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FOR THE YEAR

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BEDFORDSHIRE NATURAL HISTORY SOCIETY 1981

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THE BEDFORDSHIRE NATURALIST

No. 35 (1980)

Edited by C. R. BOON

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REPORT OF THE COUNCIL

The Council are proud to announce that the flow of new members into the Society has been steady throughout 1980. The Council hopes that this trend will continue and that the new members will remain in the Society for many years. We can gauge our success as a Society by the steady growth in membership over the last four years as shown in the following table:—

	1977	1978	1979	1980
Ordinary Members	273	311	298	326
Associate Members	41	52	60	57
Student Members	49	45	44	30
Corporate Members	9	9	9	10
Life Members	5	5	5	5
Honorary Members	4	4	4	4
Total	381	426	420	432

It is somewhat sad to see that the total number of student members has been falling steadily from the peak figure of 66 in 1975. However many of these 'lost' students are now grown up and even married and are still with the Society. Many others are at Universities and may, hopefully, rejoin us when their studies are completed. Many youngsters attend our meetings with their parents but have not been enrolled. In these cases the Council hopes that more families will enrol their children.

The Council were pleased to see the *Bedfordshire Landscape and Wildlife Subject Plan* published in December 1980 by the Bedfordshire County Council. The *Wildlife Technical Volume* was compiled by members of the Society for the County Council and we would like to thank the Bedfordshire County Council for publishing it in the name of the Society. It has been a major undertaking to produce a book of this dimension. It forms the basis for our knowledge of a large number of sites of natural history interest in the county but members of the Society must realise that this type of knowledge can never be complete. The rate of change in the countryside is so swift that we must forever be on the alert to monitor and record changes. These changes should be notified to the County Council by the Society so that master files at County Hall can be kept up to date and new sites added when appropriate.

The Society continues to supply information to many outside bodies and the Council would, once again, like to thank all the hard working Recorders who supply information on sites when needed.

We are pleased to announce that a booklet on *The Common Lichens of Bedfordshire* by Frances B. M. Davies will be published in March 1981. We feel sure that this booklet will prove useful, not only to our own members, but also to naturalists in other Societies. The Council thanks Mrs Davies for producing it and Mr C. Boon for all his work in editing and preparing the pages for the printers, in addition to the work entailed in editing *The Bedfordshire Naturalist*.

Finally the Council would like to thank all the Officers who work to keep the Society functioning efficiently and also all the members who support the Society by attending the meetings and taking part in Society activities at all levels.

E. BERYL RANDS

EDITORIAL

Owing to ill-health Beryl Rands has had to relinquish the onerous post of Secretary to the Society. I know all fellow members of the Council, the various committees and the membership at large will join me in wishing her a speedy recovery and thanking her for all the work she has done for the Society over the past twelve years. We hope she will soon be back to active recording of slugs and snails and other studies in the county. Beryl joined the Society in 1969 and immediately became recorder for Mollusca, she has been an active member of Council since 1970 and took over the thankless job of Secretary in 1975. Thank you Beryl.

Since the inception of the Society in 1946 and its first Journal in 1947 there have been several recorders of the various disciplines. The numbers have fluctuated over the years with the total standing today at 22. During all this time the posts of recorder for Botany, Hymenoptera and Meteorology have been held by the same persons, Dr Dony, Dr Chambers and Mr Guppy respectively. Owing to ill-health Mr Guppy now feels unable to continue as Meteorology recorder. Looking back over previous Journals the Meteorology report has been a valuable feature year by year and Mr Guppy's crisp résumés of the years' weather will be sorely missed. I know the Society will join me in thanking Mr Guppy for all his work for the Society.

Once more I must thank Derek Rands for his sterling work in producing the diagrams, not least for the dotty work on the tetrad maps. Also thanks to our new Secretary, Mary Sheridan, for typing the tables.

PROCEEDINGS

Indoor Meetings

- 424th Ordinary Meeting 10th January, Bedford. Members evening. Chair: Mr E. G. Headford.
- 425th Ordinary Meeting 15th January, Dunstable. "Enjoying deer" by Mr B. Barbon. Chair: Mr D. Anderson.
- 426th Ordinary Meeting 24th January, Potton. "General Natural History in Bedfordshire" by Mr W. J. Drayton. Joint meeting with the Potton History Society.
- 427th Ordinary Meeting 29th January, Luton. Members' evening. Chair: Mr V. W. Arnold.
- 428th Ordinary Meeting 7th February, Bedford. "Badgers and bats" by Mr C. Banks.
Chair: Mrs H. M. Muir-Howie.
- 429th Ordinary Meeting 12th February, Dunstable. "Wildfowl" by Mr R. V. A. Wagstaff.
Chair: Mr J. P. Knowles.
- 430th Ordinary Meeting 28th February, Leighton Buzzard. "Woodland life" by Mrs E. B. Rands.
Chair: Mr D. Green.
- 431st Ordinary Meeting 4th March, Luton. "My eighty years in Bedfordshire" by Dr J. G. Dony.
Chair: Mr C. R. Boon.
- 432nd Ordinary Meeting 11th March, Dunstable. The Chairman's evening with Mr D. Green.
Annual General Meeting 19th March, Bedford.
- 433rd Ordinary Meeting 25th March, Flitwick. "Introduction to spiders" by Mr D. R. Nellist.
Chair: Dr M. E. Nellist.
- 434th Ordinary Meeting 3rd April, Bedford. "The Great Outdoors" by Mr H. A. S. Key.
Chair: Mrs E. G. Rands.
- 435th Ordinary Meeting 8th October, Bedford. "The future of wild life conservation in Bedfordshire" by Dr B. S. Nau. Chair: Mr M. Chandler.
- 436th Ordinary Meeting 21st October, Dunstable. "Fleas" by Mr R. S. George. Chair: Mr. D. Green.
- 437th Ordinary Meeting 28th October, Leighton Buzzard. "Yellow in the countryside" by Mr D. G. Rands. Chair: Mr M. Sheridan.
- 438th Ordinary Meeting 6th November, Bedford. Natural History films by Mr W. J. Champkin; "Books on nature conservation" by Mr R. B. Stephenson. Chair: Mr H. A. S. Key.

- 439th Ordinary Meeting** 27th November, Luton. "Bedfordshire woodlands" by Dr J. G. Dony.
Chair: Mr V. W. Arnold.
- 440th Ordinary Meeting** 2nd December, Dunstable. Members' evening. Chair: Mr H. F. Pegg.
- 441st Ordinary Meeting** 10th December, Bedford. "Raptor migration in Europe and the Middle East" by Mr R. F. Porter. Chair: Mr J. P. Knowles.

Field Meetings

- 27th January **Slimbridge.** Wildfowl Trust, coach trip.
- 3rd February **Grafham Water.** Leader: Mr J. P. Knowles.
- 9/10th February **Solway weekend.** Leader: Mr W. J. Drayton.
- 16th March **Ashridge.** Leader: Mr C. Banks.
- 13th April **Flitwick Moor.** Leader Mr M. Chandler.
- 27th April **Cotswolds.** Coach trip.
- 4th May **Framsden, Suffolk.** To see Fritillaries.
- 7th May **Amptill Park.** Introduction to bird song. Leader: Mr J. P. Knowles.
- 11th May **Shire Oak** in spring. Leader: Mr V. W. Arnold.
- 14th May **Lowe's and Charle Woods.** Leader: Mr P. Smith.
- 18th May **Barton Springs.** Birds and flowers. Leaders: Mr B. J. Nightingale and Mr C. R. Boon.
- 24th May **Maulden Wood.** Identification of small mammals. Leader: Mr D. G. Rands.
- 28th May **Warden Hills, Luton.** Evening walk. Leader: Mr R. V. A. Wagstaff
- 1st June **Hunstanton, Norfolk.** To study seashore life. Coach trip.
- 8th June **Whipsnade area.** Leader: Mr H. F. Pegg.
- 13/15th June **Yorkshire Dales.** Weekend trip. Leader: Mr V. W. Arnold.
- 21st June **Maulden Wood.** Annual all-night meeting.
- 27th June **Dedmansey Wood.** Leaders: Mr W. J. Drayton and Mr V. W. Arnold.
- 29th June **Colworth House, Sharnbrook.** By kind permission of Unilever Ltd. Leader: Mrs H. M. Muir-Howie.
- 6th July **Worley's and Penn Woods.** Study of insect life. Leader: Dr B. S. Nau.
- 13th July **Shuttleworth College.** One day course on a variety of natural history subjects.
- 18th July **Stockgrove Park.** Leader: Mr V. W. Arnold.
- 20th July **Sewell Quarry.** Butterflies and flowers. Leader: Mr A. J. Martin.
- 26th July **Daintry and Washers Woods.** Leader: Dr J. G. Dony.
- 27th July **Wyre Forest.** Coach trip.
- 10th August **Pavenham.** BNHS walk no. 1. Leader: Mrs J. Carruthers.
- 17th August **Woburn Park.** BNHS walk no. 5. Leaders: Mr and Mrs A. Muir-Howie.
- 7th September **Felmersham Gravel Pits.** Leader: Dr B. S. Nau.
- 10th September **Linslade.** Grand Union Canal. Leader: Mr D. G. Rands.
- 14th September **Oxford Botanical Gardens.** Coach trip.
- 21st September **Melchbourne Park.** By kind permission of the Hon. H. de B. Lawson Johnson. Leader: Mr M. Chandler.
- 5th October **Maulden Wood.** With Hunts. Flora and Fauna Society. Leaders: Mrs. S. Wells and Mrs E. B. Rands.
- 12th October **Mansgrove and Ravensdell Woods.** By kind permission of Mrs. C. Horton. Leader: Mr A. R. Outen.
- 19th October **River Ivel, Biggleswade.** Leader: Mr M. Williams.
- 26th October **Cotswold quarries.** Study of fossils. Leader: Mr K. G. Baker.
- 2nd November **Chicksands Wood.** Annual fungus foray with the British Mycological Society. Leader: Dr D. A. Reid.
- 30th November **Grafham Water.** Leader: Mr B. J. Nightingale.
- 6th December **Regents Park Zoo, London.** Coach trip.



Members of the Society in Swaledale during the weekend trip to the Yorkshire Dales in June.

(Photo: D. G. Rands)

REPORT OF THE TREASURER

The Statement of Accounts continues to give fuller information of our income and expenditure, but the first figure you will look for is our excess of income over expenditure which is £17.00. We have therefore virtually broken even over the year on our current accounts. This is better than forecast although inflation has caused increased expenses, particularly in hall hire and printing.

Subscription income was only slightly more than last year, despite the increase in membership. Could I please ask members to check their bankers orders, if applicable, and amend where necessary?

The Publications Account now shows a healthy profit and is being used to finance the new booklet – *The Common Lichens of Bedfordshire*.

A further £1,000 was invested – in Redbridge Borough Bonds for six years at 13¼%. Our interest income was £867 and this will be further invested together with the £6,000 from the City of Nottingham Bonds which will become available during 1981.

A new item on the Fixed Assets of the Balance Sheet is an estimated £100 for the display cabinets left to the Society by Ray Palmer.

Finally you will be pleased to note that the total assets of the Society increased to £10,780.

M.R. CHANDLER

INCOME AND EXPENDITURE ACCOUNT FOR YEAR ENDED 31ST DECEMBER 1980

1979 INCOME – Current Accounts	1980
£	£
1139 Subscriptions	1142
78 Sales	56
30 Surplus on meetings	30
1 Donations	4
1248	1232
EXPENDITURE – Current Accounts	
ADMINISTRATION	
2 Officers' Expenses	–
41 Postage	25
– Sundries	8
20 Insurance	20
20 Auditors' honorarium	–
83	53
MEETINGS	
119 Hire of Halls	144
5 Lecturers and films	10
84 Programmes	99
208	253
SCIENTIFIC	
520 Journal	601
22 Subscriptions to other Societies	13
10 Recorders' expenses	34
– Sundries	17
– Site Recording	37
552	702
PUBLICITY	
70 Newsletter	170
– Application Forms	–
6 Advertising	–
76	170
EQUIPMENT PURCHASE	
– Screen	20
–	20
DEPRECIATION	
17 of equipment @ 10% on cost	17
17	17
	TOTAL 1215
385 Excess of Income over Expenditure (current accounts)	17
PUBLICATIONS ACCOUNT	
214 Brought forward	–116

2005	Income		307
2335	Expenditure		43
-116		Carried forward	+148
GRANTS ACCOUNT			
-	Brought forward		169
323	Income		-
154	Expenditure		40
169		Carried forward	129
DEPOSIT ACCOUNTS			
492	City of Nottingham Bonds		515
-	East Staff. D.C. Bonds		231
-	Redbridge Bor. Co. Bonds		30
96	Bank Deposit Account		91
588			867

BALANCE SHEET AS AT 31st DECEMBER 1980

1979				1980
£		COST	DEPRECIATION	£
	FIXED ASSETS			
35	Books and Journals			35
10	OS Maps			10
8	Bird Song Records			8
15	Display Boards			15
15	Microscope			15
3	Tools			3
2	Screen			2
-	New Screen	20	-	20
36	Slide Projector	60	30	30
66	Duplicator and stand	110	55	55
-	Specimen Display Cabinets			100
190				293
	CURRENT ASSETS			
703	Bank Account			193
170	Deposit Account			721
58	Cash in Hand			71
6000	City of Nottingham Bonds			6000
2500	East Staffs DC Bonds			2500
-	Redbridge Borough Bonds			1000
	Debtors-subscriptions			67
250	Debtors - Interest on Bonds			-
100	Debtors - Bank Payment not cleared			-
9781				10552
	CURRENT LIABILITIES			
555	Creditors			65
9412	TOTAL			10780

Honorary Auditors
P.J. HIGGINS
A.M. SMITH

METEOROLOGY

The following report has been kindly prepared for me by Mr Alan Hunter who is the Met. Observer at the National Institute of Agricultural Engineering, Silsoe. The notes are based on readings taken at Silsoe.

THE WEATHER OF 1980

Overall the year was slightly cooler than the long term average, but it was the warmest for three years. This improvement was reflected in the soil temperatures which, although below average, were higher than in any year since the hot summer of 1976.

The early months of 1980 were notable for their variation. January was sunny but cold, only 1959, 1963 and 1979 in the last 30 years being colder. February, in contrast, was the mildest for 14 years. March prevented any hopes of an early spring; not only was it very wet, it was colder than February and also dull.

The most notable feature of May was the sunny spell from the 9th to the 19th. On none of these days did the sun shine for fewer than ten hours, the mean being 13. Generally cool nights lowered the month's average temperature. The 8th/9th was the coldest May night for at least 30 years, -3.0°C . The month was one of the driest Mays on record.

Rainfall in 1980, well above average, was a good deal less than 1979, but the months of June, July and August taken together were the wettest for 18 years. June produced one and a half times its average and July twice. August 14th was one of the wettest days for many years with 45.7mm being recorded. In addition to being so wet, July was also cool.

After a difficult haymaking, a mild and fairly dry September gave good harvesting and holiday conditions. The month was, in fact, warmer than July. October brought a return to colder, wet weather; the 15th being the wettest October day for 30 years with 28.2mm. November, with the exception of the ten days up to the 25th, was cold. Sleet and snow were recorded on several occasions. The night of 2nd/3rd was especially cold with a minimum of -4.8°C . December, in contrast to several months of the year, and all four previous Decembers, was dry. It was also especially sunny.

RAINFALL AND TEMPERATURE

	Rainfall mm	Temperature $^{\circ}\text{C}$	
		mean maximum	mean minimum
January	28.3	5.0	-0.7
February	33.4	9.1	2.0
March	63.2	8.1	1.5
April	20.0	12.9	3.4
May	15.9	16.0	4.4
June	74.4	18.9	9.7
July	113.7	19.0	9.9
August	64.1	20.7	11.4
September	32.2	19.2	10.8
October	76.3	12.9	4.7
November	35.5	8.8	3.3
December	21.8	8.2	1.8
Year	578.8	13.2	5.2
Mean (1950-74)	554.6	13.4	5.4

MAMMALS

Report of the Recorder

1980 is, I think, best described as a year of consolidation for our mammal records.

We did not have a new species for the county, nor did we get as many records for the rare species that we have had in previous years. However, the number of records obtained was as many as usual and, perhaps most pleasing, the number of people supplying these records was, at 50, much higher than previous years, 1979 having only 24 people as comparison.

The records obtained were therefore mainly for the better recorded species and filled in vacant spots on the distribution maps, rather than showing up any change in range. This leads me to believe that we are at last getting a fairly accurate idea of the distribution of mammal species in Bedfordshire. Each year I add our new records to those obtained from the last ten years. I then put these totals into groups of records obtained, expressed as a percentage of possible records. The groups are:— under 5%, 5 – 10%, 10 – 25%, 25 – 50% and over 50%. The only shift in these groups as a result of our 1980 records are Water Shrew, from under 5% to 5 – 10%, and Pygmy Shrew, from 5 – 10% to 10 – 25%, a further indication of the stability and accuracy of our distribution knowledge.

Records on a 10 Km square format are sent on to Monk's Wood for the national distribution survey and for 1980 we contributed 15 new records, fairly evenly divided between the rare and not too common species. On our own tetrad – 2 Km square – maps it is surprising to find that we still have 14 tetrads with not a single record although they are, all but one, on the border of the county and they are not all in the north of the county!

Rabbits are still our most recorded species, but last year a fair number of the records mentioned myxomatosis as present in a few animals in every area. There is some concern on a national level about Hares declining, but our records were up to the usual numbers so the Bedfordshire distribution is still good, but perhaps the numbers in any area are going down. An increase in small mammal trapping produced a good number of records of the shrews, voles and Wood Mice. The Wood Mouse is by far the most widespread and abundant and I was interested to find it present when I trapped the grass verge alongside the old A6 on the county boundary, just north of Harpenden. The verge is only 15 feet wide and is very beaten down by road water spray and wind, but of six traps set on a December night, five caught Wood Mice in a habitat I had not thought at all suitable, which shows how capable the Wood Mouse is. If it can live in that sort of situation it can live anywhere – and does!

The summer was not too warm and was wet at the critical times, so it was a poor year for bats. Summer catching trips did not yield much, although five new Pipistrelle records were obtained. From the records supplied, three new sites for Long-eared Bat were obtained, a bat which is difficult to catch as it flies high around the tops of trees. These records were of dead animals, a fate which is the main source of information on this species. Early in 1981 a check was made for the first time on hibernating bats with good results, so hopefully this is a new method of obtaining records in future years.

In view of the press interest in black squirrels – which I can categorically state is just a colour phase of the normal Grey Squirrel – our records for many years past show they are present in small numbers in many locations in Bedfordshire. 1980 was no exception and several people reported seeing black squirrels in at least four areas.

Deer have had a mixed year, with our own symbol, the Muntjac, having increased sightings over the whole county. Fallow Deer were reported from a new tetrad next to the known location in Potton Wood, and in the south of the county a completely new site has been confirmed from Tingrith which is probably too far away from the herd at Ashridge to be wanderers from there. However, there were no records at all of Chinese Water Deer and, as far as I know, there were very few seen in the known locations. This does not mean that this deer is in decline, but to our knowledge it is certainly not spreading its distribution. I hope to make a fuller study of this species during 1981 so as to be better informed of its status.

As stated earlier the rarer species did not do well in 1980. A slight exception was Mink which has now been recorded in the adjacent tetrad to its previously known one and only site in the north of the county. As the Mink has a linear range of about 3 Km along a territory such as a river this new record is probably the same animal or animals we know already. Two

years ago I reported the sighting of wallabies and said then that we would have to wait to see if they managed to establish themselves. In 1979 there were no sightings nor were there in 1980. It seems that this is a species we are not going to see hopping all over the county for a while yet. Last year I also reported the sighting at two locations of Glis – the Edible Dormouse – and hoped it was the start of an increase in their numbers. However, 1980 produced no records, new sites or old, for the species, so those that saw it in 1979 were lucky and will remain, for the time being, a very select and small group. Unfortunately the house in Whipsnade, from which Glis were recorded in 1979, is to be demolished during 1981 and it will be seen in future years if the colony can find a new suitable site for themselves.

The new tetrad records for 1980 are listed below and, if added to the distribution maps published in the *Bedf Nat* 29: 36-39 and the update lists published each year since then, will give a full record of the distribution of the mammal species to be found in Bedfordshire.

- Hedgehog *Erinaceus europaeus* – 8 tetrads. 92CEI, 93S, 01C, 04A, 14J, 15D.
 Mole *Talpa europaea* – 19 tetrads. 92CKB, 93PST, 95WK, 01BC, 02GPV, 03KL, 04PX, 11P, 24H.
 Common Shrew *Sorex araneus* – 13 tetrads. 92E, 95X, 01TU, 04U, 06B, 11DE, 14EHZ, 15TV.
 Pygmy Shrew *Sorex minutus* – 5 tetrads. 92E, 06B, 14E, 15F, 24D.
 Water Shrew *Neomys fodiens* – 3 tetrads. 92E, 14S, 25K.
 Bat – 10 tetrads. 92G, 94Z, 04EINZ, 05X, 14V, 24H, 25X.
 Daubenton's Bat *Myotis daubentoni* – 1 tetrad. 03A.
 Long-eared Bat *Plecotus auritus* – 3 tetrads. 92V, 95Z, 12G.
 Pipistrelle Bat *Pipistrellus pipistrellus* – 5 tetrads. 94KL, 01D, 03V, 11E.
 Rabbit *Oryctolagus cuniculus* – 7 tetrads. 93P, 01P, 04DI, 05LQ, 12G.
 Brown Hare *Lepus capensis* – 11 tetrads. 01P, 02A, 03T, 04IM, 05Y, 06J, 11P, 15FQ, 25K.
 Common Dormouse *Muscardinus avellanarius* – 1 tetrad. 01C.
 Bank Vole *Clethrionomys glareolus* – 11 tetrads. 92E, 93V, 95Z, 02P, 06B, 11DIP, 14J, 15KT.
 Short-tailed Vole *Microtus agrestis* – 4 tetrads. 91Y, 01D, 14E, 15V.
 Water Vole *Arvicola terrestris* – 3 tetrads. 02W, 03U, 04D.
 Harvest Mouse *Micromys minutus* – 3 tetrads. 93G, 95T, 14E.
 House Mouse *Mus musculus* – 5 tetrads. 01P, 04Z, 12C, 14EN.
 Wood Mouse *Apodemus sylvaticus* – 14 tetrads. 01NTZ, 04U, 06B, 11CDEHIP, 14EN, 24I.
 Brown Rat *Rattus norvegicus* – 10 tetrads. 92X, 95XY, 01Y, 03AE, 11D, 13A, 24H, 25F.
 Grey Squirrel *Sciurus carolinensis* – 6 tetrads. 04X, 05C, 12B, 13C, 15H, 24I.
 Fox *Vulpes vulpes* – 12 tetrads. 93GV, 95W, 01HI, 03CIK, 04CX, 12C, 15I.
 Badger *Meles meles* – 6 tetrads. 82W, 92CP, 95X, 03Y, 14B.
 American Mink *Mustela vison* – 1 tetrad. 15S.
 Stoat *Mustela erminea* – 7 tetrads. 92S, 94W, 01I, 02J, 03H, 04F, 14R.
 Weasel *Mustela nivalis* – 7 tetrads. 92M, 03C, 04HL, 06B, 15CL.
 Fallow Deer *Dama dama* – 2 tetrads. 93V, 25Q.
 Muntjac Deer *Muntiacus reevesi* – 7 tetrads. 92R, 02KV, 04X, 05X, 12A, 24B.

As I stated above 1980 saw a tremendous increase in the number of people supplying records and my thanks go to the eight non-members and 42 members listed below for their efforts.

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DAVID ANDERSON

BIRDS

Report of the Recorder

INTRODUCTION

With mild weather predominating in January and February little evidence was seen of the effect that hard weather can have, as we experienced in 1979. Even so the year opened with parties of Crossbills at Maulden Woods and Stockgrove Park, and before the end of January a Long-tailed Duck, a rare visitor, had put in an appearance. However the situation stayed quiet through February and, although the weather turned colder in March, it did little apart from delaying the more adventurous of early migrants. Cold northerly airstreams continued into April and many summer visitors were not much in evidence until May. However a few days respite in mid-April, with warm air from the continent, brought a wave of Hoopoes into southern England, three of which found their way to the county. April also saw visits from Black-necked Grebe, Grey Plover, Common Scoter and Water Pipit.

In contrast May was mild and dry, encouraging migration, and unusual records included Pied Flycatcher, Ring Ouzel, Little Gull and impressive movements of Arctic and Black Terns. Waders seen during this period included Black-tailed Godwit, Whimbrel, a good passage of Curlew, Spotted Redshank and Turnstone.

Into the breeding season and the most pleasing event of the year saw the resurgence of Sparrowhawk as an established breeding species, with perhaps as many as seven pairs holding territory. Other breeding highlights included the presence of five pairs of Hobby, Quail at two sites, four pairs of Common Tern raising young and Nightingale (a BTO Survey revealed 39 singing birds in the county). On the debit side Wood Warbler, Ringed and Little Ringed Plover all had poor seasons or were absent. Indeed the wet, cool weather in June was detrimental to breeding activity and many insect eating species must have had low success rates.

With autumn migration came the usual exciting events and Honey Buzzard, Wryneck, Black-necked Grebe, Black Tern, Red-crested Pochard and Little Gull all appeared. The wader passage was interesting and involved Whimbrel, Curlew, Spotted Redshank, Wood Sandpiper and Little Stint. Strong westerlies in the first half of September brought perhaps the most unexpected visitor of the year when a Manx Shearwater was found near Sharnbrook. Connected with this movement was an influx of Cormorants.

Westerlies prevailed through to mid-October and with them a temporary lull with only a Hen Harrier and Ring Ouzel to liven the picture.

November, however, saw the arrival of Twite, Snow Bunting and Bewick's Swans, the latter gracing us with their presence into 1981.

In December one observer had a red-letter day when he recorded the first Ruddy Duck for the county, perhaps long overdue but no less worthy a record. Remarkably it was another duck species that supplied the next highlight when two Ferruginous Duck appeared at Blunham, where one stayed to be seen by many observers. Finally to complete an exciting month a pair of Bearded Tits were found at Houghton Regis Chalk Pit, remaining into 1981, as did one of a trio of Great Grey Shrikes which had appeared in an unprecedented influx. They brought the annual total of species recorded to 162, which is about average for the last few years.

My thanks as usual to the following contributors:—

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SYSTEMATIC LIST FOR 1980

Species recorded in Bedfordshire during 1980 and not included in the systematic list are:

Kestrel, Red-legged Partridge, Grey Partridge, Pheasant, Lapwing, Black-headed Gull, Common Gull, Herring Gull, Great Black-backed Gull, Stock Dove, Woodpigeon, Little Owl, Green Woodpecker, Great Spotted Woodpecker, Skylark, Meadow Pipit, Wren, Dunnock, Song Thrush, Mistle Thrush, Goldcrest, Long-tailed Tit, Marsh Tit, Willow Tit, Coal Tit, Blue Tit, Great Tit, Nuthatch, Treecreeper, Jay, Magpie, Rook, Carrion Crow, House Sparrow, Tree Sparrow, Chaffinch, Greenfinch, Goldfinch, Linnet, Bullfinch, Yellowhammer.

English and scientific names follow the '*British Birds' List of Birds of the Western Palearctic* (1978).

The following abbreviations are used in the text:—

BTQ = British Trust for Ornithology; CHP = Chalk Pit; CLP = Clay Pit; GP = Gravel Pit; L = Lake, SW = Sewage Works; R = River; RSPB = Royal Society for the Protection of Birds.

- Little Grebe** *Tachybaptus ruficollis* Highest count of 18 at Blunham GP 25th September (JTRS).
- Great Crested Grebe** *Podiceps cristatus* Young noted at nine sites. Highest winter count was 70 at Stewartby L 13th January (BRS).
- Black-necked Grebe** *P. nigricollis* An adult in summer plumage Blunham GP 21st April (JTRS), two at Barkers Lane GP 21st September, and a single on 24th September subsequently seen on several dates to 11th October (MJP, ECN, DJO).
- Manx Shearwater** *Puffinus puffinus* An exhausted storm-blown bird was picked up on 6th September near Sharnbrook and later released by RSPB near Dungeness. The first in the county since 1973, it coincided with a small influx throughout southern England (per RSPB).
- Cormorant** *Phalacrocorax carbo* Singles seen in most months of the year. Interesting influx in September following strong westerlies with singles over Bromham, Box End, Kempston, and two at Stewartby L on 13th, single at Blunham GP 14th, two Blunham GP 21st, single over R. Ouse, Bedford 22nd, single Twin Bridges GP and five Roxton GP 25th.
- Grey Heron** *Ardea cinerea* Breeding took place Luton Hoo, Bromham Park, and Southill L, with 13 nests certainly occupied, seven probably and three possibly used.
- Mute Swan** *Cygnus olor* Highest count was 45 Radwell GP 16th March (BN).
- Bewick's Swan** *C. columbianus* Two at Dunstable SW 30th November, later joined by a third, were still present into January 1981. Nine over Carlton 1st December, (WJD, DSW, et al).
Additional 1979 record: 17 Whipsnade Zoo Park 8th January (CT).
- Bean Goose** *Anser fabalis* As with all such records a single on 1st January and 16th February at Harrold GP must be of suspect origin (DSW).
- White-fronted Goose** *A. albifrons* A single Harrold GP 24th April almost certainly an escape (DSW).
- Greylag Goose** *A. anser* Goslings seen at Blunham GP, Radwell GP, Harrold GP, and Roxton GP with 46, five, 48 and 25 respectively. Outside the breeding season 150+ at Harrold GP on 4th October, and then 100+ Harrold/Radwell GP until the year end. Smaller numbers seen Barkers Lane GP, Girtford GP, Southill L, Vicarage Farm CLP, and over Blows Downs.
- Snow Goose** *A. caerulescens* Escaped birds frequented Harrold and Radwell associating with the Greylag and Canada Geese flocks. Maximum of four on 11th October (MJP, DSW).
- Canada Goose** *Branta canadensis* Recorded from virtually every wetland habitat during the year, suggesting continued increase. Breeding took place at Luton Hoo (three pairs), Battlesden L (six pairs), Brogborough CLP (three pairs), Harrold GP (one pair), Southill L (two pairs). 28 goslings were counted at Ouse Manor, Sharnbrook. Peak

numbers included 75 at Luton Hoo, 58 Barkers Lane GP, 160 Brogborough CLP, 180 Southill L and 151+ Harrold GP.

Barnacle Goose *B. leucopsis* Singles of dubious origin at Harrold GP 7th April and 9th November (IKD, DH, DSW).

'Grey' Goose *Anser* sp. 12 flew SW over Maulden 28th December (BN).

Shelduck *Tadorna tadorna* One to four birds seen in spring and summer on many dates from 9th March to 29th June at six sites. In the autumn seen from 6th August to 17th September from three sites. Singles in winter from Stewartby L, Blunham GP, and Dunstable SW.

Wood Duck *Aix sponsa* Two of this 'D' category species reported from Shuttleworth College Lakes in November (BN).

Mandarin *A. galericulata* No confirmed breeding records although one or two birds present in the breeding season at Harrold GP, Eversholt L, Blunham GP, R. Ivel near Blunham, and near Woburn. In the winter, three at Harrold GP 9th November and a pair at The Lodge, Sandy 1st November.

Wigeon *Anas penelope* Widespread during both winter periods. Record numbers at Blunham GP, with 88 on 2nd January increasing to 242 on 16th and 241 on 25th January (JTRS). Elsewhere high counts from Harrold GP, with 115 on 6th January, and Radwell GP with 56 on 16th February. In the second winter period 101 at Harrold GP and 60 Radwell GP 21st December. Smaller numbers at Battlesden L, Coronation CLP, Luton Hoo L, Stewartby L, Brogborough CLP, Vicarage Farm CLP, Southill L, and Dunstable SW.

The first return in autumn was on 21st September at Barkers Lane GP and Harrold GP.

Gadwall *A. strepera* No breeding records although a drake was seen in Luton Hoo during August (see 1979). Interesting series of counts from Blunham GP indicative of local increase. By 16th January numbers had increased to 55, but then a gradual dispersion until 21st April. The first return was noted on 25th September, increasing to 91 by 10th November, and then 121 by 24th December (JTRS). Smaller numbers reported from Harrold GP, Battlesden L, Barkers Lane GP, Stewartby L, Vicarage Farm CLP and Dunstable SW.

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

	13/1	17/2	16/3	14/9	12/10	16/11	14/12
Total	253	149	53	40	151	331	254

Numbers higher than in recent years, particularly in the second winter period, with the highest count of 150 at Radwell GP 21st December.

Mallard *A. platyrhynchos*

	13/1	17/2	16/3	14/9	12/10	16/11	14/12
Total	1711	407	204	990	1444	1430	1125

Numbers remained below average. Harrold GP was the only site to consistently hold more than 500 birds.

Pintail *A. acuta* The following records constitute an above average showing of this scarce visitor to Bedfordshire: two at Dunstable SW 27th April, two at Harrold GP on 5th October and again 1st November, three at Southill L 19th October, one at Barkers Lane GP 25th October with five there on 20th November (WJD, DSW, DH, DJK, PTr, MJP).

Showeler *A. clypeata* Records remain constant, with records from eleven sites, although double figures only from Harrold GP, Dunstable SW and Southill L. Recorded in every month except July, with highest numbers at Dunstable SW with up to 63 during August and September.

Red-crested Pochard *Netta rufina* At Blunham GP pair present on 21st September, and single duck on 8th October (PH, JTRS, JKCS).

Pochard *Aythya ferina*

	13/1	17/2	16/3	14/9	12/10	16/11	14/12
Total	359	399	145	187	449	522	351

Good numbers in both winter periods, with levels reaching a record high in October, with 243 at Barkers Lane GP on 28th October. Highest single count was 278 on 17th February at Blunham GP.

Ferruginous Duck *A. nyroca* Two drakes at Blunham GP on 21st December were the third and fourth county records this century. One stayed on through to 1981 (AHC, JTRS et al).

Tufted Duck *A. fuligula* Young seen at nine sites. Winter counts as follows:

	13/1	17/2	16/3	14/9	12/10	16/11	14/12
Total	379	275	153	166	173	307	307

Above average counts in early part of the year and from November onwards. Individual flocks remained low with none over 124.

Tufted X Scaup or Pochard *X Aythya* A near Tufted Duck drake showing features of Scaup or Pochard was seen at Blunham GP 1st November (DJF).

Long-tailed Duck *Clangula hyemalis* A single specimen of this scarce visitor to the county was seen at Stewartby L 27th January (TP).

Common Scoter *Melanitta nigra* Pair on 11th April at Blunham GP, a typical date (SGW).

Goldeneye *Bucephala clangula* About average showing with records from seven sites, with maximum of 11 at Blunham GP 29th December. Earliest return was on 8th October at Blunham GP and a very late bird was one seen at Blunham GP on 11th May.

Goosander *Mergus merganser* Reported from Harrold GP, Radwell GP, in February, November and December, from Stewartby L in January and November, and Battlesden L in November. Maximum of seven on 7th December Radwell GP. A juvenile duck at Roxton GP during September was later confirmed as an escape.

Ruddy Duck *Oxyura jamaicensis* A duck seen at Barkers Lane GP on 12th December was still present at the end of the year. An addition to the county list (MJP, DJO).

Honey Buzzard *Pernis apivorus* Single seen in wooded country in the north of the county, 3rd and 9th August.

Hen Harrier *Circus cyaneus* A 'ringtail' at Roxton GP 24th October and at nearby Palaceyard Wood 31st October (PHA).

Sparrowhawk *Accipiter nisus* Huge increase in records indicating perhaps as many as seven pairs present during spring and summer. Four young raised in the north of the county, and display seen at three other sites.

Buzzard *Buteo buteo* One seen throughout September in the Whipsnade area (AP, RC), and two in Luton Hoo November to December (AJL).

Buzzard sp *Buteo* sp Single seen in Luton Hoo 27th May (per AJL) and one over Sutton Fen drifting NE 9th May (SH).

Hobby *Falco subbuteo* From the numerous sightings a possible five pairs present during summer, although for the first year since 1975 no proof of breeding received. The earliest record was 26th April and the latest 29th September.

Quail *Coturnix coturnix* One heard 18th June near Potton Wood, and one seen near Milton Bryan 31st July (RCr, PS).

Reeves's Pheasant *Syrnaticus reevesii* Single male of this 'D' category species from Toddington Manor 10th January (PT).

Lady Amherst's Pheasant *Chrysolophus amherstiae* Records from Maulden Woods, Charle Wood and Luton Hoo, but never more than five on one day.

Water Rail *Rallus aquaticus* Breeding season records from Flitwick Moor and Houghton Regis CHP. Winter records from The Lodge, Sandy, Southill L, Harrold GP, by R. Ouse Bedford, Luton Hoo and Flitwick Moor.

Moorhen *Gallinula chloropus* Winter concentrations of 70+ Harrold GP on 19th January, and c100 Luton Hoo 2nd December (DSW, BRS).

Coot *Fulica atra* At Blunham GP 404 on 13th January and then 208 on 3rd August increasing to 304 by 16th November (DJK).

Oystercatcher *Haematopus ostralegus* Two at Barkers Lane GP 9th August and two at Radwell GP 21st September (MJP, DJO).

- Stone-curlew** *Burhinus oediconemus* Single Whipsnade Zoo Park 9th June (CT, LM).
- Little Ringed Plover** *Charadrius dubius* Present during the summer at ten sites but breeding activity noted at only four, with 11 to 13 pairs raising only seven young. First in spring noted on 29th March at Roxton GP and a late bird at Radwell GP 4th October.
- Ringed Plover** *C. hiaticula* Winter records from Harrold GP, with a maximum of seven in February, and Stewartby L. Breeding activity seen at three sites but seven to nine pairs raised only one young. Present at another four sites during the summer. Away from these localities passage noted 9th March to 18th May, and 13th July to 12th August.
- Golden Plover** *Pluvialis apricaria* Widespread and numerous during both winter periods with sizeable flocks near Bromham (200) 10th February, Clifton (225) 19th March, Everton (450–500) 22nd March, near Cardington (200) 12th April, and again (300–350) on 2nd November, Cotton End (320) 8th November, Luton Hoo (254) 16th November and Biggleswade Common (150) on 6th December. Smaller flocks from 15 other localities.
- Grey Plover** *P. squatarola* Good spring passage with singles at Radwell GP 12th April, Stewartby L 18th May, two at Blunham on the same day, and lastly a single at Houghton Regis CHP 30th May to 1st June (TP, DSW, AL, PH).
- Little Stint** *Calidris minuta* Singles Houghton Regis CHP, 30th June, Girtford GP 23rd to 25th August, an injured bird which stayed at Bedford SW from 31st August to 28th September, two at Radwell GP 7th September and a single there 4th–5th October (DJO, DPL, DSW, AL, SGW, MJP).
- Dunlin** *C. alpina* Spring passage noted from 16th March to 22nd May at three sites, and autumn passage from 12th July to 26th October at three sites. Winter records from Blunham GP with two on 16th January, a single on 1st November and from Radwell GP with two on 6th December. Special mention should be made of counts made at Barkers Lane GP and Bedford SW in November and December, maximum of 24 on 20th December at the former and 13 during November at the latter with a December maximum there of nine on 7th.
- Ruff** *Philomachus pugnax* A better than average year with single on 11th May at Radwell GP, and in autumn one 6th August and one increasing to three between 4th and 9th November, all at Bedford SW. At Radwell GP four on 9th–10th August, and two or three between 13th and 17th September.
- Jack Snipe** *Lymnocyptes minimus* In the first winter period records from Harrold GP only, where birds present from 10th February to 12th April with maximum of three. From October to December records from Harrold GP, Radwell GP and Bedford SW with never more than two together.
- Snipe** *Gallinago gallinago* Breeding suspected in Luton Hoo and Houghton Regis CHP. Notable flocks from near Langford with 130 on 22nd November, near Barkers Lane GP with 140 16th December and Radwell GP with 80+ on 26th October.
- Woodcock** *Scolopax rusticola* Roding noted from nine sites with young seen at Sutton Fen. Interesting winter record of a single in a Luton garden in December.
- Black-tailed Godwit** *Limosa limosa* One at Radwell GP 3rd May and one over Dunstable SW 30th May (DSW, AL).
- Godwit** sp *Limosa* sp. Eight godwits over Radwell GP 27th July (DSW).
- Whimbrel** *Numenius phaeopus* Strong spring passage with singles over Silsoe and Radwell GP 3rd May, and 15 over Whipsnade Downs 6th May. In autumn seven over Blows Downs 27th July and one over Whipsnade Zoo Park 24th August (BN, DSW, RC, PT, CT).
- Curlew** *N. arquata* Good spring and autumn passage. One over The Lodge, Sandy on 24th April was followed by 11 over Odell Woods 27th April. In June three were seen at Radwell GP on 14th and two flew over Old Warden 29th. One over Dunstable Downs 26th July, and then in August c30 over Blunham on 23rd, three at Radwell GP on 24th and eight the next day, when also 40+ flew over Harrold GP. A further movement took place at Radwell GP and Harrold GP in September and October with a maximum of four and finally singles at Harrold GP and over Shillington on 5th October. A single

winter record from R. Ouse east of Bedford 1st January.

- Spotted Redshank** *Tringa erythropus* One at Dunstable SW 12th April, two at Radwell GP 5th May, and then in autumn singles at Radwell GP from 10th August to 12th September and at Harrold GP 7th September (DSW).
- Redshank** *T. totanus* Breeding confirmed at two sites, present at another six during the breeding season. Found in the county in every month.
- Greenshank** *T. nebularia* Spring passage from 27th April to 1st June from four sites with maximum of three at Radwell GP 11th May. Autumn passage lasted from 13th July to 28th September at eight sites with peak of eight at Radwell GP 24th August. A late bird on 2nd November at Bedford SW.
- Green Sandpiper** *T. ochropus* Seen in every month. Winter records from Dunstable SW, Bedford SW and Stewartby L. Spring passage noted at five sites, and in autumn from seven sites, peaking in August with 16 at Bedford SW on 21st.
- Wood Sandpiper** *T. glareola* First in autumn 4th August with a single at Bedford SW, and then four at Radwell GP 9th August with the last staying until 12th October. Single at Dunstable SW 8th September (MJP, DJO, AJL, DSW).
- Common Sandpiper** *Actitis hypoleucos* Heavy and widespread passage in both seasons. Spring movements noted from 23rd April until 30th May at 12 sites with peak of eight at Barkers Lane GP on 7th May. In autumn passage recorded at 17 sites lasting from 27th June until 10th October, with peak in mid-August including 20 at Radwell GP on 15th.
- Turnstone** *Arenaria interpres* Typical dates recorded with singles at Radwell GP on 3rd May, and Barkers Lane GP on 16th May (DSW, DJO).
- Little Gull** *Larus minutus* Three adults at Stewartby L on 6th May were followed by a single first summer bird at Blunham GP 18th May. A single immature stayed at Radwell GP from 12th to 14th September. The most records in a year since 1967 (TP, JTRS, MJP, DJO).
- Lesser Black-backed Gull** *L. fuscus* Movement at Radwell GP with c100 4th September, c400 4th October, and Houghton Regis with 240 17th October.
- Gull sp.** *Larus* spp. As part of a BTO Survey, between 25–30,000 were estimated in the roost at Stewartby L 3rd February (AJL et al).
- Common Tern** *Sterna hirundo* Breeding took place at four localities. At Barkers Lane GP adults were seen feeding a downy young on 27th June, and two juveniles were present during August. Single young seen at Stewartby L 12th July with adults present all summer. At Radwell GP two adults were noisily defending territory and two young were later seen which were probably raised somewhere between Harrold and Radwell GP. At Roxton GP a pair were present throughout the summer and were seen carrying fish. Three young were seen with two adults 10th July. Away from these localities passage was noted at 12 sites lasting from 23rd April to 30th September. Of particular mention were 58 at Stewartby L on 25th April, some of which were thought by the observer to have been Arctic Tern. On 21st August 36 were seen at Barkers Lane GP.
- Arctic Tern** *S. paradisaea* 40 at Dunstable SW on 3rd May, 30+ at Radwell GP on the same day, with four on 5th, followed by 17 at Harrold GP on 31st May. See also entry under previous species (WJD, DSW).
- Black Tern** *Chlidonias niger* Heavy and long-lasting passage during both spring and autumn. In May seven were seen at Stewartby L on 11th, with five at Blunham GP the following day. Thereafter one remained until 18th when four appeared staying until 19th. Singles were also seen at Barkers Lane GP 16th May, and at Stewartby L 15th June. Autumn passage began on 27th July when one was seen at Stewartby L, followed by three on 3rd August. Passage then continued until 21st September when six were seen. At Barkers Lane GP two appeared on 9th August, singles on 7th and 11th September, 14 on 16th, four on 21st and singles 22nd and 24th. At Blunham GP four on 3rd September, followed by singles 4th and 5th and two on 21st, when three were seen at Brogborough CLP. Earlier one was seen Dunstable SW 7th August.

- Collared Dove *Streptopelia decaocto*** Large gathering of 70 at Bedford SW on 28th October.
- Turtle Dove *S. turtur*** First arrival 1st May Barkers Lane GP and last 2nd October at Vicarage Farm CLP.
- Ring-necked Parakeet *Psittacula krameri*** In January two were seen feeding on a bird table in Toddington. In March one frequented the Kempston area, and one was seen again in July. Up to four were seen in Harlington, where birds have been present since 1978, the latest date being two at the end of November (per R. Stokes). Evidence was received of two being released from an aviary in Luton.
- Cuckoo *Cuculus canorus*** Late arrival by about ten days with first on 27th April at Everton and Odell Woods.
- Barn Owl *Tyto alba*** No change in status with summer records from three sites with breeding success noted at one. Winter records from additional three sites. Remains under recorded.
- Tawny Owl *Strix aluco*** As an indication of abundance c30 located in five tetrads in TL13 on 12th May (JTRS, BN).
- Long-eared Owl *Asio otus*** Up to three present at traditional roost in January and February (SFH).
- Short-eared Owl *A. flammeus*** Three seen Coronation CLP 14th December (BN, BRS).
- Nightjar *Caprimulgus europaeus*** Single present at Warden Warren from 18th May to 12th August, with two males on 3rd June. One heard Chicksands Wood 11th May, and lastly one located at Millbrook in mid-June but not seen or heard on later dates.
- Swift *Apus apus*** First over Blows Downs on 27th April, with the second at Blunham on 29th April were typical dates. The main arrival was not until 11th May. The last was seen at Melchbourne Park 21st September. Heavy movement noted during the end of June and early July, with 5000 passing south over The Lodge, Sandy on 7th July.
- Kingfisher *Alcedo atthis*** Breeding records from four sites, with summer presence noted at a further four. In winter birds seen at another 14 sites. These records indicate a return to pre-1978/79 winter levels.
- Hoopoe *Upupa epops*** Coinciding with a large influx in southern England three of this exotic visitor appeared in the county. The first, on 15th April was on Dunstable Downs, followed by one at Stewartby L. on 4th May and one at Cuckoo Bridge near Great Barford 12th May. (SFH, RL, CB).
- Wryneck *Jynx torquilla*** A single remained at Harrold GP from 8th September, when it was caught and ringed, until 10th September (DSW).
- Lesser Spotted Woodpecker *Dendrocopos minor*** Remains reasonably widespread with records from 14 locations.
- Sand Martin *Riparia riparia*** Earliest arrival noted at Harrold GP 4th April and last on 21st September at Radwell GP. Large breeding colonies at Radwell GP with 186 nest holes and Grovebury Road Sand Pits with two colonies of c100 holes each. Other breeding colonies including one in drainage pipes at Shire Hall, Bedford with 18 adults present.
- Swallow *Hirundo rustica*** The first in spring was seen near Barkers Lane GP on 4th April, with the last over Sandy on 31st October. Impressive roost of up to 10,000 at Radwell GP during September.
- House Martin *Delichon urbica*** The earliest arrival, on 13th April over Blows Downs, was later than usual. The last was seen over Whipsnade Zoo Park 31st October.
- Tree Pipit *Anthus trivialis*** Spring movement noted at Blows Downs with a light passage on 6th April, and in autumn a single in Whipsnade Zoo Park on 3rd September. Breeding records from Home Wood, Maulden Woods, Old Warden, Odell Plantation, Palmers Wood, The Lodge Sandy and Wavendon Heath.
- Rock Pipit *A. spinoletta*** Single Blunham GP 1st January (ECN). One of the race *A. spinoletta spinoletta*, known as the Water Pipit, was seen at Harrold GP 4th April with a probable at Radwell GP on 13th April (DSW, BN).
- Yellow Wagtail *Motacilla flava*** First arrival 4th April Harrold GP.
- Grey Wagtail *M. cinerea*** A pair held territory in Luton Hoo during the summer but no proof of breeding success. Also seen during the summer in Whipsnade Zoo Park. Influx

- during October provided records from 13 localities by the end of the year.
- Pied Wagtail** *M. alba* Roosts of c100 at Radwell GP and c250 at Harrold during October, and 230 at Queens Park, Bedford on 16th November.
An example of the continental race *M. alba alba*, the White Wagtail, was seen at Stewartby L 30th March (TP).
- Robin** *Erithacus rubecula* One found dead in Whipsnade Zoo Park on 16th May had been ringed at Ivinghoe Beacon 29th July 1978 (CT).
- Nightingale** *Luscinia megarhynchos* First noted from near Old Warden on 19th April. A BTO survey disclosed 39 singing males in the county, showing a distribution pattern with a striking affinity to that in the *Bedfordshire Bird Atlas* (Harding, 1979) but with a curious absence in the county south of Heath and Reach. The results show an apparent increase from the 15–28 pairs revealed by the previous BTO survey in 1976. This increase may be the result of improved observer coverage.
- Black Redstart** *Phoenicurus ochruros* A male collecting food near Blows Downs on 2nd July was an indication of probable breeding nearby (PT).
- Redstart** *P. phoenicurus* Three pairs present in Charle Wood area, and a singing male in Palmers Wood 12th May. Small passage at Whipsnade Zoo Park with singles 5th, 8th and 27th May, and then again 23rd August, and 26th to 30th with two on 29th August. Single on Blows Downs 3rd and 5th September.
- Whinchat** *Saxicola rubetra* No breeding records. Spring passage noted at Kempston Mill, The Lodge Sandy and Cardington, from 3rd to 17th May. In autumn birds seen at five localities between 14th August to 21st September, with a maximum of 12 at Dunstable SW on 21st September.
- Stonechat** *S. torquata* Singles at Dunstable SW during January and February but then no records until November when two were seen at Dunstable SW 2nd, two at Bedford SW 29th, and then singles at Chimney Corner CLP and Bedford SW 7th December (BRS, SGW, DJO, DPL).
- Wheatear** *Oenanthe oenanthe* Widespread passage in spring with first at East Hyde and Bedford SW 29th March. Last in autumn on Dunstable Downs 11th October.
- Ring Ouzel** *Turdus torquatus* Spring passage was evident in April on Blows Downs with three on 11th, two on 12th and then one at Cockayne Hatley on 30th. A second wave occurred in May with one on 5th near Roxton and then at Bison Hill, Whipsnade with two on 5th, one on 6th, two on 7th and three on 9th. The next day three were seen at The Lodge Sandy.
In the autumn one at Everton 12th October (PT, IDH, RL, CT, AHC).
- Blackbird** *T. merula* Influx at Old Warden Tunnel following NE winds with 40+ 8th November.
- Fieldfare** *T. pilaris* First autumn arrivals were two on Blows Downs 2nd September, followed by three at The Lodge Sandy on 9th. Main arrival did not take place until mid-October. 1000 roosting on Blows Downs 23rd November was the largest flock recorded. The last to depart in spring were singles at Felmersham on 28th April and one over Dunstable 5th May.
- Redwing** *T. iliacus* 2nd October saw the first arrival with a single on Blows Downs. Large influx noted on 12th October with several hundred passing over Everton, 500 moving west over The Lodge, Sandy and a 'considerable' movement over Harrold. A roost of c2000 built up at Blows Downs during November.
- Grasshopper Warbler** *Locustella naevia* Singing males were, at 32, one less than in 1979 but localities increased from five to 14. First in spring were two near Old Warden 19th April.
- Sedge Warbler** *Acrocephalus schoenobaenus* The first was on 14th April at Dunstable SW.
- Reed Warbler** *A. scirpaceus* In spring the earliest arrival was one at Odell Plantation on 10th May. The largest breeding colony was 20+ pairs at Harrold GP, where the last was recorded on 5th October.
- Lesser Whitethroat** *Sylvia curruca* The first, and earliest since 1947, was seen at Odell Plantation on 12th April; the last at Harrold GP 28th September.
- Whitethroat** *S. communis* The first were seen in Maulden Woods 19th April.

- Garden Warbler** *S. borin* Arriving later than usual, the first was at The Lodge, Sandy 3rd May.
- Blackcap** *S. atricapilla* Winter records involved a male at Clifton on 27th January and singles Blunham 7th and 13th March. The first probable migrant was one at Odell Plantation 12th April. A late bird remained at The Lodge, Sandy on 21st November.
- Wood Warbler** *Phylloscopus sibilatrix* A very disappointing year with the only report being one singing at The Lodge, Sandy 5th to 7th July (SH).
- Chiffchaff** *P. collybita* First migrants were singles Harrold GP and Southill Park on 23rd March. One was seen in a Bedford garden on 19th December.
- Willow Warbler** *P. trochilus* The first arrival was one on Dunstable Downs on 4th April although the main arrival did not take place for another seven days.
- Spotted Flycatcher** *Muscicapa striata* Arriving late the first migrants were noted on 11th May at Arlesey Old Moat, Whipsnade Zoo Park and Girtford GP. The latest to depart in autumn were two at Blunham on 4th October.
- Pied Flycatcher** *Ficedula hypoleuca* Singles in Whipsnade Zoo Park 3rd May and Kidney Wood, Luton Hoo on 5th May (AP).
- Bearded Tit** *Panurus biarmicus* A male remaining from 1979 was still present near Icknield School, Luton on 26th January and a pair were located in Houghton Regis CHP on 3rd December, where they stayed until at least February 1981. (RAK, AJL, CT et al).
- Great Grey Shrike** *Lanius excubitor* Remarkable influx with singles at Stanbridgeford and Biggleswade Common on 30th November and Studham village 19th December. The first mentioned bird stayed until at least February 1981 (AL, SGW, JMF et al).
- Jackdaw** *Corvus monedula* A gathering of 100+ at Everton 29th March.
- Starling** *Sturnus vulgaris* A roost of 50,000+ at Carlton in March.
- Brambling** *Fringilla montifringilla* Small flocks widespread in first winter period, with maximum of 180 on 12th January Warden Hills. A late bird was seen at The Lodge, Sandy on 9th May. The first winter arrival was seen at Sutton Fen on 12th October and 30 had gathered at Barton Hill Farm by 8th November.
- Siskin** *Carduelis spinus* Small parties reported from five localities in the first winter period, 100+ at Flitwick Moor 24th February of particular note. Passage was evident at The Lodge, Sandy from 3rd April until 8th May. On 4th April display was seen at Rowney Warren.
From 2nd October until the end of the year recorded from six localities in small numbers.
- Twite** *C. flavirostris* An example of this unusual visitor to the county was seen at Blunham 10th November (JTRS, PJG).
- Redpoll** *C. flammea* During the first winter period several large parties were reported with a maximum of 160 at The Lodge, Sandy 21st January. Less abundant in the second winter period.
Two examples of the race *C. flammea flammea*, known as the Mealy Redpoll, were seen at Bedford SW 24th December (IKD).
- Crossbill** *Loxia curvirostra* All records relate to the first half of the year. On 1st January 20+ at Maulden Woods, and then three at Stockgrove Park on 12th January. On 27th April 25, including juveniles, were seen in Ampthill Park. At The Lodge Sandy up to four were seen on ten days to 19th May, and a female on 19th June.
- Hawfinch** *Coccothraustes coccothraustes* Records from Odell Woods, Odell Plantation, Old Warden, Studham, Warden Warren, Whipsnade Downs, Whipsnade Zoo Park, with never more than two seen together.
- Snow Bunting** *Plectrophenax nivalis* Single at Barkers Lane GP 8th November (PTr).
- Reed Bunting** *Emberiza schoeniclus* Roost of c200 Harrold GP during October (DSW).
- Corn Bunting** *Miliaria calandra* A flock of c80 Kempston Mill on 15th November worthy of note (DJO).

BARRY NIGHTINGALE

BIRD RINGING REPORT

by D.S. Woodhead, 79 The Moor, Carlton, Bedford

This is the first ringing report to be produced for Bedfordshire and includes a list of the number and species of birds ringed during the year 1980 and a selection of recoveries. Due to restriction on the length of the report only the more interesting recoveries can be included, some of these referring to previous years (Table 1).

A total of 4980 birds, which included 63 species (see the list below), were ringed during the year and it is hoped in future years to exceed this total as more ringers become active in the county.

Much research has taken place on the county's Sand Martin population over the last ten to twenty years culminating in a report by P.J. Wilkinson in the Journal for 1979 (*Bedf. Nat.* 34: 23-27). During 1980 a total of 663 birds were ringed at a colony at Radwell GP. Out of this total three birds ringed in 1977, ten birds ringed in 1978 and 52 birds ringed in 1979 all at Harrold GP were retrapped. Two individuals ringed feeding at Harrold were also retrapped at the Radwell breeding colony indicating the distance Sand Martins move to find suitable feeding areas during the day. Recoveries and controls of the Sand Martins caught during 1980 fall into the same general pattern as described by P.J. Wilkinson in the above-mentioned report. There is, however, one exception, a bird caught at the Radwell colony in July having been ringed in Jersey. Unfortunately, I have not as yet received any details as to when and exactly where it was ringed.

RINGING TOTALS FOR 1980

Mute Swan	4	Wryneck	1	Goldcrest	22
Great Crested Grebe	2	Sand Martin	690	Long Tailed Tit	35
Wigeon	1	Swallow	847	Marsh Tit	14
Gadwall	21	House Martin	26	Willow Tit	17
Teal	2	Yellow Wagtail	7	Coal Tit	6
Mallard	6	Pied Wagtail	19	Blue Tit	307
Shoveler	13	Wren	70	Great Tit	119
Pochard	182	Duncock	136	Treecreeper	5
Tufted Duck	302	Robin	93	Jackdaw	4
Gadwall/Shoveler Hybrid	1	Nightingale	3	Starling	268
Sparrowhawk	1	Blackbird	176	House Sparrow	29
Little Ringed Plover	1	Fieldfare	1	Tree Sparrow	69
Lapwing	2	Song Thrush	64	Chaffinch	83
Dunlin	1	Redwing	10	Greenfinch	224
Ruff	1	Sedge Warbler	84	Goldfinch	13
Jack Snipe	3	Reed Warbler	91	Linnets	9
Snipe	8	Lesser Whitethroat	57	Redpoll	56
Common Sandpiper	5	Whitethroat	9	Bullfinch	91
Cuckoo	2	Garden Warbler	37	Yellowhammer	51
Tawny Owl	1	Blackcap	62	Reed Bunting	257
Swift	8	Chiffchaff	62		
Kingfisher	4	Willow Warbler	185		

ACKNOWLEDGEMENTS

I would like to thank the following six ringers who work in the county for the prompt return of their records:

P. Holmes, P. Wilkinson, D.S. Woodhead, Dr. M.A. Woodhead, A.T.M. Zwetsloot, P. Zwetsloot.

SPECIES	RINGING DETAILS					RECOVERY DETAILS				
	RING NUMBER	AGE CODE	SEX	DATE	LOCATION	DATE	LOCATION	RECOVERY MANNER	DISTANCE km	DIRECTION (WITHIN UK)
Great Crested Grebe	GK45875	4		26. 3.79	Blunham	7. 8.80	Ipswich, Suffolk	X	103	E
Pochard	GK45896	2	♀	9.12.79	Blunham	20.12.79	Goole, Humberside	+	179	N
	GK45794	6	♂	11. 2.79	Blunham	10. 5.80	Khanty-Mansi, USSR	+	4336	
	GK45410	4	♀	21. 1.79	Blunham	12. 8.79	Latviya, USSR	+	1874	
	GK45664	6	♂	27. 1.79	Blunham	21.10.79	Kalinin, USSR	+	2498	
	GK45832	6	♀	5. 3.79	Blunham	5. 8.79	Katowice, Poland	+	1377	
	GK45436	4	♂	21. 1.79	Sandy	1. 5.79	Neubrandenburg, GDR	X	896	
	Z24382	4	♂	21. 1.76	Luzern, Switzerland	27.12.79	Blunham	V	817	
Tufted Duck	FV76976	2	♀	22.11.79	Blunham	17. 5.80	Horsholma, Foglo, Aland, Finland		1561	
	FV76684	6	♂	8. 2.79	Blunham	26. 5.80	Peene, Usedom, Rostock, GDR	X	969	
	FV76607	4	♀	5. 2.79	Blunham	5. 9.79	Londonderry, Northern Ireland	X	553	NW
	FV27444	5	♀	21. 1.79	Blunham	24. 1.80	Ijsselmeerpolders, Holland	X	389	
	FV76569	6	♂	3. 2.79	Blunham	20.12.79	Ijsselmeerpolders, Holland	X	366	
Sand Martin	A833198	3	J	8. 7.80	Ellesmere, Salop	27. 7.80	Radwell GP	V	175	SE
	KV10883	3	J	15. 7.78	Harrold GP	13. 7.80	Wetherby, Yorkshire	V	195	N
Swallow	A828258	1		29. 6.80	Crathorne, N. Yorkshire	17. 9.80	Radwell GP	V	254	S
	A054234	3		22. 7.80	Smallthorne, Stoke-on-Trent, Staffs.	4. 9.80	Radwell GP	V	145	SE
Reed Warbler	KS91006	3		16. 7.77	Packington Park, Warwicks	17. 5.80	Harrold GP	V	77	SE
Blue Tit	A632267	3	J	21. 6.80	Odell Woods	13.12.80	Cheltenham, Gloucs.	V	108	WSW
Starling	9Z99207	4	♀	18. 2.79	Antwerp, Belgium	20. 2.80	Carlton	V	359	
Greenfinch	NH40216	5	♀	7. 6.80	Ongar, Essex	25.11.80	Cranfield	V	75	SSE
Redpoll	A506169	3	J♀	10. 9.79	Braceborough, Lincs.	15. 4.80	Odell Plantation	V	57	S

Euring age code: 1 Pullus; nestling or chick
 2 Fully grown, but year of hatching unknown
 3 Hatched during calendar year of ringing (J - in juvenile plumage)
 4 Hatched before calendar year but exact year unknown
 5 Hatched during previous calendar year
 6 Hatched before previous calendar year but exact year unknown

Sex: ♂ - Male : ♀ - Female
 Recovery Manner: B Known to be breeding at recovery location
 V Controlled (trapped and released)
 + Shot or killed
 X Found dead or dying

Table 1. Details of selected ringing and recovery records for Bedfordshire.

HIRUNDINE AND SWIFT ARRIVAL AND DEPARTURE DATES

by Steven J. Jackson, 41 Church Street, Ampthill, Bedford.

INTRODUCTION

This short note analyses the arrival and departure dates of the Swallow (*Hirundo rustica*), Sand Martin (*Riparia riparia*), House Martin (*Delichon urbica*) and Swift (*Apus apus*) published in the *Bedfordshire Naturalist* for the years 1948-78. The mean first and last dates are calculated and trends through time examined.

Climatic changes towards the end of the 19th century and throughout the 20th century (Kukla et al. 1977, Manley 1974) have led to changes in the status and distribution of many bird species (Kalela 1949, Williamson 1975). It might, therefore, be expected that climatic influences would have an effect on first and last dates of both summer and winter visitors.

MEAN ARRIVAL AND DEPARTURE DATES

The arrival days, over the period of the analysis from 1948 to 1978 are plotted as histograms in Fig 1. March 1st, for arrivals, is denoted by 1 whilst for departures August 1st is denoted by 1. The analysis of the data, which assumes a normal distribution, Table 1, gives the mean dates for the period. The modal class is the period of most frequent arrival or departure and is shown by the peaks of the histograms, Fig 1.

	<u>MEAN</u>	<u>SAMPLE</u> <u>SIZE</u>	<u>STANDARD</u> <u>DEVIATION</u>	<u>COEFFT. OF</u> <u>VARIATION</u>	<u>MEAN</u> <u>DATE</u>	<u>MODAL</u> <u>CLASS</u>
<u>Arrivals</u>						
Swallow	35.7	31	7.4	20.7	5 April	31 Mar - 9 April
House Martin	41.0	31	9.8	23.9	10 April	10-19 April
Sand Martin	31.4	31	8.1	25.8	31 March	31 Mar - 9 April
Swift	56.4	31	6.2	11.0	25 April	20-29 April
<u>Departures</u>						
Swallow	90.3	31	12.1	13.4	29 Oct	20-29 October
House Martin	94.4	30	16.6	17.6	2 Nov	20 Oct - 8 Nov
Sand Martin	61.3	23	11.8	19.3	30 Sept	20-29 Sept
Swift	48.0	31	17.4	36.3	17 Sept	10-19 Sept

Table 1. Hirundine and swift arrival and departure dates.

It is possible to compare this data with that published at the turn of the century. The following information (Steel-Elliott 1904) does not give precise dates but comparison is of interest.

	<u>Arrival</u>	<u>Departure</u>
Swallow	Middle of April, but in some years a few days later.	End of September/early October, but observed as late as November.
House Martin	About the same time as the Swallow.	Generally end of September/early October, but frequently up to mid-October. Notes dates of 4.11.1878 and 17.11.1875.
Sand Martin	As early as 26.3.1897 and 3.4.1899.	Towards the end of September.
Swift	First few days of May.	End of August.

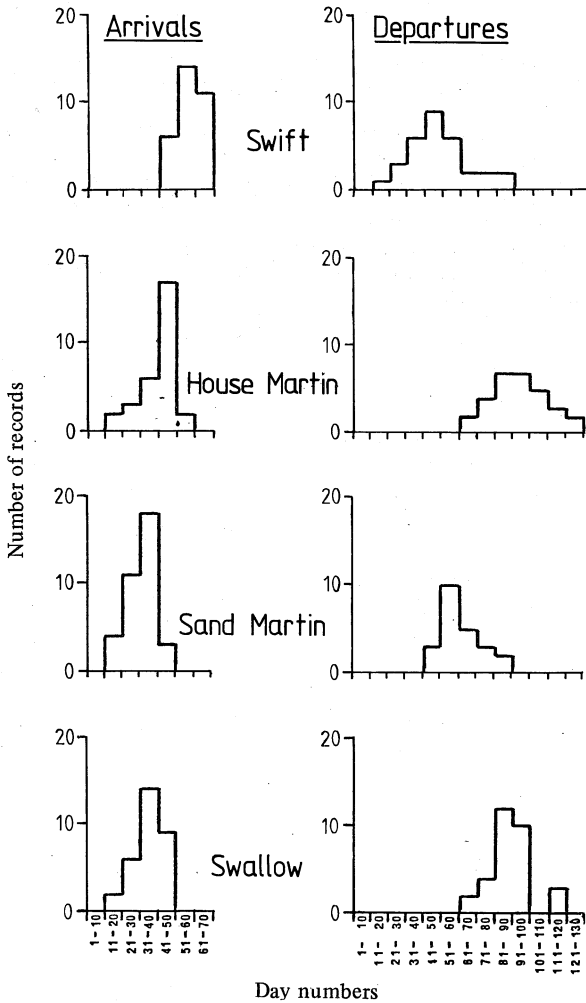


Fig. 1 Histogram of arrival (1 = 1st March) and departure (1 = 1st August) dates of hirundines and swift, 1948-78.

Arrivals

Swallow It would appear that Swallow arrivals in the past 30 years have been slightly earlier than at the turn of the century with a tendency toward the early part of April being apparent. Earliest 17.3.78, latest 12.4.62.

House Martin Arrivals in the middle of April as suggested by Steele-Elliott. Earliest 14.3.65, latest 20.4.67.

Sand Martin Although the mean and modal class are similar to those of Steele-Elliott, many of the first dates are earlier than this. Earliest 12.3.78, latest 15.4.48.

Swift From the data Swift arrivals appear very much the same as at the turn of the century, toward the end of April and first few days of May. Earliest 12.4.61, latest 4.5.70.

Departures

Swallow The mean date of 29 October and modal class of 20-29 October suggest that Swallows depart about two-three weeks later than at the turn of the century. Earliest 15.10.64, latest 22.11.63.

House Martin The modal class of 20 October – 8 November and mean date of 2 November again suggest a later departure. Earliest 6.10.52, latest 8.12.48.

Sand Martin 20-29 September modal class and mean of 30 September indicate only very small differences from Steele-Elliott, but the data are not as full as for other species. Earliest 14.9.52, latest 27.10.61.

Swift The mean date of 17 September and modal class of 10-19 September suggest that Swift departures are now on average some two weeks later than at the turn of the century. Earliest 18.8.55, latest 29.10.48.

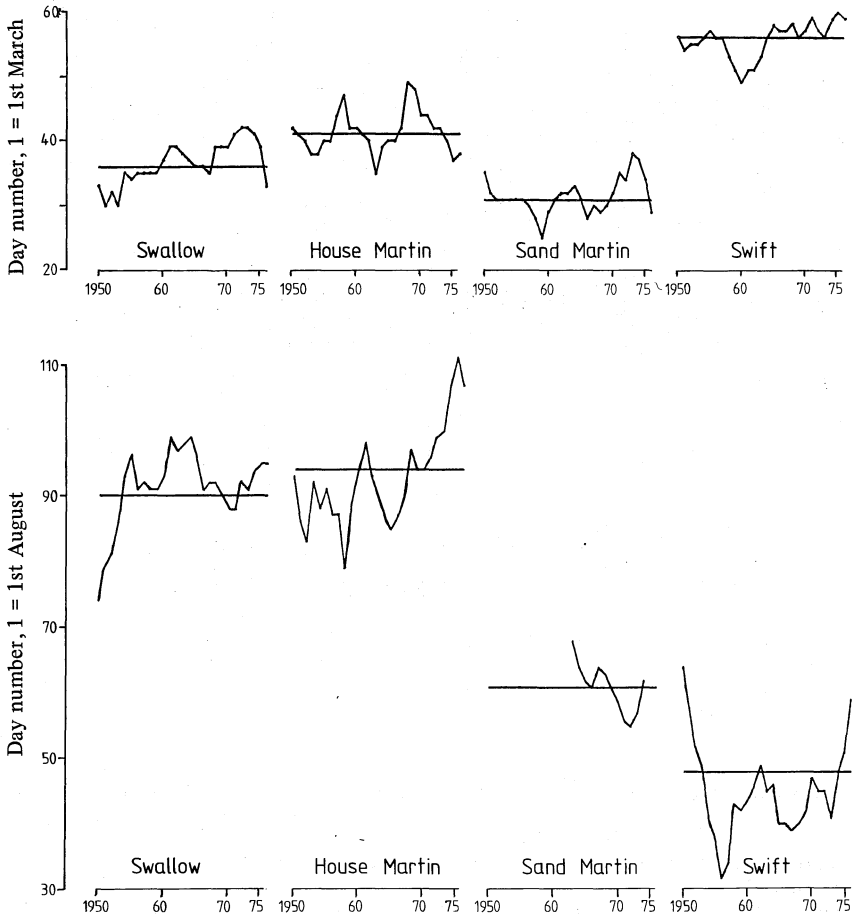


Fig. 2. Five year running means and overall mean (horizontal lines) of hirundines and swift, 1948-78, Upper – arrival dates; lower – departure dates.

FIVE YEAR MEAN ARRIVAL AND DEPARTURE DATES

Figure 2 shows the five year running means of arrivals and departures. The advantage of calculating running means is that trends become apparent, cyclic variations are clear, and irregular or random values are subdued.

Arrivals

Swallow In general there appears to have been a tendency for Swallows to arrive slightly later in the latter part of the period, although since the 1970's a trend is shown toward earlier arrival.

House Martin A cyclic variation about the mean can be seen with periods of early arrival in the early 50's and 60's and mid-70's.

Sand Martin No trends are clear, although a general tendency toward later arrival since 1960 may be seen.

Swift A very slight tendency toward later arrival, although the most marked feature is the period of early arrivals centred on 1960.

Departures

Swallow Departures show a trend toward later departure from 1950-55 after which they tend to stabilise just above the mean.

House Martin A clear trend toward later departure can be seen.

Sand Martin Although data are only available for the latter part of the period, a distinct trend toward early departure can be seen.

Swift From 1950-55 a trend toward earlier departures, after which a general increase toward later departures.

CONCLUSIONS

Comparing the last 30 years with the turn of the century there appears to be very little change in the arrival dates of hirundines and swifts. However, departures, except for Sand Martin, show a general trend towards later dates by some 2 to 3 weeks. This is consistent with fair autumns and less severe winters (Williamson 1975) and also the fact that some warblers such as Chiffchaff and Blackcap now overwinter.

During the last 30 years there was little change in arrival dates, a conclusion also reached by Nightingale (1980) for the two periods 1946-59 and 1960-79.

The analysis of the last 30 years in 5-year running means showed variations by some 15 to 20 days for arrivals and 30 days for departures. There was no consistency between the species.

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REPTILES AND AMPHIBIANS

Report of the Recorder

REPTILES

Starting with the most interesting record, 1980 provided an Adder (*Vipera berus*) record for the second successive year. It was found by school children in the grounds of their School at Leighton Buzzard and was reported to me by Bill Drayton. Now that we have two known sites for these snakes in the county, perhaps members will be extra vigilant and discover them in a few other areas. The likely habitat is on the Greensand Ridge.

Five Grass Snake (*Natrix natrix*) were seen but only two were in new tetrads. One was found at a school in Brickhill, the other at Toddington.

Seven records of Common Lizard (*Lacerta vivipera*) were received, three being in new tetrads (two of which were new 10 km square records). The most unusual sighting of a Common Lizard was at Colworth House, Sharnbrook, where a large specimen fell from the ceiling on to one of the electricians.

Only one Slow Worm (*Anguis fragilis*) was found, this being at Dedmansey Wood near Studham on a Society meeting.

AMPHIBIANS

Recording work has made great progress during the past year, thanks to the hard work of several members, particularly Mr D. Rands and Mr A. Muir-Howie. Also some of the Beds and Hunts Naturalists' Trust members provided some useful data following an appeal for records in their newsletter. Altogether 50 records of Common Frog (*Rana temporaria*), 33 being in new tetrads, were received.

58 records of Common Toad (*Bufo bufo*) were obtained, 16 of which were in new tetrads.

There were 27 records of Smooth Newt (*Triturus vulgaris*), 14 being in new tetrads, and seven of Great Crested Newt (*Triturus cristatus*) of which six were new tetrad records.

ACKNOWLEDGEMENTS

I would like to thank all those who submitted records to me during 1980.

HELEN M. MUIR-HOWIE

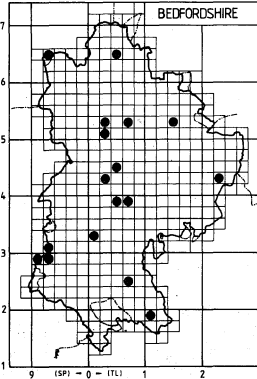


Common Frog *Rana temporaria*

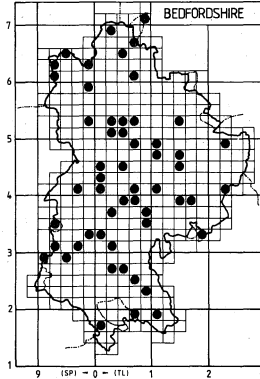


Common Toad *Bufo bufo*

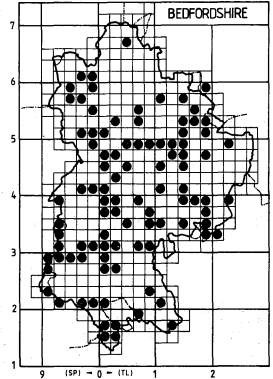
Photos: D. G. Rands



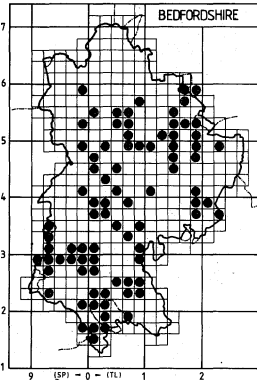
Great Crested Newt *Triturus cristatus*



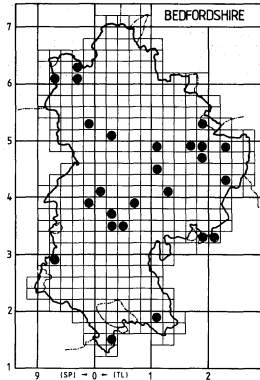
Common or Smooth Newt *Triturus vulgaris*



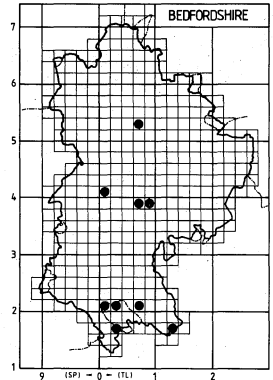
Common Toad *Bufo bufo*



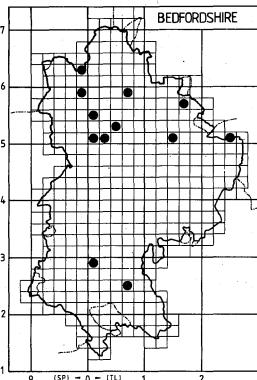
Common Frog *Rana temporaria*



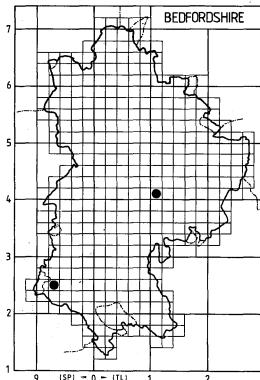
Common Lizard *Lacerta vivipera*



Slow Worm *Anguis fragilis*



Grass Snake *Natrix natrix*



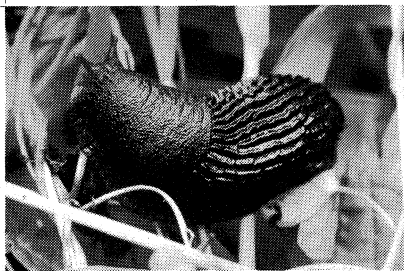
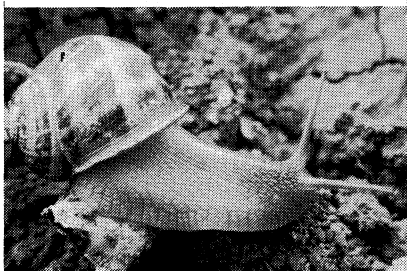
Adder *Vipera berus*

Distribution maps of Reptiles and Amphibians

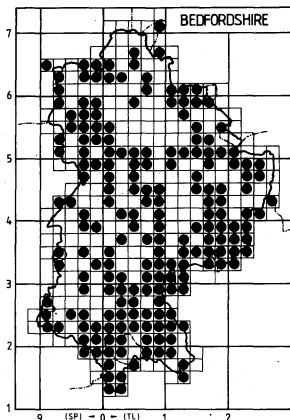
SLUGS AND SNAILS (Mollusca) Report of the Recorder

The recording of Mollusca during 1980 has been very poor due chiefly to my own ill health. I have had to rely on other members of the Society for records.

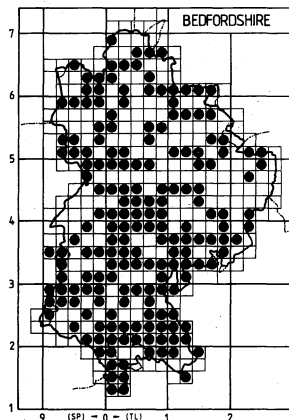
I am pleased to report that Mr D. Guntrip has continued to show a keen interest in land molluscs and has, in turn, encouraged Mr G. Rowe to take an interest in them. Their progress in learning this group has been good and both share a common desire to name their finds before bringing them to me for checking.



Photos: D. G. Rands



Helix aspersa – Large garden snail



Arion ater – Large black slug

I would like to ask all members to help me during 1981. The large garden snail, *Helix aspersa*, and the very large black slug, *Arion ater*, are unmistakable. However the distribution coverage is far from complete as seen on the maps. Please help by 'filling in' some of the gaps by deliberately looking in your own gardens. While looking for these two species you are bound to come across other slugs and snails. Please let me have them for identification and if you have a pond please let me have some water snails.

Your help in this could mean that next year I will be able to report that great progress has been made through your efforts.

E. BERYL RANDS

FISH

Report of the Recorder

I am very pleased to report that 1980 produced a new species record for the county, namely Barbel. In the Journal for 1977 (*Bedf. Nat.* 32: 22) I mentioned a specimen being caught from the Great Ouse outside the county boundary in Buckinghamshire and added: "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". Well, thanks to information passed on via David Anderson, this speculation has been confirmed. It seems that there have been attempts to introduce Barbel into the Great Ouse/Ivel system over the past 110 years or so, but they never seem to become fully naturalized. This is hardly surprising for Barbel are lovers of strong, fast-flowing rivers which do not form part of the Bedfordshire landscape and as Mr Fred Soper the Society's original Fish Recorder pointed out back in 1947: "It is open to doubt whether this species occurs naturally in the county". Certainly our more recent specimens are probably part of a group of 49 individuals which were introduced in 1972. Therefore, further reports will be received with great interest. To anyone who would like more information on the history of the Barbel and, indeed, all the other species of fish which inhabit our county, I would strongly recommend them to try and obtain a copy of the Journal for 1947 and read Mr Fred Soper's excellent article "The Fishes of Bedfordshire" (*Bedf. Nat.* 2: 34-37).

But to return to more routine matters. The general level of recording in 1980 was slightly up on the previous year, with a total of 131 records received compared with 99 in 1979. Coincidentally, though, the number of "new" county tetrad records is exactly the same as last year - i.e. 56. Also the number of species reported is slightly up with 19 in 1980 against 16 in 1979. However, the number of "smaller" species recorded is not only at exactly the same level as 1979 with a total of two but they are also the same two species - namely 3-spined Stickleback and Minnow. There can be no doubt that this indicates the importance of the angling fraternity who supply the bulk of our fish records. But they, of course, are only interested in the "larger" species, so I would be most grateful if members whose disciplines lead them to aquatic habitats would keep an eye open for the "tiddlers" whose scientific importance is just as great as the "record-breaking" specimens.

Finally, I am indebted to the following members who made most valuable contributions during the year:

D. Anderson, V.W. Arnold, M. Green and A. Muir-Howie.

NEW TETRAD RECORDS FOR 1980

- Pike *Esox lucius* - 3 tetrads. 04Z, 15AM.
- Perch *Perca fluviatilis* - 4 tetrads. 92D, 14N, 15AT.
- Roach *Rutilus rutilus* - 4 tetrads. 92E, 14NU, 15T.
- Rudd *Scardinius erythrophthalmus* - 6 tetrads. 95Y, 05CDE, 14N, 15T.
- Dace *Leuciscus leuciscus* - 3 tetrads. 14U, 15AT.
- Chub *Leuciscus cephalus* - 2 tetrads. 14U, 15T.
- Gudgeon *Gobio gobio* - 5 tetrads. 92BC, 14NU, 15T.
- Bleak *Alburnus alburnus* - 1 tetrad. 95Y.
- Common Bream *Abramis brama* - 2 tetrads. 15AT.
- Tench *Tinca tinca* - 8 tetrads. 95Y, 05CDE, 14NU, 15AT.
- Barbel *Barbus barbus* - 4 tetrads. 95Y, 05CDE.
- Carp *Cyprinus carpio* - 6 tetrads. 92E, 95Y, 05CDE, 14N.
- Crucian Carp *Carassius carassius*. Recorded in 1980 but not in new tetrads.
- Zander *Stizostedion lucioperca* - 3 tetrads. 04ABP.
- Eel *Anguilla anguilla*. Recorded in 1980 but not in new tetrads.
- 3-spined Stickleback. *Gasterosteus aculeatus* - 1 tetrad. 03M.
- Minnow *Phoxinus phoxinus* - 1 tetrad. 15A.
- Ruffe *Gymnocephalus cernua* - 2 tetrads. 92D, 15A.
- Rainbow Trout *Salmo gairdneri* - 1 tetrad. 14N.

TONY PETERKIN

SPIDERS (Araneae)

Report of the Recorder

Since the last report in 1976 (ref. 28) a further fifteen spider species have been taken, one deleted as it had been incorrectly identified, and another wrongly named due to a change in nomenclature. All this brings the number of Bedfordshire spiders to 276 which is approximately 45% of the British species.

Finding additional species is becoming steadily more difficult. Therefore, in order to establish which spiders are present in the county, my collecting is now of two forms. The first employs beating and sweeping at the roadside verges, ditches and hedges in the various tetrads. In this way the distribution of the "expected" or "common" species may be determined. So far 55% of the tetrads have been examined using this technique. The second form of collecting is deliberately more intensive, in that certain specific areas are visited regularly and various gathering methods are used, e.g. pitfall trapping. It is these particular procedures that have taken most of the new species noted below. The map summarises the number of species in the 10Km squares. The underlining indicates where the intensive collecting has been – and still is being – carried out.

Amongst the new species was *Scytodes thoracica* Latreille, the spider that sprays silk over its prey. A number of these spiders were seen in 1978, at Ampthill, amongst the roof tiles of a house during renovation. Unfortunately none have been seen since, and the only record is now a badly damaged specimen in my collection. However this discovery revived hopes of finding its close relative *Pholcus phalangioides* (Fuesslin) and, in 1980, a flourishing colony was reported, then verified, at Blunham.

The gnaphosid *Zelotes electus* (C.L.Koch) was taken in the heather area of Sandy Lodge, which is the furthest inland that this species has been found (ref. 29). This capture shows how important are the few heather sites in the county. If they can hide such a spider then what other unexpected species are present?

The *Theridion denticulatum* group has now been examined and contains the two species *T. melanurum* Hahn and *T. mystaceum* L. Koch (ref. 28).

The corrections to the previous lists are for the linyphiids *Porrhomma convexum* (Westring) and *Pocadicnemis pumila* (Blackwall). The former was mis-identified and should be *Porrhomma microphthalmum* (O.P. – Cambridge), already recorded in 1974 (ref. 27) and the latter renamed *Pocadicnemis juncea* (Locket and Millidge) (ref. 30).

Finally, apart from *Pholcus phalangioides* (Fuesslin), the following species noted in the literature have now been taken, *Heliophanus cupreus* (Walckenaer), *Arctosa perita* (Latreille), *Pelecopsis parallela* (Wider) and *Panamomops sulcifrons* (Wider).

ADDITIONS TO THE COUNTY LIST

Family DICTYNIDAE

Dictyna pusilla Thorell

D. latens (Fabricius)

Family SCYTODIDAE

Scytodes thoracica Latreille

Family GNAPHOSIDAE

Zelotes electus (C.L. Koch)

Family THOMISIDAE

Xysticus audax (Schrank)

Family THERIDIDAE

Theridion melanurum Hahn

T. mystaceum L. Koch

Robertus arundineti (O.P. – Cambridge)

Family ARANEIDAE

Cercidia prominens (Westring)

Family LINYPHIIDAE

Walckenaera capito (Westring)

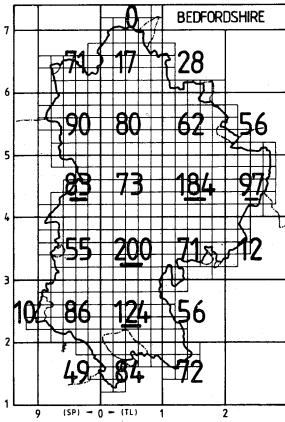
Tmeticus affinis (Blackwall)

Trichopterna thorelli (Westring)

Thyreosthenius parasiticus (Westring)

Milleriana inerrans (O.P. – Cambridge)

Centromerus capucinus (Simon)



Species per 10km square

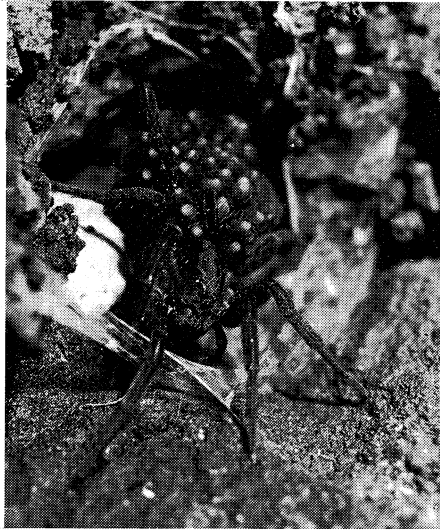
ACKNOWLEDGEMENTS

My thanks to Mr and Mrs D. Woolnough for *Scytodes* and to Mr and Mrs M. Heckler for *Pholcus*, with my added appreciation to both families for their kindness when I invaded their homes. Also thanks to the RSPB, Sandy Lodge, for allowing me to collect there and to Dr P. Merrett of Furzebrook Research Station for checking identifications.

REFERENCES

- The reference numbers continue from the report in *Bedf. Nat.* 31: 45-47.
27. THOMAS, T.J. 1975 Spiders in Bedfordshire. *Bedf. Nat.* 29: 43-49
 28. THOMAS, T.J. 1977 Spiders in Bedfordshire. *Bedf. Nat.* 31: 45-47
 29. MERRETT, P. 1980 Private communication
 30. MILLIDGE, A. 1975 Re-examination of the erigonine spiders "*Micrargus herbigradus*" and "*Pocadicnemus pumila*" (Araneae: Linyphiidae). *Bull. Brit. Arach. Soc.* 3(6): 145-155.

T. J. THOMAS



Trochosa terricola Female with young on her back, 8-10mm
(Photo: T. J. Thomas)

DRAGONFLIES (Odonata)

Report of the Recorder

1980 was remarkable for its miserably wet summer – not the sort of weather in which dragonflies desport themselves. Nevertheless eleven new 10km square records were added to the county list, four in TL06 (all from Melchbourne Park), four in TL24 (from Sutton Fen N.R.), two in SP96 (from West Wood) and one for SP93 (from Mermaids Pond). My grateful thanks to Bernard Nau and Ian Proctor (RSPB warden in 1980) for six of these records, and also to Tom Thomas, Bob Brown, Douglas Willison and Alistair Muir-Howie, all for new tetrad records.

As a help to would-be dragonfly spotters – as a hobby it combines well with coarse fishing – I now have colour prints of all the Bedfordshire species, photographed by my husband John Dawson, which I would gladly demonstrate to anyone who calls in to the Naturalists' Trust office at 38 Mill Street, Bedford.

As a further spur to recording, I have set out the current Bedfordshire dragonfly list with the numbers of the 10km squares in which each species has been recorded (since 1961). This was last done in the Journal for 1976 (*Bedf. Nat.* 31: 49), and national lists were published in 1978 which showed the five most ubiquitous species to be *Ischnura elegans*, *Enallagma cyathigerum*, *Pyrrosoma nymphula*, *Sympetrum striolatum* and *Coenagrion puella* in that order. The picture that emerges in Bedfordshire is that *Aeshna mixta*, the scarce aeshna, and *Orthetrum cancellatum*, a blud bodied darter, seem to be going from strength to strength. Both species have a southern distribution, and are at the edge of their range in Bedfordshire. *Lestes sponsa*, a green damselfly and *Pyrrosoma nymphula*, an early flying red damselfly, although common nationally, remain local here. Finally *Platycnemis pennipes*, the white-legged damselfly, seems restricted to the Ouse, and has not been recorded downstream of Bedford since the AWA canalised the river.

BEDFORDSHIRE DRAGONFLIES LISTED IN ORDER OF UBIQUITY

The records in brackets are shown in the 2nd Edition (1979) of the Provisional Atlas but not known to me. They may well come from outside the county.

Species	10km squares	Total
<i>Enallagma cyathigerum</i>	92, 93, 94, 95, 96, (01), 02, 03, 04, 05, 06, 11, 12, 13 14, 15, (16), 24, 25	17 (+2)
<i>Ischnura elegans</i>	92, 93, 94, 95, 96, 02, 03, 04, 05, 06, 11, 12, 13, 14, 15, (16), 24, 25	17 (+1)
<i>Aeshna grandis</i>	92, 93, 94, 95, 96, (01), 02, 03, 04, 05, (06), (11), 13, 14, 15, (16), 24, 25	14 (+4)
<i>Sympetrum striolatum</i>	92, 93, 94, 95, 96, 02, 03, 04, 05, 06, (11), 13, 14, 15, (16), 24	14 (+2)
<i>Aeshna cyanea</i>	92, 93, 94, 95, (01), 02, 03, 04, 05, 06, 13, 14, 15, (16), 24, 25	14 (+2)
<i>Aeshna mixta</i>	93, 94, 95, 96, 01, 02, 03, 04, 05, 06, (11), 13, 14, 15, 24	14 (+1)
<i>Orthetrum cancellatum</i>	92, 93, 94, 95, 02, 03, 04, 05, 13, 14, 15, (16)	11 (+1)
<i>Coenagrion puella</i>	92, 93, 94, 95, 03, 04, 05, 13, 14, 15	10
<i>Anax imperator</i>	92, 94, 95, 02, 03, 04, 11, 14, 24	9
<i>Agriion splendens</i>	95, 03, 04, 05, 06, 13, 14, 15	8
<i>Pyrrosoma nymphula</i>	92, 93, 94, 95, 03, 04, 14	7
<i>Libellula quadrimaculata</i>	93, 95, 03, 04, 14, 15	6
<i>Lestes sponsa</i>	92, (93), 95, 02, 04, 24	5 (+1)
<i>Libellula depressa</i>	(91), 95, 03, 13, 15	4 (+1)
<i>Platycnemis pennipes</i>	95, 04, 05, 15	4
<i>Sympetrum sanguineum</i>	94, 95, 04	3
<i>Erythromma najas</i>	95, 13, 14	3
<i>Cordulegaster boltonii</i>	95 (migratory swarm, 1975)	1

NANCY DAWSON

BUGS (Hemiptera-Heteroptera) Report of the Recorder

In this 9th report I can only announce one addition to the county list which has resulted from fieldwork during the year. This is a reflection of the cool summer and autumn rather than the effort expended. In fact I have actively continued mapping the county on a 10km basis so that now it is only marginal squares which have fewer than 100 species recorded. Twelve species are known from all squares, and this total is expected to increase further yet. A clear picture is emerging of the importance of the Greensand Ridge to this group. The seven richest squares all lie along this ridge. A few hours in the field in this part of the county is invariably rewarding in summer whereas elsewhere, and particularly on the Boulder Clay uplands in the north of the county, equivalent effort is usually poorly rewarded.

Again I found the blue scabious bug *Placochilus seladonicus* (Fall.) in good numbers on its host plant, *Knautia arvensis*, beside the disused railway track at Leighton Buzzard in August. This site is very much at risk, as commercial developments are already encroaching – the track is now used as access to adjacent premises. It would be sad to lose the only known colony of this bug in Britain – only one specimen has been found away from this site.

The Osier bug, *Campylomma annulicornis* (Sig.) which was also added to the British list from Bedfordshire, presents a more encouraging picture. I have now found it in all adjacent counties. As often as not it is to be found wherever *Salix viminalis* is well established.

Four species turned up this year for the first time since these reports began. *Hebrus ruficeps* is a minute aquatic bug associated with Sphagnum and was present on Flitwick Moor in good numbers in the same *Carex* swamp that has already yielded three other species of bug known from nowhere else in the county (13th Apr 1980). On the same day I searched Sphagnum at Wavenden Heath Ponds in vain, there is no other very likely site in the county. The second species is the ground-bug *Peritrechus lundi*. Two females were found on 18th May above Barton Springs on the uncultivated margin of a field of cereals, taking cover in cracks in the bare soil. Nationally this bug is said to be widespread but local. The third species is a mud-bug *Saldula orthochila* which is, contrarily, a species of dry open ground. Having got my eye in, I find this is a widespread species favouring moss colonising neglected tarmac, gravel or sand – a habitat which is often found on verges following roadworks. The last of this quartet of rediscovered species is the plant-bug *Mecomma dispar*, which was on Lady Fern in Lowes Wood, Woburn (29th June), with the fern bug *Bryocoris pteridis* another species not often encountered. Just a few feet away on the same occasion I found the second Beds specimen of the Enchanter's Nightshade bug *Metatropis rufescens*.

The uncommon water boatman *Sigara concinna* appeared in a new farm irrigation lagoon at Steppingley, previously this bug has turned up at UV light traps several times but not in the water. Another of the less common water boatmen, *Corixa panzeri*, was found in a roadside pond at Shelton.

The Oak bug *Psallus variabilis* is a relatively recently separated species so it was nice to add another site in the county, Whipsnade Heath (27th Jul and 3rd Aug). *Megacoelum infusum* is another Oak bug met infrequently, this was found in Bromham Park and at Chiltern Green. Finally, on a Society field meeting at Melchbourne, a second site for the Box bug *Anthocoris butleri* was found, near Melchbourne House.

ADDITIONS TO THE BEDFORDSHIRE LIST

(As in previous years, nomenclature follows Kloet and Hinks, 1964.)

BERYTINIDAE

Berytinus minor – this has been found in several 10km squares and was in fact overlooked in an earlier list.

CIMICIDAE

Anthocoris visci – I was highly delighted to find this after a number of fruitless attempts to establish the presence of this Mistletoe species in Bedfordshire. A single specimen was shaken from a moribund clump of Mistletoe on a fallen Poplar bough in Maulden Wood on 5th Oct. Unfortunately there is no voucher specimen as it was irretrievably squashed in transit.

B.S. NAU

GRASSHOPPERS AND CRICKETS (Orthoptera/Saltatoria) Report of the Recorder

The recording from previous years has given a very high coverage for the Orthoptera in the county and as a result new records become increasingly difficult to find. The poor weather conditions during the summer did not help either.

A special effort was made to find the Slender Ground-hopper (*Tetrix subulata*) which is a wetland species and a search was made around the edges of some of the old flooded mineral working pits of the county. The species was found where the edge was more marshy and quite often it was seen swimming in the water.

Grasshopper nymphs or instars are difficult to identify to species and for that reason no dates have been given as to when they can be first seen in the year in this county. B.S. Nau reported having seen grasshopper nymphs at Stockgrove Park on May 25th.

A nymph of the Oak Bush-cricket (*Meconema thalassinum*) was found on May 24th at Maulden Wood. The earliest previous record was June 18th 1977 at Melchbourne.

The following records are additions this year to the maps published in the Journal for 1977 (*Bedf. Nat.* 32: 25-30).

Oak Bush-cricket – 1 tetrad 06B.

Speckled Bush-cricket – 3 tetrads 93V, 95X, 06B.

Common Green Grasshopper – 2 tetrads 95Q, 01D.

Meadow Grasshopper – 2 tetrads 96W, 06A.

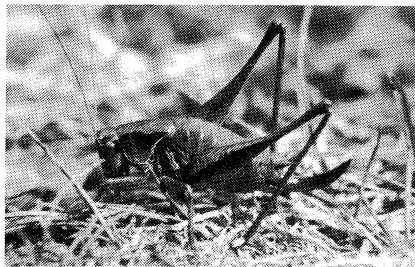
Common Field Grasshopper – 2 tetrads 96W, 02V.

Slender Ground-hopper – 4 tetrads 92B, 95T, 04Z, 13Y.

The distribution map for the last species has not yet been published.

Records are required for the House-cricket (*Acheta domesticus*) and any cockroaches known in the county. All these species can only be found in heated buildings or large council rubbish tips that are capable of generating heat. Send me specimens of the cockroaches and I will identify them.

D.G. RANDS



Dark Bush-cricket
Pholidoptera griseoptera



Photos: D. G. Rands

Common Field Grasshopper
Chorthippus brunneus

BUTTERFLIES (Lepidoptera)

Report of the Recorder

In a year that has had very little to commend it as far as the butterflies are concerned, it gives me great satisfaction to report a piece of good news. All the 2km tetrads for the county have now been visited and at least one species of butterfly has been recorded for every square. This is the result of a determined effort by certain of the recorders to wipe off all the black spots from the map published in the Journal for 1979 (*Bedf. Nat.* 34: 41).

This does not mean that the task is completed by any means, so this year a map is published showing the tetrads from which less than five species have been recorded, and I am sure that the determination exists to make this map also rapidly redundant. In connection with the work already carried out I would like to express my thanks to the people listed below, but especially to Mr V.W. Arnold who has supplied 145 individual new records for the 1980 season.

The other great event was the arrival in the spring of large numbers of Painted Lady (*Vanessa cardui*). These settled down to breed well and the resultant generation in the late summer made this beautiful insect a common sight in many suburban gardens as well as the countryside. Its life history is shown in photographs accompanying this report. A visitation on such a grand scale does not occur very often because a population explosion in North Africa, coupled with the southerly winds necessary to speed these large numbers on their way to Britain does not often happen during April and May.

These highlights, however, do not allow 1980 to be remembered as a good year for the order, as the weather was so very variable with many cold and wet days occurring at the breeding times of the year. Many species only held on to their numbers with great difficulty some only being seen by the recorder in their egg or larval form.

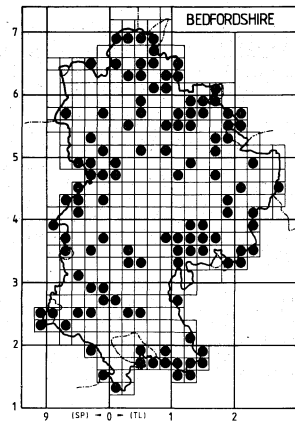
Very few Small Blue (*Cupido minimus*) were seen on the Chalk downs but their easily found eggs were seen in good numbers on the flowerheads of Kidney Vetch (*Anthyllis vulneraria*). The Chalk Hill Blue (*Lysandra coridon*) was hardly seen at all and as the egg and larval stages are so difficult to find on the Horseshoe Vetch (*Hippocrepis comosa*) leaves their fate is unknown.

The common species showed up reasonably well and indeed many nettle patches were seen to support very good colonies of Small Tortoiseshell (*Aglais urticae*) and Peacock (*Nymphalis io*) larvae, but the resultant brood of butterflies was no larger than in any other mediocre year.

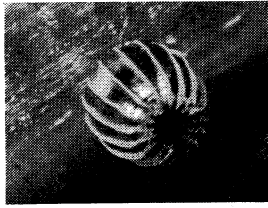
The 'browns' were another group that only seemed to hold its own and only once on a bright June day did I see a meadow full of them, accompanied by the common skippers and blues. This should be a commonly seen occurrence in a good year.

The White-letter Hairstreak (*Strymonidae w-album*) is still hanging on in the county and the White Admiral (*Limenitis camilla*) was seen again in Marston Thrift, but neither species will ever be commonly seen again in the county as forest management suffers from the effects of economic recession.

There are now large areas of farmland throughout Bedfordshire which are best described as cereal deserts, where no wasteland or even hedgerows exist to permit butterflies to feed and breed. The only hope for them in these regions are the now neglected roadside verges, where once again butterflies can be seen colonising these linear habitats. Indeed it was



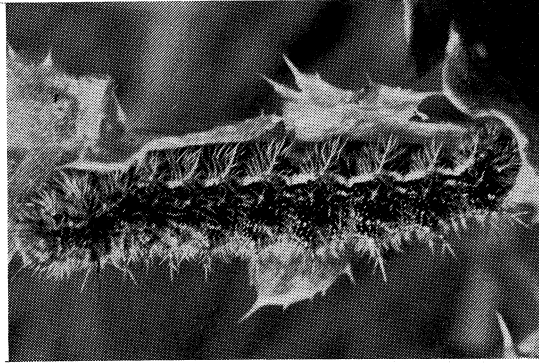
Dots indicate tetrads in which less than five species have been recorded



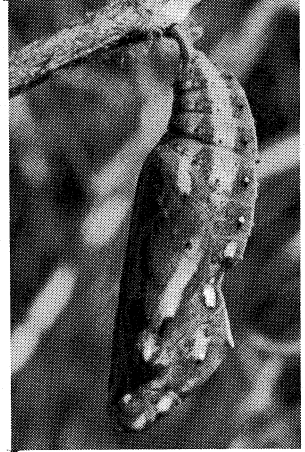
Ova

Life History of Painted Lady (*Vanessa cardui*)

Photographed from Bedfordshire stock during 1980 (A.J. Martin)



Larva



Pupa

Imago



from these very verges that many of the records came to wipe the black spots off the 'zero' tetrad map mentioned earlier.

There were new records for the distribution of Grizzled Skipper (*Pyrgus malvae*) and White-letter Hairstreak which were very encouraging to receive. However this does not mean that these species are becoming more common but that the observers are becoming more proficient.

Historical records for the period 1942-1956 received from Mr J.A. Payne of Wellingborough show that from the areas in and around Odell Wood and Podington Airfield were recorded many of the fritillaries. Marsh Fritillary (*Euphydryas aurinia*), Pearl-bordered Fritillary (*Clossiana euphrosyne*), Dark Green Fritillary (*Argynnis aglaia*), High Brown Fritillary (*A. cydippe*) and Silver Washed Fritillary (*A. paphia*) were all to be found but recent trips to these localities to rediscover any of these species have proved fruitless.

Records for 1945 received from Mr R.F. Bretherton of Guildford, Surrey, show similar sightings from the area of Kings Wood, Heath and Reach but once again current exploration has turned up none of these species. Nevertheless searches of both these and many more promising areas will be continued in the hope that at least one of these species may still exist in Bedfordshire.

My thanks must be recorded to the following who sent me records for 1980:

D. Anderson, V.W. Arnold, C.W. Burton, Mrs F.B.M. Davies, Miss A. Doody, W. Drayton, S. Halton, Mr and Mrs J.G. Headon, A. Horder, Mrs B. Jarvis, J.P. Knowles, Mrs. D. Muckleston, A. Muir-Howie, D. Odell, J. Payne, R. Revels, A. Smith, B. Stephenson (who also contributed in 1979 but whose name was left off that list of recorders), T. Thomas, Mr and Mrs K. Weedon.

ALAN J. MARTIN

HOVERFLIES (Diptera-Syrphidae)

Report of the Recorder

The bad weather in 1980 did not produce as poor a season as might be expected, both for Diptera in general and for hoverflies in particular. The normally abundant species of syrphids were suppressed more, so that less frequently encountered species seemed relatively much commoner.

Woods again yielded the majority of new records, West Wood (SP96) and Dedmansey Wood (TL01) being particularly rewarding when visited in spring. 50 new 10 km square records were added, including 7 new species for the post-1960 county list.

SPECIES LISTS

Species found in 1944-49 and in 1980

Melangyna umbellatarum

Xanthocramma citrofasciatum

Species found only in 1980

Dasysyrphus lunulatus
Parasyrphus punctulatus
P. vittiger

Criorhina berberina
Pipiza luteitarsis

N.F. JANES

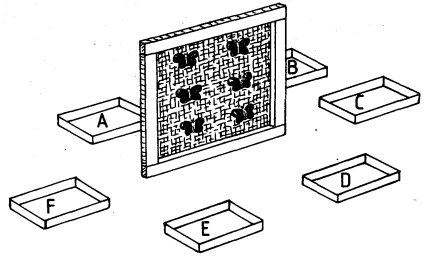
A FURTHER EXPERIMENT ON THE ASSEMBLING OF THE EMPEROR MOTH (*SATURNIA PAVONIA*)

by Alan J. Martin, 18 Aragon Road, Ampthill, Bedford

Following the limited success of the assembling experiment reported in the Journal for 1979 (*Bedf. Nat.* 34: 45), a further experiment suggested itself from those results. It had been observed that the scent given off by the 'calling' female was a putrid smell, not unlike that of a sewage works. The natural flight path of the males from Flitwick Moor had taken them close to the Amthill sewage works but this had not seemed to deter them. In this experiment therefore it was decided to surround the calling females with as many powerful alternative smells as possible. Having successfully reared six females, which emerged around May 1st 1980, the emerged males were returned to the wild. These six females were placed on a frame of wire netting, where they sat calling, and six dishes were placed around them each containing a different scent source, as shown in the diagram.

These were as follows:—

- A. Rotting shell fish.
- B. Disinfectant (a necessary precaution as well as additional smell).
- C. Beer brewing waste.
- D. Petrol soaked rag.
- E. Rotting fish remains.
- F. Paint thinners.



Layout of experiment in the garden

These substances gave a mixture of naturally powerful smells at the biological level and, it was hoped, hydrocarbons that would react with any natural oils occurring in the male moths' scent detecting apparatus.

The resulting column of scent was very powerful and, hopefully, would blot out the calling scent of the females.

Wind coming from the south-east carried the scent towards Coopers Hill, Ampthill (about 1 mile away) where the Emperor Moth is known to exist in the wild. Within half-an-hour male moths were seen flying into the garden. These males were not confused at all by the adjacent scents, neither were they distracted from their naturally designated task.

As each female was paired she was removed with her mate to a sealed container so as to reduce the overall effect of the calling scent. While the female stops calling as soon as pairing takes place, the scent will persist for a short while on her body, a fact supported by the unwanted attention of additional males to the couple.

Pairings took place until only one female remained and it appeared that the males could not find her among the confusion of the scent sources. However, upon examination she was seen to be deformed and was not calling at all.

All insects were then returned to the wild.

It would appear that the male Emperor was unaffected by the alternative scents provided in the vicinity of the females, as their observed reaction was no different to that seen many times before.

An improvement in the experiment would be to divide the females into two groups, only one of which should have been surrounded by the alternative scent sources. This would give a useful comparison between the reaction of the visiting males. It was not possible to do this in the present experiment as the garden of my house is far too small to make such a separation feasible.

MOTHS (Lepidoptera)

Report of the Recorder

Although 1980 was not a very outstanding year for moths, due mainly to the inclement weather, it did produce some interesting observations and records. A noticeable feature of May was the tremendous amount of defoliation of various trees and bushes, including oak, ash, maple and hawthorn, by the larvae of several species of moth. This was very noticeable on Bison Hill, Whipnade, Marston Thrift and Maulden Wood. In the latter some areas of the ground were black with their droppings. One of the main culprits was (1303) *Tortrix viridana* but also seen were (139) Gold tail, (145) Common Lackey and (619) Figure of Eight.

During the year the Rothamsted trap at Shuttleworth Agricultural College, Old Warden, was closed down, but this has now been transferred to School Lane, Eaton Bray, where it is being run by Mr G. Buss. A one-day course held by the Society at Shuttleworth Agricultural College included a session on the identification of moths. This was very well supported and it is hoped that it will lead to an increase in fieldwork and records from members who took part.

Fieldwork continued at Maulden Wood, Sewell Railway Cutting and Flitwick Moor, while K.F. Webb with the co-operation of Mr and Mrs H. Simpson, started a survey of Dedmansey Wood, Studham. Some of the more interesting moths that were recorded during 1980 include (314) Triple-spotted Clay from a field meeting to Stockgrove Park on the 18th July, (278) Archer Dart from both Shire Oak, Heath and Reach and Stockgrove Park. This latter moth is considered to be a coastal species but exists with us at a few sites on the Greensand. At Flitwick Moor (455) Slender Brindle and (564) Suspected were both recorded – the latter in good numbers. Miss L. Sharrock found the larvae of (515) Alder Dagger feeding on hawthorn in her garden at Blunham and Mr A. Muir-Howie recorded (790) Scarce Tissue from his trap at Bromham. On the 5th August, at Sewell Railway Cutting, a specimen of (767) Large Pheonix came to light – this is a very under-recorded Bedfordshire moth. Both R. Revels and K.F. Webb took specimens of (340) Dark Bordered Straw and (538) Tawny Pinion from their traps at Biggleswade and Luton respectively. I. Woiwod submitted the second county record for (668) Light Orange-underwing from Potton Wood where he stated they were fairly common. From Maulden Wood came records of (87) Pine Hawk – two being seen on the 3rd July – this was particularly satisfying as I had been searching the wood for several years for this species. (J.B. Barnwell also took this moth at his home in Aspley Heath both in 1979 and 1980, so it must be considered to exist at suitable sites on the Greensand ridge throughout the county.) Also recorded at Maulden Wood were (386) Lead Coloured Drab on 16th April and (433) Vines Rustic on 26th September.

At the Society's A.G.M. in March I was introduced to Mr J.B. Barnwell who, during the period 1940 – 1960, was a very active lepidopterist, mainly in the areas of Aspley Heath and Woburn Sands. Mr Barnwell had made a collection of many of the species of moths that he had caught and bred and he has kindly allowed me to study this collection. A lot of valuable information has started to come out of this, including some new records, and also the fact that species that have in the past been considered "new" have been recorded by Mr Barnwell. It is hoped that during 1981 he will be running his own light trap in his garden once again. Mr Barnwell also drew to my attention that one of his fellow collectors, the late Colonel Kershaw, had a large collection of moths including a number of Bedfordshire specimens, but at the moment the current whereabouts of this is still unknown. It is hoped that this would provide some useful historical information, if it is still in one piece!

In my last report (*Bedf. Nat.* 34: 42-43) I stated that in the recently published Vol. 9 of *The Moths and Butterflies of Great Britain and Ireland* there were some Bedfordshire records that were unknown to me. During the year I contacted John Heath, the editor, who provided me with the source of his information. This was duly investigated and, even though it was thought by those concerned that certain species had been included in error, the results are contained in the following list.

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 for 1980, 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 VCH).
 HEATH, J. 1979. *The Moths and Butterflies of Great Britain and Ireland*. Vol. 9. (Abbreviated MBGBI).

Species marked * are new county records.

- 91* **Bedstraw Hawk** A record of this migratory moth appears in MBGBI. This was supplied to the editor by R.F. Bretherton. In a letter to me, Mr Bretherton quotes the source as 'Aspley Heath, June 1943, by Colonel Kershaw'. This is the only known county record.
- 92 **Striped Hawk** This is incorrectly included in MBGBI. Mr Bretherton has stated that this is an error and is not a valid Bedfordshire record.
- 98 **Broad-bordered Bee Hawk** Recorded by R.F. Bretherton from Kings Wood, Heath and Reach, July 1945, feeding on lavender. It is believed that this moth is now extinct in the county.
- 138 **Brown Tail** Taken at light by K.F. Webb at Dedmansey Wood (26/7/80) and Kingsdown Ave. Luton (27/7/80). These appear to be the first genuine records for this moth since VCH. As this species can occur in plague proportions in certain parts of southern England, it is hoped that these were isolated specimens and not the start of an invasion.
- 224 **Osier Hornet Clearwing** Several specimens in J.B. Barnwell's collection taken from Woburn Sands in the late 1940's. This is the only record that I know of since VCH but I feel that it must still be with us. All clearwings tend to be rather secretive and hard to find.
- 316 **Square-spotted Clay** A record of this species from MBGBI. Recorded from the Bedford area in the late 1960's by C. Warren Smith. Due to lack of reliable information this record is not accepted.
- 347 **Silvery Arches** As previous species, not accepted.
- 397* **Striped Wainscot** Recorded by W.J. Champkin during 1965, from The Lodge, Sandy, Sharnbrook Summit, Souldrop and Ampthill Firs.
- 791* **Shell Scallop** Two specimens in J.B. Barnwell's collection, taken in the Aspley Heath - Woburn Sands area in June 1947 and July 1951.
- 804* **Short-clasped Treble Bar** Kings Wood, Heath and Reach, July 1945 taken by R.F. Bretherton.
- 840 **Plain Pug** Taken by W.J. Champkin, 12th July 1972 at Old Warden Tunnel. This is the only known record since VCH, but like the following five species has probably been overlooked or misidentified in the past and is no doubt common.
- 843 **Slender Pug** Stagsden, 1st August 1974, taken by W.J. Champkin. First record since VCH.
- 865* **Bell Flower Pug** Record from D.V. Manning - taken during 1975 at Sharnbrook.
- 869* **Ochreous Pug** Manor Farm, Stevington 17th July 1964, by W.J. Champkin.
- 870* **Pimpinel Pug** Record from D.V. Manning - taken at Sharnbrook in 1975.
- 883* **Dwarf Pug** Taken at light, Maulden Wood, 3rd July 1980 by the recorder - the identity being confirmed by J. Reid who has made a special study of this very difficult family of moths.
- 909* **Barred Umber Thorn** Recorded by W.J. Champkin, 2nd April 1965 from Manor Farm, Stevington.
- 948* **Square Spot Beauty** Mentioned in Vol. 2 of *The Moths of the British Isles* by R. South

as "found in woods in Bedfordshire". Current status unknown.

953* **Common Annulet** Recorded by W.J. Champkin from Sharnbrook Summit, Souldrop, 12th July 1964.

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

ACKNOWLEDGEMENTS

My thanks go to the following for records, help and assistance: J.B. Barnwell, G.T. Buss, R.F. Bretherton, W.J. Champkin, R. Collings, Mrs F.B.M. Davies, J. Gould, J. Heath, D.V. Manning, A.J. Martin, A. Muir-Howie, J. Reid, D.G. Rands, R. Revels, Miss L. Sharrock, R.B. Stephenson, Mr and Mrs H. Simpson, T.J. Thomas, K.F. Webb and I. Woiwod and his colleagues at Rothamsted.

ADDENDUM

312 **Plain Clay** This was recorded in error, please delete references to this species. (*Bedf. Nat.* 23: 9, 24: 9, 27: 43.)

V.W. ARNOLD

SOME HISTORICAL MOTH RECORDS FOR BEDFORDSHIRE by V.W. Arnold, 96 St. Augustine Avenue, Luton, Beds.

Over the past few years, I have been trying to compile an accurate check list of all of the species of "macro" moths that have been recorded for the county. The majority of species recorded are still to be found, but there are a certain number for which no current information is available – these are the species featured in this article. It is hoped that this will draw attention to the moths mentioned as probably still being with us, and that future editions of this journal will contain news of their current status within the county. I have included species that are considered to have been recorded in error as well.

The trouble with historical records is usually the complete lack of information on precise sites, dates etc. All too often the phrase "taken in woods near Bedford/Woburn/Luton" appears, which does not help in trying to trace the site and the species.

The sources of information used in the list below are as follows:—

1. GRAHAM, W.B. 1878. A few notes on the Entomology of Bedfordshire. *Trans. Bedf. Nat. Hist. Soc.* 1876-1877, 126-133.
2. BARRETT, C.G. 1904. *Lepidoptera. Victoria County History of Bedfordshire* 1, 78-88.
3. FOSTER, A.H. 1934. *Butterflies and Moths. The Natural History of the Hitchin Region.* (R.L. Hine, Ed.) Hitchin, 120-140.

- 99 **Narrow-bordered Bee Hawk** (2) "Dr Nash records this species in woods near Bedford". Now presumed extinct in the county.
- 136 **Dark Tussock** (2) "Taken in woods near Bedford by Dr Nash". Normally a moth associated with moorlands, but could still be with us on the Greensand ridge.
- 151 **Grass Eggar** (2) "Dr Nash reports that he has reared this species at Bedford". As this species was reared from presumably imported stock, it seems strange that it was considered worthy of publication in V.C.H. initially!
- 158 **Mulberry Silkworm** (1) Reared for silk in Bedfordshire, which was spun at Sharnbrook. Presumably done on a commercial basis – dates unknown!

- 305 **Heath Rustic** (3) "At Rowney Warren only, by Nash, Brocklehurst and C.Downs". Not likely now at Rowney Warren, due to changes in the habitat, but could possibly still be found on the Greensand ridge.
- 410 **Anomalous Wainscot** (2) "Bedford". Not considered as a Bedfordshire species – probably a case of mistaken identity.
- 534 **Water Betony Shark** (1) "Larvae found on *Scorophularia aquatica*, in a ditch by the side of the Corporation farm". Considered to be an incorrect identification.
- 545 **Red Sword Grass** (2) "Bedford". Could still turn up somewhere in the county.
- 569 **Grey Chi** (2) "Bedford, usually a northern species". Not considered as a Bedfordshire moth – presumably another case of mistaken identity.
- 675 **Small Grass Emerald** (2) "Recorded at Bedford by Mr J. Sharpin". Misidentified species – not a Bedfordshire moth.
- 692 **Mullein Wave** (2) No details given, apart from the name of the moth. A coastal species – presumably misidentified!
- 693 **Lace-border Wave** (3) "Common on Barton Hills – Dr Nash". This is presumably still with us, but awaits rediscovery!
- 755 **Royal Mantle** (3) "At Pegsdon". The above remarks apply to this, and the following species.
- 756 **Ruddy Carpet** (3) "At Pegsdon".
- 839 **Shaded Pug** (3) Known as the Scabious Pug, "Pegsdon Hills – Foster, Nash and Brocklehurst". Almost certainly still with us, but either overlooked or misidentified.
- 858 **Satyr Pug** (2) No details given, apart from the name of the moth. Probably still with us, but overlooked!
- 880 **Juniper Pug** (2) "Luton, among Juniper". As Juniper was last recorded in Bedfordshire in 1889, this species must be considered no longer with us, unless it has been artificially reintroduced with cultivated junipers, or on cupressus. (See *Bedf. Nat.* 34: 42 report on Juniper Carpet).
- 882 **Larch Pug** (3) "Common at Rowney Warren". This species must be still with us but overlooked.
- 927 **Speckled Yellow** (2) "Woods near Luton". (3) "Near Luton". This moth was recorded in Ray Palmer's field note book from the 1950's as "woods near Luton". I have been searching in vain for this attractive day flying moth, as I am sure that this species is still to be found in the county.

The above list contains 19 species of moth of which possibly ten could still be found in the county. I hope, with the help of members of the Society, to be able to report in the future that indeed they still are.

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

THE NATURAL VEGETATION OF DUNSTABLE AND WHIPSNADÉ DOWNS

by John G. Dony, Biological Records Centre, Luton Museum and Art Gallery

Until about 1930 Dunstable and Whipsnade Downs formed a continuous stretch of west-facing chalk downland 2½ miles (4 km) in length with a well-used public footpath on the crest of the downs from Dunstable to Dagnall. It was intersected only by the then little-used road from The Plough public house on the B489 to Whipsnade. To the best of my memory there were no marked differences in the vegetation of this length of downland which consisted of a close turf caused by many years of sheep grazing. By 1930 this grazing had much diminished and may have even ceased.

WHIPSNADÉ DOWNS

In 1927 the Zoological Society of London purchased 423 acres (171ha) of land, which included the whole of the Whipsnade Downs (Fig 1), to form the nucleus of the present Whipsnade Park. In the following four years a perimeter fence was erected and the Bison Enclosure set aside, leaving 21 hectares of the Whipsnade Downs cut off from Dunstable Downs by the time the Park was opened to the public in 1931. Below the Bison Enclosure there was an arable field previously part of the farmland of Vallence End Farm and now part of the Park. This was also enclosed and allowed to revert to grassland, being used by the Zoological Society for the grazing of various imported animals, the records of the Society showing that Soay sheep were first introduced here to graze as early as 1932. By the early 1950s the perimeter fence separating the field from the downland fell into disrepair causing some of the flock of Soay sheep to escape, having then freedom in the Park until the late 1960s when they were contained. Since then there have been no sheep either on the downland or in the field at Vallence End part of the Park.

In the early days of the Park various species of wallaby were introduced being kept in separate enclosures, but from about 1946 some animals of one species, *Macropus rufogriseus*, either escaped or were deliberately allowed to roam the downland having since become a popular feature of the Park. An annual count of their number is made – in 1980 it was 210, many of which had young. Other introduced grazing mammals that have freedom in the Park are the European hare, Chinese water-deer, Reeve's muntjac and Patagonian cavy or mara, but their number is probably few and their effect on the grazing less than that of the wallabies. A more recent and popular introduction is the North American prairie marmot which while not primarily a grazing animal may eat vegetable matter. It affects the vegetation much more by its burrowing. In addition to these introduced species there is a large population of rabbits.

For the greater part of the 50 years that Whipsnade Downs has been cut off from Dunstable Downs they have been grazed in some manner or another. In addition they have been subject to little trampling, for notwithstanding that the Park has many visitors few of these walk the downland except to see The White Lion, cut into the hillside in the early days of the Park but covered during the war period.

DUNSTABLE DOWNS

This longer stretch of downland is in two parishes, Eaton Bray and Totternhoe, there being no clearly marked boundary between them. It is, perhaps, best considered in the following two portions (Fig 1) –

The portion in the parish of Eaton Bray (32.5 ha)

Most of this was acquired by the National Trust in 1935, its maintenance since having been mainly the part responsibility of a tenant farmer. The Trust has also itself planted a

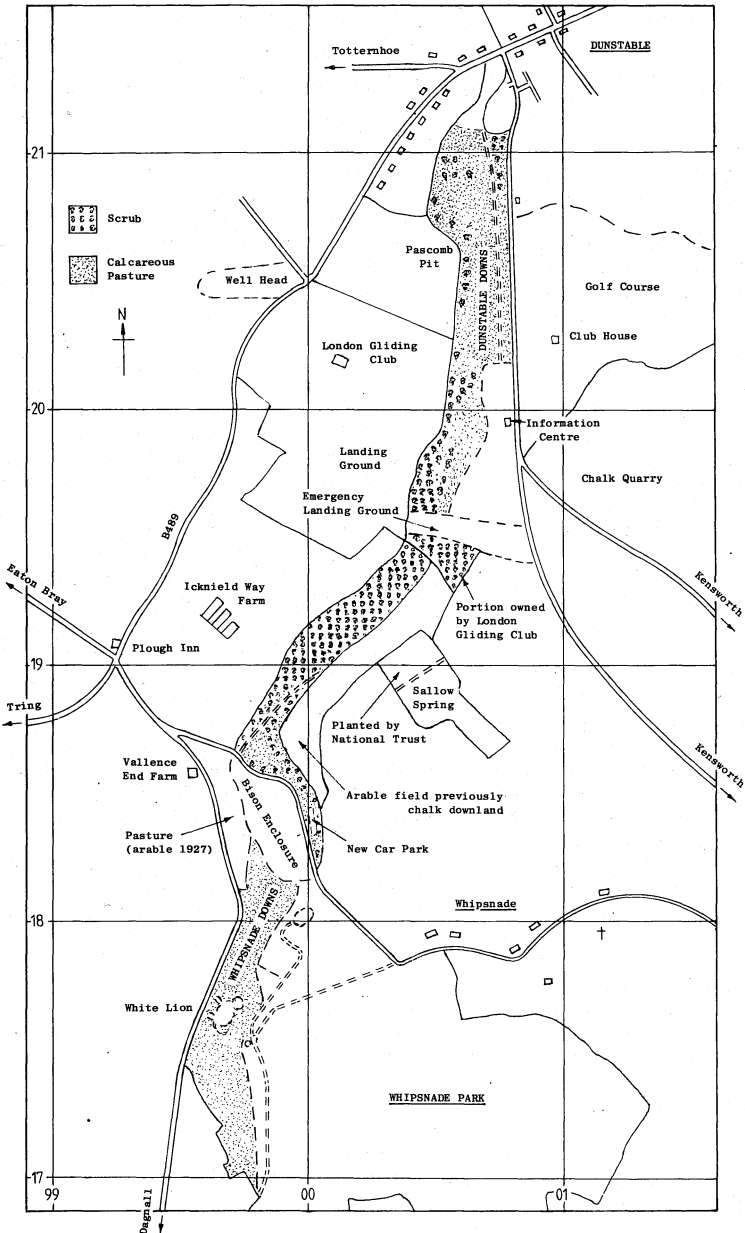


Fig. 1. Map of Dunstable and Whipsnade Downs.



Photo: P. J. Ford

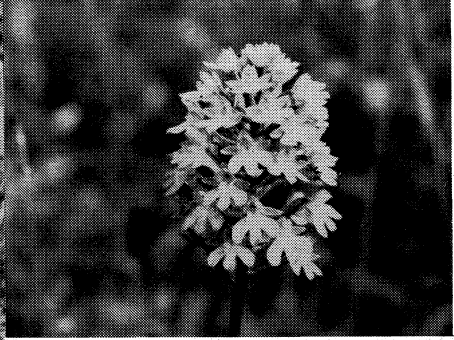


Photo: D. G. Rands

Pyramidal Orchid *Anacamptis pyramidalis* is frequent on the Bedfordshire chalk downland. It survives both the trampling on Dunstable Downs and the grazing on Whipsnade Downs.

small wood of about 2 hectares, adjacent to Sallow Spring, on adjoining land which was not part of the downland. With lack of grazing the scrub developed rapidly on the downland except on the steep slopes on the sides of ancient trackways and on the even steeper slope by the side of the road where there is evidence of a small earlier chalk working. The excellent viewpoint at this, the southern end of the National Trust property, has, because of its nearness to the Bison Enclosure in Whipsnade Park, gained it the misnomer of Bison Hill. A few years ago the tenant farmer was allowed to clear scrub on 14 hectares of the higher part of the hill and improve the pasture for grazing of cattle. This has unfortunately been more recently ploughed, reducing the downland to about 18 hectares which has now become almost entirely impenetrable hawthorn scrub. Trees, mainly beech and birch, are taking a hold and in time this will probably revert to woodland. A small area above the road has within the last few years been cleared by the Trust with a welcome return of the downland flora. In 1980 a new car park was made which should attract more visitors and increase trampling.

The portion in the parish of Totternhoe (46 ha)

Totternhoe was the last Bedfordshire parish to be enclosed by parliamentary enclosure, its Enclosure Act of 1891 giving the control of the regulated pasture in the parish, which included this part of Dunstable Downs, to a Board of Conservators. The northern portion of the downs being near to Dunstable had long been a popular site for minor fetes and concert parties and was not far from the Five Knolls tumuli of archaeological interest. Few people ventured much further except on Good Friday to take part in the orange rolling, of unknown origin, in Pascomb Pit. A greater attraction came in 1930 with gliding over the downs following the formation of the London Gliding Club in 1929. For many years the gliders were



Photo: B. Fowler

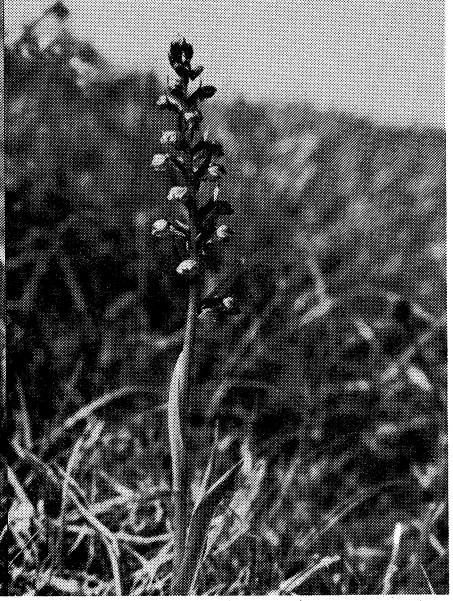


Photo: P. J. Ford

These two species occur on Dunstable Downs only. Field Fleawort *Senecio integrifolius* (left) is a nationally rare species. It is frequent here but apparently not survived the grazing on Whipsnade Downs. Frog Orchid *Coeloglossum viride* (right) is present in at least two places but is apparently absent on Whipsnade Downs.

catapulted from the crest of the downs at the southern end of the portion in the Totternhoe parish where for a period a part was owned by the Club which now holds only a small triangular plot, entirely scrub, adjoining the National Trust property.

The post-war years with an increase in the number of cars brought additional pressure on the downs with uncontrolled parking on the road and on the grassland adjoining. Clearing of litter became a problem, being the responsibility of the Board of Conservators who, now that grazing had long ceased, had little income beyond what could be collected as dues from an increased number of ice-cream vendors. They asked the Bedfordshire County Council to explore means whereby they could be relieved of their responsibilities. After a long period of negotiation the County Council ultimately assumed full control of the downs in 1961, shortly after which parking was made illegal on the roadside and from 1970 regulated on the downland with four parking areas set aside intended to be used in rotation. An Information Centre with much-needed lavatories was also provided. These improved facilities at what is the finest viewpoint for many miles around made the downs still more popular, with yet another attraction with the arrival of hang gliding over Pascomb Pit to be added to the normal gliding which itself increased. Counts are made from time to time of the estimated number of visitors, the largest being 13,000 in a ten-hour period on one day with an estimated movement of 3,000 cars. A large number of visitors leave their cars either to get a better view of the gliding or to walk the downland. The parking areas have reduced the downland by about two hectares but still more has been lost by erosion caused by wide well-used paths on the crest of the downs. The area of the present downland is not more than 40 hectares. It is a close turf, with scrub being mainly limited to the lower slopes and dense only in a few places at the southern end close to the National Trust property.

A SURVEY OF THE NATURAL VEGETATION

Species lists were made during 1980 for both Dunstable and Whipsnade Downs but no attempt was made to compile separate lists for the portions of Dunstable Downs in different ownerships. Notes were made on the location and abundance of species present which are rare on chalk downland in Bedfordshire. Quadrat studies were also made on both Dunstable and Whipsnade Downs.

The species list

166 species were recorded – these are listed in Table 1, the English and scientific names following Dony et al (1974):

82 species were recorded on both Dunstable and Whipsnade Downs.

68 species were recorded on Dunstable Downs only.

16 species were recorded on Whipsnade Downs only.

The 82 species recorded on both sites include regular members of calcareous grassland communities and these species appear to be able to survive both the intensive grazing of the wallabies and excessive trampling on Dunstable Downs. These are –

<i>Anacamptis pyramidalis</i> Pyramidal Orchid	<i>H. pubescens</i> Downy Oat-grass
<i>Asperula cynanchica</i> Squinancywort	<i>Hieracium pilosella</i> Mouse-ear Hawkweed
<i>Briza media</i> Quaking-grass	<i>Hippocrepis comosa</i> Horseshoe Vetch
<i>Bromus erectus</i> Upright Brome	<i>Koeleria cristata</i> Crested Hair-grass
<i>Campanula glomerata</i> Clustered Bellflower	<i>Linum catharticum</i> Fairy Flax
<i>C. rotundifolia</i> Harebell	<i>Lotus corniculatus</i> Common Bird's-foot-trefoil
<i>Carduus nutans</i> Musk Thistle	<i>Pimpinella saxifraga</i> Burnet-saxifrage
<i>Carex caryophyllaea</i> Spring-sedge	<i>Polygala vulgaris</i> Common Milkwort
<i>Carlina vulgaris</i> Carline Thistle	<i>Poterium sanguisorba</i> Salad Burnet
<i>Cirsium acaule</i> Dwarf Thistle	<i>Primula veris</i> Cowslip
<i>Euphrasia nemorosa</i> Eyebright	<i>Reseda lutea</i> Wild Mignonette
<i>E. pseudokernerii</i> Eyebright	<i>Scabiosa columbaria</i> Small Scabious
<i>Festuca ovina</i> Sheep's-fescue	<i>Thymus drucei</i> Wild Thyme
<i>Gentianella amarella</i> Autumn Gentian	<i>T. pulgoides</i> Large Thyme
<i>Helianthemum chamaecistus</i> Common Rock-rose	<i>Trisetum flavescens</i> Yellow Oat-grass
<i>Helictotrichon pratense</i> Meadow Oat-grass	<i>Viola hirta</i> Hairy Violet

The 16 species recorded only on Whipsnade Downs include ten not normally found in calcareous grassland and are no doubt influenced by a cap of Clay-with-Flints on the summit of the downland. These are –

<i>Agrotis tenuis</i> Common Bent	<i>Luzula campestris</i> Field Wood-rush
<i>Anthoxanthum odoratum</i> Sweet Vernal-grass	<i>Myosotis arvensis</i> Field Forget-me-not
<i>Bromus mollis</i> Soft-brome	<i>Sagina procumbens</i> Procumbent Pearlwort
<i>Cerastium glomeratum</i> Sticky Mouse-ear	<i>Ulex europaeus</i> Gorse
<i>Geum urbanum</i> Wood Avens	<i>Veronica arvensis</i> Wall Speedwell

Two species – *Arum maculatum*, Lords-and-Ladies, and *Brachypodium sylvaticum*, False Brome – were found only adjacent to a belt of woodland at the base of the hill. One tree of *Sorbus aucuparia*, Rowan, was present and it is interesting to note that *Swida sanguinea*, Dogwood, and *Rhamnus catharticus*, Buckthorn, (the latter also present on Dunstable Downs) are, with *Ulex europaeus*, Gorse, apparently resistant to the grazing by wallabies. This leaves only two species of calcareous grassland – *Brachypodium pinnatum*, Tor-grass, (a small patch and possibly a recent arrival) and *Origanum vulgare*, Marjoram – which are resistant to or even encouraged by the grazing.

SPECIES	W	D	SPECIES	W	D	SPECIES	W	D
<i>Achillea millefolium</i> Yarrow	X	X	<i>Fagus sylvatica</i> Beech	X	X	<i>Prunella vulgaris</i> Selfheal		X
<i>Agrimonia eupatoria</i> Agrimony	X	X	<i>Festuca ovina</i> Sheep's-fescue	X	X	<i>Prunus avium</i> Wild Cherry		X
<i>Agrostis stolonifera</i> Creeping Bent	X	X	<i>F. pratensis</i> Meadow Fescue	X	X	<i>P. spinosa</i> Blackthorn		X
<i>A. tenuis</i> Common Bent	X	X	<i>F. rubra</i> Red Fescue	X	X	<i>Quercus robur</i> Pedunculate Oak		X
<i>Anacamptis pyramidalis</i> Pyramidal Orchid	X	X	<i>Filipendula vulgaris</i> Dropwort			<i>Ranunculus bulbosus</i> Bulbous Buttercup	X	X
<i>Anthoxanthum odoratum</i> Sweet Vernal-grass	X		<i>Fraxinus excelsior</i> Ash	X		<i>R. repens</i> Creeping Buttercup	X	X
<i>Anthriscus sylvestris</i> Cow Parsley	X	X	<i>Galium aparine</i> Cleavers	X	X	<i>Rosa lutea</i> Wild Mignonette	X	X
<i>Anthyllis vulneraria</i> Kidney Vetch	X	X	<i>G. mollugo</i> Hedge Bedstraw	X	X	<i>Rhamnus catharticus</i> Buckthorn	X	X
<i>Arenaria serpyllifolia</i> Thyme-leaved Sandwort	X	X	<i>G. verum</i> Lady's Bedstraw	X	X	<i>Rhinanthus minor</i> Yellow Rattle		X
<i>Arrhenatherum elatius</i> False oat-grass	X	X	<i>Gentianella amarella</i> Autumn Gentian	X	X	<i>Rosa canina</i> Dog Rose	X	X
<i>Artemisia vulgaris</i> Mugwort	X	X	<i>Geranium robertianum</i> Herb-Robert	X	X	<i>Rubus fruticosus</i> Bramble	X	X
<i>Arum maculatum</i> Lords-and-Ladies	X		<i>Geum urbanum</i> Wood Avena	X		<i>R. idaeus</i> Raspberry		X
<i>Asperula cynanchica</i> Squinancywort	X	X	<i>Glechoma hederacea</i> Ground-ivy	X	X	<i>Rumex acetosa</i> Common Sorrel	X	X
<i>Barbarea vulgaris</i> Winter-cress	X	X	<i>Gymnadenia conopsea</i> Fragrant Orchid	X		<i>R. crispus</i> Curled Dock	X	X
<i>Bellis perennis</i> Daisy	X	X	<i>Hedera helix</i> Ivy	X	X	<i>R. obtusifolius</i> Broad-leaved Dock		X
<i>Betula pendula</i> Silver Birch	X		<i>Helianthemum chamaecistus</i> Common Rock-rose	X	X	<i>Sagina procumbens</i> Procrumbent Pearlwort	X	X
<i>Brachypodium pinnatum</i> Tor-grass	X		<i>Helictotrichon pratense</i> Meadow Oat-grass	X	X	<i>Salix caprea</i> Goat Willow		X
<i>B. sylvaticum</i> False Brome	X		<i>H. pubescens</i> Downy Oat-grass	X	X	<i>Sambucus nigra</i> Elder	X	X
<i>Briza media</i> Quaking-grass	X	X	<i>Heracleum sphondylium</i> Hogweed	X	X	<i>Scabiosa columbaria</i> Small Scabious	X	X
<i>Bromus erectus</i> Upright Brome	X	X	<i>Hieracium pilosella</i> Mouse-ear Hawkweed	X	X	<i>Senecio integrifolius</i> Field Fleawort	X	X
<i>B. mollis</i> Soft-brome	X	X	<i>Hippocrepis comosa</i> Horseshoe Vetch	X	X	<i>S. jacobaea</i> Common Ragwort		X
<i>B. sterilis</i> Barren Brome	X	X	<i>Holcus lanatus</i> Yorkshire-fog	X	X	<i>Silene alba</i> White Campion	X	X
<i>Bryonia dioica</i> White Bryony	X		<i>Ilex aquifolium</i> Holly	X	X	<i>S. dioica</i> Red Campion		X
<i>Bunium bulbocastanum</i> Great Pignut	X		<i>Koeleria cristata</i> Crested Hair-grass	X	X	<i>S. vulgaris</i> Bladder Campion	X	X
<i>Campanula glomerata</i> Clusters Bellflower	X	X	<i>Lapsana communis</i> Nipplewort	X		<i>Solanum dulcamara</i> Bittersweet		X
<i>C. rotundifolia</i> Harebell	X	X	<i>Lathyrus pratensis</i> Meadow Vetchling	X		<i>Sonchus arvensis</i> Perennial Sow-thistle	X	X
<i>Capsella bursa-pastoris</i> Shepherd's Purse	X	X	<i>Leontodon autumnalis</i> Autumn Hawkbit	X	X	<i>S. asper</i> Prickly Sow-thistle		X
<i>Carduus nutans</i> Musk Thistle	X	X	<i>L. hispidus</i> Rough Hawkbit	X	X	<i>Sorbus aria</i> Common Whitebeam		X
<i>Carex carophylla</i> Spring-sedge	X	X	<i>Leucanthemum vulgare</i> Oxeye Daisy	X	X	<i>S. leucoparia</i> Rowan	X	X
<i>C. flacca</i> Glaucous Sedge	X	X	<i>Ligustrum vulgare</i> Wild Privet	X		<i>Stachys sylvatica</i> Hedge Woundwort	X	X
<i>Carlina vulgaris</i> Carlina Thistle	X	X	<i>Linaria vulgaris</i> Common Toadflax	X		<i>Stellaria holostea</i> Greater Stitchwort	X	X
<i>Catapodium rigidum</i> Fern-grass	X	X	<i>Linum catharticum</i> Fairy Flax	X	X	<i>S. media</i> Common Chickweed	X	X
<i>Centaurea nigra</i> Common Knapweed	X		<i>Listera ovata</i> Common Twayblade	X		<i>Swida sanguinea</i> Dogwood		X
<i>C. scabiosa</i> Greater Knapweed	X	X	<i>Lolium perenne</i> Perennial Rye-grass	X		<i>Tamus communis</i> Black Bryony		X
<i>Cerastium arvense</i> Field Mouse-ear	X	X	<i>Lotus corniculatus</i> Common Bird's-foot-Trefoil	X	X	<i>Taraxacum officinale</i> Dandelion	X	X
<i>C. glomeratum</i> Sticky Mouse-ear	X		<i>Luzula campestris</i> Field Wood-rush	X		<i>Thymus drucei</i> Wild Thyme	X	X
<i>C. holosteoides</i> Common Mouse-ear	X	X	<i>Medicago lupulina</i> Black Medick	X	X	<i>T. pulegioides</i> Large Thyme	X	X
<i>Chaerophyllum temulentum</i> Rough Chervil	X	X	<i>Myosotis arvensis</i> Field Forget-me-not	X	X	<i>Torilis japonica</i> Upright Hedge-parsley		X
<i>Cirsium acule</i> Dwarf Thistle	X	X	<i>Onobrychis viciifolia</i> Sainfoin	X		<i>Tragopogon pratensis</i> Goat's-beard	X	X
<i>C. arvense</i> Creeping Thistle	X	X	<i>Ononis repens</i> Common Restharrow	X		<i>Trifolium dubium</i> Lesser Trefoil	X	X
<i>C. vulgare</i> Spear Thistle	X	X	<i>O. spinosa</i> Spiny Restharrow	X	X	<i>T. pratense</i> Red Clover	X	X
<i>Clinopodium vulgare</i> Wild Basil	X	X	<i>Origanum vulgare</i> Marjoram	X	X	<i>T. repens</i> White Clover	X	X
<i>Coleoglossum vulgare</i> Orchid	X		<i>P. hirtellum</i> Smaller Cat's-tail	X	X	<i>Trisetum flavescens</i> Yellow Oat-grass	X	X
<i>Conium maculatum</i> Hemlock	X		<i>Picris hieracioides</i> Hawkweed Oxtongue	X	X	<i>Tussilago farfara</i> Colt's-foot	X	X
<i>Convolvulus arvensis</i> Field Bindweed	X	X	<i>Pimpinella saxifraga</i> Burnet-saxifrage	X	X	<i>Ulex europaeus</i> Gorse	X	X
<i>Crataegus monogyna</i> Hawthorn	X	X	<i>Plantago lanceolata</i> Ribwort Plantain	X	X	<i>Urtica dioica</i> Common Nettle	X	X
<i>Crepis capillaris</i> Smooth Hawk's-beard	X	X	<i>P. major</i> Greater Plantain	X	X	<i>Veronica arvensis</i> Wall Speedwell	X	X
<i>C. vesicaria</i> Beaked Hawk's-beard	X	X	<i>P. media</i> Hoary Plantain	X	X	<i>V. chamaedrys</i> Germaner Speedwell	X	X
<i>Cynosurus cristatus</i> Crested Dog's-tail	X	X	<i>Poa annua</i> Annual Meadow-grass	X	X	<i>Viburnum lantana</i> Wayfaring-tree	X	X
<i>Dactylis glomerata</i> Cock's-foot	X	X	<i>P. pratensis</i> Smooth Meadow-grass	X	X	<i>V. opulus</i> Guelder-rose	X	X
<i>Dactylorhiza fuchsii</i> Common Spotted-orchid	X	X	<i>P. trivialis</i> Rough Meadow-grass	X	X	<i>Vicia angustifolia</i> Narrow-leaved Vetch	X	X
<i>D. praetermissa</i> Southern Marsh-orchid	X		<i>Polygala vulgaris</i> Common Milkwort	X	X	<i>V. hirsuta</i> Hairy Tare	X	X
<i>Daucus carota</i> Wild Carrot	X		<i>Potentilla anserina</i> Silverweed	X		<i>V. sepium</i> Bush Vetch	X	X
<i>Epilobium hirsutum</i> Great Willowherb	X	X	<i>P. reptans</i> Creeping cinquefoil	X		<i>Viola hirta</i> Hairy Violet	X	X
<i>Euphrasia nemorosa</i> Eyebright	X	X	<i>Poterium sanguisorba</i> Salad Burnet	X	X			
<i>E. pseudokernerii</i> Eyebright	X	X	<i>Primula veris</i> Cowslip	X	X			

Table 1. List of species recorded during the survey.

The 68 species recorded only on Dunstable Downs include some intruders, trees and shrubs, but the following 20 may be considered to be species of calcareous grassland –

<i>Anthyllis vulneraria</i> Kidney Vetch	<i>Lathyrus pratensis</i> Meadow Vetchling
<i>Bunium bulbocastanum</i> Great Pignut	<i>Leucanthemum vulgare</i> Oxeye Daisy
<i>Centaurea scabiosa</i> Greater Knapweed	<i>Listera ovata</i> Common Twayblade
<i>Cerastium arvense</i> Field Mouse-ear	<i>Onobrychis vicifolia</i> Sainfoin
<i>Coeloglossum viride</i> Frog Orchid	<i>Ononis repens</i> Common Restharrow
<i>Dactylorhiza fuchsii</i> Common Spotted-orchid	<i>O. spinosa</i> Spiny Restharrow
<i>D. praetermissa</i> Southern Marsh-orchid	<i>Picris hieracioides</i> Hawkweed Oxtongue
<i>Daucus carota</i> Wild Carrot	<i>Potentilla reptans</i> Creeping Cinquefoil
<i>Filipendula vulgaris</i> Dropwort	<i>Rhinanthus minor</i> Yellow Rattle
<i>Gymnadenia conopsea</i> Fragrant Orchid	<i>Senecio integrifolius</i> Field Fleawort

Dunstable Downs (58 ha) is larger in area than Whipsnade Downs (21 ha) and may be expected to have more species of calcareous grassland but not as many more as shown here. Some of its additional species are rare on Dunstable Downs but others are in such abundance, eg. *Filipendula vulgaris*, Dropwort, *Rhinanthus minor*, Yellow Rattle, and *Senecia integrifolius*, Field Fleawort, that it is almost certain that they were previously present also on Whipsnade Downs. An interesting conclusion that may be made is that the 20 species survive the trampling on Dunstable Downs and picking, although the more attractive of them are not in sufficient quantity to make picking worth while.

The quadrat studies

Nine quadrat studies were made (Table 2) – five on Dunstable Downs and four on Whipsnade Downs – as a means of determining the composition of the vegetation in sample plots. A quadrat one-metre square was used and this divided into nine equal compartments. The number of compartments in which the various species were rooting was counted and is given in the table provided here. Other species observed within an estimated 1.5m of the centre of the quadrat are shown thus: +. The studies were all made at the height of summer and show in the first place a marked difference in the nature of the vegetation of the two sites. On Whipsnade Downs there was a short closely grazed turf making it necessary to identify many of the species by their vegetative characters only. Later in the year with the vegetation at its full height *Arrhenatherum elatius*, False Oat-grass, was seen to be dominant at the southern end of the site and *Holcus lanatus*, Yorkshire-fog so frequent in the control area that it seemed surprising that it had been recorded in only one quadrat. *Bromus erectus*, Upright Brome, was co-dominant in only one quadrat, the most northerly (see below). *Lotus corniculatus*, Common Bird's-foot-trefoil, was in all quadrats but *Hippocrepis comosa*, Horseshoe Vetch, in none, making it impossible to come to any conclusion with regard to the effect of grazing of wallabies on legumes. *Campanula rotundifolia*, Harebell, was present in all quadrats and *Helianthemum chamaecistus*, Common Rockrose, was co-dominant in three quadrats but absent in one; it was co-dominant in all the quadrats on Dunstable Downs. *Crataegus monogyna*, Hawthorn, was present in all quadrats on Whipsnade Downs but never more than 5 cm tall, giving some indication that its growth is checked by grazing. On Dunstable Downs there was no marked difference in the appearance in the vegetation later in the year. There was less variation in the nature of the vegetation with *Bromus erectus*, Upright Brome, co-dominant in all quadrats.

Notes on some individual species

Bromus erectus, Upright Brome, was rare on well-grazed chalk downland but increased when sheep grazing ceased around 1930, its increase being most obvious between 1940 and 1950. It would appear that it may have reached Whipsnade Downs at about the same time that wallabies began to graze the site. It is now present only in the northern part of Whipsnade Downs, being the part nearest to Dunstable Downs, its increase southwards being checked by

Table 2. Species recorded from the quadrat surveys with notes on the individual quadrats.

SPECIES PRESENT	WHIPSNADE				DUNSTABLE				
	A	B	C	D	A	B	C	D	E
<i>Arrhenatherum elatius</i> False Oat-grass				4					
<i>Briza media</i> Quaking-grass	5	2	1	1	+		+	7	1
<i>Bromus erectus</i> Upright Brome	+	9	1		9	9	9	9	9
<i>Carex caryophyllaea</i> Spring-sedge	2	1	1					1	
<i>C. flacca</i> Glaucous Sedge	6	7	9		1	2	6	4	
<i>Dactylis glomerata</i> Cock's-foot				+					
<i>Festuca ovina</i> Sheep's-fescue	9	9	9	9	7	9	9	9	9
<i>Helictotrichon pratense</i> Meadow Oat-grass	9	9	9	9	6	4	5	9	7
<i>H. pubescens</i> Downy Oat-grass	+	+	+	+					2
<i>Holcus lanatus</i> York-fog								1	
<i>Koeleria cristata</i> Crested Hair-grass	1	2	4	3	+	4	+	2	2
<i>Lolium perenne</i> Perennial Ryegrass					7				
<i>Poa trivialis</i> Rough Meadow-grass								3	
<i>Trisetum flavescens</i> Yellow Oat-grass				+					
<i>Achillea millefolium</i> Yarrow	1		5	1					
<i>Anthrillis vulneraria</i> Kidney Vetch								1	3
<i>Asperula cynanchica</i> Squinancywort	9	2	2	9				3	1
<i>Bellis perennis</i> Daisy				+					
<i>Campanula glomerata</i> Clustered Bellflower								1	2
<i>C. rotundifolia</i> Harebell	8	9	9	2			3	5	4
<i>Centaurea nigra</i> Common Knapweed	+	1			9	5	9	7	
<i>C. scabiosa</i> Greater Knapweed									+
<i>Cerastium holosteoides</i> Common Mouse-ear				+					
<i>Cirsium acule</i> Dwarf Thistle	2	2	3	5	4	2	8	6	
<i>C. vulgare</i> Spear Thistle				1					
<i>Clinopodium vulgare</i> Wild Basil				1					
<i>Crataegus monogyna</i> Hawthorn	6	1	1	2	3	+	2	4	1
<i>Filipendula vulgaris</i> Dropwort							2	1	1
<i>Galium verum</i> Lady's Bedstraw	5	9	+		9				
<i>Gentiana amarella</i> Autumn Gentian									1
<i>Hellianthemum chamascistus</i> Common Rock-rose	9	9	9	9	9	9	9	9	9
<i>Hieracium pilosella</i> Mouse-ear Hawkweed	+	1	1		1	5			
<i>Hippocrepis comosa</i> Horseshoe Vetch					9	9	6		
<i>Leontodon hispidus</i> Rough Hawkbit	+	+	5	8		9			
<i>Leucanthemum vulgare</i> Oxeye Daisy					4				
<i>Linum catharticum</i> Fairy Flax	7	7	+	9	3	+	9	5	
<i>Lolium corniculatum</i> Common Bird's-foot-trefoil	9	7	2	5	2	3	7	1	
<i>Onobrychis viciifolia</i> Sainfoin									+
<i>Primula saxifraga</i> Burnet-saxifrage	4	5	2		3	2	2	1	4
<i>Plantago lanceolata</i> Ribwort Plantain	3	2	5	8	1	5	4	9	4
<i>P. media</i> Hoary Plantain				2		1	4		
<i>Polypala vulgaris</i> Common Milkwort	+	2	+	5	+	+	3		
<i>Poterium sanguisorba</i> Salad Burnet	5	2	6	9	2	9	9	8	
<i>Primula veris</i> Cowslip					+				
<i>Prunella vulgaris</i> Selfheal	2					1	1		
<i>Ranunculus bulbosus</i> Bulbous Buttercup	4	6	1			3	1	1	
<i>R. repens</i> Creeping Buttercup	1								
<i>Rosa canina</i> Dog Rose						2			
<i>Rumex acetosa</i> Common Sorrel						1			
<i>Scabiosa columbaria</i> Small Scabious	1				1	2	2	2	
<i>Senecio integrifolius</i> Field Fleawort							5		
<i>S. jacobaea</i> Common Ragwort	3	7	2		+				
<i>Swida sanguinea</i> Dogwood		+							
<i>Taraxacum</i> sp. Dandelion sp.	1		1	1	1	1			
<i>Thymus drucei</i> Wild Thyme					1				
<i>T. pulegioides</i> Large Thyme								4	1
<i>T. sp.</i> Thyme sp.	4		2	6					
<i>Tragopogon pratensis</i> Goat's-beard						1	4		
<i>Trifolium pratense</i> Red Clover						1	4	+	
<i>T. repens</i> White Clover						1			
<i>V. hirta</i> Hairy Violet				4					
Moss	7	2	6			3	4	8	

NOTES ON QUADRATS

WHIPSNADE DOWNS

A SP9855 1755, 12 June 1980

Aspect: 280°; Altitude: 165m; Height of vegetation: 5cm; Slope: c. 15°
Species per m²: 22.

Immediately below the White Lion in an area heavily grazed by wallabies and to some extent by rabbits. Minimum of trampling.

B SP9880 1820, 12 June 1980

Aspect: 290°; Altitude: 169m; Height of vegetation: 5cm; Slope: c. 15°
Species per m²: 23.

To the south of the Bison Enclosure and heavily grazed by prairie marmots and wallabies. Probably little grazing by rabbits. More subject to trampling but this is comparatively slight.

C SP9970 1315, 20 June 1980

Aspect: 250°; Altitude: 183m; Height of vegetation: 10cm; Slope: c. 15°
Species per m²: 27.

In the extreme southern end of the downland in Whipsnade Park and grazed by wallabies less closely than elsewhere and possibly more by rabbits. Subject to a minimum of trampling.

D SP9865 1755, 20 June 1980

Aspect: 230°; Altitude: 186m; Height of vegetation: 5cm; Slope: c. 15°
Species per m²: 21.

To the south of the tail of the White Lion and about one metre from a little worn patch being subject to some trampling. Heavily grazed by wallabies.

DUNSTABLE DOWNS

A SP9895 1880, 20 June 1980

Aspect: 290°; Altitude: 183m; Height of vegetation: 40cm; Slope: c. 5°
Species per m²: 20.

In the National Trust portion and at the end of an approach track and, being a clearing in an area of incipient scrub, subject to some trampling. Grazed by rabbits.

B TLO065 1955, 12 June 1980

Aspect: 310°; Altitude: 183m; Height of vegetation: 40cm; Slope: c. 10°
Species per m²: 15.

Below the southern end of the most southerly parking area (1980) and in an area of incipient scrub adjacent to one more dense. Little trampling.

C TLO030 2010, 27 June 1980

Aspect: 270°; Altitude: 190m; Height of vegetation: 40cm; Slope: c. 15°
Species per m²: 18.

Below the northerly end of the most northerly parking area (1980) and subject to much trampling. No evidence of grazing by rabbits.

D TLO030 2030, 27 June 1980

Aspect: 279°; Altitude: 183m; Height of vegetation: 10cm; Slope: c. 19°
Species per m²: 29.

On the downland slope opposite the entrance to the golf clubhouse. This affords a good view of the launching of the gliders which may account for the shorter vegetation. Much trampling but no evidence of grazing by rabbits.

E TLO065 2070, 30 June 1980

Aspect: 225°; Altitude: 152m; Height of vegetation: 30cm; Slope: 15°
Species per m²: 29.

On the lower slope of Pascomb Pit and north of the most northerly of three paths at the foot of the hill. There is some trampling and with incipient scrub higher on the slope probably some grazing by rabbits.

the grazing of the wallabies.

Senecio integrifolius, Field Fleawort, and *Bunium bulbocastanum*, Great Pignut, are both nationally rare species but frequent in a number of places on Dunstable Downs.

Dactylorhiza praetermissa, Southern Marsh-orchid, was found by R. Bateman at the southern end of the National Trust portion of Dunstable Downs in 1980, near to where *Epipactis palustris*, Marsh Helleborine, was found in 1970. This latter flowered only one year and occurred only in a vegetative condition the following year. Marsh plants may occur on chalk downland, but it is too early to decide whether either or both of these species can be considered to be permanent here.

Coeloglossum viride, Frog Orchid, has long been known on the Bedfordshire County Council portion of Dunstable Downs and was reported in 1980 by B.S. Nau to be present also on the National Trust portion. This is a locally rare species.

To the best of my knowledge only three plant species recorded from Dunstable Downs are not still present. *Arabis hirsuta*, Hairy Rock-cress, was known for many years in an area now included in one of the car parks and *Himantoglossum hircinum*, Lizard Orchid, appeared only once, in 1926 (Dony, 1953) at a time when this species occurred spontaneously in other sites in the southern counties. *Ophrys apifera*, Bee Orchid, also not recorded, is irregular in its appearance and may well be still present.

FLORISTIC RICHNESS

This could be measured in terms of the total number of plant species in the two sites but this would include a number of intruders as well as ubiquitous species. In common with other sites I have measured it in terms of the number of the more rare species present. The *Bedfordshire Plant Atlas* (Dony, 1976) was based on tetrad (2km x 2km) records, there being 249 complete and 121 part tetrads in the county. Species listed below for the two sites are those with 120 or fewer tetrad records updated to 1980, the number of such records being given in brackets –

Whipsnade Downs – 28 species

<i>Euphrasia pseudokerneri</i> Eyebright (13)	<i>Anacamptis pyramidalis</i> Pyramidal Orchid (34)
<i>Thymus drucei</i> Wild Thyme (13)	<i>Scabiosa columbaria</i> Small Scabious (36)
<i>Origanum vulgare</i> Marjoram (16)	<i>Sorbus aucuparia</i> Rowan (51)
<i>Carex caryophylla</i> Spring-sedge (17)	<i>Festuca ovina</i> Sheep's-fescue (55)
<i>Asperula cynanchica</i> Squinancywort (20)	<i>Euphrasia nemorosa</i> Eyebright (61)
<i>Hippocrepis comosa</i> Horseshoe Vetch (20)	<i>Carduus nutans</i> Musk Thistle (79)
<i>Campanula glomerata</i> Clustered Bellflower (22)	<i>Catapodium rigidum</i> Fern-grass (71)
<i>Gentianella amarella</i> Autumn Gentian (22)	<i>Campanula rotundifolia</i> Harebell (77)
<i>Helianthemum chamaecistus</i> Common Rock-rose (25)	<i>Brachypodium pinnatum</i> Tor-grass (85)
<i>Helictotrichon pratense</i> Meadow Oat-grass (29)	<i>Ulex europaeus</i> Gorse (90)
<i>Carlina vulgaris</i> Carline Thistle (30)	<i>Briza media</i> Quaking-grass (106)
<i>Polygala vulgaris</i> Common Milkwort (30)	<i>Cirsium acaule</i> Dwarf Thistle (112)
<i>Koeleria cristata</i> Crested Hair-grass (31)	<i>Bromus erectus</i> Upright Brome (113)
<i>Thymus pulegioides</i> Large Thyme (32)	<i>Reseda lutea</i> Wild Mignonette (118)

Dunstable Downs – 39 species

Unfortunately the records are not detailed enough to make a distinction between the portions owned by the Bedfordshire County Council and the National Trust.

- **Dactylorhiza praetermissa* Southern Marsh-orchid (3)
Coeloglossum viride Frog Orchid (4)
Senecio integrifolius Field Fleawort (8)
Sorbus aria Common Whitebeam (11)
Euphrasia pseudokernerii Eyebright (13)
Thymus drucei Wild Thyme (13)
Gymnadenia conopsea Fragrant Orchid (14)
Carex caryophyllea Spring-sedge (17)
Asperula cynanchica Squinancywort (20)
Hippocrepis comosa Horseshoe Vetch (20)
Campanula glomerata Clustered Bellflower (22)
Gentianella amarella Autumn Gentian (22)
Cerastium arvense Field Mouse-ear (24)
Bunium bulbocastanum Great Pignut (25)
Helianthemum chamaecistus Common Rock-rose (25)
Onobrychis vicifolia Sainfoin (28)
Helictotrichon pratense Meadow Oat-grass (29)
Carlina vulgaris Carlina Thistle (30)
Polygala vulgaris Common Milkwort (30)
Koeleria cristata Crested Hair-grass (31)
Filipendula vulgaris Dropwort (32)
Thymus pulegioides Large Thyme (32)
Anacamptis pyramidalis Pyramidal Orchid (34)
Scabiosa columbaria Small Scabious (36)
Anthyllis vulneraria Kidney Vetch (43)
Festuca ovina Sheep's-fescue (55)
Picris hieracioides Hawkweed Oxtongue (59)
Rhinanthus minor Yellow Rattle (59)
Euphrasia nemorosa Eyebright (61)
Carduus nutans Musk Thistle (70)
Catapodium rigidum Fern-grass (71)
Campanula rotundifolia Harebell (77)
Listera ovata Common Twayblade (78)
Dactylorhiza fuchsii Common Spotted-orchid (101)
Ononis spinosa Spiny Restharrow (102)
Briza media Quaking-grass (106)
Cirsium acaule Dwarf Thistle (112)
Bromus erectus Upright Brome (113)
Reseda lutea Wild Mignonette (118)

*Included in the hope that it may be permanent.

It is to be expected that Dunstable Downs having the larger area may have more species than Whipsnade Downs, which may be seen also in their comparison with other Bedfordshire chalk downlands given below, Table 3, and shown in graphical form in Fig 2.

Table 3 shows the relationship between these selected species and the areas of the chalk downland of Dunstable and Whipsnade Downs (sites 13 and 9). For comparison they are also shown with the data available for other chalk downland sites in Bedfordshire. The relationship between the total number of plant species and the areas of the sites in which they occur, for sites similar in their nature, follows a now familiar pattern of

$$S = C A^k$$

- where S = the number of species in a site
 A = the area of the site
 C = the number of species in a site of unit area
 k = an index of species-richness

If this holds for the total number of plant species in the sites it is reasonable to suppose that it will also hold for a natural selection of these species. It does so here, taking the areas of the sites in hectares with $C = 17.62$ and $k = 0.181$ (Fig 2), needing however to be interpreted with some caution as the areas of the sites are estimated.

Applying this relationship to the data shows that while Dunstable Downs has 11 more of the selected species than Whipsnade Downs, when the areas of the sites are taken into account one could expect a difference of six species. Whipsnade Downs has 2.6 fewer species than one would expect and Dunstable Downs 2.3 species more. Assuming that the two sites were identical in their vegetation 50 years ago it would appear that the continuous grazing of Whipsnade Downs has brought a loss of five species, or more exactly four since one of the species, *Dactylorhiza praetermissa*, Southern Marsh-orchid, listed for Dunstable Downs may not be permanent.

The assessments of the sites made in Table 3 show that, in terms of the plant species selected on the basis of their local rarity, the choice of sites as National and Local Nature Reserves and as Sites of Special Scientific Interest has some justification.

NO.	SITE	A	B	C	D
1	Moleskin	4	24	22.6	106
2	Harlington chalkpit (disused chalk working)	4.5	27	23.1	117
3	Skimpot (disused chalk working)	4.5	23	23.1	100
4	Slope below Ravensdell Wood *	5	27	23.6	114
5	Bradgers Hill	8	11	25.6	43
6	Knocking Hoe (SSSI and NNR)	9	47	26.2	177
7	Totterhoe Knolls (SSSI and LNR)	12.5	33	27.9	119
8	Sharpenhoe Clappers (SSSI and National Trust)* 15	26	26	28.8	90
9	Whipsnade Downs	21	28	30.6	91
10	Dallow Road Hills	24	24	31.3	77
11	Blows Downs	34	25	33.5	75
12	Deacon and Noon Hills (SSSI)	35	42	33.6	128
13	Dunstable Downs (part National Trust)	58	39	36.7	105
14	Barton Hills (SSSI and NNR) *	60	48	37.0	130
15	Warden and Galley Hills	69	37	38.0	98

Column A = area of site in hectares

Column B = number of species recorded for 120 or fewer tetrads in Bedfordshire known in site

Column C = expectation of number of these species in a site of this area

Column D = $B \div C \times 100$, that is an assessment of the species-richness of the sites

* These sites contain or have adjacent to them additional habitats that may add to their interest.

NR National Nature Reserve; LNR Local Nature Reserve; SSSI Site of Special Scientific Interest, 1970 schedule.

Table 3. Floristic richness data for chalk downland sites in Bedfordshire.

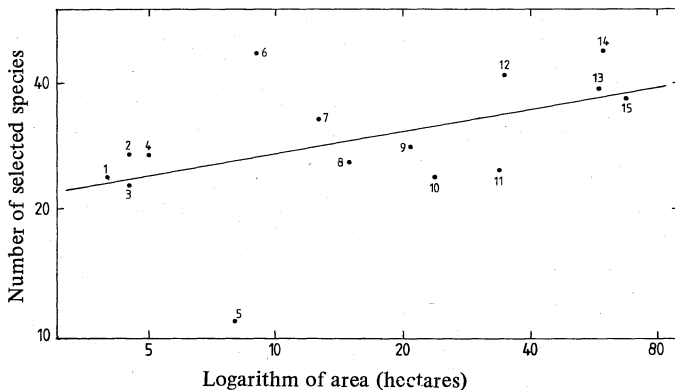


Fig. 2. Logarithm of number of species as a function of logarithm of area for the chalk downland sites listed in Table 3.

SCRUB INVASION

This is most advanced on the National Trust portion of Dunstable Downs but is also considerable on some parts owned by the Bedfordshire County Council. While predominantly hawthorn, in addition to beech and birch already mentioned, other trees observed – mainly on the fringes of the scrub – are oak, ash, wild cherry, holly, whitebeam, goat willow and buckthorn. It may be many years before the scrub develops into what may be considered to

be woodland, still leaving considerable doubt as to what its nature will be. If it has been National Trust policy to allow a natural succession to take its full course it seems a pity that 14 hectares were turned to arable. There has been some beneficial clearing of scrub by the Trust on parts of Bison Hill and the County Council intends to have some of the less advanced scrub on its portion cleared during 1981.

SUMMARY

The natural vegetation of the chalk downland of Whipsnade and Dunstable Downs has some interesting features:—

The grazed area of Whipsnade Downs

This is important in being one of the few remaining continuously grazed areas of chalk downland in the neighbourhood. It is reminiscent of the downland grazed by sheep more than 50 years ago. In those days flocks of sheep were moved from site to site, and at a particular site, from one part of it to another. An area recently grazed appeared to be denuded of much of its vegetation but there was always an interval before the next grazing to allow some recovery. On Whipsnade Downs the grazing has been continuous. There is no evidence that the wallabies are selective in their grazing, being probably less so than the rabbits also present. If the grazing ceased there would no doubt be a recolonisation by the species now apparently lost and an extension of the now limited sward of *Bromus erectus*, Upright Brome. The large amount of small hawthorn plants present suggests that in a short time there would also be an invasion of scrub.

The area of Dunstable Downs subject to public pressure

This is equally important but it is difficult to account for all the factors involved. Excessive trampling has caused much erosion but the constant pressure has been largely responsible for reducing the rabbit population to an extent that evidence of rabbit grazing is seen mainly near the areas of incipient scrub at the base of the downland. The limited scrub may be due to there being fewer birds than previously and no doubt fewer rodents also, these being major agencies in causing scrub invasion. *Bromus erectus*, Upright Brome, now dominant, left much litter in the early days of its colonisation which excluded some of the original vegetation but this appears to be no longer so. Although reduced in its extent by the car parks, the erosion and the increase in scrub, it is somewhat surprising that the remaining downland retains almost all the plant species known from the site.

ACKNOWLEDGEMENTS

My thanks are due to Mr V.J.A. Manton, MRCVS, Curator (Whipsnade Park) Zoological Society of London, for providing me with much useful information and for giving my wife and me facilities, allowing us to study the vegetation of the downland in Whipsnade Park: to Mr. P. Smith, AMA, FGS, Chief Arts and Recreation Officer, Bedfordshire County Council, for the loan of maps and aerial photographs and giving information with regard to the County Council's portion of Dunstable Downs: to Mr J.R. Jeffries, Manager of London Gliding Club for useful information and to Mr C.R. Boon for helpful discussion and providing a calculated fit for the data in Table 2.

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FLOWERING PLANTS, FERNS AND FERN ALLIES (Spermatophyta and Pteridophyta) Report of the Recorder

This has been another full year of plant recording in the county during which an additional 440 tetrad records were made. These included further records of some of the rarer plant species in Bedfordshire including Dyer's Greenweed (*Genista tinctoria*) found by C.R. Boon near Elstow (04H). Long-stalked Crane's-bill (*Geranium columbinum*) reappeared near the gravel pit at the foot of Barton Hills (13V) and was also found in an entirely new part of the county for this species on a railway bank near Souldrop (96V). Mare's-tail (*Hippuris vulgaris*) is now abundant in the recently cleared lake at Toddington Manor (03A) where it may have been originally introduced and finding the changed conditions conducive. Star Sedge (*Carex echinata*), one of the county's rarest sedges and recently lost in two of its few stations, was a welcome find in a marsh at Nares Gladley (92D). In 1971 I had clearly marked Wood Barley (*Hordelymus europaeus*) on a record card as being present in Swineshead Wood (06NT) but six years later when compiling the *Bedfordshire Plant Atlas* had doubted the record. It is good to report that it is in two parts of the wood and also in Browns Wood (05H) which is not far from Twin Wood where A.B. Sampson found it in 1902.

Orchids had their usual attraction: Stephen Oakes-Monger, a young botanist from Hertfordshire, found one plant of Man Orchid (*Aceras anthropophorum*) on Sundon Hills (02P), an additional site to the well known one on Totternhoe Castle Hill and where one hopes it may be permanent. Another young Hertfordshire visitor, Richard Bateman, found Southern Marsh-orchid (*Dactylorhiza praetermissa*) on Bison Hill (91V) very close to where Marsh Helleborine (*Epipactis paulstris*) appeared for two years about ten years ago. It is strange that so many marsh species may also grow on chalk downland. It was also on Bison Hill that B.S. Nau refound Frog Orchid (*Coeloglossum viride*). 1980 appears to have been a favourable year for other orchid species such as Broad-leaved Helleborine (*Epipactis helleborine*) with no fewer than nine additional tetrads added to the previous 23 and not all in primary woodland, the normal habitat of this species.

While it is pleasing to be able to report additions to the flora it is with great sorrow that losses must also be noted. With the drying out of the small remaining part of Totternhoe Mead it is now eight years since Caraway (*Carum carvi*), Flat-sedge (*Blysmus compressus*) and Slender Spike-rush (*Eleocharis uniglumis*) were seen there in their last remaining site in the county. A similar story may be told of wetland species elsewhere. It would be very helpful if members would report any marshes or wet meadows known to them, however small or apparently unimportant they may appear to be.

Naturalists' gardens from time to time reveal the unexpected, such being the case with Mrs Robinson's at Stevington with *Chenopodium capitatum* which had only been recorded once previously in the county in 1950, and also in a garden! Dr Nancy Dawson's garden at Ickwell Green produced Sickie-leaved Hare's-ear (*Bupleurum falcatum*) which has been recorded as a possibly native species in Essex and Surrey but presumed extinct in both. It is difficult to believe that the unaccountable occurrence in the county of unusual species such as these is limited to the gardens of members of either the Society or the Trust.

In 1979 Reflexed Saltmarsh Grass (*Puccinellia distans*), native elsewhere in Britain, was reported from roadside verges in 13 tetrads on the A1 trunk road in the county (*Bedf. Nat.* 33: 68-69). It was presumed to be encouraged by the salting of the road in winter. In 1980 it was recorded in an additional 29 tetrads on other roadside verges — it was, however, apparently absent on the A5 and on the A6 south of Barton. Four new wool aliens may be added to the already long list of these species: *Aegilops speltoides* (Gramineae), found in 1979 and grown on in our garden, *Modiola caroliniana* (Malvaceae), *Lavatera punctata* (Malvaceae) and *Trifolium leucanthum* (Leguminosae), the last two species probably being new to Britain.

JOHN G. DONY

OBSERVATIONS CONCERNING THE SPREAD OF TWO ALIEN BRYOPHYTE SPECIES IN BEDFORDSHIRE

by Alan R. Outen, 15, Manor Close, Clifton, Shefford, Beds.

It is generally well known that our native fauna and flora have from time to time been added to by introductions from abroad, both accidental and deliberate. Many of these aliens are only transitory but others have spread rapidly, sometimes proving rather too successful for native species to be able to compete effectively. Two alien species of mosses seem to be demonstrating such a situation in Bedfordshire.

Orthodontium lineare first appeared in Britain in 1920 from the southern hemisphere. It has now spread to over ninety vice-counties, the first record for Bedfordshire being in 1947. It is now extremely common throughout the county on rotting wood and also on peaty ground. The first record for this species at Flitwick Moor was in 1958 and it is now abundant there having increased considerably in the last ten years. Coincident with this spread on the moor I have observed a decline in the frequency of native species with a similar habitat preference. This has been particularly apparent on rotting wood, both in general terms and on specific microhabitat sites where an invasion by *Orthodontium* has resulted in a decrease in frequency of *Aulacomnium androgynum* and *Tetraphis pellucida*, presumably because they are unable to compete effectively for substrate with the more vigorous growth of the *Orthodontium*. Unfortunately I did not begin accurate quantitative measurements in support of these observations until recently and the involvement of other factors cannot yet be ruled out.

Campylopus introflexus also probably arrived from the southern hemisphere and was first recorded in Britain in Sussex in 1941. The following year it made its first appearance in Ireland and by the end of 1950 it was known from a further three localities. By 1963 it was recorded for 45 vice-counties in Britain and Ireland, ten years later for 118 and by 1980 for 140 out of a possible 152 vice-counties. In some of the remaining underworked areas it may yet await detection. Its spread through Continental Europe has been equally dramatic. Richards and Smith (1975) report that "in addition to increasing its range and abundance during this time *C. introflexus* has given further evidence of its wide ecological tolerance".

In Bedfordshire *C. introflexus* was first recorded in 1966 at Flitwick Moor and in my own experience it was still comparatively scarce there in 1971. Since that time however it has spread rapidly over the moor as a primary coloniser of bare peat, on burnt ground, on rotting wood and as an epiphyte. It is also to be observed in some extremely wet areas liable to frequent flooding. Richards and Smith state that "it does not seem to displace already established species to any extent", but my recent observations at Flitwick Moor suggest that the established *Dicranella cerviculata* may be competing with it rather inadequately in those areas where the two species are now found together.

At Sandy Warren there is further evidence to suggest that *C. introflexus* does displace established species. At this site *C. introflexus* was first recorded in 1971 and by 1975 it was still only observable at two places. Since that time it has spread dramatically as has been observed by both Dr Harold Whitehouse of Cambridge University and myself. Coincident with the increase in this species there has been a decline in frequency of *Leptodontium flexifolium*, a small species quite scarce in this region of Britain, though also recorded at Rowney Warren. As Dr Whitehouse points out (pers. comm.) "the decline of the *Leptodontium* at Sandy could well be due to competition from the *Campylopus*, since what little *Leptodontium* remains is mixed with it".

A very similar threat seems to be facing another local rarity present at Sandy, the liverwort *Ptilidium ciliare*, which also seems to be competing rather unsuccessfully with the coloniser. Certainly both *Leptodontium* and *Ptilidium* are much smaller and slower growing than the *Campylopus* and as this encroaches on their previously held territories, so its more vigorous growth would seem to supplant them. It must however be borne in mind that this is not just a natural process of bryological succession since the *Campylopus* is not a native plant. Also it is itself occurring as a primary coloniser which by its more rapid growth then overruns the natives. At both Sandy and at Flitwick Moor *C. introflexus* has been observed fruiting

abundantly and as well as reproducing by spores it is also spreading very efficiently by natural fragmentation.

At Rowney Warren *C. introflexus* is also spreading fast though it is not yet particularly evident in the areas containing *Leptodontium*. It will be interesting to observe how the population balance of these two species changes here in the next few years.

ACKNOWLEDGEMENTS

I would like to thank Dr H.L.K. Whitehouse for discussion on *C. introflexus* and *L. flexifolium* at Sandy Warren.

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LICHENS

Report of the Recorder

Churchyards are among the most important habitats for saxicolous lichens in urban areas and it has been estimated that over 66% of the total lichen flora in the Luton and Bedford area occurs in such habitats. Not only the memorials but the church walls and the fabric of the church itself provide suitable substrates for lichen growth. The types of stone used in their construction, their age, aspect and location all govern the number and type of lichen assemblages to be found growing in any churchyard.

Of the many churchyards visited in Bedfordshire those of Barton (41 species), Maulden (38 species), Kensworth (37 species) and Pottton (35 species) proved the most interesting. The commonest species to be found in all churchyards is *Lecanora conizaeoides* which prefers the vertical north or west facing surfaces of headstones and is often the only coloniser of the wooden crosses erected above memorials. A rich assemblage of lichen species may be found on the edges, ridges and top surfaces of headstones, chest tombs and walls, for these areas provide good illumination combined with nutrient enrichment due to bird perching. This community is characterised by the orange-yellow rosettes of the nitrophilous lichens *Xanthoria aureola*, *X. parietina* and especially *Caloplaca heppiana* on limestone, and the grey patches of *Physcia caesia* and *P. grisea*.

Where there is excess water run-off from leaking pipes or guttering, the thick, swollen, jelly-like dark masses of *Collema tenax* and *Collema crispum* may often be found growing amongst various mosses. Nutrient streaks caused by run-off from iron bolts, window frames, copings and facings provide substrates that only a few lichen species can colonise, although *Lecidea macrocarpa* and *Lecanora polytropia* are often found on the iron enriched substrates. The bright yellow-green patches of *Lecidea lucida* are often very distinctive on vertical, shaded surfaces and can often be seen picking out inscriptions on headstones as this lichen prefers to grow in the damp grooves of the carving cuts.

Cracks in stonework or walls, old gravel paths and stones bordering paths and memorial gardens are often colonised by *Cladonia chlorophaea*, *Cladonia coniocraea* and *C. fimbriata* whilst the newer concrete paths and slabs provide habitats for the fast growing, pioneer, crustose lichens such as *Lecanora dispersa* and *Lecanora muralis*. Where the churchyard lawns

or gardens have been neglected the short, open mossy turf may be colonised by the large grey leafy lobes of the Dog Lichen *Peltigera canina*.

Old churchyards in Bedfordshire have far more lichens than any other habitat in the county and the older memorials have the best lichen communities growing on them. Few lichens can colonise and develop on the polished marble or granite memorials and headstones that are now fashionable.

FRANCES B.M. DAVIES

THE FUNGUS FORAY

This year the fungus foray, led by Dr D.A. Reid, was held on November 2nd at Chicksands Wood and was attended by about 40 enthusiasts who trudged around the footpaths and rides in a vain attempt to gain access into the wood itself.

Chicksands Wood is highly unsuitable as a site for a fungus foray being in part a dense conifer plantation and otherwise a dense area of secondary regrowth scrub. Even the broad grassy rides are inhospitable for fungi since the grass is tall and rank which precludes most turf-loving species. Having said this it is perhaps surprising to note that a total of 122 species were collected of which eight were new to the county and two confirmed previous ancient records.

Reference to the list of fungi collected shows a preponderance of rather small, dull coloured, unexciting species belonging to such genera as *Conocybe*, *Galerina* and *Coprinus* along with a number of species of *Clitocybe*, *Collybia* and *Marasmius*. A striking feature of the list, however, is the inclusion of 14 species of *Mycena* which is an indication of the scanty occurrence of agarics generally and of the determination of those present to collect everything they found, no matter how small. Amongst the larger fungi 'weedy' species of *Hebeloma*, *Inocybe* and *Cortinarius* were well represented and also other ubiquitous fungi such as *Laccaria laccata*, *Hypholoma fasciculare*, *Armillaria mellea* etc. Species of *Lactarius* and *Russula* were also found but these are strictly associated with certain trees with which they form mycorrhizae.

Of the agarics new to the county — *Conocybe aporos* is a small brown annulate species with a somewhat campanulate to flattened cap, 1-4 cm diam., and delicate stem 2-5 cm high and 1-4 mm wide. As with other annulate species of this genus the ring, although well formed and plicate above, is often deciduous and quickly lost. Confirmation of identity rests on examination of the spores, (7.2-)8.0-10.0 x 4.5-5.5µm, which lack a germ-pore.

Of the four species of *Cortinarius* found, two are new to the county and *C. tabularis* confirms an old record. The latter belongs in the *C. anomalus* group amongst which it is distinguished by total lack of violet tints and in having a pallid dirty-buff or ochraceous-buff cap which is slightly viscid when moist. *C. decipiens* sensu Favre is a tiny, very dark brown species with purple flesh and spores measuring 7.5-8.5 x 4.5-5.0µm. *C. uraceus* sensu Lange is altogether more robust but is also entirely dark blackish-brown. In this collection, the stem was paler than the cap but became blackish when handled; the flesh was also dark blackish-brown and the spores measured 7.0-8.0 x 4.5-5.0µm.

Confirmation of the occurrence of *Hebeloma longicaudum*, often cited as *H. nudipes*, was of interest. It resembles the common *H. crustuliniforme* in colour and microcharacters but has a tall elongated stem.

Species of *Inocybe* can seldom be named in the field since identification rests largely on microcharacters. *I. leptocystis* is a species with brown, felty cap and a naked pallid stem, belonging to the group with smooth spores and well differentiated cystidia. The latter are characteristic in being long, narrow subcylindric, often slightly constricted in places, and in having thin or only very slightly thickened walls. This fungus, not uncommon in Britain, has yet to be officially recorded.

Mycena margaritipora is seemingly very rare in this country although probably often

overlooked due to its small size and pale brown cap. It is readily identified under the microscope by its round, coarsely warted spores, 5-6µm, and long, narrow thin-walled, pointed cystidia with several tiny apical prongs. This species grows on mossy stumps etc.

Hyphoderma setigerum is a very common resupinate corticioid fungus, and although only now added to the county list, is, no doubt, widespread. It has like so many of these whitish Corticioids been left severely alone by forayers.

Amongst the cup-fungi only *Encoelia fascicularis* represents an addition to the county. This species, on dead branches of *Populus*, forms small erumpent clusters of cup-shaped fruitbodies, each 5-10 mm across, with a dark bay-brown disc and mealy exterior. The spores are hyaline, allantoid, 12-15 x 3-4µm. The remaining new record – *Dactylaria chrysosperma* refers to a mould.

Agaricus campestris; *Armillaria mellea*; *Baeospora myosura*; *Clitocybe fragrans*;

C. geotropa; *C. phyllophila*; *Collybia cookei*; *C. dryophila*; **Conocybe aporos*; *C. appendiculata*; *Coprinus disseminatus*; *C. lagopus*; *C. micaceus*; *C. plicatilis*; *Cortinarius anomalus*; **C. decipiens*; †*C. tabularis*; **C. uraceus*; *Crepidotus luteolus*; *Galerina hypnorum*; *G. mutabilis*; *Hebeloma crustuliniforme*; †*H. longicaudum*; *H. sacchariolens*; *H. sinapizans*; *Hygrophorus leucophaeus*; *H. niveus*; *Hypholoma fasciculare*; *Inocybe geophylla*; *I. geophylla v. lilacina*; *I. griseolilacina*; **I. leptocystis*; *Laccaria amethystea*; *L. laccata*; *Lactarius blennius*; *L. deliciosus*; *L. pyrogalus*; *L. subdulcis*; *Lepiota cristata*; *Lyophyllum decastes*; *Marasmius oreades*; *M. ramealis*; *Melanoleuca melaleuca*; *M. grammopodia*; *Mycena aetites*; *M. epipterygia*; *M. fibula*; *M. galericulata*; *M. galopus*; *M. inclinata*; *M. leptocephala*; **M. margaritispora*; *M. olida*; *M. polygramma*; *M. speirea*; *M. viscosa*; *M. vitilis*; *M. vulgaris*; *Pleurotus dryinus*; *Pluteus lutescens*; *P. psathyrella gracilis*; *Pseudohiatula stephanocystis*; *Resupinatus applicatus*; *Rhodotus palmatus*; *Russula atropurpurea*; *R. fragilis*; *R. sardonica*; *Tricholoma argyraceum*; *Tubaria furfuracea*.

Amphinema byssoides; *Chondrostereum purpureum*; *Clavaria acuta*; *Clavulina cinerea*; *C. cristata*; *Clavulinopsis helveola*; *Coniophora puteana*; *Coriolus versicolor*; *Cylindrobasidium evolvens*; *Daedaleopsis confragosa*; *Ganoderma applanatum*; *Gloeocystidiellum porosum*; **Hyphoderma setigerum*; *Hyphodontia sambuci*; *Leptotritum semipileatus*; *Peniophora lycii*; *Phlebia merismoides*; *Piptoporus betulinus*; *Radulomyces confluens*; *Schizopora paradoxa*; *Stereum gausapatum*; *S. hirsutum*; *S. rugosum*; *S. sulphuratum*; *Typhula erythropus*.

Calocera cornea; *Dacrymyces stillatus*.

Auricularia mesenterica.

Sebacina incrustans.

Cyathus striatus; *Lycoperdon perlatum*; *L. pyriforme*; *Scleroderma verrucosum*; *Sphaerobolus stellatus*; *Vascellum pratense*.

Calycella citrina; *Chlorosplenium aeruginascens*; *Cyathicula coronaria*; *Dasyscyphus virgineus*; **Encoelia fascicularis*; *Polydesmia pruinosa*; *Propolis versicolor*.

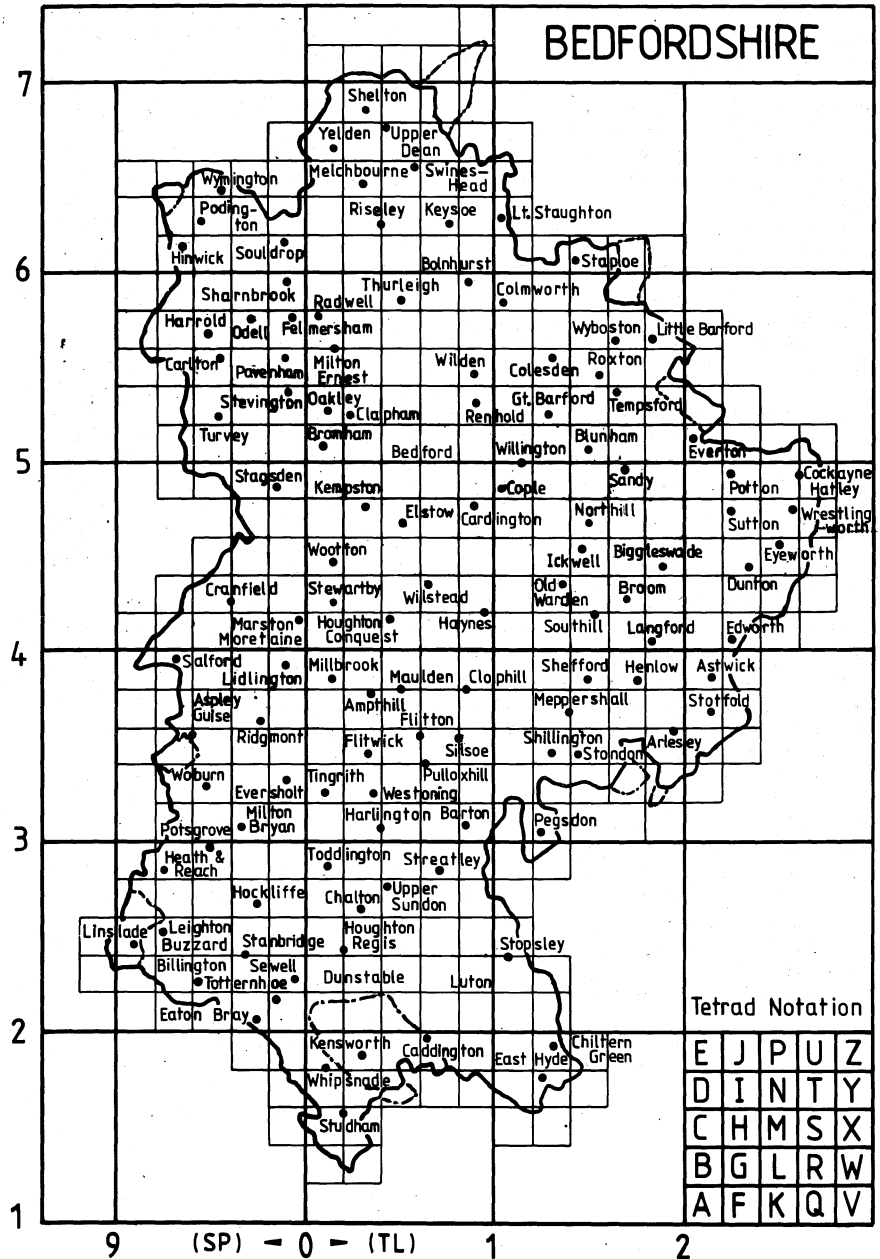
Daldinia concentrica; *Diatrype disciformis*. *D. stigma*; *Hypoxylon fuscum*; *H. rubiginosum*; *H. serpens*; *Nectria cinnabarina*; *Sphaerotheca pannosa*; *Thaxteria phaeostroma*; *Xylaria hypoxylon*.

**Dactylaria chrysosperma*.

* = New county record

† = Confirmation of existing record.

DEREK A. REID



Tetrad map of Bedfordshire showing the main towns and villages.

RECORDERS

Meteorology: Mr A.W. Guppy, 22 Poplar Avenue, Bedford.

Geology and Fossils: Mr K.G. Baker, 34 Lorraine Road, Wooton, Bedford.

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

Birds: Mr B.J. Nightingale, 9 Duck End Lane, Maulden, Bedford.

Amphibians and Reptiles: Mrs H.M. Muir-Howie, 24 Mowbray Close, Bromham, Bedford.

Fish: Mr T. Peterkin: 129 Manor Road, Barton-le-Cley, Bedford.

Slugs, Snails and Leeches: Mrs E.B. Rands, 51 Wychwood Avenue, Luton, Beds.

Spiders and Harvestmen: Mr T.J. Thomas, 142 Selbourne Road, Luton, Beds.

Dragonflies: Dr N. Dawson, The Old House, Ickwell Green, Biggleswade, Beds.

Grasshoppers and Crickets: Mr D.G. Rands, 51 Wychwood Avenue, Luton, Beds.

Bugs: Dr B.S. Nau: 15 Park Hill, Toddington, Dunstable, Beds.

Lacewing Flies: Dr B. Verdcourt, The Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey.

Butterflies: Mr A.J. Martin, 18 Aragon Road, Ampthill, Bedford.

Moths (macro): Mr V.W. Arnold, 96 St. Augustines Avenue, Luton, Beds.

Hoverflies: Dr N.F. Janes, 82 Marston Gardens, Luton, Beds.

Bees, Wasps, Ants etc.: Dr V.H. Chambers, 50 Shefford Road, Meppershall, Shefford, Beds.

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Woodlice, Centipedes and Millipedes: Dr A.J. Rundle, 29 Burlington Avenue, Kew, Richmond, Surrey.

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Mosses and Liverworts: Mr A.R. Outen, 15 Manor Close, Clifton, Shefford, Beds.

Lichens: Mrs F.B.M. Davies, "Rose Cottage", 69 The Hill, Wheathampstead, St. Albans, Herts.

Fungi: Dr D.A. Reid, The Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey.

Sites: Post vacant.

**Price: £1-70 (including postage) from The Membership Secretary, 17 Pentland Rise, Putnoe,
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