Notes and Comments

A Discovery of Mediæval Plough-Marks in St Andrews

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I

On the south side of the eastern end of South Street in St Andrews stands the sixteenth-century building known as Queen Mary's House (Fig. 1). As part of the continuing programme of urban archaeology in St Andrews an opportunity was taken in 1974 to excavate the cellars of this house. The main results of this excavation will be published later: this paper is concerned with one specific feature which, revealed unexpectedly by the investigation, throws light on agricultural practice in St Andrews in the mediæval period. In the northern face of Trenches A and B are markedly clear ploughing patterns (Plate IV). Their possible date, their method of formation and the agriculture of which they are part are considered here by reference to other archaeologically revealed features, to documentary evidence and to pollen analysis. Such plough marks as these are believed to be the first discovered from an archaeological site in mainland Scotland.

II

Queen Mary's House is built, as is much of St Andrews, on a raised beach site which has a flooring of coarse yellow sand in its undisturbed state. This can be seen in the foreground of Plate IV. As a consequence of this colouring, interference by man's activities is quite easily recognised, especially where this has involved the addition to the soil of organic material or the deposition of charcoal subsequent to burning. Plate IV shows a layer of very dark material, the base of which lies in a scalloped pattern: this is the result of ploughing, most probably with the old Scots plough. The plough marks are not as clear at the eastern end of the section as at the western but they are plain enough to suggest that the marks are part of a system of ploughing which is summed up in Fig. 2. The surface manifestation of the cultivation has been destroyed by later use of the site, but the subterranean evidence suggests that in the region of the 0·50 m mark on the scale there is located the centre of a furrow of a mediæval ridge and furrow system. As the trench face is not absolutely at right angles to all the plough lines it is difficult to determine ploughing dimensions. The worked soil is at least 0·25 m deep and the sod width appears to be approximately 0·20 m.

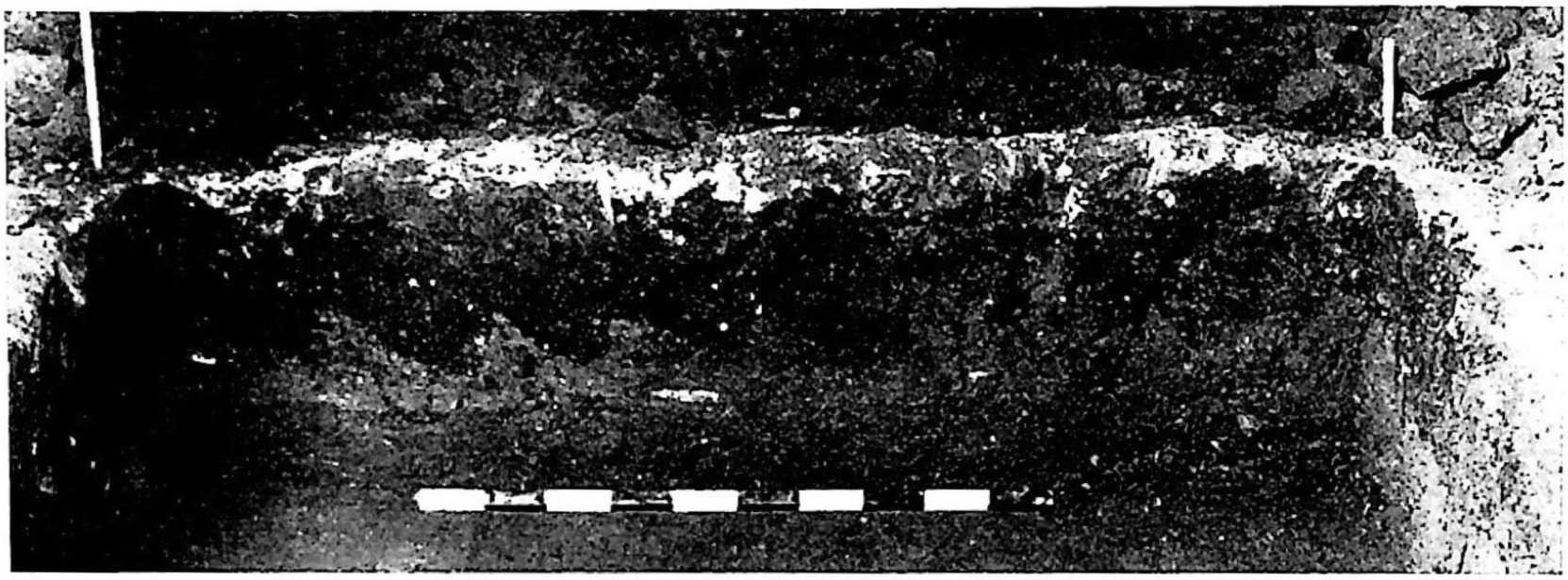

PLATE IV The plough marks as revealed in the northern face of Trench B.

Line of house facades on the northern side of South St.

SOUTH STREET

Formerly partly occupied by a track from the settlement of Argyll to the Cathedral

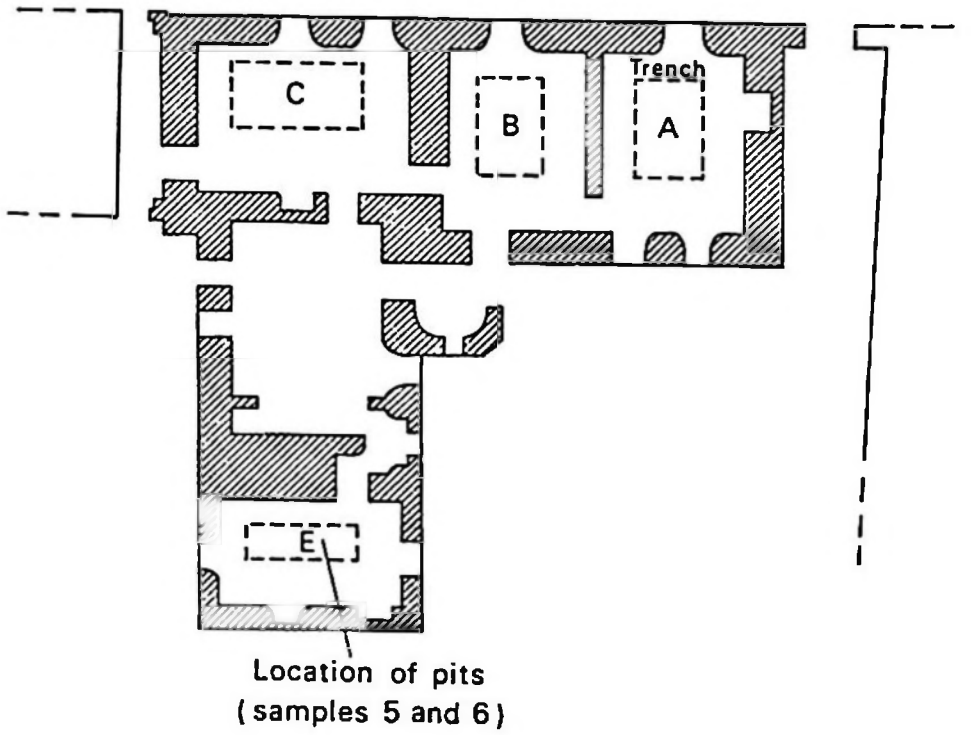

FIG. 1 A ground plan of Queen Mary's House showing the location of excavated areas. The area available for ploughing after the erection of houses on the north side of South Street and the development of the burial ground would have restricted the north-south direction to a maximum length of 64 yards.

The plough marks and the size of the furrow slice accord well with the capabilities and performance of the old Scots plough with fixed mouldboard. It is envisaged (Fig. 2) that the slices were turned away from the furrow centre to form ridges of about 3–5 m in width. There are records of the crowns of such ridges being up to 2 m above the level of the furrow but such probably only occurred on very wide and rather old ridges, neither of which conditions appear to be operative here. Because the site is located on coarsely textured sand, the soil would not have made great demands upon animal traction power and thus it is likely that the old Scots plough was here pulled by a small team; indeed perhaps in line with an observation made by J. Anderson (1794:80) who wrote 'where soil is light . . . it could be ploughed with two horses'. Depending upon the date of the construction of houses on the north side of South Street and the

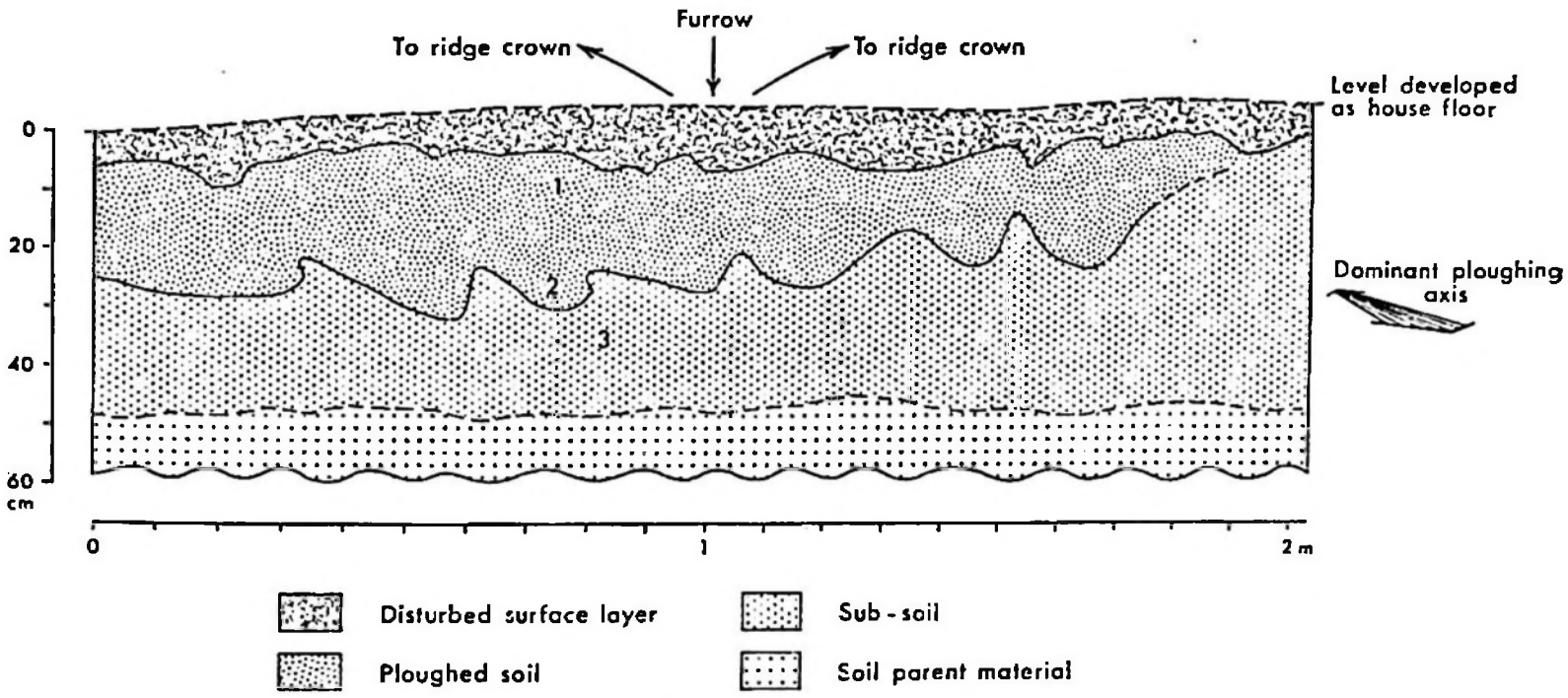

FIG. 2 A diagrammatic interpretation of the features shown on Plate IV.

first use of the ground to the south as a burial ground, the size of the plough team could be of great importance because, while the cultivation marks are commensurate with the interpretation given above, there still remains the puzzling feature of the extremely restricted space available for ploughing (Fig. 1). Whatever the reason could have been for ploughing in so limited a space, there would certainly have been no room for a large plough team with its considerable demands on a headland area for turning, nor would the ploughing appear to have been economically rewarding. In such circumstances as these, spade cultivation would appear to be much more likely but the form of the cultivation marks is against that. Indeed if repeated ploughing took place here then the remarkable sharpness of the plough marks is also puzzling: this topic will be returned to later.

III

Samples were taken for pollen analysis from the north face of Trench B at points 1, 2 and 3 (Fig. 2). Two further samples (5 and 6) were analysed from the infill of two pits exposed in Trench E (Fig. 1).

(*i*) *The pits* The infill of both pits had a high organic content, and the one providing sample 5 was waterlogged, thus providing good conditions for pollen preservation. Sample 5 had the highest proportion of arboreal pollen (AP) of any of the material analysed, giving *Betula* (birch, 17 per cent Total Land Pollen) and *Alnus* (alder, 17·4 per cent TLP) as dominant species, with *Ulmus* (elm) and *Quercus* (oak) also present: together the trees provide 39 per cent TLP. This sample also had a significant total of *Corylus* (hazel) pollen (13·4 per cent TLP). Of the non-arboreal pollen, Gramineae (grass) occurs at 24·4 per cent but in contrast to the other samples *Calluna* (heather) only provides a low total of 12·1 per cent TLP. The other herbaceous pollens occur at values of less than 1 per cent TLP, except *Ranunculaceae* and *Plantago* sp. Unfortunately the *Cerealia* grain was too poorly preserved for species identification. Evidence of waterlogging in this pit was also attested by the presence of *sphagnum* spores.

The pollen spectrum for sample 6 differs markedly from that obtained for the neighbouring but deeper pit. The arboreal pollen total is only 4 per cent. Gramineae provides 34·6 per cent TLP but *Calluna* is the dominant pollen present (52·3 per cent TLP). Only *Plantago* (plantain) of the other herbaceous species present reaches a value greater than 1 per cent TLP.

(*ii*) *The ploughed soil* All three samples from this area have similar pollen assemblages and are probably best treated as one unit. They have an arboreal pollen total of between 10 and 12 per cent with *Corylus* between 1·5 and 3 per cent. Sample 2 shows a higher percentage of *Calluna* (56 per cent) than the other two samples (34 and 39 per cent) but also has slightly lower totals in all the other herbaceous species present, including Gramineae. The main components of the non-arboreal pollen are *Compositae lig.* and *Chenopodiaceae* but *Compositae tub.* and *Plantago* sp. also occur at more than 1 per cent. Eight cereal pollen grains were isolated: on the basis of grain and anulus size and surface sculpturing (Beug 1963) they were identified as *Hordeum* sp. (barley) and *Triticum* sp. (wheat); no *Avena* (oats) pollen was found.

IV

The ploughing marks were certainly in existence before 1520, in that a stone-built house was erected on the site in that year and there is proof of continuous occupance ever since. There is also documentary evidence in St Andrews University Muniments (SL 110 PW 10) of the grant of a feu on the site by St Andrews Priory to a Janet Douglas in 1409. There is no mention of a building in that document but its form is com-

mensurate with a feu granted for building purposes. Furthermore the pits and the disturbed upper layer of the ploughed soil revealed large quantities of burned daub, which could be the remains of a house dating from the fifteenth century, possibly burned deliberately after a plague. The excavations in Trenches A and B (Fig. 1) revealed, underlying the ploughed area, a ditch which has every appearance of having been rapidly refilled, and which, from the Leuchars-ware pottery contained in the infill, dates from no later than the thirteenth century but could be as early as the twelfth. The period during which the ploughing could have occurred therefore lies between the twelfth and sixteenth centuries. There is also considerable likelihood that the terminal date could be as early as the beginning of the fifteen century for even if the earliest house did not occupy the whole of the ploughed area its close proximity to the ploughing lines would have reduced the area available for cultivation to an uneconomic size.

The environment in which the ploughing took place is suggested by the pollen spectra from the pits uncovered in Trench E. From their pottery content (again Leuchars-ware) the pits appear to be roughly contemporaneous, although from the variation in pollen content the pit yielding sample 5 could be earlier. The high percentage of tree pollen (39 per cent TLP) suggests that the area around Queen Mary's House was not entirely clear of trees: the existence of birch, alder, elm, oak and hazel could be claimed to show that an early twelfth-century date is likely, because after that the agricultural involvement of St Andrews Priory in the land to the south of the town was developing. The pit which yielded sample 6, as well as possessing a pollen spectrum similar to that displayed by the ploughed soil, has a very low content of arboreal pollen (4 per cent TLP) which indicates that tree clearance in this area of St Andrews had progressed considerably over a short period if the rough contemporaneity of the pits is correct.

A feature of considerable interest revealed by the pollen analysis is the variable amounts of *Calluna* pollen in the samples. In sample 5, which it is suggested is the earliest, *Calluna* only provides 12·1 per cent TLP, whereas in sample 6 the percentage is 52·2, and it even reaches 56 in the ploughed soil (sample 2). The high percentage of *Calluna* pollen is puzzling for such a high total is usually associated with heathland which is unlikely in this urban context. There are however other possible explanations which not only throw light on the agricultural practices of the time but would also help to explain the extremely dark nature of the ploughed soil. A major problem facing mediæval agriculture was the maintenance of soil nutrients at a level which would ensure no fall in grain yields. To achieve a satisfactory level several methods of nutrient replacement were employed and two of these could account for the high level of *Calluna* pollen. The most usual nutrient maintenance practice was to spread on the land, before ploughing, the manure from the cattle byres. It was common for heathery turves to be used for cattle bedding: this would provide one possible source for the pollen. Mediæval houses in St Andrews were normally thatched. A variety of materials, including heather, were available. When the roof covering was renewed, the old, soot-encrusted thatch was added to the byre manure and spread on the fields, thus

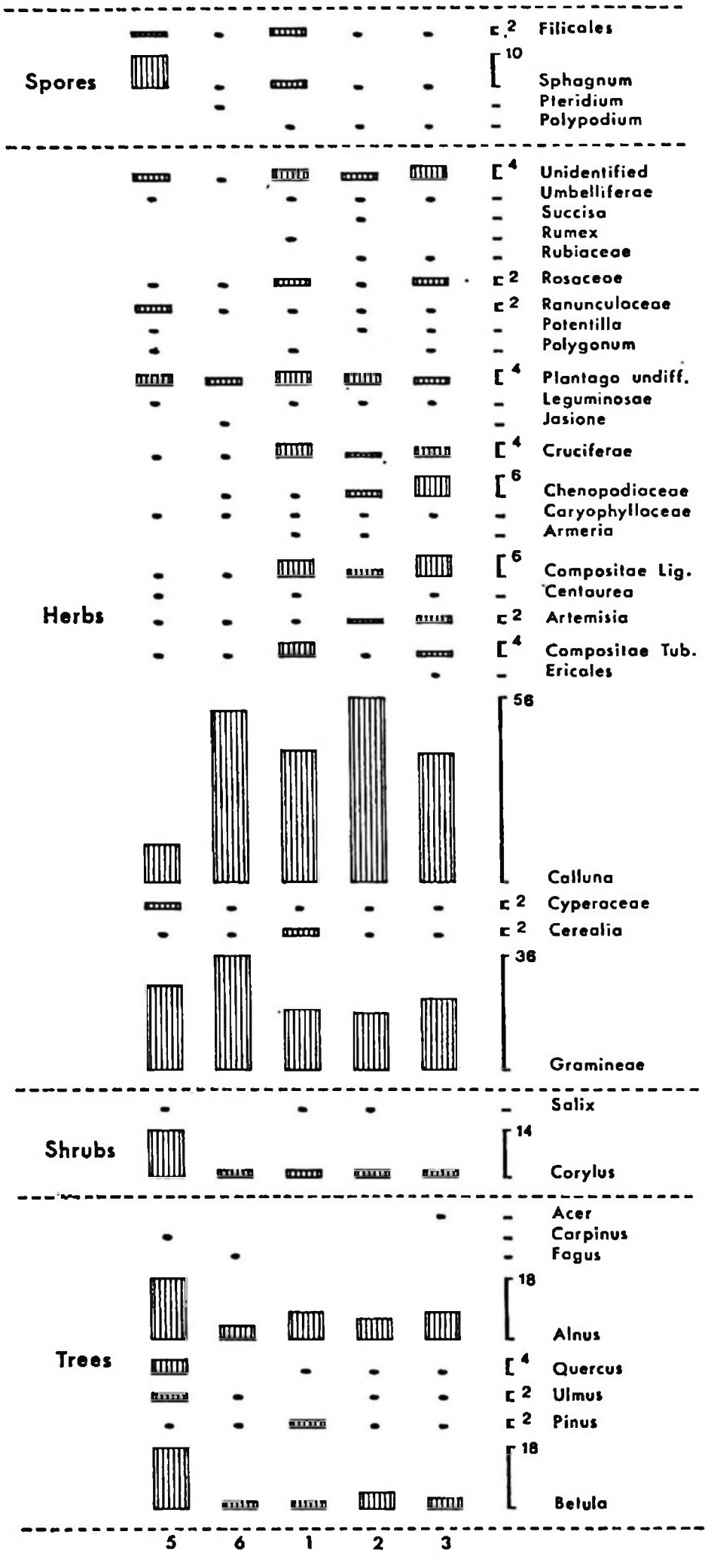

FIG. 3 The spectra revealed by pollen analysis of samples 5 and 6 from the pits and samples 1, 2 and 3 from the ploughed soil. All pollens are expressed as a percentage of the Total Land Pollen. The numbers on the right of the diagram show the maximum percentage achieved by the pollens in any one of the samples. The dashes on the diagram refer to pollen totals of less than 1 per cent.

providing a second possible source for the pollen and a possible origin for the soil carbon. The basic soil derived from the raised beach sands is coarse in texture, very porous and deficient in humus. To overcome this the custom of manuring with turf, which is known from pre-historic times onwards, could well have been adopted. This involved the cutting of turves from an area beyond the zone of cultivation and their deposition and frequently their burning on the land before ploughing. In this way both the *Calluna* pollen and the carbon would be added to the soil. The presence of the *Calluna* pollen in the pit could occur in a variety of ways, but as heather can be a copious producer of pollen its mere presence on the site would probably be enough to ensure that its pollen became incorporated in the pit.

The pollen evidence suggests that both barley and wheat were grown on the site but this evidence is by no means conclusive on its own. Only in Sample 3 does the *Cerealia* total attain a value of 1 per cent, a frequency much lower than might be expected if the cereals were grown on the plough ridges. Heim (1962), for example, has recorded values for cereal pollen, in the modern pollen rain, of the order of 3–4 per cent TLP up to 2 km from the point at which the cereals were actually being grown. Whatever the main crop here, however, the cultivation of cereals is made more likely by the high frequency of pollen of *Chenopodiaceae*, a family which includes species characteristic of fields supporting a grain crop. Although there is no direct evidence of other crops, the presence of high frequencies of *Plantago* sp. and *Ranunculaceae* suggests that the site might have been used for pasture also. This is supported by the Gramineae totals. This apparently mixed nature of pollen types, characteristic of different agricultural activities, is perhaps not surprising as the soil containing the plough marks would have undergone considerable mixing, not only by ploughing but also by earthworm activity which would have continued until the time when the land was sealed by building. The effect of such mixing would have been to create a relatively uniform pollen spectrum throughout the old cultivated soil and this appears to have happened here. This would also explain the relatively low cereal pollen percentage as those pollen grains would have been widely dispersed throughout the whole profile.

Yields from mediæval and indeed later arable agriculture were considerably depressed because the peasantry did not indulge in crop-weeding. Among the most troublesome weeds in grain crops was *Chrysanthemum segetum* (corn marigold), commonly known as *guild* or *goold*. This plant belongs to the *Compositae* family and yet it is noticeable that the pollen attributable to all *Compositae*, for which the site had very suitable growing conditions, is relatively very low. This suggests that the monastic agricultural rules which led to fines being levied for allowing *goold* to grow on monastic land, which this land was, well may have been in operation here. The situation certainly contrasts with that revealed by pollen analysis of material from another excavation within St Andrews but outside the monastic area, in which *Compositae* comprised 60 per cent of TLP.

In summary it appears than an advanced form of agriculture was being practised on the site, perhaps a forerunner of the high farming for which the monasteries became

famous. The low content of the most prevalent weed of the time, the absence of the commonly grown oats, the presence of wheat, and the likelihood of a realistic size of plough team, all provide evidence to vindicate such a view. It must also be emphasised, however, that while such agriculture almost certainly took place on the site, it is possible that the plough marks are totally unrelated to it. When a house was deliberately destroyed because the inhabitants had been involved in a treasonable act or afflicted by the plague the house site underwent a 'ritual' ploughing as a sort of cleansing act. If this were the case here, it would be possible to explain the puzzling sharpness of the plough marks and the apparent shortness of the plough run—they would be the result of a single ploughing which was unconnected with agricultural needs. If this ploughing had been deep enough it would have destroyed all the physical evidence of early cultivation with the exception of that surviving in the pollen spectra.

ACKNOWLEDGMENTS

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