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FOR THE YEAR

1977

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THE BEDFORDSHIRE NATURALIST

No. 32 (1977)

Edited by C.R. BOON and J.G. DONY

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REPORT OF THE COUNCIL

During 1977 the Council was very pleased to see the publication of the 'The Bedfordshire Naturalist No. 31' under the new editor, Dr J.G. Dony, and his co-editor, Mr C.R. Boon. This edition covered the events of 1976 and not only was it published in record time but it was also the largest copy of the Journal that the Society has issued. It contained reports from nearly all the recorders for the Society as well as some notable articles on the fauna of the county. Dr Dony and Mr Boon are to be congratulated on the excellence of their teamwork.

The Newsletter, under its Editor Mr R.V.A. Wagstaff, continued to improve and expand, both in size and the variety of its contents. Many items are now becoming stable features of the Newsletter but new contributors are always welcome to add to the variety and coverage.

Miss Helen Webb took over the complicated duties of being Programme Secretary and with the help of an active working party produced a well-balanced and interesting programme of events during 1977. Coach trips continued to be popular and approximately one coach outing every two months appeared to be the right balance.

The Student Section continued to decline as is shown in the membership figures below. It is hoped that some of our present students will come forward in the not too distant future.

The membership figures are as follows:—

	1975	1976	1977
Ordinary Members	263	271	273
Associate Members	41	49	41
Student Members	66	65	49
Corporate Members	8	9	9
Life Members	5	5	5
Honorary Life Members	3	4	4
	386	403	381

The total of new members for 1977 was only 54 as against 93 in 1976. This shows a decrease of 39 but the overall decrease was only 22 members. This means that our loss of old-established members has in fact decreased and this is most encouraging. Every effort must be put into publicising the Society during the coming years, so that our gains will exceed our losses. By continually increasing the numbers of members it may be possible to continue to function efficiently as a society without an early increase in the subscription rate although, eventually, some increase will become inevitable to keep pace with increased costs.

The Society continues to play a major role in active survey work within the county, both for our own records and also in order to furnish outside bodies with information about specific sites. We are fortunate, as a society, to have an increasing number of members acting as recorders. Very few counties can boast of so many active field workers in groups which do not usually attract much attention. We welcome the appointment of Mr B. Nightingale as our new Bird Recorder, following the resignation of Mr B.D. Harding.

It is with regret that our Chairman, Mr P. Smith, has had to decline re-nomination due to increased pressure of work and we would like to record our thanks to him for steering us through three years of Council meetings, not always an easy task! We hope that he will continue to take an active interest in the Society and be available, in a consultative capacity, whenever help is needed.

Finally Council wishes to thank all members of the Society for their continued support and especially to all those who helped the 'funds' by distributing Journals and Newsletters in their area. We hope that you will continue to enjoy being members of the Bedfordshire Natural History Society.

E. BERYL RANDS

PROCEEDINGS

Indoor Meetings

365th ORDINARY MEETING, 13th January. Bedford. "The role of natural history societies in local development" by Mr. J.C. Kelcey. Chairman: Mr. J.P. Knowles.

FILM SHOW, 18th January. Library Theatre, Luton. Joint film show with the Wildfowl Trust.

366th ORDINARY MEETING, 25th January. Dunstable. Members' evening. General discussions on natural history and the role of the B.N.H.S. Chairman: Dr. J.G. Dony.

367th ORDINARY MEETING, 1st February. Ampthill. "Wild life in South Africa" by Dr. B.S. Nau. Chairman: Mr. D. Green.

368th ORDINARY MEETING, 10th February. Bedford. "Rabies and wild life in Bedfordshire" by Mr. J.N. Elliman. Chairman: Mr. J.M. Dymond.

369th ORDINARY MEETING, 16th February. Luton. "A naturalist's view of Sutherland" by Mr. A.G.H. Osborn. Chairman: Mr. D.G. Rands.

370th ORDINARY MEETING, 22nd February. Dunstable. Natural history films.

371st ORDINARY MEETING, 10th March. Bedford. "Any Questions?" Question master: Mr. W.J. Drayton.

ANNUAL GENERAL MEETING, 15th March. Ampthill.

SPECIAL MEETING, 24th March. Leighton Buzzard. "The natural history of Bedfordshire" by Mr. A.J. Martin and Mrs. E.B. Rands. Chairman: Mr. P. Smith.

372nd ORDINARY MEETING, 29th March. Dunstable. "The biology of angels - a light-hearted look at extra-terrestrial life" by Mr. E.A. Eastwood. Chairman: Mrs. F.B.M. Davies.

373rd ORDINARY MEETING, 6th April. Luton. "Basic ornithology" by Mr. R.A.N. Croucher. Chairman: Mr. M. Chandler.

374th ORDINARY MEETING, 14th April. Bedford. "Introduction to grasshoppers and crickets" by Mr. D.G. Rands. Chairman: Dr. B.S. Nau.

375th ORDINARY MEETING, 26th April. Dunstable. "The chalk downland flora" by Dr. J.G. Dony. Chairman: Mrs. B. Chandler.

376th ORDINARY MEETING, 6th October. Bedford. "The Jos Plateau, Nigeria, and its environment" by Mrs. J. Allen, O.B.E. Chairman: Miss H.M. Webb.

377th ORDINARY MEETING, 11th October. Dunstable. "Stereo photography of Bedfordshire flowers" by Professor J.H. Fremlin. Chairman: Dr. J.G. Dony.

378th ORDINARY MEETING, 20th October. Ampthill. "Practical fungi" - an evening to identify specimens from Ashridge. Chairmen: Mr. M. Chandler and Mr. A.R. Outen.

379th ORDINARY MEETING, 25th October. Luton. Membership evening. Chairman: Mr. D.G. Rands.

380th ORDINARY MEETING, 2nd November. Bedford. "A vanishing world; the Great Ouse of Bedford" by Mr. B.R. Sacree. Chairman: Mr. H.A.S. Key.

381st ORDINARY MEETING, 10th November. Dunstable. "Exotic natural history of the Seychelles" by Dr. A.J. Rundle. Chairman: Mr. D.G. Rands.

382nd ORDINARY MEETING, 22nd November. Ampthill. "Harvest mice in Bedfordshire" by Mr. D.G. Rands. Chairman: Mrs. E. Hollingworth.

SPECIAL MEETING, 1st December. Aspley Guise. "Bedfordshire wild flowers" by Dr. J.G. Dony. Chairman: Mrs. E.B. Rands.

383rd ORDINARY MEETING, 8th December. Bedford. "An introduction to photography" by Mr. M. Chandler. Chairman: Mr. R.B. Stephenson.

384th ORDINARY MEETING, 13th December. Dunstable. Films: "The living river - the River Test, Hants." "The private life of the large white butterfly." "The oldest inhabitants - survival problems of woodland mammals in a forest at Gransden, Beds." Introduced by Mr. K. Taylor of the World Wildlife Fund. Chairman: Mr. M. Chandler.

385th ORDINARY MEETING, 22nd December. Ampthill. A film evening. Chairman: Dr. M.E. Nellist.

Field Meetings

- 2nd January TRING RESERVOIRS. Leader: Mr. R.V.A. Wagstaff.
 6th February BELVIDE AND GAILEY RESERVOIRS. Coach trip.
 27th February R. IVEL, BIGGLESWADE. A walk by the river. Leader: Mr. D.G. Rands.
 20th March WOBURN PARK. A walk along the footpaths. Leaders: Dr. B.S. Nau and Mr. J.P. Knowles.
 3rd April FORTY FOOT LANE, SHARNBROOK. Leader: Dr. J.G. Dony.
 24th April OTTER TRUST, SUFFOLK. Coach trip.
 4th May BEDFORD PARK. "Let's see what we can find". Leader: Miss H.M. Webb.
 8th May Joint meeting with the Northampton N.H.S. Leader: Mr. A.G.H. Osborn.
 12th May MAULDEN WOOD. Study of bird song. Leader: Mr. J.P. Knowles.
 15th May SEWELL QUARRY. General natural history. Leader: Dr. D.R. Grant.
 22nd May COLWORTH HOUSE, SHARNBROOK. Natural history of the estate by kind permission of Unilever Ltd. Leader: Miss H.M. Webb.
 25th May BIGGLESWADE COMMON. General natural history. Leader: Mr. K.O. Pressland.
 29th May BROGBOROUGH BRICK PITS. Migrant and breeding birds. Leader: Mr. B.D. Harding.
 4th June REX GRAHAM RESERVE, SUFFOLK. To see the military orchid and then some local Breckland flora. Leader: Mr. E. Milne-Redhead.
 9th June TELEGRAPH HILL. An evening walk to study general natural history.
 15th June WHITEHILL FARM, LUTON. Visit to Mr. P.H. Shaw's farm following his talk to the Society last winter.
 18th June MELCHBOURNE PARK WOODS. General natural history of the woods by kind permission of The Hon. H. de B. Lawson Johnson. Leader: Dr. J.G. Dony.
 23rd June POTTON WOOD. An evening walk followed by moth catching. Leader: Mr. I.P. Woiwod.
 26th June EATON SOCON MEADOWS. General natural history. Leader: Dr. J.G. Dony.
 9th/10th July MAULDEN WOOD. The annual all-night meeting.
 15th July ASPLEY GUISE LAKES. General look at the lakes followed by moth catching. By kind permission of Mr. and Mrs. N. Sloccock. Leaders: Mr. V.W. Arnold and Dr. B.S. Nau.
 17th July SANDRINGHAM HOUSE GARDENS, NORFOLK. Coach trip.
 19th July SHARPENHOE CLAPPERS. General natural history with a particular interest in entomology. Leader: Dr. V.H. Chambers.
 24th July DOUBLE ARCHES SAND PIT, HEATH AND REACH. Joint meeting with the Northampton N.H.S. to study the natural history and geology. Leaders: Mr. A.G.H. Osborn and Dr. B.S. Nau.
 7th August FLITWICK MOOR. Leader: Mr. A.R. Outen.
 20th August FELMERSHAM GRAVEL PITS. General natural history of a Beds. and Hunts. Trust Reserve. Leader: Mr. M. Chandler.
 4th September R. OUSE, BEDFORD. A walk along the embankment towards Kempston. Leader: Mr. A.R. Outen.
 7th September R. IVEL, BIGGLESWADE. A walk by the river in late summer. Leader: Mr. K.O. Pressland.
 14th September MAULDEN CHURCHYARD. Study of lichens. Leader: Mrs. F.B.M. Davies.
 2nd October SAVERNAKE FOREST, WILTSHIRE. Coach trip. Fungus foray and general natural history. Joint meeting with the Wiltshire N.H.S. and the British Mycological Society. Leader: Dr. D.A. Reid.
 16th October ASHRIDGE FOREST, HERTS. Fungus foray. Joint meeting with the Letchworth N.H.S.

- 30th October WILSTEAD WOOD. The annual fungus foray. Joint meeting with the British Mycological Society. Leader: Dr. D.A. Reid.
 13th November MAULDEN WOOD. Study of galls. Leader: Mrs. E.B. Rands.
 27th November BEDFORD PARK. General interest in late autumn. Leader: Miss H.M. Webb.
 10th December SOUTH KENSINGTON, LONDON. Coach trip to the museum.

Student Meetings

- 4th January, Ampthill. Records and projects meeting. Chair: Joy Latham.
 2nd February, Ampthill. "Really common birds" by J.P. Knowles. Chair: David Lawrence.
 3rd March, Ampthill. Members evening. Chair: Steve Drayton.

REPORT OF THE TREASURER

The Income and Expenditure Account is presented in a slightly different form to show the expenditure in greater detail and under self-explanatory headings so that members can now readily see where their money goes and Council and the Committees are able to monitor their costs and income and compare them with their budgets.

Current income was £849 and expenditure £783 (including a further £50 of car stickers in stock), giving us a surplus of £66 on the year, but you will note that the Newsletter cost us only £47 against last year's £160 as we were using up the paper stocks mentioned in my previous report – further supplies will be needed shortly. Subscription revenue was down slightly, due to the fall in number of members and as this is our major source of current income we should all be considering ways of recruiting and keeping members. Our second source of income is the surplus on meetings – mainly from coach trips. This was £51, almost our annual surplus.

If we can continue to attract new members and so increase our subscription income it may be possible to hold the subscription at the current rate for another year but this is something which the Finance Committee will keep under review.

The final payment from the Theed Pearce legacy of £763 was received during the year together with bank interest of £234. Continuing the policy laid down by Council this money is considered separate from the current income.

£6,000 of this legacy was re-invested in City of Nottingham Bonds at 12¼% for four years to give us an annual interest income of £735. The balance is being held to provide some capital to fund the proposed Bird Atlas.

M. CHANDLER

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st DECEMBER 1977

Year to
31.12.76

£	£		£	£
		INCOME		
767		Subscriptions		
		Current Year		745
		Other Income		
	70	Sales		
	121	Surplus on Meetings	40	
	11	Sundries	51	
267	65	Warden Hills	—	
			13	104
		Interest		
	434	Interest on Deposit Account		
434	—	Interest on Nottingham City Bonds	235	
			230	465
1468		TOTAL INCOME		1314
		EXPENDITURE		
		Administration		
	—	Officers' Expenses	3	
	94	Postage	13	
	145	Stationery	10	
	7	Sundries	5	
	—	Purchase of Car Stickers (Adjusted for stock)	8	
	13	Insurance	13	
	20	Auditors' Fee	20	
	24	Advertising	—	
	303		72	
		Meetings		
	104	Hire of Halls	112	
	32	Lecturers and Films	19	
	59	Programmes	51	
	—	Officers' Expenses	2	
	—	Students Section	9	
	195		193	
		Scientific		
	221	Journal	341	
	16	Subscriptions to other Societies	16	
	—	Site Recording	—	
	6	Recorders' Expenses	8	
	27	Sundries	24	
	31	Warden Hills	15	
	301		404	
		Publicity		
	35	Newsletter	47	
	56	Application Forms	—	
	91		47	

£	£		£	£
907	17	DEPRECIATION ON EQUIPMENT @ 10% ON COST	17	733
£561		EXCESS OF INCOME OVER EXPENDITURE		£581

BALANCE SHEET AS AT 31st DECEMBER 1977

Year to
31.12.76

		FIXED ASSETS	COST	DEPRECIATION	
	35	Books and Journals	35	—	35
	10	O.S. Maps	10	—	10
	8	Bird Song Records	8	—	8
	15	Display Boards	15	—	15
	15	Microscope	15	—	15
	3	Tools	3	—	3
	2	Screen	2	—	2
	54	Slide Projector	60	12	48
	99	Duplicator and Stand	110	22	88
241			258	34	224
		CURRENT ASSETS			
	17	Bank Account		93	
	6649	Deposit Account		1646	
	54	Cash in Hand		45	
	—	City of Nottingham Bonds		6000	
	—	Debtors — Interest on Bonds		230	
	3	Debtors — Subscriptions		14	
6717	—	Stock of Car Stickers		50	8078
6958					8302
		CURRENT LIABILITIES			
	20	Creditors			20
£6938		NET ASSETS			£8282
		REPRESENTED BY CAPITAL ACCOUNTS			
	1809	Balance Brought Forward			2370
	561	Excess of Income over Expenditure			581
	2370				2951
	4568	Theed Pearce Legacy			5331
£6938					£8282

Honorary Auditors
S.M. CROSS
O.N. MORGAN

METEOROLOGY

REPORT OF THE RECORDER

THE WEATHER OF 1977

To those who feared a repetition of the heat and drought of the previous summer, the year 1977 came as a welcome return to normal and average conditions in most respects, although the unusually high rainfall of the first six months continued a tendency which became established in September 1976.

The first three months of 1977 were, on the whole, comparatively mild, with only short cold spells, and snow in mid-January and at the end of March. As is so often the case, April was a rather chilly month, with a prevalence of northerly and easterly winds and some wintry showers between the 7th and 10th, and this type of weather continued into the first half of May. The second half of the month was sunnier, but still with cool easterly winds, and much of June was similar. The middle of the latter was notable for the heavy thunderstorms which affected most of south-east England on the 13th and 14th and which contributed largely to the high total rainfall for the month.

July, and the first five days of August, produced the driest and warmest period of the year; in fact, July was one of the driest on record in some places. There was a sudden drop in temperature on the 6th August which was thereafter a cool and unsettled month, very wet and thundery in the third week.

The early autumn brought several spells of quiet and pleasant sunshine, particularly the first fortnight of September and the last three weeks of October, although there was a period of persistent fog in the middle of the latter month. By contrast, November was unsettled and mostly cold, but there was an exceptional day on the 10th — the warmest November day in south-east England since the memorable autumn of 1947, warmer, in fact, than the 6th August previously mentioned!

Apart from an unusually fine mild spell in the second week, December reverted to an unsettled pattern, and the year finished without any 'traditional' accompaniments of frost, snow and ice at the Christmas period. These are, in any case, very largely dependent on Dickens and a few hard winters in his childhood!

RAINFALL

For the year as a whole the rainfall was close to, or very slightly above, average, although a considerable percentage of the total was due to a few isolated very wet days. February, normally one of our driest months in this part of England, was the wettest since 1900, and, probably, for the past century or more. By contrast, July was unusually dry, with a total of only 2.4 mm at Silsoe and 6.3 mm at Cardington. The only comparable figures since 1900 are the 2.5 mm in July 1921 at Great Barford House and the 4.6 mm at Cardington in July 1955.

The wettest day's total was 27.7 mm at Silsoe on the 'thunderstorm day' of 13th June, whereas Cardington's was on 17th August, with 23.0 mm.

There were two drought periods during the year: the nineteen days from 16th May to 3rd June inclusive, and the eighteen days from 29th June to 16th July. The longest continuous wet period was of eleven days, from 31st January to 10th February.

SNOW AND HAIL

Snow fell on seven days in Bedford, the heaviest during the short blizzard on the afternoon of 13th January, but in no instance did it lie for long. Heavy hail showers fell on the morning of 6th May.

THUNDER

Thunder was heard on fourteen occasions in Bedford during the year. On two occasions – 13th June and 19th August – the rainfall at Cardington was not far short of the traditional 'inch' but otherwise, accompanying rainfall was not notably heavy. The Silsoe total on 13th June has already been mentioned.

TEMPERATURE

Temperatures were much closer to average than in the preceding year, the mean maxima for June, July and August falling short of the corresponding figures for 1976 by as much as 5 deg. C. The mean for the whole year was very close to 9.4 deg. C. or about 49 deg. F. The highest maximum was on 6th July with 27.5 deg. C. whilst the lowest night minimum occurred on the night 29th/30th January – minus 6 deg. C.

A.W. GUPPY

RAINFALL FOR 1977

	Bedford	Cardington	Luton	Sandy	Silsoe
January	50.6	48.7	75.2	71.4	56.2
February	81.9	93.3	95.1	66.8	79.6
March	41.4	47.3	58.1	45.5	40.8
April	29.9	33.1	36.8	43.2	23.9
May	47.0	36.4	47.1	49.5	40.3
June	81.4	78.9	82.4	73.4	67.3
July	4.2	6.3	4.9	8.5	2.4
August	114.0	112.9	107.4	123.3	114.5
September	15.2	13.8	15.7	18.5	13.8
October	21.3	22.4	32.3	37.2	24.6
November	44.3	55.3	–	51.2	36.1
December	57.1	57.5	–	61.3	52.9
Total	588.3	605.9	–	649.8	552.4
(1976)	(449.5)	434.8	562.9	496.8	447.3

Bedford – Dr D.M. Jeffreys.

Cardington – Ministry of Defence per Mr L.A. Speed.

Luton – Lee Valley Water Co. per Mr S.R. Rippon, Chief Engineer.

(Gauge at Runley Wood damaged by vandals in October)

Sandy – R.S.P.B. per Mr A. Parker, Warden.

Silsoe – N.I.A.E. per Mr A. Hunter.

Rainfall readings at Periwinkle Lane, Dunstable, are not at present being taken due to extensive reconstruction work.

MAMMALS

REPORT OF THE RECORDER

For the first time since systematic recording of mammals began in 1971, we have not added a new species to the county list. However, the level of recording has been high and the usual high number of new records have been obtained. The species list stands at 34, with 24 of these species having new tetrad records during 1977. The total new tetrad records for all species was 306, which was 20% higher than for 1976, and the highest number since 1974. New 10km records, also for all species, were 13. These 10km records were sent in to the National Biological Records Centre at Monks Wood for the British Distribution Scheme, as well as 5 more records to update pre-1970 records on their maps.

Generally most new tetrad records still come from the common species; Grey Squirrel, Rabbit, Hedgehog and Brown Hare. The exception is the Harvest Mouse which had the highest number of new records, but these were obtained by the dedicated work of one member, or is it that the Harvest Mouse is also a common species? It is good to see several new records for House Mouse, but it is still one of the least recorded species. The Water Vole is also low on records and both these species are well exceeded by the Muntjac Deer, which is somewhat of a surprise. In 1977, new records were obtained for Chinese Water Deer and Fallow Deer, but they were all in the area of previous records, so there is no known spread of these species.

The location of new tetrad records shows that for the common species, the north of the county is getting better coverage, but this is not true for the other species. These less common species still show a lack of recording in the north, and this is an area we must work to correct, so as to get a good idea of the true distribution for the whole county.

The new tetrad records for 1977 are listed below, and should be added to the distribution maps published in Bedf. Nat., 29, 1974 and the updated lists published each year since then.

Hedgehog *Erinaceus europaeus* – 25 tetrads.

91U, 92T, 93TZ, 94L, 95H, 96LVW, 01H, 02DP, 04G, 06AMSVX, 14C, 15JMNSTV.

Mole *Talpa europaea* – 15 tetrads.

92R, 93V, 95HLR, 02QT, 03S, 04D, 06CR, 13BIN, 14T.

Common Shrew *Sorex araneus* – 14 tetrads.

92R, 95F, 02T, 03MT, 04R, 13FGLR, 14GX, 15R, 24H.

Pygmy Shrew *Sorex minutus* – 4 tetrads.

95F, 02T, 14C, 24P.

Water Shrew *Neomys fodiens* – 1 tetrad.

14L.

Bat – 5 tetrads.

92R, 02G, 04V, 13G, 24S.

Pipistrelle Bat *Pipistrellus pipistrellus* – 1 tetrad.

11J.

Rabbit *Oryctolagus cuniculus* – 29 tetrads.

92Y, 93I, 94JPV, 95CDGHSWY, 96LMS, 01T, 02Q, 04JMP, 05T, 06FGMP, 13N, 14T, 25FQ.

Brown Hare *Lepus capensis* – 18 tetrads.

92R, 94TX, 95DGS, 96V, 02C, 05E, 06P, 13NW, 14Q, 24FHK, 25FQ.

Bank Vole *Clethrionomys glareolus* – 12 tetrads.

92HR, 95F, 02AN, 05U, 06T, 13FWZ, 14HL.

Short-tailed Vole *Microtus agrestis* – 14 tetrads.

92R, 93IU, 94S, 95F, 02I, 03F, 04R, 13GR, 14H, 15RT, 24H.

Water Vole *Arvicola terrestris* – 6 tetrads.

92BR, 95M, 04I, 14P, 15T.

Harvest Mouse *Micromys minutus* – 35 Tetrads.

92KLQXY, 93K, 94XY, 95Y, 02DM, 03NW, 04CHRWXZ, 05EJ, 06V, 13CHMN, 14P, 15CDHKW, 24DFG.

House Mouse *Mus musculus* – 7 tetrads.

02EFGLS, 05Q, 24D.

Wood Mouse *Apodemus sylvaticus* – 16 tetrads.

91Z, 92R, 96R, 02G, 13FGLRW, 14GHL, 15RT, 24FH.

Brown Rat *Rattus norvegicus* – 11 tetrads.

92UY, 93Q, 95H, 96Q, 02G, 04RX, 13N, 14L, 15W.

Grey Squirrel *Sciurus carolinensis* – 31 tetrads.

92SW, 93J, 95CFGHRS, 96W, 01CT, 02AGLQT, 03V, 05MWZ, 06HMPV, 13LR, 14X, 15R, 24KN.

Fox *Vulpes vulpes* – 19 tetrads.

92HL, 94J, 95FRZ, 01T, 02BG, 03DT, 04V, 12D, 13FGLR, 14J, 25F.

Ferret *Mustela furo* – 1 tetrad.

01U.

Stoat *Mustela erminea* – 8 tetrads.

96G, 02G, 13JLR, 14S, 23I, 24I.

Weasel *Mustela nivalis* – 18 tetrads.

93U, 95H, 02CG, 03B, 04A, 05E, 06CM, 13FGLRZ, 14AL, 24GN.

Chinese Water Deer *Hydropotes inermis* – 4 tetrads.

93VY, 02B, 03J.

Fallow Deer *Dama dama* – 2 tetrads.

01D, 24P.

Muntjac Deer *Muntiacus reevesi* – 10 tetrads.

93R, 95KU, 01T, 02GIY, 05K, 14X, 15R.

As with the tetrad records the number of people supplying the records is also an increase in 1977. My thanks go to the 35 people listed below, 11 of whom are non-members.

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D. ANDERSON

BIRDS

REPORT OF THE RECORDER

INTRODUCTION

1977 proved to be an interesting year for many observers, although the total of 156 species recorded was lower than in recent times.

The year opened quietly with only Bewick's Swan and record numbers of Great Crested Grebe to arouse excitement. In February a new roost of Long-eared Owls was discovered, and a Merlin appeared briefly at East Hyde, followed by, in March, Black-necked Grebe at Stewartby and two Buzzards. Mild southerly weather at the beginning of March encouraged a few very early migrants and six species of summer visitor were noted before the end of the month. The coming of April saw colder, more unsuitable conditions and the main passage was held up until well into the month.

Visitors then included Hoopoe and a strong passage of Ring Ouzels while in May, Buzzards, an Osprey and good numbers of Black Terns appeared.

June and July were typically rather quiet but Buzzards and another Osprey were unexpected. Observers continued mapping the breeding birds of the county, and for the second year hopes were raised for nesting Fieldfare and Honey Buzzard, while Hobbies were present at six sites, Golden Orioles at two and Stonechats bred successfully. On the negative side though, Red-backed Shrikes remained absent as a breeding species and a BTO enquiry failed to locate any breeding Black Redstarts. On a more encouraging note both Heron and Little Ringed Plover moved into new breeding areas.

Another Osprey appeared in August, but pride of place went to a Purple Heron, followed by the year's second Hoopoe. The Autumn wader passage came and went without much excitement.

October brought a Snow Bunting to the outskirts of Luton and Slavonian Grebe to Stewartby Lake, while highlights in November included seven Bearded Tits and the county's first Great Northern Diver. The year ended more quietly with Red-crested Pochard and Bewick's Swans, all in the north of the county.

The Bedfordshire Rarities Committee, currently consisting Dr. J.T.R. Sharrock, A.J. Livett, B.R. Squires and the Recorder, continued to vet unusual records and observers are reminded of the need to submit full notes on all such sightings.

Finally thanks go to the following contributors:

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SYSTEMATIC LIST FOR 1977

Species recorded in Bedfordshire during 1977 and not included in the systematic list are: Little Grebe, Mute Swan, Kestrel, Red-legged Partridge, Grey Partridge, Pheasant, Common Gull, Great Black-backed Gull, Stock Dove, Woodpigeon, Collared Dove, Green Woodpecker, Great Spotted Woodpecker, Meadow Pipit, Pied Wagtail, Wren, Dunnock, Robin, Blackbird, Song Thrush, Mistle Thrush, Goldcrest, Long-tailed Tit, Marsh Tit, Willow Tit, Coal Tit, Blue Tit, Great Tit, Nuthatch, Treecreeper, Jay, Carrion Crow, Starling, House Sparrow, Chaffinch, Greenfinch, Goldfinch, Linnets, Bullfinch, Yellowhammer, Reed Bunting, Corn Bunting.

The order is as set down in Professor Dr K.H. Voous's revised 1977 "List of recent Holarctic Bird Species".

The following abbreviations are used in the text:

CHP = Chalk Pit, CLP = Clay Pit, GP = Gravel Pit, L = Lake, NR = Nature Reserve, SW = Sewage Works.

Great Northern Diver *Gavia immer* Following a spate of inland sightings throughout Southern England a single bird arrived at Blue Lagoon, Arlesey on the 26th November staying until 30th. This is the first county record (since at least 1947). (AL, AP, RT)

Great Crested Grebe *Podiceps cristatus* Proof of breeding from 8 sites and present in the breeding season at another 5. Record numbers of 123 on 9th January and 98 on 16th January at Stewartby L.

Slavonian Grebe *Podiceps auritus* Single Stewartby L. 16th October (BRS).

Additional 1976 record: Single Wyboston GPs 19th December.

Black-necked Grebe *Podiceps nigricollis* Single Stewartby L. 13th March (TP,MC).

Additional 1976 record: single Stewartby L. 24th October.

Cormorant *Phalacrocorax carbo* Present at Brogborough CLP from 12th March to 19th June and again 26th to 30th December with 5 on 27th April. Elsewhere singles at Luton Hoo 9th and 16th January, 13th March and 23rd October; Melchbourne Park from 16th to 20th July; SSE over New Farm, Streatley 23rd April; 4 at Harrold GPs 15th May with one on 4th June; 2 south over East Hyde 26th November, singles Girtford G.P. 9th September and 11th November.

Cormorant/Shag *Phalacrocorax* sp. 17 south over Dunstable 2nd September; 3 moving west near Meppershall 26th November; 2 north over Oakley 20th May.

Grey Heron *Ardea cinerea* A welcome extension in the breeding range with three nests in Luton Hoo Park, the first proved there since about 1869. 12 occupied nests at Southill L., 4 nests at Bromham Hall.

Purple Heron *Ardea purpurea* This rare visitor to the county appeared at Luton Hoo Park on 4th September. At the time of going to press this record awaits ratification of the National Rarities Committee. If accepted it would constitute the county's fifth record. (AJL).

Bewick's Swan *Cygnus columbianus* 1 near Millbrook Station 2nd to 4th January, 1 Brogborough CLP 26th February and 6 at Harrold GPs 22nd December. 4 swans, almost certainly of this species, flying SW from Carlton to Turvey 31st December (MC, TP, MRS, DAW).

Pink-footed Goose *Anser brachyrhynchus* Single at Harrold GPs 12th to 16th June almost certainly an escape.

White-fronted Goose *Anser albifrons* From their behaviour 2 near Toddington on 30th May almost certainly wild. Singles from Harrold GPs on 26th December and Luton Hoo L. 13th March (BDH, DAW, AJL).

Greylag Goose *Anser anser* Broods of 9 and 17 Blunham GP 17th May and 8 Melchbourne Park 5th June.

5 at Radwell GP 29th May, 34 on 31st July and then regularly to 25th September. 33 at Blunham GP 16th October, single 11th December, 15 on 25th December and 6 on 28th December. At Harrold GPs regularly January to mid-March (maximum 28), then 24 on 12th June increasing to 52 on 24th July, and then regularly to the end of the year with maximum of 63 on 20th November. Movement of flocks between these waters makes total numbers difficult to establish.

Snow Goose *Anser caerulescens* Single, free flying, with Canada geese at Eversholt L. 11th December almost certainly an escape.

Canada Goose *Branta canadensis* Following broods raised: 10 Eversholt L., 10 Brogborough CLP, 6 Lidlington CLP, 4 Melchbourne Park, 20 Southill L., 8 Luton Hoo L. Recorded on several dates at 11 localities during year, but flocks of 110 at Coronation CLP on 16th October and 103 at Harrold GPs on 25th September worthy of mention. Total numbers difficult to establish because of flock movement but definite widespread increase in numbers.

Barnacle Goose *Branta leucopsis* Single at Harrold GPs 18th September to 6th November, singles at Eversholt L. on 11th December and Luton Hoo L. on 8th April must all be of suspect origin. (DAW, BN, AJL)

Grey Goose *Anser* sp. 6 flying west over Meppershall 27th November.

Shelduck *Tadorna tadorna* 3 at Radwell GP 24th July decreasing to 1 by 29th August, 2 Wyboston GP 28th April, 2 Stewartby L. 12th April staying until 9th May, and singles at Coronation CLP 16th October and 13th November.

Mandarin *Aix galericulata* Recorded during year at Woburn Park, Harrold GPs, Eversholt L. and Husborne Crawley. Two broods on R. Ivel near Blunham where they have bred for the last three years (per A. Zwetsloot).

Wigeon *Anas penelope* Good numbers at Harrold GPs with 114 9th January, 142 6th February decreasing gradually to 3 on 11th April and then maximum of 27 between 18th September and 27th December. At Blunham GP 6 on 16th January, then 6 on 18th September with 20 end September, then smaller numbers until 25th December when 40 present. 15 at Brogborough CLP 9th January, 14 at Radwell GPs 27th November with 30 there 11th December. Smaller numbers reported from elsewhere.

Gadwall *Anas strepera* Above average counts. At Harrold GPs up to 7 in January, up to 5 in February, 2 in March, 2 1st September, single from 4th September to end November, 3 on 11th December increasing to 5 on 26th December. At Blunham GP 2 on 16th January, up to 2 in February, 1 on 18th September, 6 on 11th December increasing to 20 on 25th December. Other records received from Wyboston GPs with singles 26th February and 22nd October, Houghton Regis CHP with 2 16th January and Luton Hoo L. with 2 on 13th November.

Additional 1976 record: 2 Dunstable SW 10th September and 4 26th September.

Teal *Anas crecca* Wildfowl counts continued at selected waters during the winter months on specific dates and the county totals are shown below and elsewhere for the species concerned.

	16/1	13/2	13/3	18/9	16/10	13/11	18/12
Total	82	61	41	68	46	102	316

Numbers remained low throughout the year until an influx during November built up in December to reach the highest levels since 1971. Specific counts included 100+ on 9th October and c150 on 20th November at Harrold GPs, c100 on 26th November at Bedford SW increasing to c200 11th December and c170 on 23rd December when also c100 at Barkers Lane GP.

An interesting breeding record from Chicksands Wood when on 29th May a duck was disturbed from a nest with nine eggs.

Mallard *Anas platyrhynchos*

	16/1	13/2	13/3	18/9	16/10	13/11	18/12
Total	964	496	231	1700	2306	1317	1453

Numbers well above average from September to December. Large flocks included c1000 on 9th January at Harrold GPs with 766 there 16th October, and c800 at Brogborough CLP, on the same day.

Pintail *Anas acuta* Present in February, March and September to December at Harrold GPs in two's and three's. The only other record was a single at Rushmere on 16th January.

Additional 1976 record: single Dunstable SW 19th and 26th March.

Garganey *Anas querquedula* For the first year since 1949 no records were received for this summer visitor.

Shoveler *Anas clypeata* Recorded in every month of the year. Reports from 15 sites with maximum of 29 at Dunstable SW on 23rd January and 40 at Blunham GP on 11th December.

Red-crested Pochard *Netta rufina* The pair seen at Blunham GP at the end of 1976 were last seen 13th February. A single duck returned on 25th December (DJK, JTRS). These sightings almost certainly refer to 'wild' birds as none of this species is kept in the collection at Blunham (per A. Zwetsloot).

Pochard *Aythya ferina* 5 young raised Luton Hoo L. Winter counts as follows:

	16/1	13/2	13/3	18/9	16/10	13/11	18/12
Total	125	105	22	58	311	139	187

Very low counts in the early part of the year, but reached higher totals in October, and again in December when 200+ at Blunham GP on 28th.

Tufted Duck *Aythya fuligula* Present at 15 sites during breeding season. Winter counts as follows:

	16/1	13/2	13/3	18/9	16/10	13/11	18/12
Total	129	146	117	259	189	251	198

Numbers reached almost record lows January to March, but regained above normal levels by the end of the year with 270 at Blunham GP on 11th and 200 on 25th December.

Goldeneye *Bucephala clangula* Recorded from Stewartby L., Blunham GP, Radwell GP, Wyboston GP, Harrold GPs, Dunstable SW and Langford GP during winter months with first arrival on 6th November at Harrold GPs. The latest spring sighting was on 24th April when a single at Blunham GP and 2 at Harrold GPs. Highest number was 11 at Blunham GP 14th March.

Red-Breasted Merganser *Mergus serrator* Single duck Luton Hoo L. 20th November (AJL).

Goosander *Mergus merganser* 3 ducks Blue Lagoon, Arlesey 3rd December, single duck Harrold GPs 4th December. (BN, DAW).

Honey Buzzard *Pernis apivorus* As in 1976, breeding hopes raised when a single bird was seen in suitable habitat in July (HCE).

Sparrowhawk *Accipiter nisus* Welcome increase in reports with singles Little Brickhill Copse (Beds-Bucks border) 30th January, Eversholt L. 13th March, Luton Hoo Park 3rd April, Brogborough CLP 29th May, Dunstable SW 21st June and singles at The Lodge, Sandy 25th October, 8th November and 13th December (JM, per AP, MRS, BRS, AJL, BDH).

Buzzard *Buteo buteo* 2 engaged in courtship display mid-Beds on 12th March with 3 nearby on 13th May. Present during March and June in Luton Hoo Park (BN, MRS, per AJL).

Osprey *Pandion haliaetus* Singles over Barton Springs 10th May, at Blunham GP 21st June and another 6th August (per RVAW, JTRS).

Merlin *Falco columbarius* Single at East Hyde SW 28th February, probably the same bird Luton Hoo 22nd to 24th April, which then possibly stayed until late May/early June per Head Keeper (MRS, AJL).

Hobby *Falco subbuteo* Following breeding successes of 1976 1 pair fledged 2 young and birds were present in 5 other suitable breeding areas.

Golden Pheasant *Chrysolophus pictus* Male found dead by A6, Maulden Woods 20th March.

Lady Amherst's Pheasant *Chrysolophus amherstiae* Recorded during year from Maulden Woods, Pedley Wood, Charle Wood, Daintry/Washers Wood, Palmers Shrub, Shire Oak, Luton Hoo Park.

Water Rail *Rallus aquaticus* Recorded from Flitwick Moor, Luton Hoo L., Harrold GPs and Toddington Manor.

Moorhen *Gallinula chloropus* High numbers reported in January with c110 Luton Hoo L. on 9th and 85 Eversholt L. on 30th.

Coot *Fulica atra* High winter count from Brogborough CLP with c700 on 16th January and c200 on 18th December.

Little Ringed Plover *Charadrius dubius* Breeding success proved at 3 sites with 13+ pairs raising 17+ young. Present at 4 other sites during breeding season. First recorded 25th March and last 29th August.

Ringed Plover *Charadrius hiaticula* Breeding successes at Harrold GPs with 7 young and Radwell GP with 4 young.

Recorded throughout the winter at Harrold GPs, maximum 3 on 23rd February. Single Vicarage Farm CLP 27th November. Small passage away from breeding sites 23rd March to 18th September at 6 localities.

Additional 1976 records: Single Houghton Regis CHP 20th February, 3 French's Avenue Tip, Dunstable 22nd February.

Golden Plover *Pluvialis apricaria* An initial BTO survey 8th/9th January revealed c1000 in the county. Other large flocks recorded during year were 440 near Souldrop on 15th April, 150 Houghton Conquest 2nd January, 140 Biggleswade Common 31st January, 130 Cotton End 26th March with 70 23rd April, c100 East Hyde 21st February, 110 near Pegsdon 27th

February, 175 Galsey Wood and 245 Higham Gobion 27th November, 168 at latter site 3rd December and 137 Copt Hall 31st December. Full details of the BTO survey, which extends into 1978, will be published later.

Grey Plover *Pluvialis squatarola* 2 calling in Houghton Regis CHP 23rd March. (BDH).

Lapwing *Vanellus vanellus* Following mild SW airstream c2000 near Ridgmont Station on 6th February, with c600 at Lidlington and c600 at Harrold GPs on the same day; c1000 north of Carlton 19th February. In autumn c600 at Radwell GP 29th August, c500 Luton Hoo Park 5th September and c2000 north of Carlton 27th December.

Little Stint *Calidris minuta* No records in 1977.

Additional 1976 record: 2 Dunstable SW 24th August.

Dunlin *Calidris alpina* Spring passage from 3rd April with single Stewartby L., another at Barkers Lane GP 17th April, 2 Girtford GP 18th April, 3 Radwell GP and 4 at Harrold GPs on 24th April with one there on 15th May. Autumn passage from 24th July with 4 at Radwell GP, 10-15 Harrold GPs 24th August and singles Stewartby L. 4th September and Harrold GPs 25th September.

Winter records from Radwell GP with 2 on 12th November, singles at Harrold GPs 27th November and 13th February with 2 there on 12th March, 5 Bedford SW 3rd December.

Ruff *Philomachus pugnax* In spring recorded only from Harrold GPs with 2 on 15th May. In autumn 10+ at Harrold GPs 4th September, and Bedford SW with 5 on 16th August, 3 29th August and single from 11-18th December.

Jack Snipe *Lymnocyptes minimus* 2 East Hyde 8th January, 1 Houghton Regis CHP 16th January increasing to 5 23rd January with one still present 2nd April. First of autumn 16th October with 3 Houghton Regis CHP decreasing to single by 30th December. Single Bedford SW 26th November with 7 on 11th December.

Snipe *Gallinago gallinago* Reported from 6 localities during breeding season.

Good numbers from Bedford SW with c90 25th September and c150 11th December; 100+ near Harrold 19th December, 50 Hollington 16th January, 147 by R. Ouse east of Bedford 31st December.

Woodcock *Scolopax rusticola* Recorded from 10 sites during breeding season.

Whimbrel *Numenius phaeopus* Single south over Blunham 16th July (JTRS).

Curlew *Numenius arquata* Singles Brogborough CLP and Wyboston GP 26th February, Girtford GP 15th April, Luton Hoo Park 18th May, SW over Bedford 14th June, Harrold GPs 26th June, over Sutton Fen 18th October.

Additional 1976 record: 4 Dunstable SW 20th April.

Spotted Redshank *Tringa erythropus* Single present Barkers Lane GP 17th to 24th April (BRS, MRS, BN).

Additional 1976 record: single Dunstable SW 17th September.

Redshank *Tringa totanus* Breeding proved at Harrold GPs and Houghton Regis CHP. Also present during breeding season at Barkers Lane GP, Bedford SW, Blunham GP, Brogborough CLP, Girtford GP, Lidlington CLP, Radwell GP, Sandy GP, Stewartby L., Vicarage Farm CLP.

Greenshank *Tringa nebularia* Single at Houghton Regis CHP 2nd June, and then typical autumn passage from 31st July to 29th August at 5 sites, with maximum of 4 Houghton Regis CHP 9th August, with a single staying on there until 23rd September.

Green Sandpiper *Tringa ochropus* During the winter at 4 sites with maximum of 4 at Bedford SW 20th November. Spring passage from 23rd March to 28th April at 5 sites and in autumn from 24th July to 25th September at 7 sites including 5 at Bedford SW 29th August.

Wood Sandpiper *Tringa glareola* Singles Dunstable SW 9th August, Bedford SW 16th August. 2 there on 28th/29th August and 3 at Harrold GPs 21st August.

Common Sandpiper *Actitis hypoleucos* Spring passage commenced on 8th April lasting until 23rd May. A single at Dunstable SW 3rd June. Autumn passage from 3rd July to 25th September with maximum of 10+ at Harrold GPs 21st August and then 6 at Radwell GP, 5/6 Bedford SW and 3/4 Barkers Lane GP all on 29th August.

Turnstone *Arenaria interpres* Single in winter plumage Radwell GP 21st August (BN).

Black-headed Gull *Larus ridibundus* Colony 500 nests Vicarage Farm CLP. Rising water level at Brogborough CLP has submerged former breeding area.

A shot bird at Marston Thrift on 2nd October was ringed at Reeuwijk (Zuid Holland) as a pullus 6th June, 1971.

Lesser Black-backed Gull *Larus fuscus* Single nest occupied in May Brogborough CLP. Winter gathering of 100 at Harrold GPs 6th November, (MRS, DAW).

Herring Gull *Larus argentatus* Single nest occupied in May Brogborough CLP. (MRS).

Common/Arctic Tern *Sterna* sp. At Stewartby L. 2 on 24 April, 4 1st May, 2 19th May, 7 19th June, singles 4th August and 19th August and 10 on 4th September. At Brogborough CLP 9 on 15th May and 10 on 4th September, at Blunham GP single 25th June and then up to 3 during July; 2 at Girtford GP 26th June.

Common Tern *Sterna hirundo* One pair bred at Roxton GPs. Juveniles seen at Harrold GPs and Radwell GP in late July were probably raised nearby. Passage noted at Harrold GPs with 3 on 22nd May, 3 on 3rd July increasing to 8 on 31st July, 5 on 21st August and 4 7th September. Elsewhere 2 at Girtford GP 19th May, 1 Radwell GPs 21st August, up to 15 at Roxton during summer, and singles Long Holme, Bedford 6th September and Great Barford 24th September.

Correction to 1976 report. Entry should read breeding near not at Harrold GPs.

Turtle Dove *Streptopelia turtur* 2 over Barton Hills 17th April were second earliest ever for the county and 12 days earlier than the average. Not recorded again until 27th April. Last Dunstable SW 25th September.

Cuckoo *Cuculus canorus* First, at Old Warden, 17th April, was a typical date. Last near Elstow 13th September.

Barn Owl *Tyto alba* Breeding reported from just one locality. Otherwise a drop in records with only 8 sightings. Obviously under reported.

Little Owl *Athene noctua* Well distributed throughout the county with records from over 25 sites.

Tawny Owl *Strix aluco* Under recorded, and reports from only 19 localities probably does not indicate genuine reduction in numbers.

Long-eared Owl *Asio otus* 5-7 present in mid-February at a new roost in South Beds (BDH, AJL, MRS et al).

Short-eared Owl *Asio flammeus* Singles at Millbrook 30th January and Pirton 6th February (CWB, BRS) and 2 near Blunham Pits 2nd October (SGW).

Nightjar *Caprimulgus europaeus* Present in breeding season at Warden Warren, The Lodge Sandy, and Chicksands Wood. A passage bird near Barton Springs 24th July.

Swift *Apus apus* First on 3rd May, when singles Blunham and East Hyde SW were a week later than average. Large feeding flocks noted end May/June including 800 Dunstable SW 5th June and 800 Radwell GP 19th June. Last on 2nd October over Whipsnade Zoo Park.

Kingfisher *Alcedo atthis* A drop in records with sightings at only 13 localities including breeding activity at one.

Hoopoe *Upupa epops* One at Cople from 26th to 29th April and another at Honeydon 9th to 15th September (CD, JMe, DJF).

Lesser Spotted Woodpecker *Dendrocopos minor* Recorded from 12 localities including one in heavily built-up area of Dunstable.

Skylark *Alauda arvensis* Typical winter flocks recorded with 200+ Someries, on 9th January and c350 by R. Ive! near Biggleswade, 31st January.

Sand Martin *Riparia riparia* First at Harrold GPs on 20th March, which equalled the previous earliest county record, was two weeks earlier than normal. Main influx mid-April. No relevant departure dates.

Swallow *Hirundo rustica* First at East Hyde SW 28th March, some two weeks earlier than recent average; main influx 16th-20th April. Roost of c4000 Radwell GP 27th September. Last heading W over Maulden 5th November.

House Martin *Delichon urbica* First were 2 around Luton and Dunstable Hospital 18th March and 3 at Eaton Bray 20th March. These were the 2nd and 3rd earliest county records, and three weeks earlier than recent average. Not well distributed until end April. A series of

late records in November from The Lodge, Sandy with 2 13th-16th, 3 on 17th and one 22nd-24th and 2 in Amptill on 15th November.

Tree Pipit *Anthus trivialis* Slight increase in breeding season records with reports from Chicksands Wood, Shire Oak, Maulden Wood, The Lodge Sandy, Clophill, Aspley Heath. First migrant 11th April Dunstable SW.

Rock Pipit *Anthus spinoletta* Single East Hyde SW 18th October (MRS).

Yellow Wagtail *Motacilla flava* Breeding success noted at East Hyde SW and Radwell GP. First in spring on 11th April, somewhat later than usual, at Dunstable SW. Widespread by 24th April.

Grey Wagtail *Motacilla cinerea* Breeding suspected at East Hyde SW, and present in breeding season Luton Hoo Park.

Recorded outside breeding season from 18 sites.

White Wagtail *Motacilla alba* Singles Dunstable SW 11th April, Harrold GPs on 17th and 24th April, Radwell GP and Barkers Lane GP 24th April.

Nightingale *Luscinia megarhynchos* Slight decrease on the last few years with single singing males from Maulden Wood, Pedley Wood, Marston Thrift, Odell Wood, Kidney Wood, Old Warden, Chicksands Wood, and 2 males Potton Wood. First of year on 30th April at 2 localities.

Black Redstart *Phoenicurus ochruros* A poor year for the species, with a BTO survey failing to reveal a single breeding pair.

Passage birds at Colworth, Sharnbrook 4th-8th April, Harrold GPs 20th February and again 20th March (LK, DAW).

Redstart *Phoenicurus phoenicurus* 1 pair bred Charle Wood/Aspley Heath area with 2 other pairs present. Pair displaying mid-May Lowes Wood near Woburn, singing male early June at The Lodge, Sandy; pair at Colworth, Sharnbrook built nest, which was later destroyed; single Shire Oak 25th May.

Single migrants at The Lodge, Sandy 23rd-24th April, 23rd May, 18th September; 24th and 30th April at Harrold GPs, 18th April Whipsnade Zoo Park and by R. Ouse west of Bedford 23rd September.

Whinchat *Saxicola rubetra* Again absent as a breeding species.

Singles recorded in spring from Old Warden Tunnel 1st May, Harrold GPs 8th May, Houghton Regis CHP 11th May.

In autumn singles Houghton Regis CHP 4th August, and then Dunstable SW 21st August, 14th September, 25th September with 3 on 27th September. Singles Girtford GP 4th September, near R. Ouse west of Bedford 10th and 23rd September and Bedford SW 25th September.

Stonechat *Saxicola torquata* Welcome increase in records continues. One pair bred raising 5 young.

Seen on many dates in January and February at 11 localities involving at least 18 birds. Similarly from October to December a total of 19 birds recorded from 10 localities.

Wheatear *Oenanthe oenanthe* Good numbers this year: first were 2 Whipsnade Zoo Park 11th March, and then singles Biggleswade Common 12th March, Leighton Buzzard GP 20th March, Houghton Regis CHP 27th March, Harrold GPs 28th March. Main passage 2nd April to 18th May, from 13 localities. Autumn passage: 2 Haynes West Wood 20th August, 8 Radwell CP 21st August with 3 on 29th August, singles Barkers Lane GP 29th August and Harrold GPs 4th September, 4 Stockwood Park Golf Course, Luton, 11th September and finally 2 Houghton Regis CHP 16th September.

Ring Ouzel *Turdus torquatus* Good spring passage with 3 Whipsnade Zoo Park 18th April, 4 Barton Hills 17th April with one still present 23rd April. 1 on Luton Golf Course 11th September (CT, AJL, DWG, et al).

Fieldfare *Turdus pilaris* Again present in the county during the breeding season. c500 Barton Hill Farm 9th January. Last migrants 23 east over Luton Hoo 23rd April. First of autumn at Mogerhanger 6th October. Large influx noted end November with c500 Arlesey 3rd December.

Redwing *Turdus iliacus* Build up at Sewell end of 1976 reduced to 2500 by 2nd January. Rather scarcer in 1977 with 250 at Felmersham NR 12th November and 250 Luton Hoo 13th

March the only other large gatherings reported. First of autumn 2nd October over Kempston and last a single over Barton Hills 17th April.

Grasshopper Warbler *Locustella naevia* An exceptionally early migrant at Dunstable SW 2nd April (MRS, BRS). An increase in breeding records with 22 singing males from 9 sites.

Sedge Warbler *Acrocephalus schoenobaenus* Earliest at Girtford GP 16th April, a typical date, and latest 25th September Dunstable SW.

Reed Warbler *Acrocephalus scirpaceus* First 1st May Luton Hoo Park. Little change noted in breeding status with records from 5 sites.

Lesser Whitethroat *Sylvia curruca* Fewer records than usual. Later in spring this year with the earliest 9th May Luton Hoo Park, last 18th September Felmersham NR.

Whitethroat *Sylvia communis* First 27th April Souldrop and latest 13th September in Dunstable. Records would suggest restoration to former breeding status.

Garden Warbler *Sylvia borin* First 1st May Luton Hoo Park, a typical date. Last 4th September same locality.

Blackcap *Sylvia atricapilla* Earliest 17th April at 3 sites, slightly later than recent average. Winter records of female in Luton 28th February, at Blunham where male present 21st-24th November, in full song 8th December and last seen 13th December, and another male in Biggleswade 10th December.

Wood Warbler *Phylloscopus sibilatrix* Breeding season records from Aspley Heath/Charle Wood with 5 pairs; singing male Sutton Fen 3rd May.

Chiffchaff *Phylloscopus collybita* Again arrivals generally early with first at Harrold GPs 12th-13th March, present at two more localities 17th March and at another three on 19th March. Main arrival not until second week in April.

Single by R. Ouse west of Bedford 1st and 5th January and 12th February, at The Lodge, Sandy 16th November and in a Luton garden 10th December.

Willow Warbler *Phylloscopus trochilus* First 3rd April Harrold GPs, was a week earlier than recent average. Main arrival around 24th April. Last 18th September Luton Hoo Park.

Spotted Flycatcher *Muscicapa striata* Slightly earlier arrival than usual with the first at Luton Hoo Park 1st May and last 1st October The Lodge, Sandy.

Pied Flycatcher *Ficedula hypoleuca* The recent monopoly from Sandy broken by a single bird on 24th April near Roxton Lock. Otherwise singles The Lodge, Sandy 18th and 23rd August and 23rd September. (BS, AP).

Bearded Tit *Panurus biarmicus* 7 at Harrold GPs 6th November decreasing to 4 on 13th November (DAW).

Golden Oriole *Oriolus oriolus* Single birds in song on 4 dates in the summer at 2 sites (name of localities and observer suppressed).

Red-backed Shrike *Lanius collurio* The only record a single male seen in suitable breeding habitat in the south of the county 19th June.

Magpie *Pica pica* Roost of c150 Dunstable Downs in February.

Hooded Crow *Corvus corone cornix* Single at Eversholt L. 16th January with 2 on 30th January. Singles The Lodge, Sandy 23rd March and Whipsnade Zoo Park 23rd-25th November.

Additional 1976 records: singles French's Avenue Tip, Dunstable 24-25th January and Sewell 15th February.

Corvidae A mixed flock of 3000 consisting mainly of Jackdaws and Rooks in Luton Hoo Park 5th September.

Tree Sparrow *Passer montanus* Winter flocks of c200 Harrold GPs 26th December and c300 Dunstable SW 30th January.

Brambling *Fringilla montifringilla* Reduction in records with single Sundon Reservoir 3rd December, 4 just outside Luton 3rd April and 150 Biggleswade Common 19th December.

Siskin *Carduelis spinus* Records very sparse; single Warren Wood 16th November, 2 in a Maulden garden 4th and 10th December, single Flitwick Moor 11th December and c15 near Harrold 18th December.

Twite *Carduelis flavirostris* 5 at Girtford GP 16th April decreasing to 3 by 18th and then single 29th April. Singles at The Lodge, Sandy 4th November, and Sandy GP 25th March (AP, RT).

Additional 1976 record: 22 near Sutton 19th December.

Redpoll *Carduelis flammea* Winter flocks much reduced from recent years with substantial numbers only from Flitwick Moor with c50 30th January and again 13th February, and at Harrold GPs with c100 13th November to the end of the year.

Crossbill *Loxia curvirostra* Single at The Lodge, Sandy 22nd March, a pair 23rd April and then up to 7 regularly to 16th June, including 3 young 29th May. 2 on 5th July, singles 20th August and 27th November. Elsewhere single at Stockgrove Park 28th May and 4 26th June, 3+ Sutton Fen 26th June, 1 Little Brickhill Copse (Beds-Bucks border) 5th November. (AP, KRW, JM).

Hawfinch *Coccothraustes coccothraustes* Only two records of this elusive finch: 2 Maulden Wood 23rd July and a single Whipsnade Zoo Park 24th September (BSN, CT).

Snow Bunting *Plectrophenax nivalis* A remarkable record of a single bird in Stopsley, Luton 24th October (VEL).

B. NIGHTINGALE

REPTILES AND AMPHIBIANS

REPORT OF THE RECORDER

REPTILES

Bedfordshire is reputed to be rather poor in reptile fauna so I was quite pleased by the number of records received during my first year as Recorder. Most of these records came from people who discovered the reptiles whilst looking for other animals and plants, so maybe if a more determined effort is made to search for these rather secretive creatures we could find that we have more than we had realised.

Grass Snake *Natrix natrix* Seven records were received from five tetrads.

Common or Viviparous Lizard *Lacerta vivipara* There were six records, each from a different tetrad.

Slow Worm *Anguis fragilis* Two Slow Worms were reported, again from two different tetrads. No records of the Adder (*Vipera berus*) were obtained although they may exist in one or two locations in the county. This will be investigated in 1978.

AMPHIBIANS

Considering that 1976 had been a year of harsh conditions for amphibians, with the hot and very dry summer, they did not seem to have suffered as badly as many people had feared. Common Frogs and Common Toads were quite widespread throughout the county.

Common Frog *Rana temporaria* There were 14 records, some of these being groups of young or breeding adults.

Common Toad *Bufo bufo* There were 15 records, again with some multiple sightings.

Crested Newt *Triturus cristatus* There were three records of this newt; on two occasions several were seen. They were recorded in two tetrads.

Common or Smooth Newt *Triturus vulgaris* These were more widespread and there were seven records, each from a different tetrad. Most were of single animals.

The first record of the year was of a Common Toad seen on 12th March, and the last sighting was again of a Common Toad on 31st October.

HELEN M. WEBB

FISH REPORT OF THE RECORDER

During 1977 a total of 82 fish records were received – 22 being valuable confirmation of reports received last year and the remaining 60 being the new tetrad records listed below. Reports were obtained for 21 species compared with 26 last year. The five species not recorded in 1977 were: Silver Bream, Grass Carp, Zander, European Catfish and Stone Loach.

I am pleased to say that several new locations were covered and we now have fish records from 59 different tetrads, against 49 last year. However, there are five 10km squares from which we have no reports whatsoever and these are: SP91, SP96, TL16, TL23 and TL25. Therefore, I would be most grateful for any records from tetrads within these areas.

While I did not really expect any new species to be added to the list published in last year's Journal, I did receive a "confirmed" report of a Barbel (*Barbus barbus*) being caught from the Great Ouse some way outside the county boundary in Buckinghamshire. If this species is present in any reasonable numbers, it is possible that there are a few to be found in that part of the river which flows through our county. According to my most valuable source of reference – the writings of Mr Fred Soper in early editions of this Journal – it is open to doubt whether this species ever occurs naturally in the county. However, he does point out that specimens have been introduced at various times, so if anyone can obtain a recent confirmed report for Bedfordshire, it will most certainly be a very important new species record.

Without doubt the most important record received in 1977 was the Spined Loach at Felmersham. This information was passed on via Michael Dawson, and according to my calculations it is only the second county record for 29 years. However, as far as wildlife is concerned, I am a great believer in the old rural proverb which says: "Just because you don't see it – it don't mean it 'aint there". With this in mind I must express my gratitude to the following (B.N.H.S. members indicated thus*) who contributed fish records and helped to prove that one or two species are, in fact, "there":

V.W. Arnold*, S. Bath, M. Clark*, M. Dawson*, W.J. Drayton* and E. Johnson. Also, for additional information, many thanks to P. Williamson.

ADDITIONAL TETRAD RECORDS FOR 1977

Pike *Esox lucius* 95Z, 14E, 15K.

Perch *Perca fluviatilis* 92EQ, 95Z, 02B, 03F, 13P, 14W.

Roach *Rutilus rutilus* 92Q, 95Z, 02BC, 03F, 05D, 15AK.

Rudd *Scardinius erythrophthalmus* 95Z, 02B, 03F, 14M.

Dace *Leuciscus leuciscus* Recorded during 1977 but not in new tetrads.

Chub *Leuciscus cephalus* 15AK.

Gudgeon *Gobio gobio* 15AK.

Bleak *Alburnus alburnus* 05D, 13P, 14W, 15A.

Common Bream *Abramis brama* 92Q, 95Z, 02BC, 15K.

Tench *Tinca tinca* 92EQ, 95Z, 02BC, 03FQ, 14M.

Carp *Cyprinus carpio* 92Q, 95Z, 02BC, 03F, 14W, 15K.

Crucian Carp *Carassius carassius* 03F.

Eel *Anguilla anguilla* 14M.

Bullhead *Cottus gobio* Recorded in 1977 but not in new tetrads.

Three-spined Stickleback *Gasterosteus aculeatus* 93Z, 14M.

Ten-spined Stickleback *Pungitius pungitius* 14M.

Spined Loach *Cobitis taenia* 95Z.

Minnow *Phoxinus phoxinus* 15L.

Ruffe *Gymnocephalus cernus* 95Z.

Rainbow Trout *Salmo gairdneri* 15S.

Brown Trout *Salmo trutta* 15S.

TONY PETERKIN

SLUGS AND SNAILS (Mollusca)

REPORT OF THE RECORDER

My last few reports have been mainly concerned with reporting the lack of Molluscs due to the dry weather. This year we have had quite the reverse in weather conditions. The generous amount of rain has helped slugs and snails to recover from the dry years and at last one is beginning to find them in fairly reasonable numbers again. Slugs have taken the longest to recover and many specimens noted have been juveniles.

Once again I am pleased to report a new record for vice-county 30, Bedford. Bernard Verdcourt, when he was the Society's Recorder for Mollusca, was convinced that *Abida secale* should exist somewhere on the chalk scarp in the county as it exists in some quantity on Ivinghoe Beacon in Buckinghamshire. Dr. Verdcourt thought Barton Springs a likely station, and I have searched the Bedfordshire chalk hills in vain in an attempt to find it. In the end it was found by B.S. Nau on Bison Hill in October, 1977, while searching for ground bugs.

My thanks must go to those who have sent me specimens and records but most especially to Adrian Rundle who always notes the Molluscs present when he is recording his own groups. Others are V.W. Arnold, C. Bradshaw, C. Burton, Miss B. Clutten, Mrs. F.B.M. Davies, J.G. and Mrs. Dony, D. Guntrip, T.S. Hollingworth, Miss L. Janes, B.S. Nau, A.R. Outen, A.G. Peterkin, T.J. Thomas and Miss H.M. Webb.

E.B. RANDS

DRAGONFLIES (Odonata)

REPORT OF THE RECORDER

In response to my request in the Bedfordshire Naturalist No.30 for dragonfly records from the south and west of the county I am very pleased to report that I have been sent 23 new ten-kilometre square records. It is even more pleasing that several of these records are of the less common species such as the beautiful Emperor Dragonfly (*Anax imperator*) from the Houghton Regis chalkpit, the Broad-bodied Libellula (*Libellula depressa*) from two ponds in the middle of the county and the metallic Green Lestes (*Lestes sponsa*) from Houghton Regis chalkpit and the Double Arches sandpit, Heath and Reach. A nationally rare species, the Ruddy Sympetrum (*Sympetrum sanguineum*), was reported from Lidlington and an even rarer one, the Scarce Libellula (*Libellula fulva*), from the River Ouse, just outside the county near St. Neots. This last species could easily be present on the Ouse in the area from Wyboston to Great Barford – look out for a fat darter-type dragonfly with a dark base to the hind wings and often smoky wing tips. It has been recorded from only nine ten-kilometre squares in the whole of Great Britain.

I wish to thank the following for records, drawings and slides: C. Carpenter, V.H. Chambers, W.J. Drayton, B.D. Harding, A.J. Martin, B.S. Nau, A. Peterkin, Mrs E.B. Rands, J.T.R. Sharrock and T.J. Thomas. Slides are particularly welcome as they enable me to verify what might otherwise be a doubtful record.

All records are now being passed to the new National Recorder for Dragonflies, Mr David Chelmick, 6 Gander Hill, Haywards Heath, Sussex, who is urging recorders to adopt the tetrad system for recording, he having just completed a five-year tetrad-survey of Sussex. He also plans to build up an inventory of key dragonfly sites for submission to the Nature Conservancy Council. If there is sufficient demand he would like to organise a field course in identification to increase interest in and knowledge of this very attractive group of insects.

NANCY DAWSON

GRASSHOPPERS AND CRICKETS (Orthoptera/Saltatoria)

REPORT OF THE RECORDER

Last year's report stated that the Mottled Grasshopper (*Myrmeleottix maculatus*) was not recorded in 1976. I have since had 1976 records for Totternhoe Knolls and the old chalk workings at Sewell, Dunstable. Two further sites this year were Cooper's Hill, Amphthill and Stockgrove Park, Heath and Reach.

The Stripe-winged Grasshopper (*Stenobothrus lineatus*) has still not been rediscovered. A search was made on Dunstable Downs, Barton Hills and Noon Hill, Pegsdon.

The Short-winged Cone Head (*Concocephalus dorsalis*) was confirmed as still having a thriving colony on Flitwick Moor by B.S. Nau. This is the only known site in the county.

Four records of the House-cricket (*Acheta domesticus*) were received bringing the county total to eight. Three records of Common Ground-hopper (*Tetrix undulata*) brings the county total to seven. This I believe is a much overlooked species.

An intensive survey during the year established the distribution patterns of four grasshoppers and three bush-cricket in the county with a total of 694 records. This has been a major contribution to our knowledge of the fauna of the county and the results are published as a separate paper in this Journal.

I will be only too pleased to teach any members who wish to learn about this group of insects. The most favourable time for study is between June and October.

ACKNOWLEDGEMENTS

I would like to thank Mrs F.B.M. Davies, Mrs E.B. Rands, Miss B.M. Clutten, and V.W. Arnold, C.R. Boon, M. Chandler, T.S. Hollingworth, N.R. Janes, B.S. Nau, A.R. Outen, and R.B. Stephenson for records. I wish you all happy hunting in 1978.

THE DISTRIBUTION OF THE COMMON BUSH-CRICKETS AND GRASSHOPPERS IN BEDFORDSHIRE

BY D.G. RANDS, RECORDER FOR GRASSHOPPERS AND CRICKETS

There are 30 species of *Orthoptera-Saltatoria* on the British Check List represented by 11 bush-crickets in the superfamily *Tettigonioidea*, five crickets in the superfamily *Grylloidea*, and 14 grasshoppers in the superfamily *Acridoidea*.

The majority of these species are to be found along the south coast of Britain, their main stronghold. The range of many does not extend as far north as Bedfordshire and with others, Bedfordshire is just within the known limit of their range (Skelton M.J. 1974).

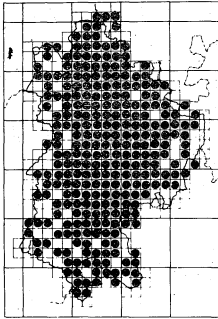


Fig.1

The Bedfordshire list to date consists of five bush-crickets, one cricket and nine grasshoppers (Rands D.G. 1976). During 1977 I carried out a comprehensive survey of the county to establish the distribution patterns of three bush-crickets and four grasshoppers. All tetrads (2km squares) that were accessible by road were visited, many of them on several occasions. The map (fig.1) shows the tetrads where records were obtained and also the comprehensiveness of the survey.

Bedfordshire is not an ideal county for the Orthopterist, but more of a challenge. These insects do not like disturbed ground and generally will not be found on pasture and arable land. The chalk downlands in the south of the county, an ideal habitat, are in fact disappearing due to encroachment of scrub and coarse grasses. The major habitats left in this county are the roadside verges and hedges which became the main source of records for this survey. Other

habitats surveyed were churchyards, village greens, disused railway tracks, old mineral workings and chalk downland.

Grasshoppers are found on the ground, mainly amongst short grass but avoiding the shade from trees. Bush-crickets are usually found off the ground amongst rough vegetation, hedges and trees.

The general method of searching for grasshoppers during this survey was by sight and sound although sound alone was never used for identification. By walking through the grass the familiar jump soon indicates their presence. Sound was used as an indicator of one or more species being present, each species having its own distinctive 'song'. Crickets were obtained by the use of a sweep net, vigorously swept through the trees and vegetation. Hawthorn and bramble were searched by sight, as a mark of respect for the sweep net. Many of the Dark Bush-cricket records were obtained by driving around the county in the evening and locating them by sound alone, the only species in the survey where sound was used as a positive identification.

Grasshoppers were only identified when adult, no effort being made to identify the nymphs. Bush-cricket nymphs however are identifiable and these were included.

At the end of the text for each species the first and last date of the year is given for when they were found. This gives a rough guide when they may be looked for as none overwinter. No dates are given for grasshopper nymphs for the reasons given above.

All records shown on the maps were made during 1977.

It is always interesting to search through literature for old county records. 'The Victoria History of England, Bedfordshire (1904)' makes no mention of Orthoptera. Records I have found are mentioned at the end of the text for the species, their only value is historical as no detailed information is given.

TETTIGONIIDAE (Bush-crickets)
Meconematinae

Oak Bush-cricket *Meconema thalassinum* (Degeer)

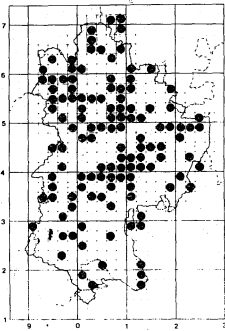


Fig. 2

This is the only bush-cricket that lives in trees, it flies readily and is attracted to light. It is nocturnal in habit but may be found during the day resting on the underside of leaves. This species has also been found at night on house windows, and attracted to the light from a moth trap.

In this county most of the records have been from hedges and trees along the roadside verges. It is easily recognised as it has wings and is a delicate light green in colour.

The Oak tree is not the only tree it may be found on but it does show a preference for it. Other trees it was found on were Maple, Ash, Sycamore, Elm, Elder, Lime, Dogwood, Beech, Poplar etc. The term tree in this context includes those that have been trimmed and form part of a hedge. The age of the tree was of no consequence.

Its distribution is widespread throughout the county, unlike the Dark Bush-cricket and Speckled Bush-cricket that are virtually absent from the south of the county.

The first record of the year for a nymph was June 18th and the last record for a nymph was July 31st. The first adult record was Aug. 5th and the last adult record was Oct. 20th.

Historical records: - found near Bedford (Burr M. 1897) found near Bedford by G.T. Porritt (Lucas 1920).

Number of tetrad records 121. Distribution map fig.2.

Dectinae

Dark Bush-cricket *Pholidoptera griseoaptera* (Degeer)

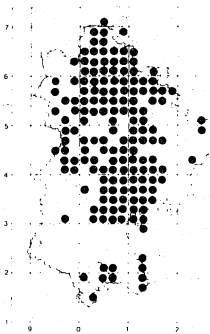


Fig. 3

A flightless bush-cricket easily recognisable by its dark brown colouring. Its habitat is amongst the rank vegetation and brambles to be found along roadside verges. As a nymph it can easily be seen sitting on the leaves of brambles and nettles. It has a pale brown broad stripe along its back which disappears when the insect becomes adult. The adults are more retiring and are more difficult to find. Towards the end of August the adult males break into song and their short 'chirp' may be heard during the day and evening, continuing well into the night. It is the only orthopteron in this county that can be heard at night. In October they appear to leave the cover of rank vegetation and become more easily seen on the short grass of the verges and again conspicuous on bramble leaves as they did as nymphs.

It is the commonest and most abundant bush-cricket in the county. Its apparent absence south of a line between Barton and Toddington has emerged as a great surprise as a result of this survey. There are however some records around Luton Airport and the Whipsnade area but their numbers were very small. These could be the fringe of a distribution pattern further south in Hertfordshire. The absence of records on the east side of the county and in the Woburn area on the west can

be accounted for by land use. The east side is intensely cultivated for horticultural purposes and there is a shortage of hedges. The Woburn area is wooded and managed as parkland.

The area in the south can be partly accounted for by the urban sprawl of Luton and Dunstable but otherwise suitable habitats do exist. A similar absence is shown on the distribution map for the Speckled Bush-cricket.

The egg stage of the Dark Bush-cricket has to pass through two winters before hatching (Hartley J.C. 1967) and so is very much at the mercy of the environment. The temperatures in the south could be lower than the rest of the county as Barton and Toddington are on the edge of the chalk scarp with higher land to the south.

Accumulated temperatures relating to this species were studied by Hartley J.C. and Warne A.C. (1973) and they concluded that even a few degrees of difference were critical.

The first nymph was recorded May 7th and the last nymph on July 16th. The first adult was recorded on July 31st and the last adult on Nov. 11th.

Historical record:— found near Bedford by G.T. Porritt (Lucas 1920).

Number of tetrad records 159. Distribution map fig.3.

Phaneropterinae

Speckled Bush-cricket *Leptophyes punctatissima* (Bosc)

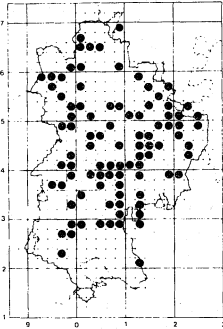


Fig.4

A flightless bush-cricket, easily recognisable by its darkish green colouring and minute speckles all over.

It is widely distributed but becomes scarce in the south of the county. It is found in a variety of places, the most common being roadside verges in rank vegetation. The commonest plant it was found on was Common Nettle (*Urtica dioica*) but only where grasses were growing amongst it, never where nettles were growing on bare ground. However it can be found amongst most rank vegetation and sometimes in the hedge.

The first record of the year was a nymph on May 29th and the last nymph record was July 31st. The first adult record was also on July 31st and the last adult record was Nov. 13th.

Number of tetrad records 92. Distribution map fig. 4.

ACRIDIDAE (Grasshoppers)

Acridinae

Common Green Grasshopper *Omocestus viridulus* (Linnaeus)

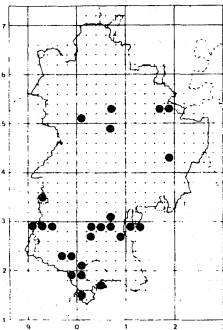


Fig.5

This species appears to favour the south of the county with isolated sites further north. It was usually abundant where found.

The habitat was mainly chalk downland but it was also on roadside verges and a sand quarry. The records in the Bedford area were on clay. It was always found on very short grass.

The most interesting site was at Studham Church where the insects were abundant amongst the gravestones. It must have been choir practice time as all the males were

singing together. The day was warm and sunny but when the sun disappeared behind a cloud the singing stopped abruptly, recommencing immediately the sun shone through again. I have never noticed this reaction before. I was trying to take a sound recording at the time.

The first record of the year for an adult was Aug.8th and the last adult record was Sep.10th.

Number of tetrad records 25. Distribution map fig.5.

Meadow Grasshopper *Chorthippus parallelus* (Zetterstedt)

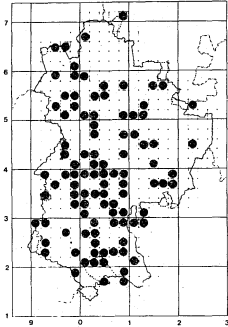


Fig.6

This grasshopper is our only flightless species and can be recognised in its adult form by the very much reduced wings. The distribution pattern is very similar to the Common Field Grasshopper, again showing a scarcity in the north of the county but also becoming scarce in the east of the county.

Compared with the Common Field Grasshopper, the habitat is the same. In numbers it is not as abundant and neither so variable in colour.

The first adult record of the year was July 15th and the last adult record was Nov.6th when fair numbers were present, the females being dominant.

Number of tetrad records 99. Distribution map fig.6.

Common Field Grasshopper *Chorthippus brunneus* (Thunberg)

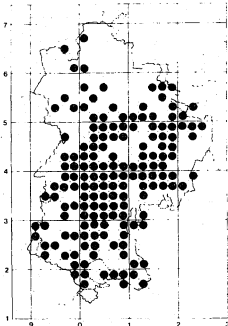


Fig.7

Of all the grasshoppers this is the one most likely to be seen and heard. It flies well on a warm day and nearly always on a curved flight path, very rarely in a straight line. It is the commonest of our grasshoppers except in the north of the county. The reasons are not obvious, but could reflect the agricultural use of the land.

This grasshopper is the one most tolerant of man and this is reflected in its variety of habitats; roadside verges, waste ground, derelict sites, churchyards, disused railway tracks, and chalk downland.

It can be found in association with all the other grasshoppers, but most often with the Meadow Grasshopper. On roadside verges in the county it is usually the dominant species.

- However—
- 1) It can be the only species present, sometimes in large numbers, sometimes only a few.
 - 2) It can be dominant with the Meadow Grasshopper or sometimes subordinate to it.
 - 3) It can be absent altogether and only the Meadow Grasshopper is found.

The Common Field Grasshopper prefers drier conditions to the Meadow Grasshopper but casual observation does not show any variation in the habitat especially when all the above conditions can be found on various stretches along the same piece of roadside verge.

This grasshopper is the most variable in colour, even within the same colony.

The first record of the year for an adult was July 19th and the last was one adult female on Nov.20th. Mating was noted on Oct.10th and nymphs were also noted in abundance on one site, also on Oct.10th. They appeared to be in the last instar stage.

Historical record:— found near Sharnbrook (Lucas 1920).

Number of tetrad records 160. Distribution map fig.7.

Lesser Marsh Grasshopper *Chorthippus albomarginatus* (Degeer)

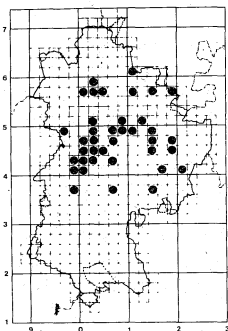


Fig.8

This species was not listed in the county by the late R. Palmer (1953) and neither was it shown on the vice-county map (Ragge D.R. 1965). More recently many records have been collected in the Cambridgeshire area by M.J. Skelton of the Biological Records Centre, Monks Wood, (Hawksworth D.L. 1974). These present Bedfordshire records therefore became an extension of the Cambridgeshire area. However the national distribution at present shows it to be mainly a coastal species.

I first recorded it in the county in 1976 and this year another 37 sites have been found. The distribution is interesting, appearing as a band across the centre of the county. Its habitat is not at all clear, having been found in a variety of places such as roadside verges, a wet meadow, village greens, disused railway tracks, the banks of old clay mineral workings etc. On Biggleswade Common, which is grazed by cattle, it was found in the hollows where the grass was more

lush. Where it has been found it is generally abundant and appears to prefer the taller grasses where normally you would not expect to find any grasshoppers.

There are a number of colour varieties but in Bedfordshire all specimens have been the 'brown' variety except for one case where the wings were green. This is unusual amongst grasshoppers, as normally there is a certain amount of colour variation.

The first adult record of the year was Aug.13th and the last adult record was Oct.14th. Number of tetrad records 38. Distribution map fig.8.

CONCLUSIONS

The value of this particular survey is that it establishes the distribution pattern of species at a particular point in time as against the normal accumulation of records over a period of time.

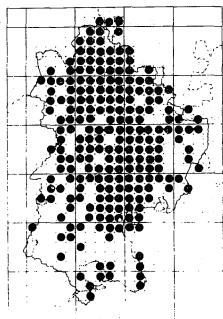


Fig.9

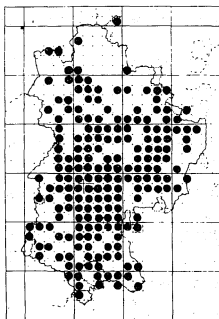


Fig.10

Fig.9 gives the combined records of the three bush-crickets and fig.10 is the combined records of the four grasshoppers in the survey. It clearly shows that bush-crickets become scarce in the south of the county and that grasshoppers become scarce in the north of the county. In the text I have endeavoured to give qualified reasons for this but the answer may only come through further field study.

Maybe if the survey was

extended beyond our own county boundaries a clearer picture would emerge. Bedfordshire being just part of this jigsaw.

As stated earlier, the presence of grasshoppers was established by walking through the grass to disturb them. In early summer there was no difficulty in doing this but as the year progressed the period of grasshopper activity got increasingly shorter. By October it was virtually impossible to disturb them before 11 a.m. and by 4 p.m. all activity had ceased. This is

related to temperature as they become sluggish in cold weather and for this reason it was not always possible to assess whether a species was abundant or not. This did not apply to bush-crickets as a sweep net was being used.

The width of a roadside verge was not important. Where the verge was wide enough, a strip adjacent to the road was usually mown which was ideal for the grasshoppers. The rank vegetation behind became an ideal habitat for the bush-crickets and behind that the hedge, the home of the Oak Bush-cricket. The hedge was more productive if nature was at least in partial control rather than the farmer or local council. Hedges on the roadside edge were also useful for Oak Bush-cricket records but hedges that overhung the road were avoided if it looked as if it had been swept by the local bus. The hedge was only swept where it was devoid of hawthorn.

National recording by 10km. square is valuable in that it shows the general distribution and range of species. County recording by 2km. squares gives far more detail of fluctuations and is a stricter discipline in that you have to be prepared to look anywhere to obtain records. Finding the ideal site in a 10km. square is usually fairly easy, but not so easy in a 2km. square. It probably does not exist. For this reason we begin to learn more about the habitat requirements or either are confused by what we read in books.

This survey has shown the importance of our roadside verges and hedges. They have become a 'last ditch' ecological niche for much of our wildlife today and must be preserved if we have any thought for the future. Without them in this county, grasshoppers and bush-crickets would be virtually non-existent.

In time I hope to establish the status of the remaining *Orthoptera* in the county but these have a more specialised habitat and require more diligent searching.

ACKNOWLEDGEMENTS

I wish to thank my wife for without her tolerance this survey would not have been possible, as many hundreds of hours were spent in the field including three weeks holiday.

I wish to thank V.W. Arnold who helped in locating the Dark Bush-cricket by sound during the evenings and to B.S. Nau who accompanied me on many occasions and added valuable records.

REFERENCES

- | | |
|----------------------------------|---|
| Burr M. 1897 | British Orthoptera The Economic and Educational Museum, Huddersfield. |
| Haes E.C.M. 1976 | <i>Orthoptera</i> in Sussex, Entomologists Gaz. 27:181-202 |
| Hartley J.C. 1967 | Some notes on hatching the eggs of <i>Pholidoptera griseoaptera</i> (Degeer) (<i>Orth., Tettigoniidae</i>) Entomologists mon.mag. 103:123-124 |
| Hartley J.C. and Warne A.C. 1973 | The distribution of <i>Pholidoptera griseoaptera</i> (Degeer) (<i>Orth., Tettigoniidae</i>) in England and Wales related to accumulated temperatures. J. Anim. Ecol. 42:531-537 |
| Hawksworth D.L. 1974 | The changing flora and fauna of Britain. pp.307-322 by Marshall J.A. Academic Press for Systematics Assoc. |
| Lucas W.J. 1920 | A Monograph of the British Orthoptera. The Ray Society. |
| Palmer R. 1947 | Bedf. Nat. 2:44-45 |
| Palmer R. 1953 | Bedf. Nat. 8:22-24 |
| Ragge D.R. 1965 | Grasshoppers, Crickets and Cockroaches of the British Isles. Warne. London. |
| Ragge D.R. 1973 | The British Orthoptera: A Supplement. Entomologists Gaz. 24:227-245. |
| Rands D.G. 1976 | Bedf. Nat. 31:49-50 |
| Richards O.W. and Waloff N. 1954 | Studies on the Biology and Population Dynamics of British Grasshoppers. Anti-Locust Bull.17 Anti-Locust Research Centre c/o Brit.Mus. (Nat.Hist.) |
| Skelton M.J. 1974 | Preliminary distribution maps. <i>Orthoptera, Dictyoptera</i> and <i>Odonata</i> . Biological Records Centre. Monks Wood. |

BUGS (Hemiptera-Heteroptera)

REPORT OF THE RECORDER

Bug fieldwork this year centred on the Maulden Woods study area but with considerable work ranging widely over the county. This, together with the valued contributions of others, notably Dr N.F. Janes, has boosted the county species-list to 289 of the 535 or so British species. It is notable that 175 of these species have been found in the Maulden Woods study area, a total surpassing any known to the Recorder for a restricted area (cf. 170 for the Norfolk Broads; 148 for Bookham Cmn., Surrey; 124 for Monks Wood, Hunts).

There were several particularly interesting discoveries of new species which extend known species ranges in Britain. The shield-bug *Aelia acuminata* was previously known from the coastal counties of E Anglia and S England. The lace-bug *Dictyonota fuliginosa* has a southern distribution as has the plant-bug *Teratocoris antennatus*, which was one of several new Beds species found at Flitwick Moor Nature Reserve. Another was *Tytthus geminus*, known only from six other counties. Finally, a fenland species *Agnocoris reclairi* was found in the Ouse and Ivel valleys, it is known from only four other counties. Although more widespread in Britain, it was remarkable to find that the Dyer's Greenweed bug *Heterocordylus genistae* is well established at both of the Beds localities for this local plant.

The aftermath of the 1976 drought was particularly evidenced by the great scarcity of the various grass-bugs (*Stenodemini*) and, perhaps more surprisingly, the predacious species *Anthocoris nemorum*. Only one grass-bug seemed in reasonable numbers, *Megaloceraea recticornis*. The delicate *Orthotylus diaphanus* was new to Beds this year but was widespread in good numbers on *Salix*, but it is not clear if this is a reflection of the recent abnormal summers. As with the plant-bugs generally, the genera *Psallus* and *Orthotylus* had an extended season this year, the more notable for the very truncated 1976 season. The Cockayne Hatley light trap of I. Woiwod (Bedf. Nat.31) this year produced fewer individuals and fewer species of bug: 128 of 23 spp this year compared with 455 of 39 spp in 1976. These figures probably reflect changes of both population size and mobility.

In conclusion, it should be noted that the number of new *Psallus* and *Orthotylus* added to the list this year reflects a special effort on these genera, identifications being based on male genitalia.

ADDITIONS TO THE BEDFORDSHIRE LIST

PENTATOMIDAE

Aelia acuminata (L) one found by D.G. Rands on the verge of a lane at Potton on 17th August.

LYGAEIDAE

Scolopostethus grandis Ho. — one in nettle bed in old gravel pit, Arlesey, found by E.B. Rands 14th May.

TINGIDAE

Acalypta carinata (Pan.) — one found in woodland litter by E.B. Rands at Melchbourne Park on 18th June.

Dictyonota fuliginosa Costa — found several times on Broom from 31st July in Maulden-Clophill area.

D. tricornis (Sch.) – one in Readshill Sandpit, Clophill, found amongst sparse grass on sand 21st August, N.F. Janes and B.S. Nau.

Physatocheila dumetorum (H-S) – one on lichen-covered Elder found by B.S. Nau on 3rd September in the Gade Valley (v.c. 20 [Beds]).

REDUVIIDAE

Empicoris vagabundus (L) – one 1st August 1974 found in Maulden Woods, T. Thomas.

CIMICIDAE

Anthocoris minki Dohrn – recorded in Leston and Southwood (1961) (Bedf Nat.31, 56-57).

MICROPHYSIDAE

Myrmedobia distinguenda R. – one Maulden Woods 25th September on dead branch of Larch, N.F. Janes and B.S. Nau.

MIRIDAE

Tytthus geminus (Flor) – one swept from *Carex* on Flitwick Moor by BSN, 15th September.

Phylus melanocephalus (L) – Maulden Woods 26th June 1976 and subsequently (BSN).

Psallus ambiguus (Fal.) – on Maple at Maulden 26 June, N.F. Janes.

P. assimilis St. – Maulden Woods 10th July, N.F. Janes.

P. perrisi (M. and R.) – Maulden Woods 27th June, N.F. Janes; and subsequently.

P. wagneri O. – Maulden Woods on various dates from 9th July, N.F. Janes and B.S. Nau.

P. flavellus St. – Aspley Guise on 15th July, N.F. Janes and B.S. Nau; and other subsequent records elsewhere.

Atractotomus mirificus Woodroffe – frequent on Scots Pine in various localities, including Maulden Woods 9th August 1975 (BSN). The congener *A. magnicornis* sensu stricto was collected in Dedmansey Wood in 1976 by N.F. Janes.

Chlamydatus pullus (R.) – Readshill Sandpit, Clophill, B.S. Nau 9th July, in sparse short vegetation on sand.

Heterocordylus genistae Sc. – in July on *Genista tinctoria* at Souldrop and Tempsford, B.S. Nau.

Pachylops bicolor (D. and S.) – 11th September at Amptill and Maulden, on Gorse, N.F. Janes and B.S. Nau.

Orthotylus tenellus (Fal.) – on Ash at Aspley Guise 15th July, N.F. Janes and B.S. Nau.

(*O. flavinervis* (K.) – Leston (1961) discounts earlier records but one was swept from Oak-Alder-Birch by BSN on 7th August, Flitwick Moor)

O. diaphanus (K.) – on *Salix* at Odell 12th August, BSN, various localities subsequently.

Agnocoris reclairei (W.) – as last species.

Plesiocoris rugicollis (Fal.) – 24th July at Heath and Reach, and elsewhere (BSN).

Dichroscytus rufipennis (Fal.) – on Scots Pine at Maulden 26th June 1976 (BSN).

Teratocoris antennatus (B.) – on *Carex rostrata* at Flitwick Moor 7th August (BSN).

T. saundersi D. and S. – as last species. Neither species found on 15th September.

DIPSOCORIDAE

Ceratocombus coleoptratus (Z.) – one under cut grass in ride, Maulden Wood, 9th October (BSN)

DELETIONS**MIRIDAE**

Dicyphus constrictus (B.) – this species is to be deleted as Beds specimens are now considered to be *D.stachydis*.

BIBLIOGRAPHY – Addendum (see Bedf. Nat.31, 56-57)

1961 Leston, D. "Observations on the Mirid(Hem.) hosts of Braconidae (Hym.) in Britain."
Ent. mon. Mag. 97, 65-71.

B.S. NAU

BUTTERFLIES (Lepidoptera)**REPORT OF THE RECORDER**

This has been my first season as recorder for the Society, and with the help of the membership, a start has been made to determine the distribution of the various species resident in the county.

It has become apparent that the dull weather of the summer months has depleted the sightings of butterflies. The spring and early summer months were favourable to the common white species with good numbers of Large Garden White, Small Garden White, Brimstone, and Orange Tip White seen right across the county. The wet summer months, however, showed a marked drop in the sightings of the locally frequent species. The Purple Hairstreak was not commonly seen and the White-letter Hairstreak was not recorded at all. This species, which had such a good season in 1976, reflects the severe depletion of the Common Elm and it is unlikely that it will ever be abundant again in the county even if it survives at all.

The summer brown species were commonly seen and the Marbled White population is apparently on the increase. This locally common species is taking advantage of the rank growth of grass on the chalk downs since the loss of the large Rabbit populations, and is rapidly expanding its own distribution. This same factor has caused a decline in the numbers of Chalk Hill Blue and Small Blue as their larval food plants become overgrown.

The skippers have fared well and the New Small Skipper is now recorded from most parts of the county. This species, obviously under-recorded in the past, is easily confused with the Small Skipper and close examination is necessary to separate the species.

The late summer produced the average numbers of nymphalid butterflies with the Peacock and Small Tortoiseshell being the most commonly seen.

It appears that the very dry summer of 1976 caused a shortage of food plants in that year, thus causing a decline in the 1977 population of butterflies, nevertheless the wet season of 1977 should soon redress this balance.

My thanks to the following people who have helped me to make a start on the distribution maps by sending in their records. Miss A. Doody, Mrs M. Weedon, Mrs E.B. Rands, Mrs J. Toomer, Mrs F.B.M. Davies, R.B. Stephenson, K. Weedon, D. Woodhead, B.D. Harding, V.W. Arnold, I.P. Woiwod, K. Lee, T.J. Thomas, R.J. Woolnough, T. Peterkin, D.G. Rands, R. Edwards, R. Revels, G. Burton, J.G. Dony.

Amendment: (55) Green Hairstreak has not yet been found in Maulden Wood. (Bedf. Nat.31, 1976).

ALAN J. MARTIN

CHECKLIST OF LEPIDOPTERA-RHOPALACERA (Butterflies) FOR BEDFORDSHIRE

BY A.J. MARTIN, RECORDER FOR LEPIDOPTERA-RHOPALACERA

Lists of Butterflies known to occur in the county have been provided by Barrett (1904) and West (1949). The numbers preceding the names of the species are those used by Heslop (1964) and the English names of the species are those given in Heslop's list. The first Latin name given is that adopted by Heslop and the other Latin names given are those used in previous lists, etc. The sources of the records, and in some instances a brief note, are added.

REFERENCES

1. Graham, W.B. 1878. A few notes on the Entomology of Bedfordshire.
†Trans. Bedf. Nat. Hist. Soc. 1876-1877, 126-133.
 2. Steuart, D.H.S. 1891. List of Lepidoptera from Bedfordshire.
Ent. Rec. 2, 206-7.
 3. Barrett, C.G. 1904. Lepidoptera. Victoria County History of Bedfordshire.
1, 78-88.
 4. Foster, A.H. 1934. Butterflies and Moths. The Natural History of the Hitchin Region
(R.L. Hine, Ed.), Hitchin, 120-140.
 5. West, B.B. 1949. Bedfordshire Butterflies. Bedf. Nat. 3, 16-21.
 6. — 1950. Report of recorder for Lepidoptera. Ibid 4, 50.
 7. — 1959. Report of recorder for Lepidoptera. Ibid 13, 24-33.
- Heslop, I.R.P. 1964. Revised indexed Check-list of the British Lepidoptera.
London.

- 4 *Aporia crataegi* (L.) Black-veined White 3, now extinct in Britain.
- 5 *Pieris brassicae* (L.) Large Garden White 2,3,5.
- 6 *P. rapae* (L.) Small Garden White 2,3,5.
- 7 *P. napi* (L.) Green-veined White 2,3,5.
- 9 *Anthocharis (Euchloë) cardamines* (L.) Orange-tip White 3,5.
- 10 *Leptidea sinapis* (L.) Wood White 5.
- 11 *Colias hyale* (L.) Pale Clouded Yellow 3,5, a rare migrant.
- 13 *C. croceus* Fourc., *C. edusa* Common Clouded Yellow 3,5.
- 14 *Gonepteryx rhamni* (L.) Brimstone 2,3,5.
- 16 *Parage megera* (L.) Wall Brown 2,3,5.
- 17 *P. aegeria* (L.) Speckled Wood 3,5.
- 18 *Eumenis semele* (L.) Grayling 5.
- 22 *Maniola jurtina* (L.) *Epinephile janira*, Meadow Brown 2,3,5.
- 23 *M. (Epinephile) tithonus* (L.) Gatekeeper 2,3,5.
- 24 *Coenonympha pamphilus* (L.) Small Heath 3,5.
- 26 *Aphantopus (Epinephile) hyperantus* (L.) Common Ringlet 3,5.
- 27 *Melanargia galathea* (L.) Marbled White 3,5.
- 28 *Apatura iris* (L.) Purple Emperor 3,4,5, no recent record.
- 29 *Limenitis camilla* (L.) White Admiral 5.
- 30 *Vanessa atalanta* (L.) Red Admiral 3,5.
- 31 *V. cardui* (L.) Painted Lady 2,3,5.
- 33 *Nymphalis (Vanessa) io* (L.) Peacock 2,3,5.
- 34 *N. antiopa* (L.) Camberwell Beauty 5.
- 36 *N. (Vanessa) polychloros* (L.) Large Tortoiseshell 2,3,5, no recent record.
- 37 *Aglais (Vanessa) urticae* (L.) Small Tortoiseshell 2,3,5.
- 38 *Polygonia (Vanessa) c-album* (L.) Comma 4,5.
- 39 *Argynnis paphia* (L.) Silver-washed Fritillary 1,3,5.
- 40 *A. cydippe* (L.) High Brown Fritillary 3,5.

- 42 *A. aglaia* (L.) Dark Green Fritillary 4,5.
 44 *Clossiana (Argynnis) euphrosyne* (L.) Large Pearl-bordered Fritillary 3,5.
 45 *C. (Argynnis) selene* (Schiff.) Small Pearl-bordered Fritillary 3,5, no recent record.
 47 *Melitaea athalia* Rott. Heath Fritillary 3, last record c.1850.
 49 *Euphydryas aurinia* (Rott.) *Melitaea artemis* Marsh Fritillary 3,5, last record 1953.
 50 *Hamearis lucina* (L.) Duke of Burgundy Fritillary 7.
 51 *Thecla betulae* (L.) Brown Hairstreak 3,5.
 52 *T. quercus* (L.) Purple Hairstreak 3,5.
 53 *Strymonidia (Thecla) pruni* (L.) Black Hairstreak 3,5.
 54 *S. (Thecla) w-album* (Knoch.) White-letter Hairstreak 3,5.
 55 *Callophrys rubi* (L.) Green Hairstreak 4,5.
 58 *Lycaena (Chrysophanus) phlaeas* (L.) Small Copper 2,3,5.
 63 *Aricia (Polyommatus) agestis* (Schiff.) Brown Argus Blue 3,5.
 64 *Polyommatus icarus* (Rott.), *P. alexis* Common Blue 2,3,5.
 65 *Lysandra (Polyommatus) coridon* (Rott.) Chalk-hill Blue 3,4,5.
 66 *L. bellargus* (Rott.), *Polyommatus adonis* Adonis Blue 3,4,5, no recent record.
 68 *Celastrina (Polyommatus) argiolus* (L.) Holly Blue 3,5.
 69 *Cupido minimus* (Fuessl.), *Polyommatus alsus* Small Blue 3,4,5.
 70 *Maculinea (Polyommatus) arion* (L.) Large Blue 3,5, last recorded 1819.
 71 *Pyrgus (Syrichthus) malvae* (L.) Grizzled Skipper 3,5.
 72 *Erynnis (Nisoiades) tages* (L.) Dingy Skipper 3,5.
 73 *Thymelicus sylvestris* (Pods.), *Hesperia linea* Common Small Skipper 3,5.
 74 *T. (Hesperia) lineola* (Ochs.) New Small Skipper 3,5.
 76 *Ochlodes venata* Br. & Grey, *Hesperia sylvanus* Large Skipper 3,5.
 77 *Hesperia (Pamphilus) comma* (L.) Silver-spotted Skipper 4,6.
 78 *Carterocephalus palaemon* (Pall.), *Cyclopides paniscus* Chequered Skipper 3,5, no recent record.

MOTHS (Lepidoptera) REPORT OF THE RECORDER

Although 1977 was not statistically a good year for moths, it did produce a surprising number of both new county records and confirmation of some old ones.

Work on the surveys of Flitwick Moor and Maulden Wood continued during the year, with regular weekly trapping sessions being held whenever the weather would allow. It was not possible, due mainly to adverse weather conditions, to visit many other sites of interest as had originally been planned. The cold, wet and windy weather of 1977 played a major part in keeping numbers of moths seen low, some species were not recorded at all and others were late in emerging. It is also worth considering how much damage the drought of 1976 did to both larvae and their food plants.

During the year Ian Woiwod, from Rothamsted Experimental Station at Harpenden, made available all the records from light traps that had been run at various sites within the county since 1969. Traps at both The Lodge, Sandy, and Whipsnade, have now been closed down, but these have been replaced with sites at Shuttleworth Agricultural College, Old Warden, and South Lodge, Cockayne Hatley. It is hoped that a future Journal will contain more information on some of the interesting species that these traps have produced.

Dr V.H. Chambers has also provided an impressive list of moths that he has recorded from various parts of the county since 1950. With all of this information, plus records from and research by other people, a start has been made on producing a Checklist of the Lepidoptera of Bedfordshire which will be eventually published in a future edition of the Journal.

Valuable field work has been carried out by various people in different parts of the county - Terry Hollingworth has produced some interesting records for Stotfold, a previously under-recorded part of the county. D.V. Manning has continued to trap at Sharnbrook and both P. Pilcher and Dr R. Munday have been running light traps in their gardens in Bedford. Other members commented on the abundance of the larvae of (121) Buff Tip, and (533) Mullein Shark throughout the county.

MICROLEPIDOPTERA

This large group of moths has been virtually ignored within the county for far too long - in fact there is not one mention of this group in any of the Society's Journals from 1946 onwards. D.V. Manning of Sharnbrook, has taken a special interest in this difficult group and the following note has been prepared by him.

"The Checklist of British Lepidoptera consists of some 2,400 species, including the butterflies and about 900 species of the larger moths covered by 'Moths of the British Isles' by R. South. The remaining 1,400 species are the smaller moths, or Microlepidoptera, on which the most recently published records for Bedfordshire are those listed in the V.C.H. dated 1904.

The Society has received occasional records of the smaller moths over recent years, and lists are now being kept of species identified from a number of sites in the county where light traps are being regularly used.

From records since about 1970 a county list is being prepared, with each species recorded on a ten-km square basis, with tetrad records noted where known. About 220 species are listed to date, with a few of the easily identified species each being recorded from ten different ten-km squares. Any member with records of Microlepidoptera can help by passing these on to the recorder, Mr V.W. Arnold. We will attempt to identify any specimen provided.

Specimens provided from members homes already include (1048) *Pyralis farinalis*, which emerged from a newly opened bag of flour, and (1078) *Plodia interpunctella*, bred from larvae found in a bowl of nuts. Also seen during 1977 for the first time, was (1271) *Lozotaeniodes formosana*, taken at light in Maulden Woods by V.W. Arnold."

SPECIES LIST

The following list contains new species and species of particular interest with comments where required. It should be noted that this list is not confined to species recorded just for 1977, but takes into consideration some of the information recently made available to me. The references used in the list are:

- Barrett, C.G. 1904. Lepidoptera. Victoria County History of Bedfordshire 1, 78-88. (Abbreviated V.C.H.)
 Foster, A.H. 1934. Butterflies and Moths. The Natural History of the Hitchin Region (R.L. Hine, Ed.), Hitchin 120-140. (Abbreviated N.H.H.R.)

Species marked * are new county records.

- 101 **Poplar Kitten** This species was recorded at Sharnbrook and Maulden in 1976 – this moth had not been recorded for the county since the V.C.H.
 173 **Round-winged Footman** Common at Flitwick Moor during July and early August. Only other previous record was from a Rothamsted trap at The Lodge, Sandy in 1973.
 176 **Four Dotted Footman** Only one specimen from Flitwick Moor in June – this confirms an old record for this site from the N.H.H.R.
 199* **Wood Tiger** Dr V. Chambers has provided records for this species from Bison Hill, Whipsnade, for 1959 and 1965.
 221 **Common Forester** Dr V. Chambers has provided a record for this species from Kings Wood, Heath and Reach for 1950. This species was last recorded in the V.C.H.
 222 **Cistus Forester** Dr B. Nau and Mr and Mrs Rands found several specimens of this attractive moth at Bison Hill, Whipsnade in June. Other records for the same site for 1959, 63, 73 have also been provided by Dr V. Chambers. Ray Palmer used to find this moth on Pegsdon Hills during the 1940's and 1950's – as its food plant is Rock Rose it should be a fairly common insect on the chalk hills.
 234* **Large Red Belted Clearwing** Recorded from Rowney Warren in 1956 by Dr V. Chambers.
 280 **Heart and Club** Both Dr R. Munday and P. Pilcher reported this species from their gardens in Bedford. It has been recorded at both Flitwick Moor and Maulden Woods for 1976, as well as from Rothamsted traps at Sandy, Whipsnade and Old Warden.
 321 **Great Brocaded Rustic** Dr R. Munday reported this moth from his garden in Bedford for 1976 – the only other previous record was from W.J. Champkin at Stevington in 1964.
 367 **Varied Coronet** T.S. Hollingworth, D.V. Manning, Dr R. Munday and P. Pilcher recorded this species from Stotfold, Sharnbrook and Bedford. This moth is a relative newcomer to the British Isles, but as the larvae are reported to feed on Sweet William it should be fairly abundant in the county.
 377 **Hedge Gothic** This species was abundant in 1976 at Leighton Buzzard, although other records for this species are lacking, it should be a common insect.
 386 **Lead Coloured Drab** During the evening of 14th March 1977, this was an abundant insect at Maulden Woods, however, trapping at the same site the following week produced no other specimens. The only other record comes from a Rothamsted trap at Cockayne Hatley in 1976.
 424* **Twin-spot Wainscot** One specimen taken at light, July 1976 at the foot of Dunstable Downs – presumably this had flown from a marshy habitat at nearby Well Head.
 427* **Rufous Wainscot** One at light, August 1977, Flitwick Moor.
 428 **Silky Wainscot** One at light, July 1977, Flitwick Moor. The only other previous record for this species is from a Rothamsted trap at The Lodge, Sandy for 1970.
 455* **Slender Brindle** One specimen at light, August 1977, Maulden Woods.
 543 **Grey Shoulder Knot** R. Porter found one specimen of this moth while searching for lichens on a wall at Astwick. Although it has been recorded from Rothamsted traps at Old Warden and Cockayne Hatley, it is very under-recorded from the county – due perhaps to its early emergence and its colouration.

- 544 **Cloudy Sword Grass One** taken at light in Maulden Woods, October 1977. The last record for this species comes from the V.C.H. and it seems strange that a moth of this size has been overlooked for the last 70 years.
- 552 **Minor Shoulder Knot** Recorded from Sharnbrook, Cockayne Hatley and Maulden Woods, July and August 1977 – confirmation of an old county record from N.H.H.R.
- 555 **Black Rustic** At light, 1975 and 76, Maulden Woods. The only other previous records from Rothamsted traps at The Lodge, Sandy for 1969 and 1972.
- 559 **Common Merveille-du-Jour** For the second year in succession this attractive insect has been recorded from the county. Recorded from Sharnbrook by D.V. Manning.
- 564 **Suspected One** at light, Flitwick Moor, July 1977 – another confirmation of an old record for this site from N.H.H.R. This species had previously been taken at a Rothamsted trap at The Lodge, Sandy in 1970.
- 565 **Brindled Green Mottle** Recorded from Maulden Woods, September 1976 and 77 – previous record for this attractive species was in the V.C.H.
- 588* **Pale Lemon Sallow One** taken at light, September 1976, Maulden Woods.
- 606* **Silver Hook One** at light, July 1977, Flitwick Moor.
- 641 **Four-spot Dr V. Chambers** reported that this species was fairly common on Souldrop Tunnel during the summer of 1977 and prior.
- 668* **Light Orange Underwing** This attractive day flying moth was recorded by A.J. Martin from Marston Thrift in 1976 flying around Aspen.
- 688 **Clay Triple Lines** At light, Maulden Woods, 1976, and from a Rothamsted trap at Old Warden.
- 773 **Blue-bordered Carpet** July 1977, at light, Flitwick Moor – this attractive insect appears to be under recorded for the county.
- 780 **Grey Spruce Carpet** Recorded by Dr R. Munday from his garden in Bedford. Previously recorded from a Rothamsted trap at Old Warden, but prior to that not since it was mentioned in N.H.H.R. from Rowney Warren.
- 782* **Reddish Pine Carpet One** at light, Maulden Woods, July 1977.
- 822 **Mallow Carpet** Recorded from Stotfold by T. Hollingworth, previously only recorded from Rothamsted traps.
- 824 **Large Autumnal Carpet** Taken at Flitwick Moor and Maulden Woods – identification being confirmed by genitalia tests.
- 827 **Christy's Carpet** As previous species.
- 834 **Dingy Shell** Recorded at Flitwick Moor for 1976 only – confirmation of an old county record for this site – as per N.H.H.R.
- 838* **Cloaked Pug** Several specimens of this moth were taken at light, July 1977, Maulden Woods.
- 901* **Blunt Peacock Angle One** at light, June 1977, Flitwick Moor; the only other previous record is from a Rothamsted trap at Old Warden in July 1976.
- 916 **Lunar Thorn One** at light, Marston Thrift, June 1976. This insect has mainly been recorded from Rothamsted traps at Sandy, Old Warden and Cockayne Hatley, although W.J. Champkin recorded it from Putnoe Woods in 1965.
- 945 **Pale Oak Beauty** Recorded at light, Maulden Woods and Flitwick Moor for both 1976 and 77. Previously from Rothamsted traps at Old Warden and Sandy.
- 950 **Grey Birch Beauty** At light, Flitwick Moor, 1976 and 77 – prior to 1972 when it was recorded from a Rothamsted trap at The Lodge, Sandy, this insect had not been recorded in the county since V.C.H.

Numbers and English names as per Checklist of the British Lepidoptera by I.R.P. Heslop, (1964 Library Edition).

My thanks goes to the following for records and assistance: Mrs F.B.M. Davies, Mrs E.B. Rands, Mrs J. Toomer, Miss L. Janes, Dr V.H. Chambers, Dr N. Janes, Dr R. Munday, Dr B.S. Nau, Messrs R. Collings, T.S. Hollingworth, K. Lee, D.V. Manning, A.J. Martin, D. Mason, R. Port, R. Porter, P. Pilcher, D.G. Rands, R.B. Stephenson, T.J. Thomas, I.P. Woiod and T. Willet-

Whittaker (British Museum Natural History). Also to the Forestry Commission and its staff for all their help and hospitality, and to the staff of the Light Trap Dept. at Rothamsted for their assistance in identifying some of the critical species.

ADDENDUM

(617) Nut-tree Tuffet was recorded from Leighton Buzzard and not Dunstable. (Bedf. Nat., 31, 1976.)

V.W. ARNOLD

LADYBIRDS (Coleoptera-Coccinellidae)

REPORT OF THE RECORDER

My first report in Bedfordshire Naturalist, 31, was remarkable in the number of species it recorded: 19 is a good list by any standard. However, for most of these, less than 50 records were received from a possible total of 381 tetrads.

Three species were added to the list in 1977 raising the total for the county to 22.

SYSTEMATIC LIST

The order and nomenclature follows that adopted by Pope, R.D. (1953). *Coleoptera-Coccinellidae* and *Sphindidae*. Roy. Ent. Soc. Lond. Hbks for Identification of British Insects, 5,7.

The number of tetrads for which the species is recorded is shown in brackets.

*species new to the county.

**Subcoccinella 24-punctata* (1)
Exochomus quadripustulatus (10)
Anisosticta 19-punctata (5)
Neomysia oblongoguttata (2)
Tytthaspis 16-punctata (36)
Harmonia 4-punctata (5)
Anatis ocellata (3)
Aphidecta oblitterata (3)
Thea 22-punctata (26)
Myrrha 18-guttata (4)
Propylea 14-guttata (146)

Calvia 14-guttata (7)
Rhyzobiellus litura (21)
 **Scymnus frontalis* (1)
Chilocorus renipustulatus (2)
Coccinella hieroglyphica (1)
C. 11-punctata (102)
C. 7-punctata (180)
Adalia 10-punctata (26)
A. bipunctata (117)
A. bipunctata x *10-punctata* (2)
 **Coccidula rufa* (7)

Clearly, many more records are needed. Even the two commonest and most easily recognisable species, the 7-spot and 2-spot have been recorded in only 180 and 117 tetrads respectively. However, I must record my thanks to those who have provided the bulk of the records: V.W. Arnold, A.R. Catlin, Mrs F.B.M. Davies, A. Davies, Lynne Janes, B.S. Nau, D.G. and Mrs E.B. Rands, and Miss H.M. Webb.

J.R.A. NILES

FISH SKIN WEEK IN MAULDEN WOOD

BY N.F. JANES, Ph.D., 105 MONTROSE AVENUE, LUTON, BEDS.

As a contribution to a national survey of blowflies (*Calliphoridae*), publicised as "National Fish Skin Week", a study was undertaken in Maulden Wood. Participants in the survey were requested to collect all flies which visited bait in a specified period. The study was extended to a series of sites in the Maulden Wood area in an attempt to detect correlation between distribution and habitat.

METHOD

The traps (Figure 1) were constructed from a polythene bag, 25 x 40 cm, and a cone of stiff paper, using a stapler. Initial trials with a piece of fish skin (at least twelve hours ex refrigerator) as bait showed the traps to be effective when pegged 0.3 – 1.0 m. above ground level, as long as the mouth was kept well open and faced upwards. 40 such traps (total cost less than £1) were used in the survey.

The area studied and the siting of the traps are shown in Figure 2. Traps 1-12 and 14-21 were on Boulder Clay, 13 and 28-44 were on Lower Greensand and 22-27 on the boundary between them. On the morning of 23 July, 1977, four observers pegged traps on suitable branches, fences and brambles and repeated the circuit three hours later to collect the traps. A tissue soaked in ethyl acetate was introduced into each trap to kill the insects, when the bait could be removed and discarded. The next day the insects in

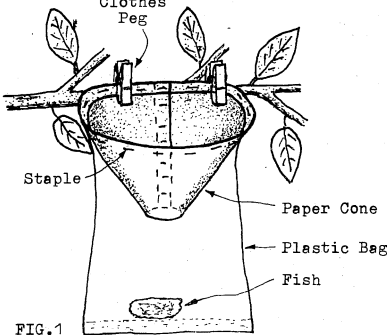


FIG. 1

all the traps were counted, the beetles separated from the flies and representative collections of the flies pinned. The remainder were stored in alcohol prior to identification.

RESULTS AND DISCUSSION

The weather during the day was hot, humid and continuously sunny with a strong south-westerly wind. Full descriptions of the environment of each site and at least partial species lists are available from the author. The table summarises the results for each of the 44 traps. A list is added of all the insects recorded in the survey with their relative abundance. All the species are considered to be generally common in the British Isles except *Lucilia richardsii*, which is considered to be only frequent, and *L. ampullacea*, said to be scarce.

The traps worked effectively catching enough insects to justify comparison between sites. Comparing the traps on the Boulder Clay with those on the Greensand, the average numbers of flies per trap were similar for the two areas, but for the beetles there was a noticeably higher catch for Boulder Clay traps. This is possibly connected with the fact that only two species were found in quantity whereas there were many more species of flies, and the necessary breakdown of counts by species (rather than total of flies) was not done.

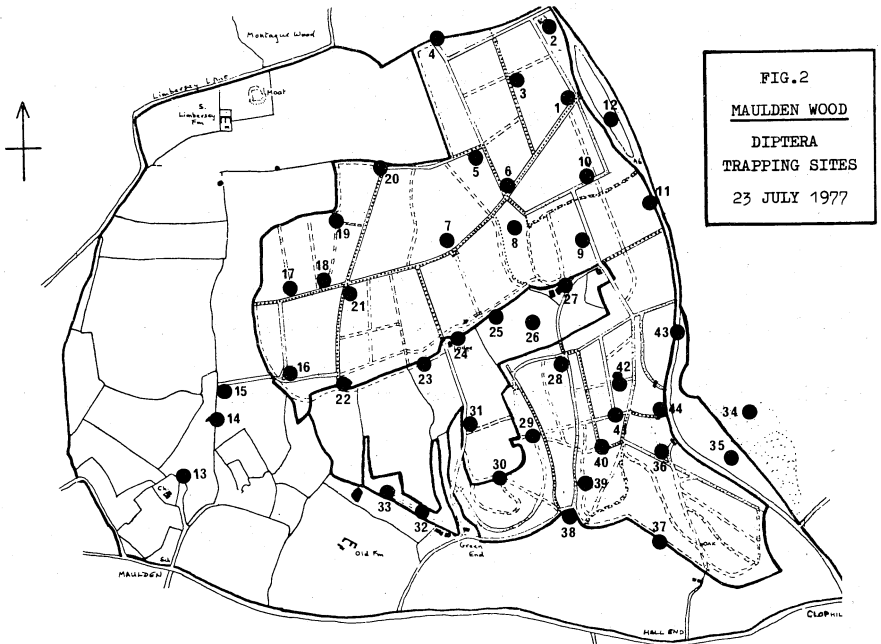
The largest catches were near the A6 lay-by (traps 1 and 12) and near habitation (traps 4 and 32) where the extra food available was probably attracting a higher density of flies. The two species of bluebottle, *Calliphora vicina* and *C. vomitoria*, prefer town and country habitats respectively, but the former was the more common species in Maulden Wood.

The greenbottles (*Lucilia*) were found more from the anticipated situations. Thus, *L. caesar* and *L. illustris*, both shade-loving species, were dominant in most of the wood, but

Table : Numbers of Insects Trapped

Trap No.	Degree of shade	Number of flies	Number of Beetles	Trap No.	Degree of shade	Number of flies	Number of beetles
1	half	224	11	21	dense	50	-
2	nil	65	1	22	half	96	1
3	half	67	1	23	nil	104	2 ^a
4	half	202	1	24	nil	4	-
5	full	55	27	25	full	96	4
6	nil	103	11	26	nil	c	c
7	half	52	1	27	nil	6	-
8	dense	92	1	28	full	71	-
9	half	65	1	29	half	49	-
10	nil	56	5	30	nil	89	-
11	nil	58	3	31	nil	c	c
12	half	222	4	32	half	213	2
13	full	72	-	33	full	61	-
14	half	66	1	34	half	28	1
15	half	59	4	35	half	8	1
16	half	72	-	36	full	97	-
17	nil	25	14	37	full	70	1
18	dense	43	1	38	full	91	1
19	nil	34	1	39	dense	44	-
20	half	88	10	40	full	169	-
				41	full	c	c
				42	full	21	-
				43	nil	55	3
				44	full	122	1 ^b

a +2 wasps
 b 2 ants
 c sample spoilt



SPECIES RECORDED IN THE SURVEY

Diptera

PIOPHILIDAE	<i>Protophila latipes</i> – in almost all traps. <i>Piophila vulgaris</i> – in almost all traps.
OTITIDAE	<i>Herina germinationis</i> – in two traps.
SCATOPHAGIDAE	<i>Scatophaga stercoraria</i> – in two traps.
MUSCIDAE	<i>Muscina pabulorum</i> – in most traps. <i>M. assimilis</i> – in most traps. <i>Ophyra leucostoma</i> – in numerous traps. <i>Hydrotaea dentipes</i> – in all traps. <i>Fannia canicularis</i> – in most traps. <i>F. manicata</i> – in all traps. <i>F. hamata</i> – in numerous traps.
CALLIPHORIDAE	<i>Calliphora vicina</i> – in most traps. <i>C. vomitoria</i> – in a few traps. <i>Lucilia ampullacea</i> – in traps 3 and 4. <i>L. caesar</i> – in numerous traps. <i>L. illustris</i> – in a few traps. <i>L. richardsii</i> – in trap 11 only. <i>L. sericata</i> – in a few traps.
SARCOPHAGIDAE	<i>Sarcophaga scoparia</i> – in trap 3 only. <i>S. subvicina</i> – in numerous traps. <i>S. hirticrus</i> – in trap 1 only.

Coleoptera

SILPHIDAE	<i>Thanatophilus rugosus</i> – in numerous traps.
HISTERIDAE	<i>Necrophorus vespillo</i> – in trap 31 only. <i>Saprinus semistriatus</i> – in numerous traps.

L. sericata and *L. richardsii*, known to favour sunny and open habitats, were commoner in traps 16 to 20, 32 and 33 which were at less sheltered sites. *L. ampullacea*, the one scarce species, is reported as causing myiasis in frogs, so it is not clear why it was found only in traps 3 and 4 since there is no open water near by.

ACKNOWLEDGEMENTS

I am deeply indebted to Mr James Dear of the British Museum (Natural History) for his support and advice throughout and particularly for his hard work in identifying the flies and assessing their relative abundance. Also for his expert comments on their distribution which form the basis of much of this paper. I wish also to acknowledge the enthusiastic help of Mrs E.B. Rands (design and supply of the traps and trapping), B.S. Nau (planning, trapping and identification of beetles) and D.G. Rands (trapping and preparing figures).

WOODLICE, CENTIPEDES AND MILLIPEDES

(Isopoda, Chilopoda and Diplopoda)

REPORT OF THE RECORDER

There was much progress during the year and the number of tetrad records in each group was about doubled. Three woodlice and four millipedes are recorded for the first time from the vice-county of Bedford (no. 30).

WOODLICE AND WATER LICE (Isopoda)

The addition of three species brings the total for the vice-county up to nineteen. The most exciting new record was undoubtedly of the very small, usually pink woodlouse *Trichoniscoides albidus* which has otherwise only been recorded five times since 1960 in Britain. The year saw the discovery of eleven Bedfordshire sites, generally distributed. It would appear to have been overlooked here and elsewhere because it lives in wet, often waterlogged, soil by the sides of streams and ditches – a most unsavoury environment. *Trachelipus rathkei*, predicted as likely last year, turned up in two typical habitats. *Haplophthalmus mengei*, a very small white species occurring locally in southern Britain was found at two sites.

564 tetrad records were obtained during the year, bringing the total to 1,082 (see Figure 1). On a larger scale this represents 204 10 km. records (see Table 1). Two previously recorded species have still to be refound. The record of *Porcellio dilatatus* from TL03 was in error and is now deleted.

CENTIPEDES (Chilopoda)

No new centipedes were added to the vice-county list. 287 tetrad records were obtained, bringing the total to 503 (see Figure 2). 59 new 10 km. records brings the total to 181 (see Table 2).

MILLIPEDES (Diplopoda)

All remaining problems of millipede identification have now been sorted out so the list presented in Table 3 is the first full statement of our recording. Four new vice-county records brings the total to twenty-seven. *Iulus scandinavius* and *Cylindroiulus britannicus* are segregates of previously unidentified species pairs. *Polydesmus coriaceus* and *Macrostermodesmus palicola* were both predicted as bound to occur last year. The former turned up at two sites in the north of the county and the latter was found by sieving soil from under a roadside hedge in Silsoe.

244 tetrad records were obtained, bringing the total to 483 (see Figure 3). There are now 201 10 km. records.

ACKNOWLEDGEMENTS

The Recorder would like to thank Mr J.G. Blower and Dr C.P. Fairhurst for their help with millipede identification. Mrs E.B. Rands and Mr D.G. Rands both deserve special thanks, not only for the many records they obtained but also for tolerating me during my forays into the county. I would also like to thank the following for their records: Mr V.W. Arnold, Mr R. Bradshaw, Mrs C.M. Dony, Dr J.G. Dony, Mr D.T. Green, Mr T.S. Hollingworth, Dr N.F. Janes and Dr B.S. Nau.

REFERENCES

- Harding, P.T. 1976 Provisional Atlas of the Crustacea of the British Isles
Part 1. *Isopoda* : *Oniscoidea* (Woodlice). Abbots Ripton
(Natural Environment Research Council), 48 pp.

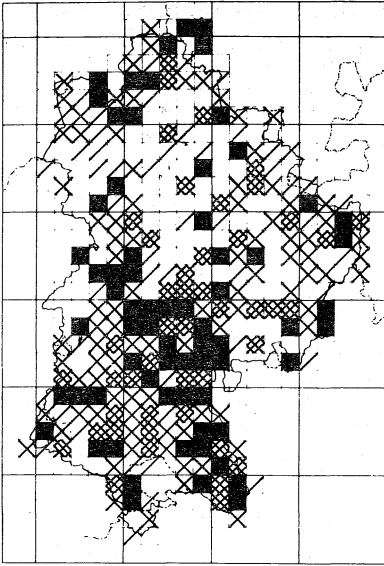


Figure 1

Isopod Summary Map

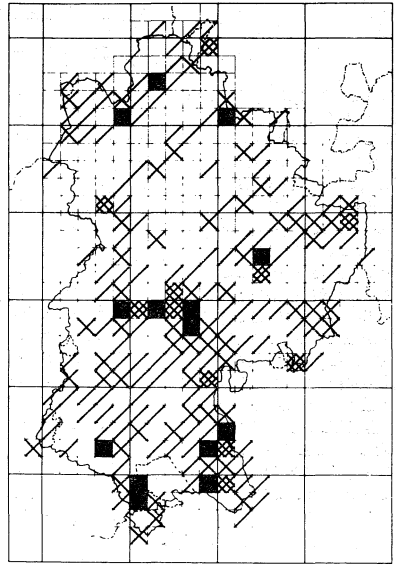


Figure 2

Chilopod Summary Map

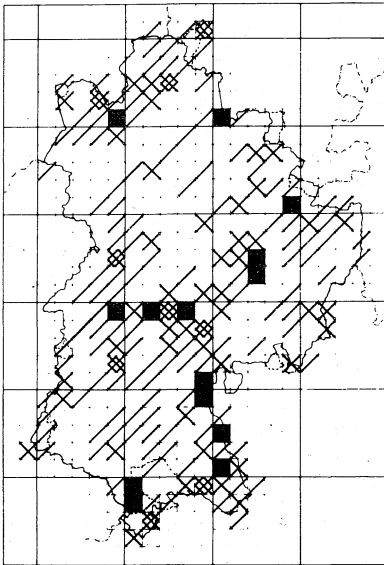


Figure 3

Diplopod Summary Map

KEY

No. of
Species



1 - 2



3 - 4



5



6 →

TABLE 1: DISTRIBUTION OF ISOPODS BY 10 KM. SQUARES

Grid Square	TL	SP	TL	TL	SP	TL	TL	SP	TL	TL	TL	TL	TL	TL	TL	SP	SP	TL	TL	TL	TL	TL	TL	TL	No. of tetrad records
	07	96	06	16	95	05	15	25	94	04	14	24	93	03	13	23	82	92	02	12	91	01	11		
<u>Platyarthrus hoffmannseggii</u>	.	x	x	.	.	.	x	.	x	x	x	.	.	x	x	.	.	x	x	.	x	x	.	37	
<u>Oniscus asellus</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	213	
<u>Philoscia muscorum</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	201	
<u>Cylisticus convexus</u>	.	.	.	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	.	1
<u>Porcellio dilatatus</u>	.	.	.	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	0	.	.	.	.	1
<u>Porcellio scaber</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	177	
<u>Metoponorthus pruinosus</u>	x	.	x	.	.	.	x	.	x	x	x	.	x	x	x	.	x	.	x	.	x	.	x	18	
* <u>Trachelipus rathkei</u>	0	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	x	.	.	.	.	.	2
<u>Armadillidium nasatum</u>	.	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	-
<u>Armadillidium vulgare</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	.	x	x	x	x	x	x	159	
<u>Trichoniscus pusillus agg.</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	0	x	x	.	155	
<u>Trichoniscus pygmaeus</u>	x	x	.	x	x	.	.	x	x	x	.	x	x	x	.	x	x	x	0	x	0	x	x	34	
<u>Androniscus dentiger</u>	.	x	x	0	x	0	.	.	x	x	x	x	x	x	.	0	x	22
* <u>Trichoniscoides albidus</u>	x	.	.	.	.	x	.	.	x	x	.	x	x	.	.	.	.	.	.	.	.	.	x	11
<u>Trichoniscoides sarsi</u>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0	.	.	.	.	.	-
<u>Haplophthalmus danicus</u>	.	x	x	0	x	0	x	.	x	x	x	.	x	x	.	.	x	.	.	.	x	.	x	20	
* <u>Haplophthalmus menzei</u>	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	.	.	2
<u>Asellus aquaticus</u>	.	.	.	x	x	x	.	.	x	x	x	.	.	x	.	.	x	.	.	.	.	.	x	23
<u>Asellus meridianus</u>	.	.	.	.	x	x	x	.	.	x	.	x	.	.	.	.	.	.	.	.	.	.	.	6
Totals:	9	9	9	7	10	8	10	6	10	13	13	9	9	11	8	8	4	12	8	8	5	11	7	1,082	

* Species new to the vice-county
 o Additional records given in Harding (1976) and not refound. These are not necessarily Bedfordshire records. These are excluded from the totals given above.

TABLE 2: DISTRIBUTION OF CHILOPODS BY 10 KM. SQUARES

Grid Square	TL	SP	TL	TL	SP	TL	TL	SP	TL	TL	TL	TL	TL	TL	TL	SP	SP	TL	TL	TL	TL	TL	TL	No. of tetrad records	
	07	96	06	16	95	05	15	25	94	04	14	24	93	03	13	23	82	92	02	12	91	01	11		
<u>Haplophilus subterraneus</u>	.	x	.	.	.	.	.	.	.	x	x	x	.	.	x	x	.	.	x	.	x	.	.	10
<u>Schendylia nemorensis</u>	.	x	.	.	.	.	x	.	x	x	x	x	x	x	.	.	.	.	x	x	.	.	.	33
<u>Chaetechelyne montana</u>	x	.	.	.	.	1	
<u>Strigamia crassipes</u>	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	x	.	.	x	.	.	.	x	4
<u>Strigamia acuminata</u>	x	x	x	x	x	.	.	.	.	.	.	.	.	x	.	.	.	.	.	x	.	.	.	13
<u>Geophilus carpophagus</u>	.	x	x	.	x	.	.	.	.	x	.	x	x	x	.	.	.	.	.	.	.	.	.	12
<u>Geophilus insculptus</u>	x	4	
<u>Neurophloeophagus longicornis</u>	.	x	x	x	.	x	x	x	x	.	x	x	x	x	x	x	x	x	x	x	x	x	x	40	
<u>Brachygeophilus truncorum</u>	.	.	x	.	x	x	.	.	x	x	x	x	.	.	.	.	.	.	x	x	x	.	x	21
<u>Cryptops hortensis</u>	.	x	x	.	.	.	.	.	x	x	x	.	.	.	.	.	.	.	.	x	.	.	.	11
<u>Lithobius variegatus</u>	.	.	x	x	x	.	x	x	x	x	x	x	.	.	.	.	.	.	x	.	x	.	x	32
<u>Lithobius forficatus</u>	x	x	x	x	x	x	.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	140	
<u>Lithobius melanops</u>	.	.	.	x	.	.	x	.	.	x	x	.	x	x	x	.	.	.	x	x	x	x	x	35	
<u>Lithobius lapidicola</u>	x	.	.	.	.	.	.	.	.	1	
<u>Lithobius aulacopus</u>	x	.	.	.	.	.	.	.	.	1	
<u>Lithobius muticus</u>	x	.	.	.	.	.	.	x	3	
<u>Lithobius calcaratus</u>	x	.	.	.	.	.	.	.	1	
<u>Lithobius crassipes</u>	.	x	x	x	.	x	.	x	x	x	x	x	x	x	x	.	.	.	x	x	x	.	x	46	
<u>Lithobius microps</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	93	
<u>Lamyctes fulvicornis</u>	x	2
Totals:	3	10	9	7	9	6	6	3	7	9	11	7	11	13	9	7	3	9	12	9	4	11	6	503	

TABLE 3: DISTRIBUTION OF DIPLOPODS BY 10 KM. SQUARES

Grid Square	TL	SP	TL	TL	SP	TL	TL	TL	SP	TL	TL	TL	SP	TL	TL	TL	SP	SP	TL	TL	SP	TL	TL	No. of tetrad records
	07	96	06	16	95	05	15	25	94	04	14	24	93	03	13	23	82	92	02	12	91	01	11	
<u>Polyxenus laurus</u>	x	.	.	.	.	.	.	.	.	.	x	.	.	x	.	.	x	.	x	.	.	.	.	7
<u>Glomeris marginata</u>	.	x	x	x	.	x	.	x	.	x	x	x	x	x	.	.	.	.	x	x	x	x	x	51
<u>Geoglomeris jurassica</u>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	.	.	x	.	3
<u>Chordeuma proximum</u>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
<u>Polymicrodon polydesmoides</u>	.	.	.	.	.	.	x	.	x	x	x	x	.	x	x	.	.	x	x	x	x	x	.	23
<u>Brachydesmus superus</u>	.	x	.	x	.	x	x	.	x	.	x	x	x	x	x	.	.	x	x	.	.	x	.	41
<u>Polydesmus angustus</u>	x	.	x	.	x	.	x	.	.	x	x	.	x	x	x	.	x	x	x	x	.	x	x	45
* <u>Polydesmus coriaceus</u>	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
<u>Polydesmus denticulatus</u>	.	.	x	.	x	.	x	.	.	x	x	.	x	x	x	.	.	x	x	x	.	.	.	18
<u>Polydesmus gallicus</u>	.	x	x	x	.	.	x	.	x	x	.	.	x	x	.	.	.	.	.	.	.	x	.	22
* <u>Macrosternodesmus palicola</u>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
<u>Ophiodesmus albananus</u>	.	.	.	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	x	.	.	x	.	6
<u>Isobates varicornis</u>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	x	3
<u>Choneiulus palmatus</u>	.	.	.	.	.	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	.	1
<u>Blaniulus guttulatus</u>	.	x	.	.	.	.	x	.	.	.	.	x	.	.	x	.	x	.	x	x	.	x	x	16
<u>Archiboreoiulus pallidus</u>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	2
<u>Boreoiulus tenuis</u>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	2
<u>Proteroiulus fuscus</u>	x	.	.	.	x	.	.	.	.	x	x	x	x	x	.	.	.	x	.	x	.	x	.	17
* <u>Iulus scandinavicus</u>	x	x	.	.	.	.	.	.	.	.	.	.	.	x	.	.	x	.	.	.	.	.	.	4
<u>Ophiulus pilosus</u>	.	x	x	x	.	x	x	.	x	x	x	.	.	x	x	x	.	x	.	.	.	.	x	17
* <u>Cylindroiulus britannicus</u>	.	.	.	.	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	5
<u>Cylindroiulus parisiorum</u>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
<u>Cylindroiulus punctatus</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	.	x	x	70
<u>Cylindroiulus teutonicus</u>	.	.	.	.	.	.	x	.	.	x	x	.	.	x	x	.	.	.	x	.	.	x	.	12
<u>Brachyiulus pusillus</u>	.	x	.	.	.	.	x	.	.	x	.	.	.	.	.	.	.	.	.	.	.	.	.	3
<u>Ommatoiulus sabulosus</u>	.	.	x	.	.	.	.	.	.	x	x	x	x	x	x	x	.	x	.	.	.	.	.	12
<u>Tachypodoiulus niger</u>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	.	x	x	97
Totals:	6	9	9	6	5	5	12	3	6	13	15	7	11	20	8	7	4	10	11	10	2	16	6	483

FLOWERING PLANTS, FERNS AND FERN ALLIES (Spermatophyta and Pteridophyta)

REPORT OF THE RECORDER

This has been a most profitable year and one to be remembered for the abundance of annual species. 1,280 additional tetrad records were made including 78 new ten-kilometre square records of which 13 were confirmations of records made between 1935 and 1969. A number of species feared to have become extinct in the county were refound. Nancy Dawson drew my attention to White Sedge (*Carex curta*), no longer to be seen at Flitwick Moor, in a small marsh near Shefford (13J). V.H. and B. Chambers found Wood Barley (*Hordeium europaeus*) in a wood also near Shefford (13P, 14K): this had not been recorded this century for that part of the county in the Watsonian vice-county 30 Bedford. In company with P.J. Ellisop, my wife and I found Mousetail (*Myosurus minimus*), last recorded 1934, on the new Millbrook golf course (03E) and with Mrs B.H.S. Russell the Scaly Male-fern (*Dryopteris pseudomas*), last recorded 1953, in Kings Wood, Houghton Conquest (04K). We were also pleased to refind Mudwort (*Limosella aquatica*) in Woburn Park (93R) where it had last been seen in 1946.

The records which pleased me most were of Green-winged Orchid (*Orchis morio*) in two pastures in South Bedfordshire where it was not uncommon until about thirty years ago. In the site with the largest population it grew with Frog Orchid (*Coeloglossum viride*) the first record of this species for the county other than on chalk downland for almost a hundred years.

A few new alien species were added to the flora - *Agrostis scabra*, *Convolvulus erubescens* and *Phalaris angusta*, all wool adventives, and *Deschampsia danthonioides* introduced with grass seed. A new hybrid was also added in that of the introduced but well established Green Nightshade (*Solanum sarrachoides*) with the Black Nightshade (*S. nigrum*). Dr C.A. Stace of Leicester University observed a broom, (*Cytisus striatus*), spreading on the banks of the M1 at Tingrith where it was probably originally planted during the construction of the motorway. In time this may become as much a feature of the sandy area of the county as Spanish Broom is fast becoming.

During the year I made another contribution to the study of the flora of the county in a paper in *Biological Conservation* 11,307-20 on "Change in the flora of Bedfordshire, England, from 1798 to 1976". By using two methods to study change in the natural vegetation it was shown that, in both a period of nearly two centuries and in a more recent period of 26 years, the floras of the woodlands and calcareous grasslands have remained remarkably constant but those of heath and acid grasslands and of marshes and water meadows have diminished.

J.G. DONY

MOSSES AND LIVERWORTS (Bryophytes)

REPORT OF THE RECORDER

Following a somewhat wetter summer the mosses and liverworts in the county have a healthier appearance than in recent years. No species have been discovered as new to the county in the last twelve months but *Tortula ruralis* and *Fissidens taxifolius* may be added to the list of species recorded for Flitwick Moor published in the 1974 journal.

The degree of support from other members in sending records is extremely disappointing and I would be very grateful to any members prepared to assist in remedying this situation. It is not necessary to identify specimens yourselves; merely send them to me, localised by grid reference and I will do the rest. Help is especially needed for 10km. squares SP 96, TL 05, 06, 15, 16, 23, 24, 25.

ALAN R. OUTEN

FRUTICOSE LICHENS IN BEDFORDSHIRE

BY FRANCES B.M. DAVIES, RECORDER FOR LICHENS

Fruticose or shrub-like lichens now grow abundantly only in the south and west of England and Wales, the extreme north of England, Scotland and Ireland. So far, only five fruticose forms have been found in Bedfordshire. Contributory factors for the paucity of these fruticose lichens may be the effects of sulphur dioxide pollution of the atmosphere and the lack of well established trees providing suitable substrates.

Table: Distribution of Fruticose Lichens by 10km. Squares

Lichen Species	10km. Squares											
	SP 92	SP 93	SP 96	TL 01	TL 02	TL 03	TL 06	TL 12	TL 13	TL 15	TL 23	
<i>Cetraria glauca</i>	X	X	X	X		X	X		X		X	
<i>Evernia prunastri</i>	X	X		X	X	X		X	X			
<i>Ramalina farinacea</i>		X									X	
<i>Ramalina fastigiata</i>	X											
<i>Usnea subfloridana</i>	X				X							

Where these fruticose lichens occur in Bedfordshire, specimens are often small or stunted and growing on solitary trees in sheltered sites. One particularly rewarding site is a small area of woodland near Billington, where one ash tree has a remarkable community of lichens growing on the south west side of the trunk. *Evernia prunastri* is especially abundant extending over most of the trunk with one plant of *Ramalina fastigiata* near the base of the tree. Additionally, there are a number of foliose or leaf-like lichens such as *Parmelia physodes*, *P. glabratula*, *P. saxatilis* and *P. sulcata*. Crustose or crust-like lichens are represented by *Lecanora chlorotera* and *Pertusaria hymenea*. Close by on another tree there is one small plant of *Usnea subfloridana*. This distinctive assemblage of lichen species is a typical one for trees with moderately acid barks.

Another well-established ash tree some 100 metres away, but still part of the same woodland, supports a comparatively disappointing flora, since there are far fewer plants on this tree. Close inspection reveals many *Evernia prunastri* but all are extremely small plants, in most cases less than a quarter of the size of those growing on the former tree.

This variability may be explained by the theories of Hawksworth and Rose (1976). They suggest that declining species persist once established but are unable to colonise new substrates in a now changing and probably hostile environment. Also, the reduction in size seen in many species may be due to changes in photosynthetic rates associated with higher levels of sulphur dioxide pollution. Thus this woodland may show the remnants of a once flourishing lichen flora now sadly in decline.

There are similar examples elsewhere in the county e.g. the Barton Hills and Stockgrove Park. More fieldwork is necessary to test the theory put forward by Hawksworth and Rose or an alternative idea that these lichens are becoming re-established in the county due to a fall in pollution levels or other influencing factors such as changing woodland management and farming techniques. Nevertheless, it is rewarding to find that some fruticose lichens do still exist in Bedfordshire, a county thought by many to be devoid of these species.

ACKNOWLEDGEMENTS

I wish to thank all those who have contributed records or suggested likely sites, especially B.S. Nau, R.A. Porter, Mrs E.B. Rands and M.C. Williams.

REFERENCES

Hawksworth, D.L. and Rose, F. 1976: Lichens as Pollution Monitors. Studies in Biology No.66

THE FUNGUS FORAY

BY D.A. REID Ph.D., RECORDER FOR FUNGI

The fungus foray, held on October 30th, with Dr D.A. Reid as leader, was attended by about 40 people who were either members of our Society or the British Mycological Society. The morning was spent in Wilshamstead Wood, which turned out to be a rather unsuitable area consisting of dense plantation or scrub traversed by boggy rides. Because of this it was decided to move on to nearby Maulden Wood after lunch. The fungi collected in these two localities are listed separately. A total of 98 species was found in Wilshamstead and 81 in Maulden and of these 16 were new to the county and one confirms an old record.

An interesting find in Wilshamstead Wood was that of *Lepista saeva*, better known as the Blewitt. This fungus, which differs from the more common *L. nuda* or Wood Blewitt in having a pale dirty brown cap devoid of lilac tints, is characteristic of open grassy situations, and its occurrence in overgrown woodland is most unusual.

Striking specimens of *Coprinus picaceus* or the Magpie Fungus were found in both localities. The fruitbodies are up to a foot or more high with a conical or campanulate cap rather similar to *C. comatus* but as the cap of the 'magpie' matures it becomes greyish then black with contrasting white patches of velar tissue; hence the common name.

Another interesting *Coprinus* determined by Miss Holden was *C. ellisii*. Similar to *C. micaceus* and its allies, it is distinguished by having shorter narrower cylindrical-phaseoliform spores, 6-8.5 x 3-3.75µm, and a veil which usually forms a brown volva-like covering at the base of the stem.

Although found previously in Odell Great Wood, *Russula perlargonii* is worthy of note since it is seldom recorded in Britain – probably because it is so easily confused with *R. fragilis*, from which it can be separated by its cream-coloured spore-print and less completely reticulated spore ornamentation.

The remaining agarics new to the county are mostly rather small and not very exciting to look at. *Conocybe appendiculata* belongs to that group of species within the genus having a veil, although when the cap expands the veil ruptures and leaves conspicuous white fragments hanging from the striate margin of the small conical, pale honey-coloured cap. *C. filaris* belongs to the same group but here the veil leaves a well developed ring on the stem and the cap tends to open, reaching 4-11 mm in diam. Another small brown-spored agaric found on rotten wood was *Naucoria centunculus*. This has a small olive-brown hemispherical cap, which is pruinose due to cystidia, and phaseoliform spores.

Perhaps the most interesting find was that of *Psathyrella canocephs*. This belongs to a section of the genus with relatively few species, all of which lack facial cystidia. The small conical caps are densely covered with the white fibrillose veil, and the reddish-brown spores measure 8-10 x 5-6 µm.

Species of *Crepidotus* all look alike since the fruitbodies form small white shell-shaped caps. As a result each gathering has to be checked microscopically before it is possible to name it. However, *C. luteolus* differs from the other species in that the pilei start yellow and fade to white. *Clitopilus pinsitus* could be mistaken for a *Crepidotus* due to the white pleurotoid fructifications but these produce pink as opposed to brown spores. These pink spores are ornamented with longitudinal ridges.

Mycena candida is a tiny white delicate fungus with decurrent gills and is found only on debris of *Symphytum*. *Marasmius recubans* is if anything even smaller, with tiny white cap and brown stalk. It is similar to *M. epiphyllus*, and like that species occurs on fallen leaves, but is

separated from it in having well developed gills and larger more ventriform-fusoid spores, 13-14.5 x 5-6 μ m.

Of the Aphyllophorales, *Oxyporus obducens* forms whitish resupinate poroid fructification with strongly encrusted cystidia in the hymenium. The two species of *Peniophora* also form resupinate fruitbodies, but with a smooth fertile surface; in *P. lycii* the hymenium is ashy-grey whereas in *P. laeta* it is orange to flesh-coloured and often slightly tuberculate. The latter fungus is restricted to twigs of *Carpinus*.

Myxarium subhyalinum forms a thin gelatinous film on the undersides of logs. It is recognized under the microscope by its myxarioid, stalked tremellaceous basidia, small sausage-shaped spores and scanty cystidia.

Two Discomycetes worthy of note were *Helvella ephippium* recognised by its pale greyish fruitbodies with villose exterior, and *Peziza micropus* which produces fawn to pale chestnut-brown shortly stalked cup-shaped fruitbodies on wood. It is one of those fungi which have become more abundant during recent years and is often found in abundance on dead elms.

Species collected in Wilshamstead Wood:-

Armillaria mellea; *Bolbitius vitellinus*; **Clitopilus pinsitus*; *Collybia cirrhata*; **Conocybe appendiculata*; *C. filaris*; *C. rickeniana*; *Coprinus disseminatus*; **C. ellisii*; *C. impatiens*; *C. lagopus*; *C. micaceus*; *C. picaceus*; *C. plicatilis*; *Crepidotus herbarum*; **C. luteolus*; *Flammulina velutipes*; *Hebeloma sacchariolens*; *Hygrophorus leucophaeus*; *H. niveus*; *Inocybe eutheles*; *I. geophylla*; *I. geophylla* var. *lilacina*; *Laccaria laccata*; *Lactarius subdulcis*; *Lepista saeva*; *Marasmius epiphyllus*; *M. ramealis*; *M. recubans*; *Melanoleuca melaleuca*; *Mycena aetites*; **M. candida*; *M. galericulata*; *M. galopus*; *M. galopus* var. *candida*; *M. inclinata*; *M. leptocephala*; *M. leucogala*; *M. polygramma*; *M. speirea*; *M. swartzii*; *M. tenerima*; **Naucoria centunculus*; *Panaeolina foenicisii*; *Pholiota gummosa*; *Pluteus phlebophorus*; **Psathyrella canocephus*; *P. gracilis*; *Stropharia aeruginosa*; *S. inuncta*; *Tubaria furfuracea*;

Chondrostereum purpureum; *Clavulina cristata*; *Coniophora puteana*; *Coriolus versicolor*;

Daedaleopsis confragosa; *Fibuloporia wynnei*; *Ganoderma applanatum*; *Grandinia mutabilis*; *Merulius corium*; *Mycocacia uda*; **Oxyporus obducens*; *O. populinus*; *Peniophora cinerea*; *Phlebia merismoides*; *Radulomyces confluens*; *Schizophora paradoxa*; *Stereum hirsutum*; *S. rugosum*; *Thelephora penicillata*; *Typhula erythropus*;

Auricularia auricula-judae; *A. mesenterica*; *Calocera cornea*; *Dacrymyces stillatus*; **Myxarium subhyalinum*;

Lycoperdon pyriforme;

Melampsora rostrupii; *Puccinia caricina*;

Coryne sarcoides; *Cyathicula coronata*; **Helvella ephippium*; *Hymenosephus scutula*; *Polydesmia pruinosa*;

Daldinia concentrica; *Lasiosphaeria ovina*; *Nectria cinnabarina*; **N. peziza*; **Uncinula aceris*; *Xylaria hypoxylon*;

Bactridium flavum; **Penicillium claviforme*;

Arcyria denudata; *Comatricha typhoides*; *Craterium minutum*; *Mucilago spongiosa*; †*Trichia scamba*; *T. varia*.

Species collected in Maulden Wood:-

Bolbitius vitellinus; *Clitocybe dicolor*; *C. fragrans*; *C. geotropa*; *C. vibecina*; *Collybia rancida*; *Conocybe tenera*; *Coprinus comatus*; *C. disseminatus*; *C. impatiens*; *C. lagopus*; *C. picaceus*; *Gymnopilus penetrans*; *Hebeloma sacchariolens*; *Hygrophorus leucophaeus*; *H. pratensis*; *H. psittacinus*; *Hypholoma fasciculare*; *Inocybe geophylla* var. *lilacina*; *Laccaria amethystea*; *L. laccata*; *Lacrymaria velutina*; *Lactarius subdulcis*; *Lepista nuda*; *Macrocyttidia cucumis*; *Marasmius epiphyllus*; *M. ramealis*; *Mycena galericulata*; *M. galopus*; *M. polygramma*; *M. speirea*; *M. vitilis*; *Nolanea tenuipes*; *Oudemansiella radicata*; *Pluteus cervinus*; *P. lutescens*; *P. phlebophorus*; *Psathyrella conopilea*; *P. gracilis*; *P. hydrophylla*; *P. tephrophylla*; *Russula fragilis*; *R. pelargonii*; *Tubaria furfuracea*; *Volvariella speciosa*;

Bjerkandera adusta; *Clavulina cinerea*; *C. cristata*; *Coniophora puteana*; *Coriolus versicolor*; *Heterobasidion annosum*; *Leptotritum semipileatum*; * *Peniophora laeta*; * *P. lycii*; *P. quercina*; *Podoporia sanguinolenta*; *Schizopora paradoxa*; *Stereum gausapatum*; *S. hirsutum*; *S. sanguinolentum*; *Vuilleminia comedens*;

Auricularia mesenterica;

Lycoperdon foetidum; *L. perlatum*; *L. pyriforme*; *Mutinus caninus*; *Phallus impudicus*;

Coleosporium tussilaginis;

Chlorosplenium aeruginascens; *Dasyscyphus virgineus*; *Helvella crispa*; *Hymenoscyphus caudatus*; * *Peziza micropus*; *Scutellinia scutellata*;

Diatrype stigma; *Sphaerotheca pannosa*; *Xylaria hypoxylon*;

Ptychogaster albus;

Arcyria denudata; *Mucilago spongiosa*; *Physarum nutans*;

* Species new to county

† Confirmation of old record

APPENDIX

Two new fungus records from Bedfordshire.

While examining his man orchid (*Aceras anthropophorum*) sites at Totternhoe on 30th October, Mr T.C.E. Wells discovered two clavarioid fungi new to the county, both members of the genus *Ramariopsis*, characterized by branched coralloid fruitbodies with small hyaline, finely echinulate, subglobose spores.

R. pulchella forms tiny fruitbodies, 1-2 cm high, which are sparingly dichotomously branched, delicate, and of a beautiful violet colour. The fruitbodies of *R. kunzei* are larger sometimes reaching 12 cm in height, more highly branched, more substantial, and white.

A BASIS FOR HEDGEROW CONSERVATION IN BEDFORDSHIRE

BY B.S. NAU, Ph.D. AND MRS E.B. RANDS

In a county as developed agriculturally, industrially and residentially as Bedfordshire the available habitats for wildlife are under continuing pressure and it is necessary to be able to identify those sites which are of particular importance, to enable conservation decisions to be made. Hedgerows reproduce many of the features of one of the richest habitats, the woodland edge, and in a county with as little woodland as Bedfordshire this gives the hedgerow added importance. Unfortunately the hedgerow is also one of the most rapidly disappearing habitats in this county, particularly where arable farming predominates. It was against this background that the present study was undertaken to provide basic information on the relative richness and diversity of the county's hedges, providing thereby a yardstick against which individual hedges could be judged when subjected to threat of destruction.

Hedges are formed from plants which can be loosely categorised as either trees, or shrubs, or climbers and much has been written in recent years on the way in which the total number of species in a hedge increases with its age — about one species per century in a 30 metre length. Hedges rich in species are often of great antiquity and therefore of historical as well as biological interest but it should be emphasised that the biological richness is not measured simply by floristic diversity for this also provides a framework for a vastly greater richness of animal life. However the flora is a convenient indicator of the hidden mass of the 'iceberg' which can only be measured with much greater expenditure of time and expertise. By way of indication of the concealed richness of animal life one might quote the numbers of species known to feed on Oak, often this is the only foodplant of the species concerned: butterflies and moths (187), beetles (50), plant bugs (47), and much larger numbers of Hymenoptera, Diptera and other groups. A more complete list is given in ref. 1. These form the lower levels of the food chain but reflect the importance of the habitat to the more conspicuous animals near the top of the chain and therefore the overall richness.

The floristic richness of hedgerows is affected by age, management now and in the past, and by soil factors, amongst others. Some factors are inter-related and it may not be easy to identify those most relevant to particular hedges without much historical research, however a local survey around Maulden (ref. 1) does illustrate the extent of the differences which can exist between two geological formations: calcareous Boulder Clay and well-drained base-deficient Lower Greensand. Almost two-thirds of the hedges on the former were richer in species than the richest of the latter. Whether this difference is intrinsically due to the geology or whether it has been determined by historical farming patterns fortunately does not matter from the present viewpoint, which is one of conservation value; the richer hedges are biologically the more important except in those areas where the very scarcity of remaining hedges gives added value to any hedge.

THE FIELDWORK

Having already established that there is a strong dependence of richness on surface geology the fieldwork for the present study was planned so as to give good cover of each geological region of the county. At the same time a good geographical distribution of sample counts was aimed at, to minimise local biases. The sample counts were of a single 30 metre length of each hedge chosen. Counts were normally begun at 10 metres from one end, as a standard practice to avoid biases due to choice of possibly unrepresentative samples. Hedges in any condition were included and this sometimes necessitated adding together shorter lengths where the hedge was discontinuous. Hedges were chosen on the basis of accessibility, there were therefore more roadside hedges than field hedges in the sample although the latter were counted wherever possible.

The location of individual counts was recorded on Ordnance Survey maps (1:25000) for future reference and the geology was assessed from the surface geology map in ref. 2, which had a grid imposed for this purpose.

Table 1: Frequencies of hedgerow trees, shrubs and climbers in different geological areas of Bedfordshire

	BOULDER CLAY			CLAY WITH FLINTS	OXFORD CLAY	GAULT CLAY	RIVER GRAVELS	GLACIAL GRAVELS	ALLUVIUM	CHALK	GREAT OOLITE	LOWER GREENSAND		
	MAULDEN	NORTH OF GREENSAND	SOUTH OF GREENSAND									MAULDEN	OTHER	
TREES	ASH	57.3	63.9	46.5	28.8	42.9	34.2	30.0	27.8	35.0	31.5	45.6	15.6	28.6
	FIELD MAPLE	61.5	39.2	39.6	44.8	26.7	16.5	10.0	5.6	5.0	20.5	29.3	---	10.7
	ENGLISH ELM	7.7	15.4	27.0	11.2	29.8	32.9	22.5	44.4	35.0	11.0	20.7	39.1	30.4
	PEDUNCULATE OAK	40.2	10.8	13.8	28.0	9.9	6.3	7.5	16.7	5.0	4.7	10.3	20.3	26.8
	YCH ELM	19.7	6.9	3.8	3.2	6.9	11.4	15.0	11.1	15.0	6.3	27.6	9.4	3.6
	SYCAMORE	13.7	1.5	7.6	2.4	2.3	6.3	7.5	16.7	---	3.7	12.1	7.8	5.4
	APPLE SPP.	6.0	6.2	6.9	8.0	5.3	2.5	2.5	---	---	7.9	5.1	15.7	5.4
	HOLLY	2.6	---	---	35.2	---	---	---	---	---	2.4	---	10.9	5.4
	WILD CHERRY	0.9	---	0.6	14.4	---	---	---	---	---	0.8	---	1.6	---
	WILLOW (alb/frag)	---	---	1.2	---	3.1	2.5	12.5	5.6	5.0	0.8	---	1.6	1.7
HORNBEAM	3.4	---	---	9.6	---	---	---	---	---	---	---	---	---	
SMOOTH ELM	---	---	---	---	---	---	---	---	---	---	---	---	28.6	
SHRUBS	COMMON HAWTHORN	70.1	81.5	87.4	86.4	90.8	91.1	82.5	83.3	90.0	87.4	87.9	82.8	73.2
	BLACKTHORN	63.2	82.3	69.2	72.8	50.4	43.0	37.5	33.3	25.0	62.2	74.1	15.6	23.2
	DOG ROSE	59.8	61.5	56.0	74.8	55.7	40.5	25.0	44.4	10.0	50.4	37.9	35.9	10.7
	ELDER	12.0	23.1	39.6	68.8	26.7	32.9	47.5	50.0	55.0	46.5	29.3	43.8	44.6
	HAZEL	61.5	16.2	17.6	68.8	1.5	---	---	---	---	17.3	6.9	6.3	8.9
	DOGWOOD	57.3	26.9	19.5	18.4	9.9	6.3	7.5	---	---	15.0	13.8	1.6	5.4
	PRIVET	11.1	17.7	9.4	1.6	10.7	---	5.0	---	5.0	3.9	5.2	1.6	7.1
	MIDLAND HAWTHORN	34.2	3.8	6.3	0.8	6.1	5.1	5.0	---	5.0	1.6	1.7	---	5.4
	WAYFARING TREE	30.8	6.9	8.2	2.4	0.8	---	---	5.6	---	10.2	---	---	---
	SPINDLE-TREE	6.8	12.3	9.4	0.8	3.0	---	2.5	---	---	1.6	3.5	---	7.1
SALLOW SPP.	19.7	1.5	6.3	8.0	1.5	---	12.5	---	5.0	0.8	---	---	---	
PURGING BUCKTHORN	---	3.8	1.9	---	3.8	---	15.0	---	10.0	8.7	---	---	---	
CLIMBERS	GUELDER ROSE	6.8	---	2.5	0.8	---	---	---	---	---	---	---	---	---
	BRAMBLE	89.7	90.8	84.9	75.2	85.5	94.9	75.0	77.8	70.0	73.2	90.0	65.6	80.5
	BLACK BRYONY	58.1	52.3	34.0	20.0	29.0	16.5	12.5	16.7	10.0	44.9	43.1	1.6	17.9
	IVY	21.4	53.1	35.2	53.6	49.6	44.3	50.0	72.2	65.0	44.9	50.0	50.0	53.6
	WOODY NIGHTSHADE	36.8	16.2	14.5	23.2	30.5	22.8	15.0	5.6	35.0	29.9	8.6	1.6	12.5
	FIELD ROSE	64.1	10.0	5.0	45.6	2.3	3.8	---	---	5.0	7.9	3.5	---	5.4
	DEWBERRY	5.3	20.8	13.2	8.8	5.3	13.9	---	22.2	20.0	32.3	20.7	1.6	7.1
	CLEMATIS	42.7	16.9	16.4	5.2	2.3	2.5	2.5	5.6	---	11.0	15.5	3.1	7.1
	WHITE BRYONY	11.1	1.5	10.7	4.0	9.9	3.9	---	5.6	15.0	9.5	3.5	17.2	17.9
	HONEYSUCKLE	35.0	---	---	11.2	---	---	---	---	---	0.8	---	1.6	1.7
HOP	---	0.8	1.9	---	3.8	1.3	---	---	5.0	2.4	---	---	5.4	

The fieldwork was conducted in the period May to November of 1976 and 1977, except for the Maulden area which was covered in 1975 (ref. 1).

ANALYSIS

The total number of hedge counts made was 1130, ranging from 414 on Boulder Clay which is the most extensive surface deposit, to 18 on Glacial Gravel. The sample sizes for all regions are given in Fig 1. The Boulder Clay and Lower Greensand samples were further subdivided, in the case of the clay into three groups: a) south of the Oxford Clay except the Maulden area, b) the Maulden area, c) that overlying the Oxford Clay and Great Oolite. The sand was divided into a) the Maulden area and b) the rest. These subdivisions were based on availability of large samples permitting more detailed analysis.

The data has been examined from two viewpoints: (i) species richness and (ii) species distribution. To facilitate comparisons the plants concerned have been allocated to one of three categories: trees, shrubs, or climbers. In some borderline cases it was necessary to allocate a species arbitrarily to one group. These categories have been used throughout regardless of whether in a particular hedge the plant was present in shrub form or tree form.

The species names used follow ref 3, to which reference should be made for Latin names.

Table 1 gives in detail the data for all species which had a county-wide frequency of one percent or more, Tables 2 and 3 summarise data for the remaining species. The practice has been followed throughout of reducing data to percentages in order to facilitate comparisons between samples of differing size.

Histograms of species richness for hedges on each geological formation are shown in Fig 1 and a county summary map is shown in Fig 2. The symbols for the latter need comment, they have been chosen to represent approximately equal size samples, thus the '8+' group contains about twenty per cent of the 1130 hedges counted, and similarly for the other groups represented by symbols in Fig 2. This concept is made use of in the histograms also, the shading at the low and high ends of the richness range indicates, respectively, the richest and poorest twenty percent bands as used in Fig 2. A simplified richness distribution map is shown in Fig 3, this indicates by shading the approximate extent of the area containing the richest forty percent of Bedfordshire hedges. Two further maps are included to assist in the interpretation of the results, Fig 4 shows the floral richness for all flowering plants from ref 2, and Fig 5 shows the surface geology, which is taken from the same source, with the addition of tetrad lines.

Turning now to the distribution of individual species in hedges, Fig 6 presents histograms showing the relative frequency of each species on the various geological formations. Only the species having an overall frequency of at least one percent are included and they have been grouped into the categories: tree, shrub, climber. There are in fact twelve tree species, thirteen shrubs and ten climbers. Several species have been selected for more detailed treatment in Fig 7, which shows distribution maps on a tetrad basis. In the histograms the species sequence followed is that of relative frequency in the county as a whole, the most abundant first, this makes it possible to see clearly deviations from the general trend for individual geological regions.

DISCUSSION

Species richness

A comparison of the shaded areas in the histograms of Fig 1 shows clearly the wide variations between geological regions. For instance, the Boulder Clay and Clay-with-Flints area show half or more of their hedges in the top twenty percent for the county whereas the Lower Greensand, the gravels and Alluvium are the reverse with nearly half their hedges in the poorest twenty percent for the county. Compared with the clays above, the Oxford Clay and Gault Clay regions are much poorer while the Chalk and Great Oolite are a little richer than the two latter. Looking at the geographical picture, Figs 2-3, it is seen that this reflects the geology in

TABLE 2

Frequency of trees recorded in fewer than 1% of hedge samples.

%		%		%		%	
0.8	Aspen	0.3	Yew	0.1	Corsican Pine	0.1	Hairy Birch
0.7	Beech	0.2	Scots Pine	0.1	Horse Chestnut	0.1	Alder
0.6	Lombardy Poplar	0.2	Norway Maple	0.1	Rowan	0.1	Spanish Chestnut
0.4	Lime spp.	0.2	Grey Poplar	0.1	White Beam	0.1	Turkey Oak
0.4	Silver Birch	0.2	Black Poplar (s.l.)	0.1	Wild Service Tree		

TABLE 3

Frequency of shrubs recorded in fewer than 1% of hedge samples.

%		%		%	
0.4	Raspberry	0.2	Barberry	0.1	Gorse
0.4	Bullace	0.2	Broom	0.1	Gooseberry
0.4	Cherry Plum	0.2	Current spp	0.1	Spurge Laurel
		0.2	Lilac	0.1	Duke of Argyll's Tea-plant
				0.1	Forsythia

general, there being rich areas in the NW and SE separated by a broad band which is poor and relieved only by islands of Boulder Clay with their associated rich hedges. Comparison with flowering plants as a whole, Fig 4, reveals both similarities and differences. The differences are most marked in the NW and the E where there are areas of rich hedges which are poor floristically. The opposite is found in the SW where a floristically rich area has poor hedges.

There are, of course, areas where hedges are very scarce and those surviving are often severely cut, even to ground level. In some cases it was observed that, present physical state notwithstanding, such hedges were still rich in species and presumably could recover much of their former value if allowed to grow more freely. More hedges have survived, and in better condition, in the livestock farming areas than in arable areas, and in the NW this is also associated with above average species richness. In some areas the scarcity of hedges is reflected in apparent gaps in sampling coverage, notably in the E and NE where it was sometimes very difficult to find any hedges to count.

A comparison of the three subdivisions of the Boulder Clay hedges, Fig 1, shows that there is no significant difference between the N and S samples but the Maulden sample is markedly more species-rich, a situation which is attributed to the preponderance there of present or past wood-edge hedges. It seems possible that this might also explain the richness of the Clay-with-Flints, an area not notably rich in its general flora.

Species distribution

Looking first at those plants which can achieve tree status, the histograms in Fig 6 show clear differences between geological areas. The frequency of tree-species is high on the Clay-with-Flints and Boulder Clay but low, about half of the above, on Chalk, Gault Clay, Alluvium and River Gravel. The Great Oolite is a little better than this low group but below an intermediate group comprising: Oxford Clay, Lower Greensand and Glacial Gravel; this intermediate group has about two-thirds of the tree frequency found in the rich group.

The Ash shows up as clearly the most frequent tree-species, in most areas it was either the most frequent or runner-up. Next was, surprisingly, the Field Maple, which is prominent on both clay and calcareous soils; on soils where Maple is scarce the English Elm is the commonest i.e. on Lower Greensand, Glacial Gravel and Alluvium. Also somewhat surprising is the low frequency of Oak, at its most frequent on Lower Greensand where it is the number two tree-species and on Clay-with-Flints where it is in third place.

The Clay-with-Flints area shows some interesting features. The Holly, for instance, is the second most frequent tree recorded, also there is a remarkable diversity of tree-species, including Hornbeam and Wild Cherry which are scarcely recorded at all elsewhere.

County distribution maps are given in Fig 7 for the Ash, Oak and Holly. From these maps one can see the uniform distribution of Ash and the contrastingly patchy distribution of Oak, which is absent from wide areas in the NE and in the Marston Vale. The Holly is even more restricted.

Next we turn attention to the shrubs. Here it can be seen that the Boulder Clay is outstanding for the diversity and abundance of its shrubs. Equally, the Gault Clay, Oxford Clay and Glacial Gravels for their relative impoverishment.

The most frequent shrub recorded was Common Hawthorn, with the Blackthorn runner-up and considerably less common on well-drained non-calcareous soils. Three species which are high on the list are Dog Rose, Elder and Hazel. The Elder does well on the dry soils, particularly in hedges which are structurally poor.

The distribution maps in Fig 7 show, for a selection of shrubs, the relatively discontinuous nature of their distributions. Perhaps most striking is the Purging Buckthorn, the foodplant of the larva of the Brimstone butterfly. Wayfaring Tree is particularly sparse, in fact more restricted even than the Clematis, which is well-known as an indicator of chalky soil, as is Wayfaring Tree. Midland Hawthorn is another interesting species, it is the woodland relative of the Common Hawthorn and it is surprising to find it absent from the NW which is an area with several large woods surviving and presumably indicative of more widespread woodland in that area in the past. In such an area one might have expected to find Midland Hawthorn surviving in hedges quite frequently.

Finally we turn to climbers. The survey results show that Bramble is everywhere the most frequent species recorded in hedge samples, on Alluvium and Glacial Gravel however the Ivy is a close second. The climbing species show much less variation geologically and geographically than do either the trees or the shrubs, but as before the Clay-with-Flints and the Boulder Clay show the greatest variety and frequency. The poorest areas are the River Gravels.

One of the more interesting distributions is shown by the Field Rose. This is very frequent on Clay-with-Flints and the Maulden Boulder Clay but rather scarce in other Boulder Clay areas and on other formations. This might be a reflection of a requirement for shade as well as a damp soil, many of the non-Maulden Boulder Clay hedges are in open arable country where there is little shade and the hedges are generally in poor physical shape, adding to the exposure of the situation.

CONCLUSIONS

There are wide variations in the richness of hedges in Bedfordshire. In some areas there are also very few hedges, although the relicts often still have a good diversity of species and therefore have potential for regeneration if allowed. The areas with the poorest hedges in terms of species diversity are the Gault and Oxford Clays, and the river floodplain deposits. The best are the Boulder Clay and the Clay-with-Flints, these have both a good diversity of species and good numbers of the less common species.

Ash and Field Maple are, overall, the most frequent 'tree-species' although frequently not allowed to gain their full stature. In some areas the English Elm becomes important, often abundant where it occurs although now mostly dead specimens, killed by Dutch elm disease. Oak is a surprisingly infrequent hedgerow species.

In assessing the value of individual hedges attention should be paid to the species-richness relative to the local area and to the importance of those species present to the dependent invertebrate fauna, further information on which is quoted in ref. 1. Naturally, where hedges are scarce this gives those remaining added value. Also, a hedge which has a number of species present in good numbers should be more highly valued than one with isolated examples of individual species. The present work did not attempt to record the abundance of each species in each hedge sample, only presence or absence, this was for practical reasons rather than because it was not thought important. The same is true of the physical structure of the hedge, which can play an important role in determining the microclimate and therefore the type and abundance of animal life.

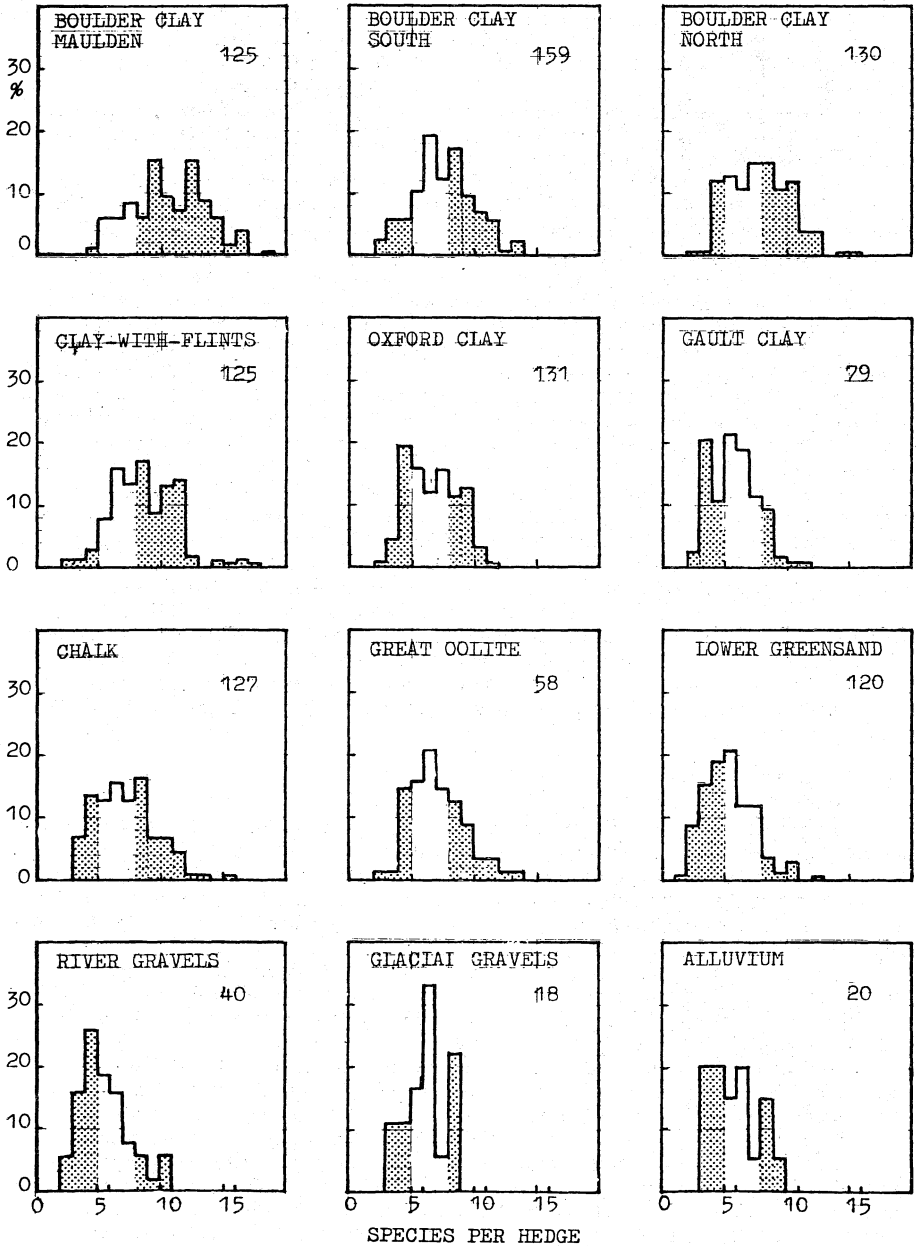


Fig 1: Species richness distributions in different geological areas.

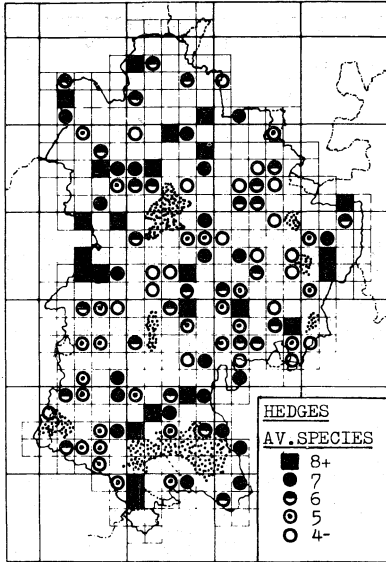


Fig 2: Tetrad map of Bedfordshire showing hedge species – richness

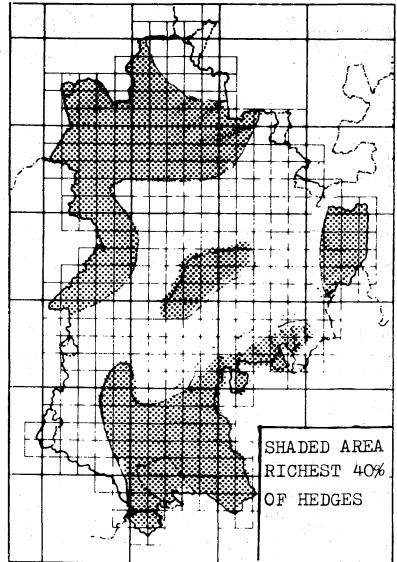


Fig 3: Areas of high species – richness (shaded)

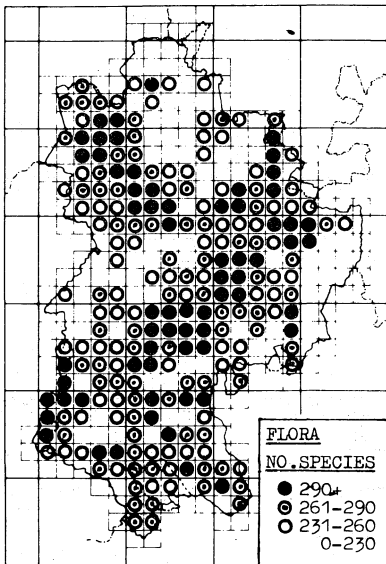


Fig 4: Tetrad map showing floristic richness (after Dony, ref 2)

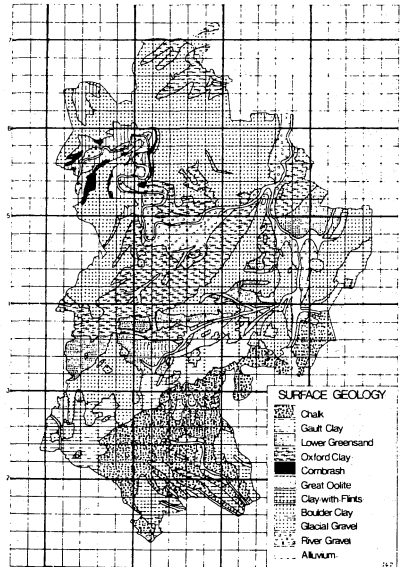


Fig 5: Surface geology of Bedfordshire (after Dony, ref 2)

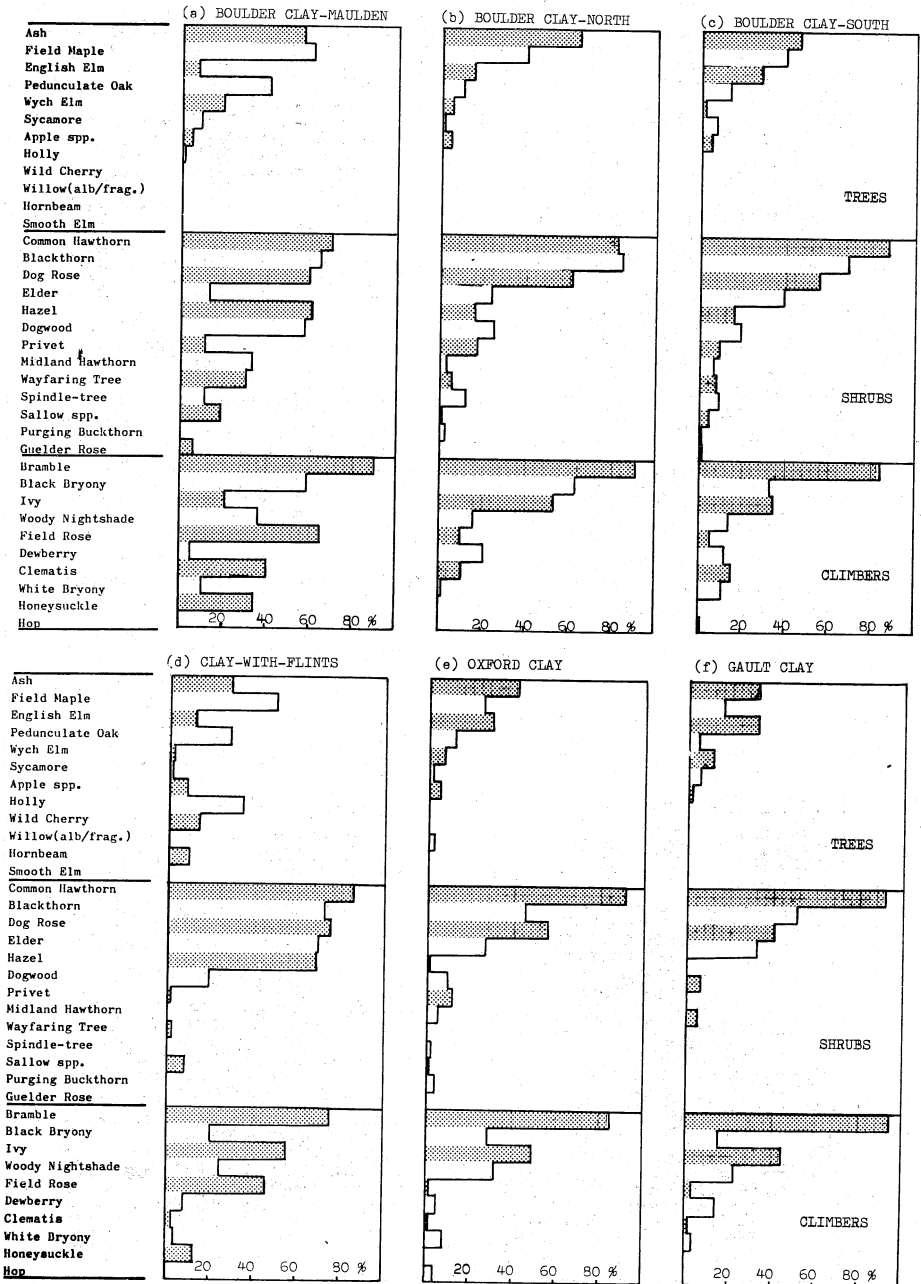


Fig 6a-f: Frequency of hedgerow species in hedges on different geological formations.

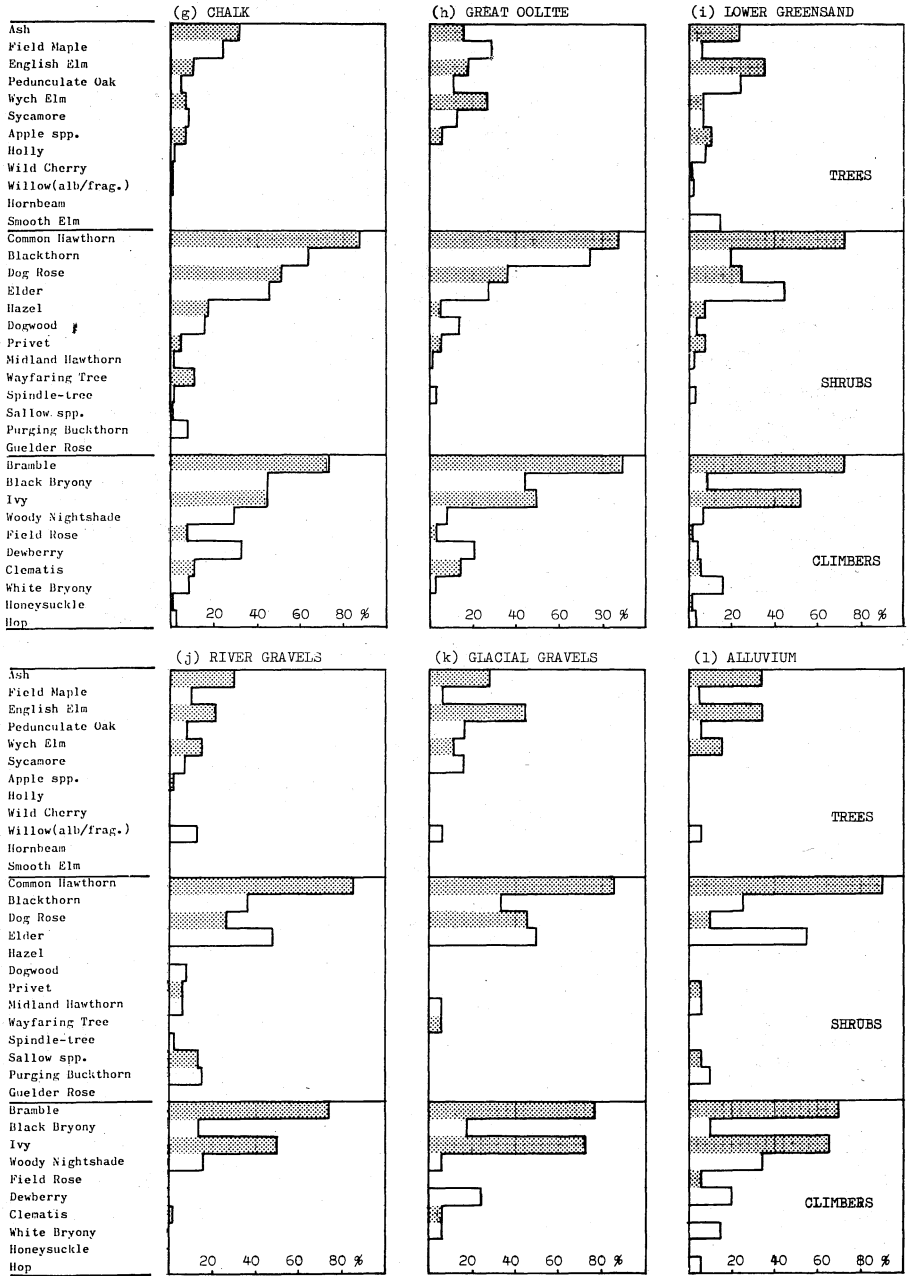


Fig 6g-l: Frequency of hedgerow species in hedges on different geological formations.

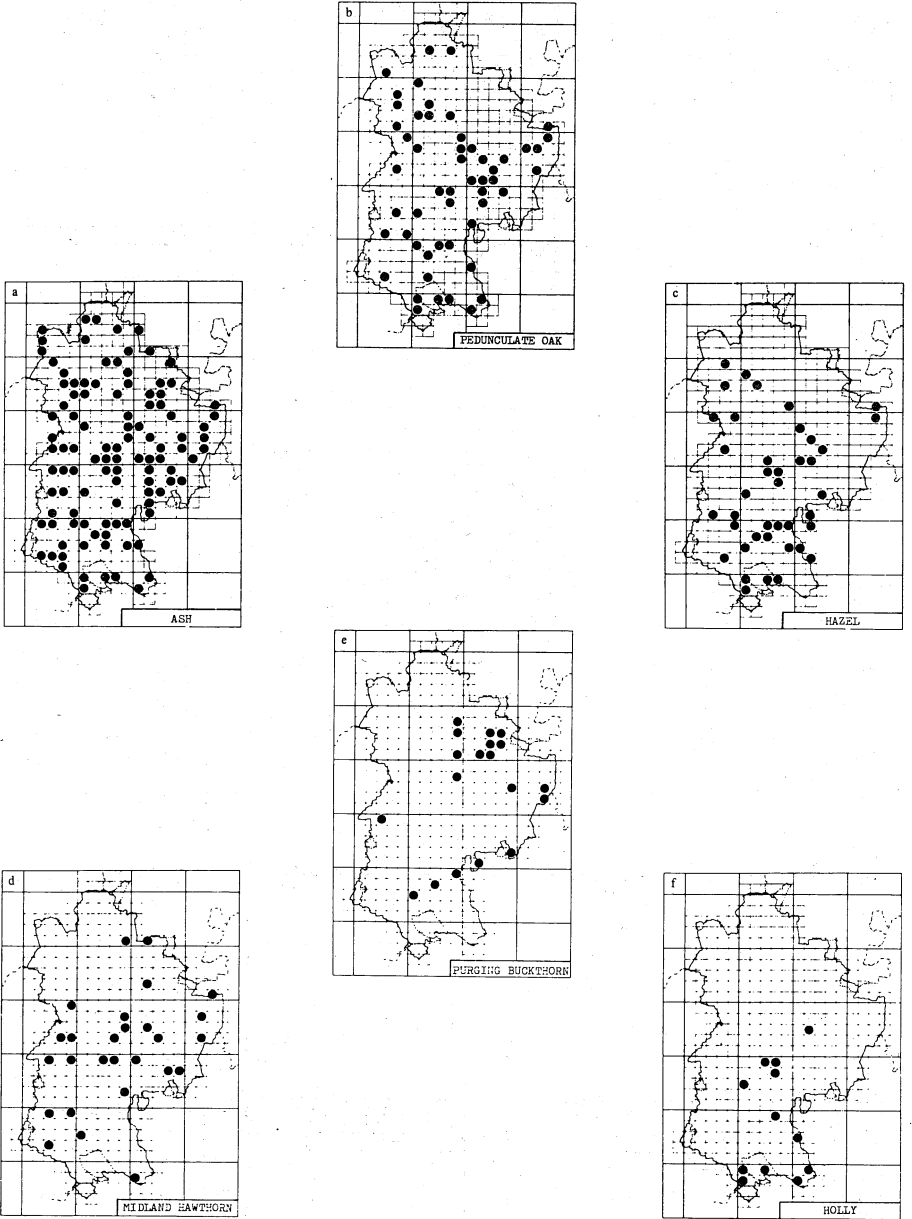


Fig 7a-f: Tetrad distribution maps of selected species in hedges.

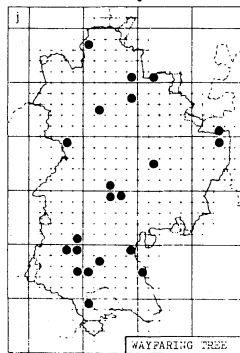
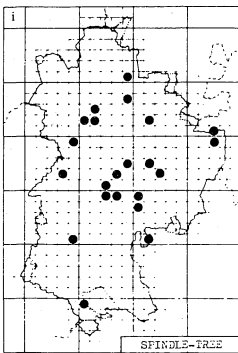
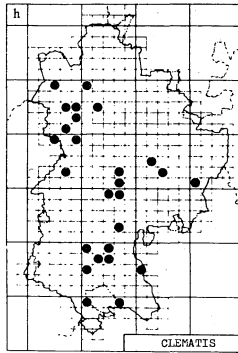
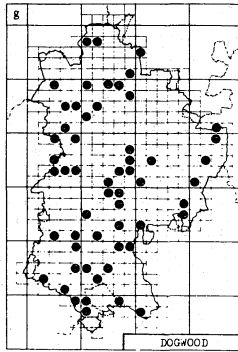


Fig 7g-j: Tetrad distribution maps of selected species in hedges.

The present survey has concentrated on species-richness and species distribution with a view to providing information necessary for the formation of sound conservation judgements and policies. Further work is clearly desirable to provide numerical data on the physical or structural aspects of Bedfordshire hedges.

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REFERENCES

- 1) Nau, B.S. and Rands, E.B. 1976. A comparative study of hedges on the Boulder Clay and Lower Greensand in the Maulden area. *Bedf. Nat.* 30, 39-52.
- 2) Dony, J.G. 1976. *Bedfordshire Plant Atlas*. Borough of Luton Mus. and Art Gallery.
- 3) Clapham, A.R., Tutin, T.G. and Warburg, E.F. 1951. *Flora of the British Isles*. Cambridge University Press.

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