

# QUATERNARY NEWSLETTER

No. 25

June 1978

Quaternary Newsletters are issued in February, June and November. Closing dates for submission of copy for the relevant numbers are 1st January, 1st May and 1st October. Contributions, comprising reviews, notices of forthcoming meetings, news of personal and joint research projects, etc. are invited. They should be sent to the Secretary of the Quaternary Research Association, Mr. J. Rose, Geography Department, Birkbeck College, London University, 7-15 Gresse Street, London W1P 1PA.

## EVIDENCE FOR CHANGING VERTEBRATE COMMUNITIES IN THE MIDDLE DEVENSIAN

By D.J. Rackham

Vertebrate faunas from the middle Devensian characteristically contain steppe and tundra species. This has led to the adoption of "steppe-tundra" as a habitat type in glacial episodes. Species common in deposits of this period include bison, reindeer, horse, woolly rhinoceros, mammoth, arctic fox, mountain hare, arctic lemming, Norway lemming and a number of small rodent species. These animals are today associated with either arctic or more southerly steppe habitats, although the total range of some is rather wide through temperate regions. Two pits in the Bain Gravels in the valley of the River Witham in Lincolnshire have yielded collectively a typical Devensian "mixed" fauna, including *Bison* sp., *Rangifer tarandus*, *Ursus arctos*, *Equus* sp., *Coelodonta antiquitatis* and *Mammuthus primigenius*. The stratigraphy of the two sites, Tattershall Castle (TF 207570) and Tattershall Thorpe (TF 228605), described elsewhere as Kirkby-on-Bain, is similar. Four to seven metres of gravel overlies organic deposits with a typical Ipswichian pollen spectrum (Phillips, quoted in Girling, 1974). Silt bands frequently occur in the lower two or three metres of gravel above the Ipswichian deposits, and have yielded radiocarbon dates indicating a Mid-Devensian age. Cryoturbation effects occur at various levels within the gravels, and numerous ice-wedge casts originating above the silts penetrate the whole succession. In terms of species present, both sites contain a similar vertebrate fauna.

Studies of insects from the silts of the two sites (Girling, 1974, 1977) have indicated contrasting climatic schemes. At Tattershall Castle a thin lower silt near the base of the gravels has yielded an arctic insect assemblage (Girling, 1974) and radiocarbon ages of 44,300 (Birm. 408) and 42,100 (Birm. 309). Above this occurs a second silt band up to two metres thick, containing a temperate insect fauna and giving dates of 43,000 (Birm. 341) and 42,000 (Birm. 409). Bison and reindeer bones have been found *in situ* in these upper silts. Despite the similar stratigraphy at the second site, only four kilometres upstream on the River Bain, a single silt horizon with an arctic insect fauna rather different from that in the lower silt at Tattershall Castle is dated at 34,800 (Birm. 250).

A more detailed analysis of the vertebrate faunal remains indicates a marked difference in the numerical representation of the species at the two sites, which can only be reconciled by postulating significant environmental differences. At Tattershall Castle the bulk of the deposit was apparently associated with the temperate interlude at the beginning of the "Upton Warren Interstadial Complex" (Coope, 1975). The faunal assemblage is dominated by the remains of bison and the shed antlers of reindeer (Table 1). The abundance of bull antlers suggests that the reindeer were wintering in Lincolnshire at the southern end of their range. It may be that the presence of numerous dung beetles, which hibernate during the winter, indicates the presence of a large herbivorous fauna in the area during the summer months. It is therefore possible that the bison and reindeer, while both occurring on the site, were actually present at different seasons. Boyd Dawkins (1875) came to the same conclusion for a very similar fauna at Windy Knoll, where the age distribution of the bison and reindeer led him to conclude that the bison were present in the district during the summer and autumn, but the reindeer in the winter and early spring.

At Tattershall Thorpe, where temperate deposits do not occur, the fauna is dominated by woolly rhinoceros, mammoth and, to a lesser extent, horse. The marked absence of bison and reindeer remains at this site suggests that, in spite of the superficial stratigraphic similarity, the gravels of the two sites are of different ages. The radiocarbon dates indicate that the gravels at Tattershall Thorpe are younger than those at Tattershall Castle.

In the temperature curve presented by Coope (1975), based upon the distribution patterns of insects found in dated middle Devensian sites, there is a marked temperate episode (Coope and Angus, 1975), which on entomological and radiocarbon evidence can be correlated with the upper silts at Tattershall Castle. On the other hand, Tattershall Thorpe seems to be contemporary with a much colder stage of the interstadial. In particular the absence of bison and the predominance of mammoth and woolly rhinoceros at Tattershall Thorpe appear to be related to the colder, more continental conditions during the later part of the "Upton Warren Interstadial Complex".

	Tattershall Castle	Tattershall Thorpe
<u>Canis lupus</u> L.	0.2	-
<u>Ursus arctos</u> L.	0.1	-
<u>Bison/Bos</u> sp.	-	1.6
<u>Bison</u> sp.	80.8	-
<u>Bos primigenius</u> Bojanus	0.1 (in peat)	-
<u>Cervus elaphus</u> L.	-	1.0
<u>Megaloceros giganteus</u> (Blum.)	-	1.0
<u>Rangifer tarandus</u> (L.)	13.5	-
<u>Coelodonta antiquitatis</u> Blum.	0.4	19.5
<u>Equus</u> sp.	0.3	6.8
<u>Mammuthus primigenius</u> Blum.	4.6	70.0
Number of bones identified	938	192

Table 1. Percentages of vertebrate species from two middle Devensian sites in Lincolnshire.

All the species listed in Table 1 are frequently recorded in Devensian deposits (Stuart, 1974). However, the mixing of chronologically distinct faunas is a likely occurrence in reworked gravels or other sites where the fauna has not been collected with adequate stratigraphic control. Such mixing has perhaps obscured the presence of two distinct ecological biotopes during the mid-Devensian, and possibly in other periods also. The numerical, ecological and stratigraphical distinction between the contrasting mid-Devensian mammalian assemblages in Lincolnshire highlights the necessity for more refined investigation of other fossil vertebrate faunas. "Mixed" faunas of steppe and tundra species may be a product of their taphonomy or our mixing, rather than a natural ecological community.

I should like to thank Dr.G.R.Coope for his help and criticism in the presentation of this paper.

#### References

- Coope, G.R., 1975. Mid-Weichselian climatic changes in Western Europe, re-interpreted from coleopteran assemblages. Quaternary Studies (Eds. R.P.Suggate and M.M.Cresswell), Royal Society of New Zealand, pp. 101-108.
- Coope, G.R. and Angus, R.B., 1975. An ecological study of a temperate interlude in the middle of the Last Glaciation, based on fossil coleoptera from Isleworth, Middlesex. J. Anim. Ecol., 44, 365-391.
- Dawkins, W. Boyd, 1875. The mammalia found at Windy Knoll. Quart. J. geol. Soc. Lond., 31, 246-255
- Girling, M.A., 1974. Evidence from Lincolnshire of the age and intensity of the mid-Devensian temperate episode. Nature, 250, 270.
- Girling, M.A., 1977. Tattershall and Kirkby-on-Bain. In: Catt, J.A., Yorkshire and Lincolnshire Guidebook for Excursion C7, X INQUA Congress, pp. 19-21.
- Stuart, A.J., 1974. Pleistocene history of the British Vertebrate Fauna. Biol. Rev., 49, 225-266

#### ON THE ECOLOGY OF THE BEAVER AND SOME SPECULATIVE APPLICATIONS

By P. Worsley

Occasional finds of beaver indicate that it was formerly a component of the British fauna. It appears to have survived at least until Saxon times, for place name evidence (e.g. Beverley, beaver lake) confirms its relatively recent presence. Overkill has resulted in its near extinction from much of the rest of Europe. Consequently in Britain there has been an understandable tendency to overlook the fact that next to man the beaver is probably the mammal most able to fundamentally control and modify its environment.

The principal geological activity of beaver is associated with dam construction. Within the surviving European beaver population (*Castor fiber*) this kind of work is more prominent among the inhabitants of the northern boreal forests. In North America, the

close relative of the European beaver (*Castor canadensis*) is an inveterate dam builder. The dams are usually 1-3m high, 2-6m in breadth and often more than 100m in length. Usually they are located across water courses where the topographic characteristics are such that a small structure will create a fairly extensive lake. Where the terrain is less favourable, a complex of dams will be built, especially where multiple channel streams are involved. This results in a series of lakes with slightly different water levels. The immediate consequence of dam building is the flooding of extensive habitats which were formerly dry, and the impact upon the vegetation is virtually catastrophic, resulting in the elimination of any pre-existing forest canopy.

Within a newly created lake the beaver will construct his home or lodge from a conical pile of tree branch material built up from the lake bed, and later this is plastered with fine grained sediment on the outside. New lodges are occupied for a number of years until food shortages force abandonment and migration to a new site. Regeneration of the forest may permit re-occupation at a later time. As with any water body, beaver lakes are subject to hydrosereal development and sedimentation, so that wetlands result ultimately. This process may take thousands of years, for the dams often survive even without the maintenance services of their creators. Some dams are subject to sudden failure, the released water causing a major flood event downstream and attendant devastation.

The animal feeds mainly on aspen and birch around the shores of the beaver lakes. With time, thickets of these trees arise, renewing the food supply. Larger trees are also felled, in the first instance as a source of material for dam building, but later, apart from some stripping of bark for food, it is difficult to explain the felling activity on a rational basis. All species of tree are affected, although the conifers have a low priority if others are present. Usually the trees are gnawed through at heights up to 1m above the ground. Those with diameters up to 0.4m or so are often eaten from one side only, whereas larger trees are attacked around the entire circumference, thus producing a symmetrical cone-shaped stump.

It is clear that a variety of evidence relating to beaver is potentially preservable in the geological record. To date discussions on the palaeo-environmental impact of beaver in Britain have hardly begun. After observing the contemporary effects of beaver on the natural environment, the impression is gained that formerly they must have been major influences on the vegetational and depositional patterns in valley situations. In the context of the Kennet Valley, Berkshire, beaver has been considered in the older literature as an agent which induced peat formation. It is suggested that this may well have wider application to valley bogs in Britain. Also, during recent years the Chelford Interstadial deposits at the Oakwood Quarry have yielded some stumps with cone-shaped terminations. These bear a resemblance to undoubted modern examples, and the suspicion arises therefore that beaver was a member of the interstadial fauna. This possibility has a further implication in that a problematic facies within the palaeo-channels - dispersed clasts of organic material within a sand matrix - might relate to floods consequent upon the burst of a beaver dam or dams. Hopefully in future work the role of beaver in the British Quaternary succession will be thoroughly reappraised.

VISIT TO MINCHIN HOLE, GOWER,  
SEPTEMBER 30th, 1978

Quaternary Research Association members are invited to inspect a section of the Ipswichian (*sensu lato*) deposits exposed in Minchin Hole cave on Saturday, September 30th, 1978.

At the time of the Association's visit in 1973 the deposits of the two raised beaches were exposed - the Inner Beach and, banked against it nearer the cave mouth, the Patella Beach. At that time the age difference of the two beaches was uncertain, and it was assumed that a single sequence of terrestrial mammaliferous interglacial and later Devensian sediments overlapped both beaches (Sutcliffe and Bowen, 1973; Bowen, 1974). Subsequent excavations in 1975 suggest that in fact there exist two distinct sequences of deposits in the cave - an inner one of which the Inner beach forms the basal unit, and an outer sequence of which the Patella Beach forms the basal unit. They are apparently separated by a substantial cliff cut by the Patella Beach sea, but this event did not occur until the deposits of the inner sequence had already become heavily cemented, suggesting a greater time interval than has previously been recognised.

Both sequences of deposits contain mammalian remains, though little is yet known about those from the inner sequence. The Inner Beach is interglacial; the climatic implications of the upper part of the inner sequence are not yet known. The Patella Beach and the terrestrial deposits immediately overlying it are interglacial; the upper part of the outer sequence is believed to be Devensian. If it proves possible to obtain an absolute date for any of the stalagmite layers in the cave, some idea of the age of the raised beaches could be obtained; do they represent two high sea levels of stage 5, or is an earlier stage also represented? Also, the mammalian faunas could then be related to this sea level evidence, which would in turn be of some importance in the interpretation of terrestrial "Ipswichian" mammaliferous deposits elsewhere.

A problem associated with this study is that the existence or magnitude of the supposed pre-Patella Beach cliff could be disputed, especially by future geologists who have not seen the field evidence. The independent opinions of other Quaternary Research Association members, especially those concerned with sea level studies, would therefore be timely. A similar buried Pleistocene cliff structure in the Cotte de St. Brelade, Jersey, has been described by McBurney and Callow (1971). Are the two cliffs equivalent features?

We shall meet at the National Trust car park beside the Heatherslade Hotel, Southgate, at 11 a.m. Please notify your intention to come to Dr. A.J. Sutcliffe, c/o Department of Palaeontology, British Museum (Natural History), Cromwell Road, London SW7 5BD before September 22nd, or subsequently c/o Heatherslade Hotel, Southgate, Swansea (Tel. Bishopston 3328). No acknowledgement will be sent, but this will enable numbers to be assessed and contact to be made in the event of any change of arrangements. The last part of the descent to Minchin Hole involves a modest scramble down the lower part of the limestone cliff, which although it is not difficult should not be attempted by anyone who is uncertain of his feet. Visitors come entirely at their own risk, and none will be admitted

to the cave who is not equipped with a hard hat.

### References

- Bowen, D.Q., 1974. The excavation at Minchin Hole, 1973. Gower, 24, 12-18.
- McBurney, C.B.M. and Callow, P., 1971. The Cambridge excavations in the Cotte de St. Brelade, Jersey - a preliminary report. Proc. prehist. Soc., 37, 167-207.
- Sutcliffe, A.J. and Bowen, D.Q., 1973. Preliminary report on excavations in Minchin Hole, April-May 1973. News1. William Pengelly Cave Studies Trust, 21, 12-25.

### M.Sc. IN QUATERNARY STUDIES

Applications are now invited for the second intake of this part-time course, commencing in January 1979. The course is run jointly by North London Polytechnic and the City of London Polytechnic. Further information and application forms may be obtained from the Course Director, Dr. R. H. Bryant, Department of Geography, Polytechnic of North London, Holloway Road, London N7. The closing date for applications is September 1st 1978.

### SUMMARY OF PROCEEDINGS OF THE ANNUAL GENERAL MEETING, April 9th, 1978

The fifteenth Annual General Meeting of the Association was held at Keele University on Sunday, April 9th, 1978, at 8:00 p.m. The President, Dr. J.D.Peacock, was in the chair, and the meeting was attended by 70 other members.

In his report, the Honorary Secretary (Dr. J.A.Catt) reported that membership of the Association currently stood at 579; 94 new members had joined during the year, but the Association had suffered the deaths of three members (W.W.Ansen from Newcastle, G.H.Crawford from North Ferriby near Hull, and S.M.Holland from Belfast).

Short field meetings were cancelled in 1977 because of the Xth INQUA Congress at Birmingham. However, the Discussion Meeting at Cambridge University on January 6th and 7th, 1978, had been attended by about 80 members. A session on the afternoon of January 6th, chaired by Professor R.G.West, had included papers on Quaternary Mammals by P. Andrews, M.J.Bishop, A.Currant, A.J.Stuart and A.J. Sutcliffe. An evening session on 6th, chaired by Dr. K. Joysey, had comprised an outstanding lecture by Professor B. Kurten entitled "Blancan and Pleistocene Mammals of North America". A third session on the morning of January 7th was chaired by Professor N. Stephens and included papers by C.B.Stringer and P.J.Boylan. Several younger research workers had also contributed short papers to the first and third sessions, and an excellent series of demonstrations had been available in the Zoology Department. Quaternary Newsletter had been

issued three times during the year, and summaries of many of the papers read at the Cambridge meeting were included in No. 24 (February, 1978).

In the financial statement for the year, the Honorary Acting Treasurer (Mrs. S. Levell), in the absence of Dr. P. Worsley, reported that the balance of £1056 inherited from the previous year had been increased to £1596 approximately. £1002 had been received in subscriptions, £143 from the sale of past Guides and Newsletters (mainly at the Xth INQUA Congress), £75 in bank interest and £62 from the surplus on two meetings. The main items of expenditure were for reprinting past Guides (£217), printing the Newsletter (£162), Secretarial expenses, mainly postages (£200), and expenses for speakers at the Discussion Meeting in January 1977 (£101). There was some discussion about how to use the large balance in hand, and it was decided that money should be made available for members to carry out JCB excavations.

The President thanked the various members of the Executive Committee who retired from office (Dr. G.R.Coope, Dr. J.A.Catt, Professor N. Stephens, Dr. K. Crabtree, Dr. E.R.Shephard-Thorn and Mr. G. de G. Sieveking) for their various services to the Association. As there were no further nominations to those proposed by the retiring committee, the President declared the following elected to serve on the committee for the period up to the 1979 Annual General Meeting of the Association:

President:	Dr. J.D.Peacock
Vice-President:	Mr. E.A.Francis
Secretary:	Mr. J. Rose
Treasurer:	Dr. P. Worsley
Ordinary members:	Mr. F.M.Synge
	Dr. C. Turner
	Mr. B.W.Conway
	Dr. A.J.Stuart
	Miss T.I.Molleson
	Mr. P.J.Boylan

The Secretary explained that the decision made at the 1977 Annual General Meeting to hold the 1979 annual field meeting at Glasgow was not being implemented, because the suggested organisers at Glasgow had stated a preference for 1980. As a result, Dr. W. Warren would organise a meeting for 1979 at Dublin. Under Any Other Business, Dr. Warren outlined the programme for the Dublin meeting, explaining that accommodation would be outside Dublin in Co. Meath, and that one day would be spent examining raised Lateglacial and Postglacial shorelines and deposits of juxtaposed Irish Sea ice and inland ice, one day examining eskers near Trim, bog deposits and the archaeology of the Boyne Valley, and a third day examining the evidence for glacial Lake Blessington, a Lateglacial corrie moraine sequence, pingos and ice marginal deposits of the Irish Sea and Midland glaciers, and the Ballybetagh bog. Two optional extra days would also be provided, and it was hoped to organise cheap group travel to and from Dublin. Minimum cost, excluding travel to and from Ireland, would be about £45.

## Q.R.A. PUBLICATIONS FOR SALE

The following Q.R.A. Publications are available for sale on application to the Honorary Secretary at the address given on p. 1 of this Newsletter. The prices quoted include the cost of postage and packing. Orders should be accompanied by the appropriate remittance.

	<u>Members</u>	<u>Non-members</u>
<u>Quaternary Newsletter</u>		
No. 1	20p	40p
2	20p	40p
3	20p	40p
Nos. 4-9 incl. not available		
No. 10	30p	60p
11	30p	60p
12	30p	60p
13	30p	60p
14	40p	80p
15	40p	80p
16	40p	80p
17	40p	80p
18	40p	80p
19	40p	80p
20	40p	80p
21	40p	80p
22	40p	80p
23	50p	£1
24	50p	£1
<u>Quaternary Research Association Field Guides</u>		
Clacton (1973)	£1	£2
Exeter (1974)	£1	£2
Aberdeen (1975) plus "Quaternary Studies in N.E.Scotland"	£2	£4
Oxford (1976)	£1	£2
Bristol (1977)	£1	£2
Keele (1978)	£2	£3
Vale of St. Albans (1978)	£2	£3

## OSTRACODS FROM DEPOSITS IN THE VALE OF ST. ALBANS

By J.E.Robinson

In his book "Voyages of the Beagle", Charles Darwin wrote of his excitement and mental speculation on the landfalls they made - would the rocks be metamorphic ? - or would they be basalts ? Much the same kind of anticipation comes into the search for microfossils; the end product is seldom seen, and samples are often taken very much in faith. So it was in the course of the recent Quaternary Research Association field meeting to the Vale of St. Albans (June 2nd-4th, 1978), when quite a number of samples were taken from sands and silty horizons within the prevailing gravels -



more in hope than expectation, and more in respect to the general absence of solid faunal evidence for the sequences being discussed. In the event, however, an unexpected success is the reason for this note, an ostracod fauna having been recovered from the Westmill Lower Gravel at Westmill Pit (TL 342162).

At the time of the visit, a 30-40cm pale coloured bed was prominent within the lower gravels below the platform formed by the Ware Till. In discussion, the bed was described as "fines accumulated in a backwater channel within the regime of a braided river system". The bed owed its pale colour to abundant debris of Chara and reworked fragments of Chalk fossils. Other than this derived fauna, however, the sample also contained an "in situ" assemblage of Pleistocene ostracods, which together constitute a fauna of a cold climate. The list includes:

Candona levanderi Hirschmann 1912  
Candona neglecta Sars 1887  
Candona cf. tricatricosa Diebel & Pietrzeniuk 1969  
Eucypris pigra (Fischer 1851)  
Eucypris cf. dulcifons Diebel & Pietrzeniuk 1969  
Herpetocypris reptans (Baird 1835)  
Ilyocypris cf. monstrifica (Norman 1862)  
Paralimnocythere compressa (Brady & Norman 1889)

From the list, Paralimnocythere compressa is probably the most significant species, being essentially a Middle Pleistocene form recorded from the Cromerian sites of Süssenborn (East Germany), Prezletice (Czechoslovakia) and Tiraspol (U.S.S.R.). In Britain, it has been found in the late Beestonian at West Runton by Patrick De Dekker in a study which analysed the changing ostracod fauna from fluviatile, through intermittent flow, to stagnant fen pool environments in Cromerian 1A and 1B. I am grateful to Patrick De Dekker for drawing my attention to this species, which promises to be useful in identifying fluviatile settings in a cold steppe or tundra climate, as well as a broad Middle Pleistocene age. Such conditions seem to have prevailed during the late Beestonian in Norfolk, and likewise could have been a feature of early Anglian times in the proto-Thames valley at Ware on the basis of the ostracods found at Westmill. It is the environment which is being stressed rather than the age, but this discovery does lend biostratigraphical weight to Philip Gibbard's reading of events, particularly his chronology for the Westmill Gravels.

For the future, more material has been collected from the site, although within the space of one week the working face had radically changed, and more work will be undertaken. Also for the future, with inward groans, it is accepted that many samples will have to be collected from the same facies - unlikely looking sands and silts - in the hope of recovering useful faunas. I could have wished for a lighter absolution.

Predictably, the excellent profile from the Hatfield Polytechnic site (TL 212075) produced useful ostracod faunas from the pale Chara marl and the grey silty clay with molluscs. What is clarified from these faunas is the initial open-water pool environment followed by the overgrown Carex fen without evidence of flowing water, the case argued by Sparks on the basis of the molluscs (Sparks, B.W., et al. 1969, Proc. Geol. Assoc., 257-258).

## BOOK REVIEWS

Fenland: Its Ancient Past and Uncertain Future

By Sir Harry Godwin. Cambridge University Press, 1978. 187 pp.  
Price £7.95p.

It isn't often that the leading research worker in a particular field writes the popular book about it. This account shows just how good a product can be achieved by this combination. However, "popular" does not here mean a watered-down version of the scientific results, but simply an account comprehensible to anyone interested in Fenland. It has something of the flavours of both detective story and travelogue, but above all this book is the fruit of a lifetime's understanding of the plants which are so largely responsible for the Fen landscape.

The opening chapters deal with the history of the peat fens as elucidated by the Fenland Research Committee: the discovery of buried forest layers, the application of pollen analysis, the dating of archaeological finds from prehistoric objects to historic drainage and navigation structures. It is demonstrated how established vegetation types of the past have been eliminated in some cases by natural, successional changes, in others by natural catastrophes such as a rise in the sea level, and in others by human interference.

The second part of the book is about man in the fen countryside. Peat working, drainage projects and crops are all discussed. There is a wealth of information on former crops, such as woad, hemp, poppy - used to alleviate the marsh ague, malaria, which used to be prevalent - and reeds and rushes. The final chapters show how the understanding of the landscape gained through techniques of Quaternary research enable predictions to be made of the consequences of altering factors today. Hence management schemes may be devised to retain or recreate the desired vegetation type, at least within the nature reserves such as Wicken Fen. A short bibliography lists some general works on Fenland that are probably not known to most Quaternary researchers. The book is well illustrated, with a total of 65 plates, many of which are of considerable historical interest.

At such a reasonable price the volume must sell rapidly among scientists of many disciplines, naturalists and enthusiastic general readers. It is strongly recommended to all who have an interest in Quaternary studies.

Frances G. Davies

Estimation of Run-off Potential of River Catchments from Soil Surveys.

By F.A.K. Farquharson, D. Mackney, M.D. Newson and A.J. Thomasson, 1978.  
Soil Survey Special Survey No. 11. 29pp. Price £1.60 (60p without map).

Soils in Clwyd I Sheet SJ 35 (Wrexham North)

By J.W. Lea and T.R.E. Thompson. Soil Survey Record No. 48. viii + 137 pp. Price £1.25 (£1 without map).

These two recent publications of the Soil Survey of England and Wales will be of interest to some readers of Quaternary Newsletter, and are obtainable from the Soil Survey, Rothamsted Experimental Station, Harpenden, Hertfordshire AL5 2JQ.

Special Survey No. 11 is the latest in a series of Soil Survey publications dealing with practical applications of soil mapping. It presents a five-fold hydrologic classification of soils, which has enabled a Winter Rain Acceptance Potential (WRAP) map to be prepared for England and Wales at a scale of 1:1,000,000. This is derived from the 1:1,000,000 Soil Map of England and Wales (see Quaternary Newsletter No. 16, June 1975) by classification of profiles representing the seventy-one units of that map according to drainage class, depth to an impermeable layer and permeability of the soil above this layer, by use of three slope classes ( $<2^{\circ}$ ,  $2-8^{\circ}$  and  $>8^{\circ}$ ), and by consideration of other catchment characteristics, such as geological and management factors. The WRAP map is used to indicate the present flood run-off potential of catchments, but could be adapted for use in some palaeo-environmental studies.

Soils in Clwyd I Sheet SJ 35 (Wrexham North) describes the distribution and origin of soil types in an important area of glacial and fluvio-glacial deposition of Irish Sea and Welsh ice. It covers the area of the Llay Readvance of D.S. Peake (1961, Quart. J. geol. Soc. Lond., 117, 335-366) and the Wrexham delta terrace, visited by some members of the Association during the annual field meeting at Keele in April 1978. The Record includes the usual chapters on local relief, drainage, geology, climate, soil classification, detailed descriptions of the soil types, land use capability, agriculture and land drainage, and to satisfy ardent nationalists there is an extended summary in Welsh. Six main soil series are mapped on the fluvio-glacial deposits and four on till. The former are separated on the basis of particle size distribution of  $<2\text{mm}$  fractions, stone ( $>2\text{mm}$ ) content and extent of gleying, and the latter on the presence or absence of a thin loamy drift over clayey till, stone content and the extent of clay illuviation in the profile.

At current prices, both publications are outstanding value for money. Compare, for example, the additional 25p charged for the 1:25,000 Wrexham North sheet with soil boundaries as well as the usual topographic details (in brown) and the normal 70p charged for folded 1:25,000 sheets with topographic information only!

#### CALENDAR OF MEETINGS

- |                              |  |
|------------------------------|--|
| September 25th-29th,<br>1978 | Quaternary Research Association field meeting, Oban. Further details and booking form are in the circular issued with this Newsletter. |
| September 30th, 1978         | Visit to Minchin Hole, Gower. Further details are given on pp. 5-6 of this Newsletter.   |

- December 16th-23rd 1978 Quaternary Research Association Study Course. The Quaternary of Majorca. Further details from Dr. K. Crabtree, Geography Department, Bristol University, Bristol BS8 1SS.
- January 5th-6th 1979 Quaternary Research Association Discussion Meeting, University College London. The Lateglacial Environment of the British Isles and Possible Correlations with North-west Europe. Further details and booking forms will be issued with the circular for November 1978. Please note that the dates of this meeting have been changed since publication of Quaternary Newsletter No. 24.
- April 6th-10th 1979 Quaternary Research Association Annual Field Meeting, Dublin. Further details and booking forms will be issued with the circular for November 1978.
- September 4th-17th 1979 Joint British Geomorphological Research Group/Quaternary Research Association Study Course, Switzerland. Glacial and Periglacial Features of High Alpine Areas. Further details from Dr. W.B. Whalley, Geography Department, Queen's University of Belfast, Belfast BT7 1NN, N. Ireland.
- September 24th-28th 1979 Quaternary Research Association Field Meeting, Channel Islands.

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Compiled and printed for circulation to Quaternary Research Association members and others by the Honorary Secretary to the Quaternary Research Association, Mr. J. Rose, Geography Department, Birkbeck College, London University, 7-15 Gresse Street, London W1P 1PA, England.