

# The BEDFORDSHIRE NATURALIST

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BEING THE  
JOURNAL  
OF THE  
BEDFORDSHIRE  
NATURAL HISTORY SOCIETY  
AND FIELD CLUB  
FOR THE YEAR  
1949

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No. 4

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BEDFORDSHIRE NATURAL HISTORY SOCIETY & FIELD CLUB

BEDFORD  
HENRY BURT & SON LTD.  
1950



HIS GRACE THE DUKE OF BEDFORD,  
PRESIDENT OF THE SOCIETY, WITH A REMARKABLY FINE  
RED DEER'S ANTLER.

**THE BEDFORDSHIRE NATURALIST**  
 BEING THE  
**JOURNAL**  
 OF THE  
**BEDFORDSHIRE**  
**NATURAL HISTORY SOCIETY & FIELD CLUB**

EDITED BY RAY PALMER, F.R.E.S., F.Z.S.

No. 4.—1949.

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**BEDFORDSHIRE  
NATURAL HISTORY SOCIETY & FIELD CLUB  
1950**

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*President*

HIS GRACE THE DUKE OF BEDFORD

*Past President*

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*Chairman*

KEITH PIERCY, B.Sc., M.B.O.U.

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*Hon. Programme and Excursions Secretary*

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MISS E. PROCTOR, B.Sc.

F. G. R. SOPER

B. B. WEST

K. E. WEST

**RECORDERS**

**METEOROLOGY:** A. W. GUPPY, Powerstock, Bromham, Bedford.

**GEOLOGY AND PALAEOLOGY:** (Vacant).

**BOTANY:**

*Flowering Plants:* J. G. DONY, Ph.D., 41 Somerset Avenue, Luton.

*Vascular Cryptogams and Bryophytes:* PETER TAYLOR, The Herbarium,  
Royal Botanic Gardens, Kew.

**ZOOLOGY:**

*Mollusca:* (Vacant).

*Insecta:*

*Orthoptera and Odonata:* RAY PALMER, F.R.E.S., F.Z.S., Hollydale,  
Aspley Guise.

*Lepidoptera:* BERNARD B. WEST, 8 St. Loyes Street, Bedford.

*Coleoptera:* C. MACKECHNIE JARVIS, F.L.S., 15 Kingcroft Road,  
Harpenden, Herts.

*Hymenoptera:* V. H. CHAMBERS, Ph.D., 47 Westbourne Road, Luton.

*Diptera:* B. R. LAURENCE, 31 Sherwood Road, Luton.

*Vertebrata:*

*Fishes:* F. G. R. SOPER, 102 Chaucer Road, Bedford.

*Amphibians and Reptiles:* RAY PALMER, F.R.E.S., F.Z.S., Hollydale,  
Aspley Guise.

*Birds:* HENRY A. S. KEY, 61b Goldington Road, Bedford.

*Mammals:* RAY PALMER, F.R.E.S., F.Z.S., Hollydale, Aspley Guise.



## Report of the Hon. Secretary

The year 1949 was most satisfactory and the Society continued to forge ahead with steady progress in all spheres of its activity. The membership continued to improve and at the close of the year there were 304 names on the register consisting of the following classes of membership:—

217 Ordinary, 14 Corporate, 14 Student, 39 Associate and 20 Junior.

The healthiest sign was in the number of new members, 47 of whom joined the Society during the year, and greatly outnumbered the few resignations, due chiefly to removal from the County. In a few cases only are the Council considering what action shall be taken owing to arrears of subscription.

The attendance at indoor and outdoor meetings was on the whole very good and once again we were honoured with lectures by outside speakers. Outstanding addresses by Derek Goodwin on Birds, and by Miss Cynthia Longfield on Dragonflies, will long be remembered, and the Society expresses its gratitude to them for their kind support. The Council trusts that all members will continue to support increasingly these lectures, which are designed to inculcate a greater knowledge and appreciation of the County natural history, and draws attention to the fact that friends of members are cordially invited to attend.

During the spring the Botanical Section came into being under its Secretary, Mr. A. W. Guppy, and commenced its first session with a number of interesting meetings (reported elsewhere). The Ornithological Section continued to flourish with indoor and outdoor meetings, which as usual included a number of trips to localities of interest outside the County. The Secretary, Mr. H. A. W. Southon, was away for the latter part of the summer and Miss P. Soper and Mr. W. J. Champkin jointly shared the responsibilities of the section until the new Section Secretary, Mr. F. C. Gribble, on demobilisation from the army, was appointed to fill the vacancy caused by Mr. Southon going up to Oxford.

All will remember our new venture, The Bedfordshire Ornithological Conference, which was held for the first time in March jointly with the British Trust for Ornithology. It is hoped that this gathering of all interested in bird life from our own and the five neighbouring Counties will become an annual event, and such was the wish expressed in the many congratulatory letters received afterwards. A crowded attendance listened to addresses by such celebrities as Mr. B. W. Tucker, M.A., Mr. W. B. Alexander, M.A., Mr. E. M. Nicholson, C.B., and Mr. P. E. Brown of the Royal Society for the Protection of the Birds, and the show of films by Mr. C. W. Holt, President of the Leicester-shire and Rutland Ornithological Society, was enthusiastically applauded. The thanks of the Society are due to Dr. G. A. Metcalfe and Messrs. D. W. Elliott and H. A. W. Southon whose loan of specimens and photographs completed the enjoyment.

The field meetings were in the main blessed with fine weather. All parts of the County were, as far as possible, represented in the

selection made during the season and this culminated in a highly successful Fungus Foray in October at Clophill.

At the Second Annual General Meeting held in Bedford on Thursday, 10th February, His Grace the Duke of Bedford, honoured the Society in consenting to become President. Mr. Oliver G. Pike, on retiring from Office, now becomes our first Past-President.

At the beginning of the year all members were shocked by the sudden illness of Dr. J. G. Dony, and are now thankful he has been restored to his former vitality. At the previous Annual General Meeting reference was made, with regret, to the decease of Miss Cicely Reid, formerly Principal of the Physical Training College, Bedford. Towards the end of the year there passed from us a boy of great promise, Oliver, the 17-year-old son of Mr. and Mrs. Ray Palmer. This was in every way a grievous loss and the Society expressed its deep sorrow to the bereaved parents. Since the close of the year, one older member, Lt. Col. R. R. S. Orlebar, of Hinwick House, has passed away. He was a most distinguished County figure, greatly respected in the many fields of his interests.

Members will be interested to learn that the nucleus of a library has now been formed and that Dr. J. G. Dony has consented to be Hon. Librarian. The books are for the time being housed in the Luton Borough Museum by kind permission of the Authorities and the Council appeals to all to present relevant volumes to the collection. These should be forwarded to Dr. Dony.

The gratitude of the Society is expressed to those authorities and various bodies who, as in former years, have kindly loaned apparatus and halls for meetings, and to the owners of properties for providing facilities to hold field meetings. Our thanks are due also to the Press for their kind co-operation in reporting our activities.

Special thanks are also due to Miss E. G. Cole for her most valuable voluntary work in reporting and typing material for the Journal.

HENRY A. S. KEY

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HENRY A. S. KEY

# THE BEDFORDSHIRE NATURAL HISTORY SOCIETY AND FIELD CLUB

## STATEMENT OF ACCOUNTS FOR THE YEAR ENDED 31st DECEMBER, 1949

RECEIPTS		£	s.	d.	PAYMENTS		£	s.	d.
To Cash in Bank, 1st January 1949	...	3	19	10	By Printing and Stationery	...	20	6	2
„ Subscriptions 1948 and 1949	...	84	17	6	„ Hire of Halls	...	6	15	0
„ Subscriptions, 1950	...	3	5	0	„ Refreshments, Ornithological Conference	...	12	15	0
„ Donation	...	1	1	0	„ Postages	...	1	13	0
„ Sale of Tickets, Ornithological Conference	...	25	15	0	„ Lecturer's Expenses	...	14	0	0
„ Sale of Programmes, Ornithological Conference	...	1	7	1	„ Wreath—late Miss C. Read	...	17	3	0
„ Proceeds of Lecture	...	3	4	0	„ Hire of Appliances	...	6	10	6
„ Proceeds of Excursions	...	21	0	0	„ Cash in Hand, 31st December 1949	...	16	16	6
„ Sale of Journals	...	22	7	0	„ Cash in Bank, 31st December 1949	...	100	9	0
		<u>£166</u>	<u>16</u>	<u>5</u>			<u>£166</u>	<u>16</u>	<u>5</u>

NOTE.—Accounts owing at 31st December 1949, for Printing Journal £69 11s. 0d. and Coach Hire £25 0s. 0d. have been paid since that date.

We have examined the above account with the books and vouchers of the Society and certify the same to be correct in accordance therewith.

BEDFORD.  
28th February 1950.

McPHERSON, TIMMINS & EDNIE,  
*Chartered Accountants, Honorary Auditors.*

## PROCEEDINGS, 1949

### Indoor Meetings

22ND ORDINARY MEETING, 6th January 1949, Bedford, "Brains Trust", consisting of the following Recorders:—

Dr. J. G. Dony, Messrs. H. A. S. Key, Ray Palmer, F. G. R. Soper, B. Verdcourt and Bernard West.

*Question Master*—Chairman of the Society (Keith Piercy).  
35 members present.

23RD ORDINARY MEETING, 20th January 1949, Luton, "Bedfordshire Butterflies", by Bernard B. West. Attendance of 36. *Chairman*—F. G. R. Soper.

2ND ANNUAL GENERAL MEETING, held on Thursday, 10th February 1949, in the St. John Ambulance Brigade Hall, Cauldwell Street, Bedford. Mr. Keith Piercy in the Chair. 58 members attended.

(This meeting was preceded by a Special Meeting for the purpose of approving an amendment to Rule 4 of the Society's Rules. The Chairman, Mr. F. G. R. Soper, read the amendment to the 53 members present and then proposed its adoption. Mr. K. E. West seconded the motion which was adopted without a division on a show of hands.

The amended Rule now reads:—

"The Management of the Society shall be vested in the Officers and a Council of ten. The Officers shall consist of a President, Chairman, Secretary, Treasurer and Editor, all of whom shall be nominated by the Council and elected at the Annual General Meeting.

The Council shall be elected annually; any candidate for election as a member of the Council shall be nominated in writing by not less than two members of the Society. All nominations must be in the hands of the Hon. Secretary not less than fourteen days before the Annual General Meeting.

The Council shall have the power to co-opt members for special Committees and to fill vacancies."

The Chairman regretted that the retiring President, Mr. Oliver G. Pike, had not been able to attend, but said that he had sent a letter wishing the Society every success in its work.

In opening the business of the Annual General Meeting, the Chairman called on the Hon. Secretary to read the Minutes of last year's Meeting. These were adopted unanimously and signed.

The Hon. Secretary then submitted his report for 1948 showing how the membership had grown and indicating how successful the indoor and outdoor programmes had been, due not a little to the favourable weather. He thanked the retiring President for his excellent lecture, given at Bedford Town Hall in May, which added a substantial sum to the Society's funds. The formation of the new Ornithological Section under its Secretary, Mr. H. A. W. Southon, was also remarked on.

The Honorary Treasurer in submitting his financial statement showing a balance in hand of £3 19s. 10d., remarked on the cost of printing the Journal and called the matter to the Council's attention before printing of the next issue. Mr. W. H. Bonnett was thanked for his valuable and untiring services and the report was adopted.

His Grace the Duke of Bedford (the new President of the Society) was then introduced by the Chairman, and he gave a brief address in which he appealed for maximum effort to preserve the countryside from the many present threats.

Next followed the election of Officers. The Council recommended that the previous President, Mr. Oliver G. Pike, should become the first Past-President

of the Society and intimated that Mr. Pike had agreed to this. The others elected were:—

*Chairman:* Mr. Keith Piercy. *Hon. Secretary:* Mr. Henry A. S. Key.  
*Hon. Treasurer:* Mr. W. H. Bonnett. *Hon. Editor:* Mr. Ray Palmer.  
*Council:* Messrs. H. F. Barnes, V. H. Chambers, J. G. Dony, Brig. C. C. Foss,  
 Mr. W. P. Gatward, Miss E. Proctor, Messrs. F. G. R. Soper, H. A. W.  
 Southon, B. B. West and K. G. West.

Messrs. D. W. Elliott and E. Lucas officiated as scrutineers and they were thanked for their services; Mr. Lucas being further thanked for auditing the Society's accounts in an honorary capacity.

The business of the meeting terminated with a discussion on future programmes.

24TH ORDINARY MEETING, 24th February 1949, Dunstable, when Brig. C. C. Foss, V.C., "On Plants of the Chalk Hills", and the Society's Secretary "On Birds of the Downs", lectured at short notice to a gathering of 60 due to the sudden illness of Dr. J. G. Dony, now happily recovered.

*Chairman*—Mr. W. D. Coales.

25TH ORDINARY MEETING, 10th March 1949, Bedford, "Hibernation and Temperature Changes in animals" by Miss E. Proctor, B.Sc. 28 members attended. *Chairman*—Mr. Keith Piercy.

26TH ORDINARY MEETING, 24th March 1949, Luton, "Biology of Native Bees" by Dr. V. H. Chambers. 26 members present.

*Chairman*—Mr. W. P. Gatward.

27TH ORDINARY MEETING, 20th October 1949, Luton, "British Dragonflies" by Cynthia Longfield. 26 attended. *Chairman*—Miss M. E. Gurney.

28TH ORDINARY MEETING, 10th November 1949, Bedford, "Bedfordshire Butterflies" by Bernard B. West. 24 members attended.

*Chairman*—Mr. H. C. M. Felce.

29TH ORDINARY MEETING, 24th November 1949, Dunstable, "Freshwater Fishes" by Mr. F. G. R. Soper. *Chairman*—Mr. W. D. Coales.

30TH ORDINARY MEETING, 15th December 1949, Bedford, "Insect Study in a Prisoner of War Camp" by Major G. Hague, of Potters Bar. Attendance of 30. *Chairman*—Brig. C. C. Foss.

## Field Meetings

SUNDAY, 8TH MAY, WESTONING MOOR AND TINGRITH DISTRICT. *Leader:* Mr. Ray Palmer. There was a good attendance for this opening meeting of the summer programme, and the weather was warm and sunny. A brief visit was made to Westoning Moor where the interest was mainly botanical; later some of the party explored Tingrith sandpit where there is a large colony of sand-martins, and then went on to certain woods near Eversholt to hear the wood warbler.

SUNDAY, 19TH MAY, GEOLOGICAL EXCURSION. *Leader:* Mr. G. D. Nicholls. A tour of a number of geological sites was made by 21 members; visits included the clay pits at Stewartby, where the party inspected an exhibit of fossils prepared by Dr. Whiting and Mr. Seal of the London Brick Company. The lower greensand was examined at Woburn, and the upper parts (silver sand) at Shenley Pits near Leighton Buzzard. A visit was later paid to the lower chalk at Totternhoe and the middle chalk at Dunstable Downs, and finally glacial gravels at Limbury.

SATURDAY AND SUNDAY, 21ST AND 22ND MAY, LUTON HOO. *Leader:* Dr. J. G. Dony. Owing to an unfortunate error in the printed programme, Dr. Dony led two excursions on consecutive days for the convenience of members and visitors of the Herts. N.H.S. Both excursions were mainly botanical and had the benefit of sunny weather.

THURSDAY, 23RD JUNE, SHEERHATCH WOOD. *Leader:* Miss J. Godber. This was an evening meeting and members were taken round the wood by the Keeper. Some interesting plants were noted but no rarities.

SUNDAY, 26TH JUNE, FLITWICK MOOR. *Leader*: W. P. Gatward. A joint meeting with the Herts. N.H.S., and the attendance was good. All parts of the Moor were visited, but the weather was so hot and sultry that little serious work was possible.

SUNDAY, 24TH JULY, WOODWALTON FEN AND HOLME FEN. *Leader*: Dr. J. G. Dony (in the absence of Mr. Tebbutt). A party from Dunstable, Luton and Bedford visited Woodwalton Fen, and dividing into several groups explored various parts of the reserve. Many interesting plants were seen, and although late in the season for birds, sedge warblers, sparrowhawks and others were observed. Insect life was particularly abundant, and the weather very hot. A short visit to Holme Fen was made on the return journey.

SATURDAY, 6TH AUGUST, EATON SOCON. *Leader*: Dr. J. G. Dony. This meeting took place in fine weather and there was a good attendance. A visit to the water meadows proved profitable botanically, and a plant new to the County—*Elcocharis uniglumis*—was discovered.

SATURDAY, 3RD SEPTEMBER, HOUGHTON CONQUEST. *Leader*: The Rev. R. H. Goode. The party met at the Rectory and rambled through Kings Wood to the ruins of Houghton House. Some interesting botanical finds were made during sunny weather.

## Botanical Section

A preliminary meeting was held in the Nature Room, The Avenue, Bedford, on 17th February 1949, under the chairmanship of Dr. J. G. Dony, at which about 25 members were present. After an address by the Chairman, and some discussion, it was decided to inaugurate a Botanical Section, and officers were elected as follows:—

*Chairman*: Dr. J. G. Dony; *Secretary*: Mr. A. W. Guppy; *Committee*: Miss E. Proctor and Miss G. H. Day (Brig. C. C. Foss later co-opted).

The principal object of the Section at present is to assist the less expert members in the identification of specimens with a view to carrying out studies in local ecology.

The work of the Section was somewhat disorganised by the illness of Dr. Dony soon after this meeting, but further indoor meetings were held on 22nd March and 19th May; at the former, an account of the previous work carried out in the county was given by the Secretary.

### FIELD MEETINGS OF THE BOTANICAL SECTION

SUNDAY, 20TH FEBRUARY. A party of about a dozen visited White's Wood at Stagsden to see the old-established station of *Helleborus foetidus*, and then moved on to Astey Wood where they were able to see a single specimen of *H. viridis*.

SATURDAY, 9TH APRIL. Three members spent the afternoon in the Bromham area, chiefly in search of violets. *Viola silvestris*, *hirta*, *odorata* and *permixta* were found. *Leader*: Mr. A. W. Guppy.

THURSDAY, 2ND JUNE. A party of six members spent an interesting evening in Hanger Wood, Stagsden.

THURSDAY, 16TH JUNE. Ten members met at Oakley Hill cross-roads, and explored Judge's Spinney and Brown's Wood. The White Helleborine was found in the former and the Butterfly Orchid in the latter. *Leader*: Miss G. H. Day.

SATURDAY, 18TH JUNE. An afternoon excursion to the gravel-pits and river-side at Felmersham was attended by six members under the leadership of Dr. Dony, now happily able to resume field activities.

THURSDAY, 30TH JUNE. Three members walked from Stevington to Pavenham, and many of the commoner grasses were identified. A fair amount of *Cynoglossum officinale* was found in fruit, and young shoots of *Impatiens fulva* were identified in one of the riverside spinneys.

SATURDAY, 13TH AUGUST. Six members spent the afternoon in the Harrold neighbourhood, chiefly along the riverside, where many aquatic species were found, including *Impatiens fulva*. The excursion ended with a visit to the field in which *Falcaria* appears annually; despite the fact that the crop had been cut that morning some specimens were found. *Leader*: Miss G. H. Day.

## The 1949 Fungus Foray

Our third Fungus Foray, now firmly established as a regular annual event, took place on Saturday, 22nd October at Clophill. Eleven members were present. Our previous leader, Dr. R. W. G. Dennis of Kew, being abroad, we were fortunate in having the guidance of Mr. J. M. B. King, who was most helpful. As the weather conditions immediately before this date had been most favourable for fungus growth the foray proved to be a great success. Fifty-two species were identified.

During the morning the State Forest at Pennyfathers' Hills was explored with profitable results and the afternoon was spent in Warren Wood. Perhaps the latter provided the most spectacular results and members will in particular long retain in their minds the glowing spectacle of scores of Fly Agarics (*Amanita muscaria*) in the autumn sunshine.

The complete list of specimens recorded during the day is given below.

*Amanita mappa*, *Amanita muscaria*, *Amanita rubescens*, *Boletus badius*, *Boletus edulis*, *Boletus luridus*, *Boletus piperatus*, *Boletus scaber*, *Calocera viscosa*, *Cantharellus aurantiacus*, *Clytocybe odora*, *Coprinus comatus*, *Collybia dryophila*, *Collybia fusipes*, *Collybia maculata*, *Cyathus vernicosus*, *Dacromyces deliquescens*, *Daedalia quercina*, *Fistulina hepatica*, *Flammula carbonaria*, *Flammula gummosa*, *Fomes annosus*, *Hebeloma crustuliniforme*, *Hypholoma fasciculare*, *Hypholoma hydrophilum*, *Hypholoma sublateralium*, *Lactarius rufus*, *Lactarius turpis*, *Lepiota rachodes*, *Lycoperdon gemmatum*, *Lycoperdon pyriforme*, *Marasmius erythropus*, *Marasmius peronatus*, *Mycena epipterygia*, *Mycena galericulata*, *Mycena galopus*, *Mycena nivea*, *Mycena sanguinolenta*, *Omphalia fibula*, *Paxillus atrotomentosus*, *Paxillus involutus*, *Phallus impudicus*, *Pholiota spectabilis*, *Polyporus betulinus*, *Polyporus giganteus*, *Polyporus squamosus*, *Psalliota campestris*, *Russula cyanoxantha*, *Russula drimeia*, *Scleroderma vulgare*, *Thalephora terrestris*, *Xylaria hypoxylon*.



## Ornithological Section

During the early months of 1949 meetings of the Section continued on the same general plan as in the last three months of the previous year. One meeting each month was held in both Bedford and Luton, and each pair of meetings had the same subject. As in the earlier meetings the subjects centred round either a taxonomic group of birds, or some particular aspect of ornithology. This system seems to have been both successful and appreciated. The "Crow Family" formed the subject of the first meeting of the year held in Luton. "Ducks" were under consideration in Bedford at the end of January and in Luton in February. Both these subjects proved to be of interest, and undoubtedly working systematically through the families of birds must occupy considerable time in the Section's future programme, as being the best way of covering a very wide field, but at the same time presenting the groups as units and as related to the whole class.

"Migration", one of the most intriguing problems in the ornithological field, was the next subject chosen and, discussed with reference to the visible and audible signs of this phenomenon, gave some indication of the scope for work in this direction within the county. This occupied the February meeting in Bedford and the March meeting in Luton.

The final meetings of the session were devoted to the discussion and planning of field activities for the spring and summer months.

While support for the indoor meetings fluctuated it was, at times very good. Over fifty members attended the January meeting in Bedford, a most encouraging response. Although the numbers at Luton meetings were always smaller than those in the north of the county, and at times very few indeed, some of the smallest meetings were, in many respects, among the most successful.

To sum up, when the end of March came, and the last meetings of the winter session were held, we were able to look back with satisfaction on the first five months of the Section's existence.

During the summer months a number of Field Meetings were held in various parts of the County, but these were not so well attended as the indoor meetings, although a great deal of useful ground work was accomplished. An additional excursion was made to Horsey Island, Essex, during the height of autumn migration in September.

A number of surveys were undertaken during the year to determine the breeding distribution of several species in the Ouse Valley and the Chalk Hills, but, unfortunately, the response to these was somewhat disappointing. It is to be hoped that next year we shall see more activity in this field.

The second Winter Programme began in Bedford on 3rd October with a most interesting talk by Mr. Derek Goodwin on "Domestic Birds and their Origin", and was attended by forty-three members. Later in the month the first meeting in Luton was held, the subject being a talk and discussion on "Eggs" and was followed in November by the closely allied subject of "Nests". In November also, a meeting was held in Bedford and took the form of a discussion on "Finches". This was illustrated by specimens kindly loaned by the Bedford Modern School Museum, where the meeting was held. At all these meetings lively discussion followed the preliminary speaker.

The final meeting of the year was a field excursion to Blatherwycke Park, Northants., and the Eyebrook Reservoir, Leicestershire. Many interesting species of wild fowl were seen including Canada Goose, Goldeneye, Sheld-duck, Goosander and Shoveler.

At the beginning of October we learned with regret that we should be losing our Secretary, as he was now leaving Bedford. The office was now kindly filled by Miss P. Soper until Mr. Gribble returned to Bedford in December.

At the ending of the first complete year of the Section's history it was felt that it could look back with satisfaction at the work started and it is to be hoped support for all meetings, especially in the field, will continue to grow in the coming year.



LEADING PERSONALITIES AT THE  
BEDFORDSHIRE ORNITHOLOGICAL CONFERENCE  
20TH MARCH 1949

*Left to right: B. W. Tucker, Keith Piercy, W. B. Alexander, E. M. Nicholson,  
Philip E. Brown, Henry A. S. Key, C. W. Holt.*

*(Reproduced by courtesy of the "Bedfordshire Times")*

## Bedfordshire Ornithological Conference

The first of what is hoped will become an annual event was held in conjunction with the British Trust for Ornithology at Bedford, on Sunday, 20th March 1949.

Nearly two hundred people, including members of our own Society and delegates from Societies in the counties of Bucks., Cambs., Herts., Hunts. and Northants., had assembled when the Chairman, Keith Piercy, B.Sc., introduced Alderman J. A. Canvin, J.P., Deputy Mayor of Bedford, who extended an official welcome to the visitors.

During the morning excellent lectures were delivered by B. W. Tucker, M.A.—Editor of *British Birds*—who spoke on “Some Problems of the Amateur Ornithologist”, and by W. B. Alexander, M.A. (Librarian, Edward Gray Institute, Oxford), who illustrated his talk on “Bird Observatories” with slides

After the luncheon interval Philip E. Brown (Director of Watchers and Sanctuaries, R.S.P.B.), gave a lively address concerning “Bird Protection: the Present Position and Future Prospects”, which led to spirited discussion, and he was followed by E. M. Nicholson, C.B. (Chairman, British Trust for Ornithology), who outlined some “Modern Trends in Ornithology”.

To round off the proceedings the assembly was entertained with show of colour films by C. W. Holt, M.B.O.U. (Chairman, Leicestershire and Rutland Ornithological Society).

Photographs by Oliver G. Pike, F.R.P.S. and Dr. G. A. Metcalfe, A.R.P.S., and others, and specimens loaned by D. W. Elliott, were much admired and stimulated keen interest. The Society expresses its gratitude to these and other persons who helped in various ways to make the events of the day so successful. We are further indebted to the *Bedfordshire Times* for reporting the proceedings and for the permission granted to reproduce one of the excellent photographs taken on this memorable occasion.

## Deer in Britain

*Presidential Address given by HIS GRACE THE DUKE OF BEDFORD, at the Third Annual General Meeting, at Bedford, on 2nd March 1950.*

The definition of a "Deer" is not, as the well-known scientist Richard Lydekker has pointed out, quite as easy a matter as might at first sight appear. Deer are usually regarded as ruminants, the males of which carry antlers the whole of which are shed and reproduced annually. This definition, however, is not entirely satisfactory since there are one or two species of living deer and several extinct forms in which the males possess no antlers, although, in the case of the living species, they possess long tusks in the upper jaw. Other features of members of the deer family are the possession of upper canine teeth and the fact that the lateral metacarpal bones of the legs are represented only by their upper and lower extremities. In some instances, however, the lateral metacarpal bones not only retain their lower ends, but are complete in their entire length.

There are many species and sub-species of deer occurring in Europe, Asia and North and South America, but deer do not occur in Africa south of the Sahara Desert, nor, of course, in Australasia except where introduced by man.

In Great Britain there are three native species of deer and three more which have been introduced and are in process of establishing themselves in a wild state.

The three native species are the Red, Fallow and Roe Deer; while the three which have been introduced are the Japanese Sika, the Reeves Muntjac from Southern China, and the Chinese Water Deer.

### RED DEER

The Red Deer is found in a wild state in large numbers in the Highlands of Scotland. A few exist in the Lake District; a certain number in Devon and Somerset; and a very few are still found in the New Forest. On the Continent, the Red Deer is found over a large part of Central and Southern Europe. In the Caucasus there is a sub-species the pelage of which is blacker and greyer and less red than that of the Western European Red Deer, while in Kashmir there is an allied, but distinct, species differing somewhat in voice, colour and in the formation of the antlers.

A local race of the Red Deer, the Barbary Deer, may also still occur in North Africa, but its present status seems rather uncertain and there is some fear that it may follow the North African race of the Fallow Deer along the path of extinction.

The Red Deer, as its name implies, is usually dark red in colour, the coat being brighter and shorter during the summer months. In the case of deer the size of Red Deer, or larger, the male is known as a stag, the female as a hind, and the young as a calf (in the case of Elk and Moose bull, cow and calf are the terms generally in use). In the case of the smaller species of deer the male is known as a buck, the female as a doe, and the young as a fawn.

Red Deer stags begin to shed their antlers in March, the fully adult males in the best condition being the first to lose their horns, while the yearling stags or "knobbers" may carry theirs until May. Antler growth is completed by the end of July or August, when the velvety skin which has covered the sensitive horn during growth dries up and is rubbed off by the animal against rough herbage or the branches of trees. Red Deer antlers vary enormously in regard to size and the number of points, food and heredity being the deciding factors. The popular belief that a stag, when growing, adds an additional point each year to his antlers is largely a fallacy. This may happen occasionally during a certain period in a stag's life but there is no general rule whatever. The first pair of antlers grown by a male deer and completed when he is about eighteen months old, consist of two single unbranched spires of horn. As a two-year-old he often has six points, and when fully adult he may have anything from ten to twenty points, or more. When a stag becomes aged, his antlers decline both in size and in the number of points. Normally, a young stag begins to grow his first pair of antlers when he is about twelve months old, but in an experiment made in Germany, when very forcing and nutritious food was given to Red Deer calves, it caused them to grow antlers when they were only about six months old.

The antlers of modern Red Deer are, on the whole, nothing like so fine as those of the deer which inhabited Europe in prehistoric times or even during the Middle Ages. Occasionally, however, even at the present time Red Deer on the Continent produce, under very favourable conditions, antlers which are inferior only to the very largest heads of bygone days, and even in Britain I know of one wild stag who has carried a magnificent head of twenty-one points. In Scotland where the feeding and shelter are poor and the deer are compelled to live a rather unnatural existence on exposed hillsides without the shelter and feeding provided by forests, even a twelve point head is often an exceptionally good one and is known as a "Royal". Judging from the records of old writers it would appear that British Red Deer a few hundred years ago were about a month earlier in all their seasons than their descendants of the present day, superior feeding being doubtless the cause.

The rut or breeding season begins towards the end of September. At this time a great change takes place in the stag's appearance and behaviour. Having for many months past preferred the company of his own sex, he now becomes exceedingly jealous and excitable, ceasing entirely to feed and spending his time in rounding up his harem of hinds and driving off, and occasionally fighting with, rivals. The stags challenge, a wild yawning roar, has been well described as one of the finest sounds in Nature, anyhow in our own country.

A good deal of nonsense has been written about the tactics employed by stags when fighting or about to fight. They do *not* "rush at one another with lowered heads meeting with a resounding crash". Two rivals about to engage in battle approach one another at a walk, stopping occasionally to roar and tear up the ground with their horns. When they are quite close together for a little while they walk along side by

side; then, as if by mutual consent, they stop, turn inwards, lower their heads and engage their antlers but pause for a second before beginning the actual struggle. When fighting, each stag endeavours to push his rival back so fast that he is thrown off his balance and obliged to expose himself to a thrust in the flank or shoulder. Fatal injuries are occasionally inflicted though these are somewhat rare.

Stags whose antlers are in velvet, and also hinds, fight by rising on their hind legs and striking one another with their forefeet, but such battles are of short duration and no real damage is done.

Hinds usually begin to breed when three years old, the single calf (twins are exceedingly rare) being born at the end of May or during the two succeeding months. The calf is profusely spotted with white, but the spots disappear even before the summer has ended. For the first few days the hind hides her calf in thick cover remaining in the neighbourhood to protect it from any fox or dog which may discover it.

When pursued by hounds or wolves Red Deer seek refuge in water where they are fast and very enduring swimmers.

The food of Red Deer consists partly of grass and heather and partly of the leaves and bark of trees, the ash being the favourite. They are fond of chestnuts and acorns and stags will rise on their hind legs and strike the low-growing branches of oaks with their antlers in order to make the acorns fall. Unless very hungry and in very large numbers Red Deer do not do much damage to evergreen conifers and the intense hostility displayed towards all deer by the Forestry Commission, who kill them regardless of sex and season and often with cruel and unsuitable weapons, such as shot-guns, is hardly justified. It must be admitted, however, that Red Deer are very fond of farm crops and can do great damage where they have access to them.

Red Deer have a keen sense of smell and are more disturbed by the scent of a man than by seeing him. Their eyesight is fairly good but very inferior to that of wild sheep and goats.

In addition to his challenge during the rutting season, the Red Deer stag has a more plaintive call which is used by the weaker animal when engaged in a friendly sparring match, and is apparently a request to the stronger not to be too rough. Occasionally, though rarely, the stag will utter a bark of alarm. This call, however, is much more frequently used by the hind, who in addition has a special call for summoning a calf. The latter has a high-pitched cry when calling to its mother, and when in great fear or distress it will also scream like a hare.

#### FALLOW DEER

The early history of the Fallow Deer in this country is a matter of some uncertainty and dispute. There is a not very well authenticated tradition that it was first introduced by the Romans, but the fossil remains in Pleistocene deposits indicate the presence in this country of a deer practically indistinguishable from our modern Fallow Deer, so that it is just possible that the species may always have been here in a wild state.

At present the most ancient wild herds in the country are those in

the New Forest and in Epping Forest, but as the deer in the latter are black they were probably introduced by human agency at some fairly remote period. Fallow Deer are very much smaller than Red Deer. Those of the original wild colour are brown in winter with paler underparts. The tail is fairly long and black on the upper surface and white on the under. The summer coat is much brighter and there are a certain number of yellowish-white spots mingled with the brown. Having been semi-domesticated in parks for many centuries, Fallow Deer, like most domestic animals, have come to display a great variety of shades of colour—black, dun, white, blue-grey, cream-yellow and a fairly pale type, the menil, which retains its spots throughout the year, but is much more brightly spotted in summer. For some unknown reason the black race of the Fallow Deer is usually referred to by writers as "the dark brown breed", although it is quite black on the upper part of the body and very dark grey on the lower part.

A Fallow buck has two points on each antler which project forward, the top portion of the antler being much flattened with a large number of little points or snags along the top and rear edges. The better the head the buck carries, the wider is the palmation and the longer and more numerous are the points on the palmated portion of the horn. Deer which are degenerate from lack of proper food or in-breeding often show very little palmation. A Fallow buck is fully grown when six years old, but he is not a long-lived animal, beginning to show signs of age a very few years later and much sooner than a Red Deer stag.

Adult Fallow bucks begin to shed their antlers about the third week in April and clean them of velvet in August a few weeks later than Red Deer. The first male Fallow Deer to clean their antlers are usually those yearlings who were strong early fawns and came through the winter well, and the latest bucks to clean are sometimes the fully adult ones with the finest heads. In this respect Fallow Deer differ from almost every other species for it is usually the adult males which are the first to get rid of the velvet and the yearlings which are the last.

The breeding season of Fallow Deer begins somewhat later than that of Red Deer. An odd buck may be heard calling at the very beginning of October but actual mating does not occur until the third week of the month. Fallow fawns are born in June and July and, as in the case of Red Deer, their mothers hide them for the first few days, or, if thick cover such as bracken, be available, for a considerably longer period. As in the case of Red Deer, twins are exceedingly rare and triplets quite unknown.

Fallow bucks have a well-developed territorial instinct closely resembling that of certain birds. Although the ancient story that herds of bucks, marshalled under recognised leaders, will meet and do battle for favourite grazing grounds, is, to say the least of it, somewhat of an exaggeration, different herds do show a mutual recognition of each others' territorial rights.

In Woburn Park, at any rate, it is also not uncommon for individual Fallow bucks, during the height of the rut, to stake out territories fairly close to one another with boundaries invisible to the human eye, but

very definitely recognised by the deer themselves, each buck being supreme as long as he stays on his own territory. The does come on to these territories, but Fallow bucks, unlike Red Deer stags, make little attempt to keep their harems together.

After the breeding season is over, Fallow bucks, if in good condition, take great pride in their place in the herd, there being considerable rivalry for the position of master. Although it is difficult to credit animals with a capacity for abstract thought, some of my observations on Fallow Deer have made it almost impossible for me not to conclude that a Fallow buck is capable of thinking of the mastership as something desirable in itself. I have often known strong deer with ambitions for the first place, to leave their herd and forego the food they were receiving, and, for a few days, live in solitude in a different part of the Park and go into training, as it were, before returning and challenging the master-buck to a duel. If the challenger were successful, he would celebrate his victory by uttering, for a day, the rolling grunt characteristic of the breeding season, but he would only indulge in this form of celebration if he had won the actual mastership. Any lesser successes were not considered worthy of such advertisement!

Fallow Deer are undoubtedly more intelligent than Red Deer and when living in a wild state are much better able to evade their human enemies.

Male Fallow Deer have a number of different calls—the challenge of the breeding season already described; a short grunt or bark of alarm, rarely heard; a series of grunts uttered in a rather minor key when a weaker animal is giving way to a stronger one; a call occasionally uttered under the influence of extreme pain or fear, and another call, sometimes heard when a buck is fighting but realises that he is the loser and will soon have to beat a hasty retreat. The doe utters a bark of alarm; a special call for summoning her fawn and a plaintive squeaking noise when giving way to a stronger animal. Fawns have their own call for their mothers and a scream when in distress.

In a wild state, the Fallow Deer occurs in certain parts of Southern Europe, the colour being similar to the ordinary brown type found in English parks although the summer coat is, on the whole, more spotted. In Mesopotamia a much larger and distinct species of Fallow Deer at one time existed which has, unfortunately, become extinct within the past fifty years.

#### ROE DEER

Roe Deer are widely distributed in Scotland where suitable cover exists, as they are mainly woodland animals. They are also found in Central and Southern Europe and allied forms occur in Asia as well.

The summer coat of the Roe Deer is a more or less uniform bright red. The winter coat is a darker greyish-brown with a white patch on the throat, a white spot on each side of the dark muzzle and a white rump patch. Albino and melanistic forms sometimes occur, the latter being common in certain districts of Germany. In England, the Roe after becoming extinct some centuries ago has been successfully re-introduced in certain districts, Dorset being the main centre of distribution from which the species has spread rather widely.



Roe Deer begin to shed their antlers at the end of November, and the new ones are hardened by early April. A normal antler has three points, one more or less vertical and a posterior terminal fork nearly at right angles to the basal part of the beam, which is much roughened. The breeding season takes place at the end of July and the beginning of August, the fawn or fawns, for twins are very common, being born at the end of May. The period of gestation is a long one, the embryo developing very slowly until the middle of the winter. The doe Roe Deer, like the female of many other species, hides her young in thick cover during the first few days of their lives.

Although not averse to polygamy should opportunity offer, the Roe buck is often content with a single mate and may remain with her during a considerable part of the year, with the possible exception of early autumn. The challenge of the Roe buck has been compared to the bark of an old Collie dog, and he also barks freely when alarmed. The female Roe Deer has a similar alarm call and a different one when she wishes to attract the male.

Roe fawns are spotted at birth and make attractive pets as long as they are small. Some does remain gentle with grown-up people when they are fully adult, but are seldom to be trusted with children. Bucks, in spite of their small size, become exceedingly savage and dangerous.

As a general rule, Roe Deer do not thrive very well in close confinement and if kept in captivity need a generous and varied diet which includes corn and the leaves and twigs of trees. It is impossible to keep this species in health in a grass park suitable for Red or Fallow Deer.

In Scotland, Roe Deer are occasionally killed by eagles if the latter can catch them away from the shelter of thick cover. Foxes are fond of the young fawns, but are only able to kill them in the absence of their mothers who are well able to protect them if they are at hand.

Roe, like other deer, are much persecuted by the Forestry Commission although, when in moderate numbers, the damage they do to plantations and crops is much less serious than that inflicted by the larger species.

#### INTRODUCED SPECIES

Reference has already been made to the three species of deer not native to Great Britain which are in process of establishing themselves, locally, at liberty.

The Japanese Sika has been turned out in certain deer forests in Scotland and also in Dorset and it is kept in a few Parks. It is a rather smaller animal than the Fallow Deer, very dark brown in winter with a patch of white hairs around the rump which are capable of being erected when the animal is alarmed. The summer coat is rather redder than the winter one and is more or less spotted.

The buck carries an eight-point head with brow and tray antlers and a terminal fork. The rutting season takes place at the end of October and the beginning of November and the fawns are for the most part born in July. The challenge of the male is a kind of clear whistle in ascending and descending tones which may be repeated several times in succession, or uttered only once and followed by a deeper note. The

Japanese Deer has a peculiar gait when running, the four feet leaving and striking the ground almost simultaneously. Apart from its susceptibility to John's disease, the species is hardy and thrives in woodlands or under the more austere conditions of a Highland deer "forest."

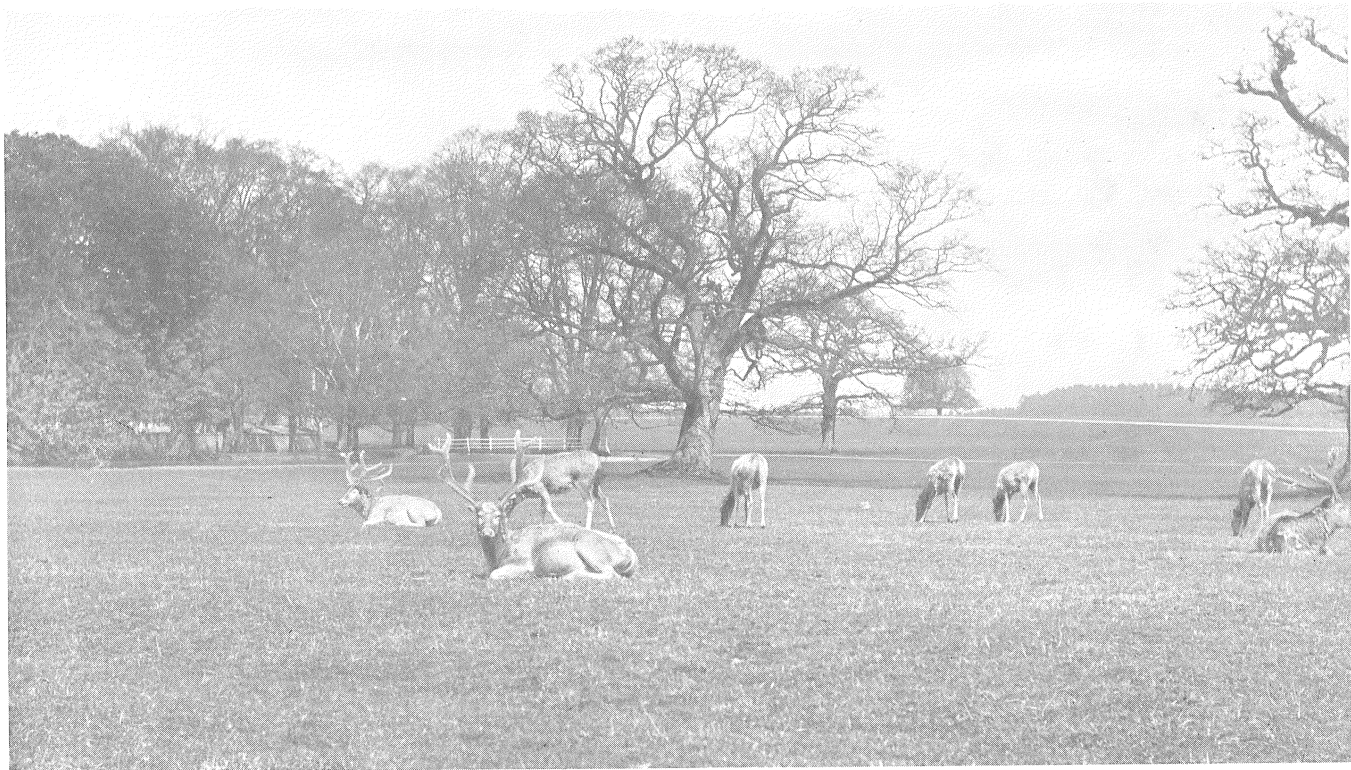
The Reeve's Muntjac from Southern China is a very small animal, no larger than a field spaniel, and the second smallest deer in existence. It was first turned out on the Woburn Estate and from there has spread to several neighbouring counties. It is a woodland species and either solitary in its habits or found in pairs. The colour, which does not vary much with the seasons, is brown shading into red-brown and the under surface of the tail, which is held erect when the animal is running, is white. The buck has very short horns with two points only and slightly curved at the tip, which grow on hair-covered pedicles. He is also provided with tusks in the upper jaw which are used in fighting. The fawns, which are slightly spotted at birth, may, as in the case of some other tropical and sub-tropical deer, be born at any season of the year. The buck, when searching for a mate, utters a hoarse bark at frequent intervals, but Reeve's Muntjacs do not use the barking alarm call to the same degree as the larger Indian species. Muntjacs are somewhat destructive to young plantations and market garden crops but their small size and slow rate of increase makes it easy for their numbers to be kept under control.

The Chinese Water Deer was not deliberately released, but some escaped when the gates of Woburn Park were left open during the war. It is rather larger than the Muntjac, but smaller than our native Roe Deer, which it resembles in colour when in summer coat. In winter, however, it is browner and less grey. The male is without antlers but has long tusks in the upper jaw which are capable of being moved by a special muscle and which are used in fighting.

The rutting season takes place in December and the fawns are born in May and June. The Water Deer is unusually prolific, twins and triplets being common and quadruplets not unknown. Although found in all types of country, it prefers open ground to woodlands. It is almost entirely a grazing animal and, unlike most deer, is harmless to young plantations. It also does very little damage to farm crops as it does not care for ripe corn nor are its teeth strong enough to enable it to bite roots. The venison is of a very high quality indeed. The only calls appear to be a hoarse bark of alarm uttered by both sexes and a scream when in great fear or distress. When running, Water Deer have a peculiar habit of throwing their hind feet up in the air, but they are not very fast and a dog can often overtake them. They are found singly, in pairs, and in small parties, but never in large herds.

#### PÈRE DAVID'S DEER

There is one other species of deer which, though not a native of Britain, nor living at liberty in this country, is, strange to say, represented almost exclusively by specimens in an English Park. This is Père David's Deer which formerly existed in the Honan district of China, but became extinct there many centuries ago, so that it has probably never been seen in an entirely wild state by a European.



PÈRE DAVID'S DEER AT WOBURN PARK IN EARLY SPRING.

A herd was, however, preserved in the Imperial Hunting Park in Peking, where it was first seen by Père David, the French missionary and scientist, after whom it is named. During the Boxer war the deer in the Park were destroyed or escaped and were killed in the surrounding districts, so that the only survivors were those which had been sent to a few Zoological Gardens on the Continent. These deer were collected by the eleventh Duke of Bedford and were the foundation of the herd at present living in Woburn Park, which now numbers between three and four hundred animals.

Père David's Deer is larger than the Red Deer and much more heavily built. From its fondness of water, it is evidently a marsh-loving animal, a fact further indicated by its large spreading hooves which click when the animal walks, as do the hooves of the reindeer which has a rather similar foot-formation. Père David's deer in summer are usually light red in colour with a dark stripe running along the spine and ending behind the shoulders. The winter pelage is greyer and there is an undercoat of very fine soft wool.

The antlers of the Père David stag are quite unlike those of any other deer. A few inches above the base there is a very long backward-pointing tine which often has several small snags towards the tip. This tine is much used by the animal for digging in the ground and even for collecting lumps of mud to deposit on his back and give him the luxury of a mud bath in hot weather. Some inches above this tine there is a second shorter one, the direction of which is also mainly to the rear while in good heads the antler ends in a terminal fork at right angles to the other points. Adult Père David stags usually begin to shed their antlers in October, and they are cleaned of velvet during May. At one time it was the habit of most of the adult stags to grow two small pairs of antlers in twelve months instead of one large one, but for some unknown reason there has been a reversion to what appears to have been the more usual, natural habit of growing one large pair of antlers only, and it is now very rare for any animal to indulge in the other very peculiar habit of antler growth.

The rutting season takes place in June and July. The stags at this time entirely cease to feed and are just as jealous and quarrelsome as Red Deer stags. Rival males occasionally inflict fatal injuries on one another, although they also spend a great deal of time in hostile demonstrations walking backwards and forwards and round and round a few yards away from one another. During the breeding season the master stag and his harem have a habit of taking their siesta closely crowded together on the same patch of ground which is commonly resorted to year after year and becomes quite bare of grass. The challenge consists of two or three guttural braying roars which are sometimes varied by a series of preliminary grunts if, as sometimes happens, a stag should be cantering as he calls. The calves are born in April and May after a period of gestation longer than any other deer, and are at first spotted with yellowish-white spots. Like Red Deer calves, for the first few days of their lives they lie curled up on the ground in any shelter they can find. As soon as they are able to run, they have a curious habit of associating with their fellows in a kind of "school" and may frequently

be seen all lying together about fifty or a hundred yards away from their mothers. Père David hinds, and sometimes also stags, have an alarm call, not altogether unlike that of a Red Deer hind. When summoning their calves, the hinds have a call resembling an abbreviated version of the stag's challenge and the calves themselves have a very clear, high-pitched call when anxious to find their mothers.

Père David's Deer often move at a high-actioned trot which recalls the movements of a horse rather than those of a deer and when running they partly raise their tails, which are long for a deer, with long hair reaching slightly below the hocks.

If disturbed by a person approaching them, Père David's Deer have a curious habit of starting to run away to the right or to the left and then suddenly changing their minds and rushing back in the opposite direction.

Although the Père David has no near relatives among living species and has been rightly placed in a sub-genus of its own, a very curious Red Deer hybrid was bred at the Paris Zoological Gardens many years ago, being later sent to Woburn. This animal, a female, associated with the Père David's but bred with the Red Deer, producing fertile young of both sexes. She was a remarkable animal partly by reason of her fertility although produced by the union of parents so markedly different; and partly, also, for the fact that there is a very wide difference in the period of gestation of the Red Deer and of the Père David's deer, a circumstance which, some experts would declare, would render the production of a living hybrid impossible.

EDITORIAL NOTE.—The illustrations are from the Duke of Bedford's recently published autobiography—"*The Years of Transition*", and are reproduced with His Grace's permission. Acknowledgement is made to the publishers, Messrs. Andrew Dakers Ltd., for the loan of the blocks.

# The Weather of 1949

By A. W. GUPPY

Once again the year under review was very different from its predecessor; 1948 had a cool summer and a slight excess of rainfall, whereas 1949 had one of the sunniest and warmest summers on record, and the rainfall was everywhere deficient, some localities recording little more than three-quarters of their annual average.

January and February were unusually dry. The intense anticyclone which persisted from 21st January to 6th February gave several days with long hours of sunshine and keen night frost, the lowest air temperatures of the year, 20°F., occurring on the two successive nights of 3rd and 4th February. Another chilly period was experienced for the first ten days of March, all stations recording some snow on the 5th. A few warm days occurred in the third week, but the month closed with cold dull weather. April was notable for the fine sunny weather around Easter, the temperature on the 16th reaching 77° at Bromham and Cranfield, 80° at Cardington and 83° in Bedford; this was, in general, the warmest April day ever recorded.

The first four months of the year had yielded little more than 4 inches of rain in most stations, but this was partially compensated for by a wet May, much of the rainfall accompanying the thundery conditions which persisted from 16th to 20th, particularly the violent storm on the former date.

The succeeding four months from June to September were dry, hot and very sunny with a total rainfall in some places below 3 inches. On 19 days the temperature reached 80° or more at Bromham and Cranfield, while at Cardington there were no less than 27 such days. A record night temperature was established on the night of 4th-5th September with a minimum reading of 66° though this was exceeded by a reading of 69° in Bedford.

The fine weather continued for the first fortnight in October. A very wet ten days followed, in which nearly 4 inches of rain fell, the 23rd in particular being a day of continuous downpour. November was fairly cold with normal rainfall; December somewhat warmer, though with some snow showers on 9th.

## TEMPERATURE

The average temperatures for the various months are here tabulated, and the average for the whole year compared with that recorded by Mr. Lock of Bedford. It will be seen that the average is 1.17° warmer than in the preceding year.

January	40.78	July	64.69
February	41.37	August	64.14
March	40.25	September	62.80
April	51.19	October	53.08
May	52.98	November	42.98
June	60.50	December	41.69
Average for the whole year			51.38
Average for Bedford (Mr. Lock)			50.97
(Average for 1948)			50.21)

The three hottest days were 12th July, 25th July and 5th September, all with 85°. These temperatures were exceeded at Cardington and Cranfield which recorded 89° and 88° respectively on 12th July, and 88° and 85° on 5th September.

There was no day throughout the year on which the temperature failed to reach freezing point; the coldest was 6th March with a maximum of 33°.

Air frost occurred on 53 nights, the keenest being on the nights of 3rd and 4th February on both of which 20° was recorded. There was no prolonged period of night frosts, the longest being from 27th January to 6th February. As in 1948, the first air frost of the autumn did not occur until 27th October.

#### RAIN AND SNOW

Measurable precipitation occurred on 125 days, the total amounting to 19.52 inches which is slightly over 6 inches less than in 1948. It is interesting to note that this total is almost identical with those of Kempston and Ampthill, and differs from those of Bedford and Cranfield by only about a quarter of an inch. On the other hand, the totals of the two stations to the south and east of Bedford, Cardington and Great Barford, are some 2 and 2½ inches respectively less than the Bedford figure; as in previous years the variations between stations are largely accounted for by thunderstorm rainfall, particularly that of 16th May.

Snowfall at Bromham occurred only on 5th March and 9th December; on both occasions the amount was small.

The longest dry spell without measurable rain was of 20 days duration (14th June to 3rd July inclusive).

#### THUNDERSTORMS

Thunder was heard on 13 days, but only on 16th May was it accompanied by heavy rainfall, 1.47 inches being recorded on that day. A similar amount, 1.43 inches, was measured in Queen's Park, Bedford, but Kempston had the remarkable total of 2.2 inches. Cardington recorded 0.83 inch for the same storm.

The storm of 16th July, which was severe in Bedford, gave only about 0.25 inch of rain at Bromham; that of 31st August, just under 0.5 inch.

#### PRESSURE

The highest barometric reading was on 30th January when a reading of 30.70 inches, uncorrected for altitude, was obtained. This occurred during the anticyclone previously mentioned and in a period of 16 days from 22nd January to 6th February, during which the barometer never fell below 30 inches.

The lowest reading was of 28.84 inches on 31st March.

#### SUNSHINE

The sunshine records at Cardington show that during the six months May to October inclusive there were only 8 completely sunless days and that no less than 25 days had over 12 hours apiece.

## RAINFALL FOR 1949

	Amphill	Aspley Guise	Bedford	Bromham	Cardington	Clifton	Cranfield	Great Barford	Kempston
January ... ..	0.79	0.77	0.67	0.86	0.76	0.91	0.66	0.95	0.73
February ... ..	1.19	1.27	0.98	0.98	0.95	1.13	1.11	0.88	0.93
March ... ..	1.20	1.39	1.35	1.31	1.12	1.26	1.27	1.15	1.29
April ... ..	1.34	1.63	1.29	1.30	1.24	1.37	1.15	1.13	1.17
May ... ..	1.60	2.04	3.24	3.39	2.04	1.57	2.39	2.34	3.97
June ... ..	0.81	1.12	0.91	0.88	0.71	0.67	1.15	0.60	0.99
July ... ..	1.30	1.04	0.90	1.06	0.98	2.05	0.94	1.17	0.93
August ... ..	1.85	1.90	0.85	1.02	1.25	1.36	1.64	0.74	0.92
September ... ..	0.68	1.37	0.62	0.53	0.37	0.43	1.15	0.30	0.53
October ... ..	4.34	5.25	4.74	4.79	3.90	3.96	4.60	4.08	4.49
November ... ..	2.95	2.76	2.39	2.07	2.55	2.51	2.54	2.10	2.40
December ... ..	1.42	1.24	1.23	1.33	1.23	1.47	1.13	1.21	1.15
Total ... ..	19.47	21.78	19.17	19.52	17.10	18.69	19.73	16.65	19.50
Wet days ... ..	—	—	—	—	130	118	—	121	—

Amphill (Mr. Horne).  
 Aspley Guise (Mr. Young).  
 Bedford (Mr. Lock).  
 Bromham (the writer).  
 Cardington Aerodrome (per Mr. Speed).

Clifton (Mr. Inskip).  
 Cranfield Aerodrome (Air Ministry Daily Weather Report).  
 Great Barford (Mr. Whitchurch).  
 Kempston (Mr. Payne).



## Worm Eating Slugs in Bedford Gardens

By H. F. BARNES  
(with one Plate)

Most kinds of slugs are scavengers, feeding on decaying vegetable matter and animal refuse as well as on living plant tissue, but there is a group of three species belonging to the genus *Testacella* whose members are predaceous and live largely on earthworms. This group is peculiar in that its members have a small external shell visible on the tail end of the body (see Plate 4).

Two species, *T. haliotidea* and *T. scutulium*, occur in Bedford gardens. Specimens have been found during the last four years in Clapham Road (C. M. Lucas), Chaucer Road (C.H.), Rothsay Road and Rothsay Gardens, while an old record (1911) reports the presence of *T. haliotidea* in a Waterloo Road garden.

As is usual with all slugs, *Testacella* are nocturnal, hiding during the daytime in the soil, under leaves and stones, etc., only coming to the surface after dark. Some authorities state that they hibernate, retiring deeply into the soil and ensconcing themselves in a mucus-lined earth-chamber. The writer has no evidence of this, although surface activity is suspended whenever the temperature falls below a few degrees above freezing point, during very dry and in extremely hot weather just as is the case with other kinds of slugs. In fact *Testacella* have been found crawling about flower-beds, paths and lawns every month of the year. There do however seem to be more *Testacella* active, at least above ground, during the spring and autumn months than at other seasons of the year. This is probably due to the fact that the most favourable conditions for surface activity of the *Testacella* and their prey occur most frequently at these seasons of the year.

It may be of interest to record that on six occasions in November 1949, between 20 and 24 individuals were counted during the standard half-hour walk round one garden. The largest number seen during the spring months in the same garden was 10 on 17th May 1949. Compared with other garden slugs these numbers are not large; up to 425 Grey Field Slugs and up to 129 *Milax sowyerbyi* having been collected during the same period in Bedford gardens.

Incidentally, *Testacella* does not seem to have been affected lethally at all by the drought of 1949, since in the same garden during November 1948, when half-hour counting was being done every night, there were only six nights when 10 or more were seen and the highest number was 15. On the other hand the numbers of the Grey Field Slug were greatly reduced.

Attempts are being made to elucidate the life history of *Testacella* by making half-hour collections throughout the year in one garden and by corresponding half-hour observations, without removal, in an adjacent garden. Those seen in this latter garden are noted as "babies", "toddlers", "small", "medium" and "big", whereas those collected in the other garden are weighed and not returned. The "babies" weigh up to .01 or .02 gramme, the "toddlers" about .03 to .06, while the "big" weigh from about .80 to 2.94 or more. So far most "babies" and



Contracted at rest



Extended in motion

WORM-EATING SLUG, *Testacella* sp.

(Photographs by C. G. Builer)

"toddlers" have been seen during November and December, while most of the ones seen during the spring months have been larger individuals. Actually, the three largest specimens (2.82, 2.92 and 2.94 grammes) were seen on 19th May 1947, 30th March 1947 and 18th April 1950 respectively. The only clue to mating has been the fact that on the night of 24th May 1948, two large individuals were seen apparently following each other on a moss-covered lowest brick of a wall. If one sees the slug *Milax sowerbyi* doing this it is a sign that mating will soon occur.

An experiment was made during October 1948 in marking *Testacella* by painting their shell either red or white. These marked individuals were replaced in the garden and half-hour observations made each night until the following April. The object of this experiment was to see if it is possible to mark *Testacella*. If so one would then be able to assess the total population in a given area and also follow the activities, natural growth rates and longevity of individuals. The experiment was partly successful because the paint mark remained on at least two of the individuals for over a year and a half; two "red" slugs liberated on 15th October 1948, being seen again on 10th and 21st May 1950. Among other notes made it is recorded that a "white" individual was seen on 4th, 12th and 16th November 1948, in positions that indicated that the slug had not moved more than about fourteen feet during this period and suggested that it came up to the surface, possibly to feed, at these intervals. This individual has been seen once again on 11th May 1948, but by this time it had moved about twenty feet out of its original area and the white mark was showing definite signs of wear and tear.

Their method of eating earthworms is fascinating. The *Testacella*, on the occasions seen, have seized a worm at one or other extremity or at about one-third from the end, introverted their own head and then proceeded to suck in the worm a few segments at a time, until finally after about an hour the whole worm had disappeared from view. The slowness of this ingestion is in marked contrast to the speed at which a *Testacella* will, when handled soon after a meal, literally cough up the whole worm in a matter of seconds. The size of the worm varies but often the worms have been as much as three times the length of their captors. Once a large *Testacella*, about  $2\frac{1}{2}$  inches in length, was observed biting into a 6 to 8 inch worm one-third down from its head. The worm was writhing about and at one instant raised most of itself from the ground carrying the slug with it but the latter hung on grimly. After an interval of about two hours the *Testacella* had severed and swallowed the front portion of the worm leaving the posterior two-thirds on the surface of the soil.

On another occasion two slugs in captivity were seen ingesting one worm, each slug beginning at the opposite end to the other. A tug-of-war for possession of the worm ensued. When the suction of one slug caused 4 to 6 segments of the worm to be engulfed, the other *Testacella* had to emit 1 or 2 segments, because the swallowing process is not continuous and the slugs did not start at exactly the same moment. Then this latter slug engulfed 4 to 6 segments and the other one lost

about 2 segments it had previously swallowed. This alternating process of take and give went on for about three-quarters of an hour until, finally, the heads of the two slugs touched, each slug having swallowed about half the worm. Then about ten minutes later after great suction had been exerted by both slugs the worm broke, each slug retaining the portion it had ingested.

On no occasion has a worm after being bitten been seen to "flick" back into its burrow carrying the slug with it. This is stated to occur by some investigators. It does, however, appear that *Testacella* never releases its hold once made.

The feeding of the "baby" and "toddler" *Testacella* has not yet been observed.

I am indebted to Dr. C. G. Butler for the photographs illustrating this article and hope that these notes will encourage other members of the Society to make similar observations. It should be quite obvious that there are still great gaps in our knowledge concerning the habits of this most interesting group of slugs.

## Predators and Prey

By B. R. LAURENCE

Quite often we read that a certain group of animals is carnivorous or predacious. Far less often do we read of actual records of prey taken, whether one species of animal is preferred to another, and how much of each species is eaten. Without accurate knowledge of this kind we cannot begin to estimate the value of predators in the wild life of the countryside, what effect a reduction in numbers of any predatory animal will have on our agriculture or on our nature reserves. Quite recently at Sundon I saw a weazel catch a brown rat in the roadside verge. Not a remarkable observation, but is it significant that this rat was a young rat? In other words do weazels feed more on young rats than adults, or, does the age of the prey affect the result? Recently published observations on the badger show that this animal will feed on young rabbits, but apparently not on older. Observations on predation are uncommon, therefore any single predatory attack of any kind is worth a special record. One can, as in birds and fish, estimate what an animal eats by analysis of pellets or stomach contents, but many animals do not feed in a way that will leave recognisable fragments in their bodies. Of this latter type are those predators which only suck the juices of their prey. However, if one goes looking about for this type of predation one can usually find it.

The robber flies (Asilidae), as their name suggests, prey on other insects and suck their juices. *Machimus atricapillus* Fln., is a very common robber fly on the chalk hills, a greyish long bodied fly which rests on bare patches of earth, mole hills and tree stumps in the sunshine on the downland. From these places it makes its capture darts to secure its prey. The following is a list of prey recorded with predator from Pegsdon.

Prey of male: HEMIPTERA: *Euscelis lineolata* Brulle, male, 7.9.48; *Aphrodes albifrons* L., 23.8.48; *Aphrodes histrionicus* F., female, 23.8.48. DIPTERA: *Sciara carbonaria* Mg., female, 6.9.48; *Musca autumnalis* Deg., male, 19.8.48.

Prey of female: HEMIPTERA: *Aphrodes albifrons* L., 23.8.48; DIPTERA: *Melanostoma mellinum* L., female, 7.9.48; *Platycheirus albimanus* F., female, 31.8.47; *Chrysochlamys cuprea* Scop., female, 31.8.47; *Lydella grisescens* R.D., female, 6.9.48; *Calliphora erythrocephala* Mg., male, 16.8.48; *Melinda gentilis* R.D., male, 7.9.48; *Stomoxys calcitrans* L., male, 7.9.48; *Orthellia caesaria* Mg., male, 9.8.48; *Delia* sp., female, 9.8.48; *Pegomyia haemorrhoea* Zett., male, 9.8.48.

Prey of sex indet.: DIPTERA: *Sphaerophoria scripta* L., 23.8.48.

Females thus were taken with prey more frequently than males. The prey are mostly other flies (13 Diptera: 4 Hemiptera) but it would be dangerous to generalise and say that robber flies feed mostly on Diptera. The genus *Dioctria*, less hairy and more metallic flies which belong to a different sub-family, feed a lot on Hymenoptera. This is illustrated by a few records of prey from Fancott and Flitwick, both woodland areas.

Possibly every country visitor knows the brilliant orange or yellow dung fly one finds massed on cow pats in the spring and autumn. Yet surprisingly enough the flies do not feed on dung, but on other insects. Unlike the *Empididae* the prey have no significance in mating, in fact the reverse is true since one observer has suggested that a sexually mature male tends to release all flies it catches except females of its own species. The flies congregated on the dung are males awaiting females, which are much duller in colour and rather drab green. The larvae develop in the dung. The following recorded captures all took place away from the dung.

Prey of *Scatophaga stercoraria* L.: DIPTERA: *Dilophus febrilis* L., male, Fancott, 12.4.48; *Bibio johannis* L., males, Fancott, 9.4.45, 13.4.48, Aspley Wood, 15.4.49 (V. H. Chambers); *Sciara* sp., female, Fancott, 23.5.47; *Empis caudatula* Loew., female, Fancott, 8.7.47; *Dolichopus* sp., Totternhoe, 1.8.48; *Platycheirus albimanus* F., Fancott, 17.4.46; *Platycheirus scutatus* Mg., Fancott, 31.5.47; *Syrphus balteatus* Deg., male, Whipsnade, 1.8.48; *Calliphora erythrocephala* Mg., Studham, 19.4.46; *Muscid* sp., Flitwick, 23.7.48.

Prey of *Scatophaga lutaria* F.: DIPTERA: *Hebecnema umbratica* Mg., male, Fancott, 31.7.46.

Thus the prey recorded consists only of other flies, not many of which are dung frequenting insects.

Some species belonging to the same family as the houseflies (the Muscidae) are predacious, and in these insects the typical housefly proboscis is strengthened and armed with a few strong teeth. A similar adaptation is found in *Scatophaga*. These species seem to have difficulty in disabling their prey and seem to be less efficient predators than the Asilidae and Empididae. One individual of *Coenosia tigrina* F. on a reed at Fancott held a species of *Hilara* for three minutes. On being disturbed the predator flew away and the prey, after a short rest, began to re-fly normally over the surface of a neighbouring stream. I have also seen one roll over and over on the ground with an equivalent sized Muscid and both eventually separated and flew away.

Prey of *Coenosia tigrina* F.: DIPTERA: *Hilara* sp., 14.6.46, Fancott; *Hydrotaea meteorica* L., 14.6.46, Fancott; *Fannia serena* Fln., 14.6.46, Fancott; *Muscid* sp., 3.7.47, Fancott; *Muscid* sp., 29.6.47, Ouse Bedford.

Collecting predators and prey together is a good way of increasing the knowledge of our local fauna. Thus in Kings Wood I once took an Asilid robber fly (*Neoitamus cyanurus* Lw.) with a rather local Longicorn beetle (*Leiopus nebulosus* L.) and this turned out to be a new county record. I shall be very pleased to receive any specimens of animals caught feeding on others, for they will be a welcome addition to the records mentioned in this article, most of which are housed in the Hope Department, University Museum, Oxford. I should like to thank the staffs of the Hope Department and British Museum, and all others concerned for their help in identifying specimens and supplying literature.

## Observations on a Bedfordshire Rook Roost

By BEDFORD SCHOOL NATURAL HISTORY SOCIETY

The sociable habits of the Rook (*Corvus frugilegus*) are well known and have been studied to an extensive degree by ornithologists all over the country. Although much has been written concerning the species, however, there remains a great deal to be learned, especially with regard to distribution and roosting behaviour.

It is common knowledge that at all times of year the bird is gregarious, and its nesting colonies are a familiar sight. In all seasons it consorts with its close relative the Jackdaw (*Corvus monedula*), and this is particularly marked out of the breeding season when large mixed flocks can be seen feeding in the countryside.

The evening flights of these birds, which take place regularly out of the breeding season, are known to everyone in town and country, but not all people are acquainted with the interesting roosting habits of the species. In some counties, through the activities of various Societies, this subject has received much attention, but owing to the lack, until recently, of a suitable Society in Bedfordshire, little was known of the roosts of Rooks and Jackdaws apart from data obtained through the observations of a very few individual naturalists.

Since the inception of our own County Society in 1946, however, a great amount of field work has been done to determine the location of the roosts in Bedfordshire, and to study in detail the habits of the birds. The School Society co-operated in the National count of rookeries (i.e., nesting colonies) carried out in 1945 under the auspices of the British Trust for Ornithology, but the survey did not call for data of roosts, and no attention was paid to them.

Serious work in the County began with a study of the very large roost in Woburn Park, which stimulated much interest. The County Society then selected an area of North Bedfordshire for the special attention of the School.

It was an accepted fact that a roost existed in the Milton Ernest area, but dawn and dusk observations had not been made sufficiently in former years to determine the exact position of it. The School Natural History Society therefore focussed its attention on the area with a view to obtaining as complete a picture as possible of what was to become known as the "Pavenham" rook-roost.

The area covered by these observations was chiefly North of a line from Cranfield in the West to Sandy in the East, and since the work began in March 1949 much valuable information has been obtained concerning feeding-grounds, flight-lines, roosts, rookeries, etc., and attention will in future be given to all aspects of the subject. The following account is, we trust, an accurate report of the observations in the field carried out to date. It is obviously too early to draw conclusions at this stage, and we have endeavoured to refrain from so doing.

The actual roost was discovered to be in a narrow spinney consisting of mixed timber; chiefly ash, with some oaks and a few poplars, situated in the parish of Pavenham on the West bank of a loop of the River Ouse, and rising steeply to a height of some thirty feet above the river. The average height of the trees would be about 40 feet. Opposite the roost on the other side of the river lie level meadows divided by hedges containing a few trees. The ground behind the roost slopes gently upwards to the rise overlooking Pavenham to the South West and Felmersham to the North. Here the fields are mainly under crops and are divided by high hedges; in fact, the roost is situated on an Easterly buttress of the Oolite range.

With its tortuous meandering, the River Ouse dominates the scenery of the area in the North of the County which forms the territory of the birds supplying the roost. In the main, the limestone folds undulate gently from the flat valley lands in the East, increasing in height towards the North and North-West, with the river following an S-shaped course between the folds. The landscape is mainly agricultural with a high percentage under crops, and sprinkled with a few small woods, the larger ones being to the North, of mixed timber, often chiefly oak.

The actual area from which the Rooks come to the roost is indefinite, as there is a good deal of overlapping with the territories of adjacent roosts, but the area bounded by Tempsford, Ravensden, Thurleigh, Souldrop, Warrington, Stagsden, Cardington and Blunham appears fairly certain to provide birds at Pavenham. This may be extended to include Kempston, Astwood, Elstow and Moggerhanger to the South, and Hinwick and Podington to the North West, but evidence in both areas is, as yet, very confusing.

Known adjacent roosts are at Swineshead Wood to the North and Woburn Park to the South, while roosts near St. Neots and Edworth have yet to be confirmed in the East.

In the area known to supply the roost at Pavenham, there are 88 rookeries, and the breeding Rook population this year (1950) was 8,200 birds rather unevenly distributed, being concentrated mainly in the North and West of the area. The overall average population of breeding Rooks is about 30 birds per square kilometre, or roughly one bird to 8 acres of land. The numbers of birds attending the roost are very difficult to estimate at all, but they seem to lie between 20,000 and 30,000 at the peak of the roosting season, about 65 per cent of the total being Jackdaws.

No attempt at estimating the breeding Jackdaw population of the area has been made as yet, though it is hoped that this will be done in due course. It is a more ubiquitous species than the Rook, and the difficulties are obvious. It would, however, appear likely that during the winter months the numbers of this bird are swollen by visitors from outside the territory.

The behaviour of the birds on arrival at the roost in the evening is remarkable. The roost spinney is not entered when the birds first arrive, instead they form an assembly some distance away from it. The position of this main assembly does not vary greatly, and is never further than



800 yards from the roost, somewhere in the meadows on the other side of the river. The scattered hedgerow trees of the area come in for a good deal of attention early in the evening, as many as 200 birds sometimes being seen in one tree, but the bulk of the main assembly, which contains all the birds in the roost, must form on the ground, and most of the scattered birds soon join it.

The main assembly starts forming early in the evening, but only settles down finally at about the time of sunset. It eventually extends over a circular area about 150 yards in diameter. Arriving at the assembly the Jackdaws and Rooks often perform acrobatics, fanning their tails and arching their wings as they dive down to the ground, giving repeated calls during the performance.

Once at the assembly the birds do not usually move much, but continue to collect until it is nearly dark, particularly large flocks usually arriving after sunset. Finally, at about 34 minutes past sunset the birds rise *en masse* and fly to the roost. The time of this movement is remarkably regular in relation to the time of sunset, a number of observations giving an average of 34 minutes after sunset, with a maximum variation of plus and minus 9 minutes. This average does not include one occasion under very severe gale conditions, when the movement was earlier. However, most weather conditions, even light rain, seem to affect the time of this movement very little.

The assembly will not move into the roost even when disturbed unless it is sufficiently late in the evening. On one occasion, when there was snow on the ground, the assembly was disturbed 30 minutes before it was expected to move into the roost. The birds flew up, circled the roost, and rapidly re-formed an assembly less than 200 yards from the original spot. A few birds which had settled in the roost spinney quickly left it again and rejoined the assembly.

When the roost population is at full strength the whole of the spinney is used, but the birds show a preference for the ash plantation in the North end of the belt. Only the higher branches of the trees are used, and the birds are quite closely packed throughout the roost. After moving into the roost the birds make a considerable din which can be heard up to a mile away on a quiet night, but this dies down within half an hour or so. If the birds are disturbed in the roost while it is light enough to fly, they fly out of the trees, and go to another spinney about 200 yards away, returning when possible to their usual trees.

It is remarkable that Rooks and Jackdaws are entirely absent from the roosting spinney during the day and there is no fouling of the trees or ground either in the roost or to a noticeable extent at the assembly points. The roost spinney appears to support a fairly normal population of mammals and birds during the day.

Departure from the roost in the morning is a more straightforward affair; there is disturbance and noise in the roost at first light. About 35 minutes before sunrise the birds begin to leave the roost in small parties and fly off to their daytime territory. No assembly has been traced and the birds apparently leave the roost area straight away.

In the evening the main assembly is not entered directly by birds from the feeding-grounds. They first collect at a series of subsidiary

assemblies before moving on to the main one. The actual system of subsidiary assemblies is complicated, for in most cases there are two or three stages of subsidiary assemblies, one feeding birds to the next, and so on, until the main assembly is reached. There may be as many as four stages in a series of subsidiary assemblies. Moreover, the assemblies are not absolutely regular, their positions and times of movement varying from week to week though they retain their identities.

The pattern of subsidiary assembly varies greatly, most of the larger ones being on the ground, usually on grass, though sometimes on plough or young crops. The smaller tertiary and quaternary assemblies, consisting for the most part of the birds from single colonies of Rooks or Jackdaws, are usually situated in the main trees of the colonies. The behaviour of the birds in these assemblies also varies; sometimes they collect steadily and then fly *en masse* to the next assembly; at other times they arrive in small parties, collect, and depart again in large parties of as many as 500, always leaving some birds at the assembly to form the nucleus of another party.

A single series of assemblies will serve as an example. Early in the evening the Rooks and Jackdaws at Tempsford congregate in the elm trees above the Great North Road. Then they fly off together in a flock of about 100 in the direction of Howbury Hall near Goldington, where a tertiary assembly is formed with the birds from Willington, Great Barford, the Blunham area, and the birds from Howbury Hall Park itself. There is also some movement to this assembly from Cardington. This assembly may be formed on the ground or in the trees of the spinney beside the West Lodge of the Park. From here the birds fly off over Cleat Hill and Clapham Park towards Oakley and Milton Ernest. At one of these places they almost certainly join a secondary assembly before going to the main assembly, but so far they have not been traced as such to either place.

At Oakley the subsidiary assemblies take quite a regular form; a small assembly is formed on the field to the North of Station Road, while a large secondary assembly is formed somewhere to the South-West of Stafford Bridge on the ground, usually near the river, but sometimes up the hill to the East. A few trees on an island beside the assembly area are frequently used by part of the assembly. This assembly is joined by the birds from Station Road before it moves to the main primary assembly. The birds from this and the other secondary assemblies, of which there are four situated around the roost within  $1\frac{1}{2}$  miles, usually arrive at the roost assembly a few minutes after sunset.

In abnormal weather conditions these subsidiary assemblies usually amalgamate and frequently do not form, the birds flying straight to the main assembly without stopping.

Most of the subsidiary assemblies are associated with the positions of summer nesting colonies and all the large rookeries have birds associated with them at all times of year. Even the smaller rookeries, such as the one in Kimbolton Road, Bedford, are intermittently visited during the winter and are occasionally used as assembly points.

As to the Jackdaws, many smaller colonies of these are to be found throughout the area, the remainder of the birds being probably migra-

tory. These colonies are not so obvious, as the birds require suitable holes in which to nest and both trees and buildings are used. These sites came in for a great deal of visiting during the winter, and even in December several pairs of resident Jackdaws can often be seen sitting together in these colony assembly points.

Besides occasional visiting during the day, the Jackdaws use these points as winter subsidiary assembly points, an example on Bedford School grounds being used by about 24 birds during nearly two evenings in three from September to late January, and practically every evening from then until nesting begins.

As well as separate Jackdaw colonies, there are many examples of Jackdaw and Rook Colonies existing together, in which case the Jackdaws use the lower parts of the rookery trees as their collecting point, often mingling with the Rooks during the winter in the higher branches.

In the light of present knowledge, the community life of Rooks and Jackdaws throughout the year can be fairly fully traced.

During the summer until late July the birds live at their nests and breed; but then breeding ceases, and the birds from the smaller rookeries tend to join up with the larger colonies for roosting at night. We now find a series of small roosts often at points which will later become subsidiary assemblies, one example being Howbury Hall. At this season food is very plentiful, and the birds are able to feed on grain in large flocks. They are moulting and probably have little attachment to their nesting territories, though they keep their mates, as is clear from the pairs distinguishable in the flocks.

In late August or early September the small roosts amalgamate into the main permanent roosts and the birds again seem to show interest in their nesting-territories. This state of affairs persists until late January, when the birds start to select nesting sites and tinker with nesting material on any fine day.

In the middle of March the Rooks' nest-building is well under way, and soon they will have eggs. The Rooks now do not leave their nests until late in the evening, and some will stay behind on their nests overnight. This number rapidly increases over the course of ten days to a fortnight until all the Rooks remain at their nests all night.

Jackdaws, however, as they nest later, continue to attend the roost after the Rooks have stopped, their numbers at the roost decreasing during April until by early May only about 50 pairs of Jackdaws attend the roost. These late-roosting birds are rather erratic in movement, and usually dispense with the assembly system during April.

To conclude this account of the work done so far on Rooks in North Bedfordshire, it would be interesting to quote some data of the breeding rook population in the area. The total number of Rookeries counted this year (1950) is 154, containing 13,000 adult Rooks in an area of approximately 450 square kilometres. The overall average population is thus just under 30 birds per square kilometre.

Of this population, however, 6,300 birds (nearly half), are concentrated in an area of 150 square kilometres including Sharnbrook, Milton Ernest, Turvey, Thurleigh, Ravensden and North Bedford, giving an average population of more than 40 birds per square kilometre. In the flat plain to the South-East of Bedford, the Rook population is very low; there being only about one bird per square kilometre in an area of 35 square kilometres around Cardington and Willington.

It is also apparent from a comparison with last year's count that there has been a considerable increase in the Rook population during the season 1949-1950, 62 Rookeries counted in 1949 contained 4,052 birds, the same rookeries this year contained 5,312 birds, an increase of 30 per cent on last year's population. The possible error in these observations is estimated to be not more than 5 per cent.

## The Reptiles and Amphibians of Bedfordshire

By RAY PALMER.

### REPTILES

The reptilian fauna of Britain is scanty owing to the coldness of the climate, and such reptiles as we have are far more numerous in the southern counties than farther north, while two of the six British species of snakes and lizards are confined to a very restricted range. Owing to the general prejudice against them snakes are liable to be killed on sight, and the innocent legless lizard so inappropriately named "slow-worm" often shares the same fate.

Four of the British species are found in Bedfordshire, but only one of them abundantly.

#### GRASS SNAKE (*Tropidonotus natrix* Linn.)

No doubt the Grass Snake was at one time common in the river valleys and the marshy areas of the county, but is now a rarity. J. Steele Elliott in the *Victoria History of Bedfordshire* (1904), says—"Found in the Ouse Valley, but decreasing and now rare." It is rare in the Leighton Buzzard district, where only three have been seen in the last 25 years. (Oliver G. Pike.) Odd specimens were seen between 1943 and 1946 at Clapham, Rowney Warren, Hinwick, Toddington and Woburn by J. Saunderson, formerly County Pests Officer. Dr. G. M. Vevers reports from Whipsnade that snakes are occasionally seen on the slopes above Dagnall; but some were turned down here in 1930 by the late Miss Joan Proctor when she was curator of reptiles at the London Zoo, so that they cannot be regarded as natives. I have not yet seen one in the county.

#### ADDER (*Vipera berus* Linn.)

J. Steele Elliott (*Vic. Hist. Beds.*, 1904) makes no mention of the rarity of the Adder, but says that it occurs along the greensand ridge, mentioning Woburn, Potton and Shefford; he also records "several records from marshy ground near Westoning, where a man was bitten." This probably refers to Westoning Moor, though adders do not usually frequent marshy ground.

Mr. Pike says he has never seen any near Leighton Buzzard, but on 26th June 1947, I encountered a large female basking in the sun at Kings Wood, Heath and Reach, which is the only one I have seen in the county. Another specimen, also said to have been a large female, was killed by J. Saunderson at Clapham Park in July 1946. Dr. Vevers reports from Whipsnade that Philip Bates (now overseer at Whipsnade Zoo) remembers killing an adder when a boy about 1915, and keeping it for a time in a bottle of spirit. Adders are occasionally seen on the hillsides above Dagnall, but these are doubtless the descendants of those introduced by Miss Proctor along with the Grass Snakes mentioned above.

#### ! SLOW-WORM (*Anguis fragilis* Linn.)

Though certainly not common, the Slow-worm is evidently more abundant than either of the snakes. Dr. Vevers reports that it is fairly common at Whipsnade; but Mr. Pike refers to it as uncommon in the Leighton Buzzard area. Mr. Saunderson says he has seen very few in the county, and reports one at Stevington in 1946, and one or two on Woburn Sands golf course. The only one I have encountered was captured at Pennyfathers Hills, Maulden, during a field meeting of the Society on 17th July 1948, and taken home by me to photograph, afterwards being returned to its habitat. It is not mentioned at all by Steele Elliott.

#### COMMON, OR VIVIPAROUS LIZARD (*Lacerta vivipara* Jacq.)

The lizard can be described as common on all suitable types of land, though its extreme wariness and rapidity of movement often enables it to escape notice. J. Steel Elliott says: "Plentiful on the greensand, particularly Shefford Warren". It is, however, by no means confined to the greensand, being also found on the chalk and on marshy land. Among the localities where I have frequently observed lizards are the following: Flitwick Moor, Barton Hills, Pegsdon Hills, Rowney Warren, Sandy Heath, Ampthill Heath, Kings Wood and Rushmere Heath, Aspley Wood.

### AMPHIBIANS

The amphibians on the British list are seven in number, two frogs, two toads and three newts. In Bedfordshire we have five native species and two which are or have been naturalised.

#### COMMON FROG (*Rana temporaria* Linn.)

Very common everywhere.

#### GREEN, OR EDIBLE, FROG (*Rana esculenta* Linn.)

This species, though on the British list, is not a native of Bedfordshire. It was introduced at Woburn Park about 50 years ago, and has bred there ever since, but in decreasing numbers. The Duke of Bedford informs me that what he believes to be one of the last survivors of the original stock was seen there in the summer of 1948. Since then a fresh supply has been imported from the Continent, so that the species will no doubt re-establish itself.

COMMON TOAD (*Bufo vulgaris* Laur.)

Very common everywhere.

NATTERJACK TOAD (*Bufo calamita* Laur.)

This little toad was formerly found in an area on the eastern border of Bedfordshire, and is referred to in *The Natural History of Cambridgeshire* (1904) as follows:—

“It was first found in considerable abundance on Gamlingay Heath in 1824, by Henslow and Jenyns. Gamlingay is still the chief locality where this little toad is frequent. During the months of May and June they resort to certain clay pits, in the shallow water of which they spawn between the rushes. They hibernate in deep holes, either dug by themselves, or appropriating those of sand martins, which have established a colony in the steep and high walls of the sand which there overlies the clay.”

Although Gamlingay Heath is actually in Cambridgeshire there is evidence that Natterjacks were found over adjoining areas of both Cambridgeshire and Bedfordshire. Writing in *The Zoologist* in 1905 (p. 315), J. Steele Elliott recorded: “Natterjacks fairly abundant in some water holes of a sand pit in the parish of Sandy, evidently their spawning haunts.” In 1930 I searched the neighbourhood of Sandy and Potton fairly thoroughly without success. Later I obtained some circumstantial evidence that toads did spawn at a certain pit on the Bedfordshire border as late as the end of May, and made a great noise at night. This certainly sounded like Natterjacks, but I was never able to get actual confirmation, and my recent investigations have met with no better success. Any evidence of Natterjacks in the Sandy and Potton district will therefore be welcomed. On the west of the county Mr. Oliver Pike writes: “I have seen the Natterjack Toad in our garden at Leighton Buzzard on several occasions.”

MIDWIFE TOAD (*Alytes obstetricans* Laurenti.)

This little toad, famous for its extraordinary breeding habits in which the male takes charge of the eggs and carries them about until they are ready to hatch, is a native of France and other parts of western Europe. It is not a native of Britain, but is mentioned by Edward Step in his *Animal Life of the British Isles* (p. 172), as follows:

“As we have naturalised representatives of the Continental frogs here, so we have an isolated colony of the European Midwife Toad, established many years ago in what was then a nurseryman’s garden at Bedford. The circumstances attending its introduction are not now known, but the colony still exists.”

This book was published in 1921, but this colony of Midwife Toads seems to have been forgotten and was unknown to Bedfordshire naturalists of the present day until it was mentioned by John Armitage in a broadcast of “The Naturalist” programme on 2nd January 1948, saying that the colony was still in existence and thriving. As a result of this I began to make enquiries, and with the assistance of several other members succeeded in locating two colonies of these toads in large private gardens in Bedford.

The facts appear to be somewhat as follows: The Midwife Toad became established in a Bedford nursery round about 1878, but whether accidentally introduced or deliberately imported is not now known. In this nursery they flourished and increased for about forty years, and then about 1919 the site was obliterated by building operations. Before this took place, however, the owner of the nursery collected as many of the toads as he could find and turned them down in a large garden with an artificial pond and rockery, where they have continued to thrive until the present day. From here they were introduced into another garden not far away. The "rediscovery" of these naturalised European toads has created a good deal of interest, and one of the colonies was visited by Dr. Malcolm Smith, of the Reptile Department of the Natural History Museum; but the owners naturally do not wish them disturbed or "collected", and so the details of the sites must be withheld from publication.

GREAT CRESTED NEWT (*Triturus palustris* Linn.)

Fairly common in the breeding season in most large ponds where there is suitable vegetation, but less abundant than the Smooth Newt.

SMOOTH NEWT (*Triturus vulgaris* Linn.)

Very common in the spring in all suitable ponds, and occasionally found hibernating under stones etc.

[PALMATED NEWT (*Triturus helveticus* Raz.)

This species has not yet been recorded in Bedfordshire, but it is known to breed in ponds in the Ashridge district within about two miles of the county boundary. It should be looked for in the Studham and Whipsnade area.]

## Bedfordshire Naturalists

### IV—WILLIAM HILLHOUSE (1850-1910)

By J. G. DONY

After the death of Charles Abbot in 1817, there follows a blank period of almost sixty years in which the study of natural history in the county is almost at a standstill. The little work done was limited mainly to botany and was that of individuals the most noteworthy of whom were William Crouch (see *Journ. Beds. Nat. Hist. Soc.*, 1 (1947) 50) and John McLaren working in solitude at Cardington compiling his two large herbaria. Odd notes it is true appear in scientific journals, but little serious work was attempted. In 1875 the period of relative stagnation ends and with the awakening interest records pile upon each other, but the centre of attention is still botany. Two events contributed to the change, the publication in 1873 and 1874 of H. C. Watson's *Topographical Botany* and the formation in 1875 of the Bedfordshire Natural History Society.

Watson's lifetime work was the study of the composition and distribution of the British flora. *Topographical Botany* was the first serious attempt to account for the distribution of British plants on a county basis. Most of the records of his vice-county 30, Bedford (see *Journ. Beds. Nat. Hist. Soc.*, 1 (1947), 8) rested on Abbot's work and on a few visits made to the county by W. W. Newbould, one of the best field botanists the country has ever known and who had held curacies at Bluntisham and Comberton in neighbouring counties. It was obvious that there were many species awaiting record and that Abbot's *Flora Bedfordiensis*, then 75 years old, was in need of revision. *Topographical Botany* could be the basis of many years work. A well meaning invasion of Hertfordshire botanists in the persons of Alfred Reginald Pryor working on his *Flora of Hertfordshire* (1881), a model county flora, Thomas Bates Blow of Hitchin, probably the most extraordinary individual ever to dabble in Bedfordshire botany, and James Pollard, who lived a few yards over the county boundary at High Down, Pirton, helped to goad the more peaceful and leisure loving Bedfordshire naturalists into some measure of activity.

A controversy on the status of the Sweet Flag (*Acorus Calamus* L.) by the Ouse in the neighbourhood of Bedford brought the Bedfordshire Natural History Society into being. Its main interest was in botany and the only serious work it ever did was on the botany of the county. There had, of course, to be someone to direct the work it attempted and to relate it to the work being done in the larger field of the country as a whole. That person was William Hillhouse. He it was who proposed that the society be formed, he became the first treasurer, the first botanical secretary and later continued to hold these offices with that of joint-secretary.

Hillhouse was at the time only twenty-five. He was born at Bedford, the son of John Paton Hillhouse, on 17th December 1850. He was educated at Bedford Modern School, but I can find no information on his later education. A visit to Norway brought with it a keen desire



to know more of plant distribution. In 1875 he was an assistant master at Bedford Modern School.

His work for Bedfordshire botany was of short duration and done mainly in connection with the society. The Duke of Bedford was persuaded to donate £25 towards the cost of preparing a new Flora of Bedfordshire and Hillhouse planned the work thoroughly. Botanists were beginning to realise that a county was too large an area for the study of plant distribution and many had adopted sub-divisions based on river drainage. He rejected this basis and in a paper "On the Surface Geology and Physical Geography of Bedfordshire" (*Trans. Beds. Nat. Hist. Soc.*, 1875-6 (1877), 83) he suggested the division of the county into seven districts each with seven sub-divisions based mainly on geological formations. Such a basis would have much to commend it, although Hillhouse's knowledge of the drift geology of the county was of necessity incomplete. The greatest difficulty in using such a basis is that of relating the boundaries of the divisions to something which can be seen on the ground and Hillhouse made no attempt to define clearly the boundaries of his suggested divisions.

He had already in "A Contribution Towards a New Flora of Bedfordshire" (*ibid.*, 65) made a list of 430 species recorded by him in 1875 and a second list, "Bedfordshire Plant List for 1876" (*ibid.*, 1876-7 (1878), 198), reveals the progress made in one year, as the list grows to 700 species and he acknowledges the help of fifteen correspondents in various parts of the county.

He was taking his botanical studies more seriously. In 1876 he had become a Fellow of the Linnean Society and in 1877 he decided to take up the study as his full career and won a scholarship to Trinity College, Cambridge, where C. C. Babington was then in his prime. He lectured in botany in the university and at Girton and Newnham Colleges and became assistant curator of the herbarium. In 1882 he became the first professor of botany at Mason's College, later Birmingham University, and soon put his whole energy into building up the new department. He spent at first some time in Germany working with Strasburger in translating his *Practical Botany*, for many years a standard work. He retained his membership of the Bedfordshire Society, but his active work for the county ceased when he went to Cambridge. Two papers on plant morphology were read by him in 1878, but after that his name alone appears in the list of members.

He retired from his professorship in 1909, having been a sick man for some years, and after a retirement of only four months at Malvern he died there on 27th January 1910.

It is doubtful if any naturalist did so much in so short a time for any county. He added himself few species to the county list: *Papaver somniferum*, *Armoracia lapathifolia*, *Vicia lutea*, *Anchusa officinalis*, *Populus canescens* and *Lilium Martagon*; but he was the first Bedfordshire botanist to distinguish more than one water buttercup, wood violet, hawthorn, oak, field speedwell, etc.

His greatest contribution was that he re-started serious work. It may have been too difficult for his successors to continue it in the way he had planned, but it was the means of bringing John McLaren, James Saunders and John Hamson together. One other less lasting achievement of a similar nature was the occasion when he brought Pryor and Newbould to Bedford to study Abbot's herbarium, an event at which one would have liked to have been present. His own herbarium of Bedfordshire plants, with his other specimens, passed after his death to Birmingham University. This is now partly incorporated into the main collection there, a study of which may throw light on his few doubtful records and give stations for other interesting records which he unfortunately rarely did in his lists.

## Reports of Recorders

### BOTANY

This has been a most successful year, to which no doubt the excellent summer contributed to a large degree. The best finds were two Corn Salads, *Valerianella rimosa* Bast. by W. D. Coales in an arable near Barton, and *V. eriocarpa* Desv. by the recorder on a heath at Heath and Reach. The former had been recorded for all neighbouring counties and its discovery in Bedfordshire had been long awaited. The latter had been found usually as a colonist in the west of England and some study of status with us is demanded. In another category is *Scirpus Tabernaemontani* C.C. Gmel., found by the recorder in the gravel pits, Eaton Socon. It is usually found in tidal waters and on salt marshes, but there is no reason why it should not be native at Eaton Socon. In the water meadows at the same village S. M. Walters found an interesting colony of *Eleocharis* including *E. palustris* (L.) R. Br. em. R. & S. var. *microcarpa* Walters, *E. uniglumis* (Link) Schult and hybrids between them. Some species not found for a number of years included *Myriophyllum verticillatum* L., found by C. C. Foss and the recorder at Oakley Bottom.

Somewhat fewer new district records were made, an indication that the distribution of most species within the county is more fully known, but the haul of new alien species encouraged no doubt by the warm summer was as large as ever.

J. G. DONY

### MOLLUSCA

Since the writer has been at Kew and in Africa during the past year there has been little time for field work, but a few records may be given. Several lists are also given for individual localities which have been examined for the first time during the year.

*Ancylastrum fluviatile* (Müll.). Under stones, river Flit at Clophill by Lobb's stables (30.1.49); abundant under stones, River Ouse at Stafford Bridge, Oakley (3.4.49). The water is swift in both of these localities. The species is doubtless common in the right kind of habitat and has been overlooked previously, though there is not much swiftly flowing water in the county.

*Ena obscura* (Müll.). One on dolite wall, Hinwick (3.4.49); dead shells, including an elongate form, common on the Railway Embankment (L.M.R.) at Radwell.

*Clausilia rolfhii* (Leach in Turton). Mr. Stratton, who discovered this species near Deadmansey Wood last year (as reported in this Journal), failed to find it in Hertfordshire which is only a few yards away from the Bedfordshire locality. The writer found some specimens under moss in an elder scrub just within the Hertfordshire boundary (2.4.49). This scrub lies opposite Deadmansey Wood on the opposite side of the road. The only other record for Hertfordshire is an old one near Hertford.

*Acanthinula aculeata* (Müll.). One on elder branch, chalk escarpment wood on the left of Barton Cutting as one approaches the village (20.3.49). See also below.

*Cæcilioides acicula* (Müll.). Old shells in debris in front of rabbit holes, dry chalk bank on right of Barton Cutting.

*Helicella itala* (L.). Shells abundant (but few living) on Sharnbrook Tunnel baulk, together with *H. caperata* (Mont.) (frequent) and *Monacha cantiana* (Mont.).

*Helicigona lapicida* (L.). Fairly old shell, Barton Cutting Beech Wood (18.9.48).

*Retinella pura* (Alder). Little "alcove" with pile of old mossy bricks on Sharnbrook Tunnel baulk, together with *Carychium tridentatum* (Risso) (rare), *Goniodiscus rotundatus* (Müll.) (frequent), *Clausilia bidentata* (Ström.) (rare), *Retinella nitidula* (Drap.) (frequent), *Oxychilus helveticus* (Blum) (rare) and *Cepæa hortensis* (rare) 8.5.49.

The following are brief surveys of a few individual localities:

A. Kings Wood, Heath and Reach (10.4.49)

This wood is on greensand with deposits of boulder clay. The northern portion of the wood is on greensand and the flora consists mainly of bracken and *Leucobryum* moss, with pine and birch. Very few mollusca were found here.

*Arion circumscriptus* (Johnston), rare. *Oxychilus alliaris* (Mill.), rare.

The other parts of the wood were more productive, and the following species were found under dead oak leaves, sticks, moss and logs, mostly quite moist habitats:

*Carychium tridentatum* (Risso), rare. *Acanthinula aculeata* (Müll.), rare. *Cochlicopa lubrica* (Müll.), mostly young, frequent. *Punctum pygmaeum* (Drap.), scarce. *Goniodiscus rotundatus* (Müll.), frequent. *Arion juveniles*, common. *Trichia hispida* (L.), scarce. *Euconulus fulvus* (Müll.), frequent. *Retinella radiatula* (Alder), frequent. *Oxychilus helveticus* (Blum.), scarce. *O. alliaris* (Mill.), scarce. *Vitrea crystallina* (Müll.), scarce.

Certain specialised areas in the wood yielded further species.

*Salix atrocinerea*, swamp near road at south end of wood: *Carychium minimum* (Müll.), *sensu stricto* frequent, on wet leaves and at the roots of rushes. *Euconulus fulvus* (Müll.), rare. *Punctum pygmaeum* (Drap.), rare. *Retinella nitidula* (Drap.), rare. *Arion* sp., rare.

Cart ruts full of water—semi-permanent.

*Lymnaea truncatula* (Müll.), frequent, on muddy edges. *Carychium minimum* (Müll.) s.s., scarce.

B. Sandpit, Silsoe (27.12.48 and 20.3.49)

Large pit on greensand—flora of sweet chestnut, oak and some elder.

*Vallonia costata* (Müll.), rare. *Cochlicopa lubrica* (Müll.), scarce. *Goniodiscus rotundatus* (Müll.), frequent; on sticks, logs, etc. *Arion hortensis*, *Arion circumscriptus* Johnston. *Clausilia bidentata* (Ström.), scarce. *Trichia hispida* (L.), scarce. *Cepaea hortensis* (Müll.), dead shells. *Retinella nitidula* (Drap.), common. *Oxychilus alliaris* (Mill.), scarce. *O. helveticus* (Blum.), abundant. *O. cellarius* (Müll.), scarce. *Vitrina pellucida* (Müll.), scarce.

C. Odell Great Wood (3.4.49)

Mixed wood, chiefly oak-ash on clay.

*Vallonia excentrica* (Sterki), rare, under moss. *Vertigo pygmaea* (Drap.), common, under stones and at the roots of rushes by clayey puddles in rides. *Acanthinula aculeata* (Müll.), rare, on mossy sticks, ground debris. *Cochlicopa lubrica* (Müll.), rare, under moss. *Ena obscura* (Müll.), frequent, under mossy sticks, etc. *Goniodiscus rotundatus* (Müll.), common, on sticks and under stones. *Arion circumscriptus* Johnston, juvenile, rare, on sticks. *Arion "ater"*, in fungi, acid part of wood (birch). *Arion* sp., juveniles, in wood, and at roots of rushes. *Clausilia bidentata* (Ström.), rare, under bark of fallen oak. *Cochlodina laminata* (Mont.), very abundant, adults in cop. amongst mossy sticks, under boiler blocks, logs and moss. Common in the elder scrub parts. Juveniles ( $\frac{1}{3}$ – $\frac{2}{3}$  grown) in scores under bark of fallen tree. The writer has never seen the species so plentiful anywhere else in the county. *Monacha cantiana* (Mont.), on hedges, etc., in the green lane but not in the wood. *Trichia hispida* (L.), at the roots of *Juncus inflexus*. *Retinella radiatula* (Alder), scarce, under moss. *R. nitidula* (Drap.), frequent, under logs, bark, moss, etc. *Oxychilus alliaris* (Mill.), rare. *O. helveticus* (Blum.), abundant, amongst sticks, moss, etc. *O. cellarius* (Müll.), scarce, under moss in birch part. *Agriolimax laevis* (Müll.), rare, at roots of *Juncus inflexus*, clayey puddles.

This list compares favourably with the fauna of many of the southern beech woods of the county.

To conclude this report the writer must deplore the filling in of the interesting pond at Fancott, which is mentioned elsewhere in this issue. Southern Bedfordshire is far from rich in aquatic habitats of any kind.

BERNARD VERDCOURT

## BUTTERFLIES

There are two additions to the Bedfordshire list, bringing the county total up to 47; a new locality for a particularly local species is also recorded.

*Melanagia galathea* (L.), Marbled White.

A further locality—Deacon Hill, Pegsdon, 12th July 1947, recorded by R. M. Newland, of Knebworth.

*Nymphalis antiopa* (L.), Camberwell Beauty.

A specimen recorded on buddlia along Bromham Road, Bedford, in the summer of 1947 gives us at last a record of this rare insect for our county.

It was seen to fly across the road at one time and cross the wall of "The Den" to flowers in the garden.

*Hesperia comma* (L.), Silver Spotted Skipper.

S. R. Bowden of Letchworth, informs me that he takes this insect commonly at Knocking Hoe and adjacent hills at Pegsdon in August, and he says it is another host of the mite *Belaustium*. This is the first record I have of this species for the county.

BERNARD B. WEST

## BIRDS

In compiling this report I wish to thank all those who have submitted details of their observations during the year. We have quite a fair number of members who are interested in varying degrees in the subject and a small number of these are most ardent field-workers; others through various reasons and causes, are not able to pursue their investigations so intensively. Much remains to be done, however, in noting down observations at the time and submitting what to the observer may seem a trivial matter, yet may be of inestimable value to the Recorder. All observations are most welcome and it is hoped that many more reports will be sent in during future seasons. Likewise we trust that the sphere of field-work will be widened by an ever increasing body of "watchers". Much still remains to be done in the county and I appeal to any who are interested to take an active part in the meetings of the Ornithological Section, reported elsewhere.

The study of migration routes demands particular attention and the Section will give some priority to this during 1950. It is also particularly desirable to note the last dates on which summer visitors are observed; these at present constitute a notable omission in our records.

Climatically the year was average and not marked by extremes of weather. Again, hatching was on the whole good and most species seemed to have fared well. The one outstanding success of the year was the discovery by C. S. Payne of the first recorded breeding of the Short-eared Owl in the county. During the year an increasing amount of attention has been given to the roosting habits of Rooks and Jackdaws and these investigations are proceeding.

Owing to the open winter no large numbers of wildfowl were seen and certain species observed only in really hard winters were not, therefore, encountered.

*Abbreviations of Observer's names*

K.A.=K. Allsop, B.Sch.=Bedford School Natural History Society, W.J.C.=W. J. Champkin, H.C.=H. Cole, D.W.E.=D. W. Elliott, F.C.G.=F. C. Gribble, A.J.=A. Johnston, J.K.=J. Kennedy, R.P.=Ray Palmer, C.S.P.=C. S. Payne, W.K.P.=W. Keith Piercy, O.G.P.=Oliver G. Pike, Rec.=Recorder of Birds, S.W.R.=S. W. Rodell, H.B.S.=H. B. Sargent, W.G.S.=W. G. Sharpe, H.A.W.S.=H. A. W. Southon, B.B.W.=B. B. West.

HOODED CROW (*Corvus cornix*). One with two Carrion Crows near Carrington 5th January–19th March (Rec., B.Sch., and H.A.W.S.). Up to twelve—Dunstable Sewage Farm on 5th and 18th February and one again on 13th December. One near Sewell on 28th December (A.J. and H.B.S.).

**SISKIN** (*Carduelis spinus*). Up to thirty at Folly Wood, Flitwick, in company with a large party of **LESSER REDPOLLS** (*Carduelis flammea cabaret*) on 9th January and 20th February, and twelve at Westoning Moor on 20th February (Rec., H.A.W.S. and R.P.). Up to a hundred at Southill Park, 23rd January–26th February (W.K.P.) and twenty in Maulden Wood area, 6th and 8th February (B.Sch.).

**TWITE** (*Carduelis flavirostris*). Several with other Finches at Flitwick, 7th December (R.P.). Field characters noted included yellow bills and unmarked buffish throats.

**BRAMBLING** (*Fringilla montifringilla*). Upwards of fifty, Bedford Sewage Farm from 20th November onwards (Rec., B.Sch., H.A.W.S. and F.C.G.). Similar party at Blow's Downs, Dunstable, 27th–30th December (H.B.S.). Few at Studham early in January (K.A.); two, Dunstable Sewage Farm, 22nd December (A.J.); several, Flitwick Moor, 23rd December (R.P.); and one East Hyde, 27th December (H.C.).

**TREE-SPARROW** (*Passer montanus*). Flock of several hundred, Bedford Sewage Farm, on 20th November (F.C.G.).

**WOOD-LARK** (*Lullula arborea*). In addition to the resident pairs, another pair was seen in the Southill area during June (C.S.P.).

**TREE-PIBIT** (*Anthus trivialis*). First arrivals near Sharnbrook on 15th April (Rec.).

**YELLOW WAGTAIL** (*Motacilla flava flavissima*). First arrivals, six, at Bedford Sewage Farm on 12th April. Large party here on 28th August (Rec.).

**GREY WAGTAIL** (*Motacilla cinera*). Single birds seen at Bedford Sewage Farm during January, February, September, October, November and December and two in October. Three at Dunstable Sewage Farm—January and February (Rec., B.Sch., J.K., F.C.G., and H.B.S.); one at Harrold, January (Miss Day); one at Clapham, 9th October (B.Sch.); six, East Hyde, 25th September to 31st December (H.C.).

**GREAT GREY SHRIKE** (*Lanius excubitor*). One at Bedford Sewage Farm, 1st January–19th March (Rec. and W.J.C.); one at Elstow–Kempston Hardwick area, early February—13th (R. F. Lyle and B.Sch.).

**RED-BACKED SHRIKE** (*Lanius collurio*). Six on Blow's Down, Dunstable, from 1st May (A.J.); at least three nests near Luton (H.C. and S.W.R.); nest near Stopsley, 17th July (S.W.R.).

**WAXWING** (*Bombycilla garrulus*). Two at Whipsnade, 27th March (O.G.P.); one at Clapham Road, Bedford, 16th February—reported seen several days earlier (B.Sch.).

**SPOTTED FLYCATCHER** (*Muscicapa striata*). First arrival at Studham, 14th May (K.A.); one at Bromham Park, 25th September (B.Sch.).

**CHIFFCHAFF** (*Phylloscopus collybita*). First arrival, Flitwick Manor, 19th March (W.G.S.).

**WILLOW-WARBLER** (*Phylloscopus trochilus*). First arrival near Sewell, 1st April (S.W.R.).

**WOOD-WARBLER** (*Phylloscopus sibilatrix*). Pair near Eversholt, 30th April, onwards—reported heard several days earlier (W.G.S.).

**GRASSHOPPER-WARBLER** (*Locustella naevia*). One singing at Flitwick Moor on 16th April (R.P.); one at Odell Great Wood (new locality) on 18th April (Rec.).

**REED-WARBLER** (*Acrocephalus scirpaceus*). Nest with three eggs and one Cuckoo egg at Southill Lake, 19th May (Rec. and H.A.W.S.).

**SEDGE-WARBLER** (*Acrocephalus schænobæus*). First arrival at Bedford Sewage Farm on 12th April (Rec.).

**GARDEN-WARBLER** (*Sylvia borin*). First arrival at Southill Park on 17th April (Rec.).

**BLACKCAP** (*Sylvia atricapilla*). Male singing in Astley Wood, Stagsden—first arrival—on 27th March (B.B.W.).

**WHITETHROAT** (*Sylvia communis*). First arrivals at Kempston (C.S.P.) and Sharnbrook (Rec.), on 15th April.

**LESSER WHITETHROAT** (*Sylvia curruca*). First heard at Barton on 1st May (R.P.).

**FIELDFARE** (*Turdus pilaris*). One at Pegsdon on 17th April (Rec.); large movements northwards during March; first winter visitors at Kempston on 13th October (C.S.P.).

**REDWING** (*Turdus musicus*). Five near Studham on 22nd September (K.A.).

**WHEATEAR** (*Oenanthe oenanthe*). At least two pairs bred on a North Beds. aerodrome (H. W. Gover); others seen were pair on Blow's Down, Dunstable, 5th-7th May; one at Houghton Regis on 16th April; one on Dunstable Downs on 21st April (A.J. and H.B.S.); one at Bedford Sewage Farm on 7th August (J.K.) and one at Studham Common on 20th August (H.C.).

**WHINGCHAT** (*Saxicola rubetra*). One at Kempston Hardwick on 15th May (C.S.P.); two at Houghton Regis on 2nd June (A.J.); pair with young at Cardington on 27th July (J.K.); three pairs bred near Luton and one pair in the Totternhoe region (H.C.); one on Blow's Downs, Dunstable, on 9th September (S.W.R.).

**REDSTART** (*Phoenicurus phoenicurus*). First arrivals seen on 10th April; female near Dagnall (Rec.), male near Stagsden (D.W.E.).

**NIGHTINGALE** (*Luscinia megarhyncha*). First arrivals heard on 15th April; at Odell (Rec.); Wootton Wood (C.S.P.) and Chiltern Green (H.C.).

**SWALLOW** (*Hirundo rustica*). One seen at Turvey 26th March (B.Sch.). Seen at Bedford Sewage Farm up to the second week in October (F.C.G.).

**HOUSE-MARTIN** (*Delichon urbica*). First arrivals, five, at Felmersham gravel pits on 4th April (Lady Wells); one at East Hyde on 6th November (H.C.).

**SAND-MARTIN** (*Riparia riparia*). With Swallows at Tingrith Lake on 3rd April (W.G.S.).

**SWIFT** (*Apus apus*). First seen at Bedford Sewage Farm on 23rd April (F.C.G.); one at Goldington on 27th September (B.Sch.).

**NIGHTJAR** (*Caprimulgus europæus*). One seen flying at Southill on 20th April (W.K.P.).

**CUCKOO** (*Cuculus canorus*). First birds seen and heard on 15th April at Elstow (C.S.P.), Flitwick Moor (R.P.) and Chiltern Green (H.C.).

**LONG-EARED OWL** (*Asio otus*). Continued searches failed to discover any sign of this species in the county.

**SHORT-EARED OWL** (*Asio flammeus*). Most important discovery of the year. The first recorded breeding of this species in the county was on a bracken covered area on the Greensand. (See "Notes and Observations".)

**PEREGRINE FALCON** (*Falco peregrinus*). One flying near Pedley Hill on 3rd December (K.A.).

**HOBBY** (*Falco subbuteo*). One bird seen flying near Southill on 8th June (C.S.P.) and another near Eversholt on 3rd July (W.G.S.).

**COMMON HERON** (*Ardea cinerea*). Increase in the Southill heronry.

**BITTERN** (*Botaurus stellaris*). Apparently a Bittern frequented the River Ouse near Oakley Bridge during the latter part of the summer, as in 1948. The observer, one of the two anglers who saw the bird in the previous year, did not report the occurrence until the summer of 1949. No actual dates were given. (See 1950 report.)

**GEESE** (*Anseres*). During January more flights than usual were reported over the county, mostly of birds heading in a South-Westerly direction. Some were heard at night and the others were only identified with certainty as "grey" geese. These included 10th January (*Bedfordshire Times*), 16th and 23rd January (R.C. Coleman) all over Bedford; fifteen over Luton on the 18th January (S.W.R.), and nine near Oakley on the 9th October (B.Sch.).

**WHITE-FRONTED GOOSE** (*Anser albifrons*). Four at Bedford Sewage Farm, 17th February (W.J.C.).

**PINK-FOOTED GOOSE** (*Anser fabalis brachyrhynchus*). Six at Box End, Kempston, on 7th January (H. T. James), and up to forty here on 10th January (M. H. Crummie). The meadows froze on the 8th and 9th and no birds were present until the following day. Whether those then seen were the same flock as that of the 7th, or fresh arrivals, is not known.

**CANADA GOOSE** (*Branta canadensis*). Ten flying northwards over Elstow on 20th July (C.S.P.).

**SHELD-DUCK** (*Tadorna tadorna*). One at Kempston Hardwick clay-pit on 17th April (C.S.P.).

**GADWALL** (*Anas strepera*). Pair on Drakelow Pond, Woburn, on 13th February (Rec. and F.C.G.).

**TEAL** (*Anas crecca*). Largest flock of year at Bedford Sewage Farm (c. 150) on 24th November (B.Sch.).

**WIGEON** (*Anas penelope*). Reported from usual localities. Largest flock of year (c. 200) at Kempston Hardwick clay-pit on 13th February (F.C.G.); twelve at Southill Lake on 30th September (B.Sch.).

**SHOVELER** (*Spatula clypeata*). Three at Bedford Sewage Farm on 9th January, 13th and 30th March (B.Sch. and F.C.G.); two at Kempston Hardwick on 27th March; one at Battlesden Lake on 24th April (Rec.).

**COMMON POCHARD** (*Aythya ferina*). "Large party"—numbers should have been stated—at Kempston Hardwick pit on 30th January (B.Sch.). Up to thirty seen on Southill Lake during winter months. No reports of breeding during the season.

**TUFTED DUCK** (*Aythya fuligula*). Largest party, up to thirty, at Woburn on 13th February. A male remained throughout the summer at Felpersham gravel pit but no trace was found of a female or a nest. Two pairs with young were seen on Henlow Gravel Pits on 7th August (W.K.P.).

**GOLDENEYE** (*Bucephala clangula*). A male remained at Kempston Hardwick clay-pit from 23rd January—20th March (B.Sch., C.S.P. and F.C.G.).

**CORMORANT** (*Phalacrocorax carbo*). One at Felpersham gravel-pit on 1st April (J.K.).

**GREAT CRESTED GREBE** (*Podiceps cristatus*). A pair attempted, unsuccessfully, to nest on the flooded clay-pit at Kempston Hardwick (C.S.P.).

[**SLAVONIAN GREBE**] (*Podiceps auritus*). A bird almost certainly of this species was seen at Bedford Sewage Farm on 17th December (F.C.G.). Unfortunately, bad light and distance prevented the observer noting sufficient diagnostic details.

**BLACK-NECKED GREBE** (*Podiceps nigricollis*). A bird assuming summer plumage was seen at close range on Drakelow Pond, Woburn, on 24th April. The uptilted bill was particularly noticeable (Rec. and H.A.W.S.).

**STOCK DOVE** (*Columba oenas*). About a hundred (no Wood Pigeons with them), seen on Luton Airport on 4th December (H.C.).

**TURTLE DOVE** (*Streptopelia turtur*). First arrival heard near Sandy on 29th April (R.P.).

**BAR-TAILED GODWIT** (*Limosa lapponica*). Two at Bedford Sewage Farm on 8th May (F.C.G.).

**COMMON CURLEW** (*Numenius arquata*). One at Bedford Sewage Farm on 3rd April (Rec.), large passage over Leighton Buzzard—northwards, for half an hour—during night of 24th March (O.G.P.); one at Oakley Bridge on 26th March (B.B.W.); one over Cardington on 6th August (J.K.).

**WHIMBREL** (*Numenius phaeopus*). Large passage northwards over Bedford heard in the early hours of 12th May. Intermittent passage continued for over one hour (Rec.).

**WOODCOCK** (*Scolopax rusticola*). Still more information obtained concerning the breeding range throughout the Greensand area.

**JACK SNIBE** (*Lymnocyrtus minimus*). Two at Bedford Sewage Farm on 13th March (F.C.G.).

**DUNLIN** (*Calidris alpina*). Up to four at Bedford Sewage Farm, 24th—30th March (F.C.G.). Two at Dunstable Sewage Farm on 2nd June (A.J.).

**RUFF** (*Philomachus pugnax*). One at Bedford Sewage Farm, 25th—30th March (F.C.G.).

**COMMON SANDPIPER** (*Actitis macularia*). Three at Dunstable Sewage Farm on 10th April (H.B.S.); one at Stewartby pits on 21st August (F.C.G.); one at East Hyde 19th November—18th December (H.C.).

**GREEN SANDPIPER** (*Tringa ochropus*). Two at Oakley Bridge on 26th March (B.B.W.); one at Flitton Bog on 4th August (Rec.); one at Henlow on 7th August (W.K.P.); one at Stewartby pit on 21st August (Rec.); three at Fenlake on 26th September (J.K.) and small numbers (maximum eight on 30th August) at Bedford Sewage Farm intermittently from 30th July—18th December (Rec., F.C.G. and J.K.).



REDSHANK (*Tringa totanus*). Breeding birds returned to Sewage Farm area on 11th March—earlier than is usual. Forty-five were here on 24th March, after which they dispersed.

RINGED PLOVER (*Charadrius hiaticula*). One at Arlesey pits on 2nd June (R.P.).

GOLDEN PLOVER (*Pluvialis apricaria*). Flock of several hundred at Broom Fields on 6th October (F. White); Flock of two—three hundred in Kempston—Elstow Hardwick area on 27th March—13th April (Rec., H.A.W.S. and C.S.P.). Several hundreds near Cardington on 8th February (B.Sch.).

BLACK TERN (*Chlidonias niger*). Seven or eight remained for a few hours at Felmersham gravel-pits on 14th May (Lady Wells).

COMMON TERN (*Sterna hirundo*). One at Kempston Hardwick pit on 15th May (F.C.G. and C.S.P.).

COMMON GULL (*Larus canus*). One with Black-Headed Gulls (*Larus ridibundus*) at Bedford Sewage Farm on 13th March (F.C.G.).

HERRING GULL (*Larus argentatus*). Bedford Sewage Farm—seven on 7th January, four on 24th March, four on 20th October and six on 20th November. One at Kempston Sewage Farm on 27th March; eight at Bromham on 6th February; several at Willington on 13th March; three over Maulden Wood on 6th February; about twenty-five at a Luton rubbish tip from 10th—30th December and a hundred by 1st January 1950, a remarkable number (Rec., F.C.G., B.Sch. and H.C.).

LESSER BLACK-BACKED GULL (*Larus fuscus*). One at Bedford Sewage Farm on 22nd November (B.Sch.).

GREAT BLACK-BACKED GULL (*Larus marinus*). One feeding with Herring Gulls (*Larus argentatus*) on rubbish-tip at Luton on 11th December (H.C.).

CORN-CRAKE (*Crex crex*). Two birds heard in the Toddington-Tingrith area on 1st June (W.G.S.). Heard during several subsequent evenings.

WATER-RAIL (*Rallus aquaticus*). One at Bedford Sewage Farm on 7th and 8th January (J.K.) and one also here on 17th and 18th December (F.C.G. and Mrs. C. M. Lucas).

(1948 record—three at Flitton Bog on 27th December (F.C.G.).)

QUAIL (*Coturnix coturnix*). One calling near Sidegate Spinney, Stagsden, on 21st June (D.W.E.).

HENRY A. S. KEY

## MAMMALS

HARVEST MOUSE (*Micromys minutus soricinus* Hermann). Following the reports in last year's Journal, I am glad to be able to record additional evidence of the continued existence of this little mammal in Bedfordshire. Mr. T. H. Ream, of Portobello Farm, Sutton, reported to me that on 12th August 1949, his son saw several Harvest Mice while harvesting barley on a field adjoining Sutton Fen. A clear description of the mice left no doubt as to their identity.

BLACK RAT (*Rattus rattus* Linn.). Dr. G. M. VEVERS reports from Whip-snade that he caught two examples of this species in his poultry run in the autumn of 1949. The two previous records for the county were both from the neighbourhood of Bedford.

BADGER (*Meles meles* Linn.). There is interesting evidence that Badgers visit Flitwick Moor. My attention was first drawn to this by finding that a wasps' nest that I had observed during the summer had been dug out and remains of the broken combs lay scattered around. Badger's footprints were clearly visible in the peat on the adjoining bank of the stream, and later I found what was evidently a regular crossing place, with numerous footprints on both banks. During the winter fresh footprints were discovered on the stream banks in various parts of the Moor. It is thus evident that Badgers visit the Moor at night on foraging expeditions, and since they do not live there must travel some considerable distance.

RAY PALMER

## Notes and Observations

### SLUGS IN A BEDFORD GARDEN

Following the appeal of Dr. H. F. Barnes during his lecture on 11th March, 1948, for samples of slugs from Bedford gardens, I carried out regular sampling of my garden once a month throughout 1949, picking up all the slugs I could during half an hour's walk round the garden after dark, using an ordinary hand torch to see them. I put the slugs into a closely sealed tin and took them to Dr. Barnes, who kindly identified them for me.

I am now able to report that the numerically dominant species was the Grey Field Slug (*Agriolimax reticulatus*). Out of 527 slugs collected during the year, I picked up 486 specimens of this species. The expected autumnal increase did not take place, as can be seen from the following monthly figures (January to December): 76, 52, 58, 61, 20, 78, 57, 14, 0, 30, 8, 32. This can be attributed to the scarcity of rain during the summer and early autumn.

Other species I found were *Milax sowerbyi* (26 specimens), *Arion hortensis* (8), *Limax flavus* (7), and *Arion circumscriptus* (2). In addition during the daytime I found two specimens of a *Testacella* species, probably *T. haliotidea*, one during March and the other in June.

(Mrs.) C. M. LUCAS

(EDITORIAL NOTE.—Dr. Barnes will welcome samples of slugs collected in a like manner from other gardens in Bedford.)

### WATER FLEAS IN BEDFORDSHIRE

No one seems to have studied the water-fleas of the county although two species of Ostrococha are recorded from Pavenham in the Victoria County History. The Cladocera can be identified from the keys published by the Freshwater Biological Association (1941, Scientific Publication No. 5) and the following species have been recorded from random, rather than intensive, collecting. The larger number of species recorded from Fancott Lake indicates what more intensive collecting can do. Unfortunately, the lake was filled in by the owner in 1948, apparently in an attempt to reduce disease-carrying insects, not one of which bred in the lake. Southill Lake is the largest stretch of water we have and one would expect more local species to occur here. All the other records except three are from small ponds at various places in the county. The first nine species of the list tend to swim freely in the water, whereas the last seven species occur on the bottom and amongst weed.

*Sida crystallina* (O. F. Muller), Southill Lake.

*Daphnia pulex* (De Geer), Bramingham, Sharpenhoe, Silsoe, Thurleigh, Whipsnade, Copt Hall.

*Daphnia obtusa* Kurz, Fancott Pond (not in lake), Bramingham, Thurleigh

*Scapholeberis mucronata* (O. F. Muller), Fancott Lake. This species attaches itself to the water film and then rows itself along beneath the surface. Also form *cornuta*.

*Simocephalus vetulus* (O. F. Muller), Fancott Lake, Maulden, Bramingham, Harlington Wood End, Legrave.

*Simocephalus exspinosus* (Koch), Fancott Lake, Tebworth, River Ouzel at Leighton Buzzard, Southill Lake.

*Ceriodaphnia reticulata* (Jurine), Bramingham. Surprisingly no other record.

*Ceriodaphnia pulchella* Sars, Southill Lake.

*Moina macrocoopa* (Straus), small muddy puddle, Old Bedford Road part of Warden Hills, Luton (D. J. R. Laurence). The species is rare and the habitat in this case very impermanent.

*Leydigia leydigi* (Schodler), Fancott Lake.

*Alona quadrangularis* (O. F. Muller), Thurleigh.

*Alona rectangularis* Sars—Fancott Lake.

*Peraecanthe truncata* (O. F. Muller), Southill Lake.

*Pleuroxus trigonellus* (O. F. Muller), Fancott Lake; Boating Lake, Bedford; Southill Lake.

*Pleuroxus aduncus* (Jurine), Fancott Lake.

*Chydorus sphaericus* (O. F. Muller), Fancott Lake and Pond; Bramingham; Caddington; Copt Hall; Thurleigh; etc.

B. R. LAURENCE

#### FOOD OF A HARVESTER

I once enclosed an inoffensive looking *Opilio parietinus* Deg. in a pill box with a fly, *Phagocarpus permundus* Harr., male, an attractive little fly which has a sharply defined black star marking on each wing and whose larvae live in the fruits of hawthorn and *Berberis*. Looking into the box later I found the fly sucked dry, obviously attacked by the harvester. Both animals were from Whipsnade.

B. R. LAURENCE

#### WOODPECKERS—BEFORE AND AFTER THE GREAT FROST

Much has been written as to the effect of the arctic weather in 1947 on bird life, but so far as my own garden on the outskirts of Bedford is concerned, the most striking feature since then has been the complete substitution of the greater spotted woodpecker for the green woodpecker.

It was somewhere about 1936 when my lawn became heavily infested with ants and the green woodpeckers first arrived. Although they always looked awkward and out of place on the ground, the birds quartered every part of the lawn with assiduity and the holes left by their bills were visible over the whole turf, although they did no damage to it. They became relatively tame and our movements at the window or even outside the house did not disturb them at all. On the other hand, they seemed to have well defined territories and any strange green woodpecker who appeared was invariably driven off with loud cries. In contrast, they entirely ignored the noisy, squabbling starlings who shared the lawn with them. Dissection of their droppings indicated that their diet consisted almost exclusively of ants and there can be little doubt that at the end of 1946, a considerable proportion of the green woodpecker population in the district was subsisting almost entirely on this diet. In these circumstances it is not surprising that when the ground became ice-bound for weeks on end and ants and their larvae were unobtainable in consequence, a very large proportion of these birds perished.

On the other hand the greater spotted woodpecker, which never appears to have developed any considerable taste for ants, still found its customary diet of insects in its arboreal haunts and was thereby enabled to pass through the wintry ordeal with little or no loss. More than that, the great reduction in the numbers of its larger congener probably removed a source of competition for which it must have suffered in some degree. Anyhow it is certainly more common now than before the great frost and although my garden has little to offer it beyond a few fruit trees, it is now a regular visitor where formerly it was unknown, whilst the green woodpecker is never now seen. Recently three of these brightly coloured birds were sporting in my small pear tree, their bright crimson under tailcoverts shining in the wintry sun. They do not confine their attention to the trunk of the tree, but examine the outer twigs with all the thoroughness of a tit. The achievement which calls for particular comment is their ability to split almonds. Overhanging my garden fence is a large almond tree which yields annually a profuse harvest of the hardest nuts. No ordinary nut cracker can deal with them and as breaking them with a hammer soon palls, they are usually left on the ground as they fall. Since the arrival of the greater spotted woodpeckers, the presence of the neatly split shells beneath the tree with all the kernels removed, has been a common feature and whilst it is hard to understand how the bird can achieve what we find so difficult to accomplish with metal tools, the fact remains that they do so and with comparative ease.

F. G. R. SOPER

#### BREEDING OF THE SHORT-EARED OWL IN BEDFORDSHIRE

A surprise discovery of Short-Eared Owls (*Asio flammeus*) breeding well inside the county of Bedfordshire was made on the evening of 6th June 1949. Cries of the young from very rank herbage first attracted attention, and soon the parents were seen to visit them. The first impression given when seeing the adults was that they were a large species of hawk, because of the long wings, but

after being able to distinguish them as owls, it was noticeable that their flight was much superior to other species of owls, gliding on one occasion for about seventy yards. The young birds had left the nest, and were dispersed over a considerable area hidden down among a mass of dead bracken. They kept up a persistent call, but stopped whenever a close approach was made. Once an exceptional view with a telescope was obtained of an adult whilst it was perched in a tree at less than 20 yards distance. The short ears were occasionally erected and the other conspicuous features noted by the observer were the almost completely circular whitish border to the face, the brown and golden spangled plumage of the upper parts, and the pale under parts. An interesting experience occurred during another visit, when an agitated parent calling with a harsh note flew around for some time at no great height, whilst the observer and a friend were trying to find one of the young. The sun had set for some minutes at eyelevel, but it still brightly illuminated the owl as it flew overhead. It had not a feather out of place, and in this setting, at such close range and through binoculars appeared a very beautiful bird. By comparison, its mate looked rather dishevelled, having some secondaries missing from one wing. It was very difficult to assess the number of young birds, but by their calls, it would appear that there were not more than five or six.

In all six visits were made to the area during the next few weeks, on five of which the birds were seen. The area was searched for the nesting site, but this was not discovered.

C. S. PAYNE

#### SPOTTED FLYCATCHER PELLETS

Published references to the ejection of pellets by the Spotted Flycatcher are few and the information given scanty. Hartig (*Zool.*, 1880, p. 292 and 1889, p. 265) stated that the pellets resemble small blue pills and contain insect remains.

In my experience pellets are ejected whenever necessary and consequently are spread widely over the birds' territory. Accumulations of the castings do however occur in such places as roosts and under favourite perches. Soon after ejection the pellets dry out and disintegrate. Since the small remains are blown away, whole pellets are difficult to find. Although I have never witnessed an actual ejection I am of the opinion that the "yawning" of the birds that I have seen is the natural preliminary.

The pellets are egg-shaped and in colour black, impregnated with the coloured and iridescent elytra of beetles. In length they range from 8-13 mm. and in breadth from 6-9 mm., the largest measured being 12×9 mm. On analysis they were found to contain indigestible remains of insects, occasionally whole insects, sand particles, frequently small stones and almost invariably vegetable matter. This latter was usually fragments of grass blades, both dried and green, and very occasionally small ovate leaves.

One would expect the types of insects in the pellets to vary according to the habitat of the birds and the time of year. Examination of about 20 pellets belonging to a pair of Spotted Flycatchers inhabiting dry suburban territory in Bedford during June provided evidence that the main food of this particular pair included Dermaptera (earwigs), Coleoptera (two-spot ladybirds, leaf beetles and click beetles as well as other black beetles), Hymenoptera (Vespoidea and Sphecoidea), Diptera (drone flies, green- and blue-bottles, blow flies, horse-flies and *Protocaliphora azurea* which is ectoparasitic on birds) and Lepidoptera (moth wings were found). Observation of this pair of birds showed that in addition they fed on small flies caught mostly during the evening. It was also noticed that a small earthworm was fed to their young during a day of persistent rain.

J. C. C. OLIVER

#### "PINE MARTEN" IN BEDFORDSHIRE ?

The following letter is reprinted from the *Bedfordshire Magazine* of December 1949, with the Editor's permission.

*"To the Editor of the 'Bedfordshire Magazine'*

Dear Sir,

I was most interested to read in the article 'Wild Mammals of Bedfordshire' by Ray Palmer, in the autumn magazine, that the Pine Marten had been extinct in the county for over a hundred years.

I am absolutely positive beyond a shadow of doubt that I saw a pine marten at Battlesden in late August 1947. I was out blackberrying and was just crossing a little bridge in the lane leading to the village, when I saw a dark brown cat-like animal, something like a squirrel but larger, scampering on all fours along the wall of the bridge. It moved quickly, but not so swiftly as a squirrel, and I had an excellent view of it, from only a few feet away. Its head was not unlike a small fox's, but it had whiskers like a cat, its feet were spread out like a cat, and it had a big bushy tail stretched out behind. Its fur was a very rich dark brown, far darker than any squirrel or other creature I have ever seen. When it reached the end of the bridge it ran through a gap in the hedge into a thick copse near by and disappeared.

I was convinced at once that it was a pine marten from pictures I had seen, but a few weeks later when visiting the Natural History Museum at South Kensington I went to make sure. There in a glass case labelled 'Pine Marten' was a handsome creature identical in every detail with the one I had seen.

I shall be interested to hear if any more pine martens have been seen in Bedfordshire, or if anybody can solve the mystery of how the one I saw happened to be there.

Yours faithfully,

(Mrs.) MARGARET LEWIS.

(33 Grosvenor Avenue, North Harrow, Middlesex)'.  
(EDITORIAL NOTE:—In commenting on the above in the *Bedfordshire Magazine*, I pointed out the extreme improbability of the mammal seen by Mrs. Lewis being a Pine Marten, and suggested four possible alternatives: (1) A melanic variety of the Grey Squirrel, of which there are many about of varying degrees of darkness; (2) an escaped polecat-ferret; (3) a mink, escaped from a fur farm; (4) a wild polecat, though this is almost as unlikely as a marten, and has been extinct in this part of the country for about the same period. There remained the possibility of a marten escaped from captivity, and the only place where such an animal was likely to have been kept would be at Woburn Park; but our President has informed me that no martens have ever been kept there, and expressed the opinion that the animal was either a melanistic grey squirrel or a ferret. Mr. Oliver Pike also suggests a polecat-ferret as a possibility, if the animal was really not a squirrel. A squirrel when disturbed would almost certainly have run up a tree, which apparently this animal did not do. Any comments from members will be welcomed.—R.P.)

## ABSTRACTS OF LITERATURE ON BEDFORDSHIRE NATURAL HISTORY FOR 1949

### 1. THE BEDFORDSHIRE MAGAZINE. Vol. 1.

- (a) (Winter 1948-9) "Falconry in Bedfordshire", by Frank Illingworth, pp. 241-7. (Illustrated.)
- (b) (Spring 1949) "The Glory of Trees", by C. H. Gardner, pp. 300-2. (Illustrated.)

### THE BEDFORDSHIRE MAGAZINE. Vol. 2.

- (a) (Summer 1949) "Birds of Prey in Bedfordshire", by H. A. S. Key, pp. 15-18. (Illustrated.)
- (b) (Autumn 1949) "The Wild Mammals of Bedfordshire", by Ray Palmer, pp. 53-7. (Illustrated.)
- (c) (Autumn 1949) A review of V. H. Chambers' Paper on "The Hymenoptera Aculeata of Bedfordshire", from the Trans. Society for Brit. Entomology, p. 79.
- (d) (Winter 1949) "Was it a Pine Marten?" by Mrs. M. Lewis. A letter to the Editor regarding a strange mammal seen at Battlesden in 1947, with a comment by Ray Palmer, p. 118.

2. BRITISH BIRDS. Vol. XLII (1949).
  - (a) "Recovery of Marked Birds". No. 9, pp. 264-76. A Sedge Warbler (*Acrocephalus schoenobaenus*) ringed as a juvenile in Bedford on 14.7.48 was recovered at Greenford, Middx., on 31.8.49 and a Mallard (*Anas platyrhynchos*) ringed at Slimbridge, Glos., on 8.11.48 was recovered at Bedford on 27.12.49.
  - (b) "Extended song periods". No. 9, p. 288. A short note on a Lesser Whitethroat (*Sylvia curruca*) singing at Thurleigh on 24-25 July 1949, by C. W. Towler.
  - (c) "Anting of Green Woodpecker". No. 12, p. 390. Observations on a Green Woodpecker (*Picus viridis*) at Studham in September, by K. Allsop.
3. BRITISH FLOWERING PLANTS AND MODERN SYSTEMATIC METHODS (Rep. of Conference organised by Bot. Soc. Brit. Is., April 1948), 1949.
  - (a) Plate IX, photograph of herbarium sheet of *Nasturtium microphyllum* (Boenn.) Rchb. collected at Souldrop.
  - (b) p. 79, Mr. W. C. R. Watson exhibited a sheet of *Rubus pubescens* Weihe collected at Claphill. (This should be Clophill, J.G.D.)
4. BRITISH SCIENCE NEWS. Vol. 2 (1949).
 

"Development of research on the insect aerofauna", by C. G. Johnson, D.Sc., pp. 243-46. (Illustrated.) Short description of the balloon trap at Cardington and gives illustration of daily rate of aphids captured during 1947.
5. ENTOMOLOGIST. Vol. 82 (1949).
  - (a) "Migration Records 1948", by T. Dannreuther, p. 106. Mentions *Hippotion celerio* L. caught at Milton Ernest.
  - (b) "*Lysandra bellargus* in Herts. and Bucks.", by G. B. Oliver, p. 277. Records this species along the chalk from Aldbury, through Barton Hills, up to Royston. This species was released in Bucks. in 1920 and also in the Tring district.
6. ENTOMOLOGIST'S MONTHLY MAGAZINE. Vol. 84 (1948 and 85 (1949).
  - (a) "Turnip Sawfly (Hym. Tenthredinidae) in Bedfordshire", by B. Verdcourt, vol. 84, p. 270.
  - (b) "Observations on *Microphorus crassipes* Macquart (Dipt. Empididae)", by B. R. Laurence, pp. 282-83. Records habits from Harlington of this Empid which visits prey on spider's webs.
  - (c) "*Kimminsia rava* (With). (Neur. Hemerobiidae), etc., in Bedfordshire", by B. Verdcourt, p. 286.
  - (d) "Note on *Empis tessellata* F. (Dipt. Empididae)", by B. R. Laurence, vol. 85, p. 23. Describes a variety of this species which seems to have a more restricted habitat range.
  - (e) "Note on *Stollia fabricii* Kirkaldy (Hem. Pentatomidae)", by B. Verdcourt, p. 79. Localities for this bug which is associated with *Stachys sylvatica* L.
  - (f) "Some venational abnormalities in the Neuroptera", by B. Verdcourt, B.Sc., F.R.M.S., p. 90. (Illustrated.) Abnormalities of *Chrysopa ventralis* Burm. and *C. carnea* Steph. from Bedfordshire.
  - (g) "Additions to Bedfordshire list of Sawflies (Hym. Symphyta)", by V. H. Chambers, Ph.D., A.R.C.S., pp. 146-49. Records 78 sawflies new to Bedfordshire, with biological data, and comments on the rarer species.
  - (h) "Alate aphids trapped in the British Isles 1942-1947", by L. Broadbent and J. P. Doncaster, pp. 174-82. Aphid traps operated at Ampthill and Woburn. 97 species recorded from Woburn but specific list not given. Record of complete data is deposited at Rothamsted Experimental Station.
  - (i) "Food of Mecoptera", by B. R. Laurence, p. 182. Scorpion flies feed on animals which are already dead. Five instances recorded from Fancott.
  - (j) "*Agapanthia villosoviridescens* Deg. (Col. Cerambycidae) in south Bedfordshire", by B. Verdcourt, p. 216.

7. JOURNAL OF ANIMAL ECOLOGY. Vol. 18 (1949).  
 "The Distribution of Harvestmen (Phalangida) in Great Britain and Ireland, with notes on their names, enemies and food", by W. S. Bristowe, pp. 100-114. Notes 11 harvesters as occurring in Bedfordshire, including *Lacinius ephippiatus* C.L.K. not previously recorded.
8. PROCEEDINGS OF THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON (A). Vol. 24 (1949).  
 "Seasonal records in 1947 and 1948 of flying Hemiptera—Heteroptera, particularly *Lygus pratensis* L. caught in nets 50ft. to 3,000ft. above the ground", by C. G. Johnson, D.Sc., and T. R. E. Southwood, F.R.E.S., pp. 128-30. Records eleven species from the Cardington balloon trap. *Acomporis pygmaeus* Fallen not previously recorded from Bedfordshire.
9. WATSONIA I (I) Jan. 1949. (II) April 1949. (III) Oct. 1949.
- (a) "Plant Records". (I) 37-61 contains records of 16 species, most new to the county.
- (b) "The Australian *Myriophyllum verrucosum* Lindley in Britain", by J. P. M. Brenan and J. F. G. Chapple (II) pp. 63-70. (Illustrated.) The authors describe the appearance of this species, its first in the Northern Hemisphere, in the gravel pits, Eaton Socon, where it was first found in 1944 by J. G. Dony and re-appeared in 1945 and 1946.
- (c) "Weihean Species of *Rubus* in Britain", by W. C. R. Watson (II), pp. 71-83. The author, well known to Bedfordshire naturalists, writes on the discovery of *R. Libertianus* Weihe at Heath and Reach and *R. Schlechtendalii* Weihe at Deadmansea Wood and at Heath and Reach.
- (d) "Studies in the British *Epipactis*", by D. P. Young (II), pp. 102-13. (Illustrated.) The author has original theories on the relationship between British species of self-fertilised *Epipactis* and makes many references to the Bedfordshire colonies of *E. pendula* C. Thomas.
- (e) "Plant Notes", by various authors (II), pp. 117-22, pp. 118-9. *Trifolium subterraneum* L. var. *oxaloides* (Bunge) Rouy, J. E. Lousley records this new variety for Britain from the gravel pits, Eaton Socon. It is a wool alien which is apparently grown as a fodder crop in Australia. *Salix cinerea* L., A. J. Wilmott discusses this species and the closely allied *S. atrocinerea* Brot. There was some doubt as to its occurrence in Britain until it was discovered on the B.E.C.s Excursion in the county in 1947.
- (f) "*Rubus Watsonii* sp. nov.", by W. H. Mills (III), pp. 135-6. The author notes that this bramble, which he has named in honour of Mr. W. C. R. Watson, has been found in many places in South Bedfordshire by Mr. Watson and J. G. Dony and that he had also seen it there.
- (g) "*Aphanes microcarpa* (Boiss. et Reut.) Rothm. in Britain", by S. M. Walters (III), pp. 163-9. (Illustrated.) A Bedfordshire record is given for the closely allied *A. arvensis* L. (*A. microcarpa* has now been found in the county, J.G.D.)

## NEW MEMBERS

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## CHANGES OF ADDRESS

Boyd-Watt, Mrs. H. W. to "San Sineon", 52 Wimborne Road, Bournemouth, Hants.  
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## NOTICE TO CONTRIBUTORS

The Editorial Committee welcomes suitable contributions on the natural history of the county for publication in THE BEDFORDSHIRE NATURALIST. Short paragraphs from members about their own observations of general interest are specially desired. All material should if possible be typewritten in double spacing on one side of the paper only, or written very legibly. Illustrations should not be prepared before consultation with the Editor.

Contributions to be considered for publication in the next issue must be submitted by 31st January 1951, and should be sent to the *Honorary Editor*:

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