The Bedfordshire Naturalist

JOURNAL OF THE BEDFORDSHIRE NATURAL HISTORY SOCIETY FOR THE YEAR **1971**

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THE BEDFORDSHIRE NATURALIST

THE

JOURNAL

OF THE

BEDFORDSHIRE NATURAL HISTORY SOCIETY

EDITED BY R. V. A. WAGSTAFF

NO. 26 1971

CONTENTS

BEDFORDSHIRE NATURAL HISTORY SOCIETY

1972

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RECORDERS

BOTANY:

Fungi:
Dr. D. A. Reid, The Herbarium, Royal Botanical Gardens, Kew.

Except Fungi: Dr. J. G. Dony, 9 Stanton Road, Luton.

METEOROLOGY:

A. W. Guppy, 22 Poplar Avenue, Bedford.

ZOOLOGY:

Bees, Wasps and other Hymenoptera:
Dr. V. H. Chambers, 12 Douglas Road, Harpenden, Herts.

Butterflies and Moths: W. J. Champkin, 59 Rosamond Road, Bedford.

Bugs (Hemiptera-Heteroptera): Dr. B. Nau, 15 Park Hill, Toddington.

Amphibians, Fishes and Reptiles:
F. G. R. Soper, The Briars, Bromham Park, Bedford.

Mollusca: Mrs. E. B. Rands, 51 Wychwood Avenue, Luton.

Birds: P. F. Bonham, 32 Heronscroft, Bedford.

Mammals: D. Anderson, 51 Springfield Crescent, Harpenden, Herts.

BEDFORDSHIRE NATURAL HISTORY SOCIETY

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st DECEMBER, 1971

1970	RECEIPTS	£	£	1970	PAYMENTS	£
106	Cash in hand and in bank, 1st January, 1971		254.85	29	Printing, postage and stationery	44.98
	Subscriptions:			—	Beds. Naturalist Nos. 24 and 25	285.37
	For 1971 and earlier ...	186.13½		6	Subscriptions to Societies	8.00
219	For 1972	53.47½		17	Hire of halls and rooms	26.95
			239.61	115	Film Shows	14.87
7	Sale of Journals		5.40	9	Permits for reserves	—
—	Sale of old copies of Ibis ...		11.00	46	Printing programmes, forms and cards ...	57.17
16	Payments for reserves permits ...		—	4	Sundries	13.26
—	Yorkshire weekend trip		223.50	9	Auditor's fee	2.00
—	New Forest coach trip		29.00	—	Refund Lloyds Bank	1.00
5	Collections at meetings		—	—	Lecturers' fees, etc.	11.75
163	Film shows		100.60	—	Yorkshire weekend trip	199.54
3	Refund of deposit Civic Theatre		—	—	New Forest coach trip	29.00
3	Refund on display board ...		—	—	Advertising	18.87
—	Donations		2.00	—	Social evening	18.90
—	Social Evening and Putnoe Wood Open Day		42.57	—	Newsletter and Bird recorders' expenses ...	6.85
—	Putnoe Wood brochures ...		2.10	32	Display Board	—
				236	Cash at Bank, 31st December, 1971	160.12
				19	Cash in hand, 31st December, 1971	12.00
£522			£910.63	£522		£910.63

I have examined the above Receipts and Payments account which are in agreement with the books and vouchers of the Society.

7TH MARCH, 1972.

Honorary Auditor.

Leighton Buzzard.

P. SMITH,

EDITORIAL

1971 being the 25th anniversary of the foundation of the Society it was felt by the Council that we should commemorate the event in various ways and a special issue of the Journal was considered appropriate to the occasion. I was asked to take over as the Editor and a special committee was appointed to plan this issue and as a result of its recommendations certain members were invited to contribute articles on various aspects of the past 25 years. You will see that the response was very good and this journal contains some excellent articles of outstanding interest.

Apart from the special articles I was very pleased with the amount of normal reports and material which we have been able to publish in this issue. This is very encouraging and I very much hope that this trend will continue in the future.

And what of the future — the next 25 years? We live in such a rapidly changing world that it is difficult to prognosticate but there is no doubt that there has been an enormous increase in popular interest in natural history in recent years. One does not need to look far for the reasons for this. Television, increased leisure and mobility have all played their part. There was a time when natural history was the province of a few scientists, parsons and landed gentry but people are now introduced to the Ospreys of Loch Garten and the New Forest deer on television and have the time and the opportunity to see these things for themselves. This interest is being created at a time when our environment and that of our wild life have never been so threatened and I believe that our future aim as a Society should be to foster it to the maximum degree.

I believe that the future outlook makes it increasingly important to observe and record the inevitable changes in the flora and fauna and to this end it is essential that as many of us as possible get down to the necessary field work particularly on threatened species. I very much look forward to seeing even better Journals as a reflection of these efforts.

R. V. A. WAGSTAFF.

REPORT OF THE COUNCIL

An increase in membership to a total of 369 was indicative of the mounting interest in the Society's activities in this our 25th anniversary year. Of the 99 new members enrolled a significant proportion were juniors. It is regrettable that so little has been done to cater for the youngsters in the past but I am pleased to report that plans are afoot to offer them interesting and instructive activities in 1973.

Outdoor meetings were fairly well attended, the highlight being the weekend trip to the Yorkshire Dales. Mr. Key's superb organisation made this a memorable occasion for the 46 participants despite unfavourable weather. The open days at Putnoe Wood were well worth the hard work of all those concerned. Indoor meetings again showed an increase in attendances. The continued success of those held in Dunstable is encouraging. The showing of the film "The Last of the Wild" at Luton proved to be a very popular event.

The regular publication of our newsletter has found widespread approval and has proved a successful means of informing members of recent happenings and future plans. Mr. Wagstaff's efforts in its production have been well rewarded.

Following his appointment as Mammal Recorder, Mr. D. Anderson succeeded in stimulating sufficient interest in this much neglected subject to collect an encouraging number of records by the end of the year. Mr. W. J. Champkin, after his first year as Recorder for Butterflies and Moths reported that only three members had submitted records. Surely we can do better in 1973.

The departure at the end of the year of Mr. J. N. Dymond to take up his appointment as Warden on Lundy Island left us without a Bird Recorder. We are indebted to him for his hard work and enthusiasm during the year. The Society is fortunate to have such a competent successor as Mr. P. F. Bonham to take up this position.

At the Annual General Meeting Mr. L. A. Speed was elected President. As one of our most faithful members and an office bearer for 21 consecutive years his appointment was most appropriate.

The Council records its appreciation to all those who have assisted the Society in its effort to fulfil its aims and in achieving a measure of success in its 25th year.

D. GREEN, *Hon. Secretary.*

PROCEEDINGS

INDOOR MEETINGS

261st ORDINARY MEETING, 14th January, Dunstable. Informal evening. *Chairman*: Mr. R. V. A. Wagstaff. Attendance 25.

262nd ORDINARY MEETING, 21st January, Bedford. Social evening. *M.C.*: Mr. J. M. Dymond. Attendance 50.

263rd ORDINARY MEETING, 27th January, Luton. "Nature Conservation" by Mr. J. M. Schofield, Deputy Regional Officer for the Nature Conservancy. *Chairman*: Mrs. E. B. Rands. Attendance 19.

PUBLIC FILM SHOW, 10th February, Luton. Eugen Schuhmacher's film "The Last of the Wild". Attendance 265.

264th ORDINARY MEETING, 18th February, Bedford. "The Snails of Bedfordshire" by Mrs. E. B. Rands. Attendance 34.

265th ORDINARY MEETING, 25th February, Dunstable. "The Birds of Turkey" by Mr. R. Porter, of the R.S.P.B. *Chairman*: Mr. A. J. Livett. Attendance 35.

266th ORDINARY MEETING, 11th March, Dunstable. "The Wild Flowers of Bedfordshire" by Miss G. Elwell. *Chairman*: Mr. R. B. Stephenson. Attendance 25.

ANNUAL GENERAL MEETING, 18th March, Bedford. Attendance 52. *Chairman*: Mr. A. W. Guppy.

267th ORDINARY MEETING, 24th March, Luton. "Bedfordshire Bird Song" by Mrs. E. Allsopp. *Chairman*: Mr. A. J. Livett. Attendance 23.

PUBLIC FILM SHOW, 5th October, Dunstable. "The Lonely Level" and "Kites are Flying". Jointly with the R.S.P.B. Attendance about 300.

268th ORDINARY MEETING, 14th October, Dunstable. "Birds in Bedfordshire". An informal discussion evening led by Mr. J. N. Dymond and Dr. J. T. R. Sharrock. Attendance 69.

269th ORDINARY MEETING, 21st October, Bedford. "Hunting Wild Orchids in Britain" by Mr. A. G. Ford. *Chairman*: Dr. D. M. Jeffreys. Attendance 32.

270th ORDINARY MEETING, 27th October, Luton. "The Snails of Bedfordshire" by Mrs. E. B. Rands. *Chairman*: Mr. D. Green. Attendance 17.

271st ORDINARY MEETING, 28th October, Bedford. Special social evening to commemorate the Society's 25th Anniversary. Guest Speaker — Mr. Walter Flesher, the Yorkshire broadcaster and naturalist. *M.C.*: Mr. H. A. S. Key. Attendance 70.

272nd ORDINARY MEETING, 11th November, Dunstable. "The Geology of Bedfordshire in Relation to its Natural History" by Mr. G. Osborn, President of the Geology Section, Northants. Natural History Society. *Chairman*: Mrs. E. B. Rands. Attendance 25.

273rd ORDINARY MEETING, 18th November, Bedford. "Pond Life" by Dr. Nancy Dawson. *Chairman*: Mr. F. G. R. Soper. Attendance 40.

274th ORDINARY MEETING, 24th November, Luton. "History of the Vegetation of Bedfordshire" by Dr. J. G. Dony. *Chairman*: Mrs. E. B. Rands. Attendance 20.

PUBLIC FILM SHOW, 25th November, Bedford. Eugen Schuhmacher's film "The Last of the Wild". Attendance about 100.

275th ORDINARY MEETING, 9th December, Dunstable. "Birds of the Isles of Scilly" by Mr. D. Hunt, of the R.S.P.B. *Chairman*: Mr. P. Smith. Attendance 46.

276th ORDINARY MEETING, 17th December, Bedford. "Mammals of Bedfordshire" by Mr. M. Clark, mammal recorder for Hertfordshire. *Chairman*: Mr. L. A. Speed. Attendance 63.

FIELD MEETINGS

SUNDAY, 31st JANUARY. TRING RESERVOIRS. *Leader*: Mr. R. V. A. Wagstaff. Attendance 3.

SUNDAY, 14th MARCH. PUTNOE WOOD. *Leaders*: Members of the Scientific Sub-Committee.

SUNDAY, 25th APRIL. R.S.P.B. RESERVE AT MINSMERE. *Leader*: Mr. B. R. Squires. Attendance 14.

SUNDAY, 9th MAY. BRECKLANDS-LAKENHEATH AREA OF SUFFOLK. *Leader*: Miss G. Elwell. Attendance 7.

WEDNESDAY, 12th MAY. MAULDEN WOOD. *Leader*: Mr. D. Green. Attendance 26.

THURSDAY, 20th MAY. BROMHAM PARK Snail hunt. *Leader*: Mrs. E. B. Rands. Attendance 20.

WEEKEND 5th-6th JUNE. YORKSHIRE DALES. Special event to commemorate the society's 25th anniversary. *Leader*: Mr. H. A. S. Key. Attendance 46.

WEEKEND 12th-13th JUNE. PUTNOE WOOD. Open days. Nature trail and natural history exhibition.

WEDNESDAY, 23rd JUNE. LEIGHTON BUZZARD AREA. Tetrad recording of plants. *Leader*: Dr. J. G. Dony. Attendance 20.

SUNDAY, 27th JUNE. THRIPLOW MEADOWS NATURE RESERVE, CAMBRIDGE. *Leader*: Mr. A. Ford. Attendance 9.

THURSDAY, 8th JULY, CHICKSANDS WOOD. *Leader*: Mr. A. W. Guppy. Attendance 14.

SUNDAY, 18th JULY. MONKS WOOD EXPERIMENTAL STATION AND WOOD WALTON FEN. *Leader*: Dr. D. M. Jeffreys. Attendance 16.

SATURDAY, 14th AUGUST. BROMHAM. Moth evening. *Leader*: Mr. W. J. Champkin. Attendance 21.

WEDNESDAY, 1st SEPTEMBER. BARTON SPRINGS. Snail Hunt. *Leader*: Mrs. E. B. Rands. Attendance 10.

SUNDAY, 26th SEPTEMBER. NEW FOREST. *Leaders*: Miss G. Elwell and Dr. D. M. Jeffreys. Attendance 22.

SUNDAY, 3rd OCTOBER. SOUTHILL PARK. Fungus Foray. *Leader*: Dr. D. A. Reid. Attendance 24.

SATURDAY, 9th OCTOBER. BROMHAM. The flora of a rubbish tip. *Leader*: Dr. J. G. Dony. Attendance 33.

SUNDAY, 10th OCTOBER. TRING RESERVOIRS. *Leader*: Mr. R. V. A. Wagstaff. Attendance 8.

SATURDAY, 23rd OCTOBER. PUTNOE WOOD. Fungus Foray. *Leader*: Miss M. Holden. Attendance 24.

THE FUNGUS FORAY AT SOUTHILL PARK

The fungus foray, with Dr. D. A. Reid of Kew as leader, was held at Southill Park on 3rd October, and attended by 24 people. Unfortunately the weather was overcast and owing to the dry season fungi were scarce. A total of 61 species was collected of which 5 were new to the county.

The most interesting find was that of *Tyromyces fissilis* [formerly known as *Polyporus albosordescens*] growing at a height of about 12 feet up a living oak tree. This large white polypore which is inclined to bruise pink on handling is a decidedly rare species. Another unusual find was *Fistulina hepatica* growing on sweet chestnut [*Castanea sativa*] instead of oak [*Quercus* spp.] which is its usual host. A collection of the small Birds Nest Fungus — *Crucibulum vulgare* caused considerable excitement and is of interest since it is the first time it has been reported since Abbot recorded it in 1798. Also worthy of mention was the presence of numerous young elm trees [*Ulmus* spp.] killed by Dutch Elm Disease caused by the fungus *Ceratocystis ulmi*. The presence of such trees was not surprising in view of the widespread current outbreak of the disease.

Armillaria mellea (Vahl ex Fr.) Karst.; *Clitocybe infundibuliformis* (Schaeff. ex Weinm.) Quél.; *Collybia dryophila* (Bull. ex Fr.) Kummer; *C. erythropus* (Pers. ex Fr.) Kummer; *C. peronata* (Bolt. ex Fr.) Kummer; *Coprinus comatus* (Mull. ex Fr.) S. F. Gray; *C. disseminatus* (Pers. ex Fr.) S. F. Gray; *C. lagopus* (Fr.) Fr.; *C. plicatilis* (Curt. ex Fr.) Fr.; *C. radians* (Desm.) Fr.; *Gymnopilus penetrans* (Fr. ex Fr.) Murr.; *Hypholoma fasciculare* (Huds. ex Fr.) Kummer; *Lepiota friesii* (Lasch) Quél.; *L. rhacodes* (Vitt.) Quél.; *Marasmius rotula* (Scop. ex Fr.) Fr.; *Mycena acicula* (Schaeff. ex Fr.) Kummer; *M. galericulata* (Scop. ex Fr.) S. F. Gray; *M. galopus* (Pers. ex Fr.) Kummer; *M. polygramma* (Bull. ex Fr.) S. F. Gray; *M. speirea* (Fr. ex Fr.) Gillet; *Oudemansiella radicata* (Rehl. ex Fr.) Sing.; *Panaeolina foensecii* (Pers. ex Fr.) Maire; *Panaeolus campanulatus* (Bull. ex Fr.) Quél.; *Pluteus cervinus* (Schaeff. ex Fr.) Kummer; *Psathyrella candolleana* (Fr.) Maire; *P. microrhiza* (Lasch) Konrad & Maubl.; *Stropharia inuncta* (Fr.) Quél.

Daedaleopsis confragosa (Bolt. ex Fr.) Schroet.; *Fistulina hepatica* [Huds.] Fr.; *Heterobasidion annosum* (Fr.) Bref.; *Inonotus dryadeus* (Pers. ex Fr.) Murr.; *Laetiporus sulphureus* (Bull. ex Fr.) Murr.; **Tyromyces fissilis* (Bourd. & Galz.) Donk; *T. kymatodes* (Rostk.) Donk; *Xylodon versiporus* (Pers.) Bond.

Clavulina cristata (Fr.) Schroet.

Coniophora arida var. *flavobrunnea* Bres.; *C. puteana* (Schum. ex Fr.) Karst.; *Cristella confinis* (Bourd. & Galz.) Donk; *Hyphodontia papillosa* (Fr.) J. Erikss.; **Peniophora rufo-marginata* (Pers.) Litsch.; *Radulomyces confluens* (Fr.) Christ.; *Stereum gausapatum* (Fr.) Fr.; *S. hirsutum* (Willd. ex Fr.) S. F. Gray.

Hirneola auricula-judae (Bull. ex St. Amans) Berk.

†*Crucibulum laeve* (Huds. ex Relh.) Kambly [=*C. vulgare*]; *Lycoperdon perlatum* Pers.; *L. pyriforme* Schaeff. ex Pers.; *Phallus impudicus* L. ex Pers.; *Scleroderma verrucosum* Bull. ex Pers.

Hymenoscyphus (*Helotium*) *fructigenus* (Bull. ex Merat) S. F. Gray; *H. scutula* (Pers. ex Fr.) Phillips.

**Ceratocystis ulmi* (Buism.) C. Moreau; *Diatrype disciformis* (Hoffm. ex Fr.) Fr.; *Nectria cinnabarina* (Tode ex Fr.) Fr.; *Xylosphaera* (*Xylaria*) *hypoxylon* [L.] Dumort.; *X. polymorpha* (Pers. ex Merat) Dumort.

**Botryosporium pulchrum* Corda; **Papularia sphaerosperma* (Pers. ex Fr.) Hohn.

Didymium difforme (Pers.) S. F. Gray; *Lycogala epidendrum* (L.) Fr.

†Confirmation of existing record.

*New record for the county.

DEREK A. REID.

FUNGUS FORAY AT PUTNOE WOOD

A fungus foray additional to the usual annual event was held in Putnoe Wood, Bedford, on 23rd October, 1971. Miss Margaret Holden of Rothamsted acted as leader and there was an attendance of 24.

In spite of heavy rain the previous week-end, the wood was very dry and fungi were by no means plentiful. It was a fine and sunny day, however, and an enjoyable afternoon was spent in the wood, a total of 60 species (including 6 Myxomycetes) being recorded. Most of the fungi were on logs and stumps and on a large bonfire site. The Agaric list included seven species of *Mycena* and four of *Coprinus* including the rather uncommon *C. picaceus.* The most interesting find was actually outside the wood; this was the Hawthorn Tubaria (*Tubaria autochthona*) growing in vast numbers alongside the hedge between the car-park and the wood. This little species is very uncommon and usually occurs only in ones and twos on fallen haws. [This hedge is an old one consisting exclusively of hawthorn.—Ed.]

Armillaria mellea; Collybia carbonaria; C. dryophila; Coprinus disseminatus; C. lagopus; C. picaceus; C. plicatilis; Cortinarius sp.*; Gymnopilus junonius; Hebeloma crustuliniformis*(*)*; Hypholoma fasciculare; Inocybe geophylla; I. lilacina; Laccaris laccata; Lactarius quietus; Lepiota rhacodes; Mycena alcalina; M. filopes; M. flacoalba; M. galericulata; M. inclinata; M. polygramma; M. tenerimma; Pleurotus dryinus; Pluteus cervinus; P. salicinus; Pholiota carbonaria; P. gummosa, Psathyrella candolleana; P. caudata; P. gracilis; Stropharia aeruginosa; Tubaria autochthona; T. furfuracea.*

Lycoperdon pyriforme; Scleroderma verrucosum.

Bjerkandera adusta; Coriolus versicolor; Dacromyces deliquescens; Exidia albida; Merulius corium; Peniophora cinerea; Phlebia radiata; Serpula himantioides; Stereum hirsutum; Tiromyces caesius.

Bulgaria inquinans; Chlorosplenium aeruginascens; Coryne sarcoides; Baldinia concentrica; Hypoxylon fuscum; Nectria cinnabarina; Xylaria hypoxylon; X. polymorpha.

Arcyria cinerea; A. denudata; A. pomiformis; Didymium melanospermum; Lamproderma scintillans; Trichia botrytis.

(*)confirmation of old record.

MARGARET HOLDEN.

SPECIAL SOCIAL EVENING — THURSDAY, 28th OCTOBER, 1971

To complete the programme of special events which commemorated the 25th anniversary of the Society, a social evening was held in Trinity Hall, at the rear of Trinity Church, Bromham Road, Bedford.

In opening the proceedings at 7.30 p m., Mr. Henry A. S. Key, as M.C., introduced the well-known Yorkshire broadcaster, Mr. Walter Flesher, as guest speaker. As he expounded the virtues of the countryside as few are gifted to do, he held his audience in rapt attention and in recounting with his usual witty style some of his many amusing experiences, induced paroxysms of laughter. The address was followed by spontaneous and prolonged applause.

Then followed an interval for refreshments, prepared by Mrs. O. G. Key and Mrs. V. M. Sharman, assisted by a group of volunteers. Those who were present are not likely to forget the varied and sumptuous spread, to which all did justice. The gathering was highly amused when Mr. Flesher remarked, that in his native Yorkshire, such feasts are known as 'fattenings".

The remainder of the evening was taken up with the showing of a selection of his excellent colour cine films by 'Wally' Champkin and colour slides with commentaries by several members, some of which related to the recent trip to the Yorkshire Dales. It was approaching midnight before the programme closed and there was a unanimous expression of gratitude to all concerned for what was voted to have been one of the most successful and outstanding events in the Society's history.

YORKSHIRE DALES EXCURSION
SATURDAY/SUNDAY, 5th/6th JUNE, 1971

Feeling very strongly that the 25th year of the Society's existence should be suitably commemorated with a number of special events, I suggested to the Council that a coach outing might be arranged to an area outside the more normal range of the Society's activities and one that would cater for a variety of interests. The dales in the West Riding of Yorkshire I felt would be an ideal venue; the journey would not be too ambitious and it ought to be possible to arrange suitable overnight accommodation. The idea met with unanimous approval and I was deputed to proceed with the necessary arrangements and to act as honorary organiser.

It was when lecturing in Sedbergh in January that the idea first occurred and when I enquired about the possibility of overnight stay, such was the response of traditional Yorkshire hospitality, that offers of assistance poured in from many local residents and it was very evident that not only would the excursion be possible but that our hosts would ensure the success of the venture. The members of the Society responded rapidly to the news, a coach was engaged and the seating was soon fully booked.

Such an excursion was going to demand detailed and careful planning and a private party travelled in our Volkswagen, one cold weekend in March, to go over the proposed routes. Some interesting experiences occurred during the journey. 'Wally' Champkin and I measured with surveyors' tape all narrow roads, bridges, cattle grids, etc., and the quizzical gaze of the locals, who were puzzled as to who the 'officials' with book, tape and chalk could be, were highly amusing. As a result of this survey many amendments were made to the original plans, to finalise a smooth and trouble-free itinerary.

The highlight of the trip was meeting for the first time Mr. Walter Flesher, whose broadcasts on the Yorkshire scene and wild life we had listened to so intently on many occasions. With our mutual interest in that wonderful county, I felt that I already knew him. We were introduced by 'Wally' who had first met Walter in Speyside and since then our friendships have been cemented and we have shared many happy experiences. When I suggested that we would like him to join the trip as guest of honour and explain to our members the virtues of his beloved countryside, he was delighted to accept — after this we could not care what the weather had in store for us. Towards the end of this brief outing, the weather did in fact deteriorate and falling snow only just allowed the ascent of the Buttertubs pass, which we crossed into Swaledale. The vehicle furthermore skidded and turned completely round on a junction with the Great North Road. However, the party all returned home safely, arriving in the early hours of the morning. So much for the preliminaries.

On the fine morning of Saturday, 5th June, the coach collected a small party of members from Luton and arrived at St. Peter's Green, Bedford, where the remainder of the group embarked promptly and the convoy started at 7 o'clock with myself, ahead in the Volkswagen, as pilot. The journey northwards was made more interesting by announcements from a

prepared log, indicating items of significance. The first brief halt was made at Grantham and a mid-morning break for coffee in a lay-by south of Doncaster. Leaving the A1 at the Tadcaster Junction, the coach proceeded via Harewood and Otley to Burley-in-Wharfedale, where Mr. Flesher joined us and was introduced to the members. Onwards through Ilkley with glimpses of Wharfedale and the rocky escarpment of Ilkley Moor, the route lay through the market town of Skipton (often referred to as 'the gateway to the dales') and thence by lovely country lanes to Grassington, where we were met by a 'Panda' car of the West Riding Constabulary, which escorted the convoy and the police arranged suitable parking for our vehicles at Grass Woods. We record our indebtedness to the officers of that force, both for their unstinted help and suggestions, which ensured a smooth passage through narrow meandering lanes.

Lunch was taken in the woods, with the party listening intently to Mr. Flesher's helpful advice. Groups climbed the limestone clints, ambled casually along the woodland paths or meandered through the meadows bordering the adjacent River Wharfe. A variety of interesting birds was seen, especially noteworthy being the nuthatches; and among the more outstanding of the wide variety of flowering plants encountered — for which the wood is so famous — were Rock Rose (*Helianthemum chamaecictus*), Bloody Cranesbill (*Geranium sanguineum*), Water Avens (*Geum rivale*), Solomon's Seal (*Polygonatum multiflorum*) and Columbine (*Aquilegia vulgaris*).

Continuing with the programme, we passed close to the renowned glacier-eroded outcrop of limestone called Kilnsey Crag (publicised by television broadcasts of rock climbers scaling its face). The streams nearby were golden yellow with Monkey Flower (*Mimulus guttatus*) often erroneously referred to as 'Musk' — which is a related species. The coach then proceeded to Malham, where a longer period was allowed for visiting either the remarkable horseshoe escarpment of Malham Cove, or the awe-inspiring cliffs of Gordale Scar. To reach the latter spectacle, I ferried small parties to and fro in the Dormobile. Note was taken of the interesting limestone flora of this Craven area. From Malham we pressed forward to another focal point of the region, Settle, where a brief halt was made in the market place, before proceeding through Ribbledale, famous for its pot holes and limestone caves and views of the rock strewn slopes of that outstanding hill Pen-y-Ghent.

By the White Scar Caves, the bulk of the party disembarked and proceeded across several fields and across stepping stones over the river. Then dividing into two groups, one was conducted down the somewhat shorter route, following the River Doe, through beautiful glens with many waterfalls and the other, crossing the lower slopes of Whernside, by a longer and hillier path, along an old Roman Road hemmed in by stone walls, to the head of the valley of the River Twiss. A descent was then made, passing firstly the spectacular Thornton Force and subsequently through wooded ghylls, with their abundant 'Spouts', until both parties were re-united in the coach park at Ingleton.

The concluding stage of the day took us to Kirkby Lonsdale, where opportunity was given to see the scenery of the River Lune, crossed by its celebrated Devil's Bridge. Sedbergh was reached about nine o'clock and the members dispersed to their several billets, retiring happily to recapture the day's experiences. Not yet so for the catering party, consisting of Mrs. V. Sharman, my wife and other members, assisted by some of the hosts, who prepared the following day's refreshments till long past midnight.

Up almost with the proverbial lark on Sunday, 6th June, many of the party, already refreshed with a comfortable rest, were abroad early, investigating the sights of this delightful country town, before assembling at the coach park for the second leg of the programme. The first item on

the agenda was a visit to the nearby valley of the River Lune, with outstanding views of the Howgill Fells. The hedge-banks were resplendent with a riot of Bluebells, Stitchwort, Cranesbill, Red Campion and Sweet Cicely (*Myrrhis odorata*) — an umbelliferous plant so characteristic of the Northern scene — among a varied display of species too numerous to mention. At Tebay we were joined by a car driven by our member, Eric Clifton, in company with 'Wally' Champkin and our mutual friend and Lake District Naturalist, Jim Cooper of Glenridding, who had broken their return journey from Scotland to share this day's experiences with us. We drove along the recently opened M6 from Tebay and proceeded from there through Sedbergh, along the valley of the River Cleugh, called Garsdale, past the viaduct of the main railway here at Garsdale Head and the lonely Moor Cock Inn, eventually halting short of Hawes for morning coffee. Only a few miles further on, an extended halt was made at the village of Hardraw where lunch was taken and the party visited the glen near the village, to see the outstanding Hardraw Force, with its eighty foot uninterrupted cascade of water. The craggy ravine was hung with a display of Red Campion and Forget-me-nots and several other species, but we were too late in the season to see the starry white blossoms of Ramsons (*Allium Ursinum*) whose leaves were very apparent. I must mention here that throughout the various excursions, most of the characteristic birds of this region had been seen, by one or other of the party.

Suitably refreshed, we then commenced the long pull up to the summit of the Buttertubs pass, to see the remarkable 'pits' with their columnar shafts, on the steep slopes of the hill. Some of the botanists searched in vain for the Sundew in the boggy ground, but the bitter deteriorating weather did not encourage much investigation. This, however, failed completely to damp the enthusiasm of our members. The coach descended the other side of the pass into Swaledale, with its magnificent vistas; and, at Muker, the School was pointed out, where those celebrated pioneer naturalists, the Kearton brothers, gained their early education. Between Gunnerside and Reeth we halted, where an optimum view enabled the party to appreciate the lovely scenery of this middle reach of the dale, with its profusion of stone walls and outbarns. Before leaving the valley there were many remarkable views of the river as it twisted its way towards Richmond and we eventually branched off returning once again into Wensleydale to our appointment at Castle Bolton — a ruined though partly restored fortress — where the celebration high tea had been arranged. After looking over the castle rooms and the museum, the party assembled in the large banqueting hall, where, after full justice had been done to the excellent spread, the President of the Society, Mr. L. A. Speed, expressed the gratitude of all concerned to the Organisers "with a few well chosen words".

Before the return journey, the whole gathering stood on the Castle steps, while a commemorative photo was taken. In the group were the President and Secretary of the Wharfedale Naturalists' Society, and their wives, invited together with Mr. Flesher as our guests, and who, at last, regretfully said their farewells, with gratitude for a most enjoyable mutual experience.

The return journey via the Great North Road was uneventful and the members disembarked at both Bedford and Luton round about midnight. Altogether the trip was a very rewarding and unforgettable experience and resulted in so many expressions of appreciation, that the project could be considered as extremely satisfactory.

HENRY A. S. KEY.

A NEW SYSTEM OF RECORDING FOR BEDFORDSHIRE

By John G. Dony

The greatest change in the study of the natural history of the British Isles in recent years has been the adoption of the National Grid as a basis for recording. For the purposes of national recording the ten-kilometre grid square has been generally used with the satisfying result of a series of distribution atlases. The relationship of this system of national recording to Bedfordshire is shown in Figure 1.

With the success of this system there is no reason why a similar one should not be adopted for local recording. For such a purpose the ten-kilometre square itself, 6¼ miles x 6¼ miles, gives too large a unit, but there are three ways in which the square may be divided into smaller squares of equal size:

(1) into four squares each 5 km. x 5 km. This has been done in a few counties, but the maps produced do not reveal satisfactory distribution patterns. There would be 60 viable units in Bedfordshire if we adopted this system.

(2) into one hundred squares each 1 km. x 1 km. This has, so far, not been adopted in any county. It would make an ideal system but would give about 1,100 units if we adopted it in Bedfordshire. It is extremely doubtful if we have enough field workers to make it a success.

(3) into twenty-five squares known as tetrads, each 2 km. x 2 km. (see Figure 2). This has been adopted in many lowland counties including Cambridgeshire, Huntingdon and Peterborough, Buckinghamshire and Hertfordshire, all of which adjoin Bedfordshire. It gives an ideal number of units to be worked by a team. The advantages of this system are many:

   (a) while based on the grid, it is not essential to be able to read the grid to use it.

   (b) records can be used to make the national recording more complete.

   (c) within a tetrad it is unlikely that there will be two woods or two rivers or two stretches of downland; in other words, the record will, in many cases, be the clue to location.

   (d) its application to Bedfordshire is most appropriate as the main natural features — belts of woodland, chalk downland, the Lower Greensand ridge, the Ouse and Ivel water systems — are quite distinct. The use of the tetrad system would show interesting distribution patterns.

It is hoped that the adoption of this system of recording in the county may result in the production of a series of atlases. Using the same system in Hertfordshire, a third as big again as Bedfordshire, I was able to publish maps 1.7 ins. x 1.2 ins. on which the details were clear. Maps of Bedfordshire need be no larger.

Workers elsewhere are using various means of numbering or lettering the tetrads. The one used here is that which I used for the Hertfordshire survey and is, incidentally, the only one so far published. It is also the one now adopted by the Biological Records Centre of the Nature Conservancy. One of the chief virtues is the economy in space of spelling out the distribution if a map is not used, e.g. 92/VYZ 02/CEJ 03/ADEFGIPUX could indicate occurrence in these fifteen tetrads.

The time taken to complete a tetrad survey is an important consideration. With the assistance of a small but welcome team of helpers I was

able to accomplish the Hertfordshire flowering plant survey in ten years. Given the same amount of help a Bedfordshire survey should take six or seven years. The task is never fully completed, but, given sufficient time and enough attention to every individual tetrad, convincing results will be obtained.

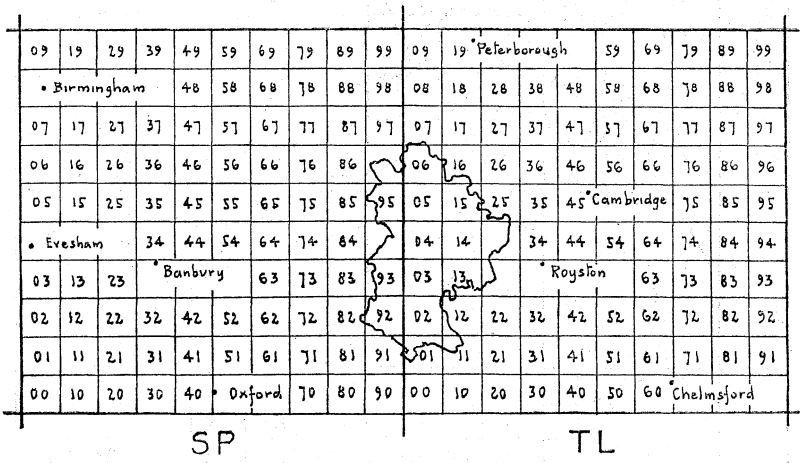


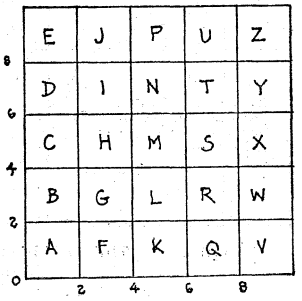
Figure 1 THE NATIONAL GRID

The ten-kilometre grid square is used for national recording. There are about 3,500 such squares in the British Isles, four of which are entirely in Bedfordshire and there are parts, often small, of nineteen others. The ten-kilometre grid square is too large for local recording in a county of the small size of Bedfordshire.

In adopting a modification of the grid for local recording in Bedfordshire there is no need to use the prefixing letters SP or TL so long as it is clear that the recording refers to the county.

Figure 2 THE TETRAD SYSTEM

A ten-kilometre grid is divided into 25 tetrads, each 2 km. x 2 km. or 4 sq. km. This system is now widely used for local recording and the enumeration of the tetrads shown here is that most in use. Note that O is not used, to save confusion with Q.



There are 249 complete tetrads in Bedfordshire in its widest sense and parts, some very small, of another 134. A full survey should aim at getting records for all the complete tetrads and for about a half of the remainder. On no account should records be counted from parts of tetrads outside the area intended to be covered by the whole survey.

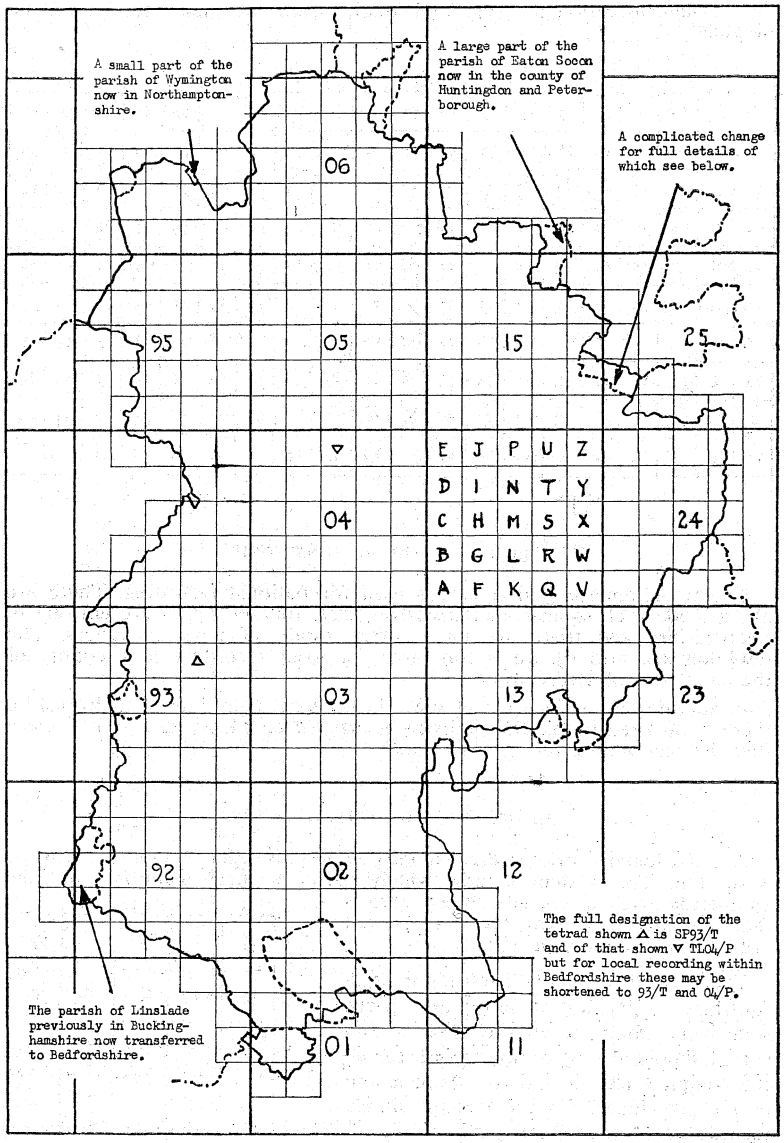


Figure 3 THE APPLICATION OF THE TETRAD SYSTEM TO BEDFORDSHIRE

On this map the present (1972) county boundary is shown in firm outline and the dotted line shows the boundary of Watsonian vice-county 30, Bedford, where this differs from the present county boundary. Botanists and conchologists still link their records to the Watsonian system as well as record on the grid basis. There are 13 cases where the boundaries differ, and most of these were accounted for in a paper in Journ. Beds. Nat. Hist. Soc. 1 (1946).

Changes since then are described on the map. The complicated change involves the transfer to Bedfordshire of the previously detached part of the parish of Tetworth in Huntingdonshire but nevertheless considered to be part of vice-county 30. With this was also transferred an adjoining part of the parish of Gamlingay, previously in Cambridgeshire.

The numbers shown on the map are those of the ten-kilometre grid squares used for national recording. In one of these — No. 14 — the number is not shown but the lettering of tetrads instead.

REPORTS OF RECORDERS

BOTANY

This was a most profitable year in which pride of place must be given to the discovery by Dr. Nancy Dawson of *Rosa rubiginosa* L. near to Home Wood. I have looked in vain for this on the Bedfordshire chalk downland but Dr. Dawson reported it in fruit late in 1970. A visit in 1971 in the flowering season confirmed that she had made a correct determination.

A railway bank near Harlington produced a fine colony of *Vicia tenuifolia* Roth. and railway banks elsewhere added considerably to our hawkweeds with *Hieracium sublepistoides* (Zehn.) Druce, *H. grandidens* Dahlst., *H. diaphanum* Fr., *H. maculatum* Fr., and *Pilosella prealta* subsp. *arvorum* (Naegeli & Peter) P. D. Sell and C. West. *Erophila spathulata* Lang was found plentifully in short turf on the side of Flitwick Moor.

Alien species added their normal quota with *Sorghum bicolor* (L.) Moench from Luton Dump and *Cicer aristinum* L. from Bedford R.D.C. Dump which also produced *Neslia oaniculata* (L.) Desv. last recorded for the county in 1876. Fewer wool aliens than usual were found, *Malva verticillata* L., *Amaranthus albus* L. (found in 1970), and *Polypogon paniceus* (L.) Lagasca (reported by Mr. G. Hanson) being the only additions. Mr. J. Mason has sent in the records of three grasses found by him in 1967 but not named until this year: *Cenchrus pauciflorus* Benth., *Eragrostis curvula* (Schrad.) Nees and *Panicum effusum* R.Br.

J. G. DONY.

METEOROLOGY

Considered as a whole, 1971 was a year without extremes of temperature or rainfall and chiefly to be remembered for its prolonged autumn, which was in direct contrast to the rather unsatisfactory summer which had preceded it.

The year began with five days of freezing fog, but the remainder of January was mild and wet, rain occurring on twenty days of the month; it was followed by the usual dry February, with very little frost. The first snow fell during the first week of March, but it soon went, and the rest of the month was mainly dull and cloudy with only an occasional light frost. A prevalence of easterly and north-easterly winds made April a cold dry month, with the exception of the 20th and 21st, when maximum temperatures temporarily reached 20 deg. C., but the last four days showed an improvement, and the first fortnight of May had several brilliantly fine spring days, notably the 2nd, 3rd, 10th and 11th, on the last of which the temperature exceeded 24 deg. C. The final ten days of the month, however, were cool and unsettled, and similar conditions prevailed throughout June, apart from a couple of fine warm days on the 1st and 2nd. The 10th June was a particularly unpleasant day, with a maximum temperature of only 14 deg. C. and unusually heavy rain which caused extensive flooding in some parts of southern England.

July saw a change to much drier weather, with the highest temperatures of the year which reached 30 deg. C. on the 8th and 11th, and 29 deg. C. on the 2nd, 10th and 30th, the latter being succeeded by a short but spectacular thunderstorm in the early hours of the following morning. This thundery activity continued during the first week of August and was followed by cool and unsettled conditions for the rest of the month.

The extended autumn made some amends for the summer's shortcomings; there were three main periods of warm dry weather, the first and longest comprising the first three weeks of September, the second and third corresponding to the first ten and last ten days of October respectively. A maximum temperature of 24 deg. C. was recorded on the 21st September, and, even a month later, on the 23rd October, the unusually high figure of 20.5 deg. C. was still attained.

It was not until the 5th November that the fine weather at last collapsed; thereafter, November was a wet and unsettled month with a high rainfall. An anticyclone became established to the west of the British Isles for the first sixteen days of December, giving mild cloudy weather without night frosts and a day maximum of 16 deg. C. on the 16th. Christmas Eve and the morning of Christmas Day were sunny and mild, but the year closed with a change to colder and less settled conditions.

Temperatures

Temperatures for the year as a whole were close to average, but January and February were decidedly milder than usual, whereas June was very much below average. October was also warmer than usual.

The maximum day temperatures of the year were all recorded in July, 30 deg. C. being reached on both the 8th and 11th.

The minimum night temperature of —5 deg. C. occurred on the three nights of 1st/2nd January, 2nd/3rd January and 4th/5th March.

Rainfall

In the north of the county the rainfall for the year as a whole was very close to average, but in the south there was a deficiency of up to ten per cent in some places. In the north, January and June were the two wettest months, with rainfall approaching twice the average in the former, but, in the south, August was generally wetter than January and at Silsoe the month's total was over 55 per cent in excess of normal, largely due to the heavy thunderstorms which were a feature of the first fortnight.

Against this, September was everywhere the driest month, except at Sandy, although February and July were also well below average at all stations.

At Cardington there were 20 wet days in January, eleven of them consecutive, from the 18th to the 28th inclusive, and 21 in August, although the actual rainfall in these periods was not as heavy as in the ten consecutive days 11th-20th October, when 76.1 mm. was recorded.

The heaviest day's fall at Cardington was 17.9 mm. on the 19th October, and this was closely followed by the 16.9 mm. which accompanied the thunderstorm of the 3rd August.

There was an unusually dry period of 23 days without measurable rain from the 31st August to 22nd September inclusive, and another period of absolute drought comprised the 15 days from 21st October to 4th November.

Snow

Very little snow was recorded during the year, apart from a slight fall on the evening of the 1st March which melted on the following day. There were further slight snow showers during the ensuing week, but nothing more until the 30th December.

Thunder

Thunder was heard on eleven occasions, six of them during the thundery period at the beginning of August. Reference has already been made to

the early morning storm of the 31st July. The storms on the afternoon of the 20th October were accompanied by remarkably heavy rain locally.

TWENTY-FIVE YEARS IN RETROSPECT

During the twenty-five years in which these annual reports have been compiled there have been some exceptional meteorological events, and few years have been entirely free from the unusual.

The most sensational and devastating was the thunderstorm and tornado of Sunday, 21st May, 1950, which has been the subject of several subsequent papers by meteorologists. Although Bedford and the surrounding area escaped the worst effects of the tornado, which unroofed a large number of houses at Linslade, the accompanying thunder- and hailstorm was at its worst in the Bromham-Oakley neighbourhood; some roads were blocked by drifts of hail and trees were stripped of their foliage. Some of the jagged fragments of hail exceeded three inches in length.

Much more prolonged unpleasantness was provided by the two memorable winters of 1947 and 1963. In the first, the snow lay unmelted for 51 days, and there were 53 consecutive nights of frost. The great blizzard of 4th March blocked most main roads into Bedford. The ultimate thaw gave rise to the worst floods in the Ouse valley within living memory. Yet, despite all this, the following summer was exceptionally warm and dry.

The winter of 1963 produced the lowest temperature of our whole quarter-century. In Bedford the thermometer fell to 5 deg. F. or —15 deg. C. on the night of the 23rd January. Snow lay unmelted for 64 consecutive days.

The record rainfall for one day was during the thunderstorm of August Bank Holiday 1948, when the astonishing total of 85 mm. came down in one evening at Bedford; Cardington was not far behind with 83.8 mm.

Our wettest year was 1958, with rainfalls of nearly 30 inches in the north of the county — about 40 per cent above average. At the other extreme was 1964, with barely more than one-half this amount.

There is little doubt that 1959 was our hottest summer, and almost certainly our sunniest. July, in particular, had no less than five days exceeding 90 deg. F. and there was a drought lasting 57 days from 16th August to 10th October. Perhaps our pleasantest summer, however, was that of 1969 which lasted almost unbroken from early June to early November, and included the driest October on record.

To conclude, one may perhaps mention four unusual little occurrences, unimportant in themselves, but providing that element of the unexpected which the amateur observer always enjoys, even when engaged in the apparently incomprehensible hobby of keeping weather records:

An extraordinarily low barometer reading of 28.01 inches on the 4th February, 1951.

A snowstorm on the 17th May, 1955.

A thunderstorm on New Year's Day, 1956.

And finally, a display of the Aurora Borealis on the 29th September 1957.

A. W. GUPPY.

RAINFALL FOR 1971

	Cardington	Dunstable	Kempston	Luton	Luton	Sandy	Silsoe
January	83.4	83.9	84.8	71.6	84.1	78.0	81.2
February	12.1	25.6	58.7	21.0	21.3	22.1	10.4
March	46.1	71.9		52.7	63.2	42.7	44.3
April	31.0	42.1	30.2	34.0	36.9	36.6	23.5
May	34.7	54.0	37.6	44.0	48.7	44.7	32.2
June	80.1	100.4	84.7	87.8	90.3	78.2	66.8
July	21.9	24.5	19.6	20.7	20.5	19.1	13.9
August	73.4	86.8	67.1	89.1	85.0	74.9	96.5
September	12.0	9.2	15.5	19.2	12.4	27.2	8.7
October	76.5	75.2	77.7	80.8	77.3	67.3	66.0
November	67.7	72.4	73.7	57.4	67.9	66.0	57.8
December	20.4	23.7	22.1	19.3	20.0	20.3	21.1
TOTAL	559.3	669.7	571.7	597.6	627.6	577.1	522.4
AVERAGE	552.9	—	579.4	672.3	—	—	559.0
1970 TOTAL	571.5	669.4	616.0	687.4	678.5	562.0	566.7

(All figures in mm.)

Cardington, R.A.F. Station per Mr. L. A. Speed.
Dunstable, Periwinkle Lane P.S. per Mr. E. G. Meadows.
Kempston, Stuart Road, Mr. C. S. Payne.
Luton, Crescent Road and Runley Wood P.S. per Mr. E. G. Meadows.
Sandy, R.S.P.B., The Lodge, per Mr. D. Elias.
Silsoe, N.I.A.E., Wrest Park, per Mr. A. Hunter.

LEPIDOPTERA

1971 proved to be a year of mixed blessings as far as Lepidoptera were concerned. Although the summer weather was favourable, on the whole, for butterflies, several species were noticeably scarce, particularly Red Admiral (*Vanessa atalanta*), Painted Lady (*Vanessa cardui*), Comma (*Polygonia c-album*) and Small Copper (*Lycaena phlaeas*).

However, on the credit side, 1971 turned out to be a good year for Holly Blue (*Celastrina argiolus*).

Due to working away from home quite a lot of the season I did not run the M.V. trap as often as I would have wished.

Several interested people commented on the large numbers of larvae of the Common Lackey Moth (*Malacosoma neustria*) seen in various places, especially roadside ornamental trees, on which batches of these larvae could be seen on webs of silk during their skin changes with whole branches denuded of leaves where they had been feeding.

Silver Y Moths (*Plusia gamma*) were very abundant during their second brood in the autumn and were to be seen hovering at flowers to feed both during sunny periods by day as well as in the evenings.

I was very pleased to receive records of Lepidoptera from Mrs. Nancy Dawson of Ickwell Green, R. Frith of Dunstable and C. W. Burton of Pirton and I hope that other members will follow their example in the future and send me any observations they may make.

W. J. CHAMPKIN.

The following list comprises records sent in by three observers. Mrs. Nancy Dawson for Tetrads TL04P. TL14C. TL14I. TL14M. TL14N. TL14U. TL14Y. TL14Z. (Butterflies). Mr. R. Frith for Tetrads TL02A. TL03Q. TL01E. SP92Y. (Butterflies and Moths). Mr. C. W. Burton for Tetrads TL13F. TL13G. TL13K. TL13L. TL13Q. TL13R. (Butterflies). Recorder for Tetrads SP93H. TL14C. TL05K. TL05A. TL05Q. (Moths). The numbers of the list refer to the New Label List of British Macrolepidoptera by I. R. P. Heslop, 1961.

Butterflies

5. *Pieris brassicae L.*	Large Garden White	TL14M. TL02A. TL13F. TL13G. TL13K. TL13L. TL13Q. TL13R.
6. *Pieris rapae L.*	Small Garden White	TL14M. TL14N. TL02A. TL13F. TL13G. TL13L. TL13Q. TL13K. TL13R.
7. *Pieris napi L.*	Green Veined White	TL14M. TL14C. TL02A. SP92Y. TL13F. TL13G. TL13K. TL13L. TL13Q. TL13R.
9. *Anthocharis cardamines L.*	Orange Tip White	TL14N. TL02A. TL13F. TL13G. TL13K. TL13L. TL13Q. TL13R.
14. *Gonepteryx rhamni L.*	Brimstone	TL14M. TL14C. TL02A. TL13F. TL13G. TL13K. TL13L. TL13Q. TL13R. TL05Q.
16. *Pararge megera L.*	Wall Brown	TL14M. TL14N. TL02A. TL13F. TL13G. TL13K. TL13Q.
17. *Pararge aegeria L.*	Speckled Wood	TL14I. TL14N. TL14Y.
22. *Maniola jurtina L.*	Meadow Brown	TL14C. TL14N. TL14M. TL14U. TL14Y. TL02A. TL13F. TL13G. TL13K. TL13Q.
23. *Maniola tithonus L.*	Gatekeeper	TL14C. TL14I. TL14N. TL14U. TL14Z. TL13F. TL13G. TL13K. TL13L.
24. *Coenonympha pamphilus L.*	Small Heath	TL14C. TL14Y. TL14Z. TL02A. TL03Q. TL13F. TL13K.
26. *Aphantopus hyperantus L.*	Common Ringlet	TL14I. TL14N. TL13F. TL13G. TL13K. TL02A.
30. *Vanessa atalanta L.*	Red Admiral	TL14Y. TL02A.
31. *Vanessa cardui L.*	Painted Lady	TL14Z.
33. *Nymphalis io L.*	Peacock	TL14M. TL14Y. TL02A.
37. *Aglais urticae L.*	Small Tortoiseshell	TL14C. TL14M. TL14Y. TL02A. TL13F. TL13G. TL13K. TL13L. TL13Q. TL13R.

38. *Polygonia c-album L.*	Comma	TL14Y. TL02A. TL13K.
54. *Strymonidia w-album Knock.*	White Letter Hairstreak	TL13F. (Herts.) one seen.
58. *Lycaena phlaeas L.*	Small Copper	TL14N (Very scarce this year).
63. *Aricia agestis Schiff.*	Brown Argus Blue	TL03Q. TL13F. TL13K.
64. *Polyommatus icarus Rott.*	Common Blue	TL14C. TL14N. TL02A. TL13F. TL13K. TL13R.
68. *Celastrina argiolus L.*	Holly Blue	TL04P. TL02A.
72. *Erynnis tages L.*	Dingy Skipper	TL13F.
73. *Thymelicus sylvestris Poda.*	Common Small Skipper	TL14I. TL14N. TL14U. TL14Z. TL02A. TL13F. TL13G. TL13K. TL13Q.
74. *Thymelicus lineola Ochs.*	New Small Skipper	TL14C.
76. *Ochlodes venata Br. & Grey.*	Large Skipper	TL14C. TL14N. TL13F. TL13G. TL13K. TL13Q.

Moths

139. *Euproctis similis Fuessl.*	Gold Tail	TL02A.
145. *Malacosoma neustria L.*	Common Lackey (Larvae)	TL02A. TL05Q.
154. *Philudoria potatoria L.*	Drinker	TL01E.
162. *Drepana cultraria F.*	Barred Hook-Tip	TL02A.
192. *Spilosoma lubricipeda L.*	White Ermine	TL01E.
217. *Zygaena lonicerae Scheven.*	Narrow-Bordered 5-Spot Burnet	TL14C.
218. *Zygaena filipendulae L.*	Narrow-Bordered 6-Spot Burnet	TL02A.
229. *Aegeria tipuliformis Clerck.*	Currant Clearwing	TL05Q.
232. *Aegeria vespiformis L.*	Yellow Legged Clearwing	SP93H.
269. *Hepialus lupulina L.*	Common Swift	TL02A.
273. *Euxoa nigricans L.*	Garden Dart	TL02A.
281. *Agrotis denticulatus Haw.*	Light Feathered Rustic	TL02A.
285. *Agrotis exclamationis L.*	Heart And Dart	TL02A.
295. *Spaelotis ravida Schiff.*	Stout Dart	TL02A.
313. *Amathes c-nigrum L.*	Setaceous Hebrew Character	TL02A.
315. *Amathes triangulum Hufn.*	Double Square Spot	TL02A.
331. *Noctua pronuba L.*	Common Yellow-Underwing	TL02A.
345. *Mamestra brassicae L.*	Cabbage Dot	TL02A.
351. *Diataraxia oleracea L.*	Bright-Line Brown-Eye	TL02A.
368. *Hadena bicruris Hufn.*	Lychnis Coronet	TL02A.
407. *Leucania lythargyria Esp.*	Clay Wainscot	TL02A.
408. *Leucania conigera Schiff.*	Brown-Line Wainscot	TL02A.
444. *Apamea monoglypha Hufn.*	Dark Arches	TL02A.
473. *Phlogophora meticulosa L.*	Large Angle-Shades	TL02A.
503. *Amphipyra tragopoginis Clerck.*	Mouse	TL02A.

533.	*Cucullia verbasci L.*	Mullein Shark (Larvae)	TL05A.
553.	*Aporophyla lutulenta Schiff.*	Deep Brown Rustic	TL02A.
619.	*Episema caeruleocephala L.*	Figure of Eight	TL02A.
635.	*Plusia gamma L.*	Common Silver Y	TL02A. TL05K.
649.	*Phytometra viridaria Clerck.*	Small Purple Bars	TL03Q. New record
666.	*Laspeyria flexula Schiff.*	Beautiful Hook Wing	TL02A. New record
717.	*Sterrha aversata L.*	Riband Wave	TL02A. TL14C.
729.	*Xanthorhoë montanata Schiff.*	Silver Ground Carpet	TL02A. TL03Q.
730.	*Xanthorhoë fluctuata L.*	Garden Carpet	TL02A.
758.	*Euphyia bilineata L.*	Yellow Shell	TL02A.
770.	*Lygris mellinata F.*	Currant Spinach	TL02A.
772.	*Cidaria fulvata Forst.*	Barred Yellow	TL02A.
802.	*Odezia atrata L.*	Chimney Sweeper	TL02A.
818.	*Ortholitha chenopodiata L.*	Shaded Broad Bar	TL02A. TL14C.
873.	*Eupithecia innotata Hufn.*	Angle Barred Pug	TL02A.
894.	*Bapta bimaculata F.*	White Pinion Spotted	TL02A.
895.	*Bapta temerata Schiff.*	Clouded Silver	TL02A.
915.	*Selenia bilunaria Esp.*	Early Thorn	TL02A.
917.	*Selenia tetralunaria Hufn.*	Purple Thorn	TL05K.
919.	*Gonodontis bidentata Clerck.*	Scalloped Hazel Thorn	TL02A.
923.	*Opisthograptis luteolata L.*	Sulphur Thorn	TL02A.
928.	*Ourapteryx sambucaria L.*	Swallow-Tailed Elder	TL02A. TL05K.
938.	*Cleora rhomboidaria Schiff.*	Willow Beauty	TL02A.
940.	*Deileptenia ribeata Clerck.*	Satin Beauty	TL02A.
964.	*Chiasmia clathrata L.*	Heath Lattice	TL14C.

MOLLUSCA

1971 was a year of consolidation where the recording of Mollusca was concerned and many of the gaps in the 10 km. squares have now been filled. Work began in earnest to transfer the existing records on to maps of individual species on a tetrad, or 2 km. basis. All work is now proceeding on a tetrad scale in order that an Atlas of the Mollusca of Bedfordshire can in due course be produced.

Once again I would like to thank those members who sent me specimens for identification. Some have brought me bags of leaf litter from woods in which they were pursuing some other recording, and these have yielded valuable information. It is very encouraging to note that some members are beginning to diversify their interests.

I would like to appeal for more contributors. If every member sent me specimens from his own garden a great many tetrads would be represented.

List of Contributors

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Special thanks must go to Dr. M. P. Kerney, Imperial College, London, for his continued help in identifying difficult speceis.

Table showing records of Mollusca in 10 km. squares in the Bedfordshire Area *additional* to those tabulated in the Beds. Naturalist No. 25.

Mollusca species	10 km. Squares																							
	SP91	SP92	SP93	SP94	SP95	SP96	TL01	TL02	TL03	TL04	TL05	TL06	TL11	TL12	TL13	TL14	TL15	TL16	TL23	TL24	TL25
Viviparus contectus																x					
Valvata piscinalis					x										x						
,, cristata									x												
Bithynia tentaculata															x						
,, leachii									x												
Carychium tridentatum										x											
Lymnaea truncatula												x	x			x				x	
,, palustris					x							x									
,, stagnalis												x									
,, auricularia									x							x					
Planobarius corneus							x														
Planorbis leucostoma										x			x								
,, crista									x						x						
Acroloxus lacustris													x		x						
Succinea putris											x										
Cochlicopa lubricella																x					
Vertigo antivertigo															x						
,, pygmaea																x					
Lauria cylindracea											x										
Acanthinula aculeata									x							x					
Ena obscura																	x				
Helix hortensis										x						x					
Monacha granulata									x	x											
Helicella caperata		x								x											
,, virgata																	x				
,, itala											x					x					
Punctum pygmaeum										x			x			x					
Arion intermedius					x					x							x				
,, circumscriptus										x											
,, subfuscus								x									x				
Vitrea contracta										x			x								
Oxychilus draparnaldi					x		x										x				
,, alliarius					x																
Retinella radiatula					x					x											
,, pura										x											
Zonitoides nitidus					x						x				x						
Milax sowerbyi										x	x				x	x				x	
,, budapestensis										x											
Limax maximus									x												
Lehmania marginata								x													
Agriolimax laevis										x		x			x	x					
Unio pictorum					x																
,, tumidus	x																				
Anodonta cygnaea									x						x	x					
,, anatina																x					
Sphaerium rivicola	x																				
,, lacustre									x				x								
Pisidium amnicum															x						
,, casertanum					x																
,, personatum										x											
,, obtusale					x				x	x											
,, milium					x				x						x						
,, henslowanum									x												
Testacella scutulum											x										
Total No. of species now recorded per 10 km. square	88	85	53	41	82	88	63	73	83	81	92	45	68	60	83	79	83	69	60	52	42

BIRDS

Introduction

In 1971 there was a sharp rise in the number of observers submitting records, and correspondingly in the volume of records submitted. The number of keen young observers now active in the county is particularly encouraging. Some localities were covered daily or almost daily during peak migration periods and many others were visited each weekend. In consequence the style of presentation of the systematic list has had to be somewhat compressed, which I hope does not make it significantly less readable. The British Trust for Ornithology's national Atlas of breeding birds continued to preoccupy many observers in Bedfordshire in the summer months; the progress of this project is discussed more fully in a separate paragraph.

Altogether 161 species and four additional subspecies were reliably recorded in the county in 1971, including seven species that were either probable escapes from captivity or recently feral. The inclusion in the systematic list of certain feral species, such as Greylag Goose (where introduced), Golden Pheasant and Lady Amherst's Pheasant, is a new feature of the report in accordance with recent trends in British ornithology; all records, both past and present, of these and of others that may occur in the county (such as Mandarin Duck, Ruddy Duck, Egyptian Goose and Reeves's Pheasant) are required.

Additional 1970 records of Golden Pheasant and Blackcap are given under those species in the main body of the systematic list.

B.T.O. Atlas Survey — Progress Report

1971 was the fourth year of this five-year project to map the distribution of the breeding birds of Britain and Ireland. Fieldwork continued in the Bedfordshire area and further valuable data were obtained. During 1968-71 118 species were found in the area in possible breeding habitat, but about eight of these were recorded only in parts of 10 km. squares outside the Bedfordshire boundary. Of the 118 species in the whole area, Gadwall, Stone Curlew and Stonechat were recorded only as first-column entries (present in possible breeding habitat). A further five species — Corncrake, Curlew, Common Sandpiper, Grey Wagtail and Siskin — were recorded only to second-column status (probably breeding), and for 110 species breeding was proved. Fifty-five species were found in all 21 10 km. squares, and 27 of these were proved to be breeding in all the squares.

In the systematic list that follows, the figures against the species' names indicate the number of 10 km. squares in the Bedfordshire area in which that species was recorded in each of the three categories of breeding evidence during the four years 1968-71. For example, the 2-1-13 against Little Grebe means that, respectively, in two squares it was recorded as present in breeding habitat, in another square it was recorded as probably breeding, and in 13 of the remaining 18 squares breeding was proved. For some of the scarcer species, Atlas data that refers to parts of adjacent counties have been so designated.

A county breeding bird survey by tetrads (2 km. squares) is also currently in progress, and a full report will appear in due course. Similar surveys are being carried out in Kent, London, Hertfordshire and Lincolnshire.

Submission of Records

This is a simple matter. Printed record cards are sent on request, free of charge, to observers who complete them, one species per card, through the year. Completed cards should be returned to the Recorder preferably every three or six months, or at least at the end of the year. Alternatively,

records may be sent in list form, which the Recorder will then transfer to record cards (but since this causes unnecessary work, observers are asked to avoid this method).

Records of species rare in the county are considered by the Society's Bird Records Committee, which consists of P. F. Bonham (Recorder), B. D. Harding, A. J. Livett, R. F. Porter and Dr. J. T. R. Sharrock; descriptions are circulated in batches and there are procedures for re-circulation and majority verdicts. About 80% of the records circulated in 1971 were accepted; most of the others were rejected only because the committee felt that the evidence as given did not establish the identification with reasonable certainty, not because they thought that a mistake had been made. Species of sufficient rarity in Bedfordshire to merit supporting details, including a written field description, are listed below. Records of these species should be submitted *as they occur through the year*, preferably on pre-printed 'unusual record' forms of which the Recorder has a supply. Full notes are also required, of course, for species rarer than those listed, for species new to Bedfordshire, and for all national rarities (these last will be passed to the Rarities Committee of *British Birds*). Other species not on the list that occur out of their normal seasons or in other exceptional circumstances should also be submitted with full details.

Please do not write field descriptions on record cards; they are too small and it is much better to use an 'unusual record' form or a large sheet of paper. It is usually worth attempting to sketch the whole or particular parts of an unfamiliar bird, on the spot or immediately afterwards, and note colours and other features with 'pointers' to the sketch. With a little practice, writing up a field description becomes surprisingly easy.

All divers
Red-necked Grebe
Slavonian Grebe
Black-necked Grebe
All petrels
All shearwaters
Fulmar
Gannet
Cormorant
Shag
Bittern
Red-crested Pochard
Scaup
Ferruginous Duck
Long-tailed Duck
Velvet Scoter
Common Scoter
Red-breasted Merganser
All geese except Canada and feral Greylag
Whooper Swan
Bewick's Swan
All birds of prey except Kestrel
Quail
Spotted Crake
Corncrake
Kentish Plover
Grey Plover
Dotterel
Bar-tailed Godwit
Little Stint
Temminck's Stint
Pectoral Sandpiper
Avocet
All phalaropes
Stone Curlew
All skuas
Glaucous Gull
Iceland Gull
Little Gull
Kittiwake
All terns except Black and Common
All auks
Hoopoe
Wryneck
Woodlark
Shore Lark
Golden Oriole
Bearded Tit
Ring Ouzel
Black Redstart
Marsh Warbler
Firecrest
Pied Flycatcher
Rock and Water Pipits
Yellow Wagtail races other than *flavissima*
Waxwing
Great Grey Shrike
Twite
Cirl Bunting
Lapland Bunting
Snow Bunting

All records of the above species are required, and also of the following, which do not normally require field descriptions: other ducks and waders of irregular occurrence, Golden and Lady Amherst's Pheasants, Water Rail, all owls, Nightjar, Kingfisher, all woodpeckers, Stonechat, Whinchat, Redstart, Wood Warbler, Grey Wagtail, Red-backed Shrike, Hawfinch, Siskin, Crossbill and Brambling. In addition, all records of breeding numbers and young are required for Great Crested and Little Grebes, Heron, all ducks (except Mallard), geese, waders (except Lapwing), gulls and terns.

The Recorder will be pleased to assist with any queries that may arise, and also to send bird record cards and 'unusual record' forms on request. All records for the 1972 Bird Report should be sent to the Recorder by the end of February 1973, at the latest.

List of Contributors (Non-members in italics)

Thanks are due to all contributors, as follows: D. J. Armitage, P. Ashby, Mrs. M. R. Bonham, P. F. Bonham, C. W. Burton, G. J. Buss, W. J. Champkin, G. M. A. Clarke, Mr. and Mrs. J. Crudass, *R. J. Darlington*, R. Dicker, K. R. Dugmore, *Mrs. L. M. Dugmore, R. E. Dugmore*, J. N. Dymond, Mrs. M. E. Dymond, D. Elias, *M. J. Everett*, I. J. Ferguson-Lees, P. A. M. Gepp, D. Green, *N. Hammond*, B. D. Harding, *M. Heckler, D. Hillyard, P. N. Holden*, A. Houghton, *P. Hull, Dr. K. Hutton*, T. James, *A. R. Jenkins*, H. A. S. Key, *D. Lea*, A. J. Livett, *W. Lloyd, J. P. Lynch, W. Marler, P. J. Morgan, R. A. Morgan, Squadron-Leader P. G. Murton, P. G. Murton* (PGMn), B. J. Nightingale, R. Palmer, *J. Parker*, R. F. Porter, I. Pyrke, *R. Raby*, Mrs. J. Read, *A. Rhodes*, M. Rogers, Miss D. A. Rook, M. R. Seaman, Dr. J. T. R. Sharrock, C. R. Skinner, S. C. Smith, B. Squires, R. B. Stephenson, *G. Stewart, R. Thorpe, R. R. Tombs*, P. Trengrove, K. R. Weeden, *E. J. Whiteman*, S. Winter, M. A. Woodhead and *A. Wright*.

Systematic List for 1971

Species recorded as present in Bedfordshire during 1971, and not included in the systematic list, are: **Mute Swan** *Cygnus olor* (0-0-16), **Kestrel** *Falco tinnunculus* (0-3-18), **Red-legged Partridge** *Alectoris rufa* (0-1-20), **Partridge** *Perdix perdix* (0-3-18), **Pheasant** *Phasianus colchicus* (0-1-20), **Moorhen** *Gallinula chloropus* (0-0-21), **Great Black-backed Gull** *Larus marinus*, **Lesser Black-backed Gull** *Larus fuscus* (0-0-1), **Herring Gull** *Larus argentatus*, **Common Gull** *Larus canus*, **Stock Dove** *Columba oenas* (0-3-18), **Feral Pigeon** *Columba livia* (3-0-6), **Woodpigeon** *Columba palumbus* (0-0-21), **Barn Owl** *Tyto alba* (7-2-9), **Little Owl** *Athene noctua* (0-2-19), **Tawny Owl** *Strix aluco* (0-3-18), **Great Spotted Woodpecker** *Dendroscopos major* (4-6-11), **Skylark** *Alauda arvensis* (0-0-21), **Carrion Crow** *Corvus corone corone* (0-0-21), **Rook** *Corvus frugilegus* (0-0-21), **Jackdaw** *Corvus monedula* (0-0-21), **Jay** *Garrulus glandarius* (4-3-14), **Great Tit** *Parus major* (0-0-21), **Blue Tit** *Parus caeruleus* (0-0-21), **Coal Tit** *Parus ater* (2-1-18), **Marsh Tit** *Parus palustris* (1-2-18), **Willow Tit** *Parus montanus* (0-6-15), **Long-tailed Tit** *Aegithalos caudatus* (0-0-21), **Tree-creeper** *Certhia familiaris* (1-3-17), **Wren** *Troglodytes troglodytes* (0-0-21), **Mistle Thrush** *Turdus viscivorus* (0-0-21), **Song Thrush** *Turdus philomelos* (0-0-21), **Blackbird** *Turdus merula* (0-0-21), **Robin** *Erithacus rubecula* (0-0-21), **Goldcrest** *Regulus regulus* (4-6-11), **Dunnock** *Prunella modularis* (0-0-21), **Pied Wagtail** *Motacilla alba yarrellii* (1-2-18), **Starling** *Sturnus vulgaris* (0-0-21), **Greenfinch** *Carduelis chloris* (0-0-21), **Goldfinch** *Carduelis carduelis* (0-0-21), **Linnet** *Acanthis cannabina* (0-0-21), **Bullfinch** *Pyrrhula pyrrhula* (1-1-19), **Chaffinch** *Fringilla coelebs* (0-1-20), **Yellowhammer** *Emberiza citrinella* (0-0-21) and **House Sparrow** *Passer domesticus* (0-0-21).

The following abbreviations are used in the text: SF—Sewage Farm, ChP—Chalk Pit, ClP—Clay Pit, GP—Gravel Pit, SP—Sand Pit, L—Lake, NR—Nature Reserve. All records are of single birds unless otherwise stated.

Great Crested Grebe *Podiceps cristatus* 0-0-13

A total of at least 17 pairs raised at least 19 young at Cityfields GP (Henlow), Elstow ClP, Harrold GP, Luton Hoo L, Stewartby L and Wyboston GP. Also recorded during April-July at 13 other localities. The annual post-breeding gathering at Stewartby L rose steadily to 62 on 24th October; only subsequent counts were 25 on 7th November, 56 on 14th and 70 on 12th December.

Slavonian/Black-necked Grebe *Podiceps auritus/nigricollis*
Two at Langford GP on 24th April (ARJ). The description supplied did not eliminate either species.

Black-necked Grebe *Podiceps nigricollis*
One at Wyboston GP from 6th February, two together from 20th March to 24th April (displaying and in full breeding plumage from 18th to 24th April), one on 30th, none found on 9th May (JND, AH, RFP, RR, JTRS, PT).

Little Grebe *Tachybaptus ruficollis* 2-1-13
About 22 pairs and seven single birds recorded during April-July at 16 localities, but breeding success largely unknown.

Cormorant/Shag *Phalacrocorax carbo/aristotelis*
A party of six south-east over Luton SF on 20th January (MRS). The description supplied did not eliminate either species.

Grey Heron *Ardea cinerea* 9-0-4
About five pairs bred at the Bromham heronry, as in 1970 (*per* CRS). No count was received for the one at Southill L.

Bittern *Botaurus stellaris*
One first recorded at Langford GP in May 1970 stayed until May 1971 (EJW).

Mallard *Anas platyrhynchos* 0-0-21
The maximum monthly counts at selected localities from January to April and from September to December are tabulated. In this and the following tables '—' indicates that no count was received.

	Jan.	Feb.	Mar.	Apr.	Sep.	Oct.	Nov.	Dec.
Brogborough ClP	40	—	70	—	—	—	84	100
Harrold L & GP	43	51	47	23	100	40	48	53
Luton Hoo L	266	79	30	17	250	—	385	178
Southill L	—	150	80	—	190	450	250	330
Stewartby L	350	50	100	100	500	623	500	300
Vicarage F. ClP	250	—	70	40	—	60	173	300
Wyboston GP	50	100	56	30	3	20	15	10

Totals of less than 100 were recorded at many other localities in all months.

Teal *Anas crecca* 6-0-1
The maximum monthly counts at selected localities from January to April and from September to December are tabulated.

	Jan.	Feb.	Mar.	Apr.	Sep.	Oct.	Nov.	Dec.
Bedford SF	50	8	24	3	—	16	180	—
Luton Hoo L	13	16	1	2	—	—	39	19
Southill L	12	44	34	—	35	60	160	80
Stewartby L	15	7	—	40	20	40	20	15
Wyboston GP	40	100	12	8	0	3	6	5

The high November peaks at Bedford SF (PT) and Southill L (MRS) were both on 14th. This was the only count received for that month from Southill L, but other counts at Bedford SF were three on 7th and 85 on 20th (PT). Totals of less than 25 were recorded at 13 other localities, but none in May, June or July.

Garganey *Anas querquedula*
A pair at Girtford GP on 9th April (RFP), a pair at Bromham GP on 28th April (PT) and one at Girtford GP on 22nd August and 3rd September (PNH).

Gadwall *Anas strepera* 1-0-0

Four at Bedford SF on 13th March (PT), two at Heath and Reach SP on 17th April (PAMG), one to two drakes and one to two ducks at Wyboston GP from 18th to 30th April (JND, JTRS) and a drake there on 12th September (MRS).

Wigeon *Anas penelope*

Two to nine at six localities during January-March and two to five at four localities during October-December.

Pintail *Anas acuta*

A pair south over Dunstable SF on 9th January (GS), three at Bedford SF on 30th January (PT), three at Wyboston GP on 7th March (JND), and singles at Battlesden L on 27th March (KRW), Bedford SF on 15th October (PT) and Luton Hoo L on 12th December (AJL).

Shoveler *Anas clypeata* 2-0-3

One to four at four localities up to 21st April. Two drakes and two ducks at Harrold L on 1st May and a duck with five small young there on 27th May (JND). A pair at Blunham GP on 12th June (RFP) and one at Felmersham NR on 28th July (KRW). One to six at three localities during August-November.

Scaup *Aythya marila*

A drake on R. Lea at East Hyde from 18th to 23rd January (AJL, BS, MRS).

Tufted Duck *Aythya fuligula* 2-3-12

A total of at least 13 pairs raised at least 50 young at East Hyde, Elstow ClP, Harrold GP, Luton Hoo L and Wyboston GP; also recorded during April-July at 16 other localities.

The maximum monthly counts at selected localities from January to April and from September to December are tabulated.

	Jan.	Feb.	Mar.	Apr.	Sep.	Oct.	Nov.	Dec.
Blunham GP	—	61	49	15	—	—	—	135
Luton Hoo L	75	31	16	10	9	—	47	73
Stewartby L	30	22	50	50	80	40	11	20
Wyboston GP	166	217	153	109	7	100	70	110

Totals of less than 75 were recorded at many other localities during these months.

Pochard *Aythya ferina* 3-0-8

A pair attempted to nest at Girtford GP, but no young were seen. Other records during April-July were 26 at Stewartby L on 10th July and up to six at Blunham GP, Cityfields GP (Henlow), Luton Hoo L and Wyboston GP.

The maximum monthly counts at selected localities from January to March and from September to December are tabulated.

	Jan.	Feb.	Mar.	Sep.	Oct.	Nov.	Dec.
Brogborough ClP	56	—	2	60	—	143	70
Southill L	18	25	32	13	41	60	80
Stewartby L	76	2	7	10	120	2	1
Wyboston GP	20	53	41	1	5	10	50

Totals of less than 50 were recorded at many other localities during these months.

Goldeneye *Bucephala clangula*

During January-April frequently recorded at Stewartby L (up to ten) and Wyboston GP (up to four). A pair at Stewartby L on 8th and 9th May, a female there on 17th and 21st October, one on 14th November and four on 12th December. Otherwise recorded only at Dunstable SF (six flying south on 6th February), Felmersham NR (a female on 21st November) and Vicarage Farm ClP (one on 12th December). Taking together all records in which the numbers of each sex were given, there was a mean ratio of about three ducks to every drake.

Goosander *Mergus merganser*

Stewartby L, two drakes and one 'red-head' on 17th January, and one drake and two 'red-heads' on 7th March (JND). The only other record was of a 'red-head' at Southill L on 14th February (MRS).

Smew *Mergus albellus*

A drake and two 'red-heads' at Harrold GP on 24th January and 7th February (MAW).

Shelduck *Tadorna tadorna* 0-0-1

Dunstable SF, three on 5th January, one on 10th, four on 15th, one on 22nd February, two on 28th March and one on 4th August (many observers). Otherwise only single birds at Wyboston GP on 21st April (JTRS) and Coronation ClP on 25th (JND). The record of proved breeding was outside the county.

Ruddy Shelduck *Tadorna ferruginea*

Two at Dunstable SF on 7th April, which eventually flew off west, were very tame and are presumed to have escaped from captivity (JPL).

Greylag Goose *Anser anser* 2-0-3

Two feral pairs nested and reared young at Girtford GP (PNH, RFP). Six at Wyboston GP in April (JND) were almost certainly feral stock.

Snow Goose *Anser caerulescens*

Two flying south over Brickhill, Bedford, on 14th April (JTRS) were almost certainly of captive origin.

Canada Goose *Branta canadensis* 5-0-2

Eight at Luton Hoo Park on 10th January (AJL) and one on R. Ouse in Bedford from 4th February to 8th March (RBS). Up to three adults at Luton Hoo/East Hyde from 4th April; one pair bred at Luton Hoo Park, rearing three young, apparently the first record of breeding in the county, and the family stayed until the end of the year (AJL, MRS). Singles at Sandy Lodge on 26th July and 23rd December (DE). The other record of proved breeding was outside the county.

Bewick's Swan *Cygnus bewickii*

Spring passage: Nine adults at Girtford GP on 6th March, one of which remained from 7th March to 9th May, an unusually late date; it was absent on 10th (PNH, RFP *et al.*). A flock of *c*40 ENE over Sandy Lodge on 10th March (TJ *et al.*) and one at Wyboston GP on 13th March (RFP).

Autumn passage: An adult at Dunstable SF on 27th October (JP) and five south over Wyboston GP on 13th November (JND).

Buzzard *Buteo buteo*

One at Luton Hoo Park in January and from late July to late November was presumed to be the bird recorded in 1970 (*per* AJL). One at Marston Thrift on 11th May (MH), two at Sandy Lodge on 16th Sepetmber (DE, MJE) and one at Houghton Regis on 19th October (JPL, SW).

Buzzards not specifically identified were seen at Sandy Lodge on 6th August (TJ) and 21st August (*per* DE) and at Hardwick NR, Stagsden, on 12th December (WJC, HASK).

Sparrowhawk *Accipiter nisus* 7-2-2
An immature at Battlesden L on 24th January (BS), a female soaring over Fenlake, Bedford, on 20th April (MR) and a female at Sandy Lodge on 14th November (TJ, RR) were the only localised reports.

Marsh Harrier *Circus aeruginosus*
A female circling over Dunstable SF on 1st May drifted south after being mobbed by Carrion Crows (JPL, GS).

Montagu's Harrier *Circus pygargus*
A male on both sides of the Hertfordshire border south of Upper Stondon on 26th September (CWB).

Osprey *Pandion haliaetus*
One soaring over Heath and Reach on 15th May was watched for about a minute before it flew off north-west (PAMG).

Hobby *Falco subbuteo* 4-1-2
Singles west over Sandy Lodge on 29th June (NH, RFP), and at Houghton Regis on 15th July (GS) were the only localised reports.

Quail *Coturnix coturnix* 4-6-1
One heard calling from a barley field near Knocking Hoe NR, Pegsdon, on 25th July (CWB).

Golden Pheasant *Chrysolophus pictus* 2-0-0
One feral in Palmers Wood, Old Warden, during the summer (Keeper, *per* JTRS). This locality is in the same square (TL14) as Sandy Lodge (see below); the other Atlas record was outside the county.

ADDITIONAL 1970 RECORD: A feral male at Sandy Lodge bred with an introduced female, raising at least two young, but all disappeared in the summer (DE).

Lady Amherst's Pheasant *Chrysolophus amherstiae* 2-0-3
Feral birds were reported as follows. Twelve pairs in Luton Hoo Park in summer; at least four young seen (Keeper, *per* AJL). One pair raised young in Warden Great Wood (Keeper, *per* JTRS). At least ten in Charle Wood on 14th February (JND, JTRS), and smaller numbers in Maulden Woods, at Breakheart Hill (Millbrook) and in Birchall's Wood (Eversholt) on various dates during January-May (JND, BS, JTRS). A male's tail-feather found in Palmers Wood, Old Warden, during the summer (Keeper, *per* JTRS).

Water Rail *Rallus aquaticus* 5-3-2
The only localised record during May-August was of one 'singing' for about ten minutes near Sandy Lodge on 28th July (DE). Outside this period, up to six at Flitwick Moor on several dates, and one or two at Barkers Lane GP (Bedford), Battlesden L, Chalton SF, Dunstable SF, Harrold GP and Wyboston GP.

Coot *Fulica atra* 1-0-19
Counts of 200 or more at Brogborough ClP, Chimney Corner ClP, Luton Hoo L, Vicarage Farm ClP and Wyboston GP during January-March and November-December, with smaller numbers in all months at these and many other waters. Still not recorded in the breeding season in TL24.

Lapwing *Vanellus vanellus* 0-1-20
The largest flocks reported were of *c*500 at three localities during September-December. No large movements were reported.

Ringed Plover *Charadrius hiaticula* 0-0-2

Spring passage: Dunstable SF, two on 6th April, singles on 22nd April and 5th May, 21 on 26th May, 32 on 27th, nine on 29th and twelve on 30th. Houghton Regis ChP, two on 16th May, three on 24th, twelve on 30th and 31st, two to five during 2nd-7th June and one on 8th. Singles at Bedford SF on 17th April, Blunham GP on 18th April, 16th and 18th May and 14th June, and Stewartby L on 3rd May.

Breeding: A pair laid three eggs, but it is not known whether they were successful. The locality and observer's name are withheld for security reasons; the other Atlas record was outside the county.

Autumn passage: Dunstable SF, two on 25th July, one on 6th August, two on 12th and 14th and 8-24 daily from 15th August to 1st September; two on 8th September and one on 9th. Houghton Regis ChP, two on 27th July, 2nd and 8th August, three on 9th, and one on 8th and 10th September. The only other record, and the latest of all, was of one at Bedford SF on 26th September.

Little Ringed Plover *Charadrius dubius* 0-2-9

Spring passage: The first was at Blunham GP on 27th and 28th March, followed by three on 16th and 18th April, five on 20th etc. (see also 'Breeding'). Chalton SF, one on 4th April and two on 6th June. Dunstable SF, two on 6th April and up to six from 11th April to 29th May. Stewartby L, one on 14th, 18th and 19th Arpil and two displaying on 8th May. Girtford GP/Sandy SF, singles on 16th April and 3rd May. Houghton Regis ChP, two on 17th April, three on 25th April and 17th May etc. (see also 'Breeding'). Bromham GP/Clapham GP, one on 18th April and one or a pair on three dates in May. Wyboston GP, two on 18th April, three on 24th and 30th and two on 9th May (see also 'Breeding'). Harrold GP, four to six from 20th April onwards (see also 'Breeding').

Breeding: Seven or (more probably) eight pairs at Blunham GP, at least three of which raised six or more young. Six birds at Houghton Regis ChP; at least two pairs bred (two nests and several chicks found; two free-flying young seen). Three birds at Wyboston GP on 25th June, but no details of breeding received. Ten to twenty birds (adults and young) at Harrold GP; three pairs reared young.

Autumn passage: Breeding sites largely deserted during August; recorded elsewhere as follows. Up to eleven, mainly juveniles, at Dunstable SF from 22nd July to 25th August; up to four at Bedford SF from 15th August to 14th September; and singles over Luton at night, calling, on 3rd August, at Stewartby L on 7th, 8th and 21st August, and at Sandy SF on 14th September.

Grey Plover *Pluvialis squatarola*

One at Dunstable SF and Houghton Regis ChP on 6th April (RD, DG, AJL, JPL).

Golden Plover *Pluvialis apricaria*

Recorded up to 18th April at seven localities, the largest flock being 130 at Southill on that date (DJA). During the latter half of the year, three south-west over Dunstable SF on 7th August (BJN) were very early; otherwise recorded from 29th September at nine localities, maximum 170 at East Hyde on 17th December (MRS).

Dotterel *Eudromias morinellus*

One at Pegsdon Hills on the evening of 8th May was watched for 20-30 minutes; it had gone by dawn next day (LMD, RED).

Turnstone *Arenaria interpres*

One at Blunham GP on 8th May, which flew off ENE in the late evening (RFP); two at Dunstable SF on 25th and 26th May (JPL, GS), and one there from 16th to 22nd August (many observers).

Snipe *Gallinago gallinago* 8-5-4

Widespread, particularly in spring, autumn and winter, but the only reported concentrations of 50 or more were at Bedford SF during August-October (maximum *c*80 on 28th September) and at Wyboston GP in November (at least 60 on 28th).

Jack Snipe *Lymnocryptes minimus*

One to three up to 30th April and from 24th October at Bedford SF, Chalton SF, Dunstable SF, East Hyde, Sandy SF and a tip near Grange Mill, Heath and Reach.

Woodcock *Scolopax rusticola* 4-6-7

Still not recorded in the breeding season in TL02, 05, 13 and 15.

Curlew *Numenius arquata* 0-1-0

One over Houghton Regis at 01.30 hours on 22nd July (BDH), one at Harrold GP on 30th July (MAW) and two together west over Park Farm, Eaton Bray, on 4th September (JR).

Black-tailed Godwit *Limosa limosa*

One at Bedford SF on 25th April (JND, PT) and one at Girtford GP and Sandy SF on 8th September (PNH).

Green Sandpiper *Tringa ochropus*

Winter: One or two on six dates during January and February at Bedford SF; up to five on six dates in January at Dunstable SF; and singles at Sandy Lodge on 16th January and at Blunham GP on 14th and 24th February.

Spring passage: Single birds at Sandy Lodge on 7th April, Bromham GP/Clapham GP on 14th, Bedford SF on 25th, Dunstable SF on 27th and Chalton SF on 2nd May, and two at Blunham GP on 18th April.

Autumn passage: Bedford SF, one on 25th June, three on 2nd and 5th July, then from 17th July to 30th August (maximum 16 on 21st August), one or two throughout September and October and singles on 1st and 20th November. Dunstable SF, from 9th July to 30th August (maximum six on 6th August), and singles on 7th and 21st November. Houghton Regis ChP, one or two from 25th July to 29th August. Sandy Lodge, one on 29th July, one or two during 4th-19th September and two on 26th October. One found dead near Stagsden on 4th July, two at Harrold GP on 7th, and singles at eight other localities between 9th July and 12th September.

Winter: One at Dunstable SF on 25th December.

Wood Sandpiper *Tringa glareola*

Spring passage: Single birds at Blunham GP on 5th May (RFP) and at Dunstable SF on 4th and 17th June (JPL, GS).

Autumn passage: Singles in August at Dunstable SF on 4th, 6th and 20th (PAMG, JPL, MRS), Stewartby L on 7th and 8th (MRS), Houghton Regis ChP on 12th and 25th (RD, BDH), and Sandy SF on 21st and 23rd (PNH, RFP).

Common Sandpiper *Tringa hypoleucos* 2-1-0

Spring passage: One or two at Dunstable SF from 16th April to 22nd May, singles at Blunham GP on 16th April and from 8th to 17th May, one at Heath and Reach SP on 17th April, one at Bromham GP on 18th April and two there on 28th, one at Stewartby L on 19th April, one at Harrold GP on 20th and 24th April and two there on 23rd May, one at Houghton Regis ChP on 28th April, two there on 16th May and one on 24th, one at Bedford SF and five at Wyboston GP on 30th April, and one at Harrold L on 1st May.

Autumn passage: Blunham GP, one on 1st July, up to three from 14th July to 8th August and five on 21st August. Harrold GP, one on 1st July, two from 21st to 28th July and one on 7th September. Bedford SF, one on 17th July, then from 23rd July to 2nd September (maximum eight on 21st August). Dunstable SF, one on 22nd July and up to six from 4th August to 12th September. Houghton Regis ChP, three on 25th July, two on 27th and up to six from 12th August to 17th September. Eight at Stewartby L on 7th August, and one to three there and at seven other localities on odd dates between 1st August and 1st October.

Redshank *Tringa totanus* 3-1-9

Winter: Bedford SF, singles on 30th January and 20th February and two on 24th February and 7th March.

Spring passage and breeding: Bedford SF, eight on 13th March and somewhat fewer thereafter; two pairs raised at least three young, and up to three other birds were present on various dates in spring and summer. Two at Southill L on 14th March may have wintered. Otherwise, records of small numbers on passage and/or probably breeding from 27th March at twelve localities, including pairs displaying, singing or holding territory at Brogborough ClP, Coronation ClP, Stewartby L and Vicarage Farm ClP, and birds in late May or June at Bromham GP, Dunstable SF, Harrold GP and Houghton Regis ChP. Maximum count, 13 at Stewartby L on 14th April.

Autumn passage: Up to five at six localities between 10th July and 3rd September, then singles at Brogborough ClP on 3rd October and Harrold GP on 24th.

Greenshank *Tringa nebularia*

Spring passage: An early one at Dunstable SF on 14th April (JPL), three at Harrold GP on 9th May (MAW), and singles at Blunham GP on 15th May and Girtford GP on 18th (PNH).

Autumn passage: Dunstable SF, singles on 28th June, 19th and 24th August. Houghton Regis ChP, two on 30th June and then almost daily from 23rd August to 6th September (maximum three on 29th). Harrold GP, singles on 30th June and 21st July. Stewartby L, one on 8th August, two on 12th September and one on 26th. Singles at Sandy SF on 17th and 18th August and at Chalton SF on 7th September, and three at Bedford SF on 21st August.

Little Stint *Calidris minuta*

One at Dunstable SF on 15th August and two there from 24th to 30th (PAMG, BDH, BS, GS, MRS).

Dunlin *Calidris alpina*

Winter: Bedford SF, singles on 9th January and 7th March. Dunstable SF, three on 10th January and singles on 21st February and 1st March.

Spring passage: Dunstable SF, ten on 6th April, singles on 7th and 13th and two on 16th; then one on 23rd May, 13 on 26th, nine on 27th and three on 29th. Blunham GP, one on 14th and 15th April, three on 16th and one on 11th May. Stewartby L, one on 14th April. Bedford SF, five on 16th April, two on 17th and one on 25th. Harrold GP, two on 23rd May. Houghton Regis ChP, two on 24th and 25th May and singles on 30th May and 17th June.

Autumn passage: Blunham GP, one on 14th July, two on 21st and one on 28th. Houghton Regis ChP, two on 25th July, three on 27th, four on 15th August and three on 8th September. Harrold GP, one on 28th July. Dunstable SF, one on 4th August, one or two daily from 6th to 14th, at least three daily from 15th to 22nd (maximum seven on 17th), up to three from 24th to 27th, four on 30th and 31st, three on 1st September, two on 8th and four on 9th. Bedford SF, one on 30th August and 2nd September.

Sanderling *Calidris alba*

Three at Dunstable SF on 23rd August (BDH).

Ruff *Philomachus pugnax*

Spring passage: Bedford SF, singles on 14th March and 16th April, and two on 25th April. Single birds at Dunstable SF on 4th April and Wyboston GP on 24th.

Autumn passage: Dunstable SF, two on 15th and 16th August, three on 17th and 18th, eight on 19th, then two to seven daily until another peak of nine on 30th and ten or eleven on 31st; in September one on 5th, two on 6th and one on 11th. Houghton Regis ChP, one or two on five dates from 23rd August to 17th September. Bedford SF, one from 25th August to 2nd September and one on 18th September.

Avocet *Recurvirostra avosetta*

One at Dunstable SF in evening of 29th March (DG, BDH), presumably on spring passage — an exceptional record so far inland.

Little Gull *Larus minutus*

An immature at Dunstable SF on 16th April (RD, JPL).

Black-headed Gull *Larus ridibundus* 0-0-5

In late April there were about 20 birds at Wyboston GP, 45 pairs at Chimney Corner ClP, five to seven pairs at Coronation ClP, 30 pairs at Stewartby Brickworks pond and 100-200 pairs at Vicarage Farm ClP; on 8th May 34 nests were counted at Chimney Corner ClP, all the early eggs having been taken by boys, and on 25th June a pair was occupying a nest at Wyboston GP (JND).

Black Tern *Chlidonias niger*

Spring passage: Singles at Dunstable SF on 21st April and at Longholme L, Bedford, on 24th; two at Vicarage Farm ClP on 25th April and ten at Stewartby L on 25th May.

Autumn passage: Four at Stewartby L on 7th and 21st August, and one at Dunstable SF on the latter date.

Common Tern *Sterna hirundo* 0-0-2

Wyboston GP, four on 24th April, seven or more on 9th May and about four pairs subsequently; an agitated pair with a juvenile on 15th August and a juvenile on 12th September. Three at Stewartby L on 8th May had gone next day, and about twelve were present there on 25th May. Two at Girtford GP on 13th May, three at Bedford SF and one at Harrold GP on 23rd, and two at Brogborough ClP on 28th. None specifically identified in autumn except at Wyboston, but see 'Common/Arctic Tern' below.

Common/Arctic Tern *Sterna hirundo/paradisaea*
Two at Bedford SF on 14th July, one at Dunstable SF on 11th August, and three at Stewartby L and four at a gravel pit near Grove Lock, Leighton Buzzard, on 21st August.

Turtle Dove *Streptopelia turtur* 0-3-18
First at Studham on 22nd April (BDH) and last at East Hyde on 22nd September (MRS). 15-20 pairs in tetrad TL02Y (MRS).

Collared Dove *Streptopelia decaocto* 1-5-14
Now recorded from every square but one (SP93).

Cuckoo *Cuculus canorus* 0-7-14
First at Sandy Lodge on 11th April, very early relative to the national picture (DE), then heard at two other localities on 19th and widespread soon afterwards; last at Bedford SF on 5th September (RBS).

Long-eared Owl *Asio otus* 4-3-1
The only localised record received was of one, perhaps two, heard at a site in the south of the county on 7th April (BS, MRS).

Short-eared Owl *Asio flammeus*
Six over arable farmland on the Hertfordshire border south of Upper Stondon in January and February, and two there in March (CWB); none at the end of the year. One soaring over Pegsdon Hills on 24th January and one on the golf course below Warden Hill, Streatley, on 3rd and 4th July (AJL).

Nightjar *Caprimulgus europaeus* 3-5-1
None recorded at Sandy Lodge for the first year since 1967. Only one localised report, of probable breeding, was received.

Swift *Apus apus* 2-2-17
First at Bedford SF on 17th April, a very early date (AH), then at many localities from 1st May; last, four to six birds at Girtford GP on 15th September (PNH).

Kingfisher *Alcedo atthis* 2-2-12
Localised records from 21 localities, and five new Atlas records (including pairs found in three new squares), reflect this species' continued increase. Two pairs bred on R. Ouse between Bromham and Kempston (KH, JR) and at Cople (DH) and three pairs bred at Wyboston GP (Water Bailiff, *per* PFB).

Bee-eater/Blue-cheeked Bee-eater *Merops apiaster/superciliosus*
One at Manor Farm, Upper Stondon, in the afternoon of 4th September was watched for about a minute before it flew off east (PGM, PGMn). The description was submitted to the Rarities Committee of *British Birds* who considered that the lack of colour detail, other than green, did not eliminate the rarer Blue-cheeked Bee-eater.

Green Woodpecker *Picus viridis* 0-12-8
Now recorded in every square except TL23.

Lesser Spotted Woodpecker *Dendrocopos minor* 7-4-8
Localised records from 16 localities, and six new Atlas records including three of proved breeding. Still not recorded in the breeding season from TL11 and TL16.

Shore Lark *Eremophila alpestris*
One watched at close range at Houghton Regis ChP on 10th October (JPL) coincided with arrivals on the east coast.

Swallow *Hirundo rustica* 0-0-21
First at East Hyde on 5th April (MRS) and at Bedford on 6th (AH), and last at Luton SF on 27th October (MRS).

House Martin *Delichon urbica* 0-0-21
First, two at Stewartby L and one at Dunstable SF on 10th April (JPL). Last, three at Sandy Lodge on 25th October (DE).

Sand Martin *Riparia riparia* 2-0-15
First, four at Stewartby L on 5th April (JND) and one at Bedford on 6th (AH); last, two at Heath and Reach on 26th September (BS, MRS). 115 nest-holes completed at the Blunham GP colony by 29th June (RFP).

Hooded Crow *Corvus corone cornix*
One with Carrion Crows *C. c. corone* near Dunstable SF on 22nd January showed the charcaters of this subspecies (GS).

Magpie *Pica pica* 2-2-16
Scarce in the north-east of the county, and still not recorded in the breeding season in TL16.

Nuthatch *Sitta europaea* 4-3-8
Scarce or absent in parts of the north of the county, and especially the north-west; not yet recorded from SP94, 95, 96, TL13, 24 and 25.

Fieldfare *Turdus pilaris*
Several flocks of up to at least 350 in April; last, 17 at Ravensden (PT) and one at Little Billington (PAMG) on 1st May, and three at Galley Hill, Streatley, on 2nd (MRS). First in autumn, one at Sandy Lodge on 18th September (DE) and three at Houghton Regis on 24th (JPL), but few until late October and early November.

Redwing *Turdus iliacus*
Many small flocks up to early April; last, one in full song at Twin Wood, Clapham, on 12th April (JTRS) and eleven at Galley Hill, Streatley, on 14th (MRS). First in autumn, *c*25 at Pegsdon Hills on 10th October (AJL), soon followed by many reports of sizeable flocks and movements, including *c*600 at Sandy Lodge on 14th (DE). Much scarcer in late November and December.

Ring Ouzel *Turdus torquatus*
Single males at New Farm, Streatley, on 10th April, at Galley Hill, Streatley, on 27th April, and at Barton Hills on 14th October (MRS).

Wheatear *Oenanthe oenanthe* 3-1-1
Spring passage: First at Barton Cutting on 31st March (AJL) and two near Houghton Regis on 1st April (RD, JPL), but few reports until mid-April; last at Houghton Regis ChP on 9th June (RD).
Autumn passage: First, a juvenile at Warden Hill, Streatley, on 13th July (MRS); last at Dunstable SF on 27th October (RD).

Stonechat *Saxicola torquata* 1-0-0
During the early part of the year only two reported, a male at Bedford SF on 14th February (JND) and a female or young male at Heath and Reach SP on 7th March (PAMG). An adult male was seen in suitable breeding habitat in the south of the county on 27th July (KRW). The only autumn reports were of one at Bedford SF on 30th October (PT) and a male at Elstow ClP on 14th November (MRS).

Whinchat *Saxicola rubetra* 3-3-4
The only spring migrant reported was a male near Dunstable SF on 13th May (RD). No localised reports of breeding. Autumn passage extended from 12th August to 18th September, reaching a peak during the last week of August when there were up to ten at Dunstable SF.

Redstart *Phoenicurus phoenicurus* 1-2-4

First at Brickhill, Bedford, on 15th April (JTRS). Localised reports of breeding or possible breeding from four localities, all in the south-west of the county; two former breeding sites in TL14 destroyed through felling. Last near Whipsnade Park on 7th October (GJB).

Black Redstart *Phoenicurus ochruros*

One at Dunstable SF on 3rd April (JPL).

Nightingale *Luscinia megarhynchos* 1-14-3

First at Stewartby L on 8th May (PT). Still no breeding records from SP92, TL11 and TL23. No autumn dates were notified.

Grasshopper Warbler *Locustella naevia* 1-13-7

First at Chalton SF on 18th April (AJL, MRS), near Heath and Reach on 19th (BDH) and at Girtford GP on 20th (PNH). No autumn dates were notified.

Reed Warbler *Acrocephalus scirpaceus* 1-2-12

First at Langford GP on 25th April (JND); last, about three at Heath and Reach SP on 26th September (BS, MRS).

Sedge Warbler *Acrocephalus schoenobaenus* 1-1-19

First at Dunstable SF on 8th April (JPL), extremely early relative to the national picture. Last at Luton SF on 21st September (MRS).

Blackcap *Sylvia atricapilla* 0-2-19

First at Sandy Lodge on 17th April and last at the same locality on 3rd October (DE).

ADDITIONAL 1970 RECORD: A wintering female in a Bedford garden from 15th January to 21st February (IJFL).

Garden Warbler *Sylvia borin* 0-8-13

First, two at Luton Hoo Park on 2nd May (AJL). No autumn dates were notified.

1970 CORRECTION: MRS has withdrawn the record of one at Southill Park on 26th April, which was submitted in error. The first spring record thus becomes one at Sandy Lodge on 4th May (DE).

Whitethroat *Sylvia communis* 0-0-21

First at Coronation CIP on 25th April (JND) and at New Farm, Streatley, on 27th (MRS). At least 20 pairs in tetrad TL02Y (MRS). Last, three at Bedford SF on 14th September (JTRS).

Lesser Whitethroat *Sylvia curruca* 1-6-14

First, five singing in four widely scattered localities during 24th-25th April (JND). About ten singing males in tetrad TL02Y (MRS). Last at Harrold GP on 12th September (MAW).

Willow Warbler *Phylloscopus trochilus* 0-0-21

First, many singing in Odell Great Wood (KH) and two at Chalton SF (MRS) on 10th; soon abundant. Last at Luton SF on 16th September (MRS).

Chiffchaff *Phylloscopus collybita* 0-2-19

Winter records of two in Charle Wood, Woburn, on 10th January and four there on 17th (KRW), one in a garden at Stratford, Sandy, on 19th and 23rd February (DAR), and one at Dunstable SF on 21st February with two there on 22nd and 24th (JPL). In view of the last-mentioned, one at Dunstable SF on 14th March (BS) seems likely to have wintered, and perhaps this is true also of one at Maulden Wood on the previous day (KRW). The next report was of a probable migrant at Sandy Lodge on 19th March (*per* DE). Last in autumn, five in the Bedford SF area on 26th September (PT) and one at Luton SF on 29th (MRS).

Wood Warbler *Phylloscopus sibilatrix* 0-3-3

The only localised report was of a probable migrant at Rowney Warren on 1st August (KRW).

Spotted Flycatcher *Muscicapa striata* 1-0-19

First at Sandy Lodge on 25th April (DE). Still not recorded breeding in SP94. A fall of at least 30 between the upper and lower lakes in Luton Hoo Park on 12th September (AJL) and the last in a Luton garden next day (MRS).

Pied Flycatcher *Ficedula hypoleuca*

At Sandy Lodge an early male from 16th to 19th April (DE *et al.*) and singles on 28th August (DE), 9th, 10th and 12th September (RR, RRT, *et al.*).

Meadow Pipit *Anthus pratensis* 2-3-9

Apparently absent as a breeding species from much of the north and east of the county, with no breeding records in SP95, 96, TL05, 06, 11, 14 (an extremely well-covered square) and 24.

Tree Pipit *Anthus trivialis* 2-6-7

First, six singing males at Stockgrove, Heath and Reach, and singles at Dunstable Park and Sandy Lodge, on 19th April (DE, BDH). No records of breeding yet in SP95, TL05, 06, 15, 23 and 25. Only autumn report was of one at Houghton Regis ChP on 24th August (BDH).

Rock/Water Pipit *Anthus spinoletta*

Single birds showing the characters of the Rock Pipit *A. s. petrosus* at Luton SF on 28th September and 15th October, and at Dunstable SF on 24th October and 13th November (MRS).

Birds showing the characters of the Water Pipit *A. s. spinoletta* were recorded as follows: one remaining at Luton SF from 1970 stayed until 16th March (MRS); one at Chalton SF from 28th February to 10th April was joined by another from 6th to 10th April (RD, MRS); and autumn records, all from Chalton SF, were of one or two on 13th November, one on 14th November, 11th and 27th December and two together on 28th December, one of which stayed to 9th January 1972 (BJN, BS, MRS).

White Wagtail *Motacilla alba alba*

Birds showing the characters of this subspecies were recorded as follows:

Spring passage: Dunstable SF, one on 16th April, two on 17th, and two on 5th June (JPL). Bedford SF, five on 17th April; Blunham GP, one on 18th April (JND). Chalton SF, one on 3rd May (AJL).

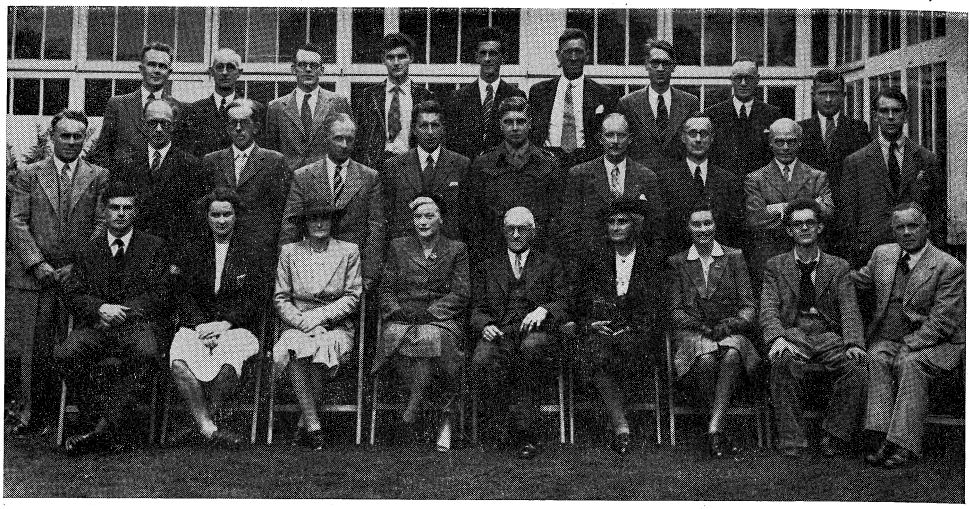
Autumn passage: One to two juveniles at Luton SF between 16th August and 2nd September (MRS).

Grey Wagtail *Motacilla cinerea* 0-1-0

In the early part of the year singles at Blunham Mills, Dunstable Park, East Hyde, Girtford GP, Harrold GP, Luton SF and in the centre of Luton, one to two at Chalton SF, and up to three at Dunstable SF. Last, a male at Blunham Mills on 25th April (PFB).

First in autumn, a juvenile at Luton SF from 12th to 20th July, and one at Dunstable SF from 25th to 29th July (MRS). Singles subsequently at Barton Springs, Bedford SF, Colworth (Sharnbrook), East Hyde, Harrold GP, two sites in central Luton, and Sandy SF; one to two at Dunstable SF and Sandy Lodge; two at Biggleswade and Flitwick Moor; and up to four at Chalton SF and Luton SF.

[*Photograph by J. C. Brown, Bedford*



INAUGURAL MEETING IN BEDFORD, 14th OCTOBER, 1946

BACK ROW: H. B. Souster, A. W. Guppy, R. Scurfield, B. Verdcourt, R. L. Lucas, D. W. Elliott, M. Holdsworth, H. S. Stapleton, V. H. Chambers

MIDDLE ROW: K. E. West, E. C. Brown, F. G. R. Soper, R. Palmer, G. A. Metcalfe, H. A. W. Southon, H. A. S. Key, G. H. Heath, F. W. Kuhlicke, K. Piercy

FRONT ROW: D. W. Snow, I. J. Allison, M. E. Bonnett, E. Proctor, O. G. Pike, G. H. Day, B. Garratt, P. Taylor, W. H. Bonnett

25th ANNIVERSARY EXCURSION TO YORKSHIRE

BOLTON CASTLE, WENSLEYDALE, 6th JUNE, 1971

[*Photograph by David J. Vollans, Leyburn*

WORKING PARTY IN PUTNOE WOOD
[*Photograph by 'Bedfordshire Times'*

HARDWICK SPINNEY, STAGSDEN
[*Photograph by H. A. S. Key*

Yellow Wagtail *Motacilla flava* 2-1-14

First at Dunstable SF on 10th April (JPL). At least five pairs nested at Blunham GP (RFP). No breeding records so far in TL01, 11, 12 and 23, all squares on the chalk hills in the south and south-east of the county. Last at Luton SF on 28th September (MRS).

One male showing the characters of the Blue-headed Wagtail *M. f. flava* with other Yellow Wagtails at Blunham GP on 19th and 20th June (RFP, RT).

Waxwing *Bombycilla garrulus*

Single birds in a garden at Brickhill, Bedford, on 30th March (AW), in a garden at Upper Caldecote on 5th December (RJD), and at Sandy Lodge on 23rd December (MJE, RFP); three in a garden in Mill Lane, Sandy, on 31st December (PH, *per* DAR).

Great Grey Shrike *Lanius excubitor*

One at Wyboston GP on 17th January (JND). One in the Great Coombe, Pegsdon, on 14th March (WL, *per* KRD) flew off north-east and it was probably this bird that was reported just over the Hertfordshire border on the edge of Tingley Wood, Pirton, on 28th March (PAMG). One at Yelnow Lane, Odell Great Wood, on 10th April (KH).

In the latter part of the year singles at Sandy Lodge from 1st November (DE, MJE, TJ, WM, *et al.*), at Harrold GP from 12th December (MAW) and at Dunstable SF from 25th December (MRS) all stayed into 1972.

Red-backed Shrike *Lanius collurio* 2-1-2

One pair bred successfully, raising at least two young. Three other records of adult males in June and July probably involved two individuals. In view of the precarious status of this species neither the localities nor the observers' names are published.

Hawfinch *Coccothraustes coccothraustes* 5-0-6

Singles at Sandy Lodge on 26th April and 9th June (DE), four adults near Heath and Reach on 1st June (RD, *et al.*) and two adults near Whipsnade Park on 15th (GJB). Three pairs, two building nests, at Warren Wood, Clophill, on 2nd May (JTRS). No other localised reports.

Siskin *Carduelis spinus* 0-2-0

In the early part of the year recorded singly or in small numbers at Brickhill (Bedford), Charle Wood (Woburn), Clophill Wood, Southill Park, Stockgrove Wood (Heath and Reach) and Woburn Park. Larger parties of up to *c*20 at Sandy Lodge, *c*25 at Old Warden and *c*100 at Eversholt L. Last at Sandy Lodge on 21st April.

First in autumn, two at Sandy Lodge on 8th August. Up to *c*30 subsequently recorded there, and up to six at Eversholt L, Flitwick Moor and Putnoe (Bedford).

Redpoll *Acanthis flammea* 3-5-13

Recorded in the breeding season in eight new squares, and now recorded in every square. Several flocks of 40-60 during January-April and October-December.

Two showing the characters of the Mealy Redpoll *A. f. flammea* among a flock of 15 Redpolls at Putnoe, Bedford, on 13th February (JND).

Crossbill *Loxia curvirostra* 1-0-2

Charle Wood, Woburn, five on 10th January, twelve on 17th January, one on 14th March and ten on 13th June, including several adult males (KRW). Sandy Lodge, a male and two females on 20th May (DE, DL) and a male on 30th December (TJ). Aspley Heath, about twelve on 15th June (PJM, RAM) and ten on 19th (RAM).

Brambling *Fringilla montifringilla*

Very few reports received, as follows: two parties of *c*25 and *c*10 about a quarter of a mile apart at Luton Hoo Park on 10th January and one bird there on 14th March (AJL); 20-30 at Barton Hill Farm, Barton in the Clay, on 24th January (AJL); about five near The Heath, Heath and Reach, on 29th January (PAMG); and two at Pegsdon Hills on 5th December (MRS).

Corn Bunting *Emberiza calandra* 1-8-12

Widespread and common; recorded in the breeding season in every square. 35-40 pairs in tetrad TL02Y (MRS).

Reed Bunting *Emberiza schoeniclus* 0-1-20

Five to eight pairs in dry chalk grassland in tetrad TL02Y (MRS).

Tree Sparrow *Passer montanus* 0-0-21

Remarkably widespread and common in the county. Largest flock was of *c*800 at Bedford SF in February and March (JND).

P. F. BONHAM.

MAMMALS

After a lapse of many years an effort is being made to resume recording details of mammals in the county. As mammal recording only recommenced after the A.G.M. and record cards had to be printed and circulated, the records, in effect, cover only eight months of the year.

However, an excellent return was obtained, making a good start to our county records. It must be pointed out that the details printed below do not reflect actual distribution or density of species in the county, but only a record of mammals observed.

A total of 26 species were recorded in the county. This can be compared with a list of 42 species recorded in the county since 1900. In line with the latest methods of recording in all branches of natural history, the tetrad method — 2 km. squares — was used. The total number of tetrad records for all species for the year was 177. As there are a total of 354 tetrads in the county the overall level of recording can be judged. Of these 177 records, 94 were new records for the National Survey and these were passed on to the Nature Conservancy at Monks Wood. As Bedfordshire is well under-recorded this level of national records cannot be expected to continue in future years.

THE RECORDS:

HEDGEHOG. Recorded in 27 tetrads.
SP—92H, 93R.
TL—01D/T, 02C/E/R/S/U/V/W/X, 03M/S/Y, 04L/M/R/Z, 05Q, 12E/I, 13A, 14F/G/L/R.

MOLE. Recorded in 13 tetrads.
SP—92D, 93L.
TL—01D/E, 02X, 05R, 12E, 14F/G/L/R, 15M/N.

COMMON SHREW. Recorded in 2 tetrads.
TL—02K, 14M.

PYGMY SHREW. Recorded in 1 tetrad.
TL—02W.

WATER SHREW. Recorded in 1 tetrad.
TL—02W.

BAT (Sp). Recorded in 6 tetrads.
TL—01T, 02R, 04U, 05A, 11E, 12F.

LONG-EARED BAT. Recorded in 1 tetrad.
TL—11D.

NOCTULE BAT. Recorded in 1 tetrad.
TL—05Q.

RABBIT. Recorded in 31 tetrads.
SP—92M, 93R.
TL—01D/N, 02G/T/W, 03C/L/W, 04Q/S, 05R/V, 11E/J, 12A, 13F/G/J/L/R, 14A/C/F/H/I/L/M/N/U.

BROWN HARE. Recorded in 13 tetrads.
TL—01E, 02G/U/Y, 04Z, 11E/J, 12F, 13F/G/L/R, 14C.

BANK VOLE. Recorded in 1 tetrad.
TL—01C.

FIELD VOLE. Recorded in 2 tetrads.
TL—02X, 14C.

SHORT-TAILED VOLE. Recorded in 2 tetrads.
TL—13F/L.

WATER VOLE. Recorded in 8 tetrads.
TL—02C, 11E/I, 12A, 13G/L/R, 14M.

HOUSE MOUSE. Recorded in 2 tetrads.
TL—01D, 02R.

WOOD MOUSE. Recorded in 2 tetrads.
TL—14C/M.

BROWN RAT. Recorded in 12 tetrads.
TL—01D, 02C/L/N, 04P, 11I, 13F/G/L/R, 14M/S.

GREY SQUIRREL. Recorded in 24 tetrads.
SP—92D/U, 93G/R/S.
TL—01D, 02C/W, 03G/U/X, 04P/Q, 05R, 11E/J, 13F/G, 14G/I/L/M/Y/Z.

FOX. Recorded in 2 tetrads.
TL—05V, 14D.

BADGER. Recorded in 2 tetrads.
SP—92S.
TL—02U.

OTTER. Recorded in county; no other details available.

STOAT. Recorded in 8 tetrads.
TL—01E, 02C/I, 11E, 13F/G, 14C/M.

WEASEL. Recorded in 8 tetrads.
SP—92X, 93R.
TL—01D/N, 02T, 11J, 14I/T.

CHINESE WATER DEER. Recorded in 1 tetrad.
SP—93R.

MUNTJAC DEER. Recorded in 5 tetrads.
SP—93L.
TL—01D/E, 03U, 11E.

RED DEER. Recorded in 1 tetrad.
TL—11J.

NOTES:

It is noted that there is still a lot of myxomatosis among the Rabbits. Both the Badger records were for dead animals found by the side of the road, having been killed by vehicles. It is very pleasant to be able to record the presence of an otter in the county. This record comes to us

from the Universities Federation for Animal Welfare and no other details are available due to the need to protect this species from persecution by otter hunts. The record of the Chinese Water Deer is important as Bedfordshire is its main territory, the animals being escapes from both Woburn Park and Whipsnade Zoo. The Red Deer record is for a fine stag that has lived for some years in the very south of the county. It has never been established where the animal came from and unfortunately it has now been killed. It can be seen that there is severe under-recording of Bats and small mammals. Bats have to be identified in the hand, which means either netting or visiting their roost. Small mammals are best recorded by trapping and this requires the availability of equipment, as well as some time and knowledge. However, it is hoped to concentrate on these areas in the coming year to enable more members to gain the knowledge and facilities required to give us fuller records of these species. Some species that were not recorded in 1971, but should be present in Bedfordshire are: all Bats (particularly Pipistrelle and Daubenton's), Yellow-Necked Mouse, Harvest Mouse, Fat Dormouse, Common Dormouse and Fallow Deer. These species are therefore particularly worth looking for and records would be very welcome, but please be sure of your identification before making any record.

My sincere thanks go to all members who have sent in record cards for 1971, whether they were for one record or 50, or for a Rabbit or an Otter.

DAVID ANDERSON.

HARDWICK SPINNEY, 1971

Thanks to the continued facilities granted to the Society by the owners, Messrs. Cartwright, and to the renewal of our agreement with them in September 1971, the work of restoring this small woodland has gone ahead throughout 1971 with results that are already very gratifying, especially to those few who have put in long hours of work there.

The general long-term management proposals can be summarized as follows:

(1) Elimination of excess of dead timber and removal of dead branches.

(2) Cutting of the overgrown shrub layer in order to cause re-growth from the base and to form compact dense bushes.

(3) Cutting and laying of the boundary hedges to encourage re-growth and to close existing gaps.

(4) Re-planting of existing species which have dwindled in numbers during the past period of neglect, e.g. Hazel, Bramble, Dog-rose.

(5) Excavation and lining of a small pond in the central clearing to encourage visits from birds.

(6) Erection of a number of nest-boxes of varying size and type to attract different species of nesting birds.

(7) Control of weeds which are agricultural pests, such as nettle and creeping thistle.

During the year considerable progress was made with the implementation of most of these proposals, especially during the period January to March, and again in November and December. The clearance work at the beginning of the year was mostly devoted to the south-eastern half of the spinney, but, as a result of observations made during the summer, it became clear that the north-western half required equally drastic treatment

and the autumn work was, in consequence, concentrated on that area. This had not been completed by the end of the year, but it is intended that the bulk of it shall be complete by the end of March 1972.

A small pond was excavated and lined, and this now forms an attractive feature of the open space to the north-west of the hut. A feeding-table has been built nearby.

Much of the old hut and 'hide' originally built in 1943 (see below) was found to be too far decayed to permit repair. Little more than half of it remained after reconstruction, and the accommodation it then provided for equipment and members alike was hardly adequate. However, a second-hand sectional wooden shed became available in the autumn and was successfully transported from Bedford in the early hours of the 5th September for erection alongside the old one, thus adding considerably to our storage and shelter facilities.

Former Activities in the Spinney

It was in 1943 that the spinney was established as a private reserve through the interest of the then owner, Mr. D. W. Elliott of Burdelys Manor, and the vegetation was suitably controlled to induce a variety of habitats. The hut and its 'hide', the feeding-table and water-trough (not pond) were all constructed in that year. Nest-boxes were positioned, and, from then onwards, individual records were kept but never collated, apart from those of the Society's survey in 1953. Several evening and dawn chorus meetings were held during the first few years, and on the early morning of 21st April, 1946 no less than thirty species of birds were singing in the spinney.

Investigations continued until 1955, when interest waned. The condition of the spinney thereafter gradually deteriorated, vegetation became rank and the amenities were neglected; the shrubs and hedgerows developed rapidly, until, by 1970, when the Society renewed its interest, the interior was dark, with dead and fallen trees blocking access. There was little evidence of plant life, apart from the Dog's Mercury and a relatively sparse show of bluebells in the spring. The floor of the spinney was hummocky with the many rabbit burrows, the inhabitants of which were partly responsible for the paucity of plant-life, as also were sheep which gained access to the interior. Generally speaking, the spinney had become little more than a roost for woodpigeons, and a rookery had developed after previous discouragement — this latter an overflow from the nearby Sidegate Spinney after some nesting trees had been felled.

The remainder of this article deals with the present conditions in the spinney, together with summaries and comparisons with earlier records. Reference should also be made to the account of the Society's survey of 1953 which was published in Volume 8 of the 'Journal'.

Amphibia

The only species encountered was a single Common Toad (*Bufo bufo*) found under a decaying log.

Birds

Although a preliminary list of species appeared in the Journals for 1953 and 1954 (Vols. 8 and 9), a more complete list of the birds seen in the spinney prior to 1970 is appended for the purpose of future comparison. Those known to have nested are indicated with an asterisk:

Sparrow Hawk (*Accipiter nisus*); Kestrel (*Falco tinnunculus*)* Partridge (*Perdix perdix*); Pheasant (*Phasianus colchicus*)*; Moorhen (*Gallinula chloropus*)*; Woodcock (*Scolopax rusticola*); Stock Dove (*Columba oenas*)*; Wood-Pigeon (*Columba palumbus*)*; Turtle-Dove (*Streptopelia turtur*);

Cuckoo (*Cuculus canorus*); Little Owl (*Athene noctua*)*; Tawny Owl (*Strix aluco*)*; Green Woodpecker (*Picus viridis*); Great Spotted Woodpecker (*Dendrocopos major*)*; Carrion Crow (*Corvus corone*)*; Rook (*Corvus frugilegus*)*; Jackdaw (*Corvus monedula*)*; Magpie (*Pica pica*)*; Jay (*Garrulus glandarius*)*; Great Tit (*Parus major*)*; Blue Tit (*Parus caeruleus*)*; Coal Tit (*Parus ater*); Marsh Tit (*Parus palustris*)*; Long-tailed Tit (*Aegithalos caudatus*); Tree-creeper (*Certhia familiaris*)*; Wren (*Troglodytes troglodytes*)*; Fieldfare (*Turdus pilaris*); Mistle Thrush (*Turdus viscivorus*); Song Thrush (*Turdus philomelos*)*; Redwing (*Turdus musicus*); Blackbird (*Turdus merula*)*; Redstart (*Phoenicurus phoenicurus*)*; Nightingale (*Luscinia megarhyncha*)* — once, two pairs in one season; Robin (*Erithacus rubecula*)*; Goldcrest (*Regulus regulus*); Dunnock (*Prunella modularis*)*; Starling (*Sturnus vulgaris*)*; Pied Wagtail (*Motacilla alba yarrellii*); Greenfinch (*Carduelis chloris*)*; Linnet (*Acanthis cannabina*); Bullfinch (*Pyrrhula pyrrhula*)*; Chaffinch (*Fringilla coelebs*)*; Brambling (*Fringilla montifringilla*); Yellowhammer (*Emberiza citrinella*); House Sparrow (*Passer domesticus*); Tree Sparrow (*Passer montanus*)*; Blackcap (*Sylvia atricapilla*)*; Whitethroat (*Sylvia communis*)*; Lesser Whitethroat (*Sylvia curruca*)*; Willow Warbler (*Phylloscopus trochilus*)*; Chiffchaff (*Phylloscopus collybita*)*. In all, these comprise fifty-one species, of which not less than thirty-four are known to have nested with varying degrees of success.

At the end of the first winter's programme of reclamation some encouraging improvement was noted in the variety and population of the bird life, although, as the season progressed it became apparent that only a basic number of species was present, and that the summer visitors were represented by only one species, the Willow Warbler. A few seasons of growth suitable for nesting sites, and the consequent increase in insect life to form a better ecological balance, will be necessary before the spinney achieves the population which would be truly representative.

The most notable absentee has been the Nightingale and it may be several seasons before the establishment of suitable undergrowth can tempt the return of this species. Years ago the spinney reverberated with the song of one or two males (two pairs have nested in one season), which stimulated response from others in the neighbouring How Wood and Sidegate Spinney. During his last visit to his native country in 1954, the late Mr. Theed Pearse, then over eighty, expressed a wish to hear the song of this bird and thus relive memories of his boyhood. At the invitation of Mr. D. W. Elliott, he, together with his host, the Hon. Secretary and a few other members paid a visit to the spinney on a moonlight night in June and Mr. Pearse stood in the narrow riding listening entranced to a bird singing continuously in a bush not more than ten feet away; he remarked that this experience alone had made his voyage from distant Vancouver Island, British Columbia, very worth while.

The following sepcies were recorded during the year 1971:

Buzzard (*Buteo* sp.) — a new record for the wood. A bird was seen perched on a small oak at the south-west corner of the wood by W. S. Champkin and H. A. S. Key on the 12th December. It flew off towards Burdelys Manor and perched on a dead tree near the farm where it was mobbed by rooks and jackdaws; it then departed in the direction of Hanger Wood, Stagsden; Kestrel; Wood-pigeon*; Tawny Owl; Great Spotted Woodpecker; Rook* (10-12 nests); Jackdaw; Great Tit*; Blue Tit*; Marsh Tit; Treecreeper; Wren* Song Thrush; Blackbird* (2 nests); Robin* (young seen); Dunnock; Starling*; Chaffinch; Tree Sparrow* (small colony — double brooded) and Willow Warbler.

FLOWERING PLANTS

During 1971 a total of fifty-three species of flowering plants was recorded which appears, superficially, to be approaching the corresponding

figure of fifty-five listed in 1953, but a closer examination of the table and summary given below will show that, in fact, considerable changes in the flora have taken place in eighteen years. In particular, there has been a very significant reduction in the perennial herbaceous species, very nearly one half of the original total failing to be recorded in 1971; the spinney thus appears to have lost some of its most attractive species, such as the Greater Stitchwort (*Stellaria holostea*), the Bush Vetch (*Vicia sepium*), the Bugle (*Ajuga reptans*) and the Spotted Orchid (*Dactylorchis fuchsii*). An unwelcome new perennial is the Creeping Thistle (*Cirsium arvense*), a pernicious weed, which has established itself along the south-eastern boundary hedge and which will obviously require determined control measures. More acceptable, and unexpected, arrivals were the Figwort (*Schrophularia nodosa*) and the White Campion (*Melandrium album*).

To offset these numerically, if not in attractiveness, there has been a big increase in the number of annual species, from three to ten. This is largely accounted for by the spinney now being surrounded by arable fields of which the new species are typical weeds; for example, the Field Pansy (*Viola tricolor*), the Fool's Parsley (*Aethusa cynapium*) and the Scarlet Pimpernel (*Anagallis arvensis*).

The Dog's Mercury (*Mercurialis perennis*) and the Bluebell (*Endymion non-scriptum*) are still dominant species in the spring, and, rather surprisingly, the Sweet Violet (*Viola odorata*) is locally abundant, particularly at the south-western end. A striking and welcome new arrival last spring was a solitary but vigorous plant of the hybrid False Oxlip (*Primula veris x vulgaris*).

It is clear that the principal apparent losses are among the summer-flowering herbaceous perennials which are the first to suffer from the steadily increasing shade caused on the woodland floor by neglect of periodic coppicing and clearance; the spring-flowering plants are less adversely affected. More than one season will obviously be required, however, before it is possible to say with certainty that all the species that failed to appear in 1971 are really extinct.

Comparison of Frequencies and Distributions of Flowering Plants

Abbreviations used:
P—perennial; B—biennial; A—annual; d—dominant; a—abundant; la—locally abundant; f—frequent; o—occasional; r—rare; 1—one plant only; L—a species found, but not abundantly, in one part only; M—a species found growing on the margin of the area.

Species		1953	1971
Clematis vitalba	P	1(?)	1
Anemone nemorosa	P	f	—
Ranunculus bulbosus	P	o	—
Ranunculus auricomus	P	f	1
Ranunculus ficaria	P	f	f
Capsella bursa-pastoris	A	o	—
Alliaria petiolata	B	o	o
Viola odorata	P	L	la
Viola reichenbachiana	P	f	—
Viola tricolor	A	—	la
Melandrium album	P	—	la
Cerastium vulgatum	P	f	—
Stellaria media	A	—	a
Stellaria holostea	P	f	—
Chenopodium album	A	—	r
Geranium robertianum	A	f	la
Acer campestre	P	f	f
Euonymus europaeus	P	o	o

Species		1953	1971
Vicia sepium	P	o	—
Rosa canina agg.	P	o	o
Rubus fruticosus agg.	P	la	la
Geum urbanum	P	f	—
Prunus spinosa	P	f	f
Crataegus monogyna	P	f	f
Malus sylvestris	P	o	o
Daphne laureola	P	M	M
Cornus sanguinea	P	o	—
Hedera helix	P	la	la
Sanicula europaea	P	f	—
Aethusa cynapium	A	—	M
Heracleum sphondylium	B	o	—
Bryonia dioica	P	o	a
Mercurialis perennis	P	d	d
Rumex sanguineus	P	f	f
Urtica dioica	P	f	la
Corylus avellana	P	f	o
Quercus robur	P	f	f
Primula veris	P	o	r
Primula vulgaris	P	a	la
Primula veris x vulgaris	P	—	1
Anagallis arvensis	A	—	o
Fraxinus excelsior	P	f	f
Ligustrum vulgare	P	o	r
Myosotis arvensis	A	—	la
Lithospermum officinale	P	o	—
Convolvulus arvensis	P	o	—
Solanum dulcamara	P	o	L
Scrophularia nodosa	P	—	L
Veronica chamaedrys	P	o	r
Stachys sylvatica	P	f	—
Glechoma hederacea	P	a	o
Ajuga reptans	P	a	—
Galium aparine	A	a	a
Sambucus nigra	P	—	f
Viburnum lantana	P	o	o
Lonicera periclymenum	P	o	o
Dipsacus sylvestris	P	L	L
Bellis perennis	P	o	—
Arctium minus	B	—	o
Carduus crispus	B	—	M
Cirsium vulgare	B	o	M
Cirsium arvense	P	—	M
Sonchus oleraceus	A	—	r
Taraxacum officinale	P	f	—
Endymion non-scriptus	P	d	d
Tamus communis	P	f	f
Orchis mascula	P	r	—
Dactylorchis fuchsii	P	f	—
Arum maculatum	P	a	a
Poa nemoralis	P	—	f
Dactylis glomerata	P	f	f
Anisantha sterilis	A	—	M

SUMMARY

	Species	Present 1953	Losses	Gains	Present 1971
Perennials	Trees	4	—	—	4
	Shrubs	13	−1	+1	13
	Herbs	33	−16	+5	22
	Sub-total	49	−18	+6	37
Biennials		3	−1	+2	4
Annuals		3	−1	+8	10
	Total	55	−20	+16	53

FUNGI

A number of species was represented in the plentiful display during the year; the most noteworthy being the large Shaggy Parasol mushroom (*Lepiota rhacodes*) growing in very large rings. A detailed survey of the group will commence in 1972.

INSECTS

These received no particular attention, and there is considerable scope for field studies which will commence in 1972.

MAMMALS

The species represented were:

Mole (*Talpa europea*). Evident from the numerous runs.

Bat (? sp.). Small numbers of this group seen flying on several occasions at dusk along the western edge of the spinney.

Rabbit (*Oryctolagus cuniculus*). All too numerous.

Brown Hare (*Lepus capensis*). One disturbed from its 'form'.

Grey Squirrel (*Sciurus carsliensis*). Had several dreys.

Bank Vole (*Clathrionomys glareolus*).

Brown Rat (*Rattus norvegicus*). One caught in a trap in the hut.

Common Red Fox (*Vulpes vulpes*). This gained access to the hut through a gap in the metal sheeting and buried the remains of a rabbit in the earthen floor.

Suppressive measures were adopted against the excess of both grey squirrels and rabbits. No detailed investigations were undertaken during the year, but it is intended to inaugurate a survey in 1972.

PUTNOE WOOD, 1971

The past year was one of great activity in the Putnoe Wood project, and one regrets, all the more, how few of our members have participated in it, so far. The amount of work of all kinds which is waiting to be done is so large that any offers of help would be more than welcome, and the wood now provides scope for field work in all branches of natural history for as long into the future as can be foreseen. This assurance of continuity is, perhaps, the most important aspect of the whole project.

CONSERVATION WORK

Although the Corporation workmen finished their work before the New Year, the Society's working parties continued until the end of March. The northern end of the Keeper's Path and the Diagonal Path were cleared throughout, a winding path was cut through the north-eastern corner of the wood in area E for use later on as part of the Nature Trail, and the Central Clearing was tidied up, following the removal of the large fallen Poplar in the previous November. Small parties of school-children and Boy Scouts also assisted in the uprooting of large numbers of sycamore seedlings in area A.

Members of the Society were given an opportunity of seeing some of the work carried out during the winter at a field meeting held in the wood on the morning of Sunday, 14th March.

The results of this conservation work after many years of neglect became very apparent during the spring and summer, and were very favourably commented on by many members of the general public using the wood, particularly the creation of the fine vista through the Long Ride, and the appearance of the newly coppiced acre in area B.

CONSERVATION PROGRAMME

The Society drew up further proposals for work to be carried out during the winter of 1971-72 and submitted them officially to the Corporation at the beginning of September; these were accepted almost in their entirety. They provide for the coppicing of a further area of about half an acre in area H, the clearance of a triangular area of scrub at the north-eastern corner of the wood in area E, and the beginning of efforts to replant the southern hedge. The cutting and laying of the northern hedge, which was sanctioned in the Council's estimates of 1970, will also be carried out this winter.

In common with many other parts of the town, Putnoe Wood has not escaped the dreaded Elm Bark Beetle, and the Society's working parties have been assisting the hard-pressed Corporation by felling and burning a number of young Elms, in area A, which had been earlier found to be diseased.

OPEN DAYS

Two Open Days had been arranged for Saturday and Sunday, the 12th and 13th June respectively, but these had to be postponed at very short notice owing to the state of the wood, following a week of heavy rain.

We were more fortunate three weeks later, on the 3rd and 4th July, when the weather was fine and warm throughout. The Corporation very kindly lent us a small marquee and erected it close to the south-western entrance to the wood; in this we arranged an exhibition of photographs by our first President, Oliver Pike, together with a display of natural history paintings, drawings, photographs and specimens. Refreshments were available at one end of the marquee. The exhibition was opened at 3 p.m. on the Saturday by Ald. Ron Sharman, Chairman of the Recreations and Amenities Committee of the Town Council, and the Mayor, Cllr. Winifred Fowler, and a number of Corporation officials and Councillors were also present; all subsequently went round the Nature Trail which had been laid out in the wood, and for which a special two-page leaflet had been prepared.

The event was our first experiment in public relations of this kind, and it was very well attended, particularly on the Sunday, despite an unfortunate and unavoidable clash with a similar event taking place simultaneously at the Beds. and Hunts. Naturalists' Trust reserve at Felmersham. We gained, as a result, the interest and goodwill of a number of local residents together with a record influx of junior members. Above all, we strengthened our already cordial relations with the local authorities.

EDUCATIONAL

Two talks on the wood and its contents were given to junior schools in the early part of the year by Mr. A. W. Guppy, with Mr. H. A. S. Key projecting a number of his colour transparencies. The first of these was on the 14th February, to an audience of over eighty children at Manton Primary School, and the second, on the 25th March, to a slightly larger gathering in the hall of Brickhill Junior School. In both cases the children were invited to ask as many questions as they wished after the talks, and there was no doubt of the tremendous interest which they take in the wood and what they see there.

A short Nature Trail was arranged on the 15th July for a party of children and teachers from both the above schools.

JUNIOR MEMBERSHIP

The growth of Bedford on its north-eastern side has, of course, made Putnoe Wood a favourite resort for many of the local children, and they formed a high proportion of those who came to our Open Days. As a direct consequence the Society enrolled a large number of new Junior Members, most of them living within a short distance of the wood and some within sight of it.

The experiment has therefore been made of forming a Junior Section at Putnoe and arranging a separate programme of field meetings for it during the winter of 1971-72. In addition our juniors have been invited to take part in the periodical Working Parties in the wood, and the response, so far, has been very gratifying, many of them giving remarkable displays of energy and enthusiasm.

THE SOCIETY'S BOOKLET

The Society's booklet entitled 'Notes on the History and Natural History of Putnoe Wood and Putnoe Lane' was issued at the beginning of November. It contains a section on the past history of the Manor of Putnoe, a general account of the vegetation of the wood as established by the Society's surveys, and lists of the various species of nesting birds, flowering plants lepidoptera and mollusca so far found. A map of the wood on a scale of 1 : 1250 is also included. By its very nature, this publication will require frequent additions and corrections as the wood becomes more closely investigated, and the results of further survey work will be incorporated as it becomes available. It should perhaps be emphasized that the booklet in its present form is not written for children, but is intended for the use of teachers using the wood, or for serious students of various branches of natural history.

FLOWERING PLANTS

The only additions to the plant list of the wood during the year were the Hemp Agrimony, *Eupatorium cannabinum*, growing on the banks of the stream along the north side of the wood, and the Aspen, *Populus tremula*, of which two specimens have now been identified and which have produced a number of seedlings in areas D and E.

The outstanding botanical event of the year, however, was the rediscovery by Mrs. Dymond, on the 15th May, of a number of fine plants of *Geum intermedium* Ehrh., the hybrid between the Wood Avens and Water Avens, *Geum urbanum x rivale*. This has been found only once previously in the wood, by J. W. Partridge in 1954, but it has presumably been present undetected throughout the intervening seventeen years. The Wood Avens is quite common in the wood, but the other parent, the Water Avens, has not been seen there for fifty years.

Dr. J. G. Dony, the Society's Recorder for Botany, visited the wood with Mrs. Dony on the brilliantly fine morning of Thursday, 20th May, primarily to see the *Geum* hybrid, but, between them, they recorded over one hundred and twenty species of flowering plants in the wood during their visit.

A preliminary survey of the flora of Putnoe Lane was carried out during the summer and, as a result, a list of about twenty-five species which occur there, but not within the wood itself, was compiled for inclusion in the Society's booklet.

FUNGI

There was a particularly striking display of various species of fungi during the warm and humid weather of late August, and Mr. Key was able to record many of them in colour. A Fungus Foray was held in the

wood a couple of months later, on the 23rd October, under the leadership of Miss Margaret Holden; this is reported on elsewhere in this issue. A first list of fungi has thus been established for the area.

THE RIDGE-AND-FURROW RIDDLE

Anyone who visits Putnoe Wood in winter, or after prolonged wet weather, cannot fail to notice the succession of minature lakes that is formed in the Long Ride which runs from east to west through the middle of the wood. What is not so obvious is, that these water-filled depressions are formed by a series of furrows which cross the Ride at right angles from north to south and extend laterally on both sides into the wood itself. These are naturally more easily seen in winter, particularly if there is a light powdering of snow on the floor of the wood to throw the intermediate ridges into relief.

Immediately following the Society's field meeting at the wood on the morning of Sunday, 14th March a small working party stayed on to measure the position of the ridges and furrows throughout the length of the Long Ride, almost exactly 1500 feet. It was impossible, of course, to do this with a high degree of accuracy; in many cases the furrows have elongated into ponds six or seven feet long, and in others the intervening ridges are barely visible, or have vanished altogether.

However, plotting the readings on squared paper shows at a glance that over a considerable length of the Ride, the ridges and furrows fall into a number of distinct series, distinguishable by their spacing:

Series (a) Between the Dry Ditch and the west gate Seven ridges, some indistinct, with an average spacing of 18.7 feet.

Series (b) Between the Dry Ditch and the Keeper's Path. Twenty-six ridges with spacings varying from 18 to 34 feet, with an average of 25.5 feet.

Series (c) To the east of the Keeper's Path. A number of short irregular sequences with spacings varying between 11 and 42 feet.

What are these ridges and furrows and how are they to be explained? Are they remains of ancient plough-lands, once cleared of woodland and then allowed to revert to their original condition? Or are they some form of drainage channels cut through water-logged woodland at a period when conditions were much wetter than those of today? We need to know much more of the earlier history of the wood and carry out a great deal of field-work before any realistic answer can be attempted.

OUR SOCIETY — TWENTY-FIVE YEARS IN RETROSPECT

BY F. G. R. SOPER

It was on a fine September day in 1946 that 28 enthusiasts met at the St. Johns Ambulance Headquarters in Bedford and decided to form the Society. Every branch of natural history was represented; an acting council was chosen, Oliver Pike the veteran bird photographer became first President, Keith Piercy Chairman, Henry Key, General Secretary and Ray Palmer Editor. The Council got down to work quickly, a public meeting was arranged in Bedford on 14th November when James Fisher spoke to a full audience on the functions of a Natural History Society, while on 6th December, the first meeting at the Luton end was addressed by John Gilmore of the R.H.S. Wisley who spoke on the History of British Botany. The chairman that evening should have been Sir Frederick Mander himself a keen botanist but illness kept him away and the Duke of Bedford readily agreed to take his place.

1947 was a noteworthy year. It says much for the enthusiasm of the members that in spite of the snowbound roads and arctic conditions which prevailed until the end of March, council and ordinary meetings held

alternately at Bedford and Luton were well attended. Eight indoor meetings were held that year and in addition Peter Scott spoke on "Wildfowl" to a packed house of members and friends in Bedford Town Hall. No fewer than 28 field meetings and excursions were arranged. Of these several were particularly noteworthy. There was a visit to some of the more secluded Norfolk Broads in June, a tour of Woburn Park in July conducted by the Duke of Bedford through what was then unknown territory. In September we went to Whipsnade where Dr. Vevers was our host on behalf of the Zoological Society and on 17th November we were met by Peter Scott as the newly opened headquarters of the Wildfowl Trust at Slimbridge. Altogether it was a wonderful year.

In 1949, the first Ornithological Conference was held. B. W. Tucker, W. B. Alexander, E. M. Nicholson and other leading figures took part. The Ornithological Section started in the previous Autumn with Hugh Southon as secretary and a Botanical Section was formed with Arthur Guppy as secretary. The Duke of Bedford had become our President and both indoor and outdoor meetings continued to get active support. Thanks to the good offices of Elsie Proctor, biology mistress at the Bedford Training College and one of the Society's founders, we were fortunate in obtaining the use of the Nature Room at the College for the Bedford meetings. It was a most delightful setting and thanks to Miss Proctor it remained our Bedford home for many years.

By 1950, a number of the original founders had been lost to us. Dr. Holdsworth had taken up an appointment in New Zealand, Hugh Southon and Bernard Verdcourt had gone to East Africa whilst others had secured posts elsewhere in the U.K. On the other hand, useful newcomers had joined to take their places, Dr. Barnes of Rothamsted, Brigadier Foss, V.C., an enthusiastic botanist as well as two ardent youngsters in Frank Gribble and Bernard West.

Space will not permit a detailed review of subsequent years. By 1953 we had lost by death our President, the Duke of Bedford who had been a tower of strength from the Society's formation and also Brig. Foss. Another loss was occasioned when Ray Palmer left for Cornwall. A splendid all round naturalist, he had served on the Council from inception and had been Editor of the Journal. Only those of us who served on the Council realise what the Society owes to Ray Palmer for his work during those early years.

One of the Council's main anxieties in 1954-55 was the weakness of the Luton end of the Society. During the first few years of the Society's existence, the Bedford members used to go over to the Luton meetings, but when this ceased to be regular practice, the attendance at Luton several times dropped to 12 or 13 only and if the speaker happened to be a person of national repute it placed the Council in a position of embarrassment. However, Mr. W. G. Harper joined Mr. Rodell on the Council, some local advertising was done and the Luton end slowly but steadily built up to what it is today.

Of the 28 who formed the Society in 1946, only three are still actively concerned with its management, namely Henry Key, Arthur Guppy, Fred Soper but there is one of those founders who must be mentioned in this brief review of the Society's 25 years existence and that is Dr. Metcalfe. George Metcalfe, a busy local doctor was unwilling to commit himself to service on the Council but his quiet help in the Society's early years was quite invaluable. His splendid bird photographs always added enjoyment to our Ornithological Conferences and how many times he thrilled our members with his bird films often deputising at short notice for a lecturer who had let us down, is hard to recall. The Society had in him a good friend and we wish him well in his well earned years of retirement.

CHANGES IN THE BEE AND WASP FAUNA DURING THE PAST TWENTY-FIVE YEARS

By V. H. Chambers

The starting point for this review is my list published in the *Transactions of the Society for British Entomology* 1949 9: 197-252, describing the results of my collecting from 1930-1945. This named 297 species of aculeate hymenoptera (i.e. including ants); since then, although I have not paid anything like the same attention to this group, 40 more species have been added. Owing to the great changes in the richest localities over the past 20 years, I think that it is most unlikely that the same species variety could be found today. I will discuss some of these old localities in turn.

Whipsnade Heath, even after its spoilation by the road built across it after the opening of the Zoo in 1931, remained a first class locality. Sheep were grazed there until after the 1939-45 war, followed later by cattle. The turf was short, heather and a variety of light-soil plants flourished in open community, with patches of bare soil, and gorse blazed in the spring. Nineteen species of the ground-nesting, solitary *Andrena* bees and eleven species of their inquiline *Nomada* were found, sometimes in great abundance; including the beautiful *A. cineraria* and its equally beautiful and rare specific inquiline, *N. lathburiana.* Several of the small wasps that build nests in sandy exposures or in broken bramble or other twigs occurred: altogether I recorded 58 species of bees and wasps, although probably twenty or more could have been added, as few bumble bees or *Halictus* had been noted. Today, especially since the disappearance of formerly abundant rabbits, the heath is largely covered with coarse grass giving a permanent dead mat, a barrier to the germination of seeds or the excavation of burrows by fossorial hymenoptera. Even brambles and roses have diminished. I doubt whether one quarter of the species found up to 1945 survives.

The neighbouring Deadmansea Wood, now managed by the Forestry Commission, has been considerably tidied up. Twenty-five or more years ago it was in a partially felled and neglected state, with open areas carrying a rich flora — John Dony and I enjoyed ourselves with the willow-herbs — brambles, roses, young willows and aspens, and dead wood and twigs, suitable for small wasps, lying about. Owing to habitat diversity the fauna was rich, with 106 species of bees and wasps. These included among the bees *Andrena* 17, *Nomada* 9, *Halictus* 8, *Sphecodes* 9; but the greater richness lay in the twig- and ground-nesting and spider-hunting wasps, 46 species to be taken on the bare banks and paths and flying around bushes. Even the sand wasp, *Ammophila sabulosa,* was once seen. With the now reduced habitat diversity, impoverished flora and more uniform vegetation cover, many of the former species must have been lost or greatly reduced in numbers.

Moving off the plateau on to the chalk downs proper, the great changes in this area since sheep grazing had to be stopped as an indirect result of the plebianisation of the motor-car, and the destruction of the rabbit, are known to naturalists. Dunstable Downs carried a rich flora in a short turf from relict heather patches on the top down to the banks along the arable fields below: this was never a good locality for bees although some unusual species occurred e.g. *Nomada flavopicta, Andrena marginata,* but there were always the flowers upon which they could be found. The slopes are now little more than a hawthorn-infested coarse grass monoculture. The area around Totternhoe Knolls was richer — and is still of interest — more particularly the grassed-down ancient quarries which carried the entrances to the stone adits, destroyed after 1948 by extensive chalk quarrying. Here in some seasons almost every dandelion carried one of

the shell-nesting bees *Osmia bicolor,* a species only seen occasionally today. Its relative, *O. spinulosa,* flying two months later, has also nearly vanished. Restriction of nesting sites and reduction of forage plants (e.g. arable weeds, prune orchards) has reduced the solitary and bumble bee populations at Totternhoe since my pollen-foraging studies of 1944-45. However, the conservation work underway at Totternhoe — and more recently the welcome start with scrub clearance by the National Trust at Sharpenhoe — should help the survival of downland species. Dr. M. G. Morris, in his work on the Barton Hills exclosures, has shown that good numbers of solitary bees are surviving in areas of intensive sheep grazing.

The uncultivated areas of the lower greensand are *par excellence* localities for bees and wasps. Cooper's Hill, Ampthill, the conifers having been felled in the 1914-18 war and not replanted, was largely covered by heather, a minimum of bracken, extensive bramble and gorse, some young birch, an area of sandpits and heavily rabbit-infested. A characteristic sand-wasp fauna (fifty species) nested at the edges of sandy paths, the vegetation providing the variety of insect prey. Broken bramble stems gave sites for five species of *Prosopis* bees, including the rare *P. cornuta.* The bee fauna was not as rich as elsewhere, with only six *Andrena* (but characteristic species), eight *Halictus* and only *Nomada lineola,* but it was one of the few sites for the maritime leaf-cutter bee and its curious inquiline *Coelioxys conoidea.* Today, with the spread of bracken, cultivation and the elimination of brambles, the fauna is severely affected. However, recent visits show that characteristic species survive: the heather bee *Colletes succincta,* with its pretty grey, pink and white inquiline, *Epeolus variegatus;* several Andrenas; *Ammophila sabulosa,* the large red-black sandwasp can still be seen searching for large moth caterpillars, and as elsewhere on the sand, the late solitary wasp *Mellinus arvensis* is conspicuously abundant. Probably owing to reduction of small insect prey, the many species of tiny sandwasps, including spider-hunters, are no longer numerous on the banks. Up to 25 years ago 83 species of bees and wasps were known: erosion by public access may also be a reducing factor.

The heaths within Aspley Heath parish were never first rate bee and wasp localities but I have records for seventy species. Planted in the late 18th century and last felled during the 1914-18 war, heather and huckleberry spread rapidly: once in the mid thirties while collecting on the heath, I was told by estate constable Emerson that after the war he issued annually 200-300 permits for the locals to collect berries. The growth must have lead to an increase in *Andrena lapponica,* a bee which forages only on *Vaccinium,* which I last recorded in 1949, and which is probably now extinct. Entirely as a result of growth of the pines, planted in 1924-28, leading to elimination of heather, shading and erosion of nesting sites and disappearance of forage/prey, most of the recorded species appear to have gone or become greatly reduced in numbers. I still frequently visit the area: even *Ammophila sabulosa,* formerly numerous, I have not seen for several years; apart from *Mellinus,* only the specialised sand bee *Andrena barbilabris* flourishes with its inquiline *Sphecodes pellucidus.* This is because, burrowing deeply in loose sand, it is not disturbed by human and horse traffic, and it has the ability to orientate foraging flights along the rides between the tall pines, enabling it to collect in distant hedgerows, as I have shown by pollen forage studies. Changes in the fauna of such habitats must be regarded as cyclic: no doubt increases in some species may follow present and future fellings.

It must be remembered that up to the 1939-45 war, farming was not prosperous: some marginal areas were not worth cultivating. Throughout the greensand were small corners of fields or woodland edges tumbled down to heath: I knew several in Clophill, Maulden, Sandy, Shefford and near Rushmere with unusual bee and wasp fauna. These have now gone and with them rare and beautiful insects such as the long-haired bee

Dasypoda hirtipes and the largest and most striking of the Andrenas, *A. thoracica.* However I am sure that as new sandpits are opened and old exhausted in the Heath and Reach area, new habitats will be created for many of the species formerly found in the district. It would be excellent if an old pit could be managed as a special reserve but unfortunately this area is in demand for housing. Again, due I suspect to increased trampling, the paths to Bragenham over the heath near Baker's Wood no longer support colonies of *Cerceris* and other wasps, although colonies of the slave-making ant *Formica sanguinea* — the only locality in this part of England — still flourish. The opening by the County Council of the adjacent country park will undoubtedly lead to erosion, but it is hoped that further encroachment can be contained.

Changes having an adverse effect upon the bee and wasp fauna during the past 25 years can be summarised as follows:

1. Destruction of the rabbit, leading to coarse grass cover, loss of open plant communities and plant diversity.
2. Final elimination of drift sheep grazing under shepherds on downland.
3. Changes in farming practice, leading to reduced flowers for forage e.g., weed control in cereals (charlock); tidying-up of farm surrounds; disappearance of forage crops such as sainfoin, lucerne and clovers, either pure or mixed stands; removal of field boundary hedges, giving loss of forage and nest-sites; locally, reduction of orchards.
4. Mechanical cutting of hedgerows and roadside verges by farmers or local authority: this reduces flowering of hawthorn and blackthorn. Wholesale removal of brambles and roses: the intermittent cutting-back by the old lengthmen left the cut ends of brambles as nest-sites for many small bees and wasps.
5. Changed or lack of economic wood management; replacement by exotic trees, and locally, maturation of plantations, leading to loss of plant/habitat diversity.
6. Increased trampling and erosion by the urban public with the spread of the motor-car, and loss by urban encroachment.

Naturalists must realise — as do nature conservationists — that conservation means maintaining by management areas of countryside in a chosen condition such that maximum diversity of plant and animal life can survive and reproduce: to speak of the 'balance of nature' in this context is inappropriate.

TWENTY-FIVE YEARS OF RIVER CHANGE

By F. G. R. Soper

Although twenty-five years is an insignificant period of time in the life of a river, the years since our Society was formed has seen quite considerable changes in the Ouse and the life it contains. Our forebears regarded rivers as the normal channel for the disposal of refuse and for many centuries, all domestic sewage went into our rivers, raw and untreated. The plant life and underwater fauna dealt with it so that the river was restored to a wholesome state again within a mile or two. No great harm was done except when a large volume of sewage entered the stream at a time of low flow, absorbing all the oxygen and causing fish to die of suffocation. By the end of last century, the increased size of communities and consequently the volume of sewage and a growing awareness of health hazards led to the establishment of sewage farms to clarify the

effluent before discharge to the river and finally modern sewage purification works with their settling tanks and biological filters. However the pollution laws were hardly adequate and having regard to the increasing use of our rivers for drinking water, Parliament passed the River Boards Act in 1948 which laid down that nothing could be discharged into a stream unless it complied with the conditions laid down by the River Board. These limited the amount of suspended solids in the final effluent and also its biological oxygen demand.

Although this Act saw the end of crude sewage pollution other problems arose. The introduction of detergents occurred about this time. These were phosphatic compounds and although they did not prevent the authorities from producing a satisfactory effluent this contained dissolved phosphates which together with fertiliser draining off farmland, led to the "eutrophication" of the river and promoted an increased growth of river vegetation and in static water such as Grafham Water, a profuse crop of algae. However, a more sinister effect of farming activities resulted from the wider use of pesticides the persistent organo-chlorides used as seed dressings. Ornithologists still recall with sadness the widespread destruction of our birds of prey whose food had contained these compounds but few people realise the effect it had on our rivers. Few fish died but their bodies contained sufficient of the persistent residues to be deadly to those whose main diet consisted of fish and prominent among the birds whose death was due to this cause were herons, grebes and other fish-eating birds. There is a tendency to blame the present shortage of kingfishers to the severe winter of 1963 but I feel the pesticide aspect is far more to blame. Another sad feature of this problem is the loss of the otter, another fish eater, who has practically disappeared from our streams. It can only be hoped that as the use of these persistent pesticides gets less, both otters and kingfishers will return to their former numbers, in the same way as our birds of prey are recovering.

Another significant feature of recent years is in the number of frogs and toads which in many localities have become very scarce. Here again, I feel that pesticides washed into ponds and streams are to blame. The tadpoles hatch out but do not reach maturity.

Possibly the most worrying feature of all when considering the condition of our streams is the prevalence of oil. The past 25 years has seen a vast increase in the use of oil for transport as well as heating and industrial purposes. If one stands in a railway station and looks down on the oil-soaked permanent way, or surveys a car park or bus stop, one cannot fail to realise how impossible it is to prevent oil washing into our streams when it rains. Again all too frequently we hear of hooligans breaking into premises and cutting fuel pipes, letting oil flow into the river to the detriment of swans and other waterfowl. Although it does not kill fish, it provides an oily scum that destroys the floating insect life of the river and in addition is aesthetically displeasing.

Certainly the twenty-five years of our Society's existence has brought many fresh problems to those of us who are concerned with the condition of our river and its wildlife.

RAINFALL AT CARDINGTON A CENTURY AGO AND TODAY

By A. W. Guppy

John McLaren came to Bedfordshire at the beginning of 1846 on his appointment as gardener to Samuel Whitbread and immediately started meteorological observations at Cardington which were continued for upwards of forty years. His monthly rainfall figures for the 31-year period 1846 to 1876 inclusive were published in the second volume of Transactions of the old Bedfordshire Natural History Society, of which McLaren was a founder member. Although no further records appear in the two subsequent volumes of Transactions, he continued to send annual returns to Symons's 'British Rainfall'. He kept three rain-gauges at Cardington, an 8 in. at ground level, a 12 in. at 3 ft. 6 in. and an 8 in. mounted 36 ft. above ground level for comparative tests. The readings published in the Transactions appear to have been taken with the 12 in. gauge. None of these, by the way, would fulfil present day standards.

Since his rainfall figures begin one hundred years before the formation of our own Society, the writer considered that an interesting comparison might be made between McLaren's records for the 25 years 1847 to 1871 inclusive and the corresponding figures for a similar period a century later taken at Cardington Aerodrome and made available annually through the good offices of Mr. L. A. Speed.

Many middle-aged and elderly people firmly believe that the weather has changed for the worse since their early childhood, or since the days of their parents and grandparents. Here are some records which can be compared and analyzed, and from which definite conclusions can be drawn. They are arranged in the following tabular summaries:

Table A — Monthly Averages and Extremes, 1847-1871

Month	Average in.	Wettest in.	Driest in.
January	1.73	3.28 (1852)	0.46 (1858)
February	1.22	2.56 (1848)	0.17 (1857)
March	1.40	3.92 (1864)	0.12 (1850)
April	1.46	3.25 (1848)	0.40 (1852)
May	1.81	3.40 (1847)	0.03 (1848)
June	1.98	4.28 (1860)	0.25 (1849)
July	2.10	4.35 (1850)	0.15 (1868)
August	2.26	4.87 (1852)	0.35 (1861)
September	2.05	4.71 (1871)	0.41 (1851)
October	2.33	5.47 (1865)	0.76 (1871)
November	1.58	5.15 (1852)	0.36 (1867)
December	1.53	3.10 (1868)	0.11 (1857)
Total	21.45		

TABLE B — MONTHLY AVERAGES AND EXTREMES, 1947-1971

Month	Average in.	Wettest in.	Driest in.
January	1.77	3.42 (1948)	0.68 (1967)
February	1.40	3.24 (1950)	0.07 (1959)
March	1.54	5.10 (1947)	0.07 (1961)
April	1.50	2.99 (1966)	0.21 (1957)
May	1.78	3.99 (1969)	0.45 (1956)
June	1.90	5.02 (1958)	0.15 (1962)
July	2.11	4.27 (1965)	0.18 (1955)
August	2.29	5.09 (1948)	0.02 (1947)
September	1.70	3.68 (1960)	0.05 (1959)
October	1.73	3.97 (1960)	0.09 (1969)
November	2.17	4.33 (1970)	0.65 (1956)
December	1.79	3.58 (1965)	0.38 (1963)
Total	21.68		

TABLE C — EXTREMES OF ANNUAL RAINFALL

Wettest		Driest	
	in.		in.
1848	30.86	1870	14.87
1852	30.71	1864	16.20
1865	26.17	1854	16.25
1958	28.57	1953	16.43
1960	28.21	1964	16.44
1966	27.28	1949	17.10

TABLE D — FREQUENCY DISTRIBUTION OF ANNUAL RAINFALLS

Annual Rainfall, inches	1847-71	1947-71
Below 16.5	3	2
16.5 to 18.5	4	4
18.5 to 20.5	4	5
20.5 to 22.5	8	6
22.5 to 24.5	0	1
24.5 to 26.5	4	4
Above 26.5	2	3

Conclusions:

(1) The average annual rainfalls for the two periods considered differ by only about one per cent — remarkably close agreement (Tables A and B).

(2) The 19th century period had wider extremes than the 20th; two of its years were wetter, and three drier, than any year in the later period (Table C).

(3) The frequency distribution of annual rainfalls about the average is closely similar in both periods (Table D).

(4) The frequency distribution is markedly unsymmetrical for both periods, i.e. there are many more years below the average than above it. This apparent anomaly is explained by the fact that the wetter-than-average years tend to be *very* wet, whereas there are many years with only slight or moderate deficiencies. It is a curious fact that in only *one* of the fifty years considered has the annual total lain between 22.5 and 24.5 inches.

(5) There are significant differences in the monthly averages for the two periods. In the 19th c. period, October was the wettest month of the year, on average, with August, July and September, in that order, all exceeding 2 inches. In the 20th c. August has become the wettest month, with July still in third place, but October and September have slipped down to 8th and 9th places respectively.

February is still easily the driest month of the year, though April now is in second place, instead of March.

The over-all picture that emerges emphasizes the similarity rather than the difference of the two periods. The average rainfall was much the same then as it has been recently, with a very similar pattern of wet and dry years, although with several years more extreme than any we have recently experienced. It is the amounts received in the various months, however, that shows a distinct change; the early autumn has become much drier, and we have had to wait until November and December to replenish our depleted water supplies.

It should be emphasized, of course, that the periods considered are too short to allow conclusions to be drawn about permanent or long-term changes in the rainfall pattern. There will, however, be opportunities for further surveys in future years; perhaps one of our present junior members might care to undertake a similar article in 1997!

BIRDS IN BEDFORDSHIRE — TWENTY-FIVE YEARS IN RETROSPECT

By Henry A. S. Key

This article is not intended as, nor could be, a comprehensive survey of the bird life of the county during the period since the re-formation of the society, but I felt that the time was opportune for a summary to be made of the excellent progress that has been achieved during the past twenty-five years, in the study of the occurrences and distribution of various species.

When, as the Society's first Recorder of Birds, I wrote a brief account of the 'Birds of Bedfordshire' in the first issue of the Journal, I remarked that: "With the formation of the new Society, and the consequent stimulus to study our bird life more closely, I have no doubt that the next few years will see many important additions to our County list" and went on to indicate the reasons for this assumption, based not only on local factors but on a consideration of the distribution in contiguous counties, as well as on national reports.

An inland county could not be expected to show any phenomenal changes during this period, but the results achieved so far have exceeded expectations, due mainly to the efforts of a group of enthusiastic field-workers. Their standard of reporting has greatly improved during recent years, and if this trend continues, a still more interesting and accurate knowledge of the birds of the County will be available to increasing numbers not only of our own members but of the interested public as well.

There are still many whose interest in the subject is less enthusiastic but whose observations are still of value and one hopes that they can be encouraged to note down what they see and forward reports to the Recorder of Birds. Details of the commoner species are no less welcome and will assist in a better assessment of distribution.

Before we deal in detail with the various families and species, some consideration must be given to factors affecting fluctuation of population and distribution, such as urban developments, changes in agricultural systems, the excavation of mineral deposits and not least the widely-varying effects of weather, which have produced some notable extremes during the period considered.

I will deal firstly with urban expansion. Everyone is aware of the spread of our larger towns, with their expanding populations and industries. An increasing amount of the countryside is being built over and, to some extent, this has an adverse effect on the species which normally nest in the fields and hedgerows. The encroachment in the Luton-Dunstable area towards the downs, for example, appears to be affecting certain species, not only because of land use, but mainly through recreational activities over a wide area. Some woodlands are either becoming increasingly accessible, or are gradually being absorbed in building projects.

So-called 'green belts' remain as such for a relatively short period before becoming eroded by civic expansion and one wonders where it will all end. Yet the picture is not wholly black, for it is found that where planning has allowed for sufficient garden space especially on the new estates, many of the commoner species find nesting sites in the shrubs and ramblers that are planted. Interesting surveys could be undertaken into the status of species in these localities and some remarkable data would probably be forthcoming. One new arrival to the County — the Collared Dove — has already shown its preference for urban habitats and become well established therein. Parks with their shrubberies and lakes, are often merely accepted without investigation.

Town services also provide one further field of study in the form of sewage farms, the types and systems of which vary from the compact precessing station at Luton, to the more open irrigation schemes at Bedford and Dunstable, with their variety of flooded 'pans'. The records of past observations in the Journal will show in detail many species that may be encountered by the observer who chooses to walk in 'these salubrious precincts' as a former President of the Society, the late Duke of Bedford so aptly phrased it to me. Many villages now have their own disposal works, where a variety of birds can be observed feeding in the sprinkler filters.

Turning to the various processes of extraction, there is no other county in which, related to its area, the effect of these processes is more widely felt. The materials excavated include chalk, clay, gravel, sand and to a minor extent stone. The chalk quarries in the south of the County are a familiar sight, if not actually an eyesore, but as they are essential to industry, our only regret is that the processes of reclamation and improvement fall far short of the ideal. Some quarries have a tendency to flood and the resultant pools can be very dangerous, being hemmed in by steep cliffs, so that there is probably no option but to infill these with refuse and overlay with top soil, to return them to agricultural use.

During the process of dumping of urban waste, such pits attract a variety of species, among which the commoner types of gulls predominate, such as Lesser-Backed, occasionally Greater Black-Backed, Common and Black-headed. It is almost certain that the first breeding record of the latter species in the County occurred on one of these sites at Houghton Regis (see Journal No. 9-1954). These scavengers have gradually extended their range inland to feed on urban dumps and it is probable that they spread originally from flocks in the Thames basin, moving northwards along the valley of the River Lea.

There are other and choicer sites such as in the Sundon area where the worked-out sections could be left untouched to be colonised gradually by representative chalk flora, thereby forming a habitat for Whinchats, Pipits and associated species to form a nature sanctuary. I understand that some consideration is already being given to this ideal, and we hope that some fruitful action will result, before yet another opportunity is lost.

The net consideration is of clay workings. There are numerous deep pits in the Oxford Clay, chiefly in the Marston Valley area, which provide some potentially interesting habitats. These excavations are initially kept dry by pumping during extraction and the overburden was formerly tipped

in conical heaps — grey peaks in a sombre wilderness. When these pits are worked out, there is a tendency for them to flood, and gradually the taller mounds became islands, until most of them disappear under the rising waters. When in the optimum 'island' state these mounds hold an interesting nesting population of several species. At one time Stewartby Lake had upwards of a hundred nests of Black-headed Gull with many of Great-Crested Grebe, Mallard, Tufted Duck, Pochard Mute Swan and Coot and others. Another pit yielded a further County breeding record in 1968, when several pairs of Lesser Black-back Gulls nested. The flooded workings are also the roosting areas of large flocks of gulls in the winter months. A disappointment to ornithologists is that, to date, not one of the many excavations has become a nature reserve, in part or wholly. There is an abundant subject here for educational and ecological study and some effort should be made by all interested organisations to secure one such habitat while there is yet time. Pressure to provide amenities for the public has so far ordained that these pits should become basins for yachting and associated water sports but many of us hope that some compromise can be reached at an early date.

Next for consideration is the extraction of gravel. Such workings are in river valleys and consequently are flooded from the beginning. The earlier systems resulted in ridges being left above water as the work progressed and these islands were soon overgrown with aquatic and other plants and willows. The irregular ridges produced a number of bays and occasionally there remained exposed shallow spits of sandy shingle. Many wading birds and wildfowl are attracted to them and they become in consequence veritable Meccas for bird-watchers.

Several additions to the County list have resulted from these localities, chiefly of waders as might be expected and one of these, the Little Ringed Plover, bred for the first recorded time with us. Not only did the Black-headed Gull extend its range to Wyboston pit but an exciting discovery was made in 1963 when a pair of Common Terns nested. In subsequent seasons the numbers of nesting birds of this species rose to a maximum of five pairs. Again, the demand for water sports has meant that most of these localities have been earmarked for 'improvement', but some co-ordinated action by all Societies interested in nature conservation could surely result in positive action being taken, to secure at least one suitable habitat with the necessary seclusion for breeding birds. The Bedfordshire and Huntingdonshire Naturalists Trust is to be complimented on its admirable management of the Felmersham gravel pits, which are mainly a haunt for wildfowl. Readers are referred to my article in the No. 13 (1958) Journal outlining the nature and potential of such workings.

Sand pits are of relatively less significance unless they have a few shallow pools of water where waders may be encountered and the Little Ringed Plover may breed. Usually these workings are relatively dry and apart from possibly Pipits, Wagtails and Buntings with the addition of Finches and Warblers attracted by scrub growth, the most outstanding feature will probably be the colonies of Sand Martins which excavate their nesting holes in the abandoned 'cliff' faces. As, however these dry sites are ideal for infilling with town refuse and eventual reclamation for agriculture, the ornithological interest may be short-lived.

Changes in agricultural systems are the next consideration and there are one or two prominent features. Firstly everyone must be aware of the removal of hedgerows and the creation of relatively large areas of uninterrupted crops. Some reduction in the number of passerines is apparent, though it is yet too early to ascertain the true situation and future surveys may reveal that the species concerned have adapted themselves to changing environment. Some will be driven to the cover afforded by woodlands, but as many of these are decreasing in area or quality, the whole question is for the time being undecided.

Neglected woodlands tend to become overgrown with blackthorn and have dark interiors with a comparatively sparse ground flora. These are little more than roosts for crows and wood pigeons. Alternatively under severe management most of the old timber suitable for nesting sites is removed, and the pattern now is to plant closely with conifers which when mature, achieve much the same effect as with the original neglected woods leaving few nesting sites for Warblers etc. On some estates a better balance is maintained, and well-managed woodlands, such as Odell Great Wood, have, in consequence a richer variety of bird and plant life. Although mainly engaged with economic forestry, the Forestry Commission shows a well informed approach to the various aspects of the problem in the woodlands under their care. Those who have followed the well-laid out nature trails at Maulden Woods will appreciate these remarks.

Rivers and lakes must receive some consideration. Drainage schemes associated with the main waterways have influenced the distribution of some species through the removal of reed-beds and other vegetation. This was discovered during a riverside survey some years ago, but by now I hope that my fears were ill-founded. There is urgent need to repeat the investigation in the near future. The pollution of some streams has been responsible for the poisoning of fish which form the main food of some species.

The Great Ouse River Authority has by careful management succeeded in improving greatly the quality of its waters so that the threat may now have passed; at any rate it is gratifying that the number of Kingfishers appears to be increasing. The various lakes in private grounds have maintained their standard and being relatively free from public access, the sanctuary they afford should enhance the breeding population of these reserves.

Of the former marshes of the County, the only one of note remaining is Flitwick Moor. Here the excavation of the peat has resulted in a waterlogged area of ornithological and botanical significance. Now that extraction has ceased, this area should progressively mature under the management of the Trust to become one of the County's more interesting reserves and a habitat for variety of plants and birds. Already the Water Rail appears to have established itself there. There is a hope that the old timber in adjoining Folly Wood will not be removed; this will provide an ideal feeding ground as well as nesting sites for tits and woodpeckers.

The vagaries of the weather are our final consideration. Although our average rainfall is less than in some other areas, certain wet summers have had adverse effects on the breeding of game birds and other ground nesting species. There have been several extremes during the period of the last twenty-five years. The disastrous effects of the winter of 1946/47 were reported in my article which appeared in the Journal of the latter year (No. 2) but unfortunately the next few summers were relatively mild so that breeding populations were restored, yet not all losses were made good as since that time, for example, Green Woodpeckers appear to be scarcer than before.

Gale force winds in the Spring of 1950 caused a 'wreck' of Little Auks, one of which was picked up in the County and similar conditions in the Autumn blew a Manx Shearwater to us. Two years later another Autumn gale was responsible for the arrival of no less than five Leach's Petrels. The following year had such a fine Autumn that the late departure of migrants was not noticeable. The year 1954 began with storms and this resulted in more interruptions of coastal species; several Shags, a Cormorant and a Puffin were noted. This was repeated with cold east to north-east winds early in 1958 when there was an invasion of Shags during January and February (see special bird note in the Bird Report of that year).

The end of December 1961 provided sharp contrast when the freeze-up of waterways caused the disappearance of nearly all ducks, driven to find open pools and feeding places elsewhere. The following year ended similarly, and the conditions carried over into 1963, when the severe wintry conditions closed all but a few stretches of the River Ouse, open pools being mainly adjacent to the power stations at Bedford and Little Barford, due to the outfall of warm water. From these localities were reported up to seventy White-fronted Geese, some uncommon species of duck such as Goosander and Red-breasted Merganser as well as Whooper and Bewick Swans. Among the visiting passerines were larger flocks than usual of Fieldfares and Redwings and parties of up to thirty Bramblings. As a result of such arctic conditions, there was a noticeable absence later in the year of Lapwings and Snipe among others. These effects were, therefore similar to those experienced in 1946-47, though less severe.

Let us turn finally to more specific details concerning the various families, conscious of the fact that only a broad outline can be envisaged within the scope of this article and the reader should consult past issues of the Journal for more comprehensive data.

A five year venture known as the B.T.O. Atlas Project began in 1968 in which it is hoped to survey and record from the ten kilometer squares of the County map, all the species occurring in these areas, in order to build up gradually a comprehensive account of the birds of the County and to contribute to a better picture of the national coverage. Details of this scheme have appeared elsewhere in the Journals. Of course, even the completed report will not be final but the data assembled will be useful locally and nationally for reference and to assist conservation.

When the Society was re-formed in 1946, a letter by 'Touchstone' (Chris Carter) in his column of the 'Bedfordshire Times' stated:

"But I fear that they (i.e. the members of the re-formed Bedfordshire Natural History Society) will not see some of the denizens of the woods and moorland that were once familiar in Bedfordshire. The late Mr. A. S. Covington, the well-known taxidermist and naturalist, who was born in Bedford in 1847, had handled such rare birds as the Great Spotted Cuckoo; the Great Black Woodpecker; the Little Bittern; the Rough Legged Bustard (sic); several Great (sic) Bitterns (now practically extinct); the Hen Harrier; the Honey Buzzard and the Bearded Tit.

Among Mr. Covington's own collection were a Buzzard Hawk, which was shot at Putnoe Wood when he was a boy — a splendid Kite, the last one killed in Bedfordshire in 1822; a Peregrine Falcon from Colmworth; the rare Purple Heron — and a Great Bittern from Flitwick Moor."

It is highly improbable that some of the species in this article (occasionally incorrectly named), originated in the County but among the possibility of 'natives' however, it is now of interest to report that several have occurred during the period considered. These include Purple Heron, Bittern, Buzzard, Rough Legged Buzzard, Kite, Honey Buzzard, Hen Harrier, Peregrine Falcon and Bearded Tit.

During the past quarter century twenty-six species or sub-species have been added to the County list, while other records confirm previous occurrences, that for some reason, were of doubtful authenticity. The new ones are:

Black-necked Grebe, Purple Heron, Night Heron, Little Egret, Marsh Harrier, Little Ringed Plover, Kentish Plover, Grey Plover, Turnstone, Great Snipe, Purple Sandpiper, Baird's Sandpiper, Pectoral Sandpiper, Sharp-tailed Sandpiper, Avocet, Wilson's Phalarope, Great Skua, Iceland Gull, White-winged Black Tern, Sandwich Tern, Collared Dove, Bearded Tit, Rock/Water Pipits, Blue-headed Wagtail, Lapland Bunting.

In addition, the following seven species bred in the County for the first time as far as we know: Garganey, Little Ringed Plover, Lesser Black-backed Gull, Black-headed Gull, Common Tern, Collared Dove and Short-eared Owl.

It is interesting to note that the majority of the new records were obtained from marsh or water habitats, which confirms previous remarks concerning the more popular haunts of bird-watchers. It is hoped many members will increasingly visit the less spectacular areas of the countryside for the Atlas surveys so that overall investigation will yield authentic and representative data.

The Black-throated Diver has been recorded on at least one occasion and the Red-throated on at least eight. Both Great-crested and Little Grebes are well established as breeding species, while the other members of this family represented were Red-necked, seen in three years and the Black-necked (a newcomer) which occurred in at least seven instances. Winter storms drove maritime species into Bedfordshire as follows (the figures refer to the number of years recorded): Leach's Petrel 2, Manx Shearwater 4, Gannet 5, Cormorant — on at least 17, Shag at least 6, Great Skua 1 (a new record), two probable Arctic Skuas, Little Auk 1 and Puffin 3.

Common Herons still occupy heronries at Bromham and Southill Parks where they are afforded protection though former small colonies have been abandoned. Other members of this group encountered have been Purple Heron — at least twice with single instances of Night Heron and Little Egret, all three species being new to the county. Most surprising has been the frequent visits of the Bittern, observed in no less than twelve years.

In consequence of the development in number and variety of pools during recent years, there has been a noticeable increase during Autumn and Winter months of flocks of both wildfowl and gulls. Among the former Mallard, Teal, Tufted and Pochard have been the most common in decreasing numerical order, with combined parties of several thousands. The largest recorded party of Mallard (*c*2500) was on the clay pits in October 1967, with up to a maximum of 500 at Wyboston gravel pits. Teal show some preference for Barker's Lane gravel pit, Bedford — maximum here *c*450 in November 1961, Bedford Sewage Farm and Wyboston — maximum *c*350 in 1968.

Among the diving ducks, both Tufted and Pochard frequent chiefly the Stewartby and Wyboston areas as well as occurring in reasonable numbers at Southill Lake. The size of Stewartby Lake tends to attract the largest Winter parties, where Tufted reached a maximum of *c*450 on 20th December, 1967 while Wyboston holds the record for Pochard with *c*340 on 29th October, 1967 and only slightly fewer both here and at Stewartby in 1968.

Mallard are by far the commonest breeders and although Teal are widely distributed, the only positive records of nesting came from Southill in 1948 and Felmersham in 1952. Garganey have turned up in most Summers and the first proved nest was at Bedford Sewage farm in 1948 with only one since. Evidence of breeding of Tufted has been obtained in nineteen Summers and of Pochard in thirteen.

Wigeon, Pintail and Shoveller have been regular visitors, but only the latter species has bred at Southill in 1964 and 1965. Gadwall have been less frequent.

The remaining 'divers' have been observed in the following number of years:

Scaup 8, Ferruginous Duck 1, Long-tailed Duck 4 and Common Scoter 11.

'Sawbills' have been represented by Red-breasted Merganser 9, Goosander 18, and Smew 16. Shelduck have been recorded in almost every year.

Winter roosts of mixed species of gulls reached an all-time peak at Stewartby Lake on 9th March, 1968 when a total of 38,000 was estimated. The previous best has been a flock of 24,172 recorded during a gull count there on 5th January, 1966. Black-headed Gulls predominated with at times parties of some three thousand each of Herring and Lesser Black-backs and half that number of Common. Greater Black-backs were recorded in most years and increased to one hundred in parties at Elstow clay pit on 10th January, 1967 and similarly here in January 1968. A gathering of about this size was also present in the same month and year at Dunstable Sewage Farm.

Other species of gull recorded were one 'Iceland' on 18th March, 1962 (a new record for the County), Little Gull in nine years and Kittiwake in twelve.

The first authenticated breeding of Black-headed Gulls was at Dunstable Sewage Farm in 1955 and came as no surprise following the inconclusive evidence at Houghton Regis in 1954. The species soon spread to Stewartby Lake. Here in 1959 James Ferguson Lees and I counted 107 occupied nests on the sole remaining island. From various sources an estimated total of *c*100 nests was recorded in 1963, 130 in 1964, 250 pairs of birds in 1965 but the number of nests was probably less and *c*200 nests estimated in 1961. The birds eventually spread to the gravel pits at Wyboston where three pairs bred in 1968 and four pairs in 1970. When a pair of Lesser Black-backs was seen displaying in the Brogborough pit in 1966, the possibility of breeding was suspected but this was not proved in the 'clay' area until 1968 when three pairs nested in one locality to form yet another breeding record. This was not repeated subsequently.

On Spring and Autumn migration, Black Terns were variously reported in almost every year and single instances of the White-winged Black Tern from Stewartby Lake on 16th-17th May, 1961 and in 1967 form an addition to the County list. Mixed parties of Common and Arctic Terns were attracted to the various waters in the majority of seasons during passage but a surprise discovery was made at Wyboston pits in 1963 when a pair of 'Commons' nested for the first time in the County. The fortunes of this species have fluctuated since with up to five nests in one year but owing to disturbances the successes have proved to be disappointingly few. Other species of Terns recorded have been little observed in eight years and reported in each of the last four — as well as Sandwich — a newcomer in 1967 and seen again in both 1969 and 1970.

The occurrences of diurnal birds of prey have been somewhat erratic with Kestrel a reasonably common resident species. The Hobby has been seen in most Summers but nests are seldom discovered though no doubt overlooked. The Sparrow Hawk is now seemingly very scarce with hardly ever a record of breeding. (Both these species should be afforded every protection.) Other species recorded (together with the number of years observed) have been: "Golden Eagle" — an unconfirmed report from Woburn in 1954, Buzzard (species) almost every year, Rough-legged Buzzard 1, Goshawk 1 definite and a 'probable', Kite — similarly, White-tailed Eagle 1, Honey Buzzard 1, Marsh Harrier 1, Hen Harrier 2, Montagu's Harrier 4 and unconfirmed Harriers 5, Osprey 3, Peregrine Falcon — at least 10, and Merlin 4 with further probables.

Pheasant, Common and Red-legged Partridges are common residents, with fluctuating populations somewhat influenced by the weather conditions which prevail at the critical stage of breeding, but the summer-visiting Quail is not heard every year, though recorded in fourteen seasons.

Of the Crakes, the Water Rail is seen in most years and has been known to nest; the Spotted Crake has been observed once. Both the Moorhen and Coot are common residents, while the Corncrake was heard in eight years.

The Waders form a relatively large group and no less than thirty-seven species were recorded during the period under review. These are classified under the following headings according to their relative occurrence; those marked * are new county records.

(a) Species recorded virtually every year:

The commonest resident is the Lapwing whose numbers are augmented by migrants outside the breeding season. The same remarks (in lesser degree) apply also to the Common Snipe and Woodcock.

Both the Little Ringed Plover* and Redshank occur as summer visitors in small numbers and the first recorded occurrence of the former was in 1951 when the nest was also found.

The remaining passage migrants or winter visitors in this group are:

Ringed Plover; Golden Plover; Jack Snipe; Curlew; Green, Wood and Common Sandpiper; Greenshank; Dunlin and Ruff.

(b) Species of infrequent occurrence but probably overlooked:

Oyster Catcher; Turnstone*; Whimbrel; Black-tailed and Bar-tailed Godwits; Spotted Redshank; Knot; Little Stint; Curlew Sandpiper; Sanderling and Stone Curlew. The latter species has been heard during eight summers in suitable haunts without proof of breeding.

(c) The remaining species have, in the main, been recorded in single occurrences and are, in consequence, of limited ecological significance:

Kentish Plover*; Grey Plover*; Great Snipe*; Purple Sandpiper*; Temminck's Stint; Pectoral*, Sharp-tailed* and Baird's* Sandpipers; Avocet* and Wilson's Phalarope*.

A probable additional species was an unidentified Phalarope seen in 1968.

Readers must refer to the annual reports for more complete details.

Stock Dove, Woodpigeon and the migratory Turtle Dove are of regular occurrence, with very large flocks of Woodpigeon in most winters. The Collared Dove, since its first sighting in 1961, has spread to become relatively common. In every summer the Cuckoo is seen and heard.

Among the Owls, the commonest species encountered is the Tawny, with apparent decrease in both Little and Barn Owls. Long-eared, by their habits, are probably overlooked, as only in twelve years have records been submitted, but the Short-eared has been observed fairly regularly in past winters and a pair bred for the first time in 1949.

Nightjars are reported annually, though their numbers remain very small, Swifts are regular Summer visitors and the Kingfisher appears to be increasing, while Hoopoes have been seen in eleven years.

Green, Great-spotted and Lesser-spotted Woodpeckers have all been reported annually with no statistic, more exact data would be welcomed, especially concerning the first and last of these species. Wrynecks have only been observed in four years.

Woodlarks are not reported every year and no breeding records are available but the Skylark is a well distributed resident.

In every Summer, Swallows, House and Sand Martins are widely distributed visitors. A Golden Oriole was reported on one occasion only, without confirmation unfortunately.

Of the Crows, the Carrion Crow, Rook, Jackdaw, Magpie and Jay are all residents — but my own impression is that the number of Magpies is decreasing. The Hooded Crow has been seen in fourteen years.

Next comes the family of Tits. The Great, Blue, Coal, Marsh and Long-tailed occur regularly, but the Willow Tit has received little attention in the past and been noticed only in 13 of the past 15 years. Bearded Tits confirmed very old doubtful records by positive appearances during an interruption in the Winter of 1965-66.

Nuthatch, Tree Creeper, Wren, Mistle Thrush and Blackbird are residents in varying numbers with Fieldfares and Redwings as regular Winter visitors. The Ring Ouzel has been seen on migration in nine years. Wheatears, Stonechats, Whinchats and Redstarts are met with annually only the two latter species being proved to breed during the period under review. The Black Redstart has only definitely been seen in six years.

Two species recorded regularly have been the Nightingale (a decreasing Summer visitor) and the Robin, common in all areas.

Among the Summer visiting Warblers, the following are reasonably well distributed: Grasshopper, Reed, Sedge, Blackcap, Garden, Whitethroat, Lesser Whitethroat, Willow, Chiff-chaff and Wood the latter species being represented by only a very few pairs.

Goldcrests are seen at all seasons and have nested but the Firecrest appeared only once in 1968. Spotted Flycatchers turn up each Summer but the Pied Flycatcher has been seen passing through in only eleven years.

Dunnocks are widely distributed, Meadow and Tree Pipits are both regular with Rock and Water Pipits (both new records of sub-species) recorded in five years.

Pied, White, Grey and Yellow Wagtails all occur annually but the Blue-headed sub-species (a new record) was observed for the first time in 1948 and again two years later.

In ten Winters Waxwings were noted and Great Grey Shrikes in fourteen. Although reported annually, the Summer visiting Red-backed Shrike seems to be decreasing as a breeding species only one or two pairs being recorded in infrequent years.

Starlings are common at all seasons and widely spread with vast roosts in the Winter months.

Almost every season the following species of Finches are reported: Hawfinch, Greenfinch, Goldfinch, Linnet, Redpoll, Bullfinch and Chaffinch. All these breed with us in varying numbers with the Hawfinch (again an overlooked species due to its secretive habits) the least common. Both Siskins and Bramblings are regular Winter visitors and the Twite has been seen in eight years. Crossbills turn up in most Winters and have remained to breed on a few occasions.

Corn Buntings are reasonably well spread nesters but the Cirl Bunting which reaches the limit of its range with us has been recorded only twice and not for the last twenty-three years, though a keen look out has been kept for it. Reed Buntings breed somewhat sparsely in suitable habitats but the Lapland Bunting is a newcomer seen for the first and only time in 1965. Single Snow Buntings were seen at both ends of the County in January 1970. House and Tree Sparrows are of course well distributed.

This ends the catalogue, in which I have endeavoured to avoid undue repetition. I hope that the information given may stimulate increasing interest and participation in the County Atlas Surveys, thus working towards a better and more complete knowledge of Bedfordshire birds.

MAMMALS IN BEDFORDSHIRE — 1946-1971

By David Anderson

As there are not full records for mammals in Bedfordshire for the last 25 years, no detailed report can be made. However, a good comparison can be made between the start and end of that period as the 1946 Journal of the Society carried an article by Ray Palmer on the status of mammals at that time. Other information for this article has been taken from the "Mammal Society" distribution survey of Great Britain and the book "Deer of Great Britain" by Mr. G. Kenneth Whitehead.

In 1946 Ray Palmer reported a list of 32 species recorded for the county up to that date, whereas in 1971 this list stands at 44. This shows that there has been an addition of new species, although some may have been previously present but not recorded. The species list for the year 1971 was only 26 so there have also been a lot of species lost over the years. The only species not recorded at all over the years that could have been, or are present in the county are the remainder of the order of bats.

Listed below are some notes on the species that have changed in distribution over the previous years. Also listed are the species that can be considered to be stable and these are:

Hedgehog	— common	Water Vole	— common
Mole	— common	Brown Rat	— common
Common Shrew	— common	Fox	— fairly common
Water Shrew	— fairly common	Badger	— rare
Pipistrelle Bat	— common	Stoat	— common
Rabbit	— common	Weasel	— common
Brown Hare	— common		

Pygmy Shrew. Listed in 1946 by only 1 recording as was the case in 1971. In both cases this must be due to under-recording as this species should today be fairly common.

Greater Horseshoe Bat. Only 1 record ever for the county, in 1958. There are no other details for this record and, as bats must be handled to be identified, the record is in some doubt.

Barbastelle Bat. Positive records for 1901 and for some year prior to 1960.

Daubenton's Bat. Listed in 1946 as should be common, but no positive record since that time.

Long-eared Bat. Listed in 1946 as very common. Since then only recorded once in 1962 in north of county and once in 1971 in south of county.

Natterer's Bat. Only record is for small group at Turvey in 1901.

Noctule Bat. Listed in 1946 as fairly common, but again only 2 records since. Both were in the north of the county, one in 1970 and one in 1971.

Whiskered Bat. Recorded in three places some year prior to 1960.

Dormouse. Only 1 record in the 1946 list. One other record for that same year but no other records. There must be serious doubt if this sepcies still exists in Bedfordshire.

Edible Dormouse. This did not appear in the 1946 list and was presumably not present in the county at that time. The Edible Dormouse is a European animal but some were released at Tring by Lord Rothschild and are now living ferally. The first record was for 1947 at Whipsnade and although there has only been one other record since that time, also in the Whipsnade area, they are known to be fairly common around those parts. This species is very slowly extending its range and it is of national importance to keep accurate details of its movements in the future.

BANK VOLE. Shown in 1946 as probably common. As trapping is required to obtain specimens this type of animal is always under-recorded. Since 1946 it has been recorded from all parts of the county, and in many different years. Its status is in some doubt, but probably is still common.

SHORT-TAILED VOLE. Listed in 1946 as very common. Only 3 records since then, but all from owl pellets, so is probably common and one of the main foods of owls.

MUSKRAT. This American rodent was bred for fur in this country and some escaped and lived ferally. The only record for Bedfordshire was in 1931 near Luton. The species is no longer listed for Britain.

HARVEST MOUSE. This species was recorded in 1946 as having died out in the county. This report produced a number of records for all parts of the county over the following years. It has even been recorded in Barn Owl pellets. The species is still present in the county but can only be listed as rare.

HOUSE MOUSE. Listed in 1946 as very common. It must surely still be very common but since 1946 there have only been 4 records. This is a good example of a common species being over-looked and therefore under-recorded.

YELLOW-NECKED FIELD MOUSE. Not shown in the 1946 listing at all but probably was present at that time. Since then there have only been 2 records, but this species may be incorrectly identified as it is similar to the Wood Mouse. It must be listed as rare.

WOOD MOUSE. Shown in the 1946 list as very common. There have been many records since then and it is the most recorded mouse. However, it may not in fact be more abundant than the House Mouse if that species were fully recorded. Today it can be listed as common.

BLACK RAT. This species would not be expected to appear in a list of mammals for Bedfordshire as it is associated with sea ports. However, the 1946 report noted an animal positively recorded as a Black Rat in 1942 at Bromham. Since then 2 others have been reported, again positively, in 1949 at Whipsnade. No other records have been obtained. should be listed today as very rare.

COYPU. This is another animal that was bred for its fur, and some escapes have established themselves ferally. The only record for Bedfordshire was in 1943 near Bedford. Not expected in the county today, so listed as very rare.

GREY SQUIRREL. This is also an introduced species and the 1946 article states that it is established throughout Bedfordshire and southern England. It is now very common in all parts of the county. The Woburn area has a melanic-black variety which was reported in 1946. Such animals are still to be seen in 1971 and their range appears to be increasing.

RED SQUIRREL. This species was reported as more or less abundant in 1904, with 4 animals being seen in 1946. Alas only 1 record has been made since, at Sandy in 1970. This is probably the last record that will ever be made for the county and the species must now be considered not to be present in Bedfordshire. It is therefore listed as very rare.

MINK. This is another American animal farmed for its fur. The only 2 records were between 1960 and 1970, 1 in the south and 1 in the north. This species usually exists close to rivers, hence the 2 localities.

OTTER. It is interesting to see that in the 1946 article the otter was listed as fairly numerous, but other information was withheld to protect it from hunting. Today the Otter is very rare, although an animal was seen in the county in 1971. It is even more important to restrict information on this species due to the pressure from hunts. Only 4 other records are known for the years between 1946 and 1971.

PINE MARTEN. The last known record for the county was in 1840. It is not expected to be seen in any area east of Wales today.

POLECAT. This species use to be fairly common in the county up to 1895. No record since and today is limited to the same areas as the Pine Marten.

CHINESE WATER DEER. In 1946 there were no deer recorded for the county of any species. This is certainly the area of biggest increase since that time and for some species there has been a build up to considerable numbers. The Chinese Water Deer in Bedfordshire are all escapes and comprise almost all the records for the entire country. The first record was for 3 animals in 1969, with small numbers recorded for each year since then. The species is probably more numerous than the records show, but still only recordable as rare.

FALLOW DEER. A small group were reported near Hitchin in 1964. These are known not to exist today. No other records have been obtained for the county, but a few deer must stray into the county at times from the Ashridge herd.

MUNTJAC DEER. This small deer has spread to a point where today it can be listed as common. The first record is listed for 1966 and since then records have increased in number for every year. Most of the records are for the centre and south of the county, but this may be more an indication of the levels of recording than of the distribution of the species. This deer thrives well in any wood and its small size — 18 inches high at the shoulder — aids to it being unmolested.

RED DEER. There is only 1 record of this species for the county. The animal lived for up to 10 years in the very south of the county, although its origins are unknown. As the animal is now dead it is very unlikely that any other record will be obtained for Bedfordshire.

SIBERIAN ROE DEER. This species of deer was reported living outside Woburn during 1950. Three deer were seen at that time, but no later records have been obtained and it must be presumed that they no longer exist. This is really a freak record and cannot expect to be repeated unless more of the species escape from the park.

The above summary gives the position of mammal species for Bedfordshire today, for 1946 and for before that date as far as is known. Due to lack of full recording there are bound to be errors, but the trends of gains and losses are evident. The biggest gains are in the deer species and we are in this position mainly due to the existence of Woburn and its deer collection. The escapes from there are of national importance and we have a responsibility to obtain accurate and full records. The losses of certain species are sad to see. There does not appear to be much hope for the Red Squirrel in Bedfordshire, but with legal protection the Otter could regain at least some of its past numbers. More work with trapping is required to establish the actual position of the small mammals, with particular effort on the Dormouse and Harvest Mouse. The Bat species also require work to establish their density and types. With work on these lines, another report in 25 years or even 10 years would, I am sure, produce at least 2 new species for the county, as well as a much more accurate account of their position.

LIST OF NEW MEMBERS WHO JOINED DURING 1971

c Corporate *a* Associate *j* Junior *s* Student

*j*Adkins, A., 39 Queens Drive, Bedford.
*j*Adkins, Miss H., 39 Queens Drive, Bedford.
Adkins, S. J., 39 Queens Drive, Bedford.
*a*Adkins, Mrs., 39 Queens Drive, Bedford.
*j*Austin, M., 18 Rowallan Drive, Bedford.
Baker, D. G., 76 Austin Road, Luton.
Bavington, Miss P. M., 48 Spenser Road, Bedford.
*c*Bedford Modern School, Harpur Street, Bedford.
Bradshaw, D., 15 Southview, Brookside, Bromham, Bedford.
*a*Bradshaw, Mrs. E., 15 Southview, Brookside, Bromham, Bedford.
*s*Bradshaw, S., 15 Southview, Brookside, Bromham, Bedford.
*c*Brickhill Junior School, Falcon Avenue, Bedford.
*j*Brown, S. L., 126 Howbury Street, Bedford.
*s*Carleton, B. M., 5 Aldbanks, Dunstable.
*j*Coulson, Miss A. R., 79 Aspen Avenue, Bedford.
Courtney, Mrs. M. I., Greenlands, Main Road, Biddenham, Bedford.
*j*Dazley, P. J., 9 Wheathouse Close, Bedford.
*j*Dunn, A., 15 Wheathouse Close, Bedford.
*j*Footitt, K. P., 5 Parkstone Close, Bedford.
*j*Fuller, A. G., 7 Sunningdale Walk, Bedford.
*j*Fuller, R. Q., 7 Sunningdale Walk, Bedford.
Game, A. H., 161 Barton Road, Luton.
*j*Goodship, S., 54 Stancliffe Road, Bedford.
Green, W. J., Pilgrims Cottage, Haynes, Bedford.
*j*Harley, Miss V. S., 85 Putnoe Street, Bedford.
*j*Hunter, Miss E. M., 14 Turnberry Walk, Bedford.
Hunter, I. E., 14 Turnberry Walk, Bedford.
*j*Hunter, Miss K. F., 14 Turnberry Walk, Bedford.
*j*Hunter, M. R., 14 Turnberry Walk, Bedford.
*s*Jackson, N. C. S., 6 Juniper Drive, Chelmsford, Essex.
Jenks, Mrs. J., 1 Arrow Leys, Bedford.
Jones, R. E. L., 17 High Street, Pulloxhill, Bedford.
*s*Labe, R. T. J., 53 Goldington Avenue, Bedford.
*j*Lawrence, D. P., 60 Brecon Way, Bedford.
L'Estrange, Miss M., 37 Lansdowne Road, Bedford.
*j*McDermott, N., 6 Elm Close, Hillyfields, Bedford.
*j*McMenamin, K., 47 Carterways, Dunstable.
McMinn, M. D., 256 Jeansway, Dunstable.
*j*McPoland, Miss J., 119 Putnoe Lane, Bedford.
Marchbank, Mrs. R. P., 51 St. Michaels Road, Bedford.
Marlow, G., 1 Monmouth Road, Harlington, Dunstable.
Mills, B. C., 4 Pipers Croft, Dunstable.
Mills, Mrs. E., 4 Pipers Croft, Dunstable.
*j*Morrison, C. F., 42 Fairholme, Putnoe, Bedford.
*s*Muris, Mrs. E. M., 2 Ballinghall Close, Goldington, Bedford.

Nau, B. S., Ph.D., 15 Park Hill, Toddington, Dunstable.
*j*Peacock, I., 8 Quantock Close, Bedford.
*s*Pigden, T. S., 7 Harvey Road, Totternhoe, Dunstable.
*j*Pilcher, Miss D. J., 74a Putnoe Lane, Bedford.
*j*Pilcher, P. C., 74a Putnoe Lane, Bedford.
Piron, Mrs. M., 8 Bowhill, Putnoe, Bedford.
Porter, R. G., 10 Longfield Drive, Luton.
*j*Powney, A., 54 Gooseberry Hill, Luton.
Powney, R. A., 54 Gooseberry Hill, Luton.
*j*Pyburn, C., 14 Brecon Way, Bedford.
*a*Randall, Mrs. M. R., Ranfield, Heath Road, Leighton Buzzard.
Randall, W., Ranfield, Heath Road, Leighton Buzzard.
Ricketts, T. C. D., 17 Albany Road, Bedford.
Sharpe, H. A., 17 Irwin Road, Bedford.
*a*Sharpe, Mrs. P. M., 17 Irwin Road, Bedford.
*j*Silver, D. M., 62 Brecon Way, Bedford.
*j*Silver, Miss S. J., 62 Brecon Way, Bedford.
Simon, A. E., 9 Cotswold Close, Bedford.
Smart, P. J., F.R.E.S., 1 Laburnum Avenue, Bedford.
*j*Smith, M., 21 Penrith Avenue, Dunstable.
*j*Smith, S., 21 Penrith Avenue, Dunstable.
Spare, R., Home Farm, Milton Bryan, Woburn, Bletchley.
Spring, Mrs. E. B., 37 Hawthorne Avenue, Bedford.
*j*Starr, N., 60 Rowallan Drive, Bedford.
*j*Stevens, G. R., 44 Falcon Avenue, Bedford.
Stevens, W. L., 6 Windsor Road, Barton-le-Clay, Bedford.
*a*Tofield, Mrs. F. W., Southernhay, Kings Street, Leighton Buzzard.
Tofield, R. F., Southernhay, Kings Street, Leighton Buzzard.
*j*Turkington, D., 19 Gilwell Close, Bedford.
*s*Ward, Mrs. J. K., 25 Hartland Avenue, Bedford.
*j*Witherall, M. J., 12 St. James Close, Pulloxhill, Bedford.
Withers, D. T., 9 Lammas Way, Ampthill.
*j*Wyatt, R. E., 70 Brecon Way, Bedford.

BEDFORDSHIRE NATURAL HISTORY SOCIETY

RULES AS AMENDED MARCH 1972

(1) TITLE

The Society shall be called 'The Bedfordshire Natural History Society'.

(2) OBJECTS

(a) The Society shall promote the study of all branches of natural history, especially in relation to the county of Bedfordshire.

(b) The Society shall maintain records of the occurrence and distribution of the flora and fauna of the county, publishing such records as may be considered desirable.

(c) The Society shall do all that it can to protect the flora and fauna of the county and shall collaborate with other bodies in the conservation of areas of particular natural history interest.

(3) PUBLICATION

The Society shall publish an annual Journal.

(4) MANAGEMENT

The Society shall be managed by a Council composed of Officers and a Committee of ten. The Officers shall consist of a Chairman, Secretary, Treasurer, Programme Secretary, Editor and Librarian, all of whom shall be nominated by the Council and confirmed in office at the Annual General Meeting. The Committee shall be elected annually at the Annual General Meeting. Any candidate for election as a member of the Committee shall be nominated in writing by not less than two voting members of the Society, these nominations to be received by the Secretary at least seven days before the Annual General Meeting. The Council shall have power to co-opt. At a Council meeting five members shall form a quorum.

(5) MEMBERSHIP

Membership shall be granted upon application, subject to the approval of the Council and to payment of the appropriate annual subscription. Members admitted during the last three months of any year shall remain members until the 31st December of the following year without further payment.

The Society shall consist of:

(a) Ordinary members.

(b) Associate members, who must be members of the family of an Ordinary member and resident at the same address.

(c) Student members — any person under the age of eighteen years.

(d) Corporate members.

Ordinary and Corporate members, but not Associate or Student members shall each be entitled to one copy of the Journal. Ordinary, Associate and Corporate members, but not Student members, shall each be entitled to one vote at a General Meeting.

(6) HONORARY MEMBERSHIP

Honorary membership may be granted in recognition of services to the Society on the nomination of the Council and subject to confirmation at the next Annual General Meeting. An Honorary member shall be entitled to the same rights as an Ordinary member.

(7) SUBSCRIPTIONS

Subscriptions rates appropriate to each class of membership shall be approved by the Council and confirmed at a Special General Meeting.

Subscriptions shall be due on the first day of January in each year; the Council shall review the continued membership of those whose subscriptions are more than one year in arrears.

(8) ANNUAL GENERAL MEETING

The Annual General Meeting shall be held at a time and place to be decided by the Council, and all members shall receive at least seven days notice thereof. The Secretary shall submit an Annual Report on the progress of the Society and the Treasurer shall submit a Statement of Accounts, completed to the preceding 31st December and audited by two persons approved at the previous Annual General Meeting. The Recorders shall submit their annual reports.

(9) SPECIAL GENERAL MEETING

The Council may, at any time, convene a Special General Meeting, and must do so at the request, in writing, of twelve voting members. Members shall receive at least seven days notice of a Special General Meeting and of the purpose for which it is being convened. At a Special General Meeting only the business for which the meeting was convened shall be considered.

(10) MINUTES

Minutes shall be kept of the Annual General Meeting, Special General and Council Meetings. Minutes of the Annual General Meeting and of any Special General Meeting shall be read as the first business of the following Annual General Meeting.

A copy of the minutes of a Council meeting shall be sent to each Council member before the next Council meeting.

(11) FUNDS

The funds of the Society shall be held in the name of the Society and shall be controlled by resolutions of the Council. They shall be used only for the objects of the Society. A member shall not receive direct or indirect payment for services, or for anything other than expenses approved by the Council.

(12) RECORDERS

The Council shall appoint Recorders annually for various branches of natural history, and each shall present a report at the Annual General Meeting for subsequent publication in the Journal.

(13) VISITORS

A member may bring two visitors to any meeting unless the Council has decided otherwise.

(14) EXPULSION OF A MEMBER

The Council may expel a member for conduct considered prejudicial to the Society's interests, or for persistent refusal to pay overdue subscriptions.

(15) DISSOLUTION OR MERGING OF THE SOCIETY

Any resolution to dissolve the Society or to merge with another organisation must be approved by the Council and by a majority decision of the voting members as ascertained by a ballot counted at a Special General Meeting. In the event of dissolution or a merger, no part of the Society's funds or possessions shall be given to members but these shall be wholly devoted to objects similar to those of the Society as approved by the Council.

(16) RULES

Rules shall not be made or altered except by a majority decision of voting members present at a Special General Meeting. A copy of these rules shall be sent to each person admitted to membership of the Society.

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