.), residents last noted on 2nd August (R.E.W.).

COMMON CROSSBILL. *Loxia c. curvirostra* L.

S. Wimbledon Common, one heard on 12th March (R.E.W.).

Brambling. *Fringa montifringilla* L.

There was again an enormous influx in March when it appeared in many new localities, numbers being especially noticeable at this season on the sewage farms. Very few, however, were reported in the early months of the winter 1937-8.

H. Waltham Abbey, 15 on 28th December (A.R.S.).

K. Elmers End Sewage Farm, maximum 20 on 14th March, two or three seen on odd dates October to December (G.E.M.). Hayes, about 15 on 10th October (G.D.E., G.E.M.).

S. Ashtead, unusually large flocks winter 1936-7 numbering up to about 100 (J.S.W.). Beddington Sewage Farm, 15-30 were present in the early part of March, the numbers rising to 200-300 on the 26th. On 10th April there were 250+, but by the 20th there were only about eight (G.E.M., P.W.R., and others). Richmond Park, reported on numerous occasions. About 100 on 5th March (W.L.C.). None in autumn and winter 1937-8, the crop of beech-mast and hornbeam seeds being very poor (C.L.C.).

K.M.S. There are March and early April records from Brent Sewage Farm, Golders Green, Primrose Hill, Staines (about 30 on 13th March), Kew Gardens (30+ on 5th March), Epsom Sewage Farm, Mitcham (20-30 on 7th March), Beckenham, Kelsey Park, Farnborough, Limpsfield Chart, Kingswood.

Tree Sparrow. *Passer m. montanus* (L.).

H. Theobalds Park, seen in May (A.R.S.).

M. Staines Moor, bred (D.A.T.M.). Commonly reported in this district.

K.S. Usual flocks reported in autumn from the sewage farms.

Corn Bunting. *Emberiza c. calandra* L.

M. Staines, several noted in May.

S. Arbrook Common, one on 4th June (K.P.K.). Ewell, two singing on 13th June (R.S.R.F.). Molesey, two in mixed flock of buntings on 18th December (P.W.E.C.).

Cirl Bunting. *Emberiza c. cirlus* L.

S. A male frequented Richmond Park and Ham Common at the end of May and during the first week of June (R.W.H., and others).

Wood Lark. *Lullula a. arborea* (L.).

S. This species was reported from several localities in Surrey in spring, and one nest was seen with eggs. It is doubtful whether it bred in Richmond Park.

Rock Pipit. *Anthus spinoletta petrosus* (Mont.).

E. King George V Res., one on 6th March (W.A.W.).

S. Barn Elms Res., two on 1st October (G.C.L., E.G.P., *B.B.*, xxxi, p. 198).

Blue-headed Wagtail. *Motacilla f. flava* L.

M. Staines Res., a male seen by C.A.W. on 1st May was probably this species.

S. Beddington Sewage Farm, good views were obtained of a male on various dates from 30th May to 26th June (G.B.).

YELLOW WAGTAIL. *Motacilla flava rayi* (Bp.).

K. Elmers End Sewage Farm, one or two pairs bred (G.E.M.). Swanscombe, several pairs with young on 27th June (A.C.).

M. Brent Res., one pair bred (W.D.M.). Passage reported in usual numbers from the reservoirs.

S. About five pairs bred at Barn Elms Res. and two at Lonsdale Road (O.H.). Ham Common, a pair apparently with young on 14th July (R.E.B.). Other breeding localities as usual.

GREY WAGTAIL. *Motacilla c. cinerea* Tunst.

K. Shoreham, one by River Darenth on 26th June (C.L.C.).

S. Fetcham, one pair nested twice, rearing three young (H.J.B.). Mitcham, one pair probably nested, young birds being seen on 19th June (G.B.).

PIED WAGTAIL. *Motacilla alba yarrellii* Gould.

M. Staines Res., migration noted on 21st March (G.C.L.).

S. Island Barn Res., Molesey, about 60 on 27th March (P.W.E.C.). Thornton Heath, at least 20 roosting in pollarded plane trees in front of some flats on the London Road on 2nd September (L.P.). Black Pond, Esher Common, 129 were counted on 15th September at the roost described in *L.B.R.*, 1936, pp. 28-9; nearly all the birds came from the north (W.L.C.). Balham, on 11th February, about 150 birds were roosting in holly trees in a garden bordering Balham High Road (D.S.S., *B.B.*, xxx, p. 319). An article on a roost in Richmond Park is printed separately in this report.

WHITE WAGTAIL. *Motacilla a. alba* L.

E. Walthamstow Res., a male on 17th April (R.W.P.).

K. Elmers End Sewage Farm, one on 18th April (G.E.M., P.W.R.).

M. Staines Res., a male in good plumage was seen at close quarters on 31st January (C.W.G.P.), and one on 18th April (W.E.G., *B.B.*, xxxi, p. 297). The record on 31st January is an unusual date, but we consider the identification satisfactory (Ed.).

S. Barn Elms Res., one to four birds seen from 19th to 28th April (various observers). Lonsdale Road Res., a male on 3rd May (G.D.E.). Beddington Sewage Farm, one on 30th March (P.W.R.) and four males on 24th April (G.E.M.).

BRITISH WILLOW TITMOUSE. *Parus atricapillus kleinschmidti* Hellm.

E. Epping, one near here on 28th November (R.S.R.F., R.C.H.).

H. Cuffley, a pair noted in this district on 25th April; marsh tits were seen in the same wood (R.S.R.F., and others).

M. Uxbridge, two on 20th March (G.C.L.).

S. Ashtead Common, one on 16th October (R.C.H.). Limpsfield Common, seen on various dates but not in breeding season (several observers).

Great Grey Shrike. *Lanius e. excubitor* L.

S. On 1st December a single bird was seen by W.E.G. in Richmond Park. Subsequently one was also seen on Ham Common (D.A.R.) and on Wimbledon Common (R.E.W.). The last date in 1937 was 12th December on Ham Common. It is uncertain whether all these records refer to the same bird. Walton Heath, one on 31st January (H.B.).

Wood Warbler. *Phylloscopus s. sibilatrix* (Bechst.).

E. Walthamstow Res., one on 25th April (E.T.N.).

K. Dulwich, one on 3rd May (G.D.E.).

M. Hampstead, two males on 18th May and 3rd June, and one on 26th July (H.M.R.K.).

S. Kingswood, five pairs nested (H.B.). Limpsfield, two pairs at least on edge of common (R.C.H.). Richmond Park, one pair nested, a second pair was seen but did not stay (C.L.C.). Wimbledon Common, only one nest found, scarce this year (R.E.W.). Present as usual on Arbrook and Esher Commons.

Grasshopper Warbler. *Locustella n. noevia* (Bodd.).

H. Rickmansworth, one at Stockers Lake on 30th April (R.E.B.).

M. Harefield, one on 27th May and on 10th July. Ruislip, one from 4th May to 16th July (W.R.P.). Springwell, one heard on 30th April (R.E.B.).

S. Bookham, young birds seen on 25th July (H.J.B.). Ashtead and Epsom Commons, at least twelve singing males located, probably more (R.C.H.). Littleworth Common, three or four heard during the summer (R.E.B.). Walton Heath, two heard on 18th April (H.B.).

Dartford Warbler. *Sylvia undata dartfordiensis* Lath.

S. At locality "A" (*L.B.R.*, 1936, p. 9) this species is holding its own, three males being seen on 18th April. At "B" a male was seen from 13th March to 18th June, but there was no female this year. At a third locality a pair was seen on 26th October and one on various dates up to 24th December. A male was seen by D.A.R. in Richmond Park on 19th December and was still there at the end of the year.

Fieldfare. *Turdus pilaris* L.

This species was very scarce in the winter of 1936-7, but appeared in usual numbers in November 1937. On the 13th thirty were seen flying south-west at Bromley (M.M.H.), while on the 14th about 40 were seen at Mickleham (P.W.E.C.) and passage westwards was noted at Colnbrook and Stanwell (R.C.H., D.A.T.M.).

Mistle Thrush. *Turdus v. viscivorus* L.

S. Mickleham, on 2nd October large numbers were feeding on yew berries. By the 10th numbers had increased and one flock was estimated at 250. Towards the end of November large numbers were

still present but the birds were more scattered. By the end of December only a few remained (P.W.E.C., cf. *L.B.R.*, 1936, p. 9). Tadworth, on the 5th September a flock of 48 was passing south (H.B.).

Ring Ouzel. *Turdus t. torquatus* L.

S. Woldingham, one on 3rd October (G.W.C.).

Blackbird. *Turdus m. merula* L.

M. Ruislip, a roost of from 200-300 birds in Park Wood from beginning of October (W.R.P.).

Whinchat. *Saxicola r. rubetra* (L.).

M. Enfield Lock, several pairs resident in this district (A.R.S.). Harefield and Ruislip, at least seven pairs located (W.R.P.). Scratch Wood, one pair bred (W.D.M.). Wembley, two pairs bred at Barn Hill (R.W.H.).

S. Richmond Park, two or three pairs bred (various observers). Reported on passage in several localities.

British Stonechat. *Saxicola torquata hibernans* (Hart.).

E. Buckhurst Hill, one pair bred in new locality, although district is being " developed " (W.A.W.).

M. Bred Harefield, Pinner and Ruislip (W.R.P.), Wembley Park (R.W.H.).

S. Bred Mitcham Common (2 pairs, W.W.T.), Richmond Park (at least 3 pairs, C.L.C.). A pair was seen on Ham Common on 14th June (D.A.T.M.), and fledged young were being fed on Wimbledon Common on 11th July (R.E.W.). Bred on other commons as usual.

Redstart. *Phoenicurus p. phoenicurus* (L.).

H. Cuffley, several near Great Wood on 25th April (R.S.R.F.).

M. Noted on passage in spring at Mote Mount (*Field*, 17/4/37), at Ruislip (W.R.P.), and Hampstead (K.D.S.), and in autumn at Ruislip (W.R.P.). Bred in Bushy Park (J.E.R.).

S. Banstead, 22nd April (J.E.R.). Mitcham, 17th April (G.B.). Sheen Common, 17th April (E.G.P.). Wimbledon Park, 7th April (R.E.W.). At Kingswood, a male was singing on 23rd May and 10th June, but there was no evidence of nesting (H.B.). Richmond Park, status unchanged.

Black Redstart. *Phoenicurus ochrurus gibraltariensis* (Gm.).

M. Hendon, one on 31st October (*B.B.*, xxxi, p. 274).

Nightingale. *Luscinia m. megarhyncha* Brehm.

S. Ham Common, a single bird heard between 16th May and 4th June, but no evidence of nesting. First record for this locality for several years (C.L.C.).

Martin. *Delichon u. urbica* (L.).

M. Ruislip, nests were built on houses erected the previous winter (W.R.P.). W.B. records that, whereas this species was nesting on

new houses in Kenton about eight years ago when the district was only partially developed, now it no longer breeds there, the district being more built-up. He suggests that the making-up of the roads and consequent lack of soft mud, and the presence of large numbers of Starlings and House Sparrows breeding on the houses may be partially responsible.

Nightjar. *Caprimulgus e. europaeus* L.

E. Epping Forest, reported by several observers between 18th May and 2nd June.
H. Cuffley, seen in breeding season (A.R.S.).
K. Bromley Common, one on 25th May (M.M.H.).
M. Ruislip district, 13-14 pairs located (W.R.P.).
S. Recorded on the following Commons: Arbrook, one on 25th June; Esher, nest found on 5th June by R.E.B.; Epsom, two or three pairs, nest found by R.E.B. on 6th June; Headley, at least three pairs. Richmond Park, one first noted on 24th May only stayed for a few days (several observers).

Wryneck. *Jynx t. torquilla* L.

K. Cudham, one on 28th March (M.M.H.).
S. Ashtead, heard frequently in spring and summer (J.S.W.). Purley, one heard from 12th April to June, and again in early September, but no proof of breeding (J.D.R.). Also recorded at Banstead (April 22), Bookham (May 8), Limpsfield (several dates), Nonsuch Park (two on April 24), Richmond Park (April 9), and Tadworth (April 11). Information on breeding would be welcome in addition to the usual dates of arrival!

Long-eared Owl. *Asio o. otus* (L.).

K. Hayes, one was found on a keeper's gibbet in July (G.E.M.).

White-breasted Barn Owl. *Tyto a. alba* (Scop.).

E. Chingford, one on 4th May (F.J.J.).
H. Essendon, one on 2nd October (J.D.D.).
K. Bickley, one calling on 22nd November (M.M.H.).
M. Bushy Park, one on 8th December (J.E.R.). On 21st September the Zoological Gardens received a bird from the E.C.4 district (D.S.S.).
S. On 19th September a bird was received as above from the S.W.17 district (D.S.S.). Banstead, bred in a dead oak (J.E.R.). Ashtead, seen on several occasions.

Peregrine Falcon. *Falco p. peregrinus* Tunst.

M. Littleton Res., four on 8th July (W.E.G., *B.B.*, xxxi, pp. 297-8). Staines Res., one flying south-west on 25th August (C.W.G.P.).

Hobby. *Falco s. subbuteo* L.

H. Hatfield, one on 1st July (H.M.R.K.).

Common Buzzard. *Buteo b. buteo* (L.).

E. Chingford, one on 27th March (W.A.W.).

M. Westminster, one soaring overhead on 11th June (M. Milne-Watson, per E.M.N.). These two records are believed to have been referable to this species.
S. One seen wheeling over Brasted Chart on 20th June (G.E.M.).

Sparrow Hawk. *Accipiter n. nisus* (L.).

K. Hayes, four pairs nested. About 17 on keeper's gibbet during the year (G.E.M.). Fawkham, six on keeper's gibbet on 13th June (A.C.).
M. Resident in Bushy Park (J.E.R.) and at Ruislip (W.R.P.).
S. Richmond Park, at least one pair resident, two young seen on 20th June (C.L.C.). Wimbledon Common, one on 20th May (H.M.R.K.). Headley, nest with three young and two eggs on 19th June (J.S.W.). Battersea Park, a female seen to take a sparrow on 29th May (G.H.).

Other records outside the breeding season are not included.

Common Heron. *Ardea c. cinerea* L.

E. Fifty-one nests were occupied at Walthamstow Res. (R.W.P.) and 17 at Wanstead Park (per W. B. Alexander), as compared with 55 and 11 respectively in 1936.
S. Hersham, eight nests occupied, a decrease of six from 1936 (per W. B. Alexander). Richmond Park, 49 nests occupied, all in Spanish chestnuts; this is an increase of five over 1936 (C.L.C.).

The total for these four colonies was thus 125 occupied nests compared with 124 in 1936.

Brent Goose. *Branta bernicla* (? subspecies).

E. Walthamstow Res., two were definitely identified on 26th June by E.M. and R.W.P. Although these birds were very wild, the date suggests that they may have been "escapes."

Sheld-Duck. *Tadorna tadorna* (L.).

E. King George V Res., two on 28th January (A.R.S.).
M. Ruislip Res., one on 27th December (W.R.P., C.A.W.). Staines Res., seven on 24th April (C.A.W.) and on 4th and eight on 14th May (A.H.M., see also *B.B.*, xxxi, p. 298); two on 18th December (A.H.M.). One was again seen throughout the year.
S. Barn Elms Res., two on 29th May (G.C.L.). Brooklands Sewage Farm, four on 22nd May (E.M.C.). Molesey Res., a pair on 27th March and one on the 4th December (P.W.E.C.).

Gadwell. *Anas strepera* L.

S. Barn Elms Res., up to six seen on various dates (many observers). Lonsdale Road Res., one on 12th and 19th June (O.H.). One to three seen on various dates between 6th February and 15th April in Beddington district (P.W.E.C., R.S.R.F.). Godstone, a drake on 9th May (P.M.B.).

These records do not necessarily refer to wild birds (see *L.B.R.*, 1936, p. 12).

Teal. *Anas c. crecca* L.

M. Ruislip Res., a brood on 5th May (G.H.), and on 2nd and 8th July (C.A.W.).

S. Island Barn Res., Molesey, about 300 on 27th March, about 200 on 16th October, 79 on 6th and 98 on 13th November, 77 on 4th and 360 on 18th December (P.W.E.C.). On the latter date there were about 215 at Staines Res. (A.H.M.). See separate report on duck census.

Garganey. *Anas querquedula* L.

S. Barn Elms Res., two from 31st July to 4th August (E.G.P.). Brooklands sewage farm, two on 15th (D.A.T.M.) and one on 22nd August (R.S.R.F.).

Pintail. *Anas a. acuta* L.

E. King George V Res., four on 6th and five on 13th February (W.A.W.).

M. Littleton Res., a male and a female on 30th April (W.E.G., *B.B.*, xxxi, p. 298).

S. Richmond Park, a drake on the Penn Ponds from 14th to 18th April (R.E.B., E.G.P., and others); a drake and five ducks, all very wild, on 5th November (W.L.C.).

Shoveler. *Spatula clypeata* (L.).

E. Hainault, a duck on 28th November (J.H.G.P.). Sewardstone, two on 1st May and one on 21st August (W.A.W.).

H. Elstree Res., a pair on 6th February (J.D.D.).

M. Littleton Res., 30-40 on 30th September (W.E.G., *B.B.*, xxxi, p. 298). Staines Res., maximum winter 1936-7 was 30 on 7th March (G.C.L.), 23 still present on 17th April (C.A.W.), and last seen on 6th June (G.C.L.). Numbers were high in early October, 30 on the 7th (G.D.E.) and again in mid-December, there being about 35 on the 18th (A.H.M.).

S. Barn Elms Res., one on 29th November (E.G.P.). Beddington, a drake was seen on one or other of the ponds from 20th April (P.W.R.). to 30th May (G.B.), and a duck also was seen on 23rd April (R.S.R.F.). Brooklands sewage farm, a pair on 6th April (E.G.P.) and two on 5th June (E.M.C.). Island Barn Res., Molesey, a pair on 27th March, and twenty (13 ♂ 7 ♀) on 16th October rising to 88 (51 ♂ 37 ♀) on 6th November. By the 13th only five remained and on 18th December there were none (P.W.E.C.). A flock of the size seen on 6th November is very exceptional in the London area.

Common Pochard. *Nyroca f. ferina* (L.).

There is nothing exceptional to record regarding this species, there being no evidence of breeding in 1937 nor were any unusually large flocks reported. Numbers on 18th December will be found in the report on the census on that date.

TUFTED DUCK. *Nyroca fuligula* (L.).

B. Colnbrook, two pairs on Boyer's Pits during the breeding season (C.E.L.).

E. Hackney, two pairs bred in Victoria Park (J.H.G.P.). Walthamstow Res., three broods seen on 7th July (W.A.W.). Wanstead, one pair bred on Eagle Pond (A.B.H.).

K. Swanscombe, five on a flooded clay-reserve (A.C.).

M. Hampton Court, one pair bred for the first time (J.E.R.).

S. Barn Elms Res., a duck and six young on 19th August (C.A.W.). Beddington, at least four pairs bred (P.W.R.). Molesey Res., three females with broods and one on nest with ten eggs on 3rd July (P.A.D.H.). About 615 on 2nd (P.A.D.H.) and 748 (533 ♂ 215 ♀) on 30th October rising to a maximum of 864 (654 ♂ 210 ♀) on 13th November. A week previously there had been 618 (413 ♂ 205 ♀) so that the increase consisted almost entirely of drakes (P.W.E.C.). Richmond Park, six or seven pairs nested (C.L.C.).

SCAUP-DUCK. *Nyroca m. marila* (L.).

M. Hampton Res., two immature birds on 18th December (E.H.G.). Kensington Gardens, a duck on the Round Pond on 22nd March (G.C.L.). Staines Res., two on 10th (G.C.L., A.H.M.) and one on 17th January (R.E.B., R.C.H., D.A.T.M.), a female on 10th February (R.E.B.), one on 7th (G.C.L.), three to four from 12th to 28th March (E.H.G., W.E.G., G.C.L.) and one until 4th April (A.H.M.); a female from 16th October (A.H.M., D.A.T.M.) to the end of the year (various observers), and also two males on 28th November (G.C.L.). See also *B.B.*, xxxi, p. 298.

S. Barn Elms Res., a female on 6th February and a drake on 13th March (G.C.L.).

GOLDENEYE. *Bucephala c. clangula* (L.).

E. Lea Valley, from one to four recorded at King George V and Walthamstow Res., on several occasions. A male stayed on Lockwood until 8th May (E.T.N., H.A.P.).

H. Rickmansworth, a young male on Stockers Lake on 11th December (G.K.McC.).

M. Staines Res., maximum 15 on 21st February (G.C.L.).

S. Island Barn Res., one to four from 13th November onwards (D.A.T.M., P.W.E.C.). Molesey Res., seven males on 2nd February, seven males and three females on 27th March, one on 6th November rising to eleven (2 ♂ 9 ♀) on 4th and 18th December (P.W.E.C.). Mitcham junction gravel-pits, an immature male from 30th January (R.S.R.F.) to 7th March (R.C.H.).

LONG-TAILED DUCK. *Clangula hyemalis* (L.).

M. Staines Res., one until 6th April; one on 25th, two on 26th, and three on 28th September, and one to three reported from then to the end of the year (G.C.L., A.H.M., and others; see also *B.B.*, xxxi, p. 298).

Common Scoter. *Oidemia n. nigra* (L.).

M. Ruislip Res., a pair on 17th April after a westerly gale (G.H.). Staines Res., one on 29th March (G.C.L.), a male on 10th May (A.H.M.), seven on 18th July (A.H.M., D.A.T.M., see also W.E.G., *B.B.*, xxxi, p. 298), eight immature on 7th and seven on 8th November (G.C.L., A.H.M., W.E.G., *op. cit.*).

S. Barn Elms Res., a duck on 3rd and 27th July (E.G.P.). Beddington sewage farm, a duck on 4th and 5th April (G.B., P.W.R.).

Velvet-Scoter. *Oidemia f. fusca* (L.).

M. Staines Res., a duck on 18th April (W.E.G., *B.B.*, xxxi, p. 298).

Goosander. *Mergus m. merganser* L.

B. Langley Park Lake, eleven red-headed birds on 10th January. Rowley Pond, four flying over on same date (O.H.).

E. Connaught Water, one on 31st January (W.A.W.) and four on 18th and 19th February (F.J.J.). King George V Res., from one to six on various dates up to 3rd April, and one to four in December (A.R.S., W.A.W.). Walthamstow Res., seven to eight from 9th to 16th (E.M., H.A.P., W.A.W.), 17 on 24th January, and 18 on 6th February (H.A.P.).

M. Littleton Res., six on 29th March. Sunbury, seven on 7th March (P.A.D.H.). Staines Res., about 40-60 up to 13th February, except on the 6th, when C.A.W. counted 150 close to the causeway in the late afternoon; on 14th February there were 84 (C.A.W.), and on 23rd February and 7th March there were 87, falling to six on 18th April after which none until 30th May when a single bird was seen (G.C.L., A.H.M.); two on 12th November (A.H.M.) rising slowly to 27 on 4th December (C.A.W.) followed by a sharp rise to 88 on 15th and 129 on 18th (A.H.M.) and on 25th December (C.A.W.).

S. Barn Elms Res., one on various dates up to 13th March, but two on 31st January, and one again on 5th June (G.C.L.). Island Barn Res., 39 on 27th March (P.W.E.C.), 15 on 20th November (D.A.T.M.), falling to two on 18th December (P.W.E.C.). Molesey Res., 36 on 11th January and 42 on 6th February (P.A.D.H.), 8 on 27th March, 6 on 27th November, 27 on 4th and 101 on 18th December (P.W.E.C.).

Red-breasted Merganser. *Mergus serrator* L.

M. Staines Res., one from 31st January to 16th February (A.H.M., and others, see also *B.B.*, xxx, p. 323). Sunbury Res., one on 4th March (P.A.D.H., *B.B.*, xxx, p. 374).

Smew. *Mergus albellus* L.

E. Walthamstow Res., 14 on 9th January, last seen 13th March (W.A.W., and others); three on 18th December (E.T.N.).

M. Hampton Res., 16 on 13th February and 6 on 8th December (P.A.D.H.). Stoke Newington Res., 9 red-headed birds on 18th December (R.S.R.F.).

S. Barn Elms Res., one to five up to 23rd March (various observers). Lonsdale Road, maximum 14 on 26th February (A.H.M.), last seen 15th March when there were 10 (J.H.G.P.). Island Barn Res., two on 20th November (D.A.T.M.). Molesey Res., 40 on 10th January (P.A.D.H.), two on 19th (W.E.G.) and four on 27th November, 10 on 4th and 32, including ten adult drakes, on 18th December (P.W.E.C.).

Shag. *Phalacrocorax a. aristotelis* (L.).

H. One ringed on the Bass Rock on 4th July 1936 was recovered at Rickmansworth on 12th December 1936 (*B.B.*, xxx, p. 309).

M. Bow Street, one was received at the Zoological Gardens on 13th February from this district (D.S.S.). Hampton Res., one on 21st and 23rd February (P.A.D.H., *B.B.*, xxx, p. 374). Serpentine, one on 17th February (W. B. Alexander, *op. cit.*), and on 17th December (E.G.P., *B.B.*, xxxi, p. 310).

M./S. R. Thames, one by Hammersmith Bridge on 14th February (C.W.G.P.). Mortlake, three on 24th March (W.E.G., *B.B.*, xxx, pp. 373-4). One to three birds were seen on many dates from 7th April to 28th June at Barnes Railway Bridge (G.C.L., A.H.M., E.G.P., see also *B.B.*, xxxi, p. 28).

S. Balham, one was received at the Zoological Gardens on 15th February from this district (D.S.S.). Molesey Res., one was caught and ringed on 23rd January (P.A.D.H.).

In view of the number of records of Grebes and Divers which have appeared in *British Birds* the references have not been given separately, but can be found in vol. 30, pp. 323-4 and 372-4.

Great-crested Grebe. *Podiceps c. cristatus* (L).

B. Colnbrook, two pairs on Boyer's Pits but no young seen (C.E.L.).

E. Eagle Pond, Wanstead, one pair reared three young (S.A., J.H.G.P.). Sewardstone gravel pit, three pairs bred (P.H.J.).

H. Northam, a pair on Nyn Park lake on 10th April (R.S.R.F.). Hamper Mill, six nests seen; on 8th August there were 15 young birds (G.H.). Rickmansworth, two half-grown young and also an adult on nest at Stockers Lake on 20th July (R.E.B.).

M. Elstree Res., one pair bred (H.M.R.K.). Ruislip Res., several pairs in breeding season, but only two nests seen and no young reared (W.R.P., C.A.W.). Staines Res., maximum up to end of May was 35, increasing steadily to 260 on 5th September, then falling to 165 on 28th September, and numbers varying between 75 and this figure to the end of the year (G.C.L., A.H.M.).

S. Barn Elms Res., maximum 60 on 10th October (A.H.M.). Beddington, four pairs in breeding season (L.P., P.W.R.). Gatton Park Lake, three on 3rd June (H.B.). Island Barn Res., maximum 35 on 30th October (P.W.E.C.). Mitcham Junction gravel-pit, a nest with 3 or 4 eggs on 17th April was subsequently robbed (R.S.R.F.), but adults were feeding young on 25th July (G.B.). Molesey Res., maximum 257 on 13th November (P.W.E.C.). Richmond Park, two

pairs nested (C.L.C.). Wimbledon Park, two pairs, one with nest, on 9th May (O.H.).

Slavonian Grebe. *Podiceps auritus* (L.).

E. Walthamstow Res., two on 13th February (H.A.P.) and 6th and one on 20th March (E.T.N.). King George V Res., one on 10th February, and one in summer plumage on 16th April (A.R.S.); one on 13th November (W.A.W.).

M. Hyde Park and Kensington Gardens, one on 1st (G.C.L., E.G.P.) was last seen on 6th February by many observers. Sunbury Res., one on 21st February (P.A.D.H.).

S. Mitcham Junction gravel-pits, two were first seen on 31st January (L.P.), on the 6th February there were four (P.W.E.C.), and this number was last seen by E.H.G. on 4th March; on the 7th there were two, one remaining until 26th March. These birds were seen by many observers.

Red-necked Grebe. *Podiceps g. griseigena* (Bodd.).

E. Walthamstow Res., one from 2nd January to 20th February (R.W.P., E.T.N., H.A.P., and others), two on 6th March (H.A.P.) and on 18th December (R.W.P.). King George V Res., one on 6th and two on 13th February and 6th March (W.A.W.).

M. Kensington Gardens, one on Round Pond from 31st January to 10th February (G.C.L., and others).

S. Barn Elms Res., one first seen on 31st January (G.C.L.) remained until 13th February. Wimbledon Park Lake, one on 10th March (E.H.G.).

Black-necked Grebe. *Podiceps n. nigricollis* Brehm.

E. King George V Res., one on 8th and 22nd March, and on 8th November (A.R.S.). With regard to the record of *nigricollis* on 8th November and to that of *auritus* on the 13th in view of the closeness of the dates it should be stated that satisfactory descriptions have been received in each case (Ed.). Walthamstow Res., one from 2nd January to 14th February (E.M., E.T.N., H.A.P., W.A.W.) and on 28th November (E.T.N.).

M. Littleton Res., one on 19th and 29th January (W.E.G., *B.B.*, xxxi, p. 300). Ruislip Res., one from 6th to 20th February (G.H., W.R.P.). Staines Res., one from 31st January to 11th April (A.H.M., and others); on 14th February there were two present (J.E.R.). One from 2nd to 21st November (G.C.L., A.H.M., and others. See also *op. cit.*).

S. Barn Elms Res., one on 16th December was gone the next day (E.G.P.).

Great Northern Diver. *Colymbus immer* Brünn.

E. Walthamstow Res., one on 23rd January (E.H.G.) and from 6th to 20th February (E.T.N., H.A.P., and others).

S. Barn Elms Res., one first seen on 15th December 1936 (*L.B.R.*, 1936, p. 16) remained until the 28th February (many observers).

Black-throated Diver. *Colymbus a. arcticus* L.

E. Walthamstow Res., one from 6th to 20th February (E.T.N., H.A.P., and others). This bird and the Great Northern Diver mentioned above were seen swimming together on several occasions.

M. Hampton Res., one on 12th March (P.A.D.H.). Staines Res., one on 31st January (R.S.R.F., A.H.M.) and on 14th February (A.H.M.).

S. Many notes relating to this species have been received from Lonsdale Road Res. and the River Thames, and it is difficult to say positively how many birds were seen. There was one at Barn Elms on 31st January and 6th February (G.C.L.), at Lonsdale Road on various dates from 1st February (A.H.M.) up to 24th March, and on the Thames from 6th February to 5th June by which time G.C.L. records that it was in full summer plumage. While doubtless the bird(s) moved at times from one locality to the other, it is certain from the detailed notes that there were at least two of this species. Molesey Res., two from 2nd to 21st February (P.A.D.H.).

Red-throated Diver. *Colymbus stellatus* Pontopp.

E. King George V. Res., one on 20th December (A.R.S.). Sewardstone gravel-pit, one in winter plumage on 9th May (W.A.W.). Walthamstow Res., one seen on 2nd and 3rd was found shot on 24th January (E.T.N., H.A.P., see also *L.B.R.*, 1936, p. 16).

M. Littleton Res., a dead bird was found on 1st February (W.E.G.).

Stock Dove. *Columba aenas* L.

M. Staines, large numbers frequented the site of the new reservoir in autumn, the flock being estimated at about 300 on 10th October (R.C.H.).

Stone Curlew. *Burhinus oe. oedicnemus* (L.).

S. For the third year in succession one was seen in Richmond Park in April, on this occasion by F.R.M. on the 11th. Roehampton, one flew over calling at 11 p.m. on 9th April (J.E.R.).

Oyster-catcher. *Haematopus ostralegus occidentalis* Neumann.

M. Staines Res., one on 26th (E.H.G.) and 27th February (A.H.M.).

Ringed Plover. *Charadrius h. hiaticula* L.

M. Brent Res., seen on various dates from 19th August to 5th September, maximum six on 29th August (W.D.M.). Staines Res., one on 5th and 18th (A.H.M.), five on 29th August (G.C.L.), and four on 2nd September (A.H.M.).

S. Barn Elms Res., 9 on 12th July (W.R.P.) and one on 5th August (C.A.W.). Beddington Sewage Farm, three on 16th and 19th August (P.W.R.). Brooklands Sewage Farm, about 12 on 9th (E.G.P.) and four on 22nd May (E.M.C.); one to two on various dates from 15th August to 4th September (R.C.H., R.S.R.F., D.A.T.M., C.A.W.) and 5 on 11th September (C.A.W.). Island Barn Sewage Farm, two on 27th March (P.W.E.C.).

Golden Plover. *Charadrius apricarius* (? subspecies).

E. North Weald aerodrome, 17 on 28th November (R.C.H., R.S.R.F.). Sewardstone, a large party on 17th January and 20 on 6th November (W.A.W.). Stanford Rivers, about 80 on 27th March (R.McK.S.).

H. Hatfield aerodrome, 25 on 29th October (R.McK.S.). Shenley, a flock of over 500 on 3rd January (J.D.D.). Waltham Marsh, a flock on 9th January, three on 6th March and seen from 13th November onwards (A.R.S.).

M. Northolt aerodrome, 60-70 on 9th March (R.McK.S.). Staines Moor, about 150 on 10th February (G.W.C.) and on 13th March (R.C.H., D.A.T.M.) and 70-80 on 20th March (D.A.T.M.). Staines Res., 15 flew over on 28th February (G.C.L., see also *B.B.*, xxxi, p. 300), two on 20th May and one on 3rd October (A.H.M.).

S. Beddington sewage farm, eight on 10th (H.B., L.P.) and one on 17th January, and two on 18th December (L.P.).

Turnstone. *Arenaria i. interpres* (L.).

M. Brent Res., two on 8th August (W.D.M.).

S. Barn Elms Res., one on 4th May (R. C. B. Ledlie, *B.B.*, xxx, p. 28).

Ruff. *Philomachus pugnax* (L.).

M. Brent Res., one from 29th September to 29th October (W.E.G., *B.B.*, xxxi, p. 300).

S. Brooklands sewage farm, one on 27th March and 6th April (E.G.P.), one on 18th July (R.C.H.), 15th August (D.A.T.M.) and 2nd October (E.G.P., C.A.W.). Island Barn sewage farm, two on 16th October (P.W.E.C.).

Dunlin. *Calidris alpina* (? subspecies).

E. King George V Res., one on 24th April (W.A.W.).

K. Swanscombe marshes, one on 4th December (A.C.).

M. Brent Res., four on 19th August (R.C.H., W.D.M.). Staines Res., one flew over on 23rd May (G.C.L.), one on 17th and 20th July, five on 24th August (A.H.M.) and one on 16th October (D.A.T.M.).

S. Barn Elms Res., one on 10th April (D.A.T.M.), on 17th (A.H.M.) and 27th July (E.G.P.), three on 2nd September (G.B., E.G.P.), and one on 6th October (G.B.). Beddington sewage farm, one on 16th August (P.W.R.). Brooklands sewage farm, three on 27th March and about 30 on 30th May (E.G.P.), two on 11th but none on 18th July (R.C.H.), two on 15th (D.A.T.M.), 21st and 22nd August (R.S.R.F., R.C.H.), eight on 11th September (C.A.W.). Island Barn sewage farm, one on 27th March (P.W.E.C.).

Wood-Sandpiper. *Tringa glareola* L.

S. Brooklands sewage farm, one on 15th August (D.A.T.M.).

Green Sandpiper. *Tringa ochropus* L.

B. One heard south of Thorney on 14th November (R.C.H.).

E. Abridge, one on 31st January (R.McK.S.). Chigwell, one to three from 18th October 1936 (*L.B.R.*, 1936, p. 18) seen regularly up to 4th April, and one from 24th October to the end of the year (R.McK.S., W.A.W.). Sewardstone, one on 24th April and 30th October (W.A.W.). Walthamstow Res., one on 1st and 27th March, and on 3rd (H.A.P.) and 17th April (R.W.P.); one to three seen on various dates from 28th August to the end of the year (E.T.N., A.R.S.).
H. Hamper Mill, two on 8th and four or five on 22nd August (G.H.). Watford sewage farm, one on 21st August (W.D.M.).
M. Ruislip Res., three on 31st July, and one on 11th and 18th August (W.R.P.). Staines Res., two on 17th October (G.C.L., A.H.M.).
S. Barn Elms Res., one on 4th August (W.R.P.). Beddington and Mitcham, one on 20th (G.B.) and 21st March (W.W.T.), 10th April (L.P.) and 19th August (P.W.R.). Brooklands sewage farm, one on 18th (R.C.H.) and 25th July, 15th and 28th August (D.A.T.M.) and 4th September (C.A.W.). Oxted, one on 8th August (G.W.C.).

Spotted Redshank. *Tringa erythropus* (Pall.).

S. Brooklands sewage farm, two in summer plumage on 8th May (E.M.C.).

Greenshank. *Tringa nebularia* (Gunn.).

E. King George V Res., one on 31st July. Sewardstone, one on 21st August (W.A.W.).
H. Watford sewage farm, three on 31st July (W.D.M.).
M. Staines Res., one flew over on 16th May (W.E.G., *B.B.*, xxxi, p. 300), one on 12th and 19th September. Staines Moor, one on 12th September (G.C.L., W.E.G., *op. cit.*).
S. Brooklands sewage farm, one on 21st (R.C.H.), three on 22nd (R.S.R.F.), five on 25th (R.C.H.) and seven on 28th August (L.P., C.A.W.) and 4th September (R.C.H., C.A.W.), one on 17th, 19th (E.G.P.), 21st and 23rd September (C.A.W.). Richmond Park, four flew over calling on 1st August (M.H.B.).

Black-tailed Godwit. *Limosa l. limosa* (L.).

M. Brent Res., one on 18th and 20th September (W.D.M.).
S. Brooklands sewage farm, four on 15th August (D.A.T.M.).

Common Curlew. *Numenius a. arquata* (L.).

E. King George V Res., one flew over on 6th April (F.J.J.).
K. Bickley, heard flying over at midnight on 23rd June (M.M.H.).
M. Crouch End, flying over at 9.30 p.m. on 30th July (R.McK.S.). Littleton Res., one on 23rd April and three on 16th July (W.E.G., *B.B.*, xxxi, p. 300). Staines Res., one on 4th (G.C.L., A.H.M.) and two on 18th July (A.H.M., D.A.T.M., see also *op. cit.*).
S. Barn Elms Res., three flying over on 24th September (E.G.P.). Cheam, one flying over at 11.10 p.m. on 23rd June (P.W.E.C.). Fetcham, one flying north on 11th April (H.J.B.). Tadworth, one

flying west on 29th June. Walton Heath, two going north on 18th April (H.B.). Worcester Park, heard at midnight, 27th July (F.W.B.).

WHIMBREL. *Numenius p. phoeopus* (L.).

S. Beddington sewage farm, one on 9th September (P.W.R.).

JACK SNIPE. *Lymnocryptes minimus* (Brünn.).

E. Abridge, one on 31st January (R.McK.S.). Chigwell sewage farm, one to four up to 4th April, one on 17th October and on 12th and 26th December (R.McK.S., W.A.W.). Walthamstow Res., one on 18th December (J.H.G.P.).

K. Elmers End sewage farm, one to three from end of January to 14th March; three on 14th November and one or two during December (G.E.M.).

M. Ruislip Res., one on 12th March (W.R.P.), and first autumn bird on 18th September, an early date (G.H.). Staines Moor, two on 26th September (G.C.L.), one on 10th (R.C.H.), three on 17th October (A.H.M.), and one on 5th December (D.A.T.M.).

S. Beddington sewage farm, ten on 20th March (P.W.R.) and five on 10th April (G.E.M.). Brooklands sewage farm, one on 27th November (E.G.P.). Cuddington, one flushed from a rough field on 2nd October (P.W.E.C.). Epsom Common, one flushed from short bracken on 16th October (R.C.H.). Walton Heath, one on 11th April (P.W.E.C.).

WOODCOCK. *Scolopax r. rusticola* L.

E. Epping Forest, one on 21st March (R.E.B.), on 2nd (F.J.J.) and 14th November (R.W.R.), and on 10th December (F.J.J.).

K. Hayes, one shot on 2nd January and three on 24th February (G.E.M.). Keston, on 27th December (G.D.E.).

M. Bushy Park, seen up to 4th May (J.E.R.).

S. Epsom, one reported shot by a keeper on 20th November (R.C.H.). Mickleham, one on 14th November (P.W.E.C.). Richmond Park, present throughout winter months; three were found dead in March in fresh condition, cause of death being unknown (C.L.C.).

BLACK TERN. *Chlidonias n. niger* (L.).

E. King George V Res., one mobbed by Sand-Martins on 31st July. Sewardstone, two on 9th May (W.A.W.). Walthamstow Res., two immature birds on 19th September (O.H.).

H. Cheshunt Marsh lake, one on 3rd May (A.R.S.).

M. Littleton Res., three on 25th April and one on 21st May (W.E.G., *B.B.*, xxxi, p. 300). Ruislip Res., three on 7th August (W.R.P.). Staines Res., three on 25th April, one on 2nd May, 5th August, and 2nd September (A.H.M.) and two on 26th (G.C.L., A.H.M.). See also W.E.G., *op. cit.*

S. Mitcham junction gravel-pit, eight on 26th April (Dr G. W. Lloyd, *Field*, 22/5/37).

SANDWICH TERN. *Sterna s. sandvicensis* Lath.

E. Sewardstone, four on 9th May (W.A.W.).

M. R. Thames, Limehouse, three off Dundee Wharf on 11th September (C.W.G.P.). Staines Res., one on 29th August (G.C.L.), two on 8th, one on 9th (A.H.M.) and one on 10th October (G.C.L., A.H.M., D.A.T.M.).

M./S. Hammersmith, two on 5th October (E.G.P., see also *B.B.*, xxxi, p. 198).

COMMON TERN. *Sterna h. hirundo* L.

E. King George V Res., two seen on 11th and one found dead on 25th September (W.A.W.).

M. Staines Res., one on 14th May, and 20th August (A.H.M.), and 11th September (D.A.T.M.), three on 12th September (G.C.L.), one on 9th and two on 10th October (A.H.M.).

S. Brooklands sewage farm, one on 17th April (R.S.R.F., C.W.G.P.).

ARCTIC TERN. *Sterna macrura* Naumann.

M. Staines Res., one on 10th October (R.C.H., G.C.L., D.A.T.M., see also W.E.G., *B.B.*, xxxi, p. 300).

LITTLE TERN. *Sterna a. albifrons* Pall.

M. Littleton Res., one on 21st May (W.E.G., *op. cit.*).

LITTLE GULL. *Larus minutus* Pall.

M. Littleton Res., one on 29th January and on 1st February (W.E.G., *op. cit.*).

S. Barn Elms Res., one on 1st November (E.G.P., see also *B.B.*, xxxi, p. 328).

SCANDINAVIAN LESSER BLACK-BACKED GULL. *Larus f. fuscus* L.

M. Kensington Gardens, one on Round Pond on 5th and 15th March (G.C.L.). River Thames, Hammersmith, several on 21st and 25th August, seven on 6th October (A.H.M.), one on 23rd (W.R.P.) and 25th November. Staines Res., one on 28th July and two on 8th August (A.H.M.).

S. Barn Elms Res., two on 20th and twelve on 23rd August, 13 on 22nd September (W.R.P.). Richmond Park, one on 13th March (G.C.L.).

GREAT BLACK-BACKED GULL. *Larus marinus* L.

M. Brent Res., two on 30th September (J.D.D.). Hampton Res., two on 2nd March (P.A.D.H.). R. Thames, Chiswick, one on 30th December (W.R.P.). Hammersmith, three on 24th December (A.H.M.). Ruislip Res., one on 6th March (G.M.). Staines Res., two on 21st March (G.C.L., W.E.G., *B.B.*, xxxi, p. 301), and an adult on 7th November (W.E.G., *op. cit.*).

S. Barn Elms Res., and R. Thames, one to three on various dates in January, February, November, and December (several observers). During March one or two were seen at Lonsdale Road (W.R.P.).

Kew Gardens, one on 29th December (W.R.P.). Molesey Res., two on 16th and one on 24th January, and three on 6th February (P.A.D.H.).

KITTIWAKE. *Rissa t. tridactyla* (L.).

M. Staines Moor, one found dead on 21st February (G.C.L.). Staines Res., one on 7th (G.C.L., D.A.T.M.) and on 28th February (G.C.L., see also W.E.G., *B.B.*, xxx, p. 374).

S. Richmond Park, an immature bird on 28th February (D.A.R.).

LONG-TAILED SKUA. *Stercorarius longicaudus* Vieill.

H. A female was picked up dead at Easneye, near Ware, at the end of September, and was identified at the Natural History Museum (R. Buxton, *Field*, 4/12/37). It is uncertain whether the actual locality is inside or outside the Society's area, Easneye being near the boundary.

BRITISH RAZORBILL. *Alca torda britannica* Ticehurst.

E. King George V Res., one found dead on 6th February (W.A.W.). Knighton Wood, one is reported in *B.B.*, xxxi, p. 275, to have been seen on the lake in this wood by Mr F. C. Bromley on 18th September. As the lake is a small one surrounded by trees it is unfortunate that further particulars are not available.

SOUTHERN PUFFIN. *Fratercula arctica graboe* (Brehm).

K. One was received at the Zoological Gardens on 2nd December from Erith (D.S.S.).

M. One was received at the Zoological Gardens from the Thames Embankment on 21st November (D.S.S.).

LAND RAIL. *Crex crex* (L.).

H. Hamper Mill, one on 22nd August (G.H.).

WATER-RAIL. *Rallus a. aquaticus* L.

E. Chigwell Sewage Farm, one on 3rd January and on 12th and 26th December (R.McK.S.). Walthamstow Res., one on 17th April (R.W.P.).

M. Houses of Parliament, one was found in a coal-bunker in December 1936 (*B.B.*, xxx, p. 368).

S. Beddington, one on 8th January (W.W.T.) and on 21st March (L.P.). Mitcham, two at Watermeads on 20th March, and at the gravel-pits one on 16th October and 7th November and two on 11th December (G.B.).

RED-LEGGED PARTRIDGE. *Alectoris r. rufa* (L.).

E. Upshire, two on 28th January (F.J.J.).

H. Bayford, three on 2nd February. Waltham Abbey, seven at Galley Hill on 4th September and 18th December (A.R.S.).

K. Hayes, one, and possibly three, pairs nested (G.E.M.).

M. Enfield Lock, two on 1st May (A.R.S.). Staines, two pairs in fields east of reservoir on 30th May (G.C.L.).
S. Selsdon, one on 16th June (G.E.M.).

ERRATUM.

Black Redstart.
L.B.R., 1936, p. 10. Littleton Res., a female on 6th November should be 6th November 1935. South Kensington, a female on 9th May should be on 19th May.

Special Species for 1937.

The reports on the special species for 1937 are based on the Society's records and the publications listed on page 22 of the *London Bird Report* for 1936. To No. 18 should be added the 1936 edition of the *South-Eastern Bird Report*. References to counties refer only to those parts which lie within our area (see map in 1936 Report).

Magpie. *Pica p. pica* L.

The Magpie is resident in the rural parts of the London area, and is hardly ever seen in partly or wholly built-up districts. It favours wooded country, parklands and well-timbered commons and downland. Presence of trees and absence of man seem to be the controlling factors of Magpie population.

Magpies have been reported occasionally from the Central Parks and from Richmond Park, are resident in Ken Wood, and breed in Bushy Park. The only other recent record from suburban London appears to be of one seen feeding on monkey-nuts in a garden at Blackheath on April 4, 1937. Since Magpies sometimes escape from captivity, it is always difficult to say whether birds seen in Inner London are really wild. It seems likely that most of those which turn up in the Central Parks are escaped birds, and it is possible that one or both of the pair resident in Ken Wood were also escapes.

Records from the Essex and Kent parts of the area are few, probably owing to lack of observers, but the following seems to be the present inner limit of the Magpie's distribution round London: Woodford Bridge, Buckhurst Hill, Epping Forest, Theobalds Park, Mill Hill, Edgwarebury, Ruislip, West Drayton, Feltham, Bushy Park, Richmond Park, Malden, Sutton, Carshalton, Selsdon, Addington.

Within this ring it is doubtful if more than a very few pairs now breed, but along and outside it Magpies appear to occur and breed fairly frequently in suitable places. The Magpie is such a noticeable bird that the presence of one or two pairs in a district, frequently seen, may easily give the impression that it is common, and this probably accounts for some of the conflicting statements that have been made about its status in various parts of the area. Around North Weald and

Epping Upland, where about eight were seen on a ten-mile walk in November 1937, it is probably as common as anywhere in the area.

Glegg, in *Birds of Middlesex*, considered that in 1934 the Magpie was common in Middlesex south of the Grand Junction Canal, and uncommon and local north of it. The favourable factors in South Middlesex, where at least thirty pairs nested in 1931, were the orchards between Hounslow and Staines and the high hedges near the Thames at Shepperton. Even in the south Magpies probably did not nest east of the R. Crane in 1934.

One factor in favour of the Magpie round London is the decrease of game-preserving, especially pheasant-rearing, but as housing development is gradually pushing it further out, these two factors probably just cancel each other out as far as the total population is concerned.

Flocks of Magpies larger than five or six are very rarely observed round London, and one of ten at Harefield in 1926-7 seems to be the largest on record.

R. S. R. F.

Red-Backed Shrike. *Lanius c. collurio* L.

Information on the breeding of this species north of the Thames is too scanty for a summary to be of much value. It continues to hold its own on the open spaces in Epping Forest, two or three pairs breeding on Fairmead in 1937. Records from the Lea Valley and east of the forest are few, but breeding has been noted in several widely separated localities, and it seems probable that it is well distributed in small numbers.

Breeding records from the Hertfordshire portion of the area are few and far between, but again this is almost certainly due to a lack of observation. Definite localities within the last few years include: Broxbourne, Bushey, Cheshunt, Chorleywood, Park Street, Rickmansworth, Totteridge and Watford.

Information for Middlesex is a little more satisfactory. Eleven pairs were located in 1937 in an area of roughly 10 square miles lying between Harefield, Northwood, Ruislip and Denham. Other breeding records show that while the species tends to recede before the advance of the builder, it persists wherever open country remains.

The species breeds on practically all the Surrey commons and along the North Downs, records of nesting being too numerous to specify. Most of the nests are in hawthorns, and wherever isolated bushes occur on commonland, a few pairs are usually present. Five pairs bred in 1937 on or near Mitcham Common, and sixteen young were reared. Other localities near London are Ham Common and Wimbledon Common.

Nesting in Kent has been reported from Biggin Hill, Hayes and Beckenham, while the species was seen at Eynsford in June. At Fawkham one was shot by a keeper as vermin.

The only conclusion to be drawn from this information is that the species is fairly well distributed throughout the area in the breeding

season. There is little evidence of passage migration with the exception of a "rush" of about twenty-four at Sutton on 20th May 1933.

R. C. H.

Coot. *Fulica a. atra* L.

This species is common throughout the area wherever there are sheets of water of sufficient size. It breeds freely on lakes and gravel-pits, but is not common on running water. There would appear to be heavy mortality among the young, although adequate information is lacking on this point. In two localities it is believed to suffer persecution from water-cress growers. It is worth noting that at Elstree reservoir a small flock of non-breeding birds has been observed to stay throughout the summer, and more data on this subject would be valuable.

Considerable interest attaches to the migrations of the Coot, for in the autumn large flocks appear on many waters, and there is no doubt that their numbers are far greater than that of the local breeding population. Immigration starts as early as July, and may continue steadily up to December. In some cases the peak is reached in October, this being specially noticeable in some of the series of counts from Barn Elms, Fetcham and Molesey.

In 1931, for example, increase was first noted at Molesey on 5th July, when there were 26 birds. By 17th August the number was 157, on the 18th October it was 338, and on the 24th it was 376, after which numbers fell steadily and by the 12th December they were down to 133. At Fetcham in 1937 the influx began at the end of September, and six counts in October gave an average of 76.16, whereas eleven counts in November averaged 67.6. Although there is evidently a tendency towards a decline in numbers during October, this is by no means always the case, and the maximum number recorded on the Penn Ponds is 203 on 26th February 1933. At this locality, where Coots are normally plentiful in winter, numbers were exceptionally low in the winters of 1933-4 and 1934-5, when none of the usual pond-weed was visible.

At Elstree reservoir a series of counts in the winter of 1931-2 showed about 200 on 25th October, rising to 400+ on 20th December, with a gradual decrease in the early months of 1932. On 13th November of that year counts at the Brent, Elstree and Ruislip reservoirs and near Watford revealed a total of 501 birds, while a count was also taken for most large waters in the area on 18th December 1937, when 1449 birds were counted on the waters detailed elsewhere in this report.

These figures raise the interesting question of the origin of the flocks. The only evidence of continental origin of Coots visiting this country is reviewed by Messrs Ingram and Salmon in *B.B.*, xxix, p. 38, where they quote the case of a young bird ringed in Denmark as a nestling in June 1929 and recovered in Ireland in November 1931, and also a record of a Coot seen south-east of the Dogger Bank in February 1930. An adult ringed in Kent in March 1930 was recovered in Pas de Calais, France, July 1931, while there are a few autumn and winter

records of birds at the lights of North Wales and Ireland. Apart from this there is little indication to show whence the flocks of Coots come or why they should decline in numbers as early as December; it is interesting to note that many of the ducks which visit the large waters in the area have frequently a pronounced *increase* in numbers in this month. R. C. H.

A Census of Ducks, Great-Crested Grebes, and Coot.

ON 18th December 1937 a census of all ducks except mallard, great-crested grebes and coot was taken on all the waters set out in the accompanying schedule. So far as possible counts were made in the early afternoon, but in certain cases they were made in the morning. It is not pretended, therefore, that the figures have any claim to complete accuracy, but it is hoped that they will serve as an indication of the bird population on the larger waters in the London area at the time of the census. In the case of Barn Elms the number of tufted ducks was appreciably higher in the morning than in the afternoon, and the higher figure has been included in the schedule. Care was taken to see that birds were not counted when they flew round the reservoirs, and it should be mentioned that this difficulty was specially pronounced at Molesey, but it is believed that the figures given are minima. The waters detailed include all those of major ornithological importance within 20 miles of London, but since there are many small lakes which could not be included there is every reason to suppose that the actual population in the area in the case of the commoner species was considerably higher than that quoted. Thanks are due to the 26 observers who took part in the census for the wide area which it was possible to cover.

With regard to the object of the census, it is realised that the figures in themselves are not of great significance, but it is hoped that it may be repeated on future occasions in order to provide definite facts for the study of the varying winter population of ducks, grebes and coot from year to year. The presence of certain species on a very limited number of waters, although they may be found on these in large numbers, is a question that requires considerable investigation. A census of this nature does not throw any light on the reasons governing such winter-habitat selection, but it bears evidence of the existence of such selection and provides facts whose interpretation is a problem still calling for solution.

During the few days immediately preceding the date of the census winds were northerly, and night frosts occurred in most districts. Consequently some of the smaller waters were wholly or partially frozen over, and numbers on the larger waters were probably to a certain extent increased on account of this factor.

	COMMON POCHARD.			TUFTED DUCK.			GREAT-CRESTED GREBE.	COOT.
	Total.	M.	F.	Total.	M.	F.		
E. King George V Res.	73	50	23	64	22	42	6	8
Walthamstow Res.	43	33	10	404 (61 not differentiated)	155	188	50	295
Various ponds: Leytonstone, Hainault and Wanstead districts	27	17	10	93	57	36	—	81
H. Batchworth Lake	5	5	—	69	34	35	—	21
Elstree Res.	—	—	—	5	—	5	1	27
Hamper Mill gravel-pit	20	—	—	14	—	—	2	78
K. Cray River gravel-pit	21	14	7	—	—	—	—	—
M. Brent Res.	152	84	68	76	40	36	—	55
Hampton Res.	25	20	5	56	13	43	1	29
Kempton Res.	—	—	—	3	1	2	—	5
Littleton Res. and gravel-pit	37	—	—	20	—	—	—	—
Long Water and Round Pond, Kensington Gardens	43	37	6	307	223	84	—	4
Osterley Park	—	—	—	3	—	3	—	7
Ruislip Res.	19	12	7	4	2	2	—	174
Staines Res.	30	—	—	188	—	—	123	67
Stoke Newington Res.	19	10	9	64	31	33	9	80
Various ponds: Golders Green, Hampstead and Highgate district	—	—	—	48	22	26	—	8
S. Barn Elms Res.	22	18	4	251	141	110	35	11
Beddington Lane ponds	6	3	3	1	—	1	—	65
Fetcham pond	—	—	—	—	—	—	—	53
Island Barn Res., Molesey	—	—	—	34	21	13	9	31
Lonsdale Road Res.	65	50	15	19	11	8	8	—
Mitcham gravel-pits	56	—	—	30	—	—	—	150
Richmond Park	—	—	—	9	5	4	—	80
West Molesey Res.	81	65	16	693	548	145	141	51
Various ponds: Wandle district	—	—	—	34	18	16	—	69
Total ...	744	418	183	2489	1344	832	385	1449

SHELD-DUCK. 2, Staines Res.

TEAL. 105. King George V Res.; 10, Hamper Mill; 215. Staines Res.; 97. Littleton Res.; 59, Ruislip Res.; 360 (202 ♂, 158 ♀). Island Barn Res.; 6 (3♂, 3♀). West Molesey Res.; 1. Beddington Lane ponds. Total. 853.

WIGEON. 5. King George V Res.; 1, Leytonstone; 180. Staines Res.; 75. Littleton Res.; 7, Island Barn Res.; 4, West Molesey Res. Total. 272.

SHOVELER. 35, Staines Res.; 20, Littleton Res. Total, 55.

SCAUP DUCK. 1. Staines Res.; 2, Hampton Res. Total. 3.

GOLDENEYE. 11, Staines Res.; 6, Littleton Res.; 1, Hampton Res.; 1, Island Barn Res.; 11 (2♂), West Molesey Res. Total, 30.

Long-tailed Duck. 2, Staines Res.

Goosander. 2 red-headed birds, Elstree Res.; 129 Staines Res.; 2 red-headed birds, Island Barn Res.; 101 (14♂), West Molesey Res. Total 234.

Smew. 3, Walthamstow Res.; 6 (2♂), Hampton Res.; 9 red-headed birds, Stoke Newington Res.; 1, Barn Elms Res.; 32 (10♂), West Molesey. Total, 51 (12♂).

R. C. H.

Pied Wagtail Roost in Richmond Park.

By W. L. Colyer.

ON 16th October 1937, about 5 o'clock in the afternoon, two or three Pied Wagtails (*Motacilla alba yarrellii*) were noticed to be flying about the rushes of a pond inside Richmond Park by the Ham Gate. Further observation revealed that from 20 to 24 birds were roosting there.

The area of the pond is about half an acre. One-sixth of it, 400 square yards, is filled with rushes (*Typha*), and it is in them the birds roost, more especially amongst those nearest the middle of the pond. Horse chestnut trees grow on the banks of two sides, the south and west; the other two sides, north and east, are covered with short grass. The following notes are a summary of observations made at ten visits to the spot, the last being on 8th December 1937.

Pied Wagtails are only "fairly common" inside Richmond Park, and the birds *always* came to the roost from the north, west, and south-west, i.e., from the district between the west wall of the Park and the River Thames.

The times of the first arrivals noted down at eight visits were 30, 36, 38, 24, 22, 19, 19, and 35 minutes before sunset, an average of 28 minutes before sunset (G.M.T.).

They came in twos and threes and small batches at intervals of a few minutes. Only on two occasions did the birds fly directly to the rushes on arrival, once a party of three, and at another visit a party of five. The rule was for them to fly either to the chestnut trees, or to the grassy banks. If people were walking close to a bank, as usually happened on Saturday or Sunday afternoons, the birds would perch on the trees, even for half an hour at a time. They were quite indifferent to motor cars and horse riders on the road, although that was only 25 paces from the pond. If there were no persons walking near the pond the birds preferred the grassy banks to the trees. There they rested, or ran about, and occasionally one would chase another. Some would fly to the water-lily leaves, and walk about on them to catch insects or bathe. When it rained the birds were not troubled by it, but behaved as usual.

Much changing of roosting-perch usually took place when new arrivals entered the rushes. On one occasion six birds were seen slowly rising to the top of the rushes, where they hovered for a while before gradually fluttering down again.

From the moment of arrival of the first Wagtail at the pond there were continuous calls of "*chizik*" and other chirpings from the trees or grass-banks, perhaps most of all when the whole flock was assembled in the roost. Then gradually the calls subsided until there was unbroken silence. The times when all the calls ceased and silence ensued were recorded on nine visits; they were 26, 25, 29, 12, 18, 13, 25, 27 and 22 minutes after sunset. Thus the average time was 22 minutes past sunset (G.M.T.).

The number of birds present at the roost showed interesting and puzzling variations. The totals that follow are of birds counted, not estimated, and nearly always there were a few missed that slipped into the rushes from the side furthest from the observer.

Date.	No. of Birds.	Date.	No. of Birds.
Oct. 16	20	Nov. 10	20
,, 18	16	,, 17	16
,, 24	50	,, 24	41
,, 30	100	Dec. 1	150
Nov. 6	70	,, 8	19

From these figures it would appear that about 20 birds have been roosting regularly there throughout the autumn, but that the number was augmented between the 18th October and 10th November, and also between 17th November and 8th December. Perhaps these increases may be due to an influx of Pied Wagtails into the neighbourhood between the west of the Park and the Thames from elsewhere at those times. It is noteworthy that most of the 150 on December 1st made many flights from their perches on the banks and trees, high up and circling, with excited *chiziks* and chirping calls, which had not been the custom of the birds at *this* roost on any other occasion.

Arrival and Departure of Migrants, 1937.

Compiled by D. A. T. Morgan.

IN the following table the earliest and latest dates for each county are given except in cases where they are obviously of no significance. Comments from members on the question of continuing or omitting this table in future reports will be welcome.

SISKIN.

Mar. 26—K. Beckenham, ... P.W.R.
April 10—S. Richmond Park, D.A.R.
,, 12—M. Hampstead Heath, K.D.S.
,, 19—E. Epping Forest, P.D.H.
Oct. 24—S. Beddington, ... G.D.E.

TREE PIPIT.

April 5—E. Epping Forest, P.D.H.
,, 9—S. Richmond Park, W.L.C.
,, 11—M. Staines Res., ... G.C.L.
,, 11—M. Ruislip Common, W.R.P.
Sept. 12—S. Tadworth, ... H.B.

BRAMBLING.

Mar. 27—E. Epping Forest, J.H.G.P.
April 18—M. Staines Res., ... A.H.M.
,, 18—K. Farnborough, ... L.P.
,, 20—S. Bedddington, ... P.W.R.
Oct. 10—K. Hayes, G.D.E., G.E.M.
,, 16—S. Cuddington, P.W.E.C.

YELLOW WAGTAIL.

April 3—E. Walthamstow Res., E.T.N.
,, 3—H. Waltham Marsh, A.R.S.
,, 4—S. Barn Elms, G.C.L., A.H.M.
,, 4—S. Beddington, ... R.C.H.
,, 11—K. Beckenham, ... P.W.R.
,, 11—M. Staines Res., ... G.C.L.
Sept. 28—M. Staines Res. ..... A.H.M.
,, 29—S. Barn Elms, ... W.R.P.
,, 30—E. Walthamstow Res., A.R.S.
Oct. 15—M. R. Thames (Pool of London), ... K.P.K.

WHITE WAGTAIL.

Mar. 30—S. Beddington, ... P.W.R.
April 17—E. Walthamstow Res. R.W.P.
,, 18—M. Staines Res., ... W.E.G.
,, 18—K. Beckenham, G.E.M., P.W.R.

RED-BACKED SHRIKE.

May 6—S. Kingswood, ... H.B.
,, 19—H. Waltham Abbey, A.R.S.
,, 22—E. Epping Forest, E.M., R.W.P., W.A.W.
Aug. 3—E. Epping Forest, W.A.W.
,, 13—S. Richmond Park, A.H.M.
,, 19—H. Cheshunt Tip, ... A.R.S.
,, 23—M. Ruislip Common, W.R.P.

SPOTTED FLYCATCHER.

May 11—S. Tadworth, ... H.B.
,, 12—H. Broxbourne, ... F.J.J.
,, 14—M. White Webbs Park, A.R.S.
,, 18—E. Epping Forest, W.A.W.
Aug. 21—E. Epping Forest, W.A.W.
Sept. 4—K. Dulwich, ... G.D.E.
,, 19—S. Tadworth, ... H.B.
,, 23—H. Cheshunt, ... A.R.S.

CHIFFCHAFF.

Mar 20—M. Uxbridge, G.C.L., A.H.M.
,, 20—S. Old Malden, ... R.W.H.
,, 20—S. Mitcham, ... G.B.
,, 21—E. Knighton Wood, W.A.W.
,, 31—K. Beckenham, ... P.W.R.
Sept. 19—E. Knighton Wood, W.A.W.
Oct. 4—K. Dulwich, ... G.D.E.
,, 8—S. Barn Elms, ... E.G.P.
,, 11—M. Hampstead Heath, H.M.R.K.

WILLOW WARBLER.

Mar. 20—S. Mitcham, ... W.W.T.
April 1—M. Staines Res., ... A.H.M.
,, 9—E. Epping Forest, P.D.H.
,, 10—H. Cuffley, ... R.S.R.F.
,, 11—K. Beckenham, G.E.M., P.W.R.
Sept. 12—E. Knighton Wood, W.A.W.
,, 16—H. Cheshunt, ... A.R.S.
Oct. 3—S. Limpsfield, ... O.H.

WOOD WARBLER.

April 20—S. Beddington, ... P.W.R.
,, 20—S. Wimbledon, ... R.E.W.
,, 25—E. Walthamstow Res. E.T.N.
May 3—K. Dulwich, ... G.D.E.
July 26—M. Hampstead Heath, H.M.R.K.

GRASSHOPPER WARBLER.

April 17—S. Ashtead Common, R.C.H.
,, 30—M. Colne Valley, ... R.E.B.
,, 30—H. Rickmansworth, R.E.B.
July 25—S. Bookham, ... H.J.B.

REED WARBLER.

May 1—H. London Colney, (*Field*, 8/5/37).
,, 7—S. Wimbledon Common, R.E.W.
,, 16—E. Chigwell, ... W.A.W.
Aug. 21—E. Sewardstone, ... W.A.W.
Sept. 21—S. Barn Elms, ... E.G.P.
,, 23—H. Cheshunt, ... A.R.S.

SEDGE WARBLER.

April 18—E. Sewardstone, ... W.A.W.
,, 24—M. Staines, ... C.A.W.
,, 25—S. Epsom S.F., ... R.S.R.F.
Sept. 5—B. Langley S.F., ... C.A.W.
,, 20—H. Cheshunt, ... A.R.S.
,, 23—M. Staines Res., ... A.H.M.
,, 26—K. Elmers End, ... G.E.M.
Oct. 1—S. Barn Elms, G.C.L., E.G.P.

GARDEN WARBLER.

April 11—S. Walton Heath, P.W.E.C.
,, 22—M. White Webbs Park, A.R.S.
Aug. 8—S. Wimbledon Common, R.E.W.

BLACKCAP.

April 15—S. South Croydon, ... H.G.
,, 18—M. Mill Hill, ... W.D.M.
,, 21—K. Hayes, ... P.W.R.
,, 24—E. Hainault Forest, J.H.G.P.
,, 24—E. Knighton Wood, J.H.G.P.
,, 24—E. Epping Forest, ... S.A.
Sept. 23—M. Staines Res., ... A.H.M.

WHITETHROAT.

April 12—S. Mitcham Common W.W.T.
,, 18—M. Staines, ... G.C.L.
,, 19—E. Epping Forest, P.D.H.
,, 24—H. Cuffley, ... R.S.R.F.
Sept. 3—M. Ruislip Res., ... W.R.P.
,, 6—H. Broxbourne, ... A.R.S.
,, 23—S. Wimbledon Common, R.E.W.

LESSER WHITETHROAT.

April 14—S. Ashtead, ... J.S.W.
,, 25—H. Cuffley, ... R.S.R.F.
May 1—E. Sewardstone, ... W.A.W.
Sept. 3—M. Ruislip Common, W.R.P.
,, 18—E. Epping Forest, A.R.S.

FIELDFARE.

Mar. 27—E. Navestock, ... W.A.W.
April 19—S. Wimbledon Common, R.E.W.
Oct. 16—S. Beddington, ... G.B.
,, 31—E. Chigwell, ... W.A.W.
Nov. 13—K. Bromley, ... M.M.H.
,, 14—B. Colnbrook, ... D.A.T.M.
,, 14—M. Stanwell, ... D.A.T.M.

REDWING.

Mar. 27—E. Navestock, ... W.A.W.
,, 28—K. Elmers End, ... G.E.M.
,, 31—S. Kew Gardens, ... G.C.L.
April 4—M. Mill Hill, ... W.D.M.
,, 4—M. Hampstead Heath, W.B.W.
Oct. 5—S. Tadworth, ... H.B.
,, 11—M. Hampstead Heath, H.M.R.K.
,, 17—E. Chigwell, ... W.A.W.

WHEATEAR.

Mar. 20—S. Wimbledon, ... R.W.H.
,, 21—K. Beckenham, ... P.W.R.
April 3—H. Waltham Marsh, A.R.S.
,, 3—E. King George V Res., R.W.P., W.A.W.
,, 15—M. Hyde Park, ... G.C.L.
Sept. 18—E. Walthamstow Res. W.A.W.
,, 20—M. Brent Res., ... W.D.M.
Oct. 24—S. Barn Elms, G.C.L., A.H.M.
Nov. 28—S. Beddington, ... W.W.T.

WHINCHAT.

April 10—M. Mote Mount, (*Field*, 17/4/37).
,, 24—S. Ashtead Common, P.W.E.C.
,, 25—E. Chigwell, ... W.A.W.
Sept. 10—M. Staines Moor, ... G.B.
,, 19—E. Chigwell, ... W.A.W.
Oct. 4—S. Barn Elms, ... W.R.P.

REDSTART.

April 7—S. Wimbledon Park, R.E.W.
,, 7—S. Richmond Park, A.H.M.
,, 10—M. Mote Mount, (*Field*, 17/4/37).
,, 16—E. Epping Forest, ... F.J.J.
Sept. 15—M. Bushy Park ..... J.E.R.
,, 19—S. Wimbledon Park, R.E.W.

NIGHTINGALE.

April 11—M. Winchmore Hill, P.J.H.
,, 16—E. Epping Forest, ... F.J.J.
,, 18—S. Cheam Warren, P.W.E.C.

SWALLOW.

Mar. 27—E. Walthamstow Res., E.T.N., H.A.P.
April 6—S. Brooklands S.F., E.G.P.
,, 8—H. Waltham Marsh, A.R.S.
,, 10—M. Staines Res., D.A.T.M., C.A.W.
,, 10—M. Potters Bar, ... J.D.D.
,, 11—K. Beckenham, ... P.W.R.
Oct. 10—M. Staines, R.C.H., C.A.W.
,, 17—S. Beddington, ... G.B.
Nov. 12—E. Loughton, ... P.D.H.

HOUSE MARTIN.

April 9—S. Kew Gardens, ... W.R.P.
,, 12—M. Hampstead Heath, K.D.S.
Oct. 12—M. Ruislip, ... W.R.P.
,, 12—M. Bushy Park, ... J.E.R.
,, 22—K. Bickley, ... M.M.H.
,, 25—E. Chingford, ... A.R.S.
,, 26—S. Epsom, ... R.C.H.

SAND MARTIN.

April 1—E. King George V Res., A.R.S.
,, 4—S. Mitcham, ... G.B.
,, 6—H. Waltham, ... F.J.J.
,, 8—M. Staines Res., ... G.D.E.

Sept. 25—E. King George V Res., W.A.W.
Oct. 1—M. Staines Res., ... A.H.M.
,, 3—S. Oxted, ... R.S.R.F.

SWIFT.

April 24—M. Staines Res., ... C.A.W.
,, 26—H. Waltham Marsh, A.R.S.
,, 26—E. Lea Valley, ... J.S.W.
,, 26—S. Fetcham, ... H.J.B.
May 3—K. Blackheath, ... E.M.W.
Aug. 2—E. Sewardstone, ... W.A.W.
,, 6—M. Highgate, ... J.D.D.
,, 18—K. Beckenham, ... P.W.R.
,, 18—K. Dulwich, ... G.D.E.
Sept. 5—S. Beddington Lane, G.B.
,, 6—H. Hoddesdon, ... A.R.S.

NIGHTJAR.

May 18—E. Epping Forest, ... E.T.N., W.A.W.
,, 24—S. Richmond Park, R.E.B.
,, 24—S. Epsom Common, R.S.R.F.
,, 24—S. Headley, ... J.S.W.
,, 25—K. Bromley, ... M.M.H.
,, 31—H. Cuffley, ... A.R.S.
Aug. 11—S. Epsom Common, F.W.B.

WRYNECK.

Mar. 28—K. Cudham, ... M.M.H.
April 8—S. Ashtead, ... J.S.W.

CUCKOO.

April 10—E. Epping Forest, A.R.S.
,, 10—S. Chipstead, (*Field*, 24/4/37).
,, 10—S. Headley, ... J.S.W.
,, 11—M. Ruislip, ... W.R.P.
,, 19—K. Beckenham, ... P.W.R.
,, 21—H. Bury Wood, ... F.J.J.
Sept. 23—S. Richmond Park, E.G.P.

GOLDENEYE.

Mar. 27—S. Molesey Res., P.W.E.C.
May 2—M. Staines Res., ... A.H.M.
,, 8—E. Walthamstow Res., E.T.N., H.A.P.
Oct. 16—M. Staines Res., D.A.T.M.
,, 16—E. Walthamstow Res., E.T.N., H.A.P.
Nov. 6—S. Molesey Res., P.W.E.C.

GOOSANDER.

Mar. 27—S. Molesey Res., P.W.E.C.
April 3—E. King George V Res., W.A.W.
,, 18—M. Staines Res., ... G.C.L.
Nov. 12—M. Staines Res., ... A.H.M.
,, 20—S. Molesey Res., D.A.T.M.

SMEW.

Mar. 13—E. Walthamstow Res., W.A.W.
,, 19—M. Chiswick, ... W.R.P.
,, 23—S. Barn Elms, H.M.R.K.
Nov. 19—S. Molesey Res., ... W.E.G.

TURTLE DOVE.

April 30—S. Tadworth, ... H.B.
May 3—E. Epping Forest, ... A.R.S.
,, 4—M. Ruislip, ... W.R.P.
Aug. 23—M. Ruislip, ... W.R.P.
Sept. 29—S. Barn Elms, ... W.R.P.

COMMON SANDPIPER.

April 10—S. Beddington, G.E.M., P.W.R.
,, 26—H. Waltham Marsh, A.R.S.
Oct. 10—M. Staines Res., ... G.C.L.
,, 21—E. Walthamstow Res., A.R.S.
,, 31—S. Barn Elms, G.C.L., A.H.M.

JACK SNIPE.

April 4—E. Chigwell S.F., R.McK.S.
,, 11—S. Walton Heath, P.W.E.C.
Sept. 18—M. Ruislip, ... G.H.
Oct. 2—S. Cuddington, P.W.E.C.
,, 17—E. Chigwell S.F., ... W.A.W.

Bird Ringing, 1937.

IT is a pleasure to be able to report a striking increase in the Society's returns to the Bird Ringing Committee of the British Trust for Ornithology. The record total of 1976 birds of 52 species was ringed and this compares with 354 birds of 38 species in 1936. Three members were able to ring 937 Manx Shearwaters on Skokholm Island, but there has been an all-round increase in addition to this large total for one species. The following table shows the results of the 16 ringers who took part in the work:—

Name of Ringer.	Nestlings.	Trapped.	Total.
F. W. Blake	31	4	35
S. Boardman	28	109	137
G. A. Buckland	5	—	5
H. J. Burkill	1	1	2
C. L. Collenette	—	6	6
P. W. E. Currie	41	—	41
H. J. Evans	222	294	516
R. S. R. Fitter	9	115	124
R. W. Hale	—	318	318
R. C. Homes	13	21	34
H.M. Office of Works	—	16	16
H. Pettit	4	—	4
J. E. Roberts	10	1	11
Miss E. T. Silva	80	67	147
B. T. Ward	3	—	3
J. M. Wilson	454	123	577
	901	1075	1976
1936 figures	276	78	354

The most numerous species ringed were:—

Manx Shearwater	937	Sandwich Tern	61
Common Tern	240	Blue Tit	55
Starling	114	Robin	49
Song Thrush	80	Chaffinch	40
Blackbird	66	Lapwing	34

We welcome three new ringers:—Messrs F. W. Blake, P. W. E. Currie, and H. J. Evans.

During the year the *British Birds* Marking Scheme was taken over by the new Bird Ringing Committee of the British Trust for Ornithology. The British Trust has found it impossible to continue any special arrangements for the supply of rings and the Ornithological Committee has been obliged to make a small increase of 3d per packet. The charge for each packet of 20 rings is now 1/-, and the Bird Ringing Secretary—R. W. Hale, 6 Grendon Gardens, Wembley Park, Middlesex—will be pleased to hear from any member interested in ringing.

RECOVERIES OF RINGED BIRDS.

The following recoveries of birds included in the Society's returns have been published in *British Birds* since the last list was compiled:—

JACKDAW. *Coloeus m. spermologus.*

1. RR.6416, ringed 15/5/35 as an adult in Richmond Park (Surrey) by C. L. Collenette, and recovered where ringed 21/2/37.

STARLING. *Sturnus v. vulgaris.*

2. ZE.86, ringed 3/10/36 as an adult at St Albans (Herts.) by J. M. Wilson, and recovered 30/1/37 at Beaconfield (Bucks.).

HOBBY. *Falco s. subbuteo.*

3. RV.2901, ringed 9/8/36 as a young bird in Wiltshire by J. E. Roberts, and recovered 16/10/36 at Hagetmau (Landes), France.

OYSTER-CATCHER. *Haematopus o. occidentalis.*

4. RW.7333, ringed 30/6/36 as a nestling at Salthouse (Norfolk) by J. M. Wilson, and recovered in October 1936 at Blakeney (Norfolk).