



H.R.H. Prince Philip with the Conservation Corps at Wicken Fen, July 1960 Central Press Photo

NATURE

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CAMBRIDGESHIRE

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Cambridgeshire and Isle of Ely Naturalists' Trust Ltd.

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The drawings were specially done for this number by
Mr. B. Golding

EDITORIAL

The subject of Nature in Cambridgeshire is far from being exhausted, and in this our fourth number it has been possible to increase the number of pages devoted to notes and papers on natural history. Whether it will be possible to maintain this increased size in future years depends on two things, money and contributions; but if the present healthy expansion of the Trust membership continues there seems no reason why both should not be forthcoming.

The list of members is not included in this issue; it will be published next year and in alternate years after that.

In these days when life is lived less and less according to nature, the spread of Naturalists' Trusts is an encouraging sign. Most English counties now possess one, though there are still a few gaps which we hope may be filled before long. Their achievements are not always spectacular, but in at least two problems which have become national concerns they have been active recently. These are the treatment of roadside verges, which are increasingly important as reserves of plant and animal life, and the very complex problem of the effects on wild life of chemicals used in agriculture. For both these matters an educated public opinion is essential if any hearing is to be obtained for the naturalist's case, and to encourage this public opinion is one of the first concerns of the Trusts.

We are always grateful for contributions (which, as before, should be sent to P. G. Hall, 42 Panton Street, Cambridge), but may we appeal to contributors to submit their material early for next year's journal, if possible before the end of this year? This would greatly simplify the work of the Editor and Secretary in preparing for publication.

In the meantime, the season is once more inviting us to resume the natural history explorations which many of us have laid aside for the winter, and of naturalists as of bees (an article on which appears on another page) it may be said:-

*Saepe etiam duris errando in cotibus alas
Attrivere, ultroque animam sub fasce dedere:
Tantus amor florum et generandi gloria mellis.*

CAMBRIDGESHIRE AND ISLE OF ELY
NATURALISTS' TRUST LIMITED

FOURTH ANNUAL REPORT, 1960

The death of our Treasurer, Alfred Burton, in February was a serious loss to the Trust and a sad blow to his colleagues on the Council with whom he had worked from the foundation meeting in 1956. (An appreciation of Alfred's work for the Trust was included in last year's Journal). Mr. Steff as Treasurer and Mr. Faulkner as Assistant Treasurer were appointed before the 1960 Annual General Meeting; Mr. Faulkner is now in charge of membership, and he was able during the summer to circulate all resident life members of the Cambridge Natural History Society not yet members of the Trust. As a result of this drive and the general recruiting efforts of members, we had reached and passed our original target figure of 200 members by September.

The clerical and administrative work of the Trust is increasing - a healthy development, but one which imposes an ever-growing strain on the voluntary officers. Miss K. B. Gingell has been giving very valuable assistance in recent months, in particular by taking over the task of circulating all notices, news-letters etc. At its October meeting, the Council agreed on the desirability of appointing a Photographic Officer, and Mr. D. M. Cheason has volunteered to undertake this. The work of the Technical Committee and its Field Committee is the subject of a separate report by Dr. Perring.

Negotiations over Sites

It is not possible to report in detail on all negotiations. The following, however, are likely to be of the greatest interest to members.

1. Thriplow Meadows

Lord Walston has agreed to give the Trust a seven-year lease at a nominal rent of one of the 'orchid meadows', so that experimental cutting and grazing may be undertaken to determine the conditions under which such a rich flora persists. When the formalities of the lease are concluded, the meadow will therefore be the first property of the Trust.

2. Ouse River Board Pits

During the year the River Board kindly supplied to the Trust a list of the old clay-pits owned by them in the County, and surveys were undertaken by Trust members. On the basis of these surveys, the Trust gave to the River Board a short list of pits which it would be interested in acquiring or leasing. Negotiations are not yet complete, but it now seems very likely that some at least of these pits will be made available to us in the near future. Abandoned pits constitute increasingly valuable reservoirs of plant and animal life in a County so highly arable as ours. We are grateful to our members Mrs. G. Crompton, Mr. E. A. George and Mr. P. D. Sell for undertaking the surveys.

3. Quy Fen

Dr. Perring, as Chairman of the Quy Fen Trustees, reports as follows:

'Regular meetings of the Trustees have taken place during the year. A new agreement has been drawn up with the tenant and will shortly be completed. The fen may be visited at will but the Trustees have made certain restrictions in the interests of natural history and the grazing rights of the tenant. Notices informing the public of these restrictions will shortly be erected.

During the summer the tenant, at his own expense and with the consent of the Trustees, deepened 'the cut' (the largest coprolite pit) on the west side, an advantage to swimmers and fishermen as well as creating more diverse habitat conditions for plants.

A great deal of the fen round 'the cut' has been under water throughout the winter (1960 - 61), and it will be interesting to see whether plants like Schoenus and Anagallis tenella are more abundant next summer as a result.'

4. Parish Pits

Agreement has been reached with the Parish Councils of Stapleford, Orwell and Barrington over the management of Parish Pits in their jurisdiction, and negotiations are proceeding with several other Parish Councils. A very successful pit-clearing exercise was carried out at the Stapleford Parish Pit, Little Trees Hill, on Saturday, 24th September, when scrub was trimmed back and a lorry-load of scrap and rubbish was removed. A start was also made at Barrington in October and November, but the weather was unkind.

Village Ponds Survey

Very useful work has been done during the year, but more help is required in 1961 if the Trust is to take effective action in view of the rapid disappearance of ponds. It is not of course practicable for the Trust to do more than concentrate on a small number of village and other ponds throughout the County, and naturally those ponds which the owner or authority is already actively preserving will on the whole be most profitable. Very encouraging negotiations are now in progress with Fulbourn Parish Council about the village pond there, and it is hoped that any agreement reached in this case will provide a valuable precedent.

Area of Natural History Interest in Cambridge City

The Lime Kiln Close Management Sub-committee of the City Council's Commons Committee met in September to receive a report on the Close from Mr. W. Kingdon and Dr. Walters, representing the Trust. The recommendations of this report were adopted by the Council, and the City Surveyor was authorised to offer the necessary help with tools, etc. to a Trust work-party clearing a track round the back of the Close where it is too thickly overgrown. In general the Trust's report stressed how satisfactory the Lime Kiln Close 'nature reserve with free public access' is from our point of view.

At the same meeting, the Trust presented a report on the natural history interest of a small area of rough marshy ground by the river Cam generally known as 'Paradise'. This report was considered at a City Council meeting when the future use of this land was considered, and the Council decided to retain the land on the Development Plan as a 'public open space'. At some future date, therefore, the 'Paradise' area may be reserved for free public access and natural history use in the same way as Lime Kiln Close.

In general, the Trust's representatives found a very sympathetic consideration of their interest in sites within the City, and were encouraged to provide information and make suggestions as to management policy.

Visit of H. R. H. Prince Philip to Wicken Fen

Our Patron, Lord Fairhaven, represented the Trust on the occasion of Prince Philip's visit to Wicken as Patron of the Council for Nature (see report of Wicken Fen Committee p.12).

Roadside Verge Survey

Mr. W. H. Palmer and Dr. A. S. Watt undertook to plan a preliminary survey of the roadside vegetation along a six-mile stretch of the A.11 London - Newmarket road. Similar surveys are being undertaken in some other counties at the suggestion of the Council for Nature, who hope that it might be possible, in the light of detailed information collected, to interest amenity and tourist organisations in the problem of the roadside verge flora.

Arising from this survey, Dr. Perring and Dr. Watt saw the Cambridgeshire County Surveyor about the Trust's interest generally in roadside verges, and found him very sympathetic. The following points were established:-

- (a) No roadside spraying is being done by the County Council in Cambridgeshire proper.
- (b) If the Trust notifies particular stretches of roadside (where, for example, there are rare species) these can be given special treatment by the County Surveyor's Department.
- (c) In general, the advice of the Trust on re-seeding and experimental treatment of roadside verges would be welcomed.

Field Meetings

A successful programme of joint meetings with the Cambridge Natural History Society was carried out during the year. The weather was by no means so kind as in 1959, but the average attendance kept up well in spite of this. (Detailed accounts of these excursions are given on p.14).

Other meetings

The Annual General Meeting was held in Cambridge on Saturday, 23rd April. After the business meeting, Mr. E. J. H. Corner, Reader in Botany in the University, gave a very stimulating talk on International Nature Conservation. As in previous years, the Trust's publications and information leaflets were available at the Natural History Society's Annual Conversazione on Wednesday, 4th May. Two successful indoor meetings were held in December; the usual Members Meeting in Clare College on Tuesday, 6th December when nearly 40 members and friends were present, and a Film Meeting in the King's School, Ely on Friday, 16th December. The latter meeting was the first the Trust has held in Ely, and provided very valuable contacts and publicity, including a well-written account in the local press.

Publications, publicity, and information to members

The Trust Journal is now well established, and the Council has confirmed during the year its essential publicity value; in spite of rising costs of production, it will remain therefore at its present size and format. The support of the Cambridge Natural History Society continues, and material for publication (though usually late in arriving!) seems to be readily available.

The usual six-monthly news-letters have been sent to members, together with the Council for Nature's 'News for Naturalists' as available. Members have continued to supply 'Nature Notes' for publication, and the usual donation has been received from the Cambridge Daily News.

Talks have been given by several officers and Council members to local organisations on aspects of the Trust's work and nature conservation in general.

Growth of the County Trust Movement

The year 1960 has seen an extraordinary expansion of the movement, stimulated by a very successful Conference of Naturalists' Trusts held in Skegness in May. Mr. Palmer and Dr. Watt attended as our representatives. The Trusts Committee of the Society for the Promotion of Nature Reserves now serves to co-ordinate Trust policy, and as a vehicle by which the established Trusts can offer advice, literature etc. to Trusts in process of formation. We welcomed during the year the formation of a County Trust for Bedfordshire and Huntingdonshire, and the first steps in the formation of a Trust for Suffolk.

Council for Nature and National Conservation Problems

The Council for Nature has continued and indeed expanded its valuable work in many fields during the year. Of particular importance to the Trust is its work to arouse public concern over the use of toxic sprays and seed-dressings in agriculture. Largely as a result of the pressure of naturalists' and country-lovers' opinion expressed through bodies like the Council for Nature, the end of the year saw important action by the Ministry of Agriculture, in calling a conference of all interested parties to discuss the effect of toxic seed dressings on wild life.

The scale of these and other conservation problems emphasises how important it is to strengthen the Trust on a County basis. Only if a sufficient number of ordinary people show real concern about the effect of policies 'made

in high places' can we hope to make our reasoned case heard effectively. Two hundred members is a start, but we must aim to double that in the next four years.

Report of the Technical Committee

Now that reports have been prepared on most of the sites of scientific interest in the county, the major task of the Technical Committee has been completed, and it has been agreed that in future the committee need only meet about once a year to consider general policy in relation to sites. The supervision of the sites would now be dealt with by the newly-formed Field Committee.

The Technical Committee met in October and discussed in particular parish pits, village ponds and roadside verges, and made recommendations upon the negotiations and investigations which were necessary for sufficient examples of all three types of site to be preserved.

The Field Committee met for the first time in May and again in July. At the first meeting all the sites in which the Trust is interested were reviewed and responsibility for supervision of them was divided between the ten members.

A great deal of work was done and the Trust now has a system whereby up-to-date information on each site is readily available. Moreover, each member of the committee is expected to make himself known personally to the owner or tenant of each site so that problems of access and management can be freely discussed.

If any members, particularly those living out of the city, would like to assume responsibility for watching our interests the Secretary would be pleased to know.

TREASURER'S REPORT

There has been a welcome increase in membership which now exceeds 200. A worthwhile annual increase is essential if we are to carry out our aims as our growing experience and energies prompt us.

Subscriptions provide our income. More income will enable us to increase the scope and usefulness of our work.

The small excess of expenditure over income during the past year arose from our having to replenish our stock of printed stationery.

If each member will do all possible to introduce at least one new member during the coming year we shall face the future better equipped.

Since the end of the year under review we have been particularly pleased to welcome one of the Colleges as a member. We hope that further Corporate Bodies will assist us by membership.

Balance Sheet 31st December 1960

31/12/59	Accumulated Fund	82 4 9	31/12/59	Stock of Publications		2 9 -
76	Balance at 1st January 1960	11 18 11	70 5 10	Sundry Debtors:-		
6	Excess of Expenditure over Income for year			Miscellaneous		14 6 2
				Income Tax repayable		10 4 11
123	Life Membership Subscriptions:-	145 10 -	3	Subscriptions in arrears		24 11 1
30	Balance at 1st January 1960	30 - -	27			
133	Received during year	175 10 -	122	Cash at Bankers:-		62 17 2
			156	Current Account		161 9 7
8	Less: Transfer to Income and Expenditure Account	9 10 -	278	Deposit Account		224 6 9
80	Current Liabilities:-	8 8 -				
	Sundry Creditors	6 13 -				
1	Subscriptions received in Advance	15 1 -				
		£251 6 10				£251 6 10

Signed: Alex S. West
 Secretary }
 S. Max Walters } Council Members
 Honorary Secretary

Auditors' Certificate

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit. In our opinion proper books of account have been kept by the Company so far as appears from our examination of those books. We have examined the above Balance Sheet and annexed Income and Expenditure account which are in agreement with the books of account. In our opinion and to the best of our information and according to the explanations given us the said accounts give the true and fair view of the Company's financial position as at 31st December 1960 and of the Income and Expenditure for the year ended on that date.

Norwich Union Buildings,
 Downing Street,
 Cambridge.
 23rd March 1961

PETERS, ELWORTHY & MOORE
 Chartered Accountants

CAMBRIDGE NATURAL HISTORY SOCIETY

President: Dr. R. W. Hey

Report for 1960

The year 1960 was a notable one in the Society's History for it was marked by the publication, in May, of 'The Geology and Soils of Cambridgeshire' by R. W. Hey and R. M. S. Perrin. It was well received, and already many copies have been sold. Unfortunately, the cost of publication was unexpectedly large, and the Society was left in a rather shaky financial position.

Six general meetings were held in the Lent and Michaelmas Terms at which the following talks were given:

Dr. D. W. Tucker	'Loch Ness: The Case for Investigation'
Dr. M. W. Holdgate	'Antarctic Biogeography'
Dr. M. N. Hill	'Mountains and Plains beneath the Atlantic Oceans'
Prof. J. Z. Young F. R. S.	'Octopuses'
Dr. G. C. L. Bertram	'Lords of Creation - their numbers and their needs'
Prof. O. M. B. Bulman F. R. S.	'Evolutionary changes in Graptolite colonies'

In addition to these meetings, which were well attended, there were twenty-six sectional meetings covering various zoological, botanical, geological, and entomological subjects.

The Society's Annual Conversazione and Exhibition, most ably organised by Mr. S. H. P. Maddrell, was held on Wednesday May 4th in the Zoological Laboratory. There were 50 exhibits, somewhat fewer than in 1959.

During the summer, members of the Society joined Trust members in a number of excursions to places of interest to naturalists, in and around Cambridgeshire.

L. J. Walley Senior Secretary

Life membership 30/-. A three-year membership for undergraduates, 12/6. Annual subscription for members of training colleges and schools in Cambridge, 5/-.

Applications for membership can be made as follows:-

City: Mr. W. H. Palmer, Homerton College, Cambridge.

University: Mr. C. Turner, Queens' College, Cambridge.

'The Geology and Soils of Cambridgeshire' by R. W. Hey

and R. M. S. Perrin, may be obtained from:-

The Treasurer, C. N. H. S., c/o Zoological Laboratory,

Downing Street, Cambridge. Price 4/-.

NATIONAL TRUST

WICKEN FEN LOCAL COMMITTEE

Wicken Fen is one of the most famous Nature Reserves in the country. It lies between Ely and Newmarket, some ten miles north-east of Cambridge. The total of land owned by the National Trust is about a square mile, and consists of three main areas, Wicken Sedge Fen proper, St. Edmund's Fen, and Adventurers' Fen. The property is administered by a Local Committee of the National Trust. The officers of the Executive Committee for 1960-1961 are as follows:-

Chairman: Dr. J. T. Saunders
Hon. Secretaries: Dr. J. Smart, Department of Zoology,
Cambridge.
Dr. S. M. Walters, Botany School,
Cambridge.
Hon. Treasurer: Dr. M. G. Pitman, Botany School,
Cambridge.

To visit the Fen, go to the Keeper's House, Lode Lane, Wicken, and sign the visitors' book. No collecting of any kind is allowed unless written permission has first been obtained from one of the Secretaries.

Extracts from the Report for 1959/1960

A wet summer in 1958 was followed by a phenomenally dry one in 1959. As foreshadowed in last year's Report, it was not possible to keep the ditches into Milner-White's Fen full by use of the wind-pump, although this undoubtedly made an important contribution to retaining a reasonably high water-table until June. Growth of reed was exceptionally vigorous, and a large saleable reed-crop was taken off West Adventurers' Fen during the winter. Areas of reed were cut on the Mere, as directed by Dr. Thorpe, with the special ornithological interests of the area in mind. However, the four Bearded Tits which were on the Mere through the winter did not, unfortunately, stay to breed.

No attempt was made to extend the bush-clearing during the normal winter work programme, in view of the reduction of the labour force from three to two. The men however were able to clear the surroundings of the 'Godwin plots' near Drainer's Dyke, thus making this important demonstration area much more accessible for parties of students.

Two work parties of the Conservation Corps of the Council for Nature consisting of 18 and 34 young people

undertook bush-clearing on Milner-White's Fen from April 19th to 27th, and from July 6th to 13th. About $2\frac{1}{2}$ acres was cleared and the bushes were stacked to be burnt as convenient under the Keeper's control. Programmes of evening talks and tours of the Fen were arranged by members of the Committee, and the camps were very successful from every point of view. On Friday, July 8th, H. R. H. the Duke of Edinburgh visited the Fen to see the Conservation Corps at work, and members of the Executive Committee were present. This visit was a very successful occasion, and gave much useful publicity in the national and local press.

The small punt was installed on the Mere in February, and proves ideal for surveying the area. The island can now be visited, and a report on the development of the vegetation prepared.

The Museum was open from May to September, and from appreciative comments received has obviously been of interest and value, particularly to visiting school parties. Mr. W. Lane has given much valuable help in arranging the Museum. In spite of the very dry summer, most of the Fen plants established in the Garden grew well, and Peucedanum palustre flourished.

The Swallowtails had a very good season, and most Peucedanum plants on Milner-White's Fen had larvae on them in the summer. Larvae were also found on plants in the area on St. Edmund's Fen experimentally cleared in spring 1958. There were several records of adults seen well outside the Fen in the Wicken area.

A colony of the Marsh Carpet (Coenotephria sagittata Fab.) was discovered on the Sedge Fen last summer. (See article on p. 38).

The 'Guide to Wicken Fen' has been reprinted with minor modifications, notably the inclusion of the Addendum describing the post-war developments of Adventurers' Fen and the wind pump. The Membership Leaflet is included with all copies of the reprinted Guide.

The Committee is responsible for general maintenance of Chippenham Fen, and it is gratifying to be able to report negotiations between Mrs. B. M. Bacon and the Nature Conservancy about the future of the Chippenham reserve, at present under Covenant to the National Trust. These negotiations are designed to protect the Fen more formally and ensure its future as a National Nature Reserve.

1959 was a record year for visitors to the Fen. More than 2,500 people were registered in the book kept at the Keeper's House; this includes just over 2,000 individual signatures, and 20 organised parties varying in size from 6 to 54 members.

FIELD MEETINGS IN 1960

Seven Saturday field meetings were held jointly with the Cambridge Natural History Society. (Approximate numbers attending each meeting are given in brackets).

Saturday, May 7th. Buff Wood (40)

About 40 members and friends gathered on a warm sunny afternoon at East Hatley for a visit to Buff Wood. After a short introductory talk on the history and ecology, Dr. Watt led the party through some of the most interesting and characteristic parts of this boulder-clay wood. Members were particularly pleased to see the Oxlips, Primula elatior, Herb Paris, Paris quadrifolia, and a flourishing colony of the Green Hellebore, Helleborus viridis. Dr. Whitehouse demonstrated a number of Bryophytes and assisted in their identification.

Saturday, May 28th. Dullingham Sand-pits (30)

For their second excursion of the year the Naturalists' Trust investigated an abandoned gravel pit at Dullingham. It was immediately clear that the very dry spring had affected the growth of annual species of flowering plants; many of them had hardly developed beyond the seedling stage whilst all were small and stunted. Nevertheless it was possible to find plenty of 'Blue Fleabane', Erigeron acer, some Cudweed, Filago germanica, and one or two plants of Venus's Looking-glass with its delicate reddish-purple flowers more often a weed of our chalky fields but here growing on a steep sandy bank. Nearby on another bank the moss specialists were able to find one or two species which are rare in Cambridgeshire, including Polytrichum juniperium which is very abundant in the Breckland further north.

After an early tea the party moved to the Stetchworth end of the Devil's Dyke to admire the wonderful patch of the Cranesbill Geranium sanguineum in its only known station in East Anglia. We were also lucky enough to find two specimens of the rare Fleawort, Senecio integrifolius. The view from the top of the Dyke was a delight in itself - rarely can the air have been clearer and Ely Cathedral was easily seen on the northern horizon. Over 30 members and friends enjoyed a most satisfactory excursion in perfect conditions.

Saturday, June 18th. Wicken Fen (60)

For their third excursion this season, the Cambridge-shire Naturalists visited the famous Nature Reserve at Wicken owned by the National Trust. The day was bright and hot, but cloud gradually spread during the afternoon, and the visit was successfully concluded before a heavy storm broke in the evening. More than 40 members and friends gathered at the entrance to the Fen, and were joined there by a party of 20 or so from the Stapleford Horticultural Society. Dr. Walters gave a brief introductory talk, and then with the help of Mr. Ing and Mr. Palmer, showed the party round the Fen in groups, visiting the windmill and the observation hide.

Mr. B. O. C. Gardiner, of the University Entomological Field Station, had brought a number of adult Swallowtail butterflies reared artificially, for release on the Fen. The Swallowtail, which became extinct at Wicken in 1950, was re-introduced in 1955, and further reintroductions have been made annually after some butterflies of the previous year's stock have been seen flying on the Fen. The naturalists were very interested to see the butterflies released, and several members took colour photographs of the Swallowtails resting on flowers.

Of the fenland flowers, the Marsh Orchids were particularly good; the colours ranged from pure white through pink to a deep purple. The rare Marsh Pea and greater Spearwort were flowering, and the first flowers of the Bladderwort were just appearing in the brickpits. Among the birds of the fen, the grasshopper-warbler's song was unmistakable.

After a tea-time halt, some members visited the small Museum near the Keeper's House, in which the modest exhibits are devoted to the natural history of the Fen.

Saturday, July 2nd. Chrishall Grange Plantation (14)

For their fourth excursion this season, the Cambridge-shire Naturalists visited Chrishall Grange Plantation by kind permission of Lord Hampden.

The small party of 14 braved nettles and brambles to see a large clump of Water Avens in the new plantation, but were very disappointed not to find even leaves of the Foxglove, which had been found there two years ago - the only locality for the Foxglove in Cambridgeshire being in Gamlingay.

However, it was very exciting to see the Pyramidal Orchid and a large quantity of Viper's Bugloss was found while most of the members were having tea. It had been

decided to have tea by the roadside which is part of the Icknield Way in the hope of seeing there the Horseshoe Vetch and the special Eyebright of chalk downs, but both have been lost owing to spraying of the roadside in the spring - a fact that was much lamented by all the members. After tea the members were conducted one by one by the youngest member to see a baby cuckoo in a hedge sparrow's nest.

The members appreciated the kind help of Mr. Goodship, Lord Hampden's head gamekeeper, on the excursion.

Saturday, July 30th. Reach and Devil's Dyke (42)

The fifth combined excursion of the Cambridgeshire and Isle of Ely Naturalists' Trust and the Cambridge Natural History Society took place on July 30th. The large party of 42 members and friends met on the beautiful and unspoilt Village Green of Reach.

The first half of the afternoon was spent walking along the Devil's Dyke. The leader, the Rev. C. E. Tottenham, asked members to report if any Red-backed Shrike were seen, since they are known at the Newmarket Road end of the Dyke - though no Shrikes were reported but members did see one party of at least 15 Long-tailed Tits, 5 separate parties of Goldfinches, and a Linnet's nest with 4 eggs was found. It was also interesting to compare similar butterflies like the Chalk Hill Blue with the Holly Blue, and the Meadow Brown with the Gatehanger.

On the way back were found some interesting chalk cornfield weeds including the Corn Venus' Looking-Glass (Specularia hybrida) and two of the rarer Fumitories.

After tea on the Green a walk was taken along the Lode and the members enjoyed the splendid sight of a fen waterway in full flower - The white Waterlilies were as abundant here as the common yellow ones. Amongst the lilies were some fine spikes of Mare's Tail (Hippuris vulgaris), the pink flowering heads of the amphibious Bistort (Polygonum amphibium), and at least 3 different Pondweeds; The tall reed grass (Glyceria maxima) was abundant along the sides of the Lode - Along the edges flowered the marsh Bedstraw, the Water Forget-me-not and the Water Plantain and there were many dropping seed pods of the Yellow Flag.

Especially noteworthy were two plants each of the Flowering Rush (Butomus umbellatus) and Arrowhead - (Sagittaria sagittifolia) - Both these plants have become much rarer during this century and the beautiful pink flowers of the Flowering Rush were greatly admired.

Saturday, September 3rd. Sawston Hall and Moor (16)

The sixth joint excursion was held on September 3rd at Sawston Hall by kind permission of Capt. and Mrs. Huddleston.

The unceasing rain all morning resulted in only 16 members being present. Their courage was rewarded for the afternoon was fine. Even the sun shone and the rare Umbellifer Selinum carvifolia was flowering in abundance.

The party met in front of perhaps the most beautiful house in Cambridgeshire - being in part built with the limestones from Cambridge Castle. Mr. Teversham kindly led the way and showed the party first four plants of the Grass of Parnassus (Parnassia palustris) growing on the bank of a ditch. After crossing on to the Moor the splendid sight of hundreds of flowering Selinum was greatly admired. (Selinum carvifolia was first discovered in England in 1882, and of the five localities once known for it, today it is only extant here and in the Chippenham - Fordham area). With the Selinum was Sawwort (Serratula tinctoria), a plant at first difficult to distinguish from the more abundant common Knapweed. Before leaving the Moor a few leaves of the Bog Pimpernel (Anagallis tenella) were seen. This is a plant today only found with certainty in one other locality in the County. The ditches of the Moor were filled with flowering Fen Sedge, (Cladium mariscus). Although the area of the Moor is quite small it was interesting to note the similarity of the plants growing here with those found in a typical fen margin area as at Chippenham Fen.

From the Moor a walk was taken through the woods which were ablaze with large orange flowers of Senecio clivorum, a plant introduced at Sawston Hall about 1890, which has naturalised itself in a remarkable way.

Saturday, October 1st. Chippenham Fen - Fungus Foray (45)

In spite of unpromising weather, there was a good gathering of members and friends - 45 in all - for the final meeting of the joint excursion programme. The occasion was a fungus foray at Chippenham Fen, led by Dr. A. M. Barrett and Dr. G. A. Gresham. Fortunately the rain held off during the afternoon, and the naturalists were able to search the Fen woodland and find a good variety of Autumn fungi. Unlike last year's foray, when the hot dry weather had prevented the growth of the usual species, most of the common fungi were to be found without much difficulty. Large specimens of the Bracket fungi Polyporus

betulinus and other species were duly admired, and the ground toadstools included the large brown Boletus scaber, and species of Tricholoma and Amanita. Some of the party confessed to slight disappointment that their 'bag' did not include anything which Dr. Barrett was prepared to recommend for supper, but in spite of this the occasion was much enjoyed. Among the higher plants, a few specimens of the rare Bog Grass of Parnassus were admired, and the patch of Bog-Bean was successfully located.

WATER FORGET-ME-NOTS IN CAMBRIDGESHIRE

David Welch

During July and August 1960 I investigated the Water Forget-me-nots (Myosotis palustris aggregate), in particular some small-flowered forms occurring in Cambridgeshire. The two species of the aggregate said to occur in Cambridgeshire were Myosotis caespitosa and M. scorpioides, usually distinguished as follows:- caespitosa small-flowered and annual, scorpioides large-flowered and perennial.

Accurate measurements and observations were made of various parts of one plant from a number of populations in East Anglia, and the aggregate seemed satisfactorily divisible into the two species caespitosa and scorpioides. However, I found no caespitosa in Cambridgeshire, the problem plants being typical scorpioides, with rather small flowers. When I examined them, their diameters were within the described range for that species. Some had been identified as M. caespitosa, and it seems that the scarcity of this species in Cambridgeshire has been obscured by such misidentification. Several of the 'caespitosa' herbarium specimens turned out to be scorpioides, though there was good caespitosa from Gamlingay, Upware, Stretham and Hatley St. George. Babington (1860) considered caespitosa infrequent, giving as localities:- Gamlingay, Comberton, pit near Observatory in Cambridge, Barway, Witcham, Wisbech, between Girton and Oakington, Waterbeach, Wicken Fen, Bottisham Fen and Ely. Probably caespitosa has decreased in range since then, with the draining of fens and swamps, and the filling of ponds (e.g. the pit near the Observatory no longer exists). It is now scarce in this area, northwards to the Wash, whilst scorpioides is recorded in almost every 10 km. square. Records for the Botanical Soc-

iety of the British Isles Maps Scheme show that caespitosa is only commoner than scorpioides in the coastal area of Western Ireland, and in North-West Scotland, especially the islands off the coast. Over most of the country it is the rarer plant, and this is especially marked in the chalk districts of Southern England, the Welsh Border counties, the Pennines, and the Central Valley of Scotland.

In general it seems that scorpioides likes the richer soils, and that caespitosa is confined to more acid soils - as at Gamlingay and in the Breckland.

The difficulty in Cambridgeshire is due, I believe, to the Clapham, Tutin and Warburg (CTW) key not using the best characters for the separation of the two species. I shall discuss the characters that I measured or observed one by one, and finally will put forward another key, based on the more constant ones.

Stem Hairiness

The upper part of the stem and the cyme have adpressed hairs throughout the aggregate, whilst the type of hairiness varies in the lower part, and it is this that was recorded.

	scorpioides	caespitosa
Living	100% spreading, 15% glabrous below, being in water	100% adpressed - though one plant had a few hairs half-spreading
Herbarium	1 glabrous, 10 spreading of which 3 are glabrous below	22 adpressed, 5 glabrous

Hairiness provides a good character for separating the species. M. caespitosa never has spreading hairs, whilst (except for a few herbarium specimens nearly glabrous, labelled var. strigulosa (cf. Wade 1933)) scorpioides never has adpressed hairs. Regular submergence causes the stem to be glabrous in both species, and I am uncertain at present whether var. strigulosa is distinct genotypically, or simply an ecad.



STONE LOACH.

Stem Shape (Living plants only)

	scorpioides	caespitosa
terete	-	15
very slightly angled	1	2
slightly angled	20	5
angled	11	-

The shape of the lowest third of the stem was never terete in scorpioides, often terete in caespitosa. However, there were several plants of caespitosa with angling, so this character could not be used to distinguish between the species.

Habit (Living plants only)

	scorpioides	caespitosa
creeping	18	-
spreading	7	-
erect-spreading	1	6
erect + rhizomes (tall growth in fen)	4	-
erect	-	16

M. caespitosa is more erect and tufted than scorpioides, which usually has sterile spreading shoots. In late summer the two species look much different, there being no prominent sterile shoots in caespitosa, but many in scorpioides, giving it a greener, more leafy appearance.

Cyme Bracts

	no bracts on cyme	bracts only on a third, lower branch	bracts on cyme
<i>scorpioides</i>			
living	27*	4	2
herbarium	6	3	2
<i>caespitosa</i>			
living	-	-	23
herbarium	-	2	25

* includes 3 which have a bract at one of the cyme forks, besides many ebracteate cymes.

The bracts of the cyme provide a good character for separating the species of the aggregate. *M. secunda* and *caespitosa* have bracteate cymes, whilst *scorpioides* usually has ebracteate cymes; but bracts are occasionally found on the cymes of plants which in no other way resemble *caespitosa* or *secunda*. Thus the bracts cannot be made the sole criterion in a key.

Corolla-Lobe Shape (Living plants only)

	rounded	truncate	emarginate
<i>scorpioides</i>	12	5	15
<i>caespitosa</i>	20	1	1

As stated in CTW, the corolla lobes of *caespitosa* are mainly rounded; but *scorpioides* lobes are often rounded, in spite of the statement in the species description in CTW. The flowers of the same plant differ in the amount of indentation at the apex, sometimes from nothing to quite deep. I do not consider this a good character to use in a key to separate the species.

Style Length

The style length is a difficult character to describe, though it is quite easy to observe the style's protrusion (or lack of it) from the calyx. In CTW the style is compared in length to the tube part of the calyx, but as the depth of toothing varies, I have preferred to compare the style length to the total calyx length, as this shows more directly the differences between the species.

Since it is difficult to see the full length of the style, I expressed the distance between the end of the style and the tip of the calyx teeth as a fraction of the total length of the calyx and subtracted from 1, as shown in the diagrams.



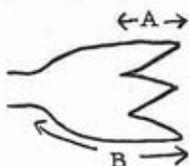
Totals:

Style length	scorpioides		caespitosa	
	living	herbarium	living	herbarium
1/3	-	-	2	-
1/2	-	-	21	26
2/3	-	-	-	1
3/4	1	1	-	-
slightly shorter	10	-	-	-
=	14	6	-	-
slightly longer	6	2	-	-
longer	1	-	-	-

Thus scorpioides is distinct from the rest of the aggregate in having a style about equal in length to the calyx, whilst caespitosa has it about $\frac{1}{2}$ the length of the calyx. The ease of observation and absence of overlap make this a very good character for use in a key.

Calyx Division

The amount of division of the calyx (i.e. tooth length: calyx length) was recorded.



Totals:

ratio is A:B

Division	scorpioides			caespitosa		
	living	herbarium	total	living	herbarium	total
$\frac{1}{4}$	2	1	3	-	-	-
1/3	22	7	29	2	2	4
2/5	8	3	11	20	19	39
3/7	-	-	-	1	1	2
$\frac{1}{2}$	-	-	-	-	4	4

Though there is overlap between scorpioides and caespitosa in the amount of calyx division, each has its characteristic value. The calyx division is a good confirmatory character, but there is too much merging for it to be put in the key. M. secunda is distinct in having a calyx division of $\frac{1}{2}$ or more (I observed mainly herbarium specimens), so it can be separated conveniently from scorpioides by this character.

The value given for calyx division of caespitosa in CTW is wrong ($\frac{1}{2}$ to $\frac{3}{4}$), unless this is meant to be tooth length: tube length, in which case the value for secunda should be 1.

Fruit Pedicel Length Ratio

The value recorded was the ratio of the fruit pedicel length to the calyx length (not the calyx tube length).

The longest pedicels were the ones used, but the basal 1 or 2 were excluded, as they were often much longer than the rest.

Length Ratio	scorpioides			caespitosa		
	living	herbarium	total	living	herbarium	total
$\frac{1}{2}$	1*	1	2	-	-	-
$\frac{3}{4}$	5	1	6	-	-	-
1	13	1	14	2	3	5
$1\frac{1}{4}$	6	2	8	10	2	12
$1\frac{1}{2}$	2	3	15	4	6	10
$1\frac{3}{4}$	1	2	3	4	8	12
2	2	1	3	2	4	6
$2\frac{1}{4}$	-	-	-	-	1	1
$2\frac{1}{2}$	-	-	-	-	3	3

* young

M. scorpioides tends to have smaller pedicels than caespitosa, the commonest occurring ratio being 1, compared to about $1\frac{1}{2}$. The ranges overlap so much that the fruit pedicel length ratio is of little use in distinguishing between the species, an impression not gained from the remarks in CTW. This gives for scorpioides 1-2X calyx length, and for caespitosa 2-3X. Only secunda has a distinct ratio - from about $2\frac{1}{2}$ X up to 5X.

Corolla Size

The diameter of the corolla was measured on graph paper, as shown in the diagram.



Living plants only.

Diameters in mm.	2½	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10
scorpioides	-	-	-	1	1	5	-	5	-	6	3	6	2	2	-	1
caespitosa	2	2	3	11	2	3	-	-	-	-	-	-	-	-	-	-

Each species has its distinct range of flower size, and the observations fit with the comments in CTW, except that a few flowers of caespitosa exceeded 4 mm. in diameter. In the range of 4 - 5 mm. it is not possible to use corolla size to distinguish between caespitosa and scorpioides, but caespitosa never exceeds 5 mm. and scorpioides only falls below 4 mm. in autumn - when the species are easily distinct by general appearance. The size of the flower decreases with the age of the cyme (e.g. one plant had flowers 8 mm. in July and 3 mm. in diameter in October) and the largest flowers that I saw were on young cymes with no fruits.

There is also genotypic variation in corolla size, causing the wide range in the diameters of scorpioides - all the measurements were done in July and early August. Despite these shortcomings, corolla size is still a good character for use in a key. In Cambridgeshire any plant with a corolla greater than 5 mm. in diameter is scorpioides; likewise except in late summer a plant with corolla less than 4 mm. is caespitosa.

Conclusions

Occurrence together in one plant of intermediate characters between those typical of caespitosa and scorpioides would indicate a hybrid, or continuous variation between types in the aggregate. There was no evidence of this.

There was no tendency for the scorpioides (identified by style length, hairiness, etc.) plants with small flowers to have a deeper calyx division, or for the caespitosa plants with largest flowers to have shallower division, or smaller fruit pedicels.

Addressed hairs, an erect tufted habit, bracteate cymes, a calyx division of 2/5, and a style length of ½ are found together on the same plant very frequently; as are spreading hairs, a spreading or creeping habit, a calyx division of 1/3, ebracteate cymes and a style length of about 1. The former is caespitosa, the latter scorpioides. Occasionally one of the characters may vary, and very rarely two, from

the typical, but I had no difficulty in classifying any living plant.

The CTW key separates out the two species thus:

caespitosa	scorpioides
(1) corolla not more than 4 mm.	corolla 4 mm. or more in diameter,
(2) lobes rounded and entire	(if less than emarginate)
(3) plant annual or biennial	plant perennial

Except early and late in the season it is not always easy to decide whether a forget-me-not is annual or perennial, and the lobe shape is unsatisfactory for separating the species. The CTW description of scorpioides gives emarginate for all sizes (cf. the key) and this will be used to supplement the diagnostic characters of the key.

I have therefore drawn up a new key for the aggregate, placing less emphasis on flower size, and correcting certain values in CTW.

- Leaves little more than twice as long as broad; fls. very pale blue
Most leaves 3X as long as broad, or more; fls. blue
M. BREVIFOLIA 2
- Corolla rarely less than 4 mm. in diameter, hairs on lower part of stem spreading, plant perennial
Corolla never more than 5 mm. in diameter, hairs on lower part of stem adpressed, style $\frac{1}{2}$ calyx length, plant annual to biennial 3
4
- Fruit pedicels not more than 2X length of calyx, calyx teeth never more than $\frac{2}{5}$ length of calyx, usually $\frac{1}{3}$; cymes usually ebracteate
Fruit pedicels $2\frac{1}{2}$ - 5X length of calyx, calyx teeth usually about half length of calyx, cymes bracteate
M. SCORPIOIDES
M. SECUNDA
- Calyx pubescent, corolla lobes flat, nutlets truncate at base
Calyx almost glabrous, corolla lobes concave, nutlets rounded at base
(sand dunes, Jersey)
M. CAESPITOSA
M. SICULA

With this key the problem plants of Cambridgeshire

would have caused no trouble, but to aid further in separating the two Cambridgeshire species, I give the following points of difference, roughly in order of merit.

scorpioides

caespitosa

style length 1	style length $\frac{1}{2}$
hairs spreading	hairs adpressed
plant perennial	plant annual or biennial
corolla 4-10 mm. in	3-5 mm.
Summer	
ebracteate cymes	bracteate cymes
calyx division ($\frac{1}{4}$ -) $\frac{1}{3}$	($\frac{1}{3}$ -) $\frac{2}{5}$ ($-\frac{1}{2}$)
(-2/5)	
spreading habit	tufted habit
fruit pedicel: calyx $\frac{1}{2}$ - 2	1 - $2\frac{1}{2}$
corolla lobes rounded	rarely emarginate
or emarginate	
stem never terete	often terete

Summary

Water Forget-me-nots were measured in several respects, and the general separation into the two species Myosotis scorpioides and M. caespitosa was shown to be reasonable. The differences between M. scorpioides and M. caespitosa were considered in detail, and the method of separating them used in CTW discussed. Finally, what is claimed to be a more reliable method, depending less on corolla size, was put forward.

I hope this paper stimulates interest in the group in Cambridgeshire, and that as a result the distribution of caespitosa in the county may be ascertained, old localities being verified and new ones found, giving us a better idea of its ecological requirements. My thanks are due to Dr. S. M. Walters for suggesting the problem, and guiding my work on it.

The nomenclature adopted is that of Dandy, 1958, following Wade 1944. ('CTW' throughout is the British Flora of Clapham, Tutin and Warburg (1952)).

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CENTIPEDES AND MILLIPEDES

Bruce Ing -

Part I: General

Introduction

Cambridgeshire is rather fortunate in its myriapod fauna, and it is surprising that the group has been neglected in the county.

Admittedly these animals are not easy to identify because of the lack of suitable literature in English and the scarcity of experts on the subject. Also in many cases only mature males can be confidently named. Furthermore they need to be preserved in an alcohol-glycerol mixture which does not make for attractive museum specimens.

In spite of the difficulties it is sad that animals so easy to find and so rewarding to study have attracted so little attention.

The term 'Myriapoda' no longer has a valid status. The component groups may show a superficial similarity but they are probably quite unrelated. At most they show a strong affinity in methods of locomotion. There are now four classes of myriapods and all are represented in the county.

Centipedes

The class Chilopoda comprises the centipedes, which have a varying number of body segments. They have from fifteen to over a hundred pairs of walking legs, but the number of pairs is always odd. Biting mouthparts, supplied with poison glands, indicate the carnivorous habit. The bite of some tropical centipedes is very painful and in warm countries is greatly feared. Reports of death from these bites are, however, confused, death usually occurring as a result of infection of the wounds.

Millipedes

The Diplododa, or millipedes, form a more diverse group than the centipedes. They are called 'double-footed' because each segment appears to have two pairs of walking legs. In fact adjacent tergal plates are fused and two segments telescoped together. There may be from eleven to seventy pairs of legs, fewer than in some centipedes.

Millipedes are usually vegetarian, though a few S. European forms are carnivorous. Some tropical species may grow to the size of small snakes.

Symphylids and Pauropods

These two small groups have been very much neglected in general. They are small colourless soil organisms and appear to be more closely connected with the ancestors of modern insects than with the groups previously mentioned. Symphylids usually have twelve pairs of legs and pauropods nine.

Water relations

Myriapods are essentially animals of dark and damp places with the same sort of exceptions as are found in woodlice. For example Schizophyllum sabulosum tends to move away from moisture until desiccation begins, when the process is reversed and it seeks cover. Some centipedes are littoral and become immersed at high tide. Most species are nocturnal and are found during the daytime in shelters from the sun and wind. The reaction in avoiding light is presumably a mechanism which enables the animal to avoid desiccation.

The cuticle is strengthened by phenolic tanning and is usually impregnated with calcium salts, but there is rarely an impervious waxy layer as in insects. It therefore has great mechanical strength but little resistance to water loss. Some information about the physiological requirements of these creatures is given in Edney (1957).

Pauropods and symphylids probably feed on soil flora and some species are definitely known to eat fungal mycelia. Millipedes in general eat vegetable matter including fungi, humus, roots, seedlings, strawberries, and other soft fruit. Blaniulus guttulatus is a serious pest at times, but Cylindroiulus punctatus is one of the most important organisms of the litter-disposal mechanism in deciduous woodlands. The pill millipedes are also key species in the breakdown of litter in Brachypodium grassland.

Most centipedes are active carnivores, the British species mostly eating small insects, slugs, or each other. Lithobius forficatus will also take woodlice and has been found eating moths on entomologists' sugar patches. Its powerful jaws can pierce human skin.

Enemies and parasites

Centipedes have few enemies. The only creatures which eat them regularly are scorpions and other centipedes. The poison protects them from more likely predators, but in various parts of the world they are eaten by man, either cooked or raw, as 'medicine' or part of a ritual.

Millipedes are endowed with repugnatorial glands which give off a nauseating vapour when the animal is alarmed or squashed. This probably acts as a deterrent to would-be predators. Nevertheless the list of creatures that do eat them is a long one. They form an appreciable part of the diet of amphibians and birds; some live almost exclusively on millipedes. The fluid produced by the glands can be sprayed several inches by some species and has an irritant action on the human skin and may cause blindness if it reaches the eyes.

Among the parasites of myriapods may be listed: Gregarines, mermithines, cestodes, flagellates, mites, tachinids and phorids (Diptera), braconids and proctotrupids (Hymenoptera), and a parasitic glow-worm beetle. In general these parasites are not widespread and probably have a negligible effect on population density. In centipedes, at least, cannibalism is a more important factor.

Reproduction

Behaviour patterns are well developed and parental care is shown by some centipedes. Many millipedes build a subterranean nest which protects the eggs from attack by various predators, including the males of the species. The number of eggs laid is usually small, and they are laid in spring and summer even if copulation took place in the previous autumn. The young of millipedes hatch with only a few pairs of legs and gradually add to them moult by moult. Newly born centipedes frequently have the full number of legs and their development is more like that of the exopterygote insects.

The female centipede stays in the nest and protects her young, but if she is very hungry she will eat them. A large number of moults take place and most myriapods are mature in three years. They are long-lived, some centipedes having been kept for six or seven years.

Distribution

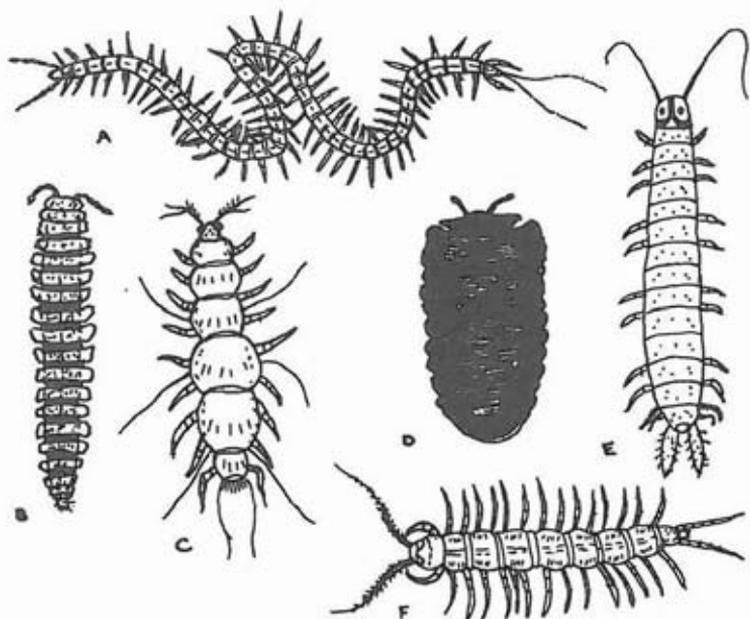
Little is known of the ecology or distribution of myriapods in Britain. The references at the end give some in-

formation but also point to the gaps in our knowledge. The Cambridgeshire species have been dealt with briefly; see Sinclair (1904), Worthington, (1932 & 1938). Much more work is required everywhere on the ecology of these animals, which present many interesting evolutionary and developmental problems.

The different soil types in the county have little effect on distribution, since most species are tolerant of quite wide ranges of soil reaction. Only waterlogged soils are really poor in species. Few are strict calcicoles, but a trace of lime is essential to most species.

Of the 44 British diplopods 18 have been reported for Cambridgeshire. With chilopods the ratio is 40:12; pauropids, 12:1; and symphylids 14:2.

For a general account of the group see Cloudsley-Thompson (1958).



Some typical myriapods

- A) *Necrophiaeophagus longicornis* (length 60 mm.)
- B) *Polydesmus* sp. (16 mm.)
- C) *Pauropus* sp. (1.5 mm.)
- D) *Glomeris marginata* (15 mm.)
- E) *Scutigera* sp. (4 mm.)
- F) *Lithobius forficatus* (30 mm.)

Part II: Systematic

Nomenclature and classification follows Brade-Birks (1939) and Blower (1958), but, for convenience, taxa above the rank of family are omitted. The figures refer to the 10 km. square in which the species has been recorded. Where the number is in brackets it indicates a record before 1930; underlined - 1930-50; otherwise, since 1950.

Class CHILOPODA

Family Lithobiidae

Lithobius lapidicola Meinert

Under stones, especially in chalk pits, occasionally under bark.

25, 45, 66.

Lithobius forficatus (L.) Common Centipede (Fig. F.)

Very common. The large chestnut centipede of gardens, woodland, etc.

25, 34, 44, 45, 46, 55, 57, 66.

Lithobius melanops Newport

One of our rarer British species, found under bark and in litter.

44, (55, 56.)

Lithobius crassipes L. Koch

A rare litter species, not found recently.

(35, 36, 57.)

Lithobius dubosqi Brolemann

Another litter species, but frequents a wide range of habitats.

45, 55, 56.

Family Schendylidae

Schendyla nemorensis (C. L. Koch)

Reported as common in gardens but, in fact, rarely recorded.

(56.)

Family Geophilidae

Members of this family are often incorrectly called 'wire-

worms ' and are killed indiscriminately. Wireworms are, in fact, the larvae of agriotid beetles. These centipedes are very useful predators and should not be killed.

Scolioplanes acuminatus (Leach)

A common litter species, particularly at home in the fens. 25, 34, 35, (45, 54,) 57, (66).

Necrophlaeophagus longicornis (Leach) (Fig. A.)

A very common soil species.

35, 44, 45, 55, (57, 64,) 66.

Geophilus carpophagus Leach

Surprisingly rare in Cambridgeshire, this is one of the commonest British 'pedes '.

(25, 66.)

Geophilus insculptus Attems

A characteristic fen species, rare.

44, (56).

Brachygeophilus truncorum (Bergsøe & Meinert)

Abundant in a wide variety of habitats and soil types.

25, 35, (45, 56,) 76.

Family Cryptopsidea

Cryptops hortensis Leach

Another litter centipede, doubtfully recorded from Adventurer's Fen.

(56.)

Class DIPLOPODA

Family Polyxenidae

Polyxenus lagurus (L.)

One of our 'prize ' millipedes, usually associated with old willows.

36, 45, 46, (57, 64.)

Family Glomeridae

Glomeris marginata (Villers) Pill Millipede (Fig. D.)

Usually associated with calcareous soils, widespread but nowhere common. Can withstand quite dry condition, cf.

the woodlouse Armadillidium.
25, 34, 35, (44,) 66, 76.

Family Craspedosomidae

Polymicrodon polydesmoides (Leach)
One of the commonest and largest species. It is found mainly in woodland litter but also occurs under bark and in caves.
25, 35, 45, (55,) 56, 57, (65,) 66.

Family Polydesmidae

Brachydesmus superus Latzel
A fen litter millipede, also found in sedge heaps. It was once considered that the British form could be distinguished as subspecies mosellanus Verhoeff, but the differences do not appear to be constant.
(45, 56, 57,) 66.

Polydesmus angustus Latzel (as Fig. B.)
The commonest British millipede, often over an inch in length. Found in a variety of situations, often in large numbers.
25, 34, 35, 36, 44, 45, 46, 55, 57, (66.)

Polydesmus gallicus gallicus Latzel
Rarely recorded in Britain; there are only five records besides the Cambridgeshire specimen found in 1914 in Adventurer's Fen, and a small colony which I discovered at Lode in 1958.
56.

Polydesmus coriaceus Porat
Another litter species, recorded from Adventurer's Fen.
(56.)

Polydesmus denticulatus C. L. Koch
A woodland species with a strong predilection for lime.
25, 35, 45, 57, (64.)

Family Strongylosomidae

Oxidus gracilis (C. L. Koch)
A tropical millipede commonly introduced in hothouses all over the world. Still to be found in the Botanic Garden.
45.

Family Blaniulidae

Blaniulus guttulatus (Bosc) Spotted Snake Millipede

This is the common millipede of arable land, where it is at times a pest. Certainly commoner in the county than records suggest.

35, (44,) 45, 55.

Proterius fuscus (Am Stein)

Under bark and stones, this is quite a common species. Males are very rare and parthenogenesis probably occurs. Often found with Cylindroiulus punctatus.

(25, 35, 56.)

Family Iulidae

Iulus scandinavicus Latz

Recorded for the county (Worthington 1932,) but in view of the difficulty in distinguishing this from the next species, the record may refer to that.

(55.)

Ophiulus pilosus (Newport)

Usually a woodland species, nowhere common.

(35, 44, 45.)

Cylindroiulus punctatus (Leach)

The commonest British iulid, found in nearly all moist habitats, including old fungi. The most abundant myriapod in Cambridgeshire.

25, 35, 44, 45, 56, 57, (64,) 66.

Cylindroiulus britannicus (Verhoeff)

Rarely recorded but this may be because it is part of a critical complex of three species. Originally recorded for the county as C. latestriatus (Curt.) but this has not yet been found here. Under bark, litter, etc.

44, (57, 66.)

Brachyiulus pusillus (Leach)

A true soil animal, very abundant at Wicken. Also found under bark.

(45,) 57.

Schizophyllum sabulosum (L.)

A very handsome species with two orange bands down the dark brown back; growing to a length of two inches. Almost confined to sandy soils, and, although suspected, only re-

cently (1958) found in the county.
25, 44.

Tachypodoiulus niger (Leach)

A beautiful black animal, often large and very common in chalky areas. Found in woods, under and in rotten wood, leaves, etc.

25, 34, 35, 36, 44, 45, 46, 55, 56, 57, 66, 76.

Class SYMPHYLA

Family ScutigereLLidae

ScutigereLLa immaculata (Newport) (as Fig. C.)

In different soils, mostly woodland.

(35, 36,) 45, 46, (64, 66.)

Scolopendrellopsis subnuda (Hansen)

In arable soil. Said to be widespread.

46.

Class PAUROPODA

Family Pauropodidae

Pauropus huxleyi Lubbock (as Fig. E.)

In arable soils. Not common.

25, 46.

List of recorders:

K. R. Allen, R. M. Gambles, G. L. R. Hancock, B. Ing, A. R. Jackson, A. P. G. Michelmore, F. G. Sinclair, P. W. Strachan, E. B. Worthington.

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A NEW STIGMELLID LEAF MINER

R. H. Richens

During the course of a survey (1959-60) of the distribution of leaf-mining and gall-forming insects on elms, a stigmellid leaf mine was discovered which differed from typical mines of the three species Stigmella marginicolella (Stainton), S. ulmivora (Fologne) and S. viscerella (Stainton) previously recorded on elms in the British Isles. The new mine is characterized by its sinuous course remote from the leaf margin; the egg is laid on the upper surface; and, most striking of all, the entire mine, or at least the earlier part of it, lies in a bright yellow fleck, presumably caused by some toxic substance released by the larva. Since these characters corresponded to those of S. fulvomacula (Skala), J. D. Bradley of the British Museum arranged for a sample to be sent to Professor E. M. Hering, who kindly confirmed the identification.

S. fulvomacula was first described in 1936 and has been collected in Austria, Czechoslovakia and South Tirol. The English counties in which it has so far been found comprise Devon, Essex and the Isle of Ely, the localities in the last named being Ely and Littleport. The types of elm mined include U. carpiniifolia Gled. and the Dutch Elm in the Isle of Ely, U. carpiniifolia in Essex, and U. procera Salisb. in Devon.

The status of S. fulvomacula is however problematic. The imago cannot be distinguished from that of S. marginicolella, in which the mine is marginal, hugging the teeth and causing no yellowing, and the egg is laid on the upper surface. Also, stigmellid leaf mines causing yellow flecking but not conforming in all respects to the above description have been found. Thus, at Tydd St. Giles, in the Isle of Ely, and in Essex, mines have been collected, differing from typical S. fulvomacula in following the leaf margin. Two yellow-flecked mines have been discovered in which the egg had been laid on the lower surface, as in S. ulmivora, one in Bedfordshire, with the mine remote from the leaf margin, and another in Lincolnshire, in which the mine was marginal. It is obviously desirable that rearing and genetical experiments should be undertaken to clarify the relationship of S. fulvomacula to the other stigmellid miners of elm leaves.

THE MARSH CARPET,
COENOTEPHRIA SAGITTATA (FABR.)

Guy A. Ford

I paid my first visits to Wicken Fen in 'the good old days' in July 1933 and again in July 1935, on the latter occasion in the company of Professor E. E. Green and George E. Lodge, the well known artist and shot. On the second visit the weather was marvellous, and insects swarmed at light and sugar, and I feel sure that it was then that I first encountered the Marsh Carpet, a single specimen flying at dusk but not taken. This is a most attractive little moth. The wing span is about 14 mm. The fore wings are a rich reddish brown, an irregular black band, edged with white, crosses the centre of the wings, and there is another smaller one, similarly edged, at the base of the wings. The body is also brown with a black band near the thorax. The hind wings are a much lighter brown tinge, edged with darker spots.

The larva is also most attractive, and merges most effectively into the background of its food plant - hence the difficulty of finding it - although with experience it becomes easier to detect. The general colour is a light green, merging into pinkish on the sides. The pink is edged below with black, and this is followed by a dark olive stripe; some of the rings round the body are wrinkled, whilst all the others are ridged across the back and along the sides.

It feeds in August on the seeds of the common Meadow Rue (Thalictrum flavum) and is said also to feed on T. minus, a local plant of the chalk in this district.

Many years elapsed before I could run this species to ground. I visited an old locality for this moth in Norfolk in August 1957, 1958 and 1959, and after prolonged search found about five larvae on each occasion. I then began to realise that only very concentrated search, unless one was very lucky, would produce results, and remembering an old account which stated that this species had the apparent habit of disappearing from its haunts for as long as ten years and then turning up again in numbers, I thought possibly it was to be found once more at Wicken, but that collectors had given up looking for it in despair.

To quote from The Entomologist's Gazette (1951), thirty years ago the Marsh Carpet was common at Wicken, but from about 1925 it became very scarce there. It is recorded that a morning's careful search of the Meadow Rue in August 1939 yielded only a single full-fed larva. I am told that one worn moth was caught at Wicken in 1940, and that, to quote my own words, seemed to be the end of the matter, at any rate with regard to Wicken Fen. However, I decided (after pretty intensive training at the game in Norfolk) to search Wicken once more. On my first visit I called at the museum cottage where in the entomological collection there are several rows of insects labelled 'extinct in the Fen'. This spurred me on no end, when I spotted sagittata in one row!

In brief, I carried out one of the most exhaustive and exhausting searches I have ever made (8 hours or so on the first visit). On 10 August 1959 I found 13 larvae and on 12 August 1959 I found 11 larvae. 2 larvae were not, I should say, more than 50 yards from the museum. I was naturally much elated and felt rather furtive knowing that I carried these beautiful 'extinct' larvae on my person. All the larvae pupated (except two - obviously 'stung') and duly emerged in perfect condition in 1960.

In 1960, 8 August, I found 4 larvae in a Norfolk fen, and on the same date 8 larvae at Wicken about half grown. On 13 August 19 larvae were found at Wicken. From these figures it looks as if sagittata is on the increase and that the removal of some larvae in 1959 for breeding did not upset the balance for the following year.

As this caterpillar was found last year further north in localities where it has never been seen before, it may quite possibly be found at present in other Cambridgeshire Fens, where it has never before been observed. I hope to look into this this year.

WILD JUNIPER ON THE FLEAM DYKE

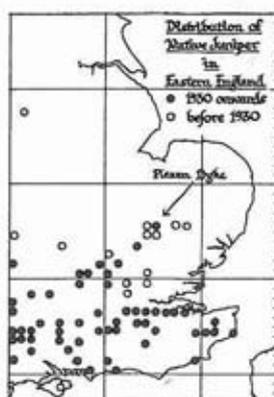
S. M. Walters

The first record of Juniper (Juniperus communis) on the Fleam Dyke appears as a note made by H. N. Dixon in his copy of C. C. Babington's Flora which gives 'Fleam Dyke, Balsham, (18)82'. Babington knew the Juniper wild only in the Hildersham-Linton area - where, indeed, it may still survive - and on the Gog-Magog estate, from which it seems to have gone. In Ray's time, (1660) Juniper was so abundant near Hildersham that he records it for 'Juniper Hill'. The history of the plant in Cambridgeshire is similar to that in several other English counties - one of decline and the loss of old localities - but we are more fortunate than Bedfordshire, for example, where it is apparently now extinct as a wild plant (cf. Dony, J. G., Flora of Bedfordshire, 1952, p. 199). Furthermore, the Fleam Dyke population may well be the only reasonably certain wild Juniper in the whole of East Anglia, for the records for Suffolk and Norfolk are old and of uncertain status. The Chilterns in Buckinghamshire provide the nearest colonies to the west.

Some record of the Fleam Dyke Juniper is therefore of special interest, and the following notes made on 3rd January 1960 are published in the hope that naturalists will continue to observe the population and record its state from time to time. Without such recording it will be difficult to decide whether any special protective measures are necessary to preserve the plant.

The Juniper bushes are scattered along the south side of the Dyke on the stretch east of the London-Newmarket road (A.11). The first bush is about 150 yards from the road and separated from the rest of the population by 100 yards or so. The others occur along the south bank as far as the Bedford Gap, where the wooded stretch begins. The limits of the population are given by the Grid References 52/550540 and 52/553537. The isolated bush is in the bottom of the ditch, and is the tallest seen, with a narrow outline and estimated at 10 to 12 ft. A few berries were seen on this bush, but not on any of the others. In the main population, there are two groups of three or four bushes each and a number of separate plants, ranging from stunted and misshapen bushes not more than 1 ft. tall to several of about 5 or 6 ft. The total seen was about 24.

It has been generally assumed by botanists who have visited the Fleam Dyke regularly in recent years that the Juniper was declining through rabbit-grazing, until the de-



struction of rabbits by myxomatosis. The present appearance of the bushes suggests that this period of decline may be over; most of the smaller bushes have healthy new growth near the ground, and only one looked moribund. However, no seedlings were seen, and although it may be too soon after the cessation of rabbit-grazing to expect active regeneration, it is of course essential that seedling establishment should take place if the colony is to survive and spread. Observations on this point in the future will be particularly important.

It would be valuable also to have more information on the effect of the rust fungus *Gymnosporangium*, which Dr. A. S. Watt informs me parasitises the Juniper on the Fleam Dyke and is responsible for deformation of the stems and twigs. Specimens of this rust, which is conspicuous as an orange jelly in the teleutospore stage in spring, would be welcome, and should be sent to the Herbarium, Botany School, Cambridge.

The accompanying map is a portion of the British distribution map prepared for the Botanical Society's Map Scheme.



ROOKERIES IN CAMBRIDGE 1945-1960

Peter Shipton

The area under consideration consists of about 16 square miles within the Cambridge City boundaries. The rookeries were counted in 1945 during the National Rookery Census organised by the Ministry of Agriculture, during 1951-1956 by Mr. P. D. Sell, and in 1959-1960 by the writer.

It should be pointed out that it has not always been possible to be sure that one is dealing with the same rookery in 1960 as in 1945, because of the latitude allowed by the Grid Reference system. Also the definition of what exactly constitutes a rookery in scattered groups of nests varies from one observer to another.

However, it seems that there were 30 rookeries counted in 1945 compared to twice that number, 62, in 1960. The total number of nests rose from 991 to 1158 - a 17% increase - while the average number of nests per rookery fell by half, from 33.3 to 18.7. It is interesting to note that the most popular rookery tree was the elm, followed by ash, beech, plane, and horse chestnut, in descending order.

It is a remarkable fact that 90% of all the nests lie to the SW of the A604, Huntingdon-Haverhill road, which runs from NW to SE; only 11 out of the 62 rookeries in 1960 lay to the NE of this line. The density of breeding pairs has risen from 62 to 72.5 per square mile (16% increase) compared to a National Average of 16 (Witherby, Handbook of British Birds, Vol. 1, 1946). To the S.W. of the A604 the density is about 10 times this average!

The rookeries are surprisingly unstable. Only 17 found in 1945 definitely survived until 1960, and most of these have shown considerable fluctuation. For example, the one in the grounds of Clare College Hostel has fallen from 104 to 43, while that along Long Road has risen from 78 to 127, with a peak of 192 in 1952, being the largest in Cambridge. A composite figure for those along the Backs, of 266 in 1945, is now only about 180.

Some even more remarkable changes have occurred, as at Cherry Hinton Hall, which has fallen from 27, after a peak of 70 in 1951, to a mere 3. The rookeries in the Brookside/Botanic Garden area have dropped from 68 nests to 20. A big build-up has occurred along Huntingdon Road from 43 to 80, whilst new ones have appeared along the Cotton Footpath (27) and Herschel Road (38), to name only two of the largest.

More interestingly, several fair-sized rookeries no longer exist, such as those at the Grange Rd./Madingley Rd. corner (38 nests), at Newnham & Selwyn Colleges (38), and at the University Farm, which had 43 in 1951. It seems possible that the one in Pembroke College (14) has been progressively deserted as the trees became infected with Armillaria mellea (Honey fungus).

In conclusion it can be seen that there has been an increase in the number of nests of about 1/6 since 1945. It is hoped to show by a rookery census in 1961 for the whole of Cambridgeshire whether this increase is a general one or only due to an influx of rooks into the City from the surrounding countryside. Readers of this journal with a longer acquaintance of Cambridge rookeries may know why and when certain rookeries declined or became extinct, and when others started.

BRYOPHYTES ADDED TO THE COUNTY LIST DURING 1960

H. L. K. Whitehouse

The following eight additions have been made to the list during the year:

Ditrichum cylindricum (Hedw.) Grout was found by P. F. Lumley in September in a stubble field on fen peat near March, and by P. J. Bourne in November in stubble fields on Oxford Clay near Papworth St. Agnes, and on fen peat near Thorney. This moss is widespread in Britain on non-calcareous soils, but as it very rarely fruits it is easily overlooked.

Acaulon muticum (Brid.) C. M. I found a few plants of this minute moss in material collected by P. J. Bourne on 5 November from the same field at Papworth St. Agnes as the Ditrichum. Strictly speaking, the plant is not new to the county, but the only other record dates from about 1796, when it was found by W. Skrimshire near Wisbech. Like the Ditrichum, it is widespread on base-deficient soils.

Bryum affine (Bruch) F. Schulz. This rare moss was found by B. Reeve (per W. Jackson) at Gray's Moor Pits near March on 3 October 1959.

Bryum argenteum Hedw. var. lanatum (P. Beauv). B & S. was found by P. J. Bourne on a path near Steeple Morden on 7 August. It is widely distributed in Britain.

Bryum erythrocarpum Schwaegr. var. hegelmaieri Podp. This plant has been overlooked previously, but seems to be almost as abundant as var. erythrocarpum in arable fields on all soils. I first recognised it in material collected on 21 December in the Papworth stubble field referred to above, but I have now seen it from 8 localities near Cambridge, the earliest gathering being by P. J. Bourne on 8 November from a stubble field near Thorney. This moss was first recorded in the British Isles only in 1953, and there are still very few records.

Brachythecium populeum (Hedw.) B. & S. was found on the Devil's Dyke by J. Harding and P. D. Brown on 5 March. It is widely distributed in the British Isles, but apparently rare in E. Anglia.

Rhynchostegiella tenella (Dicks.) Limpr. var. litorea (De Not.) Rich. & Wall. This rare moss was found by P. J. Bourne on 30 January on a stump in a hedge at West Wickham. It is a plant of Mediterranean distribution and the Cambridgeshire locality is the most northerly known in Britain.

Riccia sorocarpa Bisch. This liverwort was found by P. J. Bourne on 5 November in the stubble field near Papworth St. Agnes already mentioned. Like the Ditrichum and Acaulon, it is widely distributed in the British Isles on non-calcareous soils.



GETTING THE BEST OUT OF BUMBLE BEES

W. E. H. Fiddian

Man's concern over the preservation of his native flora and fauna varies understandably with the conspicuousness of the species. The disappearance of the nesting osprey or of a rare orchis calls for action, but a myxomycete or a humble member of the beetle family can become extinct without so much as a murmur. In this respect Bumble Bees are a convenient and profitable intermediate group for examination, because like many social insects their habits have been intensively studied, and they are of considerable economic importance. Yet man is no doubt steadily, although unwittingly, reducing the bumble bee population through his failure to appreciate the finer points of his "progress" in the countryside.

It is not so much that particular species of bumble bees are in danger of extinction - most of the 20 or so species of *Bombus* are common enough - as the fact that the time must approach, if it has not been reached already, when the reduced population of bumble bees may affect the profit of the farmer and fruit grower. In this country crops of red clover for seed are almost entirely dependent on bumble bees as pollinators. Field beans, mustard, kale, and several other brassica crops, are at least partly dependent on bumble bees, as are many of the orchard fruit varieties where self-incompatibility requires cross-pollination. In parts of Cambridgeshire field beans, mustard, kale, and clover seed form a bigger proportion of the cropping acreage than in most other English counties.

In considering bees as pollinators thoughts turn most readily to honey bees, and the fact that they may be artificially located en masse often gives them the superiority of sheer numbers. Bumble bees, however, have several advantages over honey bees. They work a longer day, starting earlier and finishing later; they work in colder, wetter, and windier weather; they work faster, visiting on average more than twice as many flowers per minute as a honey bee; they are probably more widespread and evenly spaced over the countryside; they visit fewer florets in a flower head or inflorescence before moving on to the next plant, thus increasing the chances of cross-pollination; and above all, certain species have longer tongues and can extract nectar from flowers with deeper corollas than can the honey bee.

The clovers are critical from the point of view of the relationship between corolla length and tongue length. The

white clovers of the Trifolium repens complex have shorter corollas, and the honey bee may be said to be the main pollinator of this crop in most areas. But honey bees and short-tongued bumble bees can only extract nectar in the orthodox way from the longer corolla of red clover, Trifolium pratense, when the level of the nectar in the corolla is high. If they are collecting pollen they will of course act as pollinators, but on the whole honey bees can be said to be much less efficient pollinators of red clover than certain bumble bees, a fact appreciated by Darwin and later successfully tested by the artificial introduction of bumble bees into New Zealand where no species formerly existed.

The much longer corolla of the field bean, Vicia faba, makes nectar collection from the front of the flower even more difficult. Fortunately the field bean is only partly cross-pollinated, and even some selfing can occur without flowers' being tripped by insects. Experiments have shown, however, that yields are greatly reduced in the absence of insects, and the main pollinators must be considered to be bumble bees, especially in crops distant from villages.

The field-bean corolla-tube length is, however, again critical for bumble bees, only the longer-tongued species being normally able to collect nectar from the front. In this respect size of species is no sure guide to length of tongue, one of our largest and commonest species, Bombus terrestris, having a short tongue, whereas the much smaller B. agrorum has a relatively long tongue.

Unfortunately the shorter-tongued species such as B. terrestris and B. lucorum have "learnt" to rob nectar from long corolla plants by biting holes at the base of the corolla. This phenomenon can be observed, and indeed heard, in any field of beans. Honey bees do not bite similar holes under natural conditions but freely use the holes provided by the "robber" bumble bees.

In this respect it is interesting to study flower preference of bumble bees in a garden where many species of plants are available. In the writer's garden the shorter-tongued species practically confined their visits to flowers with "open" shaped flowers or only very short corollas. Curiously enough corolla biting seemed rare, and it may be that bees have not the same opportunity to develop this habit in a flower species to which they are unaccustomed as they have in a monoculture on a farm. One might expect the longer-tongued bees to visit at random flowers ranging from the open type to those with long corolla tubes, but in fact B. hortorum seldom visited an open flower but delighted in feeding on the heads of Echinops, which no other species tackled.

It is generally recognised that the population of honey bees in this country has decreased since the war; the same is probably true for bumble bees, although for different reasons, but this is difficult to prove. Adult bumble bees seem reasonably free from obvious predators. They are usually left alone by birds (the activities of the Red-Backed Shrike are an obvious but relatively unimportant exception), they probably largely escape the disease and other troubles of the domesticated honey bee, and they are not parasitised to any extent except by a nematode worm.

They are, however, subject to the attention of Cuckoo bees, and this may be said to be a form of parasitism. Cuckoo bees belong to the genus *Psitherus*, and each species closely resembles the particular *Bombus* species which it "parasitises". The Cuckoo bee queen (there are no workers) enters the nest of a bumble bee, frequently killing the resident queen, and her eggs are reared for her by the workers of the colony.

No doubt an increasing number of bumble bees fall victims to insecticides used for controlling such pests as pollen beetles on mustard, kale, and other brassica crops, and black aphid on field beans. This is a relatively new development and one that needs urgent attention. Fortunately work at Rothamsted suggests that queen bumble bees are relatively resistant to certain chemicals toxic to honey bees.

The main limiting factors in bumble-bee population seem to concern their nesting habits. The nesting site varies with the species and may be underground or at the base of fairly thick vegetation. In either case undisturbed land is required, although land that has been ploughed and then abandoned may become an ideal habitat.

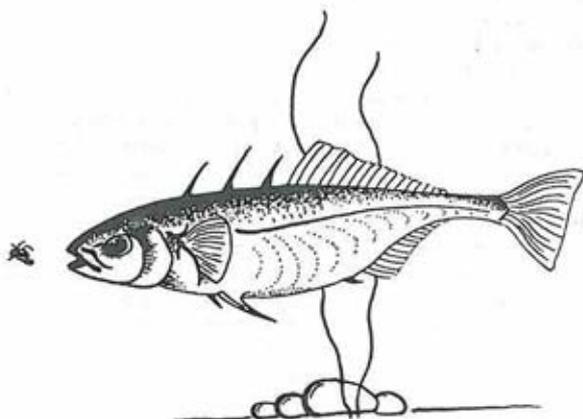
Unused nests of field mice and voles form one of the commonest nesting sites, and yet by a quaint paradox it is these same rodents that destroy so many bumble-bee nests in their quest for their honey and brood. The latter are also a favourite food of the badger. Dry banks, hedge-rows, and waste places generally, provide suitable nesting habitats, but it is just these situations that are progressively frowned upon in the increasingly intensive use of land. When one considers the large number of queens which can be seen quartering the ground for nesting sites in the spring, it becomes evident that there can easily be a shortage of suitable sites. There is some evidence that queens occasionally construct their own nests, but this seems exceptional.

It is not difficult for an experienced worker to induce queens to form colonies under artificial conditions, and

colonies can be successfully transferred to a desired location. But when it is considered that each colony may on average contain not more than a hundred workers, it is doubtful whether the bumble-bee population could be artificially increased to pollinate a particular crop in an economic manner.

For bumble bees, then, the concept of conservation must vary from the standard. It is usual to think in terms of preserving special habitats where a definite ecological pattern favours certain well-known species of fauna or flora. The odd bank or waste corner of an awkward field is not likely to appear interesting from a natural history point of view, and offers little incentive for preservation. And yet it is the home of unseen countless species, all of which have their niche in the ecological complex of the countryside.

It is strongly to be hoped that the economic importance of bumble bees will be widely recognised before it is too late, and that the preservation of roadside verges, hedges, banks, and game preserves, will maintain a reasonably adequate bumble-bee population.



THREE-SPINED STICKLEBACK.

WEATHER NOTES FOR CAMBRIDGESHIRE 1960

J. W. Clarke

The most notable feature of the weather during 1960 was the persistent cyclonic rainy spell from July to the end of the year, resulting in an above average rainfall for every month of the period—the wettest six months recorded in England and Wales since records began in 1727. At Swaffham Prior 20.43 ins. of a total annual rainfall of 28.61 ins. fell in the July—December half of the year. Despite this extremely wet period, the year was not the wettest on record in the County. Total rainfall was slightly less than in 1958, and both 1912 and 1951 were wetter. April (0.32 ins.) was the driest month. February, March and May were also drier than average. There was no period of absolute drought. The heaviest downpour of the year occurred on the 19th September, when two inches of rain fell at Bottisham in four hours.

Temperature was more equable than usual for Cambridgeshire. Only five days exceeded 80°F. and three days had maxima below 32°F. There were no night minima below 20°F. Fifty-one screen frosts were recorded—about half the usual number. The warmest and sunniest month was June with mean maximum temperatures 4°F. above average. In July, August and September, temperatures and sunshine were well below normal.

To summarise, 1960 had two distinct periods of weather—a warmer and drier-than-average first half and a cooler and wetter-than-average second half.

Weather Records at Swaffham Prior 1960

Month	Temperature		Highest	Lowest	Rainfall	Approximate Sunshine (hours)
	Mean Max.	Mean Min.				
January	42 (+1)	34 (+1)	54	22	2.08 (+0.63)	37½
February	44 (+1)	33	61	22	1.21 (-0.29)	64½
March	49 (+1)	37 (+2)	60	24	1.45 (-0.18)	65½
April	56 (+2)	39 (+1)	63	29	0.32 (-1.15)	148
May	65 (+3)	47 (+3)	76	35	0.71 (-1.06)	202½
June	72 (+4)	51	84	42	2.39 (+0.35)	261
July	68 (-3)	52 (-1)	72	41	3.39 (+1.38)	139½
August	68 (-2)	52 (-1)	74	43	3.31 (+0.83)	158
September	63 (-2)	49	72	37	3.91 (+1.75)	125½
October	56	45 (+1)	65	34	4.04 (+1.46)	78
November	50 (+2)	40 (+3)	60	30	2.86 (+0.96)	69½
December	42 (-1)	34 (-1)	55	28	2.94 (+1.57)	49½
Ann. Means and Totals	56 (+½)	42			28.61 (+7.25)	1399
1959	59	43			19.61	

Why the Trust has been formed

The countryside is changing rapidly before our eyes. Some change is, of course, inevitable; but nearly all the alteration is tending towards a loss of variety, interest and beauty, and the destruction of areas still in a natural and semi-natural state. There is a very urgent need for a local organisation to take action, before it is too late, to safeguard what remains, and to encourage the intelligent conservation of nature.

Aims of the Trust

To record and study the chief places of natural history interest in Cambridgeshire and the Isle of Ely. This interest is not confined to botany and zoology, but should include geology, archaeology and local history.

To protect these places if they are threatened.

To acquire and administer any such place as a Local Nature Reserve, if this action is the most appropriate method for conservation.

To co-operate with other local and national bodies with interests in natural history and nature conservation.

To encourage interest and understanding for an intelligent policy of nature conservation, which should not run counter to the best interests of agriculture, forestry, sport, and other rural industries and occupations.

Membership

Minimum subscription: Ordinary 10/- p.a., Life £10. Full particulars may be obtained from the Hon. Sec., 1 Brookside, Cambridge.