

The  
**BEDFORDSHIRE**  
**NATURALIST**

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BEING THE  
JOURNAL  
OF THE  
BEDFORDSHIRE  
NATURAL HISTORY SOCIETY  
AND FIELD CLUB  
FOR THE YEAR  
1959

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BEDFORDSHIRE  
NATURAL HISTORY SOCIETY & FIELD CLUB  
1960

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BADGERS AT STAGSDEN

*(Photograph by H. A. S. Key)*

# THE BEDFORDSHIRE NATURALIST

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EDITED BY A. W. GUPPY, B.Sc.

No. 14—1959

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## Report of the Council

The continuous and gratifying progress of the Society was again manifest during the year; thirty-two new members were admitted, and although there were a few resignations, one death, and the removal of the names of a number of members who were grossly in arrears of subscription, the total membership at the close of the year reached a new record of 294. It is hoped that as a result of increased activity and publicity this figure will be doubled in the near future, and, in this respect, the members themselves can do more to help than any other factor by introducing their friends at the many meetings to be held, both indoors and in the field.

One especially commendable feature has been the co-operative effort of the Luton members of the Council to publicise the activities of the Society in their area which has resulted in such striking increase in attendance at lectures. The Ornithological Section, too, inaugurated its Bird Bulletin during the year and the several issues have aroused such interest that it is hoped to increase the scope by the gradual inclusion of similar material dealing with other branches of natural history.

The largest gathering of the year which calls for special comment assembled in the Civic Theatre, Bedford, on 24th March to enjoy an excellent and greatly-appreciated lecture and film show by H. G. Hurrell on animals, birds and insects, and in December there was held in Bedford, under the auspices of the Society, a special meeting to which the Council of the Society as hosts invited the Councils of the North and South Bedfordshire Preservation Societies and the County Planning Officer, Mr P. G. Laws. The meeting was addressed by Mr A. E. Smith of Willoughby, Lincs., who so nobly made the journey while still convalescing. The object of the meeting was to explore the possibility of forming a Naturalists' Trust for Bedfordshire, and the meeting, after listening to a very enlightening address, was unanimous in its decision to go ahead with the project, and an invitation was extended to Huntingdonshire to join in a two-county venture. A Steering Committee was appointed.

Mention must be made of the very exceptional summer weather which contributed so markedly to the success of the excursions.

In expressing the gratitude of the Society again to its many benefactors the Council wishes to record especially its indebtedness, both to the Principal of the Training College and Miss E. Proctor, for the valued use of the College rooms for lectures and the loan of equipment.

The increasing interest and co-operation of members is inspiring the Officers and Council of the Society to further programmes of expansion.

HENRY A. S. KEY,  
*Hon. General Secretary.*

# THE BEDFORDSHIRE NATURAL HISTORY SOCIETY AND FIELD CLUB

## STATEMENT OF ACCOUNTS FOR THE YEAR ENDED 31st DECEMBER, 1959

STATEMENT OF ACCOUNTS

RECEIPTS	£	s.	d.	£	s.	d.	PAYMENTS	£	s.	d.	£	s.	d.
Cash in Bank, 1st January, 1959 ...	238	10	9				Printing, Postage and Stationery ...				38	10	0
Cash in Hand, 1st January, 1959 ...	2	4	3				Meeting Expenses—Hire of Hall, Luton ... ..				2	10	0
				240	15	0	Deposit re Hire of Corn Exchange, Bedford (To be refunded) ...				2	0	0
Donations and Subscriptions, 1959, and Arrears ... ..	102	6	6				Cost of Printing Journals, 1957 ...	84	12	6			
Subscriptions, 1960 and 1961 ...	1	5	0				Cost of Printing Journals, 1958 ...	84	13	0			
				103	11	6					169	5	6
H. G. HURRELL'S LECTURE:							Less Sales ... ..	4	6	0			
Receipts ... ..	27	2	3								164	19	6
Less Expenses ... ..	26	17	5				Sundry Expenses ... ..				1	18	6
						4	Expenses of Special Meeting re pro- posed formation of Bedfordshire Trust ... ..				6	12	8
Surplus on Coach Trips ... ..				6	15	0	Advertising ... ..				7	5	0
							Cash at Bank, 31st December, 1959	121	7	8			
							Cash in Hand, 31st December, 1959	6	3	0			
											127	10	8
											£351	6	4
											£351	6	4

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

BEDFORD.  
26th January, 1960.

THORNTON BAKER & CO.,  
Chartered Accountants, Hon. Auditors. 3

## PROCEEDINGS 1959

### Indoor Meetings

124TH ORDINARY MEETING, 15th January, 1959, Luton. 'Birds of a Luton Garden,' by W. T. Roberts. Attendance 27. *Chairman*: R. G. Stephenson.

125TH ORDINARY MEETING, 22nd January, 1959, Bedford. 'Some Aspects of Norway and Sweden,' by Dr. G. A. Metcalfe. Attendance 57. *Chairman*: F. G. R. Soper.

126TH ORDINARY MEETING, 5th February, 1959, Bedford. 'Photographing and Recording Birds,' by Henry A. S. Key. Attendance 33. *Chairman*: F. G. R. Soper.

127TH ORDINARY MEETING, 19th February, 1959, Luton. 'A Miscellaneous Show of Nature Films,' by D. White. Attendance 33. *Chairman*: W. G. Harper.

12TH ANNUAL GENERAL MEETING, 26th February, 1959, Bedford. Details as printed in the last issue, No. 13, 1958, page 9.

128TH ORDINARY MEETING, 12th March, 1959, Luton. 'Wild Flowers,' by Miss M. Holder. Attendance 15. *Chairman*: E. G. Meadows.

129TH ORDINARY MEETING, 19th March, 1959, Bedford. 'Know your Subject.' Brief talks on several branches of Natural History by members of a symposium led by R. G. Stephenson in the Chair. Attendance 34.

130TH ORDINARY MEETING, 15th October, 1959, Luton. 'The Farne Isles,' by Miss Hager. Attendance 48. *Chairman*: E. G. Meadows.

131ST ORDINARY MEETING, 22nd October, 1959, Bedford. 'Know Your County—the Natural History of Bedfordshire Waterways,' by Henry A. S. Key. Attendance 61. *Chairman*: F. G. R. Soper.

132ND ORDINARY MEETING, 12th November, 1959, Luton. 'Lakeland through the Seasons,' by Henry A. S. Key. Attendance 93. *Chairman*: R. G. Stephenson.

133RD ORDINARY MEETING, 26th November, 1959, Bedford. 'Looking at Wild Life in Africa,' by Miss E. Proctor. Attendance 41. *Chairman*: F. G. R. Soper.

134TH ORDINARY MEETING, 10th December, 1959. 'Fundamentals of Bird Identification,' by D. I. M. Wallace. Attendance 45. *Chairman*: I. J. Ferguson-Lees.

### Field Meetings

SUNDAY, 8TH MARCH, 1959. CLOPHILL AREA. *Leader*: A. J. Dymond. Eleven members attended this meeting in spite of a persistent drizzle all day. The party visited Cainhoe Castle area in the morning and Maulden Wood after lunch. Four badger 'sets' were found at Cainhoe. Interesting birds seen included a flock of between 250 and 300 Greenfinches, Goldcrests, Marsh Tits, Bullfinches and several Fieldfares.

SUNDAY, 12TH APRIL, 1959. GRAVEL PITS AROUND BEDFORD. *Leader*: A. J. Dymond. Meeting with cars in Bedford, twenty-four members visited gravel pits at Barker's Lane, Wyboston, Stanford, Cople, and Willington.

The day started off fine but later turned to drizzle. The interests were mainly ornithological, and among the birds seen were Sand Martins, Little Ringed Plovers, Pochard, Tufted Duck, Great Crested Grebe, Redshanks, two Red-Legged Partridges, Redwings and a flock of fifty-six Golden Plovers.

SUNDAY, 19TH APRIL, 1959. BARTON-PEGSDON. *Leader*: M. Wortley. A party of eighteen attended this meeting for a walk over the Barton Hills, the weather being dull and the light extremely poor. Two young Black-birds were ringed near Barton Hill Farm, and an excellent 'gibbet' was found in Hexton Wood, with a number of Jays, Stoats, Weasels and Grey Squirrels in good condition. The only interesting botanical find was the Pasque Flower, flowering in profusion.

SUNDAY, 26TH APRIL, 1959. ELTISLEY WOOD. *Leader*: B. B. West. Twenty-four members with cars visited Eltisley Wood, the day being fair with slight showers. The main purpose of the visit was to see the Oxlip, *Primula elatior*, but these were just past their best, although still a wonderful picture. The wood is being ruined by the Forestry Commission with the planting of Conifers, so that eventually there will be little chance of seeing this flower as the trees begin to grow. A Grasshopper Warbler was seen and heard, and Newts (Smooth) found plentifully in water-filled ruts.

THURSDAY, 30TH APRIL, 1959. BURDELEYS MANOR FARM, STAGSDEN. *Leader*: D. W. Elliot. The principal reason for this meeting was to hear the evening chorus of birds. Eighteen people were present, and a walk was taken around the farm on a beautiful warm evening. A short burst of the song of the Nightingale was heard. A Robin's and Moorhen's nests were found, both with young.

SUNDAY, 3RD MAY, 1959. FLITWICK MOOR. *Leader*: H. A. S. Key. Seven members assembled at 3.30 a.m. on a very cold morning to hear the dawn chorus of birds. The Skylark was the first to be heard, closely followed by the Sedge Warbler and Moorhen. A tape recording was made of all the song, and the party broke up at about 5.30.

THURSDAY, 7TH MAY. RAVENSDEN WOOD. *Leader*: L. A. Speed. Twenty-three members visited the Ravensden Wood area on a fine warm evening. On the field approaching the wood specimens of the Green-Winged Orchid, *Orchis Morio*, were found. The wild Daffodils in the wood had finished flowering, but many specimens of the Early Purple Orchid were seen. A Moorhen's nest with eggs was also found in a pond near the wood.

SUNDAY, 10TH MAY, 1959. BLACK MOUNTAINS, WALES. *Leader*: H. A. S. Key. Forty-one members in a coach, and four in a car, visited the Black Mountains on a fine hot day, but by the time the destination had been reached showers had developed. It was too early in the year for the most interesting flowers to be seen, but a walk over the mountain was rewarded by the sight of a Buzzard and its nest. Some of the other birds seen: Yellow and Grey Wagtails, Whinchat, Dipper, Redstart, Wheatear, Red Grouse, a Pied Flycatcher and a Raven.

MONDAY, 18TH MAY, 1959. WOOD WALTON FEN AND MONKS WOOD. *Leader*: A. J. Dymond. Meeting with cars at Bedford, thirteen people visited Wood Walton Fen, the day being fine and warm. The party was shown around the Fen by the Warden, Mr. Mason; Orange Tip, Brimstone and Chequered Skipper butterflies were seen. The botanists were interested in the finding of *Viola stagnina* and *Luzula pilosa*. Birds seen were the Nightingale, Blackcap, Woodcock and all the common Warblers. Monks' Wood was visited on the way home, but nothing of great interest was seen.



THURSDAY, 28TH MAY, 1959. WILLINGTON AREA. *Leader*: L. A. Speed. Thirteen people took part in a walk along the river at Willington on a fine warm evening. A Tree Sparrow with young in nest and Swan and nest were found, and a Mallard and Sedge Warbler seen. The Meadow Saxifrage was seen in profusion in a field near the Railway Station.

SUNDAY, 31ST MAY, 1959. BOTANICAL GARDENS, CAMBRIDGE. *Leader*: Miss E. Tattam. The visit proved abortive; when ten members arrived at the Gardens they were not allowed to enter, as the Gardens are closed to the public on Sundays.

SUNDAY, 7TH JUNE, 1959. NORFOLK BROADS. *Leader*: F. G. R. Soper. About thirty people travelling by coach and car visited Surlingham Fen in the morning of a fine warm day. Many Swallowtail Butterflies were seen and one caught and released after examination, but the most interesting find was a Poplar Hornet Clearwing Moth. Cotton Grass and Meadow Rue were seen in profusion, with the Marsh Pea and Marsh Cinquefoil common. A Bittern, Mallards with young and eggs, Willow, Sedge and Reed Warblers, etc. were observed. Rockland Broad was then visited where Snipe, Coot, Mallard and Great Crested Grebe were seen. On the return journey a call was made at Elveden Heath, Suffolk, where five Stone Curlews, a Redstart, Pheasants and Partridges with chicks were noticed.

THURSDAY, 11TH JUNE, 1959. GALLEY HILL. *Leader*: M. Wortley. Only six members attended this meeting, the weather being dull. A Curlew was observed flying at a fair height and a Tree Pipit was also heard and seen near Galley Wood. On returning across Galley Hill a pair of Whinchats was seen. A number of typical Chalk Hill plants were identified.

SUNDAY, 14TH JUNE, 1959. CHARLE WOOD AND WAVENDON HEATH. *Leader*: M. Wortley. Twelve members attended this meeting, the day being perfect, with cloudless sky and a slight wind. The most interesting observation of the ramble was the song flight of the Wood Warbler which performed perfectly, and enabled all to obtain excellent views of this very local bird. The usual feeding notes were also clearly heard. Tree Pipits were both heard in song and observed. A pair of Redstarts breeding in an area of Scots Pine afforded excellent views of both sexes, and a further female was identified later in the afternoon. After a picnic tea the party moved on to Wavendon Heath and a number of interesting botanical finds were made.

SUNDAY, 21ST JUNE, 1959. FORTY-FOOT LANE AND GREAT HAYES WOOD. *Leader*: J. M. Dymond.

Fifteen members met in cars at Sharnbrook Station and drove to the end of the Forty-Foot Lane which is fast becoming overgrown with bushes. The weather was perfect for a walk, being sunny but not too hot. Very little of outstanding interest was noted.

THURSDAY, 2ND JULY, 1959. FELMERSHAM GRAVEL PITS. *Leader*: L. A. Speed. Fifteen members attended this meeting, on a fine warm evening. Four pairs of Great-Crested Grebe some with young were seen, also Mallard and young, Coot and young, a Blackcap and a Kingfisher. The Bladderwort was found to be growing in quite healthy masses; a fine specimen of the Musk Mallow, Gipsywort and a few Pyramidal Orchids were also seen.

SUNDAY, 12TH JULY, 1959. NORTHAMPTONSHIRE BY-WAYS. *Leader*: H. A. S. Key. A convoy of cars started from Bedford and entering Northamptonshire at Wollaston, crossed the River Nene near Doddington and proceeded through Willy, Holcot, Walgrave and out to the woods at Fox Hall for lunch, viewing from a distance the deserted hamlet of Faxton. After a rainy interlude the journey continued *via* Lamport and Cottesbrook

to Naseby and thence to West Haddon with a break at Winwick for tea and a walk along a stretch of the Grand Junction Canal where many interesting aquatic plants were seen in flower. The return trip included visits to Ravensthorpe, Hollowell and Pitsford Reservoirs. Much of the trip was along almost forgotten lanes—several through fields where there was no defined track, and many gates were opened. The party was fortunate to miss a number of storms during the day, but ran into a heavy deluge at Pitsford where a magnificent view of a double rainbow provided some compensation.

SUNDAY, 26TH JULY, 1959. CHARNWOOD FOREST. *Leader*: B. B. West. On a very hot morning the journey by sixteen people was taken through Leicester with a first stop at Groby Pool where a growth of Yellow Limnanth (*Nymphoides*) was in full flower on either side of this beautiful lake. A big granite outcrop in Bradgate Park was then climbed and typical moorland plants seen; later, a visit was made to Swithland Woods and to the site of the old slate quarries—a picturesque area of deep pits and dense birchwood. Later Ulverscroft was visited, considerable interest being derived from a herd of Highland cattle near the Priory ruins.

SUNDAY, 23RD AUGUST, 1959. NEW MOTOR ROAD, BEDFORDSHIRE. *Leader*: H. A. S. Key. Twenty-three members with cars attended this meeting on a fine hot day. The leader was deputising for Mr P. J. Smart. As the authorities had decided it impracticable to give permission for a party of cars to motor along the highway, it was decided to view it from a number of strategic points. A start was made at the bridge near Salford where there is a cutting through the clay, and the party then doubled back through Brogborough in order to study the fossils in the clay workings there, and the leader also fetched material from the Stewartby pits. A cutting through the Greensand was then viewed near Ridgmont, and as the excavations were now covered, a visit was made to the sand pits by the new road near Tingrith to study the typical geological strata. Then on to another cutting, this time through the chalk near Toddington. Maps and diagrams supplied by Mr. Smart were used to illustrate several features. To round off the trip a visit was then made by a now reduced party to a disused and overgrown gravel working near Leighton Buzzard where, despite the time of the year, some interesting plants, typical of the area were still in flower.

SUNDAY, 13TH SEPTEMBER, 1959. PORTLAND BILL. *Leader*: L. A. Speed. A coach load of forty-one people visited Portland Bill on a very hot day. Unfortunately the hot dry summer had dried up all the vegetation and little of botanical interest was seen. Later a visit was made to the Chesil Beach where a Kingfisher was seen over the sea, and fishermen were catching Mackerel with seine nets. Although the day was disappointing from a naturalist's viewpoint, a very enjoyable time was spent 'by the sea'.

SUNDAY, 20TH SEPTEMBER, 1959. TRING AND WILSTONE RESERVOIRS. *Leader*: M. Wortley. Only three members turned up for this meeting which started at Startop's End. Very little was observed in the way of Autumn migration except for Swallows, House Martins, two or three Yellow Wagtails, six or eight Common Sandpipers, one Dunlin, and four Green-shanks. The usual late September birds observed included Teal, Mallard, Tufted Duck, Pochard, Herons and a flock of 250-300 Lapwings. The most interesting find of the day was a Fulmar picked up dead at Wilstone, where it had been seen alive on the previous day by one of the party, apparently in a weak condition.

SUNDAY, 11TH OCTOBER, 1959. FOLLY WOOD. *Leader*: D. Reid. This was the annual Fungus Foray. A report appears elsewhere in this Journal.

SUNDAY, 25TH OCTOBER, 1959. CLOPHILL - ROWNEY WARREN. *Leader*: M. Wortley. Fifteen members attended this meeting under an almost cloudless sky, but with a strong wind blowing. A route was taken through Warren Wood and along the river, but which revealed little of interest. The party then pushed up to Pedley Wood and into Chicksands Wood. A halt for dinner was made here in a clearing. After dinner the party moved on to Rowney Warren which also proved to be rather disappointing.

## Botanical Section

A wide range of botanical habitats was again provided in this year's Summer Programme, which, coupled with the exceptionally fine weather, enabled the Section to record a very large list of species for the season. The number of members who were interested in the botanical aspect of the general meetings showed once again, that whilst the Section is not strong enough to run independent meetings, the botanical side of the Society's activities is very much alive and enthusiasm well maintained. With the increase in meetings outside the county in the last few years, the Section has been able to see and record a considerable number of species which are not found in our county, and also to note, sometimes in abundance, species which are rare in Bedfordshire.

This season, despite the varied programme, we were only able to add two new species to our records; these were the Bird Cherry (*Prunus padus*) and the Heath Lousewort (*Pedicularis sylvatica*), which were both recorded from the coach trip on Sunday, May 10th, to the Black Mountains in Wales. This, our first visit to a mountain habitat, was from the botanical point of view too early in the year to find any of the main mountain flora, but the locality was extremely interesting, and I am certain that a further visit next year in late June or early July would be well repaid.

The coach trip on Sunday, June 7th, to Surlingham Fen in the Norfolk Broads, provided us with a good list of species, the most interesting being the Marsh Pea (*Lathyrus palustris*), Marsh Cinquefoil (*Potentilla palustris*), Early Marsh Orchid (*Orchis latifolia*), Red Rattle (*Pedicularis palustris*), Large Meadow Rue (*Thalictrum flavum*), Guelder Rose (*Viburnum opulus*), and Cotton Grass (*Eriophorum polystachion*).

The Annual Botanical Exhibition was held the following evening, Monday, June 8th, in the Nature Room, 4 The Avenue, Bedford. Nineteen members attended the exhibition, and forty-eight species were on display, most of which were from the previous day's excursion to the Broads.

Another meeting which provided us with good botanical interest was at Tuddenham Heath and district on Sunday, June 28th; here we were able to see and record many of the smaller species to be found on heathland, and the day proved very successful, the two most important 'finds' being the rare Spanish Catchfly (*Silene otites*) and the Sickie Medick (*Medicago falcata*).

Of the remaining meetings, nothing of special note was recorded, but on the meeting to Charnwood Forest, Sunday, July 26th, a very fine display of the Fringed Water Lily (*Limnanthemum nymphaeoides*) was seen in a small lake near Groby, and is worth mention.

W. DURANT.

## Ornithological Section

This year's activities got under way at an indoor meeting attended by forty-one members, in Bedford at the beginning of March, at which it was decided to launch a Bedfordshire Bird Bulletin. During the course of the year four numbers appeared, the production of which was very much a co-operative effort. It is hoped in future to extend the Bulletin to cover all aspects of Natural History. More members are requested to submit records.

There were several events of particular interest to the Ornithologist in 1959, the first being the spectacular passage of Black Terns in May which reached a peak on the 24th when forty-one birds were seen in the county. Black-headed Gulls again had a successful breeding season with approximately 120 pairs at Stewartby, the main gullery.

Possibly the most interesting ornithological event was the enormous passage of waders in the late summer. This was especially noticeable at Bedford Sewage Farm where as many as twenty-two Green Sandpipers were seen at one time. At least three Wood Sandpipers appeared in the county.

The large Thrush movements in early October which occurred throughout Britain were observed in Bedfordshire. The resulting records of Ring Ouzels were especially noteworthy.

Local field meetings during the summer months were well attended and the three coach trips proved well worthwhile for the ornithologist. In the Black Mountains we saw such typical birds as Buzzard, Black Grouse, Pied Flycatcher and Wood Warbler. At the Norfolk Broads there were several Grasshopper Warblers and a Bittern, and at Portland, Kittiwakes, Gannets, Guillemots and Razorbills.

Mr D. I. M. Wallace, the Editor of the *London Bird Report*, kindly came to Bedford in December and gave us a very entertaining and stimulating talk on the "Fundamentals of Bird Identification".

Several members have helped in the Wildfowl counts and in the surveys organised by the British Trust for Ornithology. These surveys will be repeated in the coming year and one or two new ones started, so assistance from interested members will be most welcome.

ANTHONY DYMOND.

## The Fungus Foray

The fungus foray was held on the 11th of October at Folly Wood, near Flitwick, and was led by Mr D. A. Reid. About thirty members of the Society were present.

The choice of Folly Wood for the foray this year was a particularly happy one in view of the exceptionally hot, dry summer. In fact had we visited any ordinary woodland it is highly probable that we should have been forced to collect microfungi since agarics were completely lacking in most areas.

Folly Wood is perhaps best described as a Birch-Alder swamp and as such is a rather unusual habitat for the county. For this reason it is not surprising to find that the list of fungi collected includes some unfamiliar species, several of which are typical inhabitants of sphagnum bogs or peaty places (e.g. *Naucoria myosotis*, *Psilocybe elongata*) while

others are commonly associated with Alder (*Naucoria subconspersa*, *Polyporus radiatus*).

Perhaps the most striking aspect of the foray was the abundance of *Paxillus involutus* and *Lactarius rufus*, both of which reached a very large size, in the sphagnum beneath the young birch trees. The occurrence of the latter species in this habitat is quite remarkable as it is normally found in rather dry situations under conifers. Since there were no conifers within miles and since I am informed that no conifers have grown in the area for generations any such connection in this instance is out of the question. Two other fungi, *Pluteus cervinus* and *Boletus parasiticus*, attracted considerable attention, although for quite different reasons. In the first case the attraction was purely gastronomic, although the specimens, which were growing in abundance on sawdust, were exceptionally well developed. In the second, interest was of a more scientific nature for *Boletus parasiticus* is parasitic on the 'earth-ball'—*Scleroderma vulgare* and this was the first time many members had seen it.

Few of the fungi collected could be called rare in so far as the country as a whole is concerned, but *Poria metamorphosa* would, I think, be classed in this category. The gathering was in very good condition and is undoubtedly quite the best and most luxuriant British material found to date, due possibly to its having developed beneath the bark of an old birch stump, where it was no doubt protected from desiccation. The fungus is worthy of mention from another aspect, and that is its production of a bright orange, or rusty-brown conidial state which was well seen in the Folly Wood specimen. Production of such a conspicuous imperfect conidial state among the polypores would seem to be very rare. The finding of *Peniophora eichleriana* is of great interest since it is a new record for Britain, although one has to admit that it is very close to the common *P. cremea*. However, by far the most exciting find was that of a dark purple-brown *Laccaria* sp. which is nearest to *L. proxima*. This fungus seems to be undescribed, although it is just possible that it is an American species. A further account of this collection will be published eventually in the *Trans. Brit. Mycol. Soc.*

Altogether 61 species were collected, of which 17 were new to the county, and one of these new to Britain.

*Amanita muscaria* (L.) Fr.; *A. rubescens* (Pers.) Fr.; *Armillaria mellea* (Vahl.) Fr.; *Clitocybe aurantiaca* (Wulf.) Studer; *Collybia maculata* (Alb. & Schw.) Fr.; *Coprinus plicatilis* (Curt.) Fr.; *Crepidotus variabilis* (Pers.) Fr.; *Entoloma sericeum* (Bull.) Fr.; *Hypholoma fasciculare* (Huds.) Fr.; *H. hydrophilum* (Bull.) Fr.; *Laccaria laccata* (Scop.) Cooke; *Laccaria* sp.; *Lactarius helvus* Fr.; *L. plumbeus* Fr.; *L. rufus* (Scop.) Fr.; *L. tabidus* Fr.; *L. vietus* Fr.; *Mycena galericulata* (Scop.) Fr.; *M. pura* (Pers.) Fr.; *M. speirea* Fr.; *Naucoria myosotis* Fr.; *N. subconspersa* Kühn.; *Paxillus involutus* (Batsch.) Fr.; *Pholiota mutabilis* (Schaeff.) Fr.; *P. spec-tabilis* Fr.; *Pluteus cervinus* (Schaeff.) Fr.; *Psilocybe elongata* Fr.; *P. subericaea* Fr.; *Russula fragilis* Fr.; *R. ochroleuca* Fr.; *Tricholoma fulvum* (DC.) Fr.

\**Boletus parasiticus* (Bull.) Fr.; *B. scaber* (Bull.) Krombh.

*Ganoderma applanatum* (Pers.) Pat.; *Lenzites betulina* (L.) Fr.; *Merulius tremellosus* (Schrad.) Fr.; *Polyporus betulinus* (Bull.) Fr.; *P. fragilis* Fr.; *P. radiatus* (Sow.) Fr.; *Polystictus versicolor* (L. ex Fr.) Fr.; *Poria metamorphosa* Fuckel; *P. sanguinolenta* (A. & S. ex Fr.) Sacc.; *Trametes confragosa* (Bolt.) Jörsst.

\**Mucronella aggregata* Fr.

\**Pellicularia subcoronata* (v. H. & L.) Rog.; †*Peniophora eichleriana* (Bres.) Bourd. & Galz.; *Stereum hirsutum* (Willd.) Fr.; *S. purpureum* (Pers.) Fr.; *S. rugosum* (Pers.) Fr.; *Thelephora terrestris* (Ehrh.) Fr.

*Scleroderma vulgare* (Horn.) Fr.

\**Tremella foliacea* (Pers.) Fr.

*Auricularia auricula-judae* Schroet.

\**Puccinia coronata* Corda [II & III]; \**P. magnusiana* Körn [III].

*Coryne sarcoides* (Jacq. ex Fr.) Tul.

*Claviceps purpurea* (Fr.) Tul.; *Daldinia concentrica* (Bolt. ex. Fr.) Ces. & de Not. [on birch]; *Xylaria hypoxylon* (L. ex. Fr.) Grev.

\**Epicoccum purpurascens* Ehrenb. ex Wallr.; \**Septoria arundinacea* Sacc.

DEREK A. REID.

\* New county record.

† New British record.

## Annual General Meeting 1960

The 13th Annual General Meeting was held in the Nature Room of the Training College, The Avenue, Bedford, on Thursday, 25th February, 1960. Mr F. G. R. Soper was in the chair and the attendance was fifty-four.

The proceedings opened with the reading of the minutes of the previous A.G.M. by the Hon. General Secretary, which were adopted and signed. Mr Key then presented the Report of the Council for 1959 which showed the conclusion of another successful year, with a slight increase in membership. As a result of the commendable efforts of the Luton members of the Council to publicise the Society in the south there had been a noticeable improvement in the attendance at lectures there. As the result of a special meeting to which both the Councils of the North and South Bedfordshire Preservation Societies had been invited, a start had been made to form a Naturalists Trust for our own County in conjunction with Huntingdonshire. The Report was unanimously adopted.

Mr J. M. Dymond as Hon. Treasurer then presented a very satisfactory report for the past year which showed a slight fall in assets due to costs incurred in printing stocks of stationery and advertising the Society at Luton. This latter item was considered unanimously to be well worth while. The fact that the expenditure during the year (including the cost of publishing the Journal) had exceeded the income from membership subscriptions was a point that needed to be watched in the future. A vote of thanks was passed to Mr Dymond and to the Hon. Auditor, Mr E. Lucas, for their valued services.

Mr A. W. Guppy regretted to report that, so far, he had received no material for the next issue of the Journal, and issued a warning that the closing date would be 31st March. Miss E. Proctor gave interesting details of the development of the Library, and the Hon. Programme Secretary, Mr L. A. Speed, spoke of the keener interest that had been shown in both indoor meetings and field excursions. These officers were suitably thanked from the Chair and the remarks were endorsed by applause from the audience.

As Ornithological Secretary Mr A. J. Dymond presented a record of continuing activity among the bird-watchers, whose efforts have been aided by remarkably fine weather during the summer. A noteworthy feature of the Section's activities had been the inauguration of the Bird Bulletin, the scope of which it was hoped to increase by the inclusion of material

in other branches of natural history. He announced with regret that he would probably be leaving the county in the near future and had approached Mr Michael Wortley who had consented to succeed him in this office. The appointment was approved and Mr Dymond was thanked for his untiring efforts. Mr Durant as Botanical Secretary was similarly acknowledged for his report which outlined the field activities of the members in this Section.

The election of officers came next, and by unanimous decision these were all re-elected, including the President, Dr J. G. Dony. Mr Key announced that this would be his final year in office as Hon. General Secretary, due to business commitments, and suggested the appointment of an Assistant Secretary who would take over at the next A.G.M.

Ten nominations having been received to fill a like number of seats on the Council the following were duly elected without dissent: Miss G. M. Tattam and Messrs W. Durant, C. L. Lamb, I. J. Ferguson-Lees, E. Meadows, S. W. Rodell, R. G. Stephenson, B. B. West, K. E. West and M. D. Wortley.

The business of the meeting now being concluded, the audience listened to an address by the President on 'Nature Conservation in Bedfordshire'. Dr Dony traced the events which led to the formation of the Society in the autumn of 1946 through the individual activities of several people, and then went on in some detail to explain further what was meant by Nature Conservation, showed how the problems were related to Bedfordshire, described the areas in the county that had been scheduled in the several categories, explained what had been achieved so far, and finally spoke on plans for the future.

A vote of thanks to the speaker from the Chair was endorsed with a round of applause from the body of the hall.

## **Starling Roosts observed from a Radar site in South Bedfordshire**

BY W. G. HARPER

I described in the 1958 Bedfordshire Naturalist the evidence which radar can provide of the migration movements of birds. Radar has revealed the great intensity of nocturnal migration, and the surprising heights at which some of these movements take place. Some quite different types of echo on radar displays are now known to be caused by birds, and I want to describe some effects that are associated with Starling roosts.

There is of course a substantial 'fully-resident' population of Starlings, and summer roosts form from May and June onwards. Added to this is a tremendous wintering immigration from the countries bordering the Baltic, and from Russia. Having spent the winter in our milder climate they depart again mostly in March, making direct eastward flights across the North Sea. Some of their winter roosts are known to consist of more than a million birds.

H. A. S. Key in the 1956 Bedfordshire Naturalist has given a

good description of their evening assemblies and massed movements into the roost. These can give strong echoes on a well-sited radar, but they are not very distinctive.

In contrast very striking echoes are recorded when Starlings leave their roosts at dawn. They are seen as a succession of rapidly expanding rings or arcs of echo. It seems probable that the origins of this remarkable behaviour lie in their roosting habits. They commonly roost closely packed in dense thickets or conifer plantations, often from the tops of the trees down to the lowest branches. As the time approaches for them to leave the roost there is increasing commotion and chattering. Then quite suddenly all those in the tops of the trees that have room to do so take wing. There is no circling in the air as with Rooks or Jackdaws, but immediate and purposeful flight away from the roost. There is further commotion in the roost as all the birds lower down in the trees scramble upwards, and then a second wave takes off. More scrambling, and a third wave leaves. There may be only two or three waves or as many as a dozen, depending on the size of the roost and the density of the roosting thicket. Some of the waves seem reluctant to leave, but usually there are intervals of only two or three minutes between them.

The rings and arcs of echo on the radar display expand in a surprisingly uniform way. This is because the birds all fly at closely the same speed, and, perhaps more surprisingly, that they fly straight out from the roost for mile after mile to their feeding grounds. From some roosts only limited directions are taken, so that incomplete arcs spread out, but from others there seem to be Starlings leaving in practically every direction, and then almost complete rings are seen. A drawing of the pattern at a single instant in time cannot give an impression of movement of the expanding rings. It takes a speeded-up film of the radar display to show to best advantage this quite remarkable flight behaviour. The rings then expand just like ripples on a pool.

The radars which have been operated by the Meteorological Office at East Hill, a mile north-east of Houghton Regis in South Bedfordshire have, at various times between 1957 and 1959, recorded expanding ring echoes from seven different roosting sites within a radius of fifteen miles. All the ring echoes recorded were found to be linked with specific Starling roosts, and so far as is known no other British bird behaves in this way. Fig. 1 is a drawing made from a photograph of the radar display. It shows rings from two summer roosts of Starlings. This was at 05.50 B.S.T. on 8th August, 1959, fifteen minutes after sunrise. The hatched area around the radar consists of strong permanent echoes from hills, trees, and buildings, and it is impossible to trace ring echoes through them. The rings were expanding at about 40 m.p.h., which is a typical still-air flight speed for Starlings.



It seems worth while recording what I have learnt about the individual roosts even though it has not always been possible to cross-check some of the information I have gleaned in my sporadic searches for them. It is sometimes surprisingly difficult to get reliable information. People living within a quarter of a mile of a large Starling roost can be unaware of its existence! The list may not be complete. Some roosts may have been hidden from the radar by intervening hills, because in their flights to their feeding grounds the birds do not climb to any great height. From

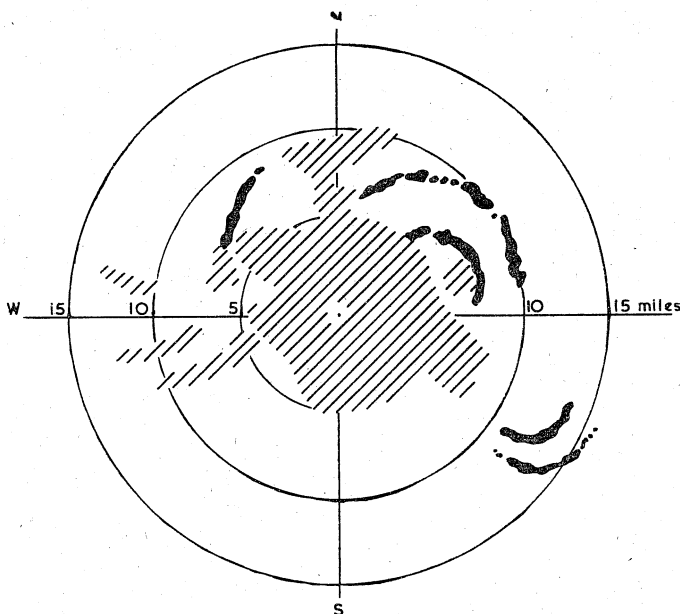
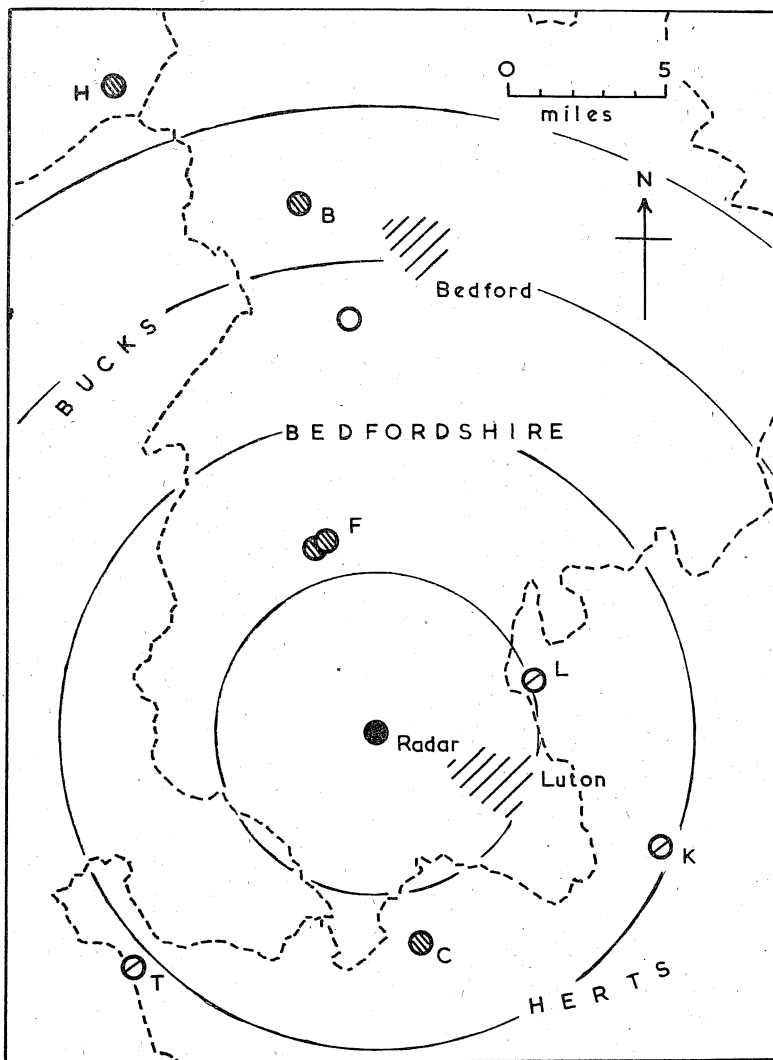


FIGURE 1

Expanding ring echoes from two summer roosts of Starlings, seen at 05.50 B.S.T. on 8th August, 1959.

my limited observations 70 to 100 feet would be a good average. The hills most affecting the radar are the Chilterns to the south. If any members of the Society can supplement or correct the notes that follow, I shall be grateful if they would send details to Mr H. A. S. Key (Hon. General Secretary) who is especially interested in Starling roosts.

I have not limited my notes to the purely Bedfordshire roosts since Starlings are no respecters of county boundaries. They are known to fly distances of up to thirty miles from feeding grounds to their roosts where suitable roosting sites are scarce, and indeed many of the Starlings that feed in Bedfordshire seem to prefer to roost outside it. Grid references are given for each roost.



WINTER ROOSTS   
  SUMMER ROOSTS  
 UNIDENTIFIED

FIGURE 2

Starling roosts mentioned in the text which have been located from radar records.

## BALLINGDON BOTTOM, CHEVERELL'S GREEN, HERTFORDSHIRE.

TL 052141 (C on Fig. 2).

Starling movements from this roost are normally hidden from the radar by the Chiltern Hills, but rings have occasionally been seen, usually when there was a considerable depth of fog. On one occasion studied in detail the radar showed that the Starlings flew away from the roost climbing steadily through dense fog for between four and five miles before breaking clear of the top of the fog some 700 feet above the ground. The roost was in a wood of conifers, and was occupied in the winters of 1956/7 and 1957/8, but was abandoned in early February, 1958, and has not been used by Starlings in the last two winters, though the south-western end of the wood, which is mixed woodland, is still a Rook and Jackdaw roost. J.F.H. had recorded in January, 1958, that flight lines over Luton were south-west towards Cheverell's Green, but on 3rd February some were flying SSW and some WNW, while on 17th and 21st all the parties of Starlings seen were flying north-west. A visit to Cheverell's Green on 15th February had in fact shown that it was abandoned. Since then winter flight lines over Cheverell's Green have been northwards towards the Flitwick roosts, thirteen miles distant.

## FLITWICK PLANTATION, BEDFORDSHIRE.

TL 005345 (F on Fig. 2).

Exceptionally well-formed arcs of echo from Starlings leaving on migration on 5th March, 1958, revealed a new roost, and it was located a few days later in a conifer wood at Flitwick Plantation. A keeper who lives on the edge of the wood confirmed that the Starlings had only come there in early February. Evening assemblies were seen close to the village of Steppingley, half a mile north-east of the roosting wood. Starlings wintered there the next year, but came for only two or three days in the late autumn of 1959. Since meanwhile the new London-Yorkshire Motorway had been built right past the plantation the possibility that disturbance by heavy passing traffic was the cause naturally suggested itself; but in fact the roost had moved only a short distance to Kinghoe Wood on the other side of the motorway, and just as close to it.

## NEW FOREST (KINGHOE WOOD), FLITWICK, BEDFORDSHIRE.

TL 001338 (almost coincident with F on Fig. 2).

This is now a large winter roost, drawing birds from quite distant feeding grounds. J.F.H. has observed north-west flight lines over Luton in January undoubtedly to this roost. Assemblies take place in trees and open fields half a mile to the north-west of the roost, but I am told that many flocks fly straight into the roost without joining the assembly. The roost is in a large conifer plantation.

## HORN WOOD, BOZEAT, NORTHAMPTONSHIRE.

SP 898577 (H on Fig. 2).

It may be remembered that Mr H. A. S. Key took a party of members of the Society to see this very big roost on 23rd February, 1958. Despite its distance from the radar, some twenty-two miles, migration departures of Starlings from it were seen on 5th March, 1958. It was in a very large conifer plantation, and has been used as a winter roost for many years. Even a cautious estimate was that it numbered some hundreds of thousands of birds. It probably draws birds from most of North Bedfordshire, and, before February, 1958, when the Flitwick roost formed, almost certainly did so from parts of South Bedfordshire as well. Evidence of this is that on 11th January, 1958, flight lines of Starlings over Woburn, four miles west of the Flitwick roost, were NNW towards Horn Wood (J.F.H.).

## BOWELLS WOOD, BROMHAM, BEDFORD.

TL 002513 (B on Fig. 2).

I learn from Mr A. W. Guppy of Bromham that a new winter roost developed in the late autumn of 1959 in Bowells Wood. It is a substantial one, but does not compare in size with that at Horn Wood. No ring echoes have been seen from it because the East Hill radar station closed down in the autumn of 1959.

## LAUREL THICKET, LILLEY, HERTFORDSHIRE.

TL 108273 (L on Fig. 2).

This has been a summer roosting place for Starlings for a number of years. It was in a densely overgrown laurel thicket, four acres in extent, which has been cut down and replanted in this past winter, and will be unsuitable as a roost for at least some years. Regular flight lines to it were seen over Luton in the summer of 1959, and in July of that year it was estimated to contain about 30,000 birds. The more northerly ring echoes in Fig. 1 are from this roost. Movements south-westward over Luton are masked by the permanent echoes, but to the north-west an arc from this roost is seen moving out over Woburn, and it could be traced as far as the Buckinghamshire border. It is reasonable to think that most of the summer-resident Starlings from South Bedfordshire were roosting there.

## PARK WOOD, KIMPTON, HERTFORDSHIRE.

TL 173189 (K in Fig. 2).

Although only six miles SSE of the roost at Lilley, Park Wood was also a summer Starling roost in 1959. It seemed to contain roughly as many birds as Lilley when we visited it on 12th September. They collected on open fields a mile to the north and north-west, and moved into the roost in a steady stream lasting for five

to six minutes. I do not think 30,000 is an overestimate at that time. Their departures are probably not quite as restricted to southerly movements as Fig. 1 appears to show, because the arcs are being seen through the Lea Valley gap in the Chiltern Hills. It is doubtful however if many Starlings from South Bedfordshire roost there, as no flight lines from it have been seen over the Luton area.

#### TRING RESERVOIRS, HERTFORDSHIRE.

SP 907127 (T in Fig. 2).

Expanding rings were seen at four different positions on the radar display on the morning of 12th September, 1959. Three of them were occurring simultaneously at 06.15 B.S.T., fifteen minutes before sunrise. The rings were from Kimpton, from Lilley, from a point near Kempston (see later), and from Tring Reservoirs. The reed beds at the southern corner of Wilstone Reservoir were known to be a summer Starling roost, and this is in excellent agreement with the rings seen. Incidentally it is worth drawing attention to the times of departure from the roosts in relation to sunrise. On 8th August the movements were well under weigh only by fifteen minutes after sunrise, but on 12th September they were well away fifteen minutes before sunrise, and the first wave had by this time reached Woburn, roughly a fifteen minute flight. This substantial difference could not be explained by the weather because if anything the fog on 12th September (see next para.) might have kept them in roost until later. The explanation may be that in the longer summer days they do not need the whole day length for feeding, and stay in the roost longer.

#### UNIDENTIFIED RINGS NEAR KEMPSTON, BEDFORD.

The unlettered site on Fig. 2.

Ring echoes from a point about a mile south-west of Kempston were also seen on 12th September, 1959. This is the only exception to my claim that all ring-echo sites had been identified as Starling roosts. Mr H. A. S. Key tells me that there is no wood or reed bed suitable for a Starling roost within a mile of the probable centre of the rings. It may be relevant that at Cardington, only four miles to the east of Kempston, which is equally low-lying in the Ouse Valley, the Meteorological Office reported thick fog. Further, the Kempston sewage farm, which would be just right as a centre for the rings, is a haunt of great numbers of Starlings by day. Perhaps Starlings roosted there in emergency when fog prevented them from finding their usual roost.

I have been able to give notes of five winter roosts, three summer roosts, and one unidentified site of ring echoes, but not more than three of the winter roosts have been in use at any one time. In addition, ring echoes were recorded on 5th March, 1958, from a

centre fifteen miles WNW of East Hill. A Starling roost was located at Narbury Wood, Little Horwood, Buckinghamshire (SP 801311), very close to the site of the rings, but I have no evidence that it was ever in regular use. It is strange that three of the roosts, those at Horn Wood, Lilley, and Cheverell's Green, are not more than a mile from the Bedfordshire county boundary, but all are outside it.

I should like to acknowledge the great help given me by my wife, and by my sons J. F. Harper and G. H. Harper, in searching for these roosts. I am glad that they have shared my enthusiasm in watching the remarkable aerial manoeuvres of these birds. I am also grateful for permission from the Director-General of the Meteorological Office to make use of the radar records.

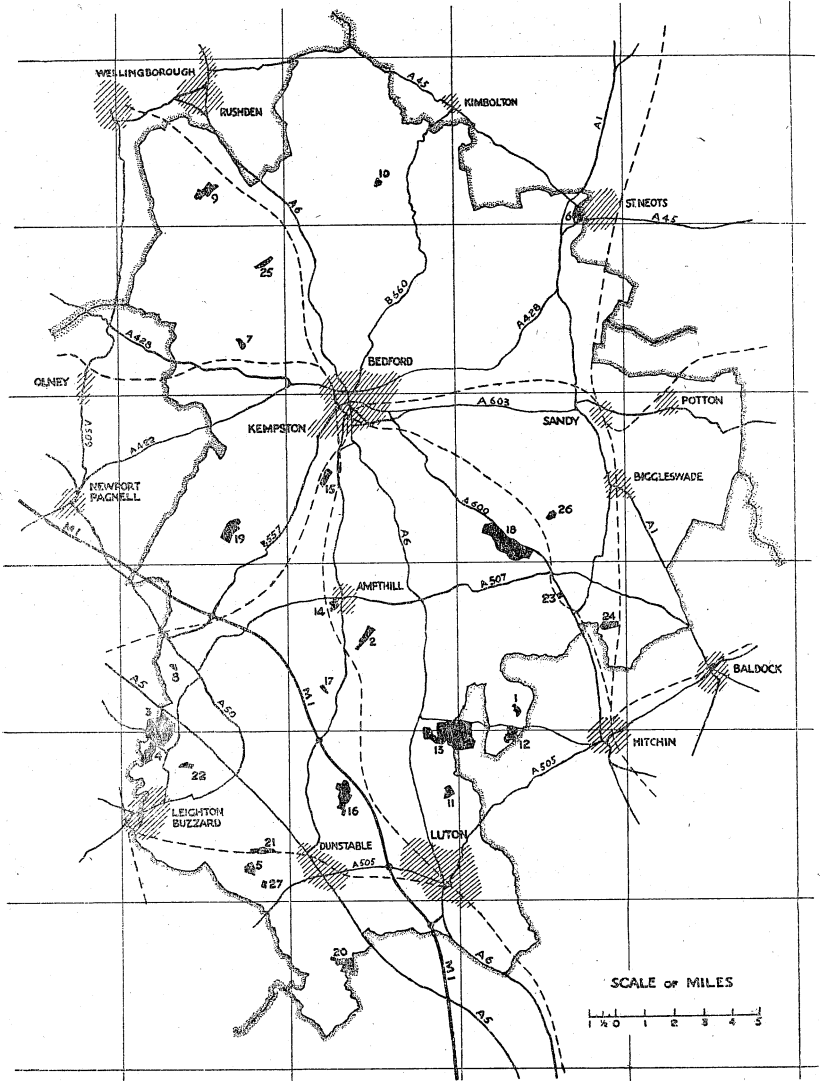
## Nature Conservation in Bedfordshire

BY J. G. DONY

During the Second War it was realised that the post-war years would bring an urgent problem in the assignment of land in Britain to its best use and various committees were set up to enquire into this question. Nature conservation was but one of the matters so investigated.

The Bedfordshire Natural History Society was formed in October, 1946, and nature conservation was one of the first problems to which it turned its attention. There was already in being an investigation committee of Bedfordshire and Northamptonshire naturalists.

In 1949 the National Parks and Access to the Countryside Act was passed and the Nature Conservancy was formed. The Act provided for the setting up of National Nature Reserves to be owned by or leased to the Nature Conservancy, or alternatively to be still in private possession but with management agreements made with the Conservancy. Provision was also made for Local Nature Reserves the administration of which would be in the hands of local government authorities. Section 23 of the Act made provision for Sites of Scientific Interest. Local authorities were to be notified of these by the Nature Conservancy and they were to notify the owners and should planning application be made to develop the site they were to notify the Conservancy. Development within the meaning of the Act was the change of use of the land, e.g. from agricultural land to a housing site or a quarry. It would not be necessary to notify the ploughing of heath or downland, the drainage of a marsh, the conversion of pasture to woodland, or the felling of deciduous woodland and replanting with conifers.



In the first instance there were no recommendations of sites as National Nature Reserves in Bedfordshire but the Conservation Committee of the Bedfordshire Natural History Society had considered 86 sites of varying degrees of interest and finally submitted 24 for consideration by the Nature Conservancy. Most of these sites were accepted and subsequently scheduled as Sites of Scientific Interest. We worked on the principle that we would recommend sites which were rich and varied in their native flora as we thought that it would follow that the insect life in these would be correspondingly rich and that they would provide good nesting places for native birds. Of the sites scheduled only Kempston Hardwick Pits, of interest as a resting place of birds of passage, was not in this category.

The following are the sites which were finally scheduled in 1950 with the brief reasons why they were recommended. A number were the subject of floristic studies described in the *Flora of Bedfordshire* and these are noted. The name of the parish is added in brackets if it is not contained in the name of the site.

1. KNOCKING HOE (Shillington), Grid Ref. 52/1330, area 20 acres. The chalk downland flora here is unique (Beds. Flora: Hab. Study 59). We consider this to be of prime importance and had the satisfaction of seeing it become a declared National Nature Reserve in 1958.

2. FLITWICK MOOR (Flitwick and Flitton), Grid Ref. 52/0435, area 139 acres. This is the largest remaining relic of the marsh and fen which was once a feature of the middle of the county (Beds. Flora: Hab. Studies 38, 39, 40). This is accepted among us of little less importance than Knocking Hoe but it has a number of owners which will make reservation difficult.

3. RAMMAMERE HEATH AND KING'S WOOD (Heath and Reach), Grid Ref. 42/9330, area 290 acres. This adjoins a site in Buckinghamshire also scheduled. King's Wood which is on varied soils is our largest wood and has a fauna no less interesting than its flora (Beds. Flora: Hab. Studies 23, 30).

4. BAKER'S WOOD AND RUSHMERE HEATH (Heath and Reach), Grid Ref. 42/9230, area 162 acres. This is very similar in its fauna to the above (Beds. Flora: Hab. Study 22). A timber yard and saw mill were erected on part of Rushmere Heath in 1952.

5. TOTTERNHOE KNOLLS, Grid Ref. 42/9822, area 38 acres. This is the site of a medieval castle and is also scheduled as an Ancient Monument. It has a rich flora and is in sharp contrast with Knocking Hoe (Beds. Flora: Hab. Study 62).

6. EATON SOCON MEADOWS, Grid Ref. 52/1860, area 28 acres. These are probably the finest water meadows in Eastern England



and in consequence have a particularly rich flora (Beds. Flora : Hab. Study 14). A boat house was erected on part of the site in 1959.

7. STEVINGTON MARSHES, Grid Ref. 42/9855, area 2 acres. This small area is the only marshy one known in the county in association with the Oolitic Limestone and its fauna and flora are undoubtedly unique in this part of England (Beds. Flora : Hab. Study 10).

8. WAVENDON HEATH PONDS (Aspley Guise), Grid Ref. 42/9334, area 3 acres. These comprise three ponds, artificial in origin, but show interesting stages in succession to sphagnum bog (Beds. Flora : Hab. Study 35).

9. GREAT HAYES WOOD (Podington), Grid Ref. 42/9661, area 67 acres. This is a good example of a Boulder-Clay wood overlying Oolitic Limestone. There are many similar woods in the area and this was chosen as its flora presented unusual problems (Beds. Flora : Habitat Study 3).

10. KEYSOE PARK WOOD (Keysoe and Bolnhurst), Grid Ref. 52/0562, area about 50 acres. This is typical of a number of Boulder-Clay woods overlying the Oxford Clay and was scheduled as such and also because it is a breeding site of the Black Hair-streak.

11. GALLEY HILL (Streatley), Grid Ref. 52/0927, area 43 acres. This is probably our most interesting hill on the Middle Chalk and of added interest because of a clay pocket on its summit (Beds. Flora : Hab. Study 66).

12. DEACON HILL (Shillington), Grid Ref. 52/1230, area 49 acres. An interesting hill on the Middle Chalk the natural history of which has probably not been fully studied. Much of the hill has been ploughed in recent years but the steeper slopes remain.

13. BARTON HILLS, Grid Ref. 52/0930, area 119 acres. This is a varied area including rough downland, more or less disturbed soil, consisting of glacial gravel overlying chalk, and our largest beech wood (Leete Wood). Scrub, which was rapidly invading the hill, has been cleared and grazing brought back. Parts of the hill have been ploughed and will be brought back to pasture. The area should remain of interest to naturalists for many more years (Beds. Flora : Hab. Studies 60, 68, 69).

14. COOPER'S HILL (Amphill), Grid Ref. 52/0338, area 55 acres. Much of this was once coniferous woodland which was cleared before 1920 and reverted quickly to heath. Part of the site is an interesting marshy area (Beds. Flora : Hab. Studies 24, 43). The most northerly portion of the site was ploughed in 1960.

15. KEMPSTON HARDWICK PIT (Stewartby), Grid Ref. 52/0345, area ? acres. This is a disused brickpit and was scheduled mainly for ornithological reasons.

16. FANCOTT WOODS AND MEADOWS (Toddington), Grid Ref. 52/0328, area about 100 acres. This was scheduled mainly because of the original research work done there on insects by B. R. Laurence. It still retains its interest but may shortly be badly affected by the effluent of a new sewage works.

The sites listed above have suffered little during the past ten years but others scheduled have been less fortunate.

17. WESTONING MOOR (Tingrith), Grid Ref. 52/0232, area 10 acres. This small area resembles Flitwick Moor very closely. In the past two years it has been badly affected by drainage and has now lost most of its interest (Beds. Flora : Hab. Study 41).

18. ROWNEY WARREN (Southill), Grid Ref. 52/1240, area 225 acres. When scheduled this consisted of mixed woodland with considerable clearings (Beds. Flora : Hab. Study 27). It has since been handed over to the Forestry Commission and planted with conifers but at our request a small portion was left unplanted.

19. MARSTON THRIFT (Marston Mortaine), Grid Ref. 52/9741, area 138 acres. This was one of the more interesting woods in the west of the county (Beds. Flora : Hab. Study 19) but has now been clear felled and will soon be planted, mainly with conifers.

20. OLDHILL AND DEADMANSEY WOODS (Whipsnade), Grid Ref. 51/0317, area 151 acres. These were two of our more interesting woods on the Clay-with-Flints (Beds. Flora : Hab. Studies 79, 80). Oldhill Wood has now become a housing estate and Deadmansey Wood is being re-planted.

21. COW COMMON (Totternhoe), Grid Ref. 42/9823, area 38 acres. This was the most interesting marshy area on the Chalk Marl (Beds. Flora : Hab. Study 56). It has now been drained and ploughed and all its interest is lost.

In addition to the above area of main concern to us as naturalists three areas of geological importance were scheduled.

22. MONDAY'S HILL PIT (Grid Ref. 42/9428). An exposure of clay overlying sands. The clay contains unique fossils.

23. MEPPERSHALL HOO PIT (Grid Ref. 52/1638). A section showing gravels contorted by ice action.

24. ARLESEY BRICK PITS (Grid Ref. 52/1835). A pit still being worked with chalk overlying clays.

The experience of ten years has shown that Section 23 of the National Parks and Access to the Countryside Act gives little security to a Site of Scientific Interest but it must be stressed that almost all of the sites chosen in Bedfordshire were in danger of development. The sites are now to be revised and there seems no purpose in retaining Cow Common and Oldhill and Deadmansey Woods on the list. The Conservation Committee of the Society has asked that the following be added to take their place :

25. FELMERSHAM GRAVEL PITS (Sharnbrook), Grid Ref. 42/9958, area 51 acres. These are the best of the flooded pits in association with the Ouse in the west of the county and provide a nesting site for many birds as well as a resting place for birds of passage. An interesting flora has already been established (Beds. Flora: Hab. Study 11).

26. SOUTHILL LAKE AND NEIGHBOURING WOODLAND, Grid Ref. 52/145427, area about 10 acres. The main interest here is ornithological but the remaining fauna and the flora demand closer study.

27. MEADOW, TOTTERNHOE, Grid Ref. 42/986214, area 3 acres. This is almost the only remaining marsh on the Chalk Marl.

The newly-formed Bedfordshire Naturalists Trust may be a better body than we have been to watch these sites. Eventually the only complete safeguard will be ownership, and the Trust will be in a better position than we are to own property. Public ownership has more virtues than private ownership, even by a Trust, and the Trust will no doubt work with this also in mind. Flitwick Moor remains with us our highest priority and we are confident that the Trust will move to secure its own or public control of this. Other sites, such as Totternhoe Knolls, may well soon be in public ownership and we look forward here to Local Nature Reserves.

## Report of Recorders

### FLOWERING PLANTS

Few records have reached me this year. Among the more interesting are Pale Sedge (*Carex pallescens* L.), from Odell Great Wood, representing a considerable extension of range, and Fly Orchid (*Ophrys insectifera* L.) from Brown's Wood, Oakley, both by Mr Marriott. The examination of the herbarium of L. W. Adams, who has now left the county for Australia, has revealed the record of Hairy Crowfoot (*Ranunculus sardous* Crantz), from Swineshead in 1958. J. M. Dymond has sent in records of Wild Columbine (*Aquilegia vulgaris* L.), and Star of Bethlehem (*Ornithogalum umbellatum* L.), from Souldrop; both are no doubt of garden origin, but not previously reported from this area.

My excursions into the county have been few and in search of wool adventives of which a further twenty species were found. The total number of these species is now about two hundred and twenty, but they are of minor significance compared with our native flora.

J. G. DONY.

### METEOROLOGY

The contrast between the weather of 1959 and that of the preceding year was very marked, with temperatures above average from February to December, an unusually prolonged summer with periods of intense heat and severe drought, and a total rainfall of only about 80 per cent of normal.

## RAINFALL FOR 1959

	Amphill	Bedford	Bromham	Cardington	Kempston	Luton A	Luton B	Silsoe
January ... ..	3.55	3.17	3.04	3.12	3.37	3.50	3.44	2.98
February ... ..	0.06	0.10	0.07	0.07	0.09	0.07	0.05	0.05
March ... ..	1.99	2.64	2.23	2.58	2.24	1.90	1.98	1.72
April ... ..	2.12	1.56	1.65	1.71	1.60	2.55	2.19	1.94
May ... ..	0.61	0.68	0.44	0.60	0.57	0.83	0.74	0.65
June ... ..	0.60	0.73	0.53	0.76	0.94	1.38	1.42	0.88
July ... ..	2.61	2.64	2.27	2.09	3.21	4.26	3.17	2.81
August ... ..	0.89	0.54	0.56	0.58	0.59	1.36	1.04	0.83
September ... ..	0.07	0.04	0.03	0.05	0.05	0.17	0.17	0.07
October ... ..	1.93	1.71	1.35	1.53	2.06	1.83	1.99	1.67
November ... ..	2.18	1.58	1.39	1.80	1.62	2.35	2.54	1.72
December ... ..	3.35	2.87	2.81	2.80	2.97	3.98	3.93	2.83
Totals ... ..	19.96	18.26	16.37	17.69	19.31	24.18	22.66	18.15

Amphill (Mr Horne)  
 Bedford (Mr Lock)  
 Bromham (the writer)  
 Cardington Aerodrome (per Mr Speed)

Kempston (Mr Payne)  
 Luton A (Crescent Road) (Mr Meadows)  
 Luton B (Runley Wood) (Mr Meadows)  
 Silsoe (N.I.A.E., Wrest Park) (per Mr Dunn)

The first three weeks of January were wet, with some snow and with three or four very cold days in mid-month, but anticyclonic conditions were established on the 23rd giving rise to some persistently foggy weather during the last week, and this was renewed in early February. This latter month was almost rainless, with a continuously high barometer which remained about 30 inches throughout the month. A "Little Spring" occurred on the 28th and lasted three days, the first day's maximum temperature of 64 deg. F. constituting a record for the present century. March, however, was a generally unsettled month without extremes of temperature, and these conditions continued into April. Another "Little Spring" occurred in the third week, with temperatures up to 67 deg.

May was a dry sunny month, mostly under the influence of easterly winds; exceptional temperatures were reached on the four days 10th-13th inclusive (82 deg. on the 11th). Similar short periods occurred in June, and Midsummer Day, for once, lived up to its name with a maximum of 89 deg. F. and some thunderstorms.

July had two exceptionally warm spells, 90 deg. being exceeded on the 4th, 5th, 7th and 8th, and 80 deg. was reached or exceeded on each of the ten successive days from 17th to 26th inclusive. The month's rainfall was mostly attributable to thunderstorms, particularly those of the night 10th-11th and the evening of the 28th.

August was very hot, dry and sunny. Rainfall was everywhere deficient, and temperatures exceeded 80 deg. during the fourth week, with a maximum of 87 deg. on the 20th. After slight rainfall on the 16th there was nothing further until 21st September—a total of 38 consecutive dry days, and the drought virtually continued until 10th October making fifty-seven days in all. Unusually high temperatures occurred during this period, notably 79 deg. on each of the three days 9th-11th September, and 78 deg. on 3rd October.

Thereafter, more normal conditions were gradually re-established, November having some of its traditional fogs and December being mild and wet throughout, with heavy gales.

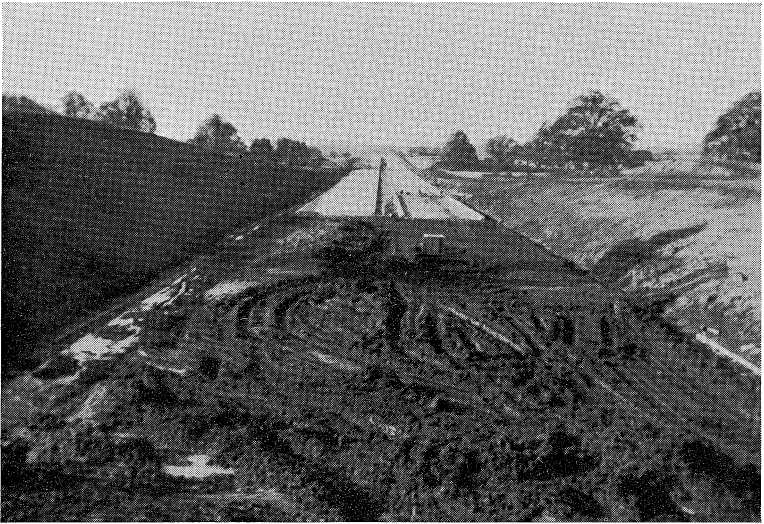
RAINFALL was everywhere deficient by about 20 to 25 per cent of the average, and this was largely accounted for by an almost rainless February, a very dry spring, and the driest September on record. The February rainfall was everywhere less than one-tenth of an inch, and the September total was as low as .03 in. in some places.

The longest dry period of the year has already been mentioned; the wettest months were January and December, the latter having rain on twenty-three days, although these were not consecutive.

The heaviest day's rainfall was that of 6th January totalling 1.16 inches, although similar amounts accompanied the overnight thunderstorms on 10th July, totals approaching 1 inch being recorded at Bedford, Kempston and Cardington, and nearly an inch and a quarter at Ampthill. A daily total of 1.30 inches was recorded at Kempston on 28th July, again as the result of thunderstorms.

SNOW occurred on only five days, all in January, but amounts were everywhere slight.

THUNDER occurred on nine days, the heaviest storms being those of the night 10th/11th July and of the 28th July.



**MOTORWAY M.1**

Facing north-west along the route, from the Woburn-Amphill road (A.418)  
near Ridgmont

Top photograph taken on 8th November, 1958, lower photograph taken  
on 7th October, 1959

The average TEMPERATURES for the year were as follows:

January ...	34.49 deg. F.	July ...	66.65 deg. F.
February ...	39.91	August ...	65.08
March ...	45.34	September ...	59.42
April ...	50.13	October ...	54.35
May ...	55.98	November ...	43.98
June ...	61.52	December ...	43.37
Average for the whole year ...	...	...	51.68 deg. F.
(Average for 1958 ...	...	...	49.86 deg. F.)

There were no less than twenty-eight days on which the temperature reached or exceeded 80 deg. and 90 deg. was exceeded on four of them. The hottest day of the year at Bromham was 8th July with 92 deg. but 4th, 5th and 7th ran it close with 91 deg. each.

The two coldest days were 15th and 29th January, both with maxima of 32 deg., while the coldest nights were those of 13th and 14th January, both with minima of 21 deg. The latest night air frost occurred on 19th/20th February, the first frost of autumn on 5th/6th November.

Remarkable SUNSHINE averages were a feature of the four summer months May to August inclusive. Figures from the N.I.A.E. at Silsoe are as follows:

May ...	...	7.2 hours average <i>per diem</i>
June ...	...	8.0
July ...	...	8.7
August ...	...	7.4

A. W. GUPPY.

## PALAEONTOLOGY

The Palaeontological Report for 1959 follows a different trend from those of previous years, and is concentrated solely on the temporary sections exposed during the construction of the London-Yorkshire Motorway or, as it is now officially known, the M.1.

Due to the pressure of this work, no normal visits to the permanent County sections were possible, and the recording of specimens from the various localities that usually feature in these records will be recommenced in 1960.

Construction of the Motorway began in 1958, when the Minister of Transport officially "cut the tape" at the ceremony held near Slip End, south of Luton, and the pattern of M.1 rapidly took shape. Work proceeded far more rapidly in some parts than others, however, depending on the nature of the soil and the depth of the cuttings involved. Several cuttings were not completely cleared until well into 1959, especially if a major overbridge was being constructed over the cutting. In these cases, it was necessary to leave diversion roads in existence until the new bridges could carry the local traffic, and not until then were the cuttings totally excavated clear of material. Sections where such diversion roads were *in situ* until after the new bridges were opened were at Luton (Section 7) where the Railway Bridge and the Bradley Road bridge were constructed; east of Chalton (Section 10) where the Luton-Houghton Regis road and the Luton-Toddington road bridges were built; east of Toddington (Section 13) where the Ampthill-Toddington road bridge was erected; east of Ridgmont (Section 21) where the Woburn-Ampthill road bridge was constructed; west of Salford (Section 24) where the Woburn Sands-Salford road bridge was built, and north-west of Salford (Section 26) where the Broughton-Salford road bridge was erected. The temporary diversion roads at these points were very useful for geological work as the strata were exposed for many months and, consequently, were allowed to weather undisturbed.

The depths of the various cuttings varied from a few feet to over thirty feet, the deepest one in the County being the section south of Dunstable Road, Luton (Section 7), and the collection of identifiable specimens from the enormous masses of rock and clay was no mean task, especially when confronted with the atrocious weather conditions that prevailed during 1958 and 1959. Many of the cuttings during the winter of 1958 were completely inaccessible, and remained so for several weeks. Notable among the sections that could not be approached for months was the one near Ridgmont (Section 21) where large amounts of sand were washed down to the base level and, mixing with the clays, formed a muddy quicksand several feet in depth. This was very unfortunate in this particular case, as a stratum of rubbly rock was exposed as a basement bed of the Lower Greensand, and this was packed with unusual derived fossils, notably specimens of the ammonite *Pavlovia* (including *Pavlovia* aff. *Iris* (Spath) ex Hartwell Clay), various brachiopods, and lamellibranchs, often unobtainable due to the conditions. However, considering the condition of the cuttings in general, and the fact that the machinery employed did not lend itself to furthering the cause of geological science (one needed eyes in the back of the head when a Euclid scraper was pounding up behind with twenty tons of rock on board), a reasonable collection of specimens was obtained and, also, a very large number of photographs showing early construction works which, of course, will never be repeated in this County (see illustration).

The section numbers quoted in the report (Nos. 1-26) are the numbers that I allocated to the cuttings on the various Ordnance Survey maps for personal convenience only, and they are not to be found on any orthodox map of the Motorway.

The routing of the Motorway, from south to north, is in a general north-westerly direction and commences at the St. Albans By-pass. It then progresses west of Stockwood Park (and east of Caddington) to the Luton-Dunstable Road, where a junction has been constructed. This access point is a two level junction, with slip roads leading to a roundabout formed on the existing road. The M.1 passes over the Luton-Dunstable Road at this point. Continuing onwards, the route passes to the west of Leagrave and on to east of Chalton, where the railway and Motorway run parallel to opposite Sundon Cement Works. At this point they diverge, and the Motorway veers to a more definite westerly direction to meet the Ampthill-Toddington road, which is a further access point. This is again a two level junction with slip roads leading to the existing road. In this instance, however, the Motorway passes beneath the Ampthill-Toddington road.

The route now by-passes Tinglethorpe to the east, and Steppingley to the west, and again veers to a more westerly direction until it reaches the next access point at the Husborne Crawley-Brogborough road. Here, again, a two level junction has been constructed with slip roads leading to the existing road. The M.1 again passes beneath the local road which, however, is built up on approaching the junction at this point. This is the final junction in Bedfordshire and the Motorway now continues onwards until it leaves the County north-west of Salford. The total length of the Bedfordshire section of the M.1 is just under eighteen miles, and twenty-six cuttings have been excavated totalling approximately 13,000 linear yards.

The cuttings are now described and locations given. These locations are taken from a six-inch scale Ordnance Survey map on which the Motorway was superimposed, and are as accurate as possible. It must also be remembered that I concentrated on certain cuttings that were very productive in the way of fossils, etc. and that the obviously barren ones were, although not neglected, by-passed for longer periods. Incidentally, I have not given map references. Fossils recorded are also quoted in each



Cutting paragraph, instead of being bulked at the end, for two reasons: firstly, to save space and secondly, it proved impossible to carry out really comprehensive collecting due to the poor conditions prevailing much of the time, and a complete collection of fossils was not obtained from any section. A list of the fauna would, therefore, be more misleading than useful, as a false impression would be given due to the occurrence of specimens not personally observed. The specimens thus quoted in the text are common fossils that can be regarded as *typical* of the relevant cuttings described. Fossils obtained from the Drift Clays are included, but annotated with the deposit from which they were derived (if known).

It is, of course, to be regretted that this report cannot be plentifully illustrated with photographs, as many of the views were of great interest. Space and economy naturally forbids this, although the illustration figures an M.1 section, but such photographs as a Euclid scraper broken down in the mud; early bridge excavations; build-ups and, more than anything else, cuttings completely flooded with water up to four or five feet deep are, unfortunately, forced to remain unpublished and unseen.

CUTTING NO. 1 was excavated for a re-alignment of the Slip End-Farley Green road (B.4540) and the length was approximately 260 yards. The location was 450 yards north-east of the Slip End cross-roads, to the old road junction 260 yards north-east. Maximum depth exposed: 12 feet.

Very little can be put on record from this section. The strata exposed consisted solely of Clay-with-Flints, and the underlying Chalk was not reached during excavations. A few fragments of *Echinoids* were observed on some of the flints, but these were too badly preserved to be identified and, also, could have been brought to this section by the machinery when build-up of a nearby embankment was commenced.

CUTTING NO. 2 was excavated for the Motorway route, and the length was approximately 560 yards. The location was from a point 50 yards south of the Woodside road to a point 560 yards south-east. Maximum depth exposed: 10 feet.

Once again, the cutting was too shallow to reach the chalk and only Clay-with-Flints was exposed during excavations.

CUTTING NO. 3 was excavated for a re-alignment of the Caddington road, and the length was approximately 200 yards. The location was 350 yards north-west of the Woodside road, and the exposure was made on the eastern side of the Motorway, forming a bank on the northern side of the Caddington road. Maximum depth exposed: 8 feet.

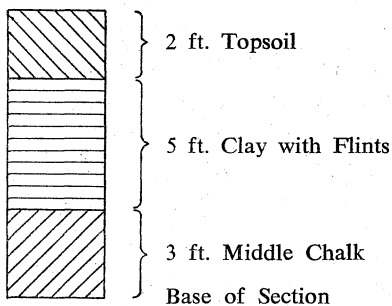
As in the previous cuttings, no fossils were obtained, although scattered lumps of chalk occurred among the masses of Clay-with-Flints.

CUTTING NO. 4 was excavated for the Motorway route, and the length was approximately 300 yards. The location was from a point 230 yards north-west of the re-aligned Caddington road, to a point 300 yards north-west. Maximum depth exposed: 9 feet.

Clay-with-Flints was exposed for the complete distance when the first survey was made on 9th July, 1958, and it was some months before I again visited this particular cutting. Later surveys showed the Chalk at the base of the section for a maximum of two or three feet, but no fossils were observed at any time.

CUTTING NO. 5 was excavated for the Motorway route, and the length was approximately 300 yards. The location was from a point 480 yards north-west of Cutting No. 4 to a point 300 yards north-west. Maximum depth exposed: 10 feet.

Clay-with-Flints was, once again, the only material exposed during the initial surveys, but later visits showed chalk below this, and a few scattered fragments of shell imprints (*Inoceramus sp.*) occurred. The deposits were rapidly jumbled together by the excavating machinery and, during scraping, the chalk was dragged and scattered over the slopes of Clay-with-Flints, with consequent loss of detail. The chalk exposed at the base of the cutting was, however, almost certainly Middle Chalk, although fossils in good condition were not obtained. The *Inoceramus* specimens did, however, compare well with those obtained from Cuttings 6 to 9, and these were in a condition good enough to prove chalk zones in the Middle and Upper Chalk. No Chalk Rock was encountered in this section, however, so the beds can be allocated to Middle Chalk, as the Chalk Rock forms the basement bed of the Upper Chalk.



CUTTING No. 5

CUTTING No. 6 was excavated for the Motorway route and the length was approximately 650 yards. The location was from a point 170 yards north-west of Cutting No. 5, to a point 650 yards north-west. Maximum depth exposed: 34 feet.

Initial surveys revealed the usual Clay-with-Flints, but later visits revealed the Middle Chalk in good section. Specimens of *Inoceramus lamarcki* were obtained, although these were generally far from common. The Middle Chalk was exposed for the full distance, and the Clay-with-Flints was much thinner in this area, being in the region of from three to four feet thick.

CUTTING No. 7 was excavated for the Motorway route, and the length was approximately 1,000 yards. The location was from a point 730 yards north-west of Cutting No. 6 to a point 285 yards north-west of Bradley Road, Luton. Maximum depth exposed: 40 feet.

This was undoubtedly the most interesting Middle Chalk cutting in the Luton area and was also the longest and deepest. The material exposed was generally more suitable for the geologist than that revealed in the previous cuttings, and I concentrated on this section in an endeavour to obtain a good collection of specimens. In this, however, I was disappointed, as fossils were rather scarce, but numbers of *Inoceramus* specimens were seen and, occasionally, well-preserved ones were obtained, notably *Inoceramus lamarcki* and *Inoceramus lamarcki* var. *cuvieri* (J. Sowerby). When one considers the amount of Chalk available for study, much of which was allowed to weather for several months, there is no doubt that lack of fossils can be attributed, in this instance, to rarity, and not to destruction by the machinery employed, as so frequently happened in the clay cuttings further north.

During early excavations north of Bradley Road, however, a very well-preserved antler of a large deer (*Cervus sp.*) was obtained on 9th July, 1958. This fossil antler was not contemporary with the Chalk and was most probably late Pliocene in age. It occurred approximately 15 feet below the surface and was excavated by the contractors (John Laing & Son). A full report of the discovery was published in *The Bedfordshire Times* on 29th August, 1958.

CUTTING No. 8 was excavated for the Motorway route, and the length was approximately 230 yards. The location was from a point 450 yards north of Dunstable Road, Luton, to a point 100 yards south-east of Lewsey Road. Maximum depth exposed: 10 feet.

This was a further cutting through the Middle Chalk and was again poor regarding fossil remains. *Inoceramus lamarcki* was recorded, and also the variation *cuvieri*, as at Cutting No. 7. This section was not completed until fairly late (mid-1959) and the number of surveys made to this particular site were less than originally intended.

CUTTING No. 9 was excavated for the Motorway route, and the length was approximately 460 yards. The location was from a point 330 yards north-west of Lewsey Road, Luton, to a point 460 yards north-west. Maximum depth exposed: 19 feet.

The Middle Chalk was again exposed but, in this particular case, the overlying Drift was fairly thick. Fossils were again very uncommon in the Chalk, but *Inoceramus lamarcki* occurred sparingly and dated the beds. Only a few were obtained, however, and none was worth keeping. The Chalk was very crushed and compacted due to the weight of the machinery employed, and this undoubtedly destroyed many of the fossils which were exposed in this section.

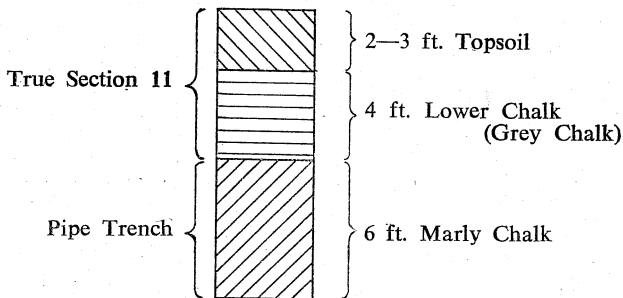
CUTTING No. 10 was excavated for the Motorway route, and the length was approximately 880 yards. The location was from a point 480 yards south-east of the Luton-Houghton Regis road to a point 120 yards north-west of the Luton-Toddington road (B.579). Maximum depth exposed: 30 feet.

This section showed a change in character of the Chalk and fossils were fairly numerous. Brachiopods (*Terebratulacea* and *Rhynchonellacea*) were fairly common, and large Ammonites such as *Austiniceras austeni* occurred, thus indicating the rock to be the Lower Chalk. Typical Lower Chalk fossils were obtained throughout the length of the cutting during 1958 and 1959, until the two diversion roads were completely removed, and the cutting slopes spread with topsoil. Much of the excavated rock was carted to form the long embankment immediately north of the cutting, so that ample material was available for study although, of course, *in situ* specimens could not be obtained most of the time.

The large Ammonites *A. austeni* were generally smashed by the machinery, as their shape was prone to damage, and none worth retaining was secured. Lamellibranchs of various species also occurred and, after several months, stood out well on the surfaces of the weathered chalk blocks. One badly-preserved Echinoid (possibly *Conulus subrotundus*, although the condition of the specimen was extremely poor) was obtained from the embankment chalk, and a considerable number of Brachiopods were collected over the months, both from the cutting and embankment. The commonest of the smaller fossils obtained during construction were "*Rhynchonella*" *martini* (Mantell); "*Rhynchonella*" *dimidiata* (J. Sowerby); *Terebratulina striata* (Wahl.); *Plicatula inflata* (J. de C. Sowerby) and *Plagiostoma globosa* (J. de C. Sowerby).

CUTTING No. 11 was excavated for the Motorway route, and the length was approximately 330 yards. The location was from a point 1,430 yards north of the Luton-Toddington road, to a point 330 yards north-west, that is, alongside Sundon Cement Works. Maximum depth exposed: 12 feet (including trench section).

This cutting was a further section through the Lower Chalk, a different horizon being exposed at this locality. The true cutting revealed similar fossils to those obtained from Section 10 but, at the side of the Motorway nearest the Cement Works, a further 6 feet had been excavated for a pipe trench. This was sunk in the marly chalk (Chalk Marl) which underlies the Grey Chalk. The Chalk Marl is exposed in the nearby quarry of the Cement Works, at the very base of the exposed material, and has featured in the annual reports of previous years. Fossils were not common in the Motorway trench, and difficulty in collecting was experienced due to a foot of water, which persistently overlapped my gum-boots as I waded along the excavation. *Ammonites Schloenbachia varians* (J. Sowerby) and *Schloenbachia subvariens* (Spath) occurred, as did *Turrilites tuberculatus* (Bosc), all previously recorded from Sundon Cement Works, and the commonest smaller fossils included "*Rhynchonella*" *martini* (Mantell) and *Plicatula inflata* (J. de C. Sowerby).



CUTTING No. 11

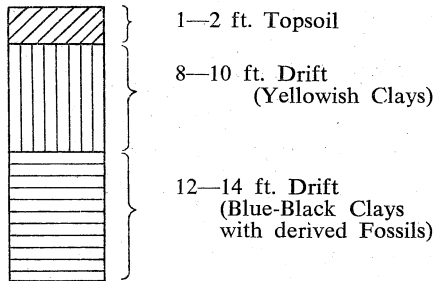
CUTTING No. 12 was excavated for the Motorway route, and the length was approximately 330 yards. The location was from a point 900 yards north-west of Sundon Cement Works to a point 300 yards north-west. Maximum depth exposed: 28 feet.

This was a further Chalk cutting and, as in Cuttings No. 10 and 11, the Lower Chalk extended from below the topsoil to the base of the section. Fossils in this cutting were not in evidence, however, and the whole mass of rock was very rubbly, such as is usually observed in the Lower Chalk quarries for about 6 to 10 feet below the topsoil. Numerous veins of reddish clay also occurred in the chalk blocks, and the chalk itself was very soft and tenacious. This cutting was the final one exposing the Chalk in Bedfordshire and, from this point northwards, the Drift clay rapidly assumes great thickness.

CUTTING No. 13 was excavated for the Motorway route, and the length was approximately 350 yards. The location was from a point 190 yards south-east of the Amptill-Toddington road (A.5120) to a point 160 yards north-west of the A.5120. Maximum depth exposed: 24 feet.

This cutting, although a fairly deep one, did not penetrate through the Drift clay to the "solid" deposits beneath. The Drift in this cutting

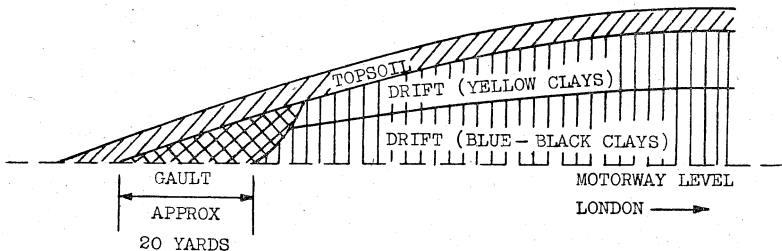
was a stiff, blue-black clay, very similar in colour to the Oxford Clay, with which it was first confused. Derived fossils were fairly common, notably *Gryphaea*, and Ammonites from the Mariae-Athleta zones of the Oxford Clay. The belemnite *Cylindroteuthis puzosiana* (ex Oxford Clay) also occurred in the Drift. Numerous *Gryphaea* were observed at the base of the excavation made for the foundation of the new bridge, which was approximately 10 feet deeper than the level of the M.1 cutting, and gave rise to a mistaken impression that the beds were sedimentary, as the specimens formed a fairly level stratum. Further surveys, however, proved that the entire cutting was Drift. The majority of the small derived Ammonites were well preserved as pyritic casts, and a fragment of a large Ammonite *Perisphinctes (Perisphinctes) varicostatus* (ex Amphill Clay), was preserved as a Mudstone cast and obtained from the foundation excavation.



CUTTING No. 13  
(Amphill-Toddington Road Bridge)

CUTTING No. 14 was excavated for the Motorway route, and the length was approximately 720 yards. The location was from a point 420 yards north-west of Cutting No. 13, to a point 720 yards north-west. Maximum depth exposed: 27 feet.

This was a further cutting through thick Drift Clay, similar in character to that exposed in Cutting No. 13. Derived fossils from the Mariae-Athleta zones of the Oxford Clay were distributed throughout the major portion of the section although they were generally rather uncommon. The northerly twenty yards of the cutting, however, exposed the true sedimentary rock of the area (the Gault Clay), which could underlie the Drift for a good part, if not all, of the total length of the section. The Gault was not very fossiliferous, unfortunately, but the small belemnites *Neohi-*



CUTTING No. 14  
(Northern end of cutting facing East)

*bolites minimus* occurred, and the lamellibranch *Inoceramus sulcatus* was also obtained. A few broken phosphatic nodules were also scattered about on the surface of the clay slope, but no well-defined nodule bands were in evidence.

CUTTING No. 15 was excavated for the Motorway route, and the length was approximately 970 yards. The location was from a point 690 yards north-west of Cutting No. 14 to a point 970 yards north-west. Maximum depth exposed: 30 feet.

This section revealed the Gault Clay for its entire length, although it was some months before the cutting was completely excavated. The overlying Drift clay was much thinner than in Sections 13 and 14, varying from 6 to 10 feet, and a good exposure of Gault clay resulted. The number of fossils obtained, however, was very disappointing. Normally, the Gault is very fossiliferous, as are the Gault Clay exposures at Leighton Buzzard. The majority of such specimens occur, generally, in well-defined nodule bands, and no bands were revealed in this cutting. The absence of such a nodule bed can, therefore, account to a certain extent for the lack of plentiful specimens and, apart from the small belemnites *Neohibolites minimus* which occurred fairly frequently, and also the lamellibranchs *Inoceramus sulcatus* (Upper Gault) and *Inoceramus concentricus*, very little can be put on record from this section. A few smooth phosphatic nodules were scattered about, as in the Gault at the northern end of Cutting No. 14, but no fossils were obtained from these.

This section was, also, one of the badly flooded ones during the latter part of 1958 and the depth of mud, when measured by myself on 24th August, 1958, was between two and three feet in places.

CUTTING No. 16 was excavated for the Motorway route and the length was approximately 35 yards. The location was from a point 430 yards north-west of the Tingrith-Steppingley road to a point 35 yards north-west. Maximum depth exposed: 10 feet.

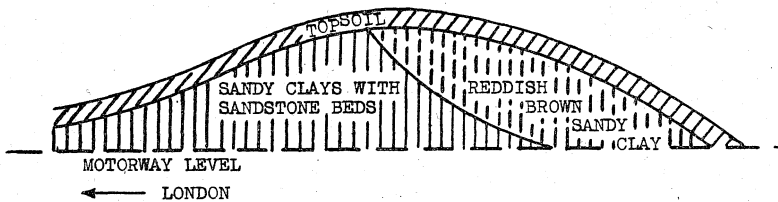
This cutting did nothing more than expose the Drift clay, with approximately two feet of yellowish sands at the base (Lower Greensands) which were entirely unfossiliferous, and nothing can be put on record from this section.

CUTTING No. 17 was excavated for the Motorway route, and the length was approximately 390 yards. The location was from a point 150 yards north-west of the Steppingley-Harlington road to a point 390 yards north-west. Maximum depth exposed: 20 feet.

This section revealed nothing but beds of vari-coloured sands, entirely unfossiliferous, extending from below the thin Drift to the base of the cutting. When the excavating was completed, beds of a pure white sand were exposed at the base, underlying the brownish and yellowish sands above. Nothing in the way of fauna can, therefore, be recorded from this section.

CUTTING No. 18 was excavated for the Motorway route, and the length was approximately 550 yards. The location was from a point 230 yards north-west of the Eversholt-Steppingley road, to a point 550 yards north-west. Maximum depth exposed: 13 feet.

This section revealed sand and clay beds of varying thicknesses, and a dense, dark blue sandstone also occurred in thin beds at various levels for almost the entire length. A bed of reddish-brown sandy clay (maximum thickness 10 feet) was exposed at the northern end of the cutting, but no fossils were obtained from any of the horizons. The sands were generally white or red, and occurred in irregular pockets, sometimes as much as ten feet wide.



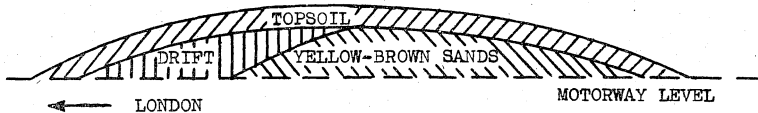
CUTTING No. 18  
(Northern end, facing West)

CUTTING No. 19 was excavated for the Motorway route, and the length was approximately 470 yards. The location was from a point 270 yards north-west of the Ridgmont-Flitwick road to a point 470 yards north-west. Maximum depth exposed: 13 feet.

This section revealed Drift Clay for its entire length and depth. A few small indeterminate pyritised Ammonites were obtained from the base of the section (a blue clay similar in character and colour to the blue Drift clay exposed in Sections 13, 14, 24 and 26) but, apart from these and one broken belemnite *Cylindroteuthis sp.*, nothing was recorded.

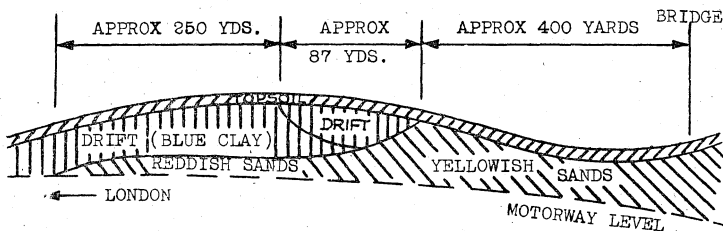
CUTTING No. 20 was excavated for the Motorway route, and the length was approximately 120 yards. The location was from a point 200 yards north-west of Cutting No. 19, to a point 120 yards north-west. Maximum depth exposed: 8 feet.

This cutting did nothing more than expose the uppermost beds of the Greensand at its northern end, and Drift clay for approximately 30 yards at the southern end. The Drift was a yellow-brown colour in this cutting and did not yield any derived fossils. The sands forming the northern 90 yards of the exposure were, likewise, unfossiliferous.



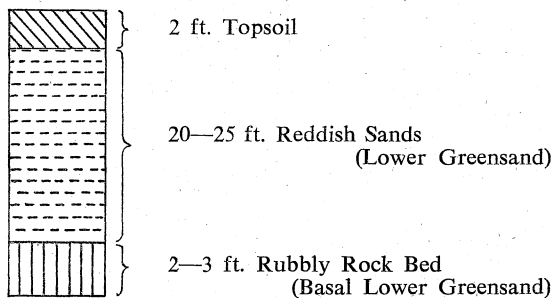
CUTTING No. 20  
(Facing West)

CUTTING No. 21 was excavated for the Motorway route, and the length was approximately 1,620 yards. The location was from a point 60 yards north-west of Cutting No. 20, to a point 670 yards north-west of the Amphill-Woburn road (A.418). Maximum depth exposed: 30 feet.



CUTTING No. 21  
(South of A.418 facing South-west)

This cutting was, when completed, one of the longest in Bedfordshire and was a very interesting one. The section exposed the Lower Greensand in fairly good detail although, for some months during 1958 and early 1959, it was impossible to approach the cutting slopes due to the depth of sandy mud. The main feature of interest was a stratum of rubbly rock below the loose sands (basal Lower Greensand) occurring at the base of the section north of the Woburn-Amphill road, and this was packed with derived fossils, notably Ammonites, and occasional indigenous Brachiopods. The derived fossils included the Ammonite *Pavlovia*, a typical species being *Pavlovia* aff. *iris* (Spath) (ex Hartwell Clay), Lamellibranchs (*Pleuromya* sp.) and occasional reptilian teeth. These latter were, however, very rare in the deposit. The indigenous fossils included the Brachiopod *Platythyris* cf. *comptonensis* (Middlemiss) but this was far from common and, over a period of several months, only a few were obtained.



CUTTING No. 21  
(North of A.418, 30 yards from Bridge)

It could be seen at first glance that many of the derived fossils had been subjected to considerable wear and tear before being finally deposited in this bed, as most of them were worn very smooth and, in some cases, the Ammonite fragments were almost spherical. The Lamellibranchs, also, were very much worn, and surface detail was almost entirely missing.

The overlying sands were not particularly fossiliferous and, of the few fragments recorded, none was obtained from *in situ*. I am inclined to think that the machinery was responsible for scattering many of the fossils of the basal rock bed over the overlying sands. It must be remembered that conditions for collecting in this cutting were very poor and the sands were, to all appearances, barren of fossils except immediately above the basal rock bed where, as mentioned previously, the machinery could be to blame. The loose sands from just above the rock bed to the top of the cutting slopes did not yield any fossils and were, so far as I could see, unfossiliferous, as the sands forming many of the Lower Greensand beds often are.

The rock bed containing the indigenous and derived fossils was not exposed south of the Woburn-Amphill road, as the cutting was not quite deep enough and, although the Lower Greensand sands were exposed (as on the north side of the A.418) they were barren of fossil remains. These sands were thickest for about 400 yards south of the Woburn-Amphill road and, although they were visible to almost the extremity of the cutting, Blue and Yellow Drift clays attained a fair thickness, and the sands were no more than 3 to 4 feet thick at a point approximately 250 yards north of the southern end of the section.



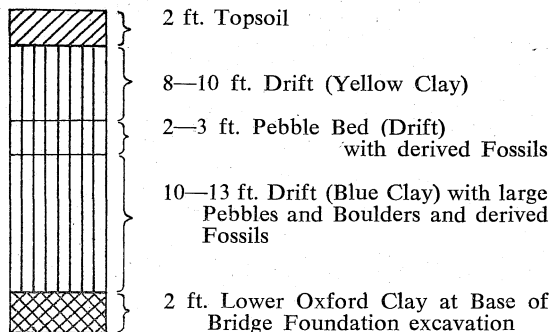
CUTTING NO. 22 was excavated for the Ridgmont-Salford road, and the length was approximately 60 yards. The location was from the Motorway to a point 60 yards north, on the east side of the Ridgmont-Salford road, where the Motorway crosses over the road. Maximum depth exposed: 6 feet.

Drift clay only was exposed, and no fossils other than a few derived *Gryphaea* were observed.

CUTTING NO. 23 was excavated for the Motorway route, and the length was approximately 180 yards. The location was from a point approximately 1,200 yards north-west of the Husborne Crawley-Brogborough road (B.557), to a point 180 yards north-west. Maximum depth exposed: 4 feet.

This was a further very shallow cutting and, after penetrating the topsoil, approximately two feet of Drift clay was exposed. No fossils were obtained, however, due to the poor exposure.

CUTTING NO. 24 was excavated for the Motorway route, and the length was approximately 1,180 yards. The location was from a point 900 yards south-east of the Woburn Sands-Salford road, to a point 280 yards north-west of the Woburn Sands-Salford road. Maximum depth exposed: 30 feet.



CUTTING NO. 24  
(Site of Woburn Sands-Salford Road Bridge)

This section was, from an indiscriminate collector's point of view, the richest M.1 cutting with regard to fossil remains. The majority of the specimens were, however, observed in the blue Drift clay which formed almost the complete exposure. Indeed, the only area where the "solid" Lower Oxford Clay was exposed was at the very bottom of the foundation hole, excavated for the Woburn Sands-Salford road bridge.

The first survey, made on 24th May, 1958, revealed a considerable excavation in the Drift clay and also exposed approximately two feet of the Lower Oxford Clay in the foundation hole, as previously stated. The Drift clay, forming almost the total exposure, was very rich in fossils, all of which were quite well preserved. Ammonites were especially common, and numerous *Gryphaea* occurred throughout the clays. Many large pebbles were scattered about, some of them clearly showing the polishing and smoothness that is to be expected from boulders and pebbles in the drift, and many of the fossils themselves were worn very smooth. A good collection of Drift specimens was made from this site during the following months and, after the new bridge was completed, the cutting was excavated on both sides of the bridge, forming the level of the Motorway itself.

During these excavations, much of the material removed was dumped north-west of Ridgmont railway station, to form a build-up to the railway fly-over. Numerous fossils were obtained from here, notably pyritised Ammonites, all from the blue Drift clay.

The commonest of the fossils obtained from the Drift were, as stated, various species of Ammonites. These were mainly derived from the Oxford Clay, although fossils from other beds were represented. Typical specimens obtained from Cutting No. 24 over the months were the Ammonites *Peltoceras trifidum* (Quenstedt), *Peltoceras broilii* (Prieser), *Kosmoceras prionae* (Buckman), *Kosmoceras rowlstonense* (Young & Bird), *Bursiceras pratti* (Spath), *Lamberticeras henrici* (Douville), *Cardioceras sp.*, *Lunuloceras sp.*, and the large belemnite *Cylindroteuthis puzosianus* (all ex Oxford Clay, mariae-athleta zones), and *Amoeboceras (Prionodoceras) prionodes* (S. Buckman) (ex Amphill Clay).

These fossils, plus many others, were scattered over the cutting slopes. The blue Drift was, however, far richer in fossils than the overlying yellow Drift clay. A pebble bed (Drift) between the Blue Drift clay and the Yellow Drift was extremely rich in very small pyritised Ammonites, many of which were in a perfect state of preservation, and showed no signs of wear and tear. These included *Euaspidoceras sp.*, *Peltoceratoides sp.* aff. *arduennensis* (d'Orbigny), *Cardioceras costellatum* (S. Buckman), *Grossouvria sp.*, *Kosmoceras cf. duncani* (J. Sowerby), *Quenstedtoceras omphaloides* (J. Sowerby), and *Kosmoceras geminatum* (S. Buckman). Encrustation with pyrites was generally less troublesome with fossils from the "pebble bed" and most of the small Ammonites, while being pyritic casts, were not encrusted with pyrite to such a great extent as was observed on Ammonites from the beds beneath. In these latter cases the fossils were frequently encased in a solid block of pyrites.

A few Brachiopods (*Terebratulacea* and *Rhynchonellacea*) also occurred in the cutting but, without any clue to their true horizon, it would take a long time to determine them.

Below the Drift Clays, the Lower Oxford Clay was exposed at the bottom of the new bridge foundation excavation, and was approximately two feet in thickness. Typical Lower Oxford Clay fossils were obtained but, as very little material was excavated, only a few specimens were obtained. These included an occasional crushed *Kosmoceras sp.*, the large belemnite *Cylindroteuthis oweni*, and a few *Nucula sp.*

CUTTING NO. 25 was excavated for the Motorway route, and the length was approximately 160 yards. The location was from a point 280 yards north-west of Cutting No. 24, to a point 160 yards north-west. Maximum depth exposed: 5 feet.

This was a further cutting through the Drift clay, and was identical with the northern end of Cutting No. 24. (Yellow Drift clay only exposed). No fossils were observed in this section.

CUTTING NO. 26 was excavated for the Motorway route, and the length was approximately 580 yards. The location was from a point 380 yards south-east of the Broughton-Salford road, to a point 200 yards north-west of the Broughton-Salford road. Maximum depth exposed: 12 feet.

This cutting was very similar in character to Cutting No. 24, as the complete section consisted solely of Drift. Unlike Cutting No. 24, however, no "pebble bed" was exposed, and fossils were generally far less common. On 11th October, 1958, however, a bulldozer had pushed masses of the Drift clay clear of the new bridge site and, during the pushing process, the clay had formed into huge rolls. These rolls, as they weathered, revealed a few fossils, notably Ammonites. Further south

along the cutting a number of fossils were picked up from the clay surface, and these were usually quite well preserved. Again, they were generally ammonites, but a few broken belemnites were also observed. Typical specimens collected over a period of months were the ammonites *Peltocheras trifidum* (Quenstedt), *Kosmoceras prionae* (S. Buckman) and *Berniceras cf. inconspicuum* (de Loriot), and the large belemnite *Cylindroteuthis puzosianus* (all ex Oxford Clay, mariae-athleta zones).

To conclude this brief description of the M.1 cuttings, many of the sections could not be surveyed in detail owing to the atrocious weather conditions that prevailed much of the time. Cutting No. 21 was the worst on the whole route (in this County) as regards mud, but close runners-up were Cuttings No. 14, 15, 24 and 26. The water reached a depth of four feet in Section 24 during excavations and, as this could not flow away, prevented access to certain parts of the cutting for a considerable time. Similar conditions existed in most of the clay cuttings, although the water disappeared faster from some than from others. Mud, however, was a great hindrance for most of the time.

Taking the Motorway as a whole, I do not think that conditions for collecting and surveying could possibly have been much worse.

Finally, I should like to record my grateful thanks to the Contractors, Messrs. John Laing & Son, for allowing me unrestricted access to any part of the Motorway at any time. Without this concession it would have proved impossible to carry out any geological research whatsoever.

P. J. SMART

#### LEPIDOPTERA

It must seem that the entomologist is never satisfied, but although the summer of 1959 will long be remembered as quite outstanding, it did not produce many unusual records. The reasons are obvious, of course; the appalling weather of 1958 was not conducive to egg-laying, and we can but hope that the fulfilment of the 1959 season will come in 1960. Dare one say, however, that the winter has been dangerously open, making conditions all too ideal for predators and diseases? Perhaps this is being unnecessarily pessimistic.

One of the strange features of 1959 was that it was a poor year for the usual immigrants, at least in the Midlands. Only a few Clouded Yellows, '*croceus*' (Fourc), were seen, one as late as 16th October by Mr Guppy at Bromham. Painted Ladies, '*cardui*' (Linn), were only seen once by the recorder, at Wellington, along Balls Lane in late June, but nowhere was there a resultant locally bred population. The exception to this paucity of immigrants was the wonderful influx of the Humming Bird Hawk, *Macroglossa stellatarum* (Linn); these continued in flight well into November, and during the intense heat of the first few days of October, particularly on the 3rd, when the temperature was in the eighties, they were swarming on the late-flowering petunias. On 12th February, 1960, a recently-dead, squashed specimen was found in the main entrance hall of the Shire Hall, Bedford.

For the first time since 1948 it was a Holly Blue year; one of the unaccountable surges took place in the second brood which produced '*argiolus*' larvae on nearly every ivy head which one searched. There was a very limited third brood emergence in nature which is a rare occurrence in hot seasons, but none of my hundred or so pupae emerged in captivity. These began to develop, starting with the reddening of the eyes in the pupa by mid-September and were all fully formed by the end of the month. There had been a sudden temperature drop from 14th-19th September and this arrested progress; there was no suggestion of full colouration being formed. As there are no records whatever of over-

wintering in this condition it is interesting now to see which form they are on emergence. The seasonal dimorphism in this species is very marked in the female and so far only one male has appeared (17th March) which is much more the late summer form than spring; proper assessment will only be possible with a full emergence.

At Totternhoe in late September the Knolls were burnt brown with the drought, yet nevertheless many dry heads of *A. vulneraria* which one searched contained hibernating larvae of the Small Blue '*minimus*' (Fuessl), and at the time of writing the few that were taken are showing the first signs of activity. On disturbance in September the larvae showed a marked preference for burrowing in cotton wool rather than returning to the flower heads from which they had fallen in transit, and they have hibernated in the positions to which they penetrated.

The M.V. lamp was run throughout the summer at Cardington Road, and several outings were made to sites in the county. The most rewarding were undoubtedly to the site we discovered late in 1958, below Bunkers Hill, Sandy, along the Stratford Lane. This site was visited on the nights of 13th and 19th June, and 18th July. On the first two occasions our intentions were directed to the Pine Hawk moth '*pinastri*' (Linn); we had long felt that the locality ought to contain it, and we were rewarded by one specimen on each night, a male on the 13th and a female on the 19th. The spread of this species from Dorset and Hampshire right into the southern suburbs of London, and from East Suffolk to the Breckland, has been a steady process for a number of years, and it seems safe to assume that ours are an extension of the Breckland stock. We intend to investigate its status around Amptill, Woburn and Brickhill during the next few years; such a distribution, if it exists, could begin to be a link between the Pine Hawks of the Breck, and those of the big coniferous woods to the south of Reading. Also at Sandy on the 19th June a perfect specimen of *Lophopteryx cucullina* (Schiff), the Maple Prominent, was taken. It seems possible that there is a sparse distribution of this rare species throughout our area.

It may be of interest to record that the Chiltern Research Committee on which the Society is represented is including in its investigations research into the status of the Clifden Blue (*Lysandra bellargus*, Rott.) linked with the distribution of the Horseshoe Vetch (*Hippocrepis comosa*). This is upon the recommendations of my father and myself, and will be organised by G. Taylor of the Hope Department of Entomology, University Museum, Oxford, to whom any data, even of past seasons, should be sent. We do appear to have almost lost this lovely insect, although there are reports of a return to a better status in some localities along the Chiltern Hills in the direction of Chinnor.

I have again received a full list of butterfly records from Lt-Col Young of Pavenham which unfortunately for reasons of space I cannot quote in full. However there are one or two items of interest which must be noted; for example, he did not see a single *V. cardui* throughout the whole season, but was fortunate in seeing one '*croceus*' var. *helice* in his garden on the 30th September. In a season which was so poor for the Clouded Yellows, a pale Clouded Yellow was an event. The *A. atropos*, Deaths Head Hawk larva, referred to in his 1958 lists, came into his possession, pupated, and emerged on 3rd July, 1959, being released at Pavenham.

I have also received a most interesting butterfly list from Mr Terence Knight of Bedford in which he records *L. camilla* (Linn), the White Admiral, at Marston Morteyne on the 16th July, a new locality. He also records the Humming Bird Hawk at Bedford, Clapham and Marston.

Mr Timothy N. D. Peet, having left Bedford School and the district, has very kindly furnished me with a complete list of all his records from

1955 to 1959, together with a cross-reference to all his cabinet specimens should any future confirmation be needed. This has proved invaluable, and contains many species which we have not yet recorded, together with records which are of interest in comparing distribution of moths from one side of the town to the other, i.e. the M.V. at Bedford School Playing Fields, and ours at Cardington Road. I sincerely hope that it will be possible for the School M.V. to be manned in the future by someone as keen as Mr Peet, and as ready to supply full records. The Check List numbers as before are based on I. R. P. Heslop's 1947 Check List and the recorders are:

TNDP — Timothy Peet, KW — Kenneth West, BW — Bernard West, EPY — Lt-Col E. P. Young, DMJ — Dr D. M. Jeffreys, TFK — Terence Knight.

Note that in the 1958 list the following species were recorded but omitted in error from the overall list, Nos. 493, 598, and 625, *Cucullia chamomillae* (Schiff), *Sterrha aversata* (Hübner), and *Anaitis plagiata* (Linn) respectively. I am indebted to Mr Peet for this correction. He also comments on my late record for *Orthosia gracilis* (Fabr.), Powdered Quaker; this was certainly a little ambiguous. It was less common than usual in 1958, but one was taken in July; for a spring species this was unusual and I meant this fact to be clearer.

The following species with their relevant notation are additions to the overall list in the 1958 Journal, and consist mainly of records supplied by T. N. D. Peet for the period 1955-59 together with our records for the 1959 season and those of the other entomologists as listed above.

82. *Hyloicus pinastri* (Linn), Pine Hawk: Stratford Lane, Sandy, June, (M.V.), (BW, KW), one specimen 13th June, another 19th June. (See notes.)

97. *Stauropus fagi* (Linn), Lobster Prominent: Stratford Lane, Sandy, June, (M.V.), (BW, KW); our first record for the county.

99. *Drymonia trimaculata* (Esp), Light Marbled Brown: Plentiful at Stratford Lane, Sandy, on 13th and 19th June, (M.V.), (BW, KW). A most unusual form of this species predominated in which the outer band of the forewing was reduced or absent giving the insect an unusually white appearance.

121. *Tethea or* (Fabr), Poplar Lutestring: Stratford Lane, Sandy, July, (M.V.), (BW, KW); a species probably based on the poplars of nearby Sutton Fen, but only one specimen taken.

154. *Drepana binaria* (Hufn), Oak Hook Tip: Stratford Lane, Sandy, June, (M.V.), (BW, KW).

166. *Pseudoips bicolorana* (Fuessl), (*quercana* Schiff), Scarce Silver Lines: One specimen, Bedford School, July, (M.V.), (TNDP). One specimen Stratford Lane, Sandy, June, (M.V.), (BW, KW).

187. *Mitochondria miniata* (Forst), Rosy Footman: Stratford Lane, Sandy, June, (M.V.), (BW, KW). Very plentiful indeed in this locality, and an early emergence; the full flight, 19th June.

194. *Eilema complana* (Linn), Scarce Footman: Stratford Lane, Sandy, June, (M.V.). The commonest Footman on the 13th and 19th June, completely outnumbering '*lurideola*' on the night of the 19th.

214. *Apatele rumicis* (Linn), Dusky Knot Grass Dagger: Unaccountably missed from the overall list in 1958 Journal. Taken each season at Cardington Road, Bedford, but generally uncommon (BW); Bedford School (M.V.), uncommon in 1959, (TNDP).

229. *Agrotis ypsilon* (Rott), Dark Dart: Bedford, (M.V.), (BW, KW, TNDP).

286. *Hadena w-latinum* (Borkh), Light Brocade: Bedford, June, (TNDP). So far our only records of this species have been for Herts.

301. *Hadena lepida* (Esp), Tawny Shears: One specimen in Rothsay Place, Bedford, 3rd June, 1959, (TNDP).

314. *Eumichtis adusta* (Esp), Dark Brocade: One specimen, Bedford School, (M.V.), 1959. Checked British Museum Nat. Hist., (TNDP).

324. *Luperina testacea* (Schiff), Flounced Rustic: Several Cardington Road, Bedford, August, 1959, (BW, KW). Fairly common, Bedford School, (M.V.), 1958-59, (TNDP).

341. *Apamea sordens* (Hufn), Rustic Shoulder Knot: Rare, Bedford School, (M.V.), 1959, (TNDP).

344. *Apamea secalis* (Linn), Common Rustic: Two, Cardington Road, Bedford, (M.V.), (BW, KW). Fairly common, Bedford School, (M.V.), in 1958 and 1959, (TNDP).

350. *Apamea monoglypha* (Hufn), Dark Arches: Very common each year, so much so, in fact, that it has been overlooked on preceding lists.

354. *Apamea ypsilona* (Borkh), Dismal Brindle: One specimen, Bedford School, July, (M.V.). Checked British Museum Nat. Hist. Confirmed though specimen worn, (TNDP).

437. *Cosmia affinis* (Linn), Lesser Spotted Pinion: One specimen, Kempston, July, (M.V.), (TNDP).

452. *Orthosia incerta* (Hufn), Clouded Drab: Fairly common, omitted from 1958 list, (BW, KW, TNDP).

462. *Agrochola lychnidis* (Schiff), Beaded Chestnut: A few, Bedford School, September, 1958, (M.V.). Not previously listed, (TNDP).

464. *Anchoscelis litura* (Linn), Brown Spot Chestnut: A few, Bedford School, September, 1958, (M.V.). Not previously listed, (TNDP).

469. *Cirrhia gilvago* (Esp), Dusky Lemon Sallow: Bedford School Boarding House, 1956-59, (TNDP).

520. *Rivula sericealis* (Scop), Straw Point: Putnoe Woods, 1958; Barton in the Clay, 1959, (TNDP).

540. *Euclidimera mi* (Clerck), Mother Shipton: One specimen, Odell Great Woods, 3rd May, 1959, (TNDP).

666. *Xanthorhoe montanata* (Borkh), Silver Ground Carpet: Missed from 1958 listing; generally common everywhere, but not, in our experience, under urban conditions, (BW).

688. *Oporinia dilutata* (Schiff), November Carpet: Sheerhatch Wood, Northhill, and Pemberley Avenue, Bedford, October, (TNDP).

791. *Abraxes sylvata* (Scop), Clouded Magpie: One specimen, Bedford School, 22nd July, 1959, (M.V.), (TNDP).

804. *Bapta temerata* (Hübner), Clouded Silver: Bedford School, 4th June, 1959, (M.V.), one specimen, (TNDP).

808. *Campaea margaritata* (Linn), Barred Light Green; (formerly Light Emerald): Missed from overall list in 1958 Journal; recorded from Cardington Road, Bedford, in 1957, and Sheerhatch Wood, Northhill, 1958, (BW, KW); Bedford Park, 13th June, 1959 (TNDP).

811. *Semiothisa alternaria* (Hübner), Sharp Angled Peacock: Seen on a willow by the Embankment, Bedford, drawing made, (TNDP). An interesting record; I have taken it only in Westmorland (BW).

824. *Plagodis dolabraria* (Linn), Scorched Wing: Stratford Lane, Sandy, 12th June, 1959, (BW, KW), one specimen; Bedford School, 4th June, 1959, (M.V.), one specimen, (TNDP).

850. *Lycia hirtaria* (Clerck), London Brindled Beauty: Clapham, February, (DMJ); a few at M.V., Rothsay Place, Bedford, April, (TNDP).

1128. *Sesia apiformis* (Clerck), Poplar Hornet Clearwing: Two specimens, male and female, from De Parys Avenue, Bedford, June, (TNDP).

2294. *Hepialus hecta* (Linn), Golden Swift: Melchbourne, June (BW).

2295. *Hepialus lupulina* (Linn), Common Swift: Generally fairly common in most seasons. Omitted from 1958 Journal general listing in error, (BW).

2298. *Hepialus humuli* (Linn), Ghost Swift: Fairly common, (BW); common in 1958 and 1959 at Bedford School, (M.V.), (TNDP).

Species previously listed which justify comment for 1959:

32. *Limenitis camilla* (Linn), White Admiral: Marston Morteyne, (TFK); a new and unusual locality.

49. *Strymonidia w-album* (Knoch), White Letter Hairstreak: Pavenham, (EPY). (which links with our Stevington localities as a colony in this corner of the Ouse Valley, there being a limited colony also just in the southern part of Felmersham parish); Sheerhatch Wood, Northill, (TNDP).

53. *Lycaena phlaeas* (Linn), Small Copper: EPY reports a lanceolate form at Pavenham.

88. *Deilephila porcellus* (Linn), Small Elephant Hawk: Stratford Lane, Sandy, June, (M.V.), a new locality. Presumably dependent on the Bed-straw of the surrounding heath.

156. *Drepana falcataria* (Linn), Pebble Hook Tip: Sandy, June, (M.V.); a new locality, (BW, KW).

871. *Bupalus piniaria* (Linn), Bordered White Beauty: Rowney Warren, 1956, (TNDP). Previously unrecorded for this locality which is, however, a typical habitat.

B. B. WEST.

## ODONATA

The long dry summer saw many insects on the wing long after their normally accepted seasons and the later ones were still flying well into advanced autumn.

Many known habitats were visited, and species recorded during previous years were again noted but new records were not established and it would appear that this field of study as far as our county is concerned has been fairly well covered. I have to report that the list published in last year's Journal was not complete as Mr Ray Palmer has forwarded his records for 1951 of *Sympetrum danae*, which I stated to be a rarity in the county, but which he found in plenty in one habitat; his list is here given in its entirety.

### NOTE ON BEDFORDSHIRE DRAGONFLIES

RAY PALMER

1951 Records from Wavendon Heath ponds (Parish of Aspley Heath, Beds.):

6th June. Dragonflies at Wavendon Heath ponds included *Libellula quadrimaculata*, *Pyrrhosoma nymphula* and *Enallagma cyathigerum*.

11th September. Several specimens of *Sympetrum danae* taken at Wavendon Heath lower pool.

12th September. *Sympetrum danae* seems quite abundant at Wavendon Heath pools, also a few *S. sanguineum* and *Aeschna cyanea*.

15th October. *Sympetrum danae* and *Ae. cyanea* still on the wing at Wavendon Heath pools.

As the summer advanced various small ponds and ditches dried right out and did not contain water again until long after anything was on the wing,

so that the depositing of eggs in these sites could not have taken place, and what life they contained must have had a hard struggle to survive, if survive it could, so it will be interesting to see what effect these conditions will have upon this year's insects.

It is the intention to visit Wavendon Heath ponds this year to see if the same conditions still obtain in that habitat. In a locality which appears to have been so long established it is fairly safe to assume that conditions have not greatly altered.

There must be many small areas of permanent water, some accessible, others quite private and unapproachable, which support their quota of Dragon-fly life and which it has not been possible to visit. I may have no knowledge of them, but members of the society may both know them and have seen things which they have not considered of interest. I should be pleased to hear from anyone who knows of such places, if only for a new locality of something already recorded.

K. E. WEST.

### MAMMALS

Although there was nothing of exceptional interest to report during the year I am happy to see that there is a keener interest being shown by an increasing number of members in this section, and I have received several interesting reports from members, one of whom must be singled out for special mention—Geoffrey Harper. He has been most active in the field and his notes have given most detailed and valued information.

Further knowledge has been acquired during the year on Badgers and their distribution, and there have again been reports of death on the roads. Foxes have suffered during the autumn and winter from a specific disease which apparently has destroyed relatively large numbers and is giving rise to some concern.

The newly-formed Chiltern Research Committee has decided to investigate the distribution in that area of the Muntjac Deer, and here is an opportunity for members of the Society to study their whereabouts, both in that region and, indeed, all the woodlands of the county.

Of the smaller mammals there have been several records of Pygmy Shrews both from the north of the county and from the Luton area. This animal I feel sure is of relatively wide distribution but is often overlooked. The same remarks probably apply to the Harvest Mouse and I am pleased to learn that these have been seen alive by Mr D. W. Elliott at Bury End, Stagsden, and by Mr C. F. Green at Stevington.

I hope that 1960 will see a great increase of interest in the wild animals of the county, and I suggest that members would do well, particularly when in woodland, to search out keepers' gibbets for evidence of species that have been shot or trapped. I shall welcome any specimens forwarded for identification and be pleased to assist any member wishing to study any group of mammals.

HENRY A. S. KEY.

## Notes and Observations

### GARGANEY BREEDING IN BEDFORDSHIRE IN 1959

A pair of Garganey was present from 12th April to 18th June, 1959, at the Stanford gravel pits and Southill Park Lake. On 23rd May at Stanford, a pair with one young about 7-10 days old were watched for over an hour from a distance of about 35 yards.

A brief description of the young is as follows: Upper parts and crown dark brown, ear coverts, chin and breast pale yellow. Bill dark, with two



dark streaks through the eyes. The young was active, and was seen to take insects from the surface of the water.

On 28th May the young could not be found, and although the pair flew in at dusk to feed, they showed no interest in their nesting site. On one occasion when the male was swimming near the female, he uttered a low crackling note, and the neck was extended.

The above-mentioned nesting site was situated near cross-roads, and was disturbed at week-ends by young boys and bathers. Carrion Crows were also plentiful. This appears to be the third breeding record for Bedfordshire.

A. R. JENKINS.

#### CARRION CROW ANNOYING CAT

I have read of a pet crow tweaking the house cat's tail, but the crow in the following account was a truly wild bird.

On the 22nd of May on the short grass of a football pitch in Kempston, I observed a carrion crow harassing a Siamese cat. The cat was walking very slowly across the pitch, with the crow walking less than two feet behind it. This looked comical as well as seeming unusual, as one would have expected a proposed attack would have been made from the air. Occasionally the bird got almost near enough to peck, but the cat, which kept giving backward glances, turned quickly round to face it, and sometimes made a spring. The crow anticipated the springs, and each time achieved a flying jump out of reach. Directly the cat resumed its walk, the crow followed on behind again, and persisted with its annoyance until they reached the bordering long grass. The bird now seemed to realise that it would be at a disadvantage in long grass and immediately flew away.

No carrion crow's nest would be within 100 yards distance.

C. S. PAYNE.

## Obituary

### H. F. BARNES, M.A., Ph.D.

The sudden death of Dr. H. F. Barnes early this year came as a grievous shock to his many friends and particularly to the members of this Society, and as one who knew him for nearly fifty years, I should wish to pay a brief tribute to his memory.

We first met in 1912. His elder brother and I were companions on many a birdnesting expedition, but his interests were more towards botany and insects. I lost touch with him after leaving school; his father had died and the family left Bedford, but he returned here subsequently so that his children should have the benefit of Bedford education, although this involved him in the tedious daily journey to Harpenden where he was a senior member of the staff on the Rothamsted Experimental Station.

He took a keen interest in our Society as soon as it was formed in 1946 and was appointed at once to the Editorial Committee. In 1948 he was elected to the Council, and in 1949 he took on the office of Membership Secretary. When Mr. Ray Palmer left this district in 1952, Dr. Barnes willingly undertook the Editorship of the Society's Journal and maintained that publication at its previous high standard until he left Bedford in 1956 to live near his work at Harpenden. During those years, too, the Society's Council held their Bedford meetings at his home, where his hospitality was warm and generous.

A man with a wide knowledge of all aspects of agricultural entomology, he was an acknowledged authority on plant galls, and many of us turned to him instinctively for guidance on mollusca.

Like many learned men, he was quiet and unassuming; he was much in demand as a lecturer by ordinary non-scientific folk, and he never "talked down" to his hearers.

The success of our Society was due to the devoted efforts of one or two inspired pioneers in its early years. Dr. Barnes was one of these pioneers, and we who are left to carry on remember him with gratitude and appreciation.

F.G.R.S.

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## NEW MEMBERS

(Up to 31st March, 1960)

- Adamson, R. M., 8 Laburnum Road, Sandy.  
 Atterbury, G., 115 Alexandra Avenue, Luton.  
 cBedford Borough Library, Harpur Street, Bedford.  
 aBignell, R. P., 11 Poynter's Road, Dunstable.  
 sBriggs, A. H., 25 Beaumont Avenue, St. Albans, Herts.  
 Brough, Miss H., 10 Rothsay Place, Bedford.  
 Cartwright, C., Flat 2, 30 Shakespeare Road, Bedford.  
 Crawley, E., 32 Steppingley Road, Flitwick.  
 Dickson, Miss W. E., 29 Chaucer Road, Bedford.  
 Donaldson, Miss J. M., 49 The Grove, Bedford.  
 Faulkner, Rev. J. W. H., 196 Foster Hill Road, Bedford.  
 Gell, Miss E. L., 31 Rosamond Road, Bedford.  
 jGillson, H. B., The School House, Milton Ernest.  
 sGray, C. H., 31 Hadrian Avenue, Dunstable.  
 Hodgkinson, Miss M., East Grange, Felmersham.  
 Hughes, Miss S. M., 97 Bromham Road, Bedford.  
 Hunt, R. J. J., 33 Queen's Road, Berkhamsted, Herts.  
 jHupp, Miss J., The Barns, Grange Road, Blunham.  
 sJennings, T. J., 16 Cottage Road, Sandy.  
 King, Miss E. A., 83 Spenser Road, Bedford.  
 Linsell, Mrs N., 55 Claremont Road, Luton.  
 Lutener, Miss B. M., 1 Brickhill Drive, Bedford.  
 Martin, R. G., 16 Shakespeare Road, Bedford.  
 jMay, Miss B., 156 Bower Street, Bedford.  
 Norman, Miss R., 11 Cutcliffe Grove, Bedford.  
 Parkinson, Mrs. P. M., 64 Village Road, Bromham.  
 jParkinson, J. J. G., 64 Village Road, Bromham.  
 jParkinson, R. W., 64 Village Road, Bromham.  
 Peterkin, D., 133 Manor Road, Barton in the Clay.  
 Tysoe, Miss M. K., 2 Franklin Gardens, Clapham.  
 Wagstaff, R. V. A., 29 Grasmere Avenue, Warden Hill, Luton.  
 Weeden, K. R., 14 Farringdon Road, Luton.  
 Wild, Mrs F., 41 Manor Road, Caddington.  
 jWilkinson, E. M., 28 Biddenham Turn, Bedford.  
 sWilkinson, P. J., 28 Biddenham Turn, Bedford.  
 Young, Mrs M., Woodstock Cottage, High Street, Flitton.  
 jYoung, J. A., Woodstock Cottage, High Street, Flitton.

## CHANGES OF ADDRESSES

- Bates, P. S., 80 Great Northern Road, Dunstable.  
 Cranfield, Miss A., 97 Ashburnham Road, Bedford.  
 Dillingham, G., 7 Bromham Road, Biddenham.  
 Dillingham, Mrs F. M., 7 Bromham Road, Biddenham.  
 Elliot, D. W., The Cottage, Bury End, Stagsden.  
 Goode, Rev. R. H., 60 Park Road, Stevington.  
 Habgood, F. C. D., "Sonning," Pavenham.  
 Jarvis, C. McKechnie, F.L.S., 13 Sloane Gardens, London, S.W.1.  
 Keens, Mrs H. M., 58 The Avenue, Leagrave, Luton.  
 Keens, Miss P., 58 The Avenue, Leagrave, Luton.  
 Meadows, E. G., 125 Stockingstone Road, Luton.  
 Metcalfe, Dr G. A., 63 Kimbolton Road, Bedford.  
 Metcalfe, Mrs D. E., 63 Kimbolton Road, Bedford.  
 Stephen, J. D., 481 Dunstable Road, Luton.  
 Wallis, Miss J., Pear Tree Cottage, Church End, Biddenham.

## CONDITIONS OF MEMBERSHIP

The Council of the Society shall approve each application for membership, but subject to this condition, membership shall be granted on payment of the annual subscription, viz :

- 10s. 0d. Ordinary members and affiliated institutions (full membership).
- 7s. 6d. Full-time students (full membership).
- 5s. 0d. Associate members (do not receive the Society's Journal).
- 2s. 6d. Junior members (under sixteen years of age, do not receive the Society's Journal).

Application forms for membership can be obtained from the *Hon. Treasurer*, 91 Putnoe Lane, Bedford.

## LIFE MEMBERSHIP

Any member may compound for life by a single payment of £10.

## SUBSCRIPTIONS

Members are reminded that their subscriptions are due on the 1st January in each year. These should be sent to :

*The Honorary Treasurer,*  
J. M. DYMOND,  
91 Putnoe Lane, Bedford.

## NOTICE TO CONTRIBUTORS

The Editorial Committee welcomes suitable contributions on the natural history of the county for publication in *The Bedfordshire Naturalist*. Short paragraphs from members about their own observations of general interest are specially desired. Whenever possible, material should be typewritten in double spacing on one side of the paper only ; if this cannot be arranged it must be written very legibly. Illustrations should not be prepared before consultation with the Editor.

Contributions for the 1960 Journal must be sent to the *Honorary Editor* by 31st March, 1961, and anything received after this date will be returned or held over for a subsequent issue.

## SETS OF THE JOURNAL

Complete sets of the JOURNAL (Nos. 1-13) are now obtainable, price 32s. 6d., from the *Hon. Librarian*. Single copies remain at five shillings each.