



Hayley Wood—coppiced area

W. H. Palmer

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EDITORIAL

My task in taking over the editorship of 'Nature in Cambridgeshire' has been made that much easier by the thorough preliminary work done by Ian Hepburn earlier in 1974. This has shown me how preparations for the 1976 issue must begin in January 1975! An appreciation of our late Editor, that most modest of men, is contributed by Dr S. M. Walters. Considerable pruning of reports has been necessary, for the cost of production of this journal has so greatly increased that we cannot contemplate much increase in size. In this issue we begin a series of papers on the survey of Bottisham Park now in progress. This will continue over several years. The attention of Trust members and their friends is drawn to the advertisement on the inside of the back cover, of the Trust's publication 'Hayley Wood' by Dr O. Rackham and others. This should prove a valuable reference book for all visitors to this important reserve.

IAN HEPBURN

The sudden death of our Editor and Press Secretary, Ian Hepburn, on the 3 July 1974, not only deprived the Trust of a most valued officer, but was a grievous loss to a wide circle of his colleagues and friends who extend right outside the field of natural history.

Ian was born in London on 29 May 1902, but his parents later moved to Rock, in the estuary of the River Camel in North Cornwall, and he grew up there with a love for the sea-coast and wild places in general. He went to school at Gresham's, and there grew to appreciate the rich natural history and the scenic beauty of the Norfolk Coast, eventually gaining a scholarship in Natural Sciences at Lincoln College, Oxford. He joined the staff of Oundle School in 1925, and taught chemistry there, retiring in 1964 from the position of Second Master which he had held for the last ten years.

During a popular and successful teaching career at Oundle, Ian developed his love of natural history and the countryside, and became particularly interested in botanical ecology. Characteristically, he always emphasised that he was no expert in botany, and whilst it was true that he had never formally studied the subject, his field knowledge of the British flora and his keen interest in vegetation studies gave him an important position in the British Ecological Society, where he served on the Council for four years. His scientific papers in the *Journal of Ecology*, published between 1942 and 1955, reveal his considerable interest and ability as a plant ecologist. The first of these describes the vegetation of the Barnack Stone Quarries in Northamptonshire (*Journ. Ecol.*, 30, 57-64 (1942)); it is a model descriptive paper which provides most valuable summary information

on a site which is now a nature reserve. One wishes that botanists, amateur or professional, had been able to do this for many more neglected sites in the period between the two wars!

Two other papers of Ian's foreshadow his best-known work—the New Naturalist volume on 'Flowers of the Coast', published in 1952 and twice reprinted. This excellent book, which combines simplicity of style with considerable technical knowledge, must have done much to popularise, in the best way, the science of ecology to generations of field botanists.

It was characteristic of Ian that, with his genuine interest in people as well as in natural history, he should enter enthusiastically into the work of the County Trusts and Natural History Societies both in Northamptonshire and later in Cambridge. He was President of the Kettering Field Club in its Jubilee Year 1955, and was associated with the publication of an excellent 50th Anniversary 'History' of the Club in that year. He served on the Council and as Vice-President of the Northamptonshire Naturalists' Trust for several years, and contributed much to the successful growth of that body in its early years.

We soon benefited from Ian's retirement to live in Cambridge in 1964. He had married in 1947 Phyllis Champ, with whom he shared a real love of music, and when Ian and Phyllis settled in Cambridge their circle of acquaintances ranged over a wide field of amateur and professional musicians and naturalists, and their contribution to both areas of voluntary activity was very great indeed. Ian joined the Trust and the Natural History Society, and soon found himself on the Council of both bodies. He became Editor of this Journal in 1966, and about the same time took over the Town Secretaryship of the N.H.S.

Ian's qualities were unusually valuable in voluntary organisations. Nothing was too much trouble for him, and he combined patience and courtesy with reliability and efficiency to an exceptional degree. His only fault might be said to be his excessive modesty: it was occasionally necessary to explain to new members that the guide on the excursion who said his identifications should not be trusted was actually one of the more gifted and experienced of British botanists, with a botanical book and several learned papers to his name! It has been to all of us, his friends and colleagues, a pleasure and a privilege to know and work with such an enthusiastic and gifted naturalist, in that remarkable tradition of the enjoyment of natural history in Britain. Ian's teaching and example must have helped so many in the younger generation to enjoy field botany as he himself did. That would, I feel, surely be the memorial he would most have desired—and of that, Ian is assured.

S. M. WALTERS

EIGHTEENTH ANNUAL REPORT 1974

(Abridged Version for Nature in Cambridgeshire)

Consideration of the increasing economic difficulties in domestic and international affairs alike makes it doubly heartening to record that the Trust again had a successful and encouraging year. 400 new members joined in 1974 but this increase was offset by a fall-out of non-renewals of 7 per cent, leaving a nett total at the end of the year of a little over 3000.

The income from membership subscriptions was augmented by a significantly increased sales campaign, and receipts for 1974 were half as much again as in the previous year. A great deal of the increase was due to the Thursday weekly stall on Cambridge Market which sold over £1000 worth of goods from May to Christmas.

New reserves continued to be designated and a further 72 acres came under Trust management during the year, bringing the total area to about 1100 acres, of which about half was in freehold ownership.

Reserve management steadily increased as the Cambridge Conservation Corps continued to develop. The majority of management work at Trust reserves was done by the Corps and a grant of £250 for the year was paid in return for this. In view of the increased scale of activity this proved to be a more suitable arrangement than the piece-meal payments of previous years.

The Trust continued its support for the Cambridgeshire Countryside Advisory Working Party and became a member of the newly formed Federation of Cambridgeshire Amenity and Environmental Societies. Mr J. V. Lee was closely concerned with the development of these activities and his departure from Cambridge at the end of the year was a heavy blow. The administrative changes in the County boundaries which came into effect in April had not so far caused any change in the territorial boundaries of the Trust. Discussions had been held with neighbouring Trusts and a closer degree of liaison with the Bedfordshire and Huntingdonshire Trust had resulted.

The death of Ian Hepburn is mentioned elsewhere in this Journal. His loss was very keenly felt as he was one of the Trust's most active voluntary helpers. Great help continued to be given by other volunteers and the Trust was particularly grateful to those who helped regularly at the office, the Cambridge market stall, Wandlebury, and at meetings and fund raising events in various parts of the County.

An unabridged copy of the annual report for 1974 has been sent separately to each member, and is available freely at the Trust office.

TREASURER'S REPORT

The detailed accounts for 1974, which are printed separately from this report have amalgamated the Hayley Wood account with the General Trust account, as it is no longer relevant to treat it as a special case financially.

The Trust has again had a successful year financially, with a further increase in membership subscriptions and sales. This is entirely due to the response from members, for which the Trust is grateful. Having said this, it must be stressed that the future of voluntary societies is far from certain and it is imperative for all members to respond 100 per cent in 1975, in order that the Trust can carry out all the tasks expected of a Conservation body.

NATIONAL TRUST

Extracts from the report of the local Wicken Fen Committee 1973-74

Visitors

The number of visitors continues to increase and has doubled in the last five years. As it is estimated that only 60 per cent of visitors sign the visitors' book, the figure of 24,282 for 1973 is far below the actual number coming to the Fen.

Publications

No new leaflets were produced during the year.

Two papers were published:

J. D. Stout (1971), Aspects of the Microbiology and Oxidation of Wicken Fen Soil, *Soil Biol Biochem*, 3, 9-25.

Professor Sir Harry Godwin, Miss D. R. Clowes and B. Huntley (1974), Report on the results of the 1972 survey of the 'Godwin Triangle', *J. Ecol.*, 62, 197-214.

General

The Executive Committee has been constantly on guard against the advance effects of 'development' in the area and in particular has lodged an objection to the development of marina facilities at Upware.

Mrs G. Crompton has completed the survey of the archives begun in 1972 and in her report has made recommendations regarding the introduction of a recording system.

Zoological Secretary's Report

Dr J. C. Brown and Mr L. J. Flowerdew of the Department of Applied Biology, Cambridge, aided in their work by a research student, Mr S. J. Hall, report that 'During 1973 we have added four further species of small mammals to the list of captives from Longworth small mammal traps, House mouse (*Mus musculus*), Harvest mouse (*Micromys minutus*), Mole (*Talpa europaea*) and Weasel (*Mustela nivalis*).

In addition we have observed Water Vole (*Arvicola terrestris*) and Stoat (*Mustela erminea*).

During the autumn of 1974 large numbers of *Peucedanum palustre* will be planted out around the Mere and in 1975 Swallowtail butterflies reared at Monks Wood Experimental Station by Dr J. P. Dempster will be released in a further effort to re-establish this beautiful insect in the area.

Bird-ringing Report

Although the man-hours spent at the Fen was fewer than in the last two years, the increased experience of ringers, combined with further equipment, meant that more birds were caught—4,868 birds of 55 species were ringed. The major scores were Reed Warbler 774, Swallow 678 and Reed Bunting 359, while in smaller numbers Kingfisher 22, Redshank 3, Little Owl 1, Tawny Owl 2, and Nightingale 1, among others, were ringed.

Sedge Warblers continue to decline but Bearded Tits are now well established.

During the year eleven birds ringed elsewhere were caught at Wicken, the most travelled being a Reed Warbler from Devon. Nine Wicken-ringed birds were recovered, seven in Britain and two abroad (a Redpoll in France and a Reed Warbler in Morocco).

Botanical Secretary's Report

Further information on the occurrence of calcifuge bryophyte communities has been obtained from a visit paid to the old 'Godwin Plots 1-5' by members of the Scientific Sub-committee accompanied by Dr H. L. K. Whitehouse. In this quite limited survey no fewer than seventeen calcifuge species were recorded, including two species of Sphagnum, *S. palustre* and *S. plumulosum*, not previously recorded at Wicken and thought to be extinct in the County since 1930.

The Scientific Sub-committee consider that, as a matter of priority, a detailed survey is needed in this area and similar areas on Verral's Fen, and it is hoped that a student suitably expert in bryology and general ecology can be found to do the work in 1974.

A survey of *Taraxacum* in Milner-White's North Breed ('Laboratory Field') was carried out and will be continued in a modified form in 1974. Well over a hundred flowering specimens of the rare Fen Dandelion (*T. palustre*) were found scattered over much of the field in the wetter areas.

A grant from the World Wildlife Fund has enabled Miss P. Cammell's work on *Lathyrus palustris* to continue through 1973 and this will be further extended in 1974.

In the Demonstration Area two plants of the newly-discovered supposedly extinct *Senecio paludosus*, raised from wild-collected seed, were planted out in different water-level positions. They have not established themselves well, but the rest of the stock in the University Botanic Garden is very healthy and further plantings can be made in 1974.

CAMBRIDGE NATURAL HISTORY SOCIETY

President: Dr S. M. Walters

Report for 1974

At the six General Meetings held in the Lent and Michaelmas terms the following lectures were given:

25 January	Dr M. George	Nature Conservation in Broadland
8 February	Dr H. J. B. Birks	Yukon Mountain Vegetation
22 February	Dr J. R. Corbett	The Uses of Pesticides in Agriculture and Public Health
18 October	Mr P. Conder	Birds and Conservation
1 November	Sir Peter Kent	The North Sea: Development problems in a new environment
22 November	Dr R. M. Laws	Antarctic Seals

The several sections of the Society each held some six meetings during the year. A successful *Conversazione* was held in the University Zoological Department on 15 March and the Annual General Meeting was held, as usual, the same day.

Members of the Trust are reminded that they are entitled to attend all the Society's General Meetings, which are held in the Main Lecture Room of the Zoological Department in Downing Street.

Subscriptions: Life Membership: £5; Annual: 50p; Members of Homerton or Hughes Hall (annual): 25p; Undergraduates (3 years): £1.25; Corporate Membership (for schools etc.): £2.

Applications to:

Mr E. J. Wiseman, The White House, Barley, Royston, Herts SG8 8HT
(City Secretary)

Mr I. H. Robertson, Sidney Sussex College (University Secretary)

FIELD MEETINGS IN 1974

Saturday, 12 January, Ouse Washes

Some 50 people from the Trust and the Cambridge Bird Club enjoyed an exceptionally mild and dry day occurring in a long spell of stormy wet weather. Although the Washes were well flooded and visibility was good, it was disappointing to note that most of the birds were on the distant Ely side and the sporadic gun-fire of wild-fowlers had a disturbing effect.

Small parties of Bewick swans were observed among plenty of Mutes. Wigeon dominated the landscape, large flocks being seen flying in from the north at dusk. A raft of Tufted ducks was studied from the hides while the only other ducks seen were three Shovelers, some Mallard and several groups of Pintails. Snipe were the only waders visible.

Other birds noted were Pink-footed Geese, Black-headed Gulls, Moorhens, Coots, Reed-buntings, Long-tailed Tits, Fieldfares, Redwings, three Kestrels going their separate ways, a single Brambling and one Great Spotted Woodpecker.

The ability to picnic in comfort in January and to watch Wigeon and Bewick Swans fighting in the low winter sun made this trip a memorable experience.

Sunday, 5 May, Hayley Wood

Despite a grey day, with a cold wind and a tendency to drizzle, there was a good turn-out to visit this splendid wood under the leadership of Mr Hepburn. The party were lucky to visit the reserve at the ideal time for the Bluebells, which were superb. The Oxlips were largely over, although there were quite a few plants still in full flower.

Members were very interested in inspecting the experiment in progress to assess the effect of protecting a small area from the unwelcome attention of the deer. It was quite obvious that inside the fence the Oxlips had flowered profusely, and their leaves also were much better developed than those of the plants outside the enclosure. It was also possible to see how well the coppiced ash stools were producing new branches compared with those outside which had been heavily nibbled so that growth was almost completely restricted. Oddly enough, the deer do not appear to eat the newly grown hazel twigs, which were developing well throughout the recently coppiced areas.

In addition to the Bluebells and Oxlips, the party enjoyed seeing the various spring flowers in bloom—the Early Purple Orchid, the Yellow Archangel, the Bugle, the Ground Ivy, the Stitchwort, etc. As to birds, many different woodland species could be heard singing, notably the

Willow Warblers and Chiffchaffs. But the party were disappointed in not hearing the Cuckoo.

Saturday, 11 May, Chettisham Meadow near Ely

Some 50 members who had attended the A.G.M. at Ely went on to spend an interesting afternoon visiting the orchid meadow at Chettisham. The approach from the little church was by a very attractive green road, with excellent overgrown hedgerows. Here many small birds—Willow Warbler, Whitethroat, Lesser Whitethroat and Blackcap being specially prominent. The 4-acre meadow is an excellent example of undisturbed grassland, showing ancient ridge and furrow. The main attraction was, of course, the Green-Winged Orchid (*Orchis morio*), which is becoming increasingly rare in England. There must have been at least 200 plants in flower, mainly on the ridges. There were also numerous plants of Adder's Tongue (*Ophio-glossum vulgatum*). The other associated plants were typical of undisturbed moist grassland—Cowslips, Sweet Vernal Grass, Pepper Saxifrage (*Silaum silaus*), the Sedge (*Carex flacca*), Sheep's Sorrel, etc.

The party returned to the cars via several other small meadows which the Trust hopes to rent. Although not so floristically interesting they were distinctly attractive and contained two ponds. Dr Walters and Mr Payne proved admirable guides, the only disappointment being the heavy rain shower which lasted through most of the expedition.

Sunday, 19 May, Thetford Forest

Some 80 members took advantage of the Forestry Commission's kind offer to demonstrate their methods of timber production and wild life conservation in the second largest forest in the country (51,600 acres).

After coffee and a welcome from the guides the party was escorted to a part of the wood north of the Little Ouse where the general principles of woodland management were described. Apart from the trees themselves the botanists were delighted with the variety of plants seen on a walk by the Longwater of Lynford Hall and through the Arboretum. Of particular interest were Water Avens (*Geum rivale*), Meadow Saxifrage (*Saxifraga granulata*) and the Green-winged Orchid (*Orchis morio*).

After an afternoon talk on the management of the deer population (chiefly Roe and Red) the party moved on to the sites to the south. One of these, fenced to exclude deer, was being used to assess the success of a number of plantations of different trees. The other was an area of Scots pine where the red squirrel population was being studied. It was hardly surprising that such a large party saw no deer or squirrels, though the

squirrels' dreys could be seen in the tree tops. The forest birds also failed to put in an appearance.

The party was greatly indebted to Mr Peniston, Mr Fletcher and the other guides for providing such an informative account of the work of the Forestry Commission.

Saturday, 15 June, River Trip to Upware and Wicken Fen

A capacity crowd of members and their children boarded the *Viscountess Bury* after a delay of three-quarters of an hour and in perfect weather made the river trip to Upware where they were met by Mr Percy Chapman and Colonel Mitchell, the Warden of Wicken Fen, who guided them along Wicken Lode to Drainer's Dyke opposite the mere in Adventurers' Fen. The Warden gave an admirable account of the natural history of the Fen and the management of Reed and Sedge crops. Time did not permit of a more detailed exploration of the area and the hope was expressed that a further visit by road could be arranged in the near future.

Others of the party visited the Field Centre Exhibition at Upware, but the Fen party were able to look in for a few minutes only, for the boat was calling its passengers for the return journey. In spite of the irritating delays all enjoyed their day out in superb weather.

Sunday, 21 July, Hardwick Wood

About 40 Trust members enjoyed a fine summer afternoon at this newest of our nature reserves. Walking to the wood via the footpath on the Toft—Hardwick road and thence past Wood Farm and Wood Barn Farm the members were able to study one of the richest botanical areas remaining in Cambridgeshire. Since the typical chalky boulder clay flora was at its best, some of the less common plants seen included Strawberry Clover, Yellow Vetchling (in one of the few remaining county sites), Sulphur Clover and a good variety of grasses. A wild lettuce (*Lactuca virosa*) was in good vigour and the only known wild specimens of Elecampane (*Inula helenium*) in the Trust's territory were seen in full flower.

Dr Oliver Rackham and Mr Ken Cramp led the party and helped with identification problems. Dr Rackham gave an interesting résumé of the history of Hardwick Wood from documented sources reaching back to the thirteenth century. The wood is one of the best documented in the whole of England.

Returning to the footpath along the bridle road on the western boundary the party noted abundance of seed heads of spring flora including Oxlips and Bluebells. The extensive margins of this long narrow woodland are of great interest as a refuge for small birds and insects.

Sunday, 18 August, Newmarket Heath

By kind permission of the Jockey Club our party of 28 Trust members, led by Mr B. D. Jones, President of the Newmarket Field Club, was able to visit the far side of Newmarket Heath which most people imagine to be in Suffolk, but is in fact, mostly in Cambridgeshire.

We planned to walk round the Warren Hill Plantation across to Long Hill, into Suffolk through the narrow gap in the county boundary below Bury Hill, returning to Cambridgeshire near the Limekilns.

The Jockey Club owns over 4300 acres of land of which 2200 acres are devoted to racing and training. This comparatively undisturbed grassland supports a rich chalk flora which we were anxious to inspect.

The only interesting bird sighted was a Green Woodpecker but we were compensated by the considerable variety of plants seen, though no particularly exciting specimens were found. The patches of *Calluna* on Long Hill and on the Beacon Course suggest interesting ideas about the previous history of these areas.

The list of plants found is far too long to give *in toto*, but it included the following: *Briza media*, *Cirsium acaulon*, *Clinopodium vulgare*, *Filipendula vulgaris*, *Gentianella amarella*, *Odontites verna*, *Pimpinella saxifraga* and *Thalictrum minus*.

Sunday, 15 September, Ouse Washes Reserve

About 40 members made a botanical visit to our reserve under the guidance of Mr Derek Wells, honorary secretary of the Trust's Scientific Advisory Committee and a national expert on grassland.

Patches of the Fringed Water Lily (*Nymphoides peltata*) and of the larger Yellow Water Lily (*Nuphar lutea*) greeted us as we entered the reserve where ungrazed zones contrasted markedly with areas grazed.

A close-cropped turf resulted from the grazing of our tenant's horses, sheep and cattle, albeit intermingled with creeping thistle—established during the droughts of the past two years. Ungrazed washes were a thicket of docks, thistles and coarse grasses. Though untidy to the eye, this variation in management resulted in a corresponding diversity of wildlife. Thus dock seeds encouraged winter wildfowl and thistle seeds attracted autumn finches, while, in spring, better grazed areas provided feeding grounds for Godwits.

Forget-me-nots, Burr Marigolds, Water Plantains and three species of Duckweed were noted in the wash ditches as Mr Wells continued to identify grasses for members.

The glow of ownership of such an attractive landscape gave that extra satisfaction to a highly pleasurable tour.

Saturday, 5 October, Holme Fen

A coach-load of 42 Trust members and their children was joined at the Fen by about 20 others who had arrived independently. The party was conducted round this rare example of Fen woodland by Dr Harry Hudson and Mr Alan Rayner.

The party was fortunate in having Dr Hudson once again as guide for he has that gift of the born teacher of being able to transfer his own enthusiasm even to the youngest of his pupils.

The early autumn weather favoured a good crop of fungi. Among the many species seen we noted several examples of the gelatinous forms including Jew's Ear (*Hirneola auricula-Judae*). The edible *Amanita rubescens* obligingly turned pink when broken and we were fortunate to find a specimen of *Cordyceps militaris*, the orange-red clubs of which spring from the bodies of the larvae or pupae of Lepidoptera. A specimen of Dead Man's Fingers (*Xylaria polymorpha*) justified its common name but did not exhibit that luminosity it is sometimes credited with possessing. Our visit was brought to a fitting conclusion by our exit from the wood leading us by a magnificent specimen of Fly Agaric (*Amanita muscaria*) glistening under the birches in the pale afternoon light.

SELECTED RECORDS FROM THE CAMBRIDGE BIRD CLUB ANNUAL REPORT 1973

H. J. Harvey

University Department of Applied Biology, Cambridge

The 1973 Cambridge Bird Club Annual Report is an important milestone in the series of reports started in 1927 for, in pursuance of the policy that it should cover the whole of the county of Cambridgeshire, it contains for the first time records from the old county of Huntingdonshire. Since the new county includes important bird haunts such as Grafham Water and the Ouse Valley Gravel Pits there is a considerable increase in the number of records but this summary is restricted to the Trust area and concentrates on the less usual birds.

The year began, and closed, with large numbers of Bearded Tits at several sites. Ringing recoveries included in a paper in the Report suggest that most of these birds come from the east coast of England with small numbers coming from the Continent and Kent. Other winter visitors present in good numbers early in the year were Stonechat and Hen Harrier but wintering duck were less numerous than usual because of low water levels on the Ouse Washes. The Washes did, however, produce Goosander, Smew, Goldeneye and Brent Geese in January and February.

Spring migration was disrupted by easterly winds and low temperatures with the majority of migrants arriving with a rush in early May. Among the less usual birds seen up to May were several Black Redstarts, two Sanderling, single Ring Ouzel, Blue Headed Wagtail, Hoopoe, Golden Oriole and two Firecrests.

The summer produced an encouraging report of the number of Quail and Stone Curlew in the south of the county which suggested that previous estimates of numbers had been too low; also in this area a Grey Wagtail bred. On the Ouse Washes Ruff and Black-tailed Godwit continued to nest and Pochard and Whinchat bred, but there was no evidence of breeding from the Marsh Harriers present there throughout the summer. There was no sign of any recovery in Whitethroat numbers and few Kestrels nested successfully, possibly due to the low numbers of small mammals noted in some areas. A paper in the Report gives some interesting observations on the nesting of a pair of Barn Owls near Cambridge.

Late summer and early autumn produced many records of migrants moving south and west, particularly among waders such as Wood Sandpiper, Spotted Redshank, Greenshank and Little Stint; less usual visitors in this group were Red-necked Phalarope and Turnstone. Two Ospreys and five Hobby were seen in this period as well as single Ring Ouzel and Wry-neck and several Gannets and Arctic Skua. A Velvet Scoter was a very rare visitor while Wheatears and Pied Flycatchers were more common than usual.

Observations in the late autumn and the second winter period suggested that both Green Woodpecker and Goldcrest were more abundant than usual. There were also reports of several Blackcaps, single Buzzard and Merlin, a late Little Stint and a Snow Bunting.

The ringing report includes details of the overseas recovery of birds ringed in Cambridgeshire; for example, two Redwings in Spain, Blackbirds in Germany and Finland, a Redpoll in France and a Reed Warbler in Morocco. Interesting among other recoveries were two Blackcaps ringed at Beachy Head and trapped at Wicken Fen, two Blackbirds more than six years old, and a Reed Bunting which moved to Nottinghamshire.

TWO FAMOUS MEDICINAL HERBS IN 'NEW' CAMBRIDGESHIRE LOCALITIES

S. M. Walters

Director, University Botanic Garden

The 1974 season produced, I am told, rather few botanical records in general. Two of them, however, are of exceptional interest, and suggest that the private estates of the County are still relatively unexplored botanically.

The most surprising discovery, since it is so near Cambridge and actually on University property, is that of a large flowering colony of the handsome Elecampane (*Inula helenium*) in the grounds of Madingley Hall, a discovery made by Professor and Mrs R. Hill on 1st August. The Cambridgeshire Flora (1964) says of this famous medieval medicinal herb: 'recorded from a few localities, recently only from Boxworth and Hardwick'. In both these known localities there are very few surviving plants, whereas at the new locality in Madingley the plant is locally abundant over a hundred square yards or so.

There is an excellent article on the medicinal and magical properties of Elecampane in Geoffrey Grigson's book 'The Englishman's Flora' (1955, pp. 368-370). From this we learn that Gerard and other writers of Herbals in the sixteenth century already knew it as a long-established and important 'physic garden' plant, so its introduction to Britain, and indeed to Europe, from its native home in Asia is ancient and unrecorded. Many Anglo-Saxon recipes contain what must be Elecampane under the name of 'elene', a word which looks cognate with 'helenium'. Whether 'helenium' really derives from the association of the magic herb with Helen of Troy is perhaps more doubtful . . . but it is an attractive derivation widely given in medieval books.

The other interesting discovery was made by Robert Payne and myself when we visited the Childerley Hall estate at the invitation of the owner, Mr John Jenkins, to do a botanical survey. Here there is an old pond by the house which has a large stand of the Sweet Flag (*Acorus calamus*). Mr Jenkins assures us that this is no recent introduction, yet there is no record, old or new, in the Cambs Flora for this interesting and local plant in the 10-km. Grid Square 36.

The Sweet Flag, like the Elecampane, is an old medicinal plant introduced into Europe and Britain. In this case, however, we know more accurately its history, for Gerard grew it as a rare and recently-imported herb, apparently originally from Turkey. By the end of the seventeenth century, it had become popular in England, and in several places it had settled down as a wild plant away from artificial ponds. Part of its popularity undoubtedly came from its use to strew on the floors of churches and the great halls of country houses, where its sweet scent made it a most attractive carpet.

Modern Cambs records are almost entirely confined to the Fens, where it grows by rivers, lodes and ponds. One of the best localities is in the nature reserve of Roswell Pits, near Ely. Like Elecampane, the Sweet Flag would survive and spread slowly but effectively in a suitable habitat by means of its underground root-stock.

The moral of these two discoveries seems to be that we botanists should,

armed with permission from the owner or tenant, look much more closely at the private estates of the County than we have hitherto done. Increasingly it is true that the variety and interest to the naturalists of such estates is in contrast to the 'prairie farming' of much of the surrounding land, and where, as is often the case, the owners are sympathetic to a reasoned case for conservation, members of the Trust can strengthen their interest by pointing out plants or animals of special value.

CLEARANCE OF SCRUB AND RE-ESTABLISHMENT OF CHALK GRASSLAND ON THE DEVIL'S DYKE

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Chalk grassland, which is so attractive to naturalists because of its diversity of species, its bright colours and its associated insect life, is a man-made plant community. We do not understand the precise way in which it developed in place of the woodland that early man cleared to make pastures and fields for his cereals but we do know that, once formed, it was maintained by the grazing of sheep and rabbits. As sheep-grazing declined in the late 19th and early 20th centuries, scrub (often of hawthorn) invaded many old grasslands. After the decimation of rabbits by myxomatosis about 1954, many areas on the chalk that had remained close-grazed developed a tall grass sward with some degree of scrub cover. Naturalists throughout southern Britain would like to clear much of this scrub and restore a more colourful grassy sward—not all the scrub, of course, because open scrub is very attractive to many nesting birds. The reason why it is unwise to attempt large-scale scrub-clearance without further treatment of the ground is obvious from an inspection of a stretch of the Devil's Dyke about 60 m. long and some way south of the Burwell road crossing. The dense scrub on this site was cleared, due to a misunderstanding, by the Conservation Corps in December 1971. It is still covered by weeds and coppicing scrub. This 'accident' has ultimately resulted in a programme of research which promises to throw a good deal of light on the control of soil fertility by plants on the chalk and which will, we hope, lead to some practical suggestions on how to re-create grassland in place of scrub.

Where the scrub was cleared on the Devil's Dyke there grew up no new chalk grassland but a sward of weeds, some of them like cleavers (*Galium aparine*) characteristic of hedgerows and yards enriched with manure or fertilizer. In fact cleavers was found in the summer of 1973 to be the most frequent plant on the cleared slope. Other, less demanding weeds like the spear thistle (*Cirsium vulgare*) grew particularly vigorously. These signs of

high fertility in the soil from under scrub contrasted markedly with the evidence on fertility-levels in chalk grassland—it is generally reckoned to be a nutrient-poor community. Similar contrasts in the apparent fertility levels between scrub and grassland soils can be seen elsewhere on the chalk, e.g. in the Aston Rowant National Nature Reserve in Oxfordshire. The origins of such contrasts in fertility have never been examined critically in Britain and the Natural Environment Research Council agreed in 1973 to finance for three years an investigation of this problem and of the failure of chalk grassland species to invade. One of us (B.A.K.) thus began work in earnest in October 1973, using the Devil's Dyke as the main study-site.

The first thing to do was to confirm that there were indeed differences in fertility and to find out what minerals were limiting growth on the poorer soil. Plants of cleavers were grown from seed, one plant per pot and ten pots per treatment, in a greenhouse at the Botanic Garden using Devil's Dyke soil. Many treatments were tried and the results were rather complicated but the essence of the experimental results is shown in Fig 1. The plants grew much smaller on grassland soil than on scrub soil and there was no significant effect of adding nitrogen alone. However, the level of phosphorus added (2 mg. per pot of 100 ml. soil) was enough to bring the yield up to that on scrub soil. Perhaps this dose was excessive because, when nitrogen was added with phosphorus, there was a huge increase in growth which far exceeded that on scrub soil. It seemed that possibly the scrub soil was richer in phosphorus *and* nitrogen. It is known that cleavers is particularly demanding for both these elements (Pigott & Taylor, 1964). Summer experiments with sowthistle (*Sonchus asper*) grown outdoors in pots have confirmed the greater growth on scrub soil and the primary limitation by phosphorus but have not always shown a further increase in growth when nitrogen has been added with the phosphorus. In a series of related, as yet unpublished experiments, Michael Fenner has shown for the brome grass (*Bromus erectus*) that the growth of its seedlings on chalk grassland soil in pots outdoors is increased by phosphorus alone but not by nitrogen alone whereas the growth of a closed mature sward of the same species is increased by nitrogen alone but not by phosphorus alone. The answer may lie in the development of the 'mycorrhiza'—the formation of an intimate association between the roots of the plant and a very specialized filamentous fungus which gains nourishment from the plant and obtains much of the phosphorus for the plant from the soil. This association takes time to develop and it may be that the lack of response to phosphorus by the grass in a mature sward reflects a relatively favourable supply through the mature mycorrhiza. Possibly annual weeds like cleavers and sowthistle never get to this stage and are limited strongly by the phosphorus supply throughout their lives.

Is it possible to get independent evidence that the supply of phosphorus, and perhaps nitrogen, is better in scrub soils? 'Available' phosphorus is notoriously difficult to measure but the National Agricultural Advisory Service in Cambridgeshire recommends for calcareous soils measurement of phosphate-phosphorus soluble in a sodium bicarbonate solution of a certain concentration. The scrub soils on the south west slope of the Dyke have an average of about 11 parts per million (p.p.m.) dry soil and the grassland soils about 5 p.p.m. The origin of the difference is not understood but it may result from deposition of phosphorus-rich leaf litter, the phosphorus concerned being brought up from low levels in the soil by the roots of the shrubs. This question is being investigated at present. Other possibilities have to be considered too—deposition of phosphorus in the faeces of birds roosting in the scrub for example—but these seem less likely.

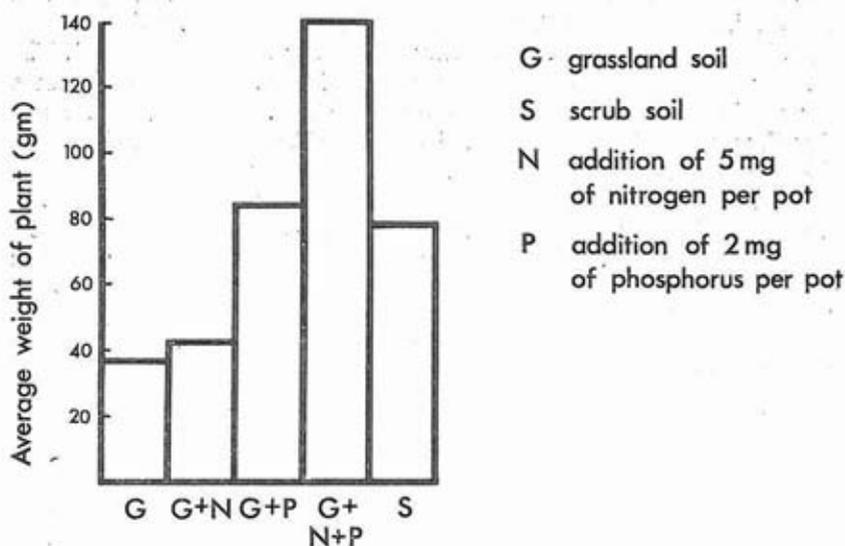


Fig. 1. Average yield of plants of cleavers grown for eight weeks on various soils from the Devil's Dyke in a greenhouse.

Nitrogen becomes available to plants in soil through the activities of certain bacteria, which convert 'organic nitrogen' (proteins and so on) into 'mineral nitrogen', i.e. ammonium and nitrate. The best test of the availability of nitrogen is to take soil to the laboratory and 'incubate' it, keep it warm and moist for a few weeks, and to measure both beforehand and afterwards the content of ammonium and nitrate. This treatment was

applied to samples of soil from the Devil's Dyke in May 1974. Ten samples from each site-type were kept for 3 weeks at 20°C with the following results:

	Average increase in nitrate-nitrogen (p.p.m. dry soil)
Grassland soil	7
Scrub soil	34
Ex-scrub soil	34

The changes in ammonium content were negligible. We have found that in similar experiments soils from calcareous grasslands elsewhere in England give even smaller releases of nitrate while soils from beech woods on chalk release relatively plentiful nitrate. Clearly nitrate release must either be stimulated under scrub and woodland or inhibited in grassland. One possible stimulus to the microbes could be the higher level of 'available' phosphorus but in experiments lasting three weeks addition of phosphate to grassland soil does not increase release of nitrate. In 1975 we shall test soil from a chalk grassland to which phosphorus has been added since 1972.

If an inhibitor is present in grassland soil, it might be expected to diffuse into scrub soil when soils from scrub and grassland are mixed on a 50/50 basis. However, incubations of such mixtures merely give a rate of release intermediate between the two extremes and there is no evidence of a mobile inhibitor. A better experiment would involve addition of washings of live brome grass roots to scrub soil. Leakage of inhibitors by grass roots has long been suspected and there is now critical evidence for rye grass, *Lolium perenne* (Moore & Waid, 1971). The contrast in nitrogen-relations between forest and grassland under the same climate seems to be a very general one and it certainly holds for the Rain forest-savannah pair in the wet tropics (de Rham, 1970).

In summary, the nature of the increased fertility under scrub on the Devil's Dyke is now fairly clear—changes in both phosphorus and nitrogen are involved—and the origins of the differences are being actively sought. It may be that the differences could somehow be reduced and the weeds discouraged. However, the failure of establishment of chalk grassland plants is certainly not due to their being 'competed out' by more vigorous weeds. Their seeds simply do not get to the ex-scrub sites or, if they do, they do not germinate; at any rate there are virtually no seedlings of them. This year we are running a preliminary experiment sowing brome grass and certain herbs into a cleared scrub site, hoping to establish new chalk grass-

land. We hope to report in future on the feasibility of extending this kind of programme, which must then involve a lot of help from volunteer labour.

Acknowledgement. We are very grateful to Mr J. W. Clarke for his generous co-operation throughout the work reported here.

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THE BOTTISHAM PARK SURVEY

P. C. Chapman

The early nineteenth century was a notable period in the study of natural history in Cambridgeshire. Much of this activity centred round Leonard Jenyns, the son of the Rev. G. L. Jenyns, who had inherited the Hall from another branch of the family just before the turn of the century. When a boy at Eton, another boy in his house had a copy of 'The Natural History of Selborne' and he was so impressed that he copied out nearly the whole of it 'under the apprehension that I might never see the book again'. He became a great admirer and disciple of Gilbert White. He went up to St John's College, Cambridge, and became closely associated with Professor Henslow, who later married his sister. He then became the Vicar of Swaffham Bulbeck, a village adjoining Bottisham, and here he lived for nearly thirty years. Charles Darwin was a frequent visitor and they often went beetle catching in the fens. He might have been the naturalist on the voyage of the *Beagle* but, after some hesitation, he felt he could not be away from his family and his cure for as much as five years. He continued to make copious observations and in 1843 he produced his own edition of 'The Natural History of Selborne' with notes. Other notes were published in 1846 as 'Observations in Natural History' and this work included 'A Naturalist's Calendar', a second edition of which was published in 1922, edited and with an introduction by Sir Francis Darwin. The manuscript which includes all this material is now in the custody of the Zoology Department in Cambridge. Leonard Jenyns became, in fact, one of the leading zoologists of the day and, among other things, wrote a full account of the fishes from the voyage of the *Beagle*.

In 1970, European Conservation Year, it occurred to the then secretary of the Field Committee of the Trust, Mr Clement Marshall, that with so much material available it might be a good idea to take another look at Bottisham Park and to compare the present situation with that known and described by Leonard Jenyns. Mr Soame Jenyns, the descendant now at Bottisham Hall, warmly supported the idea and promised to contribute to the final version. This is quite an ambitious project and, after a good deal of discussion, it was decided to serialise the reports in 'Nature in Cambridgeshire', with the possibility of binding them up together in due course. Mr Alwyne Wheeler, of the Department of Zoology at the Natural History Museum, a keen student of Leonard Jenyns, is doing the fish, and the Cambridge Bird Club has been interested in the Park for some years. Mr A. C. Leslie is tackling the plants and other contributions will include reports on the molluscs, the insects and the small mammals. Finally, Mr Jenyns hopes to tell us something about the family and to compare the current scene with that of the 'Observations in Natural History' of nearly one hundred and fifty years ago.

CHANGES IN THE WOODLANDS OF WEST CAMBRIDGESHIRE WITH SPECIAL REFERENCE TO THE PERIOD 1946-1973

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There have been rapid changes of land use in lowland England during the 20th century, particularly since the 1939-45 war. The population of England and Wales has increased by 50 per cent since 1901, to reach 48½ million in 1971. Villages, towns and cities have expanded, roads have been improved or newly created, agricultural techniques have changed to increase the production of food, and woodland management has altered to meet changing requirements for timber, pulpwood and game. A survey was done to trace the effects of land use changes on the woodlands of West Cambridgeshire between 1946 and 1973. An attempt was also made to place some of the changes in their recent historical context.

Area and Methods

West Cambridgeshire was chosen in a wider study (Peterken & Harding in preparation) as an example of an area of intensive arable cultivation where woodland has been relatively sparse for many centuries and where most woodland is privately managed. The study area totals 42,900 hectares (ha.)

and includes 10 km. squares TL25, TL26 (except Ouse Valley), TL35, TL36, plus small adjacent areas of TL24, TL34, TL45 and TL46. Approximately 2,000 ha. of the area lie within the counties of Bedfordshire and Huntingdonshire as these existed in 1973. Most of the longest established woodland lies on the chalky boulder clay plateau. Woodland has probably not comprised more than 5 per cent of the total land surface since Anglo-Saxon times.

All areas of woodland (including plantations and scrub) greater than 1 ha. (2.47 acres) in area were examined in the winter of 1973-74. The *apparent* management history and present management objectives (if any) were assessed together with the species composition of stands, and classified as described by Peterken & Harding (1974). Information from Forestry Commission and private estate stock maps and planting schedules was also used where available. Ornamental parkland was not included in the survey.

Stands were defined as being Coppice, High Forest, High Forest with a coppice layer, Scrub or Cut-over woodland. All Coppice and High Forest with coppice was composed of Broadleaved species of trees. High Forest was either Broadleaved (with up to 20 per cent Conifers), Conifers (with up to 20 per cent Broadleaved) or Mixed (Broadleaved and Conifers with at least 20 per cent of either as the minority component). Scrub was mainly hawthorn *Crataegus* spp. and blackthorn *Prunus spinosa* with a low density of other broadleaved species. Neglected coppice was not counted as scrub. Cut-over woodland was recognised as a temporary phase between felling and either restocking, natural regrowth or clearance. The breakdown of the Broadleaved High Forest and Coppice classifications are detailed in Table 2.

Information for 1946 came mainly from vertical air photographs flown by the R.A.F. between 1945 and 1947 supplemented by field examination of woods in 1973 from which their former condition could often be reconstructed. Broadleaved stands could not be defined in the detail used for 1973 (Table 2). The 'Coppice and High Forest' category was used where the broadleaved canopy structure was unclear on the air photographs. No air photographs were available for two small areas; here the stands were classified as 'Structure Unknown'.

Information on the distribution of woodland in the nineteenth century was obtained from Ordnance Survey maps (6 in. maps surveyed in 1886 and 1 in. 1st edition surveyed 1834). Details of the composition of woodland comparable to that for 1946 and 1973 were not available for these dates.

Woodlands present in the nineteenth and twentieth centuries were defined as 'Medieval' or 'Post-Medieval' in origin. Medieval woods were those known to be present in about 1650 (Rackham, pers. comm.). For

many of these there was reasonable evidence that they existed in 1279 (Rackham, 1968). Woodland known to have originated on former non-woodland sites after about 1650 was referred to as Post-Medieval.

Changes 1946-1973

Direct comparison between 1946 and 1973 is complete only at the level of major woodland types. Table 1 shows the changes and stability of these types.

There was clearance of 17 per cent of the total woodland present in 1946, of which 56 per cent of the clearance was broadleaved woodland with predictably large losses of cut-over woodland (16 per cent) and scrub (14 per cent). Clearance of Medieval woodland, 30 per cent of all clearances (Table 4), was concentrated in a few sites. Swansley Wood was almost completely cleared (12 ha.) and Waresley Wood was much reduced in area (41 ha.). Smaller clearances were at Eversden Wood (7 ha.), Weavley Clay Wood (5 ha.), Bourn Wood (4 ha.) and Elsworth Wood (3 ha.). Clearance of Post-Medieval woods was as scattered small areas. Many plantations made in the early twentieth century, especially at Longstowe, were cleared. Most clearances were done immediately post war or during the late 1960s to 1973. Clearance of at least two sites has probably continued after the date of the survey in 1973. The majority of clearances were for agriculture (239 ha.), mainly arable cultivation. A further 10 ha. were cleared as wide shooting rides and clearings within woods. Only 3 ha. were lost to development (building site, rubbish dump, cemetery).

Afforestation of non-woodland sites occurred at one site only (1 ha.) but natural regeneration of broadleaved woodland and scrub occurred at seven sites (9 ha.). Recent plantings of less than 1 ha. in area were noticed during the 1973 survey (e.g. Childerley, Boxworth) but were not included being less than the minimum area considered by the study.

Comparatively small areas have been reforested, the largest areas being at Potton Wood and Eltisle Wood (Forestry Commission) and Gamlingay Wood (formerly Economic Forestry Group). At these Medieval woods derelict coppice has been converted to mainly conifer and mixed high forest plantation. The overall trend of management, apart from clearance, has been from broadleaved woodland to conifer and mixed woodland (115 ha.), but 11 ha. have gone from mixed woodland to broadleaved woodland as the result of felling of the conifer component of mixed plantations.

Of the 1223 ha. of broadleaved woodland present in 1946, 936 ha. (77 per cent) has remained broadleaved to 1973. Some form of neglected coppice remains on 471 ha. (50 per cent) of the remaining broadleaved woodland in 1973 (Table 2). The coppice system of management declined in West

TABLE 1 Summary of changes in the main crop types of the 1487 ha. which have been wooded in either, or both, 1946 and 1973

	Total	CONDITION IN 1946					
		Broadleaf	Mixed	Conifer	Cut-over	Scrub	Not woodland
TOTAL	—	1221	89	30	55	82	10
		CONDITION IN 1973					
Broadleaf	968	936	11	—	11	4	6
Mixed	100	49	51	—	—	—	—
Conifer	85	66	—	16	—	3	—
Cut-over	29	27	1	1	—	—	—
Scrub	53	2	1	1	5	40	4
Cleared of woodland	252	141	25	12	39	35	—

TABLE 2 Changes in the structure of the 936 ha. of woodland which were broadleaved in both 1946 and 1973

		% on Medieval sites in 1973	Stand structure in 1946								
			Totals	Simple coppice	Coppice with standards	Coppice and High Forest	Plantation	Other High Forest	Structure unknown		
		936	85	349	194	143	144	21			
27	STAND STRUCTURE IN 1973										
	Coppice	Actively coppiced	85	15	—	14	1	—	—	—	
		Neglected	83	357	59	280	18	—	—	—	
		Neglected, invaded by scrub	48	16	10	4	2	—	—	—	
		Neglected, invaded by elm	61	65	9	35	17	—	4	—	
		Managed to high forest	—	6	3	3	—	—	—	—	
	High forest with coppice	Actively coppiced	17	20	—	—	19	—	1	—	
		Coppice neglected	50	17	—	—	17	—	—	—	
		Coppice neglected, invaded by scrub	—	8	—	—	—	—	8	—	
		Coppice neglected, invaded by elm	—	8	—	—	8	—	—	—	
	High forest	Originated Pre 1960	Planted	18	123	2	—	15	103	3	—
			Natural regeneration	22	144	2	3	33	2	83	21
			Elm invasion into plantation	20	113	—	—	63	18	32	—
			Coppice growing up with plantation	100	23	—	5	—	18	—	—
		Originated Post 1960	Planted	—	8	—	5	—	1	2	—
Underplanted			—	9	—	—	—	1	8	—	
Natural regeneration			—	4	—	—	1	—	3	—	

Cambridgeshire between 1850 and 1930, and had died out completely by 1946. Resulting from this decline most of the Medieval woods were left to grow up after the last coppicing. Few woods have many mature standard trees left, these having been felled in World War 2 or earlier. In the majority of the neglected Medieval woods the former large coppice (ash, *Fraxinus excelsior* and field maple *Acer campestre*) now forms a closed canopy with any standards that remain, and the former small coppice (mainly hazel *Corylus avellana* and hawthorn *Crataegus* spp.) survives with varying success in deep shade.

The invasion of elm (*Ulmus carpiniifolia* agg.) by suckers into coppice and plantation in both Medieval and Post-Medieval woodland is a feature of West Cambridgeshire woodland. Some Medieval woods are almost completely overrun by elm (Papworth Wood and Overhall Grove) so that the former structure is almost completely obscured. It seems probable that this process began in the seventeenth century and is a natural succession (Rackham, 1971). A total of 186 ha. have been invaded by elm, of which 113 ha. are plantations and 73 ha. are some form of coppice. A further 148 ha. were classified as naturally regenerated High Forest, most of which is composed of elm (Table 2). Approximately 20 per cent of West Cambridgeshire woodlands were dominated by elm in 1973.

After an interval of at least 40 years coppicing has been reintroduced at Hayley, Buff and Knapwell Woods and at Overhall Grove. Coppicing is done by volunteers for the University of Cambridge and CAMBIENT as a nature conservation measure. Some very small areas in a few other woods have been coppiced since 1960 mainly for use locally in fencing.

Changes in woodland sites 1834–1973

There was a steady gain of Post-Medieval woodland between 1834 and 1946 (Table 3), continuing a trend begun probably in the early fourteenth century. Much of the Post-Medieval woodland originating before 1834 was associated with large estates (e.g. Wimpole) and was the result of landscaping on the grand scale. Landscaped plantations were still being planted in the early twentieth century at Longstowe, but since the 1930s new plantations have been very few and small in area.

Between 1834 and 1946 there was a loss rate of less than 0.3 ha. per year of Medieval woodland, but between 1946 and 1973 the loss rate was 2.9 ha. per year (Table 4). The continued slight loss of Post-Medieval woodland between 1834 and 1946 greatly increased between 1946 and 1973 (Table 4). This increased loss was not compensated for by the creation or development of new woodland areas as was the case between 1834 and 1946 (Table 3). This increased loss between 1946 and 1973 can be related to three major factors.

TABLE 3 Area statement for woodland since 1834 (ha.)

	Total woodland	% Total land area	Medieval	Post Medieval				
				Total	Origin pre 1834	Origin 1834-1886	Origin 1886-1946	Origin 1946-1973
1834	981	2.3	700	281	281	—	—	—
1886	1198	2.8	682	516	263	253	—	—
1946	1476	3.4	675	801	257	226	318	—
1973	1233	2.9	598	636	236	198	192	10

29

TABLE 4 Changes in woodland area since 1834

Period	Changes (ha.)					Period years	Rate of change (ha./year)				
	Total loss	Gain	Net total change	Loss of Medieval woodland	Loss of Post-Medieval woodland		Total loss	Gain	Net total change	Loss of Medieval woodland	Loss of Post-Medieval woodland
1834-1886	-36	+253	+217	-18	-18	52	-0.7	+4.9	+4.2	-0.3	-0.3
1886-1946	-40	+318	+278	-7	-33	60	-0.7	+5.3	+4.6	-0.1	-0.6
1946-1973	-252	+10	-242	-77	-175	27	-9.3	+0.4	-9.0	-2.9	-6.5

1. Agricultural techniques have greatly increased the value of arable land in the area (This fact has affected other habitats such as hedges and grassland).
2. Forestry Commission holdings are small (122 ha.), largely because woodland is sparsely distributed. It is therefore unable to retain woodland as has been the case in Rockingham Forest (Peterken & Harding 1974).
3. Private woodland owners, with two exceptions, have little interest in woodland management for wood products although this disinterest is perhaps mitigated by the interest of many in game.

Medieval Woodland

The medieval history and origins of many woods on the chalky boulder clay plateau have been studied by Rackham (1968, 1971). He concludes that many of the parish woods present today were in existence in 1279. Taylor (1973) follows the view that these may be relic areas of the ancient forest which covered the area when Mesolithic man first arrived. Such relicts are defined as 'Primary' woodland (see Peterken, 1974). There are some Medieval woods which are clearly ancient but do not appear in the statistics collected for Edward I in 1279. These are 'Secondary' woods which must have originated between 1279 and seventeenth century, in many cases probably soon after 1300 during a period of economic and population decline (see Taylor, 1973). Examples of Medieval woods which are possibly wholly Secondary are Papworth Wood and Overhall Grove, but also parts of Eversden, Buff and Madingley Woods are certainly Secondary.

Several ecological studies have been done in some of the Medieval woodlands of West Cambridgeshire where the semi-natural coppices and their dependent plant and animal communities were examined. Adamson (1912) studied Gamlingay Wood, Valentine (1948) studied *Primula* species in several woods and Rackham (1967) examined the history and effects of coppicing at Hardwick and Hayley Woods. Many studies have been done in Madingley Wood by members of Cambridge University, e.g. Wardle (1959) and Coombe (1966). Ecological studies at Hayley Wood are reviewed by Rackham (1974).

Conservation Value

Peterken (1974) suggests that the conservation value of woodlands (i.e. the wildlife content and the potential for research and educational purposes in many fields) can be graded in relation to the history and development of a site. Two of the five most important types are 'Primary Semi-natural Coppice' and 'Ancient Secondary Woodland'.

The total clearance of 77 ha. of Medieval woodland since 1946 and the reforestation of 87 ha. of Medieval woodland with conifer and mixed plantations are probably the most drastic losses of conservation value for at least the last 700 years. However 598 ha. of Medieval woodland remain in 1973 of which 367 ha. are under some form of coppice and 105 ha. under elm woodland or broadleaved plantation, all of which can be considered to be of high conservation value.

The Nature Conservancy Council has scheduled 15 areas of Medieval woodland (448 ha.) as Sites of Special Scientific Interest, but these include some conifer and mixed plantations which are not of *high* conservation value. CAMBIENT manages five Medieval woods (85 ha.) and a further 27 ha. at Buff Wood and Madingley Wood are managed by Cambridge University. Coppicing has been reintroduced as a nature conservation measure at four of these woods. The Bedfordshire and Huntingdonshire Trust for Nature Conservation are negotiating for the purchase of 16 ha. of Waresley Wood. Negotiations are in progress with the Forestry Commission for a management plan for Potton Wood which would include some provision for conservation interests. At these nine sites it may be expected that the conservation value can be maintained and possibly enhanced by judicious management.

The major loss of woodland between 1946 and 1973 was of Post-Medieval woodland (Tables 3 and 4). Although Post-Medieval woodlands doubtless have a lower conservation value than Medieval woods, they do have considerable potential for research and educational purposes (e.g. Ross, 1936) and perhaps add more to the overall visual amenity of the area than do the Medieval woods. Small areas of Post-Medieval woodland at Hayley and Hardwick Woods are within Trust reserves and larger areas are used for research by Cambridge University on the Madingley estate. The recent loss rate of 6.5 ha. per year of Post-Medieval woodland is to be regretted and efforts should be made to see that this loss does not continue.

Acknowledgements

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THE WOODLICE (CRUSTACEA: ISOPODA: ONISCOIDEA) OF A CAMBRIDGESHIRE GARDEN

Paul T. Harding

1 Long Row, Boxworth, Cambridge

The invertebrate animals associated with man and his habitations are well known (Lapage, 1957; Ordish, 1960), and many species have been studied in great detail. Rural gardens can act as intermediary zones between human habitations and the surrounding landscape, and usually support a characteristic and specialised fauna. If one accepts Sir Edward Salisbury's premise that 'a weed can only be characterised as a plant growing where we do not want it', most pest invertebrates can be considered in the same way. Garden pests such as aphids, white butterflies, root flies, slugs and snails are exploiting semi-natural habitats which have been highly modified by man. Not all invertebrates which occur in gardens are pests; many (e.g. earthworms, spiders and centipedes) are beneficial. Other groups (e.g. woodlice) are often branded as pests, but on balance probably do more good than harm.

Twenty-eight species of woodlice have been recorded in the last 20 years from open air situations in England (Sutton *et al.*, 1972) of which eleven species are here recorded from my garden at Boxworth (N.G.R. 52/345640). Ing (1959) records 19 species from Cambridgeshire of which at least 3 species are probable mis-identifications. One species *Cylisticus convexus* is

here recorded for the first time from the county. Several British species are *synanthropic* (associated with, but not solely dependent upon man and his habitations). Many species have been able to extend their ecological and geographical ranges throughout the world as a result of an original synanthropic relationship (Muchmore, 1957). In the following list, the presence of species in Boxworth is related to their probable original habitats in Britain. The species recorded can be considered in three groups although there is overlapping in several cases: A, the native fauna of the ancient forests (see Taylor, 1973) which is still represented in the remaining woodlands; B, Naturally invasive species which colonised the grassland and arable areas cleared from the ancient forests; C, Synanthropic species imported by man from habitats not represented in the area.

Long Row, Boxworth was built in around 1730 (Royal Commission on Historic Monuments, 1968) but an earlier building is shown in the vicinity on the Boxworth Estate Map (1650). Most rural gardens in lowland England could be expected to contain at least four species of woodlice but there can be little doubt that the long history of habitation around the garden at Long Row has contributed to the large number of species recorded. A garden near Cardiff around a site continuously inhabited since medieval times has produced nine species (Harding & Murrell, 1967) of which seven species also occur at Boxworth.

TRICHONISCIDAE

Androniscus dentiger Verhoeff

A synanthrope that is probably native only in south-western Britain in caves and on coastal cliffs. Commonly found on rockeries in gardens in southern England. Found under old paving slabs at Boxworth.

Trichoniscus pusillus provisorius Racovitza

Native to local woodlands and not particularly associated with man. One of the few species genuinely widely distributed in Britain. Found under damp rubble and occasionally in compost.

Haplophthalmus danicus Budde-Lund

Native to local woodlands where it is usually found in decaying wood. Introduced into the garden with logs and not truly established there.

SQUAMIFERIDAE

Platyarthrus hoffmannseggi Brandt

Associated with ants especially grassland species and probably an early invader after forest clearance. Since several species of ant are associated with man, this species can also be considered as a synanthrope. Associated with *Lasius niger* L. at Boxworth.

ONISCIDAE

Philoscia muscorum (Scopoli)

The commonest grassland species in Britain, it also occurs in drier woodlands. Not common in gardens and recorded infrequently at Boxworth.

Oniscus asellus L.

Native to local woodlands, but also one of the commonest synanthropes in Britain. Very common in gardens.

CYLISTICIDAE

Cylisticus convexus (De Geer)

A synanthrope that is probably native only on coastal cliffs and beaches in Britain, possibly also on chalk downland. It is closely associated with man and occurs in several English cities. A single specimen was found at about 30 cms depth in an old land drain.

PORCELLIONIDAE

Metoponorthus pruinosus (Brandt)

A synanthrope which may not be native to the British Isles. Probably accidentally introduced in 1971 from a garden in Surrey and not established at Boxworth although flourishing colonies are known at Great Paxton and Hemingford.

Porcellio spinicornis Say

A synanthrope that is probably native only in limestone areas in Britain. It is widespread and is associated with walls (either with mortar or made of limestone) often some distance from habitations.

Porcellio scaber Latr.

Native to local woodlands and widespread in Britain, it is also a common synanthrope. Very common in gardens.

ARMADILLIDIIDAE

Armadillidium vulgare (Latr.)

A common grassland species in much of southern England and along the coasts of Wales and south Scotland. It seems to be dependent on high concentrations of lime in its environment and is very common in some gardens especially around the bases of walls.

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ECOLOGY TEACHING IN GAMLINGAY CINQUES

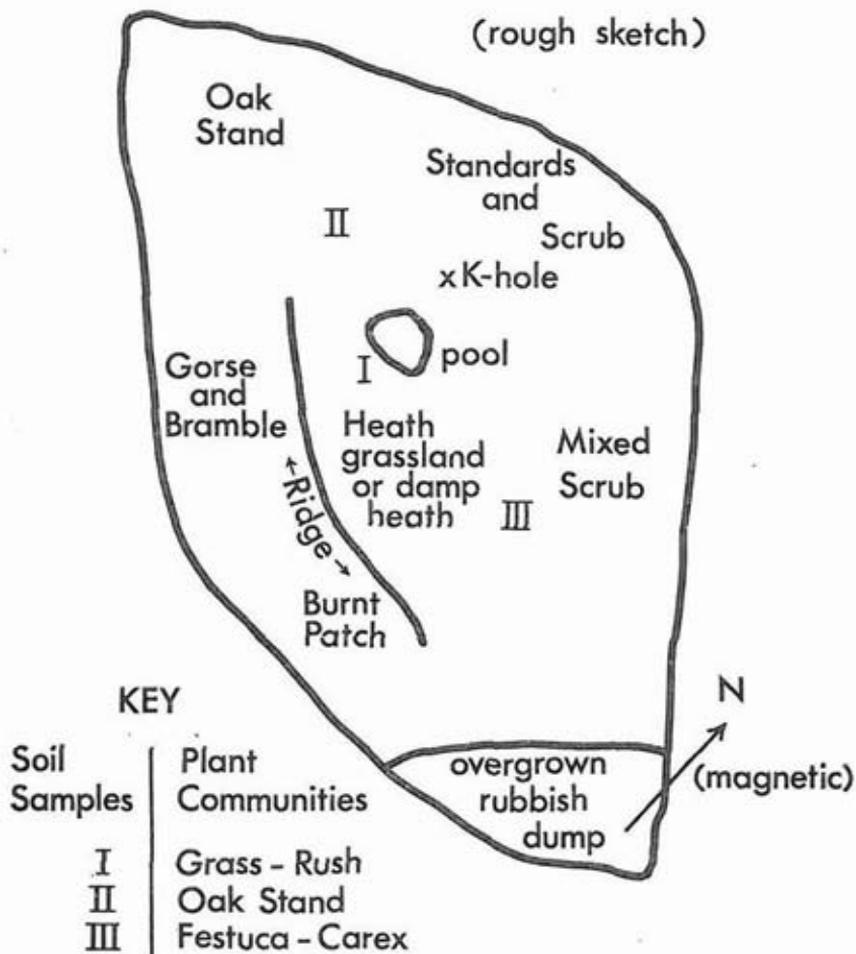
Cicely Kerr, *St Mary's Convent, Cambridge*

Gamlingay Cinques is one of the sites administered by a local committee under the auspices of CAMBIENT. It lies on the Lower Greensand about sixteen miles west of Cambridge (grid reference 226 529). Part of the site consists of an old sand pit and it is here and in the neighbouring wet meadows that remnants of heathland vegetation are to be found. The school's first contact with the pit was in 1965, when a soil profile from it was included in an exhibit at the School Fair organised for the British Association meeting held in Cambridge that year. Dr F. H. Perring (Hon. Secretary of the Technical and Field Committee) suggested that a project of wider scope, a study of the Natural History of Gamlingay Cinques Common, might be undertaken. From then until 1972, the School Natural History Society, under the guidance of Sister Christopher, our former Headmistress, made various observations including fortnightly readings of water level, soil and air temperatures. Collections of flowers, bryophytes and fungi were made and a series of photographs was taken. Sister Christopher left the school in 1972, and, from September 1973, the project has been carried on as an integral part of the A level course, giving opportunity for meaningful practice in ecological techniques and for discussions of the factors affecting the various habitats, based on data collected over the past eight years.

During 1972-73, preliminary work was done on the site with the help of several colleagues under the guidance of Dr S. M. Walters, our official adviser for the Royal Society's School Project Scheme. The Royal Society gives financial help as also did the Shell Oil Company and the Cambridge

GAMLINGAY CINQUES PIT

(rough sketch)



Institute of Education in earlier years. The old sand pit and the surrounding banks were mapped. Numbered stakes were driven in 5 metres (or a multiple thereof) apart in the bottom of the pit, so that a grid running magnetic N-S and E-W can be set up as required. This grid was plotted on the map and facilitates the plotting of any quadrats we may investigate. Unfortunately, as the site is public property, the stakes frequently disappear. However, as long as a few remain, the others can be replaced quite

easily. The grid has been enlarged from time to time. The plant communities have been identified and these form the basis of our observations so far.

An area of about 100 m.², mainly of gorse (*Ulex europaeus*) and bramble (*Rubus sp*) was burnt in November 1972. This gave us an opportunity to study recolonisation, the first seedlings appearing in February 1973. Percentage cover in random metre quadrats was estimated by some girls in October 1973. They decided that a permanent quadrat would be more worthwhile and time-saving; this has been plotted and can be found by triangulation, for stakes in such an exposed position are inevitably pulled up or kicked over. Discussions on the sequence of appearance and dominance of some plants, with investigations of growth patterns, follow on from this and records are made every few months.

Other groups have mapped the larger standards. We hope to find someone who will take an aerial photograph of the site as Fisons kindly did in 1966. We could correlate it with features on the ground using the standards as markers. In 1965 Sister Christopher referred to the 'young oaks' and asked 'when were they planted?' These are small specimens of *Quercus robur*. The shrubs and trees on the boundary of the pit were recorded and plotted in the winter of 1973-74, and subsequently verified, with some alterations in the following summer.

This was a useful exercise in the identification of the following species:

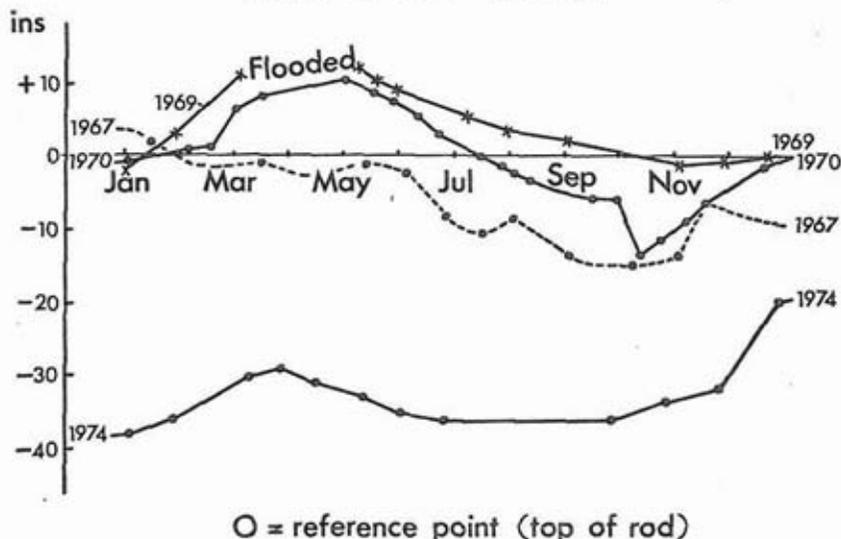
LIST OF SHRUBS AROUND THE PERIMETER OF THE SITE

<i>Acer pseudoplatanus</i>	<i>Crataegus monogyna</i>
<i>Ulex europaeus</i>	<i>Ulmus minor</i>
<i>Sarothamnus scoparius</i>	<i>Corylus avellana</i>
<i>Rubus fruticosus</i>	<i>Quercus robur</i>
<i>Rosa canina</i>	<i>Sambucus nigra</i>
<i>Prunus spinosa</i>	

The list is already out of date as the only broom plant (*Sarothamnus scoparius*) was destroyed in the spring of 1974. Some of the elms, in the north corner near the cross-roads, which were attacked by Dutch elm disease, were cut down by the local committee and were burnt on 5 November of this year.

The boundary of the scrub, mainly gorse and brambles, has also been mapped and this should be repeated at about four yearly intervals. It might be possible to see the effects of changes in the water level. Very wet conditions make the bramble and gorse rot (as can be seen from photographs taken in 1970-71) whereas drier conditions encourage their spread. The water level has fluctuated markedly over the past seven years. The soil was dry and the vegetation sparse on the bottom from 1965-68, though the

WATER LEVELS (K-hole)



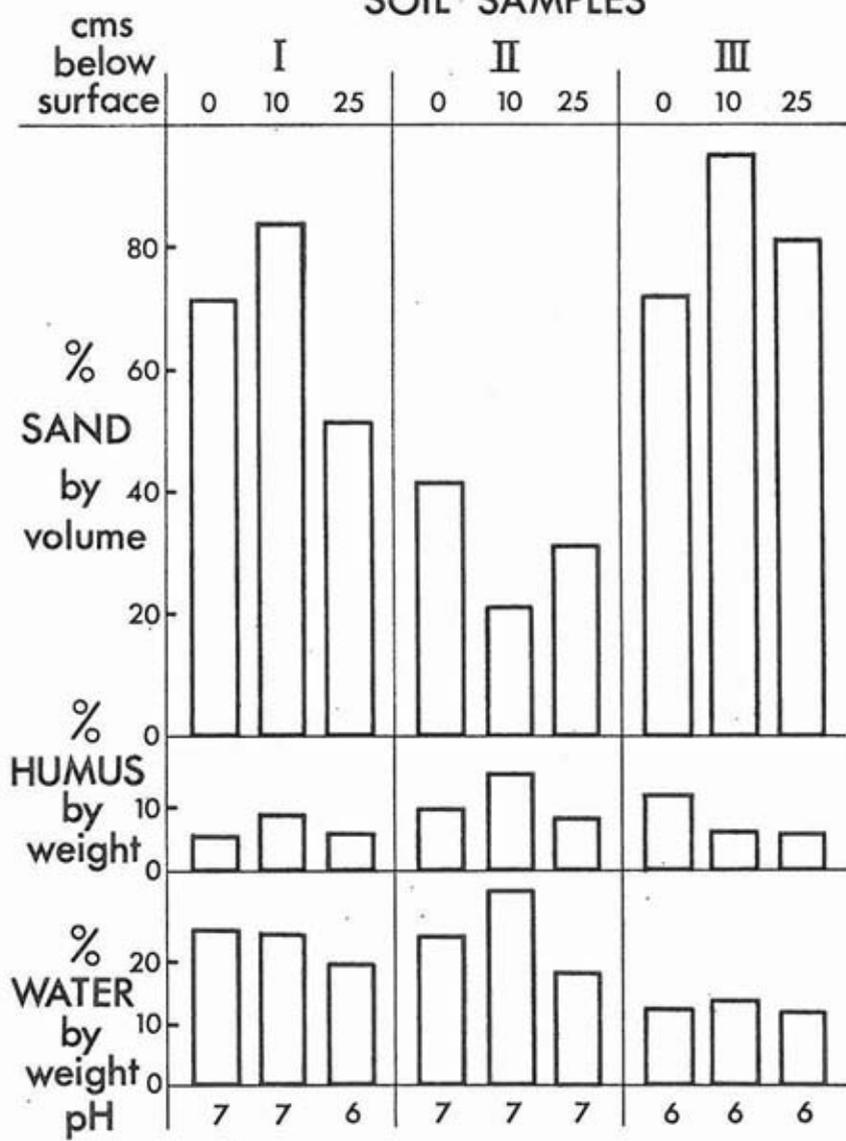
pool had water in it. In 1973 it became increasingly difficult to measure the water level, none of our pits being deep enough. In October 1973 one of them was dug out by the Conservation Corps. Four layers of concretions were gone through before water was reached 39 inches below the top of the marker rod. These extremely hard concretions must impede drainage and no doubt are responsible for the flooding when snow melts, or after prolonged and heavy rainfall.

A watch is being kept on the three patches of heather (*Calluna vulgaris*) marked on the map. These were first mentioned in 1970, though presumably they were there before. They were measured and photographed in 1972 but there has been no change since then. A patch of ground was cleared near one of them in an attempt to find out how they spread vegetatively and whether they seed. There is nothing to record as yet.

A belt transect (1 metre across) was made through the mixed scrub in the spring of 1974—a rather painful undertaking because of the gorse and brambles, but good practice in this type of investigation. Several more transects could profitably be undertaken in the future.

The whole class studied the effects of trampling by the children who play in the pit (probably the most important biotic factor). The frequency of certain species of grasses, rushes, sedges and of silverweed (*Potentilla*

SOIL SAMPLES



anserina) in the lower part of the pit near the pool was recorded. This was done for each species by estimating whether it was 'abundant', 'frequent', 'rare' or 'absent' in a large number of quadrats, the path being also plotted in them. Growth forms of the various species will be studied next Spring to see why some manage to survive and others do not. Collections of bryophyta have been made from time to time.

LIST OF BRYOPHYTES

Some (*) recorded pre-1964 may have come from the dry part of the site, now a playing field.

- | | |
|----------------------------------|---------------------------------|
| * <i>Polytrichum juniperinum</i> | <i>A. juratzkanum</i> |
| * <i>P. formosum</i> | * <i>Brachythecium albicans</i> |
| * <i>Fissidens bryoides</i> | <i>B. rutabulum</i> |
| <i>Ceratodon purpureus</i> | <i>Eurhynchium praelongum</i> |
| <i>Dicranella heteromalla</i> | <i>E. swartzii</i> |
| <i>Funaria hygrometrica</i> | * <i>Pellia epiphylla</i> |
| * <i>Leptobryum pyriforme</i> | * <i>P. fabbroniana</i> |
| * <i>Pohlia nutans</i> | <i>Calypogeia fissa</i> |
| <i>Bryum rubens</i> | <i>Lophocolea heterophylla</i> |
| * <i>Amblystegium serpens</i> | * <i>Cephaloziella starkei</i> |

No visits were made this autumn because of bad weather, but one class is investigating the structure, pH, and water and humus content of soil from three areas in the pit.

Perhaps an explanation of how and when this work has been done should be included. We travel by school minibus to Gamlingay. In 1973-74 the Sixth Form biologists and I spent a 'free' afternoon during school hours, every fortnight, weather permitting. This year, the time-table is not so convenient for our purposes and we shall have to do part of each visit out of school hours. This will make winter visits impossible because it will get dark too soon. A colleague, who lives near Gamlingay, has undertaken to record the water level and soil temperature during the winter.

We have hardly scratched the surface of the project—some headway having been made with plants but not one animal species has even been mentioned. However, we shall keep going, weather, petrol supplies and the Chancellor of the Exchequer permitting.

VASCULAR PLANT RECORDS

R. J. Pankhurst

Since my appointment to the Botany Department of the British Museum (Natural History) and our moving house to the London area, I have had to relinquish the task of Recorder of Flowering Plants. During the three years that I have kept the records I have set in motion the method of recording by tetrads (two km. squares) to assist in the production of a new Flora of Cambridgeshire.

Mrs G. Crompton of Merchants Yard, 103 Commercial End, Swaffham Bulbeck, Cambridge, has very kindly consented to take over all this work in which she has my good wishes for all possible success. Will Trust members please send their records to her? Anyone wishing to help by surveying a tetrad can obtain full particulars of this quite simple and very interesting task from Mrs Crompton. Most of the records received this year have been for aliens; space does not permit for adequate treatment of each one, so they will be held over until 1976.

WEATHER NOTES FOR CAMBRIDGESHIRE 1974

Both drought and heavy rainfall were notable features of the weather during 1974. The year was also much more equable than is usual in Cambridgeshire, with almost no winter frost or high temperatures in the summer. The total rainfall for the year (24.6 in.) was above average for the first time since 1968. More than two thirds of this rainfall total fell in the period from August to December, whilst the spring and early summer were very dry.

The year began with frost all day on 1 January, but this immediately gave way to mild weather, which persisted throughout January and February. On 15 January the temperature reached 57°F and during the night 10/11 January there was a thunderstorm of summer intensity accompanied by gale force winds. From March to June, although temperatures were about normal there was a great deficiency of rainfall resulting in crop failures with spring barley and sugar beet in some part of the county. Many trees had difficulty in putting forth their foliage, and the effect, on ash trees in particular, could be seen throughout the summer. The effects of the drought were undoubtedly increased by the low rainfall of the preceding years having left the soil watertable at a low level. Heavy rain on 26 and 27 June finally broke up the dry spell. In July the weather was mainly cool and cloudy with the mean maximum temperature 3°F below average. Rainfall (1.38 in.) was again below average. July is normally the wettest month of the year in

Cambridgeshire. The temperature returned to normal in August, and the rainfall exceeded the average for the first time since February. From early September until the end of the year, the weather was completely cyclonic in character, bringing almost continuous S.W. winds with gales and heavy falls of rain. Temperatures were below normal in September and October but considerably above in November and December—a record 61°F was reached at Cambridge on 28 of the month. The autumn and early winter were remarkably free of fog and frost, with mild, open weather persisting to the end of the year.

Weather Records at Swaffham Prior 1974

Temperature °F

<i>Month</i>	<i>Mean max.</i>	<i>Mean min.</i>	<i>Highest</i>	<i>Lowest</i>	<i>Rainfall in.</i>
January	47	37	57 on 15th	21 on 1st	1·61
February	47	37	56 on 10th	28 on 20th	2·10
March	51	36	62 on 25th	27 on 3rd	0·61
April	56	37	67 on 10th	29 on 14th	0·49
May	61	44	75 on 18th	31 on 6th	1·07
June	68	50	76 on 21st	42 on 1st	1·99
July	69	54	78 on 8th	48 on 2nd and 19th	1·38
August	70	52	78 on 15th	42 on 28th	3·07
September	63	49	73 on 16th	37 on 30th	3·31
October	50	40	56 on 9th	31 on 31st	3·58
November	49	40	57 on 9th	31 on 20th	4·10
December	50	42	60 on 28th	32 on 12th and 13th	1·29
Annual mean	56·7	43·2		Total	24·60

Number of days over 80°F	None
Number of days over 70°F	52
Number of days with a maximum under 32°F	1
Number of days with a minimum under 32°F	23
Last air frost of the Spring	6 May
First air frost of the Autumn	31 October
Days with snow lying	None

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 or semi-natural state. County Naturalists' Trusts are now active in practically all parts of Great Britain. Our own Trust, which has played a valuable part in the growth of the voluntary conservation movement, has many urgent tasks to perform in Cambridgeshire and the Isle of Ely.

Aims of the Trust

1. To conserve the wildlife interest of Cambridgeshire and the Isle of Ely.
2. To set up Nature Reserves by acquisition or agreement in order to manage and protect their wildlife.
3. To promote in the public an interest in and understanding of conservation and natural history by publicity and education.
4. To co-operate with all local and national organisations concerned with the conservation of the countryside.

Privileges of Membership

Members are entitled to visit the 1000 acres of Nature Reserves owned or managed by the Trust. They can also attend summer field excursions arranged by the Trust, and all receive a copy of *Nature in Cambridgeshire* and two newsletters each year.

Membership

Minimum subscriptions: Ordinary £2 p.a., Life £50, Family Membership (husband, wife and any children under 12) £3, Corporate Membership Schools, etc. £2 p.a., Students 50 p.p.a. Full particulars from the Secretary. 1 Brookside, Cambridge, CB2 1JF.

LEGACIES

Some members may have considered the possibility of leaving money to the Trust in the form of a legacy. We are therefore including a suggested form of bequest, worded as a codicil to an existing will, which might prove useful. The testator should, of course, consult his or her legal adviser in making this alteration.

This is a codicil to the last Will of me.....(name)
of.....(address)

I give a legacy ofpounds (£.....) free of all duty to the Cambridgeshire and Isle of Ely Naturalists' Trust, and I declare that the receipt of the Treasurer or Secretary for the time being or proper Officer of the Society shall be a sufficient discharge to my Trustees for the said legacy.

In all other respects I confirm my said Will.

Signed, dated and witnessed.

The shop with a long
history — but a dazzling
reputation for being
first with all
that's new



Joshua Taylor

Cambridge