



Small Tortoiseshell

W. H. Palmer

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Veronica spicata on Newmarket Heath, August 1973

W. H. Palmer

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Telephone: 58144

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EDITORIAL

Although no outstanding events have occurred during the year, several small, but valuable, areas have been acquired as nature reserves and a management agreement for the highly interesting Hardwick Wood may be arranged. New members have come in steadily, but it is sad to report that a number of old ones have failed to renew their subscriptions, presumably on financial grounds. It will be noticed that we have not published a list of new members this year, as an economy measure, but an up-to-date list of the whole of the Trust's present membership can be obtained from the office. We are still anxious to increase our numbers considerably and it is to be hoped that the vigorous campaign that has been carried out in the village colleges and elsewhere will bear fruit.

SEVENTEENTH ANNUAL REPORT 1973 *(Abridged version for Nature in Cambridgeshire)*

Although the year has been difficult it has also been a successful one for the Trust. Several new reserves have been negotiated including the purchase of a further 13 acres at the Ouse Washes and an agreement for a further 31 acres at Soham. An encouraging inflow of new members was received, making a nett total of 2848 at the end of the year. Very good results have come from the opportunity we have taken of consolidating the very rapid expansion of the past few years. For example, it has been possible in addition to sorting out some of the administrative problems, to increase the amount of management of our nature reserves. This vital aspect of our work has tended to be neglected during the Trust's rapid development; we hope that future years will enable this management trend will continue and intensify.

Reserve management work has again been greatly helped by the Cambridge Conservation Corps, and parties of up to 40 young people have cheerfully gone out most Sundays during the autumn and winter months under its leadership. The tasks completed included coppicing, fencing, hedge-laying, clearing scrub, bridge making and litter clearance. Welcome help has also been received from members of other organisations such as Y.M.C.A. and schools.

The purchase of land for reserves has been made more difficult than ever owing to the enormous increase in prices being asked. Nevertheless, we have added a further freehold 13 acres to our Ouse Washes reserve, with very welcome help from the World Wildlife Fund, although the price

we have paid is almost ten times as high as our first purchases there seven years ago.

The Trust participated in several rewarding exercises with other countryside organisations. The farming, wildlife and amenity exercise at Scotland Farm, Dry Drayton, in July attracted considerable attention; the Fenland Environment Exhibition in Ely Cathedral during June, with its associated wildlife meetings and walk, was most successful. The Trust also arranged a long series of evening meetings at village colleges and other adult education centres, and participated in a number of public events and shows such as the Cambridge Leisure Fair, Duxford Sheepdog Trials and Gransden Show. N.B. An unabridged copy of the annual report for 1973 is available freely on request at the Trust Office.

TREASURER'S REPORT

It is pleasing to report that 1973 has been a satisfactory year financially. The continued support of our members is reflected in the increased sales turnover and membership subscriptions. It is inevitable that costs should rise and will continue to do so. It is therefore important that Trust membership should continue to grow and our sales to increase.

The Council have decided to amalgamate the Hayley Wood Fund with the Trust's General Fund as from 1 January 1974. This has been necessary since in the not so distant future Hayley Wood will cease to be financially self-supporting. As a result, the accounts for the year 1973 which accompany this report show the Hayley Wood Fund separately for the last time.

NATIONAL TRUST

EXTRACTS FROM THE REPORT OF THE LOCAL WICKEN FEN COMMITTEE 1972-73

Visitors

During 1972, 20,862 people signed the visitors book, compared with 17,151 in 1971. This could mean at least 30,000 visitors if only about 60% of them bother to sign the book.

Publications

Three new leaflet guides were published during the year:

No. 8 Butterflies and Day-Flying Moths. Dr J. Smart.

No. 9 Micro-lepidoptera, an Annotated Check List. Lt. Col. A. Emmet.

No. 10 Lichens of Wicken Fen. J. R. Laundon.

Zoological Secretary's Report

In August 1972, Dr J. C. Brown carried out a survey of the small mammal population of the Fen, using Longworth live traps. He found that the Sedge fields supported a high density population of the Bank Vole, but surprisingly no Common Voles were caught. Small numbers of the Wood Mouse and the Common Shrew were also caught here. Carr was found to be an unfavourable habitat for small mammals; the few caught were found close to the edge of such areas. Where there was a thick ground-cover of shrubs or grasses, e.g. in patches of *Myrica gale*, the Wood Mouse appears to be the commonest species. Other species caught during the survey were moles and weasels.

Dr J. P. Dempster of Monk's Wood has continued his work on the Swallowtail butterfly. The survival of eggs (Norfolk origin) introduced to Verrall's Fen was good in 1971, but poor in 1972. This was primarily due to the poor growth of *Peucedanum* in 1972, many plants being swamped by the surrounding vegetation. As spiders abound here, mortality has been high. The status of *Peucedanum* at Wicken is far from satisfactory, and it is very patchily distributed. Work is going on in attempting to increase the areas where the plant occurs, particularly in Adventurers' Fen. Greater areas of suitable habitats are essential if the introductions are to survive.

Bird-Ringing Report

During the period from early April to mid-October 1972 the Wicken Fen Ringing Group ringed 2968 birds of 49 different species. The major scores were Reed Warbler 448, Redpoll 234, Sedge Warbler 216 and Reed

Bunting 200. Interesting species ringed in smaller numbers were Woodcock (1), Mistle Thrush (1), Long-eared Owl (1), Great Spotted Woodpecker (1), Jay (4), Whinchat (1), and Bearded Tit (1).

There was evidence of decreased breeding success by the Sedge Warbler, but Kingfishers, Wrens and Redpolls seem to have done well in 1972. Ringing recoveries indicated that some Bearded Tits found at the Fen originated from and return to Kent. During the year 7 birds ringed elsewhere (Kent, Bucks, Middlesex, Norfolk and other parts of Cambs.) were trapped at Wicken, and 14 birds ringed at Wicken were reported from elsewhere. Pride of place must go to a Reed Warbler recovered in Mauritania, 3900 km. S.S.W. of Wicken!

Despite the dry season and the lack of flood water, the duck population in the Charles Raven Reserve has remained reasonably high. The Wigeon have made considerable use of the grass on the south side of Harrison's Drove for 'grazing'. The numbers of Tufted Duck seem to have increased considerably over the last few years, Pochard remain reasonably stable, whilst Shoveler appear slightly on the increase.

Botanical Secretary's Report

Important vegetation surveys were carried out on St Edmund's Fen and on the 'Godwin Triangle' on the Sedge Fen. The aim of the former was to describe and map the extent of the main types of vegetation cover. The extent of the surface leaching, as shown by the presence of calcifuge bryophytes, was found to be much greater than expected, the most intensively leached areas coinciding with old peat diggings where there was a pattern of ridges and hollows. Two transects here showed a pH range from 4.6 on the top of a ridge to 7.5 near its base. *Sphagnum fimbriatum* occurred in the calcifuge community on the ridges.

During 1972 and 1973 Miss P. Cammell has been carrying out a field study of the internationally rare Marsh Pea (*Lathyrus palustris*). This work may prove of crucial importance in understanding management problems in protecting this and other rare fenland plants. Work has also been carried out by Dr D. M. Calder of Melbourne on the microspecies of *Taraxacum* and by Mr R. J. Pankhurst on the Fen's brambles.

The demonstration garden was fully laid out in 1972, and has proved most useful to visitors.

CAMBRIDGE NATURAL HISTORY SOCIETY

President: Dr S. M. Walters

President for Lent Term 1973: Dr J. E. Treherne

Report for 1973

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

| | | |
|-------------|--|--|
| 26 January | Prof. G. W. Dimbleby | The Impact of Early Man on his Environment |
| 16 February | Prof. J. Z. Young | Memory |
| 2 March | Dr J. E. Treherne | Presidential Address: Insects and History |
| 26 October | Dr F. R. Harden Jones Prof. J. S. Kennedy Chairman: Prof. W. H. Thorpe | Symposium on Migration |
| 9 November | Dr R. G. West | The Legacy of Britain's Glaciations |
| 23 November | Mr J. S. L. Gilmour | The Cambridge Botanic Garden |

The Zoological, Botanical, Applied Biology, Entomological, Geological and Cell Biology sections each held some six meetings during the year. A successful *Conversazione* was held in the University Zoological Department on 16 March, and the Annual General Meeting was held, as usual, on 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: 50 p., Members of Homerton or Hughes Hall (annual): 25 p., Undergraduates (3 years): £1.25, Corporate Membership (for schools etc.): £2.

Applications to: Mr I. Hepburn, 8 Millington Road, CB3 9HP
(City Secretary)

Mr A. C. Leslie, Clare College, Cambridge
(University Secretary)

FIELD MEETINGS AND OPEN DAYS IN 1973

Sunday, 11 February, Ouse Washes

Exceptionally mild weather tempted some 350 members to take part in this excursion. This fantastic number was encouraging as a measure of the great interest that members take in this reserve, but somewhat embarrassing from the point of view of guiding and traffic control.

There was no flood water in the Washes—apparently only the third time during this century that water has been absent in February. As a result members had to look carefully in the rough grass to see the Wigeon, which one of our guides (Mr J. Sorensen of the R.S.P.B.) assured us numbered at least 7000. The party walked from Welches Dam to Purl's Bridge along the river, calling at the Trust's newest hide, half-way along, and visiting various R.S.P.B. hides beyond it.

Besides the Wigeon, a number of Pintail, Teal, Tufted, Shoveler and Mallard ducks were seen. A few Ruffs were seen at Purl's Bridge. Herons and Kestrels were observed and some of the party saw a Barn Owl. Smaller birds were busy along the banks of the Washes, but there can be no doubt that the crowd of visitors inhibited the usual display of birdlife.

Nevertheless the excursion was much enjoyed by many members, who were joined by a small group from the Lincolnshire Trust. However, as a result of the large crowds, the Trust has reluctantly decided not to arrange further excursions to the Washes until improved car-parking facilities have been installed at Welches Dam. Those who came on this excursion will, at any rate, have discovered where to come on some less popular occasion, preferably in mid-week when possible.

Saturday, 28 April, Reserves around Cambridge

This excursion, which took place immediately after the A.G.M., was arranged primarily to demonstrate the good liaison which exists between the Trust and Local Authorities.

The first stop was at Cherry Hinton chalkpits, where the City Council has allowed the Trust to lay out a nature trail. Part of the area is used by members of the Caravan Club, which has made an attractive camp site on part of the land. The party was met by the Caravan Club warden, Mr Sinclair, and Dr Walters spoke about the long negotiations which had led up to a very satisfactory agreement with the City Council. He also described some of the nationally rare plants which grow there, notably *Linum anglicum* and *Seseli libanotis*. Mrs Lipstein also spoke of the Council's interest in the site and stressed the value of the whole Cherry Hinton complex of pits as an open space when the proposed housing developments in the district mature.

Moving on to Stapleford Pit, the party was welcomed on behalf of the Parish Council by Mrs Tyler. In 1960 the Trust concluded an agreement with the Parish Council to manage the site as a nature reserve. Members were shown round the reserve by Mr K. Cramp, the Secretary of the Management Committee, who described the work done by the Conservation Corps and others in clearing scrub, nettles and rubbish. The pit was full of singing birds, and the botanists present enjoyed inspecting various plants both common and rare.

The final stop was alongside the River Rhee, between Barrington and Shepreth. Here the party was met by Mr Peter While of the County Council's Planning Department, who described the Council's proposals for a public picnic site there. The Trust had been asked to lay out a nature trail on part of the area and to give advice on the future management of its less accessible parts as a nature reserve.

Sunday, 6 May, Overhall Grove

Despite intermittent showers and a violent downpour at 4 p.m., the fifty odd members who came on this excursion spent an enjoyable afternoon in this attractive and extensive new reserve (1972). They found the oxlips still making a good display and the bluebells fully out. Apart from these, the herbaceous plants are decidedly lacking in charm—Nettles and Cleavers being particularly abundant. However, a large patch of Alexanders (*Smyrniolum olustratum*) near the site of the manor house was an unusual find, and the widespread occurrence of Goldilocks (*Ranunculus auricomus*) was interesting.

Mr Peter Moule proved an admirable guide, showing the party the flourishing badger sett (with plenty of evidence of occupation) and the curious Red Well. He was able to point out the songs of the Blackcap, Chiffchaff and Willow Warbler amongst the more continuous calls of Tits, Chaffinches, Blackbirds and Thrushes. He also showed us a Robin's nest with young and two Wrens' nests with eggs.

The visitors thoroughly approved of the recent clearing of certain elm suckers to give more room for the development of some very fine oaks, but it was realised that a great deal more thinning of young elms would be necessary in the future to enable the elms themselves to develop properly.

After the storm the paths, already rather wet, became a sea of mud and very slippery. People found that great care was necessary on the return journey to avoid sitting down, but on the whole found it quite an entertaining experience. As a final excitement, the bus got stuck where it was parked and required some energetic assistance before it could leave for home.

Sunday, 20 May, Soham Reserve and Wet Horse Fen

There was a splendid gathering of some 70–80 members of all ages to visit this fine new reserve (Green Hills) for the first time. The party was lucky to have Dr Max Walters, who had known the site for many years, as their guide. Help over identifications was also available from several other distinguished botanists who were of the party. Areas of undisturbed old pasture are becoming increasingly rare, and the preservation of this botanically rich site is greatly to be welcomed.

Members were issued with a list of some 165 flowering plants and nearly 50 birds previously found in the reserve and the adjoining Wet Horse Fen. During the afternoon several new names were added to the plant list (mostly common species), but many others on the list were not yet in bloom although a number could be identified by their leaves. The party was, of course, much too large for any serious bird-watching, but it was clear that the extensive old hedgerows and numerous bushes provided admirable nesting places for all the smaller birds.

The most striking feature amongst the plants was the abundance of Meadow Saxifrage (*Saxifraga granulata*) in full bloom. This is a rare species in the county. The other local rarity, the Frog Orchid, has unfortunately not been seen on the site for some years. The display of various different buttercups was most attractive, whilst the cowslips were still at their best. The botanists enjoyed themselves identifying sedges of which there were a number of different species, including some, like *Carex nigra*, which are rare in the county.

Wet Horse Fen proved no wetter than the reserve, and was particularly notable for its display of cowslips. It was also well furnished with bushes, and finches and linnets were much in evidence. The Fen is bordered by Soham Lode, a typical fen waterway whose banks provided a pleasant route home.

The whole area visited provides an attractive oasis of over 50 acres in this intensively cultivated arable district, and the visit was much enjoyed by the large party.

Sunday, 22 July, Devil's Dyke

Despite a spell of very unsettled weather, a party of over 30 members had a fine afternoon for their expedition to this famous earthwork. It was perhaps rather late in the season for the best of the flowers, but there was plenty for the botanists to see and enjoy. Mr John Clarke, who knows the whole Dyke well, was an admirable leader.

In the course of a walk, starting from the A11 near Newmarket and reaching as far as the boundary of that section of the Dyke managed by the

Trust, a distance of some three miles, most of the characteristic chalk grassland plants were seen. Naturally the colourful displays of flowers that one associates with the latter part of June were over, but it was possible to find the tiny star-like flowers of the rare Bastard Toadflax (*Thesium humifusum*) and also to observe a few plants of the Trust's emblem, the Pasque Flower. Amongst many others, it was pleasant to see the purple flowers of the Clustered Bellflower (*Campanula glomerata*), the pure white of the occasional Dropwort (*Filipendula vulgaris*) and an encouraging number of plants of the Lesser Meadow-Rue (*Thalictrum minus*). But the single plant of the Lizard Orchid (*Himantoglossum hircinum*), seen earlier in this part of the Dyke, was not observed, and the Spotted Cat's-ear (*Hypochaeris maculata*) was over.

Members were interested in inspecting the site where the Newmarket by-pass is to cut through the Dyke—a regrettable necessity, whose deleterious effects are, however, to be reduced to the minimum.

A breezy walk along the Dyke is always a pleasant experience, and the party clearly enjoyed this. They made very good time on the return journey to reach the coach and the cars at 5.30 p.m.

Friday, 15 June at 7 p.m., Roswell Pits, Ely

About 60 people assembled at the Maltings, Ely, for this new venture of a conducted tour of the nature trail, which was open to members and non-members alike. The party went by coach to Springhead Lane and were thence escorted round by specialist members of the Trust, who had kindly volunteered to do so.

It was a perfect June evening and the small conducted groups were able to enjoy a rich variety of wildlife. Many different flowering plants were observed along the route, birds were singing from almost every bush and meadow and the entomologists found plenty to interest them. The pits were lined with tall plants of Yellow Iris, Meadow-rue, Willow-herb and Hemlock and the Yellow Water-lilies were just coming into flower on the surface of the water. But one of the highlights of the evening was a plentiful scattering of Bee Orchids through the long grass and in the short turf by the small pit.

Numerous Snipe were drumming overhead as the party walked back towards the Maltings, with the Cathedral spectacularly silhouetted against the sunset sky.

On returning to the Maltings the party were refreshed with coffee before dispersing. The Secretary was greatly encouraged by the fact that several members of the party joined the Trust on the spot. The meeting formed part of the Fenland Environment Exhibition which was set up for several weeks

in the Lady Chapel of the Cathedral, and the Trust greatly appreciated the help it received from the organisers as well as from its own staff.

Saturday, 18 August, Foul Anchor and Norwood Road Reserve at March

The 35 or so members who travelled (mostly by coach) to the far side of Wisbech spent a rewarding day in this flat Marshland area. Admittedly Cambridgeshire's 'seaside' is no beauty spot, but the weather was good and a convenient bank adjoining the interesting strip of maritime vegetation along the bank of the tidal Nene provided an agreeable picnic spot. After lunch Dr Walters gave an interesting talk on the site and its vegetation, and was constantly available for identification purposes during the afternoon. It was immediately apparent that we were near the sea for the foliage of the abundant Sea Couch Grass (*Agropyron pungens*) gave the whole area a blueish tinge. It was surprising how many different salt-marsh plants could be found in this small area. Amongst these were both Sea Plantains (*Plantago maritima* and *coronopus*), both Sea Spurrays (*Spergularia marginata* and *salina*), whose little pink flowers were everywhere, the Orache (*Atriplex littoralis*) and a fine patch of Sea Lavender (*Limonium vulgare*) in full flower. Prominent along the muddy river bank was the silvery foliage of the Sea Wormwood (*Artemisia maritima*) with occasional plants of Sea Aster (*Aster tripolium*) not yet in flower, and the Sea Club Rush (*Scirpus maritimus*). Amongst the grass the little Salt-marsh Rush (*Juncus gerardii*) was occasionally to be seen and the characteristic shiny light green leaves of the prostrate Sea Milkwort (*Glaux maritima*) were widespread. In addition to the various *Puccinellia* species of grass, occasional plants of the little grass, *Parapholis strigosa*, were seen. But the most exciting plant there was the Slender Hare's-ear (*Bupleurum tenuissimum*)—a national rarity.

Moving on to Norwood Road, March, the party was welcomed by five members of the local management committee. Although too late in the season for occupied nests, Mr Lake was able to point out many of those which had been inhabited earlier in the year. He reported that over 300 nests had been plotted in the reserve during 1973, and five cuckoos' eggs were laid in different Reed Warblers' nests. Some members spotted a Kingfisher during the visit, but he reported that he had seen no less than four birds together earlier in the week!

The party greatly enjoyed their tour round this attractive little reserve, made much more interesting by the informative local guides who accompanied them.

Saturday, 6 October, Fungus Foray in Brandon Country Park

The numbers attending this last excursion of the season were larger than

ever, some 80-90 of all ages being present. Despite a promisingly warm and sunny morning, the expedition narrowly escaped total failure since a violent thunderstorm was taking place when members were assembling at 2.30. However, it was all over before 3.0, and the sandy Breckland soil rapidly absorbed the surface water. In fact, it turned out to be an exceptionally successful meeting, and fungi were to be seen in great profusion.

Dr Hudson proved to be a delightful and enthusiastic guide, taking as much pleasure in the discovery of each fresh species as if he had never set eyes on it before. In addition, he was able to point out with exceptional clarity the characteristics of each new find, and obviously possessed a wide practical knowledge of the relative culinary merits of those which were edible.

But when a specimen of the Death Cap (*Amanita phalloides*) turned up, he was careful to point out in great detail its characteristics, as it is the most poisonous of all. The attractive, but unmistakable, Fly Agaric (*Amanita muscaria*), with its red cap with white spots, also received a strong warning. The large Parasol Mushroom (*Lepiota procera*), one of the best 'eaters', was abundant, and Dr Hudson collected a big load to take back in his car to his deep-freeze for gradual consumption at home. Various members took back baskets of these as well as several *Boletus* species, small Puff-balls *Calvatia caelata* and others. We did not hear of any unfortunate after-effects!

Amongst the wealth of different fungi one may perhaps pick out one or two of special interest. Thus the pretty pink *Lactarius torminosus* possessed a most unpleasant hot taste, the distinct blue species, *Clitocybe odora*, smelt strongly of aniseed, the little (edible) *Marasmius oreades* proved to be responsible for the familiar 'fairy rings', and the fruit bodies of the attractive Earth-stars (*Geastrum nanum* or *triplex*) when ripe were seen to discharge a shower of dusty spores. And so one might go on. Everyone, not least the many children, seemed to enjoy the afternoon in this attractive forest. Only the sun was lacking, but at least it was pleasantly warm.

RECORDS FROM THE CAMBRIDGE BIRD CLUB ANNUAL REPORT FOR 1972

H. J. Harvey

University Department of Applied Biology, Cambridge.

The systematic list in the 1972 Cambridge Bird Club Annual Report covers some nineteen pages of a size similar to those of this journal, with reviews of Wisbech Sewage Farm and the Breckland occupying a further seven

pages. In addition to records of birds seen in the club area the report contains important papers on the bird populations of the Wash, threatened by water storage schemes, and Grafham Water together with shorter contributions on the birds of the Norwood Road Nature Reserve and the New Addenbrooke's Hospital site. Brief reports on ringing in the county, on a census of birds coming to feed at bird tables during the winter and on bird road deaths on the outskirts of Cambridge are also included. It is clearly impractical to include more than a brief selection of all this material in this report.

The year began with a Spotted Crake and a possible Great Snipe on the Ouse Washes together with record numbers of Wigeon (35,500) and Bewick's Swan (1200). Both Red-throated and Black-throated Divers, Red-breasted Merganser, Goosander and Smew were also seen there in January or February. Wildfowl numbers in other parts of the county were low with Mallard, Teal, Wigeon, Tufted Duck, or Pochard at sites such as Wicken Fen, Ely Beet Factory and various gravel pits, especially Mepal, in hundreds rather than thousands. A Red-crested Pochard was seen at Waterbeach. Great Grey Shrikes were reported from four sites during these early months, as compared with three in the autumn, while Bearded Tits were present at Wicken, Ely and Fowlmere. Siskins were widely reported with some birds coming to feed at bird tables. Among the more unusual birds seen early in the year were two Bean Geese on the Ouse Washes.

The warm and sunny March resulted in the early arrival of some Chiffchaffs (16th) and Willow Warblers (26th) but many summer visitors were delayed by the cold windy conditions of April. Notable features of the spring passage period were a Firecrest at Over and the large number of Dotterel seen in the south of the county.

The summer was notable for the lack of rain and this may have affected the breeding success of species such as Redshank, for many areas dried out much more rapidly than usual. Ruff and Black-tailed Godwit continued to breed successfully on the Ouse Washes while there were reports that a pair of Sparrowhawks nested in the west of the county; if true the first county breeding record for some years. Unfortunately Common Tern and Oystercatcher, added to the county breeding list in 1971, do not appear to have bred and although Wood Warblers were again recorded in Hayley Wood breeding was not proved. The number of Stone Curlews nesting in the county continued to decline and for the first time for many years there were no records of Red-backed Shrike, another breeding species lost. On the positive side a Hawfinch seen near Gransden in July suggests that this species may not have such a limited distribution in the area as has been supposed. Nightingales were heard singing in the outskirts of Cambridge and a total of 47 Grey Heron nests were counted.

Marsh Harriers were seen regularly on the Ouse Washes during the summer months while a Red Kite was seen there in late May. Other raptors seen during the year included three Buzzards in the autumn, single Montagu's Harriers in both spring and autumn, Hobbys on six occasions and a single Merlin. Hen Harriers were more common than usual during the autumn.

The autumn period produced several interesting observations. The single Wryneck of 1971 was followed by four in 1972 while a single Black Redstart and several Redstarts were recorded. The range of waders seen was somewhat below normal but good numbers of Curlew Sandpiper and Little Stint occurred at Ely, with one of the latter being present on 2 December. Black Terns were fairly common and Little Tern and Little Gull were also seen. The departure of some summer visitors was delayed with Swifts being seen in mid-September and Spotted Flycatchers in early October.

With the onset of winter wildfowl numbers built up much as usual despite the dryness of the Ouse Washes. Another Spotted Crake was seen on the Washes where Stonechats were also present in good numbers, this species being more widely distributed than in most recent years. Bearded Tits were even more numerous than in the autumn of 1971 with many records from a number of widely scattered sites and the hope must be that they will soon remain to breed. Two winter records of Blackcaps were received.

The rarity of the year was a Tawny Pipit seen at Kentford in June while a number of birds obviously escaped from captivity were seen, including a Black Swan, a Red-headed Bunting and a Yellow-faced Grassquit.

Copies of the report may be obtained from the author, price 75 p.

THE MOLLUSCA OF WICKEN FEN WITH SOME ADDITIONAL RECORDS

M. J. Bishop

University Museum of Zoology, Cambridge

Wicken Fen is situated 10 miles north-west of Cambridge. It remains as an island of semi-natural vegetation, surrounded by many miles of arable land. The Nature Reserve consists of three main areas: the Sedge Fen, Adventurers' Fen, and St Edmund's Fen. Adventurers' Fen was drained and cultivated in 1941, but after construction of a mere and the subsequent growth of reed beds, it has become a successful wildfowl sanctuary. The Sedge Fen had for centuries been exploited for the production of sedge, litter and peat. Since the cessation of these activities at the turn of the century, extensive areas of carr have developed. Large stretches of the

bushes are now being removed so as to re-establish and extend the flora and fauna of the sedge fields. Information about the Fen can be found in the work edited by Gardiner, 1923-32, and in guides published by the National Trust.

The mollusc fauna has attracted interest as the Fen represents a rich calcareous marsh and freshwater habitat. Taylor (1899) gave a list of molluscs from Wicken Fen exhibited at a Conchological Society meeting. Brindley (1925) contributed an article to the work 'The Natural History of Wicken Fen', and Oldham (1926) added his observations. Ellis (1931) added two species to the Wicken list, and later published (Ellis, 1941) a list compiled from all the previous sources in his presidential address to the Conchological Society 'The Mollusca of a Norfolk Broad'. Stratton (1947) visited Wicken Fen and recorded species from areas other than the Sedge Fen. Paul (1967), using previous lists as a basis, presented his own findings and the results of a Conchological Society field meeting. He restricted his check list to species found in the Sedge Fen, and a number of new records were added. All the previous records from these sources are presented in the Species List under numbers 1 to 6.

My own observations are recorded under the number 7 in the Species List. Collections were made in Wicken Sedge Fen and the adjacent part of Wicken Lode during 1972. Care was taken to distinguish between records based on live individuals and those based on dead shells. Shells are so well preserved in the fen peat that records based on dead shells could be misleading.

The following species have been added to the Wicken Sedge Fen list during the course of the work: *Ancylus fluviatilis*, *Potamopyrgus jenkinsi*, *Pisidium supinum*, *P. moitessierianum*, *Unio tumidus* and *Ena obscura*. *Potamopyrgus jenkinsi* has appeared in Wicken Lode at some time in the last fifty years, although it is not known when. It is a species which is still enlarging its range in some parts of Britain, but its origin is obscure. The other new freshwater species were also found in Wicken Lode where they may previously have been overlooked. *Ena obscura* was found in the carr in the western part of the Fen. It is characteristically a species of woodland margins, and the increased bush growth may have favoured it. The Wicken Fen Species List is notable for the absence of *Acanthinula aculeata*, *Columella edentula* and *Discus rotundatus* which thrive at Chippenham Fen, for example, under apparently similar conditions. The importance of historical factors in determining the extant fauna of a site cannot be over emphasised. Wicken is now isolated from any woodland site by miles of intensely cultivated arable land. Even if conditions at Wicken have become more suitable for woodland species, the barriers to immigration may be considerable. Duffey (1973) has emphasised the importance of land-use

history in the comparison of the Wicken and Woodwalton spider faunas.

The following species have not, to my knowledge, been confirmed as present in Wicken Sedge Fen for over 40 years: *Arianta arbustorum*, *Valvata macrostoma*, *Pisidium hibernicum* and *P. pulchellum*. *Valvata macrostoma* still thrives at a site on the nearby Upware Washes.

Collections of *Succinea* from the Fen have been dissected by Dr L. Lloyd-Evans but *S. sarsii* Esmark (= *S. elegans* Risso of Ellis, 1951) has not been found. The most common *Vallonia* in the Fen is *V. pulchella*, but *V. costata* has been found in drier places particularly in the carr. Similarly in the case of *Vitrea* the most common species is *V. crystallina*, but *V. contracta* occurs in drier places. *Eucomulus fulvus* is represented at Wicken Fen by the form *alderi* which Waldén (personal communication) considers to be specifically distinct.

The Wicken Fen freshwater mollusc fauna is in no way exceptional, and similar assemblages may be found throughout the Fenland area. Amongst the terrestrial snails, *Vertigo moulinsiana* is of interest as being a national rarity. It is a marsh species which usually lives on the stems of *Carex* spp. or *Glyceria maxima* (see Butot and Neuteboom, 1958). In the most frequently visited eastern part of the Sedge Fen, only isolated individuals have been found in recent years, swept from the sedge-fields or from the vegetation around the brick pits. In 1972 a flourishing colony was located at the south end of New Dyke. The habitat consists of tussocks of *Carex elata* standing in water in the Dyke. This sort of situation is rare at Wicken, and needs to be encouraged for the maintenance of an adequate population of *V. moulinsiana*.

SPECIES LIST

| | | | | | | | |
|---|----|----|---|-----|--|-----|---------|
| <i>Viviparus coteectus</i> (Millet) | 1 | 2 | 6 | 7 | <i>Planorbis</i> (<i>Planorbis</i>) | | |
| <i>Valvata cristata</i> Müller | 2 | 3 | 6 | 7 | <i>planorbis</i> (Linnaeus) | 2 | 3 6 7 |
| <i>Valvata macrostoma</i> Mörch | | 4 | | | <i>Planorbis</i> (<i>Anisus</i>) <i>vortex</i> | | |
| <i>Valvata piscinalis</i> (Müller) | 2 | | 6 | 7 | (Linnaeus) | 2 | 3 6 7 |
| <i>Potamopyrgus jenkinsi</i> (Smith) | | | | 7 | <i>Planorbis</i> (<i>Anisus</i>) <i>leucostoma</i> | | |
| <i>Bithynia tentaculata</i> | | | | | Millet | (3) | 6 7 |
| (Linnaeus) | 2 | 3 | 6 | 7 | <i>Planorbis</i> (<i>Gyraulus</i>) <i>albus</i> | | |
| <i>Bithynia leachi</i> (Sheppard) | 2 | 3 | 6 | 7 | Müller | 3 | 6 7 |
| <i>Carychium minimum</i> Müller | | | | | <i>Planorbis</i> (<i>Armiger</i>) <i>crista</i> | | |
| seg. | 2? | 3? | 6 | 7 | (Linnaeus) | | 4 6 |
| <i>Carychium tridentatum</i> (Risso) | | | 6 | 7 | <i>Planorbis</i> (<i>Bathymorphalus</i>) | | |
| <i>Lymnaea</i> (<i>Galba</i>) <i>truncatula</i> | | | | | <i>contortus</i> (Linnaeus) | 3 | 6 7 |
| (Müller) | 2 | 3 | 6 | 7 | <i>Segmentina</i> (<i>Hippeutis</i>) | | |
| <i>Lymnaea</i> (<i>Stagnicola</i>) | | | | | <i>complanata</i> (Linnaeus) | 3 | 6 7 |
| <i>palustris</i> (Müller) | 1 | 2 | 3 | 6 7 | <i>Acroloxus lacustris</i> (Linnaeus) | 2 | 6 7 |
| <i>Lymnaea</i> (<i>Lymnaea</i>) | | | | | <i>Ancylus fluviatilis</i> (Müller) | | 7 |
| <i>stagnalis</i> (Linnaeus) | 2 | | 6 | | <i>Succinea</i> (<i>Succinea</i>) <i>putris</i> | | |
| <i>Lymnaea</i> (<i>Radix</i>) <i>auricul-</i> | | | | | (Linnaeus) | 1 | 2 (5) 7 |
| <i>laria</i> (Linnaeus) | 2 | | 6 | 7 | <i>Succinea</i> (<i>Oxyloma</i>) <i>pfeifferi</i> | | |
| <i>Lymnaea</i> (<i>Radix</i>) <i>peregra</i> | | | | | Rossmässler | 2? | 6 7 |
| (Müller) | 2 | | 6 | 7 | <i>Cochlicopa lubrica</i> (Müller) | | |
| <i>Aplexa hypnorum</i> (Linnaeus) | | 3 | 7 | | seg. | 2? | 3? 6 7 |
| <i>Physa fontinalis</i> (Linnaeus) | 2 | | 6 | 7 | <i>Vertigo anti-vertigo</i> | | |
| <i>Planorbis</i> (<i>Planorbis</i>) <i>corneus</i> (Linnaeus) | 2 | 3 | 6 | 7 | (Draparnaud) | 1 | 2 6 7 |
| <i>Planorbis</i> (<i>Planorbis</i>) <i>carinatus</i> | | | | | <i>Vertigo pygmaea</i> | | |
| Müller | 2 | | 6 | 7 | (Draparnaud) | 1 | 2 7 |

| | | | | | | | |
|---|-----|-----|-----|---|---------------------------------------|-----|---|
| <i>Vertigo moulinsiana</i> (Dupuy) | 1 | 2 | 6 | 7 | <i>Vitrina pellucida</i> (Müller) | 6 | 7 |
| <i>Pupilla muscorum</i> (Linnaeus) | | | 6 | 7 | <i>Limax maximus</i> Linnaeus | 6 | 7 |
| <i>Vallonia costata</i> (Müller) | | | 6 | 7 | <i>Agriolimax reticulatus</i> | | |
| <i>Vallonia pulchella</i> (Müller) | 3? | | 7 | | (Müller) | 2? | 6 |
| <i>Ena obscura</i> (Müller) | | | 7 | | <i>Agriolimax laevis</i> (Müller) | 3 | 6 |
| <i>Arianta arbustorum</i> (Linnaeus) | 2 | | | | <i>Unio pictorum</i> (Linnaeus) | | 6 |
| <i>Cepaea hortensis</i> (Müller) | (3) | (5) | 6 | | <i>Unio tumidus</i> Philipsson | | 6 |
| <i>Cepaea nemoralis</i> (Linnaeus) | 2 | 3 | (5) | 6 | <i>Anodonta cygnea</i> (Linnaeus) | 2? | 6 |
| <i>Helix aspersa</i> Müller | (3) | (5) | 6 | | <i>Anodonta anatina</i> (Linnaeus) | | 6 |
| <i>Hygromia (Trichia) striolata</i> | | | | | <i>Sphaerium (Sphaerium)</i> | | |
| (C. Pfeiffer) | | | 6 | 7 | <i>corneum</i> (Linnaeus) | 2 | 6 |
| <i>Hygromia (Trichia) hispida</i> | | | | | <i>Sphaerium (Musculium)</i> | | |
| (Linnaeus) | 2 | 3 | (5) | 6 | <i>lacustre</i> (Müller) | (3) | 6 |
| <i>Monacha cantiana</i> (Montagu) | 2 | | (5) | 6 | <i>Pisidium amnicum</i> (Müller) | 3 | 6 |
| <i>Helicella (Cernaella) virgata</i> | | | | | <i>Pisidium casertanum</i> (Poli) | 3 | 7 |
| (da Costa) | (3) | (5) | | | <i>Pisidium obtusale</i> (Lamarck) | 3 | 6 |
| <i>Helicella (Helicella) itala</i> | | | | | <i>Pisidium millium</i> Held | 3 | 6 |
| (Linnaeus) | (3) | (5) | 6 | 7 | <i>Pisidium subtruncatum</i> Malm | 3 | 6 |
| <i>Punctum pygmaeum</i> | | | | | <i>Pisidium supinum</i> A. Schmidt | | 7 |
| (Draparnaud) | 1 | 3 | 7 | | <i>Pisidium henricum</i> | 3 | 6 |
| <i>Arion intermedius</i> Normand | | 3 | 6 | 7 | (Sheppard) | 3 | 6 |
| <i>Arion circumscriptus</i> | | | 6 | | <i>Pisidium hibernicum</i> Westerlund | 3 | |
| Johnston agg. | | | 6 | | <i>Pisidium nitidum</i> Jenyns | 3 | 7 |
| <i>Arion hortensis</i> Férussac | | | 6 | | <i>Pisidium pulchellum</i> Jenyns | 3 | |
| <i>Arion ater</i> (Linnaeus) agg. | 3 | | 6 | 7 | <i>Pisidium moltessterianum</i> | | 7 |
| <i>Arion ater ater</i> (Linnaeus) | | | 6 | 7 | Paladilhe | | |
| <i>Eucouulus fulvus</i> (Müller) | 3 | | 6 | 7 | | | |
| <i>Vitrea crystallina</i> (Müller) seg. | | | 6 | 7 | | | |
| <i>Vitrea contracta</i> (Westerlund) | | | 6 | 7 | | | |
| <i>Oxychilus cellarius</i> (Müller) | | | 6 | 7 | | | |
| <i>Retinella radiatula</i> (Alder) | 3 | | 6 | 7 | | | |
| <i>Retinella nitidula</i> | | | 6 | 7 | | | |
| (Draparnaud) | | | 6 | 7 | | | |
| <i>Zonitoides nitidus</i> (Müller) | 2 | | 6 | 7 | | | |

1 = Taylor, 1899; 2 = Brindley, 1925; 3 = Oldham, 1926, 4 = Ellis, 1931; 5 = Stratton, 1947; 6 = Paul, 1967; 7 = Bishop, present work.
 1? = precise identification may be in doubt, particularly in the case of recently segregated species. (1) = record not from the Sedge Fen. 7 = live individuals, 7 = dead shells only.

Acknowledgements. Dr M. P. Kerney confirmed the identification of the species of *Pisidium*. Dr C. R. C. Paul discussed his previous work at Wicken with me.

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RECENT BRYOPHYTE RECORDS FOR CAMBRIDGESHIRE

H. L. K. Whitehouse
University Botany School, Cambridge.

The bryophyte excursions, which have been held every winter for many years, were particularly rewarding in 1972-73.

On 3 February the Botanic Garden was visited and two species new to the county were seen. The liverwort *Calypogeia muellerana* was found by Dr H. J. B. Birks growing mixed with the moss *Mnium hornum* at the base of the *Osmunda regalis* in the Water Garden. The *Mnium* has been known there for many years, but the *Calypogeia* had not been seen there before. It is a plant of non-calcareous wet conditions and is widely distributed in the British Isles. Its previous absence from Cambridgeshire is no doubt due to the lack of suitable habitats. There is little reason to think that the plant arrived at the Water Garden other than by natural means: the large number of calcifuge species which have recently appeared at Wicken Fen, apparently spontaneously, points to the efficiency of bryophyte dispersal. On the other hand, accidental introduction to the garden with cultivated plants cannot be entirely ruled out. The second plant of note at the Botanic Garden was *Trichostomum tenuirostre* which I found growing on moist sandstone near the entrance to the Water Garden. This is the first record of the plant in E. Anglia. It occurs on rocks in streams in the west of the British Isles and is also known from sandstone boulders in the Weald. The sandstone at the Botanic Garden was brought from the Weald, so it is possible that the plant was introduced with the rocks. The find, nevertheless, is an interesting one as it is many years since the stones were brought to the garden.

On 10 February Dr Birks found *Orthotrichum lyellii* near the base of a beech on the south-west side of the Wandlebury estate. There is only one previous record of this moss in the county, and that was from Madingley Wood, where it was found by the Rev. P. G. M. Rhodes at some time between 1907 and 1911. As it has not been seen there since, the species was regarded as extinct in the county (Whitehouse, 1964). *O. lyellii*, like many other species of the genus, is much more abundant in the west of Britain than in the east. This find is of particular interest because many species of *Orthotrichum* seem largely to have disappeared from eastern England within the last century, probably through sensitivity to sulphur dioxide pollution. The rediscovery of this plant in the Cambridge area is therefore reason for cautious optimism about atmospheric pollution. Moreover, this is the second recent find of *O. lyellii* in E. Anglia, the plant having been found by Mr M. O. Hill in 1969 in Hatfield Forest, N. Essex.

On 17 February at Harlton clunch-pit Dr Birks found extensive sheets of *Tortula vahliana* growing in deep shade on the chalk soil below the cliffs. This is a Mediterranean moss which was first found in Cambridgeshire in 1882 by H. N. Dixon. He found it on a hedge bank at Cherry Hinton, and it has been known there and in Lime Kiln Close ever since. The plant is at its northern limit in the British Isles and, perhaps because the climate is unsuitable for it, seems rarely to produce spores, the capsules withering before maturity. The plant is therefore propagated in Britain largely by vegetative means, and this may explain its somewhat erratic appearance: although recorded from many parts of southern England and in Ireland, it has been seen in recent years chiefly in Cambridgeshire. The best locality at one time was on chalk heaps near Quy Fen, but the plant is now less abundant there, and the Harlton locality is probably the best in Britain. The plant requires a calcareous substratum and grows in such deep shade that all competitors seem to be excluded.

The bryological excursions of the previous winter (1971-72) were notable for the discovery of *Lepidozia reptans* by Dr D. E. Coombe in two new localities: Papworth Wood and Fulbourn Nature Reserve. This leafy liverwort grows on decaying wood and was discovered in the county at Hayley Wood in June 1965 by Dr S. J. P. Waters. Dr Coombe has suggested that the apparent increase of this plant may be related to a change in woodland practice, the collecting of logs for firewood having now declined.

Besides the finds made on the bryological excursions, a number of other additions have been made in recent years to the list of Cambridgeshire bryophytes.

A plant collected by Mr R. E. Parker on 17 May 1953 amongst *Carex acutiformis* in a ditch on the northern margin of Wicken Fen, and originally thought to be *Mnium affine*, was identified in 1967 by the Finnish authority on the genus, Dr T. Koponen, as *M. rugicum* mixed with some *M. seligeri*. The latter is a common plant at Wicken, but this is the first record of *M. rugicum* from the county. The differences between these three species, and their geographical distributions, are discussed by Koponen (1971).

In 1956 Mr C. C. Townsend found *Phascum cuspidatum* var. *curvisetum* in a gravel pit east of Isleham plantation, Chippenham, but the find has only recently been published. This is a rare variety of a common Cambridgeshire moss. In March 1959 he found the liverwort *Riccia warnstorffii* at the *Lythrum hyssopifolia* locality near Newton, but the record was not published until 1965.

In November 1966 Dr Birks made a notable discovery at Cherry Hinton chalk-pit when he found the leafy liverwort *Lophozia perssonii* growing on the floor of the worked pit. This was only the second record of the plant for the British Isles, the first find being from Yorkshire the previous year

(Paton & Birks, 1968). Outside England the plant is known only from Sweden, Finland, and France. It has not been seen at Cherry Hinton recently, but Dr J. Dransfield found it on the Fleam Dyke on a bryological excursion early in 1967 and it has persisted at this locality. It grows there on a steep north-facing chalk slope, where the crumbling face continually provides fresh surfaces for colonization. Mixed with the *L. perssonii* at Cherry Hinton Dr Birks found *Leiocolea badensis* which was also new to the county. In February 1968 Dr J. G. Duckett and I found *Lophozia excisa* growing on the clinker of the abandoned railway beside Hayley Wood, and the plant still flourishes there. This is the only Cambridgeshire locality for this fairly common calcifuge liverwort.

In February 1966 Mr Hill found *Cephalozia connivens* on a stump in Hayley Wood. This was an interesting addition to the leafy liverworts found on decaying wood there, of which *Nowellia curvifolia* is the most notable. *C. connivens* is widely distributed in the British Isles, usually growing on damp non-calcareous humus or peat. In June 1968 Dr R. A. Finch found *Amblystegium kochii* on a cement bridge over a tributary of the river Cam at Green End, Fen Ditton. This rare moss usually occurs in marshy meadows.

In 1965 Mr Hill found the moss *Tortula virescens* growing on a wall in Garret Hostel Lane in Cambridge, though he did not identify it until recently. This species has an eastern distribution in Britain and was first recognised in this country in 1958 (Warburg & Crundwell, 1959). It has been found chiefly on trees. In 1972 Dr Finch found *Trichostomopsis umbrosa* on a wall at Grantchester. This was the first Cambridgeshire record for a moss that has only recently been discovered in Britain. It has been found in a chalk-pit in south Essex and in one or two other localities in south-east England, but otherwise is known in Europe only from Spain and Portugal. Capsules are unknown in Britain, so dispersal must be vegetative. How it reached Grantchester is a mystery.

Dr H. Syed has recently made a taxonomic revision of the very common moss *Bryum capillare* (Syed, 1973) and this has led to three additions to the county list: *B. flaccidum*, *B. laevifilum*, and *B. torquescens*. *B. flaccidum* has been known for many years on decaying logs in Madingley Wood, where I first collected it in 1955. It was found by Mr Townsend in 1956 on a rotten log in a boggy wood by Hildersham church, by Mr P. D. Sell in 1962 on an ash stump in Shadbury Lane, Bassingbourn, by Mr Hill in 1965 on rotten wood on Cracknow Hill near Orwell, and by me in 1972 on the bark of an elder in the woodland at Fulbourn Nature Reserve. *B. laevifilum* is a newly-described species which was found by Mr Sell in 1952 on the bark of a tree by the Fen road at Bassingbourn. In 1962 he found it on the base of a tree at Wandlebury. These two species are very similar, both in appearance

and in habitat. Both have axillary filamentous gemmae, which provide a means of vegetative propagation. In *B. flaccidum* these gemmae are papillose, but in *B. laevifilum* the cell-walls are smooth. Future study will reveal the relative abundance of these two plants in the county. Collectively, they seem to be common. I found *B. torquescens* in chalk grassland on the Devil's Dyke near Reach in 1958. It is a plant of calcareous ground and is never found on trees. It is probably widespread in the county.

Dr S. M. Walters has found an old Cambridgeshire record for the aquatic liverwort *Ricciocarpus natans*: the Botanic Garden entry book shows that it was obtained, with *Lemma trisulca*, from Fulbourn on 12 November 1879 by W. Hillhouse, the Curator of the University Herbarium. This is the only record of the plant from Fulbourn, but it has the peculiarity of disappearing for long periods and then reappearing, as for instance at Wicken Fen where it has been recorded only in 1928-9, 1963, 1966-7 and 1971.

In the main text of the Cambridgeshire Bryophyte Flora (Whitehouse, 1964) I listed 201 species of mosses and 35 of liverworts in the county. These figures exclude the species believed to be extinct. The note added to the Flora in proof (p. xvi), together with the remarkable finds made by Dr J. M. Lock at Wicken Fen (Lock, 1964) and a few other finds (Whitehouse, 1966) added 8 mosses and 1 liverwort. Four species of moss (the three of *Rhacomitrium*, and *Scorpiurium circinatum*) are now considered to be extinct from the county, their habitats having been destroyed, and *Fissidens minutulus* var. *tenuifolius* is now regarded (Smith, 1970) merely as a variety of *F. viridulus*, so the moss list is reduced by 5. The recent additions, however, described above, amount to 9 species of mosses and 6 liverworts, bringing the current totals to 213 mosses and 42 liverworts in the county. It is evident that, over the last decade, on average about two species of bryophytes have been added to the county list each year.

I thank Dr H. J. B. Birks, Mr A. C. Crundwell, Dr R. A. Finch and Mr M. O. Hill for criticising the manuscript.

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N.B. I found *Isopterygium elegans* on a sandy bank in White Wood, Gamlingay, on our bryological excursion there on 10 November, 1973. This was the first record of this moss in vice-county 29.

HOBSONS BROOK THEN AND NOW

Ernest A. Gray

Culture Centre of Algae and Protozoa, Storeys Way,
Cambridge

Visitors to Cambridge are familiar with the artificial river flowing past the University Botanic Gardens parallel with the London Road that terminates in an open cistern at the corner of Lensfield Road. Here stands the Conduit Head that once graced the market place and a board informs the curious that the leat is called Hobsons Brook and that it was completed in 1614 to supply Cambridge with pure water.

The parent stream rises in Shelford, about four miles due south of Cambridge, and flows north to the Cam down a wide shallow valley, the ancient bed of the Linton branch of the river. It receives the waters from two sets of springs at the foot of a chalk spur, White Hill. A solitary spring of Helocrene nature rises through the ground south of the hill. On the north aspect are the famous Nine Wells, one of the sets of springs thrown out by the Burwell Rock from Shelford to Burwell eleven miles north-east of Cambridge on the edge of the Fens. The typical spring is Rheocrene in character, water issuing through cracks in the chalk with sufficient force to drive small particles aside, leaving a clear basin.

The subsequent course of the stream was canalised three hundred years ago by inserting certain sharp bends to preserve the flow of the Nine Wells. This was so successful that although the fall from the springs to the University Botanic Gardens is little more than seven feet, a current is still maintained past the gardens. Hobsons Brook comprises the leat from the Wells to the Conduit Head, but not the parent stream or the solitary spring south of the springs. It is also though less commonly called the Vicars Brook.

A main road (Long Road) crosses the Brook about a mile north of the

Nine Wells, and divides it into an urban reach, and a rural reach south of the road wholly surrounded by arable land, of approximately equal length.

A study of the life of the rural reach was undertaken from 1945-49, and again from 1969-72. The purpose of the first enquiry was to ascertain whether Hassall (1850, 1855)¹ was correct in his assumption that ciliate protozoa (notably *Paramoecidae*) were chiefly responsible for removing bacterial pollution from the Thames (i.e. running water). The second was to study how long *Escherichia coli*, the official index of bacterial pollution, can survive in nature. Both enquiries were studies in microbiological ecology where the organisms concerned were considered in relation to the topography, physical conditions and biota of the stream. Specialists at the University identified the latter, especially during the first survey when lists were made of algae and flowering plants and of invertebrate animals.

The sharp bends introduced three hundred years ago enabled the rural reach to be divided into four arbitrary Zones for study. Zone 1 included a typical Rheocrene spring, the same at both enquiries, and its stream. Zone 2 (486 yards long) ended in a long gravel reach sloping over the 45 foot contour. At its junction with Zone 3, the parent Shelford stream entered the Brook. Zone 3 (868 yards long) ran from this point to the bridge carrying the Oxbridge (Bedford) Railway, now disused, over the Brook. Zone 4 (694 yards long) ran from the bridge to Long Road. The latter Zone was not examined during the second survey.

At both enquiries, the Brook waters were cold, alkaline, and swift. Zones 1, 2 and the upper third of Zone 3 tended to have a more uniform temperature (10°) than lower reaches, which were colder in winter and warmer in summer (6°-14°). The reaction in Zone 1 and upper third of Zone 2 tended to be about neutral; lower down the water became increasingly alkaline (pH 7.3-7.5-7.8). Zones 1, 2 were usually oxygen-saturated during the first survey except at midsummer. No estimations were made during the second enquiry.

During the first survey, the output of the springs (measured in a culvert below the London Railway bridge crossing Zone 1) was 1.5-2.2 cu. ft (50 litres)/sec. The flow from the selected spring was constant and after heavy rain water burst from the chalk with sufficient force to produce a spurt of foam. On the south of White Hill the solitary spring welled up steadily through the ground to run down the moat of an old earthwork.

No measurement of spring output was made during the second enquiry but the spring examined completely dried up on more than one occasion while its flow was never vigorous. Other of the Nine Wells springs dried up at times, while water from the solitary spring has now to be sought by digging at the bottom of a pit.

The soil surrounding the rural reach is some of the best wheat land near

Cambridge, a rich sandy loam well buffered by chalk. At the time of the first survey it was under a modified Norfolk rotation with a flock of arable sheep folded in the stubble after harvest. Despite the sheep, *E. coli* was absent except at the mouth of the parent stream in which it was abundant. The protozoa of the Brook and the soil proved the same, one habitat being the source of the other.² During the summer a group of obscure bacterial rods teemed in the water which was finally attributed to the rhizospheres of cereals growing on the banks.³ These rods proved statistically to be the chosen food of ciliate protozoa, especially *Paramoecidae*. Apparently *E. coli* was absent because it was devoured by the ciliates grazing on the root zone bacteria that closely resembled it. A communication emphasising the importance of agriculture in studying the bacteria and ciliates of such waters was read at the Twelfth International Limnological Congress, Cambridge, 1953.⁴

About that time Canadian workers had shown that continuous planting of a crop, e.g. wheat or oats, might eventually stabilise the bacterial balance of the soil and result in a bacterial picture characteristic of that crop. If this was true of the soil round the Brook, it might explain why the overall natural picture of the stream had always been much the same in living memory. The same bacteria entered the water each year to feed protozoa which removed pollution.

Many centuries were considered necessary to stamp a particular bacterial pattern on a soil, but evidence pointed to a long history of cereal cropping in the valley. It is stated in Domesday Book that 'Hervey holds of Picot land to two ploughs and a half in Trumpington and for a stream of water 450 eels.' Trumpington is the nearest village to the Nine Wells, about quarter of a mile north-west of the springs, and the Brook is the only stream in the parish. The record went back still earlier, so that when the Royal Agricultural Show was held south of Long Road besides Zone 4 in summer 1951, it could be claimed it crowned two thousand years of continuous cereal cultivation around the Brook. Unexpected confirmation of this claim came in 1969 when an Iron Age farm was exposed on level ground a mile north-east of the Nine Wells during the building of New Addenbrooke's Hospital. Moreover, adjoining the hospital site air photographs of Downing College playing field and the adjoining field have revealed crop marks of a possible Romano-British settlement.

After the Royal Show phosphatic manures were spread along the banks of Zone 3 in spring 1952, and simultaneous estimations of phosphate, potash and nitrogen in the soil and water showed a rough correlation. In July that year there was a massive overgrowth of water plants that choked Zone 4. During the first enquiry, heavy dressing of the banks of Zone 3 with farmyard manure in summer 1948 was followed in a fortnight by

excessive growth of *Nasturtium officinale* in that Zone, and by a growth of *Spirogyra varians* in Zone 2 accompanied by a massive increase in the numbers of diatom-eating ciliate protozoa.

When the second enquiry opened, the land was found to be under the modern intensive system, up to three years continuous cereal (wheat) cropping before a break, with extensive irrigation and relatively liberal dressings of mineral fertilisers (e.g. in mid-April 1970 the land beside the east bank was dressed with approximately $6\frac{1}{2}$ cwt to the acre of a mixture yielding 20 parts nitrogen, 15 potassium, 15 phosphorus; at the end of the month the land beside the west bank received the same treatment). Many of the original small fields had been thrown together to make larger areas for cultivation, while much of the old permanent grassland round the parent stream had been ploughed up. The valley now suggests the three great fields of the manorial system, two ploughed, one fallow, familiar to Sir Roger de Trumpington, who returned from the Crusades, died in 1289, and now sleeps in Trumpington church under a fine brass.

The sheep have gone, but *E. coli* was now found at all seasons throughout all Zones, even at times in the spring water.⁵ The formerly varied water bacteria now consisted of a monotonous plethora of obscure, physiologically feeble rods, not only in summer, when they might be attributed to cereal rhizospheres, but throughout the year. Ciliate protozoa were erratic in appearance, abundant at some seasons, sparse at others. No systematic identification of the biota was made but *Phragmites* no longer fringed Zones 2 and 3, *Sparganium* was not observed in Zone 3, the once conspicuous insects (*Coleoptera*, *Trichoptera*, etc) had apparently vanished, with the Millers Thumb (*Cottus gobio*) and the Kingfisher and Heron.

Despite the minerals spread on the land, no sign of eutrophication was observed in the stream. Eight successive samples of Zone 3 water were examined for phosphorus in summer 1970 after mineral dressing of the banks; the content was low. However, a new species of nitrogen-fixing bacterium isolated during the first enquiry not only from the Brook but the Cam (Byrons Pool) and the Bourn Brook was again recovered from the same sites.⁶

It was mentioned that the flow was fitful from the Nine Wells during 1969-72; one factor possibly responsible for the dearth of animal life is irrigation. The stream was dammed for the purpose twice a year for weeks at a time, usually across the lower third of Zone 3; the water level rose up to six feet behind the dam, flooding nests and burrows.

A list of the animals and plants now existing in the rural reach would make an interesting comparison with that of the 1945 survey. The strongest impression was gained during 1969-72 that as regards the animals, possibly less so the plants, the number of species was much reduced.

The reasons why a stream with a hitherto full and vigorous biota has turned almost into a drainage ditch are as obscure as whether the change is permanent or temporary.

Note: Mr E. A. George, Director of the Culture Centre, has contributed a list of algae from Hobsons Brook to the Cambs. Natural History Records, which are maintained at the Centre.

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THE OXLIP

D. H. Valentine

University of Manchester

When we say that the oxlip is one of the most interesting species in Hayley Wood, what do we mean? What makes a species interesting to a botanist? It is not its beauty, beautiful though the oxlip is. One of the most interesting species in the British Isles is the bog sandwort, found in Britain only on Widdy Bank Fell in Teesdale, and this is one of the dullest, most inconspicuous weeds that can be imagined. Rarity is certainly one of the factors; unusual geographical location is another; and controversy about status and origin is a third. The oxlip qualifies under all these headings.

There are five species of *Primula* in the British Isles. Two are mealy primroses, found in N. England and N. Scotland and do not concern us here; the other three, the primrose, the cowslip and the oxlip all occur in Cambridgeshire and are closely related. By this we mean that they resemble one another in certain technical characters of flower and leaf (e.g. they lack the powdery farina of the mealy primroses) and also that they are capable of producing fertile hybrids, and thus have a kind of blood relationship. The ability to hybridise conspicuously in nature is not particularly

common amongst flowering plants; and in the case of the three species we are describing here, it has led to some confusion both of plants and names. We shall therefore begin by saying a little about the primrose and the cowslip. These species occur throughout the British Isles; and although they differ greatly in appearance, grow in rather different habitats, and have distinct flowering times, there is sufficient overlap in habitat and flowering time to allow hybrids to be formed over a very wide area. The hybrids may be quite frequent in some localities, though they tend to occur singly and not often in very large numbers. This is at least partly because the seed formed from the cross is less good than normal seed and only a small population germinates; but the hybrids are quite vigorous and though less fertile than the parents, capable of producing offspring. In appearance they are intermediate between the parents. In particular, there is a stalked head of flowers, like the cowslip; but sometimes flowers spring singly from the leaf rosette as in the primrose. The flowers themselves are halfway between those of the parents in size, and have the orange spots of the cowslip at their throat.

This plant was, and is, often called an oxlip; and it was not until the middle of the 19th century that the true oxlip, *P. elatior*, was recognised as such, by Doubleday (1842) at Great Bardfield in Essex (hence the name Bardfield oxlip by which it has sometimes been known). It was first recorded in Hayley Wood by Babington in 1860, in his *Flora of Cambridgeshire*. Its status was convincingly demonstrated by Charles Darwin who in 1868 showed that, as a breeding unit, *P. elatior* was as good a species as *P. veris* or *P. vulgaris*, and that the so-called common oxlip was an infertile hybrid. Soon afterwards, in 1884, Christy read a paper to the Essex Field Club, in which he presented the results of extensive study of the oxlip and its distribution in Britain; and he was able to confirm that it was a well-marked species, constant and abundant over a considerable area in East Anglia, and to give some indication of the extent of its geographical distribution. This information was amplified and a fairly complete distribution map was published in 1922. Here it is shown that it occupies two disjunct areas, one to the west of Cambridge (in which Hayley Wood is found) and the other to the S.E. of Cambridge in the counties of Essex and Suffolk. There are outlying localities in Hertfordshire, Norfolk and Bedfordshire. Outside these areas *Primula elatior* is unknown in the British Isles. On the continent, on the other hand, the oxlip is widely distributed. In Central Germany, for example, the primrose is absent, while the oxlip and the cowslip are common.

In the vegetative condition, the similarities between the primrose, the cowslip and the oxlip are easily seen. They are all perennials, with a short, stout underground stem which bears a rosette of large, rather wrinkled

leaves; in the primrose, the leaves are not distinctly stalked, whereas on the other two species they are; the oxlip can usually be distinguished from the cowslip by its rounder and larger leaves. In flower the primrose with its large flowers borne singly is very distinct from the other two. The oxlip resembles the cowslip in having a one-sided cluster of flowers at the top of a stalk; but the flowers are larger and paler yellow and lack the five orange spots of the cowslip, the calyx-lobes have a shorter point, and the hairs on the stalk are longer. When the plants set seed the difference is very clear; the capsule of the oxlip is longer than the calyx, while the cowslip capsule is shorter.

From this description it is clear that there is little risk of confusing the true oxlip of Hayley Wood with the 'common oxlip' (the hybrid between primrose and cowslip), though the usage of the same name for both plants remains confusing; but there is another hybrid which comes into the picture, that between the primrose and the oxlip, for reasons which we shall now explain.

One of the interesting facts which Christy discovered about the oxlip in Britain was that, within its area of distribution, it completely replaced the primrose. He found first of all that in the central part of East Anglia, both species were virtually confined to woodland, and indeed to woodland on chalky boulder-clay. In any such wood inside the oxlip area, the oxlip was the only *Primula* present; in any such wood outside the oxlip area, the primrose was the only *Primula* present; and at the boundary of the area there were some woods in which both species were present; here they hybridised. It should be mentioned in passing that cowslips occur throughout the region to which we are referring; we shall mention cowslip hybrids briefly below.

This situation, in which one species is completely replaced geographically by another over a considerable area, is probably unique in the British flora. The factors which are responsible are certainly concerned with the past history of the area, and with the dates at which the two species reached the area during the post-glacial era, i.e. they are historical and geographical rather than ecological. The main ecological factor which is important at present is that natural migration from one isolated woodland area to another does not take place; presumably because of present environmental factors, neither species is able to migrate along hedgerows. Hence the geographical situation is stable; the only place where change is possible is within those woodlands at the border of the oxlip area in which both primroses and oxlips occur. Hayley Wood is not such a wood; and the survival and distribution of the oxlip in this wood is dependent only on the environmental factors within the wood, both natural and artificial. Nevertheless, the situation in the mixed woods in which hybrids occur

(such as Buff Wood, East Hatley) is of great interest both in itself and to lovers of the oxlip, and we shall say something about it.

In Buff Wood, the oxlips are concentrated in one part of the wood and are more or less surrounded by primroses. This pattern is not invariable in the border woodlands, but generally speaking there is some spatial separation of the two species within the wood; and this separation is associated with habitat differences. In Buff Wood, the oxlips occur in a zone in which the ground flora consists largely of lesser celandine and wood anemone, with a good deal of meadowsweet, whereas the primrose is most frequent in areas in which bluebell or dog's mercury are the main components of the ground flora. This difference in flora is often associated with slight differences in slope and also with the extent to which the soil becomes waterlogged in winter and spring. It is thus possible to speak of an ecotone in the wood, i.e., a transition from one community to another; and it is at this ecotone, where the species meet, that large numbers of hybrids are formed, though they are not confined to the ecotone and indeed extend for some distance into the areas of the parental species, being most numerous among the oxlips.

The first generation hybrids are known from experimental work to be often vigorous plants, with a stalked inflorescence (like the oxlip parent) bearing large flowers (approaching those of the primrose) and sometimes with a number of individual basal primrose-like flowers as well. Such plants are commonly found in the wood, together with others which may result from back-crosses to the parents; both first and second generation hybrids are quite highly fertile, and there are only slight intrinsic barriers to interbreeding. Indeed the strongest intrinsic barrier is at the stage of initial hybridisation, where the yield of viable seed is less than half that found within either species.

The hybrid swarm which is formed at the interface between primrose and oxlip populations is conspicuous and striking; and so numerous are the hybrids locally that it has been supposed, by Christy among others, that in woods such as Buff Wood the oxlip is being hybridised out of existence. The inference is that eventually the oxlips would disappear and be replaced either by a permanent hybrid swarm, or possibly, in the long run, by primroses. This hypothesis is probably too simple and it certainly cannot be applied as a generalisation to all woods. It is true that hybrids, because of their vigour and their probable position intermediate physiologically between their parents, are likely to be well suited to survive and compete at the ecotone; but the number which so compete will depend on the breadth of the ecotone, and there is no reason to suppose that the hybrids necessarily do better than the parents outside the ecotone. The reverse may well be the case. The position is complicated by the effects

which the management of the wood is likely to have on the *Primula* populations. Most of the woods have long been under a coppice rotation, and this means that the extent of flowering and fruiting (which are very responsive to light) will both follow a regular cycle. The rate of replacement of parents by offspring under these conditions may be slow. Certainly there is no reason to think that the relative proportions of oxlip and primrose, and the proportion of hybrids, are changing markedly at the present time. Walters (unpublished), comparing the situation in Buff Wood at the present time with that recorded twenty years earlier by Valentine (1948), comes to the conclusion that there has been little change. That some introgression will occur over a long period of time, given the abundance and vigour of the first-generation hybrids, seems inevitable; and in Buff Wood, certainly, this seems to affect the oxlip more than the primrose population. The question has recently been discussed in some detail by Woodell (1969).

Reference was made above to hybrids between the cowslip and the oxlip. These have been reliably recorded only rarely and in a very few localities; so far as is known, they do not occur in or around Hayley Wood. The species are kept apart very largely by their differences in habitat and in flowering time; but the intrinsic barriers to hybridisation are very high, as has been shown by experiment (Valentine, 1952, 1966). In England, the oxlip is predominantly a woodland plant, and only rarely (as at Bardfield where it was first recognised) does it emerge into wet meadows. In Germany and Poland it is common and widespread in meadows, and here it meets and mixes freely with cowslips; but even under these conditions hybrids are not common.

This brief account will have illustrated some of the biological features of the oxlip. It has others which can only be touched on here. One is its short period of flowering, much shorter than that of either primrose or cowslip. A second is its elusive odour, not perceptible to some, to others said to be peach-like. A third is the fact that although in Britain it is at the western edge of its geographical range, which extends a thousand miles to the east, it still occurs in immense abundance, though characteristically only in rather limited and specialised habitats; and it certainly appears to be at least as variable and vigorous as at the centre of its range. It flowers most profusely after the coppice has been cut; Christy (1884) calculated that in 9 acres recently cut in Peverill's Wood in Essex, there were half a million plants with at least a million and a half inflorescences.

A fourth feature of interest is its mode of pollination: Christy (1922a) observed insect-visitors at various times; among these were bumble-bees, hive-bees, bee-flies (*Bombylius*) and the sulphur butterfly (*Gonepteryx*); but he stated that in comparison to the number of flowers in the populations, the number of insect-visitors seemed remarkably small, and he

wondered if night-flying insects might be important. Detailed observations on seed production in the field have not been made, so far as is known; but casual observation suggests that in some seasons at least seed set is not good, and this may perhaps be related to failure of pollination. The seed itself usually lies dormant during the winter and germinates in the spring. The seedling has heart-shaped leaves which are not very like those of the adult plant; in cultivation it can mature from seedling to the flowering stage in a single year, but in nature it may well take longer. A final feature of interest is the reaction of the plant to winter conditions. Unlike the primrose, which is evergreen, the oxlip loses its leaves in early autumn, and only a fat, pointed bud remains at or in the surface of the ground. Within this bud, the flowers start to develop, and they are well-formed, in miniature, by January or February, at which time meiosis occurs and the pollen starts to mature. Flowering in April takes place in a rush, and the development of the leaves lags behind.

We have tried in this brief sketch to mention some of the more striking points in the biology and distribution of the oxlip. That much more remains to be discovered is clear, both in Hayley Wood and elsewhere. Let us hope that the bold oxlips, as Shakespeare calls them, may long continue to thrive.

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THE TEACHING OF PLANT ECOLOGY ON COE FEN

P. T. Marshall

The Leys School, Cambridge

1. Cyanogenesis in Clover

Cyanide production on crushing is a common phenomenon in clover and is thought to have a selective advantage in preventing the plant being eaten by herbivores. The cyanide is released from a substrate (represented by the gene Ac) by the action of an enzyme (represented by the gene Li). Plants with the dominant AcLi constitution release cyanide rapidly on crushing.

Those plants with *Ac* present but coupled with the recessive *li* release cyanide very slowly on crushing, while those that have *ac* (i.e. no cyanide-making substrate) cannot release cyanide at all.

Detection of these genotypes is done by crushing a few leaves with a glass rod in a small tube with a few drops of toluene. The tube is then incubated, picrate paper being inserted to detect cyanide. In *AcLi* plants the paper changes rapidly from yellow to red, in *Acli* ones the paper takes at least two hours to change, and no change occurs in *acli* plants.

Using four 3rd form sets studying an O level Nuffield course, a survey was made of the distribution and numbers of the different genotypes on Coe Fen. The results obtained were as follows:

| | | | |
|-----------------|-------------|-------------|-------------|
| <i>Genotype</i> | <i>AcLi</i> | <i>Acli</i> | <i>acli</i> |
| Numbers | 65 | 108 | 34 |
| % | 31 | 52 | 17 |

These results are not in agreement with a Hardy-Weinberg distribution, and it was noted that a number of factors might be operating in determining selection. Thus the frequency of the rapid cyanide-producer (*AcLi*) was very marked along the banks of the stream running across the middle of the Fen. It could well be that this area is subject to the most intensive grazing by molluscs and herbivores. On the islands adjacent to the river itself the clover was largely non-cyanogenic, while a few samples from the Sheep's Green bank were all rapid producers. Along the south part of the Fen the majority of the plants sampled were of the non-cyanide variety.

Some provisional experiments were made with intensive sampling of very localised populations, but the results were inconclusive. On the whole there did seem to be areas of aggregation of one genotype or the other. Sample cyanogenic plants brought into the laboratory were not eaten as readily by snails as the non-cyanogenic forms, but there is no evidence that herbivores as large as horses feed selectively. It is possible that the rapid cyanide genotype may emit the gas spontaneously in very cold weather and thus poison itself. This would result in there being fewer cyanogenic plants in the more exposed parts of the habitat.

The results show a marked heterozygosity of the clover on Coe Fen in respect of the cyanogenic gene, and a definite aggregation of the cyanide form along the stream banks. The underlying reasons for this pattern and a further elucidation of the distribution of cyanogenic plants must await the 1974 season.

The distribution of buttercup species on the Fen

As a part of ecological teaching for O and A level classes the Fen was found to be an excellent habitat for demonstrating the edaphic factors

underlying species distribution. A number of transects were taken from the wall of the University Engineering Laboratory to the stream running through the Fen and in these the numbers of plants of *Ranunculus bulbosus*, *R. acris*, *R. repens* and *R. ficaria* were noted. Random quadrats were also surveyed along the line of the transect.

The results of a typical transect (8 were counted in all) were as follows:

| | Engineering Wall | metres towards stream | | | | | | stream bank |
|--------------------|------------------|-----------------------|-----|------|------|------|------|-------------|
| | | 6m. | 9m. | 14m. | 21m. | 30m. | 35m. | |
| | % | % | % | % | % | % | % | |
| <i>R. bulbosus</i> | 86 | 2 | 5 | 0 | 0 | 0 | 0 | |
| <i>R. acris</i> | 14 | 76 | 90 | 100 | 100 | 65 | 20 | |
| <i>R. repens</i> | 0 | 22 | 5 | 0 | 0 | 35 | 80 | |
| <i>R. ficaria</i> | 0 | 0 | 0 | 0 | 0 | 0 | 15 | |

Clearly this is not a random distribution of these four species. There is a very marked zone of *R. bulbosus* on the right-hand side of the path leading from Fen Causeway to the Garden House Hotel. The middle of the Fen is largely populated by *R. acris*, while the area round the stream carries *R. repens* and *R. ficaria*. To investigate the causes for this sharp zonation a profile was taken of several of the transects, together with auger samples of the soil. These were tested for water content as well as for basic composition in terms of silt, fine sand and coarse sand content. Some typical results were as follows:

| Distance from Engineering Wall towards stream | 2m. | 6m. | 14m. | 35m. |
|---|--------|--------|------|------|
| | 6ft. | 5.5ft. | 5ft. | 3ft. |
| Water content | 14-16% | 20% | | 20% |
| Composition: Coarse sand | 40% | 20% | | 20% |
| Fine sand | 30% | 35% | | 20% |
| Silt | 30% | 45% | | 60% |

These results appeared to indicate that the buttercup distribution was dependent on the water content of the soil, with *R. bulbosus* colonising the higher and drier regions, *R. acris* the intermediate ones and *R. repens* and *ficaria* inhabiting the wetter silty soil near the stream. In order to test this hypothesis small plants of each species were grown in bowls of water in the laboratory at different levels of submergence. It was found that *R. repens* and *ficaria* continued to grow, even if their bases were completely covered in water. *R. bulbosus* and *acris* on the other hand, although they did not actually die, did not flourish under the same conditions.

During the summer of 1974 it is hoped that further work will be carried out by our ecology sets, e.g. transplanting individual plants from one

zone to another, germinating buttercup seeds in different types of soil, and attempting to analyse the mineral composition of the various soils.

The two simple projects described above have yielded a number of hours of useful ecological teaching to students at very different levels in an area very close to the school. They suggest that it is possible to find interesting and original problems to investigate in places which, at first sight, appear to offer unpromising and uniform habitats.

VASCULAR PLANT RECORDS

R. J. Pankhurst

All records are for 1973 unless otherwise stated

There have been such a number of interesting records this year that I have found it necessary to restrict these notes to first and second county records, together with a few rediscoveries. The publication of the Taraxacum Flora has stimulated a number of fresh records, of which some are listed below. Once again, a great many of the new records are of aliens from waste places.

Fumaria muralis ssp. boreae (Jord.) Pugsl. Near Holly End, GR 53/480070, July, G. M. S. Easy. 2nd modern record.

Hirschfeldia incana (L) Lagr.-Foss. Stretham tip, GR52/517745, August 72, G. M. S. Easy. 1st county record.

Barbarea verna (Mill) Aschers. Milton gravel pit, GR 52/476619, April 72, G. M. S. Easy. 1st modern county record.

Cerastium pumilum Curt. Milton sewage farm, GR 52/474613, May, G. M. S. Easy. 2nd county record.

Erodium moschatum (L) L'Hérit. Roadside at Eltisle, GR 52/268598, October, A. C. Leslie. 1st record since 1909.

Trigonella foenum-graecum L. Cherry Hinton tip, GR 52/482575, May 72, G. M. S. Easy. 1st county record, a casual, remarkable for its long pods.

Potentilla X italica Lehm. (erecta X reptans). Sawston Hall meadows, GR 52/491491, August, D. A. Wells and Mrs. K. L. Jefferies. 2nd county record.

Epilobium roseum Schreb. Garden of G. M. S. Easy at Milton, GR 52/477632, G. M. S. Easy. 2nd county record.

- Symphytum tauricum* Willd. Hedgerow at Swaffham Prior, GR 52/567637, det. F. H. Perring. 1st county record, a rare introduction.
- Verbascum X semialbum* Chaub. (*nigrum* X *thapsus*). Dernford Fen, GR 52/470503, August 72, G. M. S. Easy, det. P. D. Sell. 2nd county record.
- Verbascum blattaria* L. Waste ground at Milton, GR 52/479619, July, Miss H. F. Brenchley. Not recorded since 1942.
- Veronica spicata* L. On Newmarket Heath. P. J. Grubb and W. H. Palmer, August. Last seen in 1954. (See photograph.)
- Valerianella carinata* Lois. Landbeach gravel pit, GR 52/4865. June 1971, G. M. S. Easy, det. I. B. K. Richardson. 1st county record.
- Taraxacum*. All the following 1st county records determined by A. J. Richards.
- T. canoviride* Puolanne. Wicken. GR 52/563706, April, Part II class, Botany Dept.
- T. sublaeticolor* Dahlst. As above.
- T. crociflorum* Dahlst. Roadside, Isleham, GR 52/637752, April, Mrs R. R. Aitchison.
- T. oblongatum* Dahlst. Hayley Wood, GR 52/292530, April, W. H. Palmer.
- T. proximum* (Dahlst). Botanic Gardens, Cambridge, GR 52/455572, May, R. J. Pankhurst. Growing with *T. brachyglossum*.
- Potamogeton X zizii* Koch ex Roth. (*gramineus* X *lucens*). Fen drove at Eastrea, GR 52/299981, June 72, J. O. Mountford and G. M. B. Smith. 1st record since 1933.
- Potamogeton pusillus* L. Fen dyke at Stonea, GR 52/447936, June 72, G. M. B. Smith. 1st record since 1888, also 6 more records in 4 10 km. squares.
- Senecio X londonensis* Lousley (*squalidus* X *viscosus*). Cambridge station, GR 52/462575, G. M. S. Easy, September 72, det. S. M. Walters. 2nd county record, occurs readily where parents grow together, which they rarely do.
- Lactuca virosa* L. Milton gravel pit, GR 52/476622, and Cambridge station, GR 52/462575, July 72, G. M. S. Easy. 1st and 2nd modern records (last 1860), and other localities in Cambridge area. Probably passed unrecognised for some time: best distinguished from *L. serriola* by the dark and glabrous achene.
- Hieracium diaphanum* Fr. Waste ground near railway, Milton, GR 52/457628, June 72, G. M. S. Easy, det. P. D. Sell. 1st county record.

- Hieracium umbellatum* L. Same locality as above, August, with *H. vagum*. G. M. S. Easy, det. P. D. Sell. 1st record since 1880's; not in its native habitat.
- Ophrys insectifera* L. Eight plants at Bottisham, June, confirmed by P. D. Sell. Last seen in 1955.
- Festuca heterophylla* Lam. At edge of golf course, Gog Magog Hills, GR 52/495544, May, S. M. Walters. 2nd county record, probably introduced, and possibly overlooked elsewhere.
- Echinochloa frumentacea* Link. Cambridge tip, GR 52/482575, October, A. C. Leslie, 1st county record for this alien cereal grass.

WEATHER NOTES FOR CAMBRIDGESHIRE 1973

J. W. Clarke

Low rainfall was a marked feature of the weather in 1973. The total for the year at Swaffham Prior (18.73 ins) was considerably below average. Most of the rainfall deficit occurred in the first three months of the year, although August also was a particularly dry month. A large proportion of the rain fell in thunderstorms in May, June and September. In a violent thunderstorm on 6 July, more than an inch of rain fell in one hour at Burwell. There were three drought spells during the year when no measurable rain fell—7–30 March, 30 May–19 June, 7–27 August. No marked autumn drought developed—this has been a regular tendency in recent years since 1968.

The least rain fell in January and March (0.50 ins), and the most in June (2.75 ins) on only four rain days.

The first months of the year were mild with no severe winter weather and the spring months had about average temperatures. The summer was fine and warm with the exception of July, when temperatures were below average. August was a very warm month with temperatures some 4°F above average. On 16 August 90°F was recorded at Swaffham Prior and 95°F at Mildenhall just over the Suffolk border. The warm weather continued until the middle of September, and 87°F was recorded on the 5th.

At the end of November and the first few days of December a short spell of severe cold weather developed with snow lying all day on 29 November and the lowest temperature of the year, 16°F, during the night of 30 November–1 December. Skating became possible on the fen lodes at Burwell, Reach and Wicken for the first time for a number of years.

Weather Records at Swaffham Prior 1973

Temperature °F

| <i>Month</i> | <i>Mean max.</i> | <i>Mean min.</i> | <i>Highest</i> | <i>Lowest</i> | <i>Rainfall ins</i> |
|--------------|----------------------|----------------------|-------------------|-------------------|-------------------------|
| January | 44° | 36° | 51 on 29th | 27 on 17th | 0.50 |
| February | 45° | 33° | 52 on 6th | 22 on 26th | 0.86 |
| March | 52° | 36° | 63 on 23rd | 27 on 11th | 0.50 |
| April | 53° | 39° | 63 on 26th | 26 on 9th | 1.53 |
| May | 62° | 47° | 73 on 26th & 27th | 35 on 3rd | 2.64 |
| June | 71° | 55° | 80 on 26th | 41 on 14th | 2.75 |
| July | 70° | 55° | 82 on 1st | 45 on 8th | 2.40 |
| August | 74° | 56° | 90 on 16th | 49 on 26th & 27th | 0.68 |
| September | 69° | 50° | 86 on 5th | 38 on 23rd | 2.58 |
| October | 56° | 42° | 72 on 5th | 30 on 12th | 1.16 |
| November | 47° | 38° | 61 on 3rd | 22 on 28th | 1.23 |
| December | 44° | 35° | 52 on 4th | 16 on 1st | 1.17 |
| Annual mean | 57.2 | 43.5 | | | Total 18.73 |

| | |
|---|------------|
| <i>Number of days over 80°F</i> | 10 |
| <i>Number of days over 70°F</i> | 77 |
| <i>Number of days with a maximum under 32°F</i> | 5 |
| <i>Number of days with a minimum under 32°F</i> | 58 |
| <i>Last air frost of the spring</i> | 10 April |
| <i>First air frost of the autumn</i> | 12 October |

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.

Strange to the world, he wore a bashful look,
The Fields his study, Nature was his book.

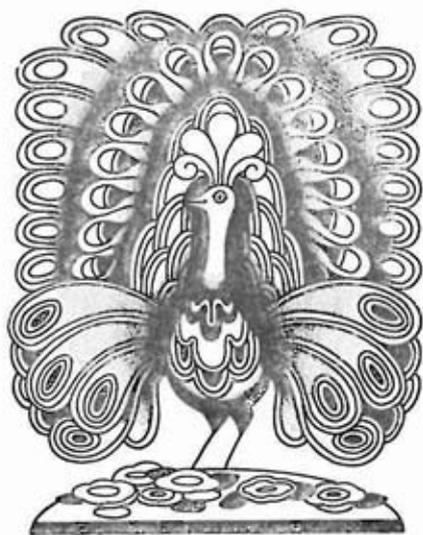
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