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REPORT

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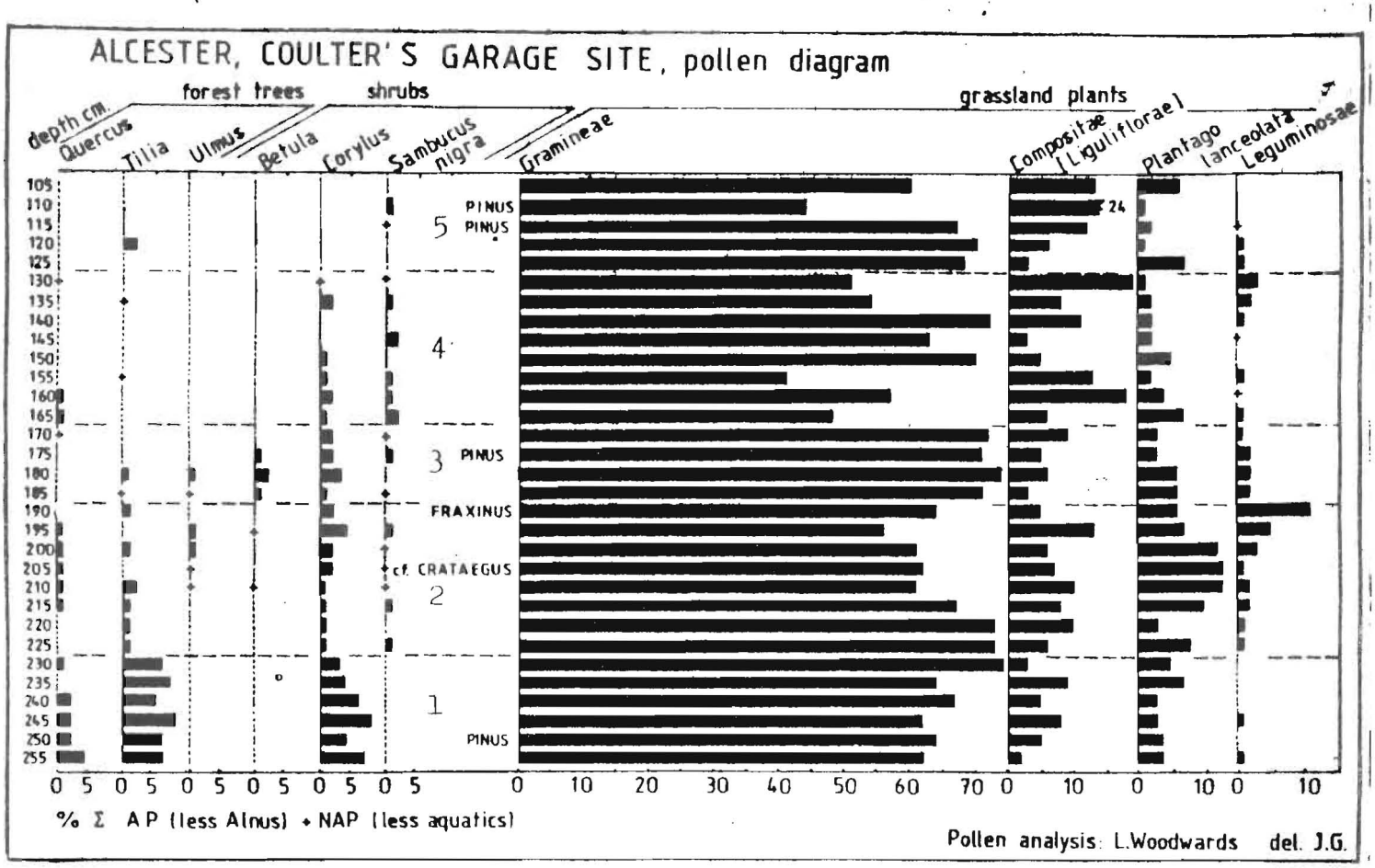
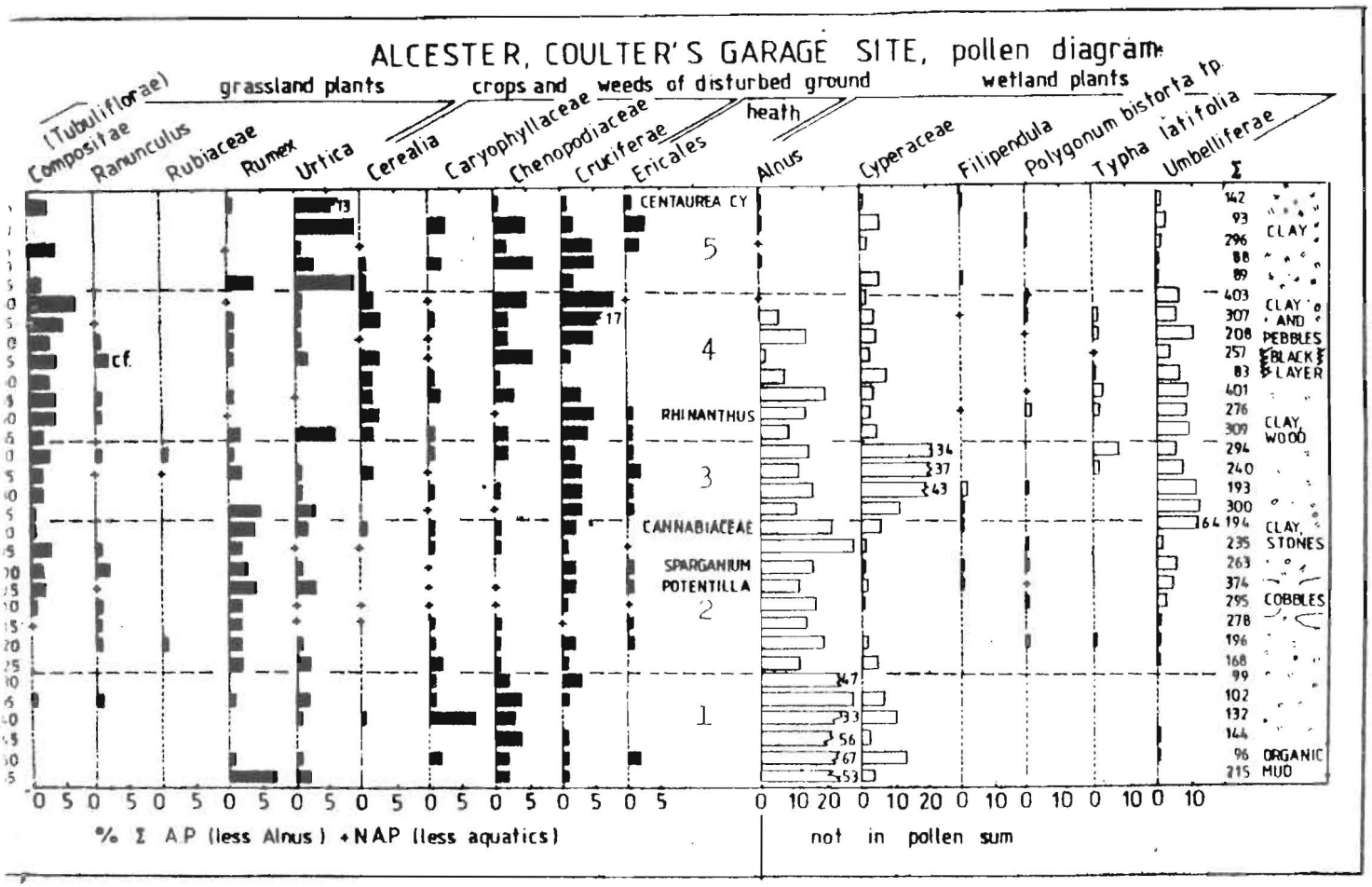
TITLE Landscape changes over the last two thousand years, deduced from remains at Alcester, Coulter's Garage Site


ALCESTER, COULTER'S GARAGE SITE, pollen diagram
forest trees
shrubs
grassland plants
depth cm.
Quercus
Tilia
Ulmus
Betula
Corylus
Sambucus nigra
Gramineae
Compositae (Liguliflorae)
Plantago lanceolata
Leguminosae
PINUS
PINUS
PINUS
FRAXINUS
cf. CRATAEGUS
PINUS
% Σ AP (less Alnus) + NAP (less aquatics)
Pollen analysis: L.Woodwards del. J.G.


ALCESTER, COULTER'S GARAGE SITE, pollen diagram
(Tubuliflorae)
Compositae
grassland plants
Ranunculus
Rubiaceae
Rumex
Urtica
Cerealia
crops and weeds of disturbed ground
Caryophyllaceae
Chenopodiaceae
Cruciferae
heath
Ericales
CENTAUREA CY
RHINANTHUS
CANNABIACEAE
SPARGANIUM POTENTILLA
Alnus
wetland plants
Cyperaceae
Filipendula
Polygonum bistorta tp.
Typha latifolia
Umbelliferae
Σ
CLAY
CLAY AND PEBBLES
BLACK LAYER
CLAY, WOOD
CLAY, STONES
COBBLES
ORGANIC MUD
% Σ AP (less Alnus) + NAP (less aquatics)
not in pollen sum

ALCESTER, COULTER'S GARAGE SITE, POLLEN DIAGRAM.

By L. Woodwards (pollen analysis) and J.R.A. Greig (final report)

Introduction

The pollen diagram from the Coulter's Garage site samples has been set out to show the main vegetation types represented by the pollen records, although such divisions cannot always be made clearly ----- for example, Rumex (dock) includes speci which mainly grow in grassland, as weeds of cultivated land, or in wetland, but the study of macrofossils can show which species are present because they can be identified more exactly than pollen. The pollen percentages have been calculated on the basis of a pollen sum ($\sum$) from dry land plants, so that the pollen diagram shows most clearly what has happened on dry land, rather than the more local changes occurring in the bog vegetation itself. The informati from the pollen diagram is supplemented by that from the plant macrofossils (e.g. seeds and wood), and from insect remains. All this information adds up to a very biased and fragmentary record of the past landscape, which therefore needs to be interpreted with great caution.

The pollen diagram

506.

The pollen diagram has been divided up into 5 zones of recognisably different pollen assemblages, and hence of different types of past vegetation.

sub-zone characteristics

CG 1 (255-230 cm.) Low forest tree pollen (ca. 10%), very high Alnus (ca. 50%), few other wetland records.

CG 2 (225-190 cm.) Very low forest tree pollen (ca. 3%), beginning of Sambucus record, somewhat higher Plantago and Leguminosae records, continuous Ericales, moderate Alnus (ca 20%), scattered records from wetland plants.

CG 3 (185-170 cm) Scattered forest tree records, high Cyperaceae

CG 4 (165-135 cm.) Practically no forest tree records, Corylus and Sambucus the main woody taxa. Continuous records of Cerealia type, moderate Compositae (T) (ca. 5%) and Cruciferae (ca. 6%).

CG 5 (130-105 cm.) Almost no tree or shrub pollen, moderate Urtica (ca. 8%), Centaurea cyanus present, Alnus scattered.

CG 1. The pollen records from Tilia (lime) and Quercus (oak), although not very large, may represent forest rather than scattered woodland, maybe part of the original forest cover of this region. Some scrub, with hazel, is also in evidence, but grassland and weeds of disturbed land are the dominant features of the pollen record here, and probably represent the local vegetation most accurately. The vegetation of the swamp itself could be the source of at least some of the grass pollen, together with the abundant Alnus (alder) pollen which shows that the overstory of the swamp was probably dominated by alder. The lack of aquatic

plant records at this stage shows that the swamp was unlikely to have been permanently flooded.

CG 2. The signs of lime/oak forest decrease, and there is a corresponding increase in signs of thin woodland, with Crataegus (very much under-represented in the pollen record) and Fraxinus, for hawthorn and ash are not forest trees. Sambucus nigra (elder) is nitrophilous, and often grows around human habitations. There are more signs of grassland on dry land, with Leguminosae (e.g. vetches and clovers), Plantago lanceolata (ribwort plantain), Ranunculus (buttercup) and Rumex (dock). The Ericales pollen record shows that heathland may have developed at this stage, but this would have been on higher, drier, land than in the immediate region of Alcester. The local swamp flora has changed, with less Alnus (alder) and records of a number of wetland herbs such as Polygonum bistorta type (e.g. bistort), Filipendula (meadowsweet) and Umbelliferae (umbellifers).

CG 3. There is a further decline in forest tree records although Ulmus (elm) is present here --- it was an important forest tree, but it seems to have also been successful in managed woods and hedgerows, probably because it can easily reproduce by suckering. It is difficult to tell whether such signs of secondary woodland represent trees and shrubs growing in woods or hedgerows. The very high values of Cyperaceae (sedge) and Umbelliferae (umbellifer) pollen probably represent the growth of a sedgy swamp vegetation.

The statistics shown above should be regarded with caution because the identifications of the glume bases and spikelet forks have not been checked. Hillman states (Catsgore, in press) that when only the lowest mm or so of glume base is present it is often impossible to separate spelt from emmer.

CG 4. Corylus (hazel) and Sambucus nigra (elder) are the principle woody plants represented, signs of an extremely treeless landscape, apart from local alder. Signs of cultivated land increase, for the Cerealia type (cereal grains) record becomes continuous, and records of probable weeds such as Compositae (Tubuliflorae) (e.g. mayweed), Chenopodiaceae (e.g. fat hen) and Cruciferae (e.g. charlock) increase. There is a gap in the Ericales (e.g. heather) pollen record, so that the increase in agriculture may have caused the removal of the heathland.

CG 5. Here there are the least signs of scrub. The decline in records from wetland plants and the corresponding increase in Urtica (nettle) and Compositae (Liguliflorae), together with less pollen preserved (shown by some low counts) are signs that the swamp was being colonised by dry land plants. The single grain of Centaurea cyanus (cornflower) pollen might suggest a medieval date.

Plant macrofossils (Fig)

The plant macrofossils show what plants were present, in more detail than the pollen record, and these results permit a more detailed interpretation to be made than would be possible from the pollen diagram alone. The macrofossil lists have been drawn up according to the main types of habitat represented. Woodland is suggested, hardly surprisingly, by only a few taxa, showing that the woodland interpreted from the pollen records was growing at a distance from the site. Hedge and scrub, represented by more plants, would appear to have been one of the types of vegetation present in the vicinity. The grassland flora is even larger, consisting mainly of

plants which are not uncommon in such places today. Carduus cf. nutans (musk thistle) is a calcicole, and such lime-rich soils are patchy round Alcester.

The weed flora is the largest component; most weeds spread their seeds widely and in great numbers, so they are usually well represented, especially in archaeological deposits, so they show that this swamp was probably close to a populated area rather than being in the wilds. Most of the weeds are common today, with the exception of Ranunculus sardous (hairy buttercup) and R. parviflorus (small-flowered buttercup), both of which are now rarities (Cadbury et al,1971). R. parviflorus achenes were also found in Roman well deposits at the Explosion site, Alcester, by S.M. Colledge. The weed flora lacks the very characteristic plants of cornfields and therefore probably represents waste rather than cultivated land.

The large flora of damp ground and wetland plants probably represents the flora of the swamp itself, which would have had alder woodland and an understory of sedges and similar plants, with only a few (Zannichellia, horned pondweed, Lemna, duckweed) which need standing water.

Insect remains

(to be added if available in time)

Discussion

Other profiles from Alcester have shown a similar stratigraphic succession:

Topsoil

Gravelly clay

Organic sediment, more or less peaty

Inorganic clay and gravel

Pollen diagrams have been prepared from samples taken from the deposits at Ragley Mill Lane and from Bull's Head Yard. Many of the horizons of these pollen diagrams seem to correspond, representing a gradual transition from swamp to dry land, and the chronologies may also correspond. CG 1 has more signs of forest trees than either of the two other short successions, so this would seem to represent the earliest phase of lanscape history recorded. (a radiocarbon sample is being dated from this level). The deforested phase seems to be covered by the pollen diagram from Bull's Head Yard which has a dated horizon at 164 cm, which appears to correspond to around 170 cm. on the Coulter's Garage diagram, which would therefore place it at around AD 200. Therefore the clearance of much of the remaining woodland, and the increased evidence of cereals, can probably be connected with the Romans. Such pollen spectra with abundant signs of a deforested, grassy, landscape, seem to be characteristic of deposits of Roman age, such as ponds, ditches and wells at sites like Hibaldstow (Lincs), Droitwich (Worcs), Worcester, Barton Court Farm (Oxon)

and Rudston (Yorks), which make a striking contrast with the signs of weeds and rubbish which usually come from medieval deposits (Greig, in press). Roman towns and their surroundings appear to have been well-organised, and matters like rubbish disposal appear to have been taken care of. The use of brick, tile, and pottery may have made a difference, compared with medieval reliance on organic material for building, roofing, containers etc.

The upper part of the Coulter's Garage and Bull's Head Yard pollen diagrams both show signs of drying-out of the swamp. It is not clear whether this was simply the result of back-filling with earth to raise the level of the ground, or whether there was any active drainage. The wet state of these peaty deposits now would suggest that there was not. The date for this backfilling may be medieval, for the single grain of Centaurea cyanus (cornflower) pollen represents a plant with an archaeological record in Britain which starts in the Early Medieval period (Greig, in press).

The reason for the presence of such a large swamp is hard to establish. It might be connected with some of the very great changes which are believed to have taken place, mainly as a result of large-scale landscape clearance in the Bronze Age (Limbrey, 1978, Shotton, 1978). This seems to have caused massive erosion, moving the original soil cover down into the river vallies and leaving deposits of alluvium which are there today. It is possible that such great changes in drainage could have caused the Alne to have changed its course, leaving its original bed as an oxbow lake by the Iron Age. It would certainly have been a major feature of the landscape

and therefore an important influence on the early history of Alcester.

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ACG Macrofossils (continued)

	240 cm.	250 cm.	pollen
Atriplex sp.(orache)	5	4	3%
Pisum /Lathyrus (pea / vetch)	-	1	-
Aethusa cynapium L. (fool's parsley)	-	1	+
Polygonum aviculare agg. (knotgrass)	61	-	-
Polygonum convolvulus L. (black bindweed)	-	3	-
Urtica urens L. (small nettle)	69	-	2%
Galeopsis tetrahit/speciosa (hemp-nettle)	-	8	-
Sonchus oleraceus L. (sow-thistle)	1	-	5%
Sonchus asper (L.) Hill (spiny sow-thistle)		1	5%
Triticum sp.(wheat) (charred spikelet fork)		1	-
PLANTS OF DAMP GROUND			
Ranunculus flammula L. (lesser spearwort)	11	-	+
Lychnis flos-cuculi L. (ragged robin)	-	4	2%
Montia fontana L. (blinks)	6	-	-
Polygonum lapathifolium/nodosum (persicaria)		2	-
Polygonum hydropiper L. (water-pepper)		4	-
Alnus glutinosa L. (alder)	216	1	50%
Cirsium cf. palustre(L.) Scop.(marsh thistle)	1	51	-
WETLAND PLANTS			
Ranunculus sceleratus L. (celery-leaved crowfoot)	43	-	+
Ranunculus subg.Batrachium (crowfoot)	31	2	+
Alisma plantago-aquatica L. (water-plantain)	25	sp:1	-
Zannichellia palustris L. (horned pondweed)	666	-	-
Juncus sp (rush)	2	2	-
Lemna sp. (duckweed)	25	-	-
Eleocharis uniglumis/palustris(spike-rush)	1	-	-
Carex flava group (yellow sedge)	2	-	10%
Carex cf. riparia/hirta (sedge)	1	3	"
Carex cf.pendula Huds. (pendulous sedge)	4	-	"
Carex cf. disticha Huds. (brown sedge)	-	1	"
Carex sp. (sedge)	4	1	"
OTHER PLANTS			
? Origanum vulgare L. (marjoram)	-	1	-
Umbelliferae (umbellifers)	-	1	-

ALCESTER COULTERS GARAGE: PLANT MACROFOSSILS

	240 cm.	250 cm.	pollen
WOODLAND PLANTS			
Silene dioica(L.)Clairv. (red campion)	-	3	2%
Stellaria graminea L. (lesser stitchwort)	-	1	"
Moehringia trinerva (L.) Clairv. (sandwort)	-	2	"
Betula pendula Roth (silver birch)	-	1	-
HEDGEROW AND SCRUB PLANTS			
Rubus idaeus L. (raspberry)	4	1	-
Rubus fruticosus agg. (bramble)	-	7	-
Potentilla cf. anglica Laicharding (trailing tormentil)	4	1	-
Prunus spinosa L. (sloe)	-	2	-
Corylus avellana L. (hazel)	-	1	6%
Ballota nigra L. (black horehound)	-	5	-
Sambucus nigra L. (elder)	2	42	-
Arctium sp. (burdock)	1	1	-
GRASSLAND PLANTS			
Ranunculus acris/bulbosus/repens (buttercup)	6	29	+
Ranunculus parviflorus L. (small-flowered ")	2	-	+
Potentilla cf. recta L. (tormentil)	-	1	-
Chaerophyllum temulentum L.(rough chervil)	1	-	+
cf. Daucus carota L. (wild carrot)	1	-	+
Rumex crispus L. (curled dock)	2	-	2%
Rumex sp. (dock)	-	47	"
Urtica dioica L. (nettle)	23	12	2%
Prunella vulgaris L. (self-heal)	4	2	-
Carduus cf. nutans (musk thistle)	1	1	-
Lapsana communis (nipplewort)	-	2	5%
Leontodon cf. autumnalis (hawkbit)	1	-	"
Gramineae (grasses)	-	1	66%
OPEN GROUND; WEEDS			
Ranunculus sardous Crantz (hairy buttercup)	12	-	+
Fumaria sp. (fumitory)	-	3	-
Stellaria media/neglecta (chickweed)	15	31	3%
Chenopodium album/suecicum (fat hen)	20	62	3%
Chenopodium polyspermum L. (all-seed)	-	18	"
Chenopodium ficifolium Sm. (fig-leaved goosefoot) cf.	1	8	"