

Spice and famine food? The botanical analysis of two post-Reformation pits from Elgin, Scotland

David Robinson *

Summary

The botanical analysis of the contents of two post-Reformation pits from Elgin has revealed some interesting details about contemporary life in the town. One pit appears to have functioned as a latrine, the other as a repository for peat ash. The latrine pit contained a wide range of arable weed seeds and fruits together with large numbers of intestinal parasite eggs. Many of the seeds and fruits are present as small fragments and they may have been ground for use as famine food. The pit also contains wads of flax and other fibres which are interpreted as 'toilet paper'. Small squares of cloth which were recovered during the excavation may have served a similar purpose or may alternatively have been used as pessaries or sanitary towels. A large number of crushed and ground black mustard (Brassica nigra) seeds were recovered from one sample and they are taken to represent usage as a spice.

Introduction

In the late 1970s portions of the 'backlands', properties which run perpendicular to the High Street in Elgin (Grampian Region, formerly Morayshire, in the north-east of Scotland), were excavated under the direction of Bill Lindsay (Lindsay forthcoming). Much of what was found dated from the 13th and 14th centuries, although material of 12th and 15th century date was also present. At one site, 26-28 South College Street, two pits of a later date, provisionally 17th or 18th century, were encountered and it is the analysis of the contents of these which forms the basis of this account. The pits were clay-lined and were cut into freely-draining natural sand. They were provisionally designated by the excavator as latrine pits and the main aim of the botanical analysis was to confirm or refute this interpretation.

Methods

Three samples were analysed. Two (856 and 863) came from the primary fill of pit 17, the third, (614) was from material used to back-fill pit 18. The whole of samples 614 and 856 were used for analysis, their total volumes being 75 ml and 50 ml respectively. A 100 ml sub-sample was removed from sample 863. The samples were dry-sorted to remove any large or obviously fragile plant remains, soaked overnight in a 1% solution of sodium hydroxide (NaOH) and sieved through 1.25 mm and 0.30 mm sieves, before the organic

* Dr David Robinson, Department of Natural Sciences, The Danish National Museum, Ny Vestergade 11, 1471 Copenhagen K, Denmark.

remains were wet-sorted and identified using both low- and high-power microscopy (max. x100 and max. x1000). The results are presented in Table 1. The nomenclature follows Clapham et al. (1981) and Watson (1981) unless authorities are given in the text.

Results and interpretations

Pit 18 - one sample

Sample 614 was very organic and contained compacted bodies of highly-humified plant remains pervaded by 'sedge' (Cyperaceae) rootlets. The impression that these represent peat fragments is supported by the fact that the majority of the few plant remains present were from species of heathland habitats. There was also a substantial fine charcoal and ash component and the sample apparently represents a mixture of peat and peat ash. A single fragment of corncockle (Agrostemma githago) seed may indicate past use of the pit for depositing latrine material or crop waste but the fragment could just as easily have originated incidentally from agricultural or domestic activities nearby or from reworking of older deposits.

Table 1. Plant and animal macrofossil remains from Elgin SC77, divided according to their likely origin or use. Abbreviations: pdf- pod fragment; s - seed; f - fragment; fb - fibre; a - achene; fr - fruit; lvs - leaves; rts - roots; lbsp - leaf-base spindle; sh - shoot; fbo - fruiting body; * carbonised; + present; ab abundant.

		Pit 18	Pit 17	
<u>Food and other useful plants</u>	part(s)	614	856	863
<u>Brassica</u> sp. (mustards, kale, etc.)	pdf			+
<u>B. nigra</u> (black mustard)	v			ab
? charred bread	f		+	+
<u>Linum</u> sp. (flax)	fb		+	+
	s			+
<u>Malus</u> sp. (apple)	pip			+
<u>Papaver</u> cf. <u>somniferum</u> (?opium poppy)	s			+
<u>Rubus idaeus/fruticosus</u> (raspberry/blackberry)	pip			+
unidentified plant fibres	fb		ab	+
<u>Weed Species</u> (° denotes possible food plants)				
<u>Agrostemma githago</u> (corncockle)	s	+	ab	ab
<u>Centaurea</u> sp. (cornflower/knapweeds)	a			+
<u>Chenopodium album</u> (fat hen)°	s		+	+
<u>Polygonum</u> sp. (persicarias/knotgrasses)°	fr			+
<u>Raphanus raphanistrum</u> (wild radish)°	pdf			+
<u>Spergula arvensis</u> (corn spurrey)°	s		+	+
<u>Stellaria media</u> (chickweed)°	s			+
<u>Thlaspi arvense</u> (field penny-cress)	s		+	+
<u>Torilis</u> cf. <u>japonica</u> (?spreading hedge parsley)	fr			+

Sample 856 was made up of fibrous plant material in a sandy-silt matrix. Fine fibres were felted and coarser ones were aligned in loose short bundles. Fine seed and fruit fragments abounded and it was obvious from the species present that the material was largely faecal in origin. This is despite the absence of cereal testa (bran) fragments which are reported in similar material from other Scottish sites (Dickson et al 1979; Fraser 1981; Fraser forthcoming; Fraser and Dickson 1982; Robinson in press). Cereal testa fragments are rather delicate and it is quite possible, given the sandy silty conditions which prevailed, that they were present but had been degraded as was the case at the medieval site in Mill Street, Perth (Robinson forthcoming). The more robust remains, the fragments of seeds and fruits of contaminant weeds which are so characteristic of fossil faeces, tend to survive. In this case the species present included corncockle (Agrostemma githago), a serious cornfield weed in earlier times, being difficult to separate from the cereal crop and notorious for its content of toxic saponins (Wilson 1975). Present in lesser quantities were flour-sized fragments of field penny-cress (Thlaspi arvense), corn spurrey (Spergula arvensis) and fat hen (Chenopodium album). These are common arable weeds and crop contaminants but they have also been used as

Heathland and wetland species

<u>Calluna vulgaris</u> (heather)	lvs	+	+
Cyperaceae (sedges, etc.)	rts	+	
Ericaceae (heaths, etc.)	fls	+	
<u>Eriophorum vaginatum</u> (bog cotton)	lbsp		+
<u>Juncus</u> sp. (rushes)	s		+

Mosses

<u>Sphagnum</u> sp.	lvs		+
<u>S. papillosum</u>	lvs		+
<u>Thuidium tamariscinum</u>	lvs		+
unidentified	sh	+	

Animal remains

bone	f		+
feather	f	ab	+
hair (deer)			+
hair (unidentified)			ab
insect remains			+
<u>Trichuris</u> sp.	eggs		+
sheep's wool (with attached skin)			+

Miscellaneous

<u>Cenococcum geophilum</u> (fungus)	fbo		+
charcoal	f	ab	+
fungus spores			+
peat		ab	
peat ash		ab	

supplements to the food supply in times of hardship (Drury 1984). That they were present indicates that flour had not been fine-sieved before use to provide 'white' flour; the absence of bran fragments is thus clearly not because only 'white' flour was consumed.

Small fragments of a charred vesicular material were moderately abundant in the sample. They were generally 2-3 mm in diameter and have been tentatively identified as charred fragments of bread. They bear a remarkable resemblance to charred reference material of dense 'sourdough' bread. Eggs of the intestinal parasite whipworm (Trichuris sp.) were abundant in the sample and in many cases were seen adhering to seed fragments. Their presence suggests at least a mild level of infection and further confirms the presence of faecal material. No attempt was made to measure the eggs or identify the species of Trichuris. In the view of the other evidence it seems likely that they are from Trichuris trichiura, the human whipworm. The few animal hairs present, provisionally identified as being from deer (H. M. Appleyard, pers. comm.), are also likely to have had their source in faeces, or perhaps kitchen refuse. Plant fibres on the other hand were much more abundant and many have been identified as being of flax (Linum sp.). These fibres are characterised by having obvious nodes or 'knees'. Not all the fibres possessed this character, however, and it appears that a mixture of fibres is present. They could represent the residue from use of the pit for retting of fibre plants or possibly textile waste dumped directly in the pit. However the most probable explanation is that the material represents 'toilet paper' as large wads of moss, the material normally present in deposits interpreted as 'cess', were absent. It is not clear whether the fibre waste was a preferred commodity or just a substitute for moss.

Sample 863 was mostly from a compacted organic sandy silt with some looser sandy material. It, too, obviously represented faecal material although it lacked the large quantity of plant fibres found in the previous sample. Cereal bran fragments were again absent, but food plant residues, possible charred bread fragments and weed seed fragments were abundant.

A very high proportion of the sieved residue was found to be made up of seeds of black mustard (Brassica nigra). These were either whole, crushed or coarsely ground. The seeds are characterised by having on their surface a coarse 'ropey' reticulum with lumina 50-100 μm in diameter. This reticulum is much more prominent than that found in any other Brassica species. In addition the palisade cells beneath the reticulum are also distinctive, having lumina which are either elongate (c. $8 \times 3 \mu\text{m}$) or roughly circular (c. $5 \mu\text{m}$ in diameter) (Winton 1916). The seeds were difficult to measure because most were crushed or misshapen; however, the majority appeared to be well in excess of 1 mm in diameter. Seed pod fragments were also recovered from this sample. They closely resemble reference material of various Brassica species and it was not possible to identify them positively as coming from B. nigra. This plant has an extremely long history of usage as a spice, being the source of mustard mentioned by Pythagoras and being employed in medicine by Hippocrates in 480 BC. It was described as a garden plant by Albertus Magnus in the 13th century and has had numerous mentions in Herbals (Hedrick 1972). The young plants were eaten like spinach or used in salads and the seeds were a major source of mustard the world over until they were replaced by those of white mustard (Sinapis alba) about two decades ago (Hemingway 1976). In the light of this it seems more likely that the seeds were used as a spice rather than a famine food. Mustard flour made from wild radish or charlock (Raphanus raphanistrum) was more commonly used in this latter respect (Drury 1984), although it also found use as a spice, the so-called 'Durham mustard'.

Other food plants present in this sample included apple (Malus sp.) pip fragments, a raspberry/blackberry (Rubus idaeus/fruticosus) pip and possibly opium poppy (Papaver cf. somniferum) seeds. The latter were and are used as a spice and as decoration on bread and pastries. Weed seeds and fruits, some intact, some in fragments, were more numerous and from a wider range of species than in the previous sample. Some, such as corncockle (Agrostemma githago), cornflower/knapweeds (Centaurea spp.), wild radish or charlock (Raphanus raphanistrum) and possibly spreading hedge parsley (Torilis cf. japonica) are likely to have been unavoidable crop contaminants. Others, like the persicarias/knotgrasses (Polygonum spp.), chickweed (Stellaria media), corn spurrey (Spergula arvensis, fat hen (Chenopodium album) and field penny-cress (Thlaspi arvense) may have been intentionally retained or even added to the food crop (Drury 1984). The flax seed fragment which was recovered may also have been part of the diet or may have had a medicinal use. Whipworm (Trichuris) eggs were again present as were animal fibres, which in this case had skin attached and were provisionally identified as being wool (H. M. Appleyard, pers. comm.). Cereal pollen grains were found adhering to the seed fragments in association with the whipworm eggs.

Conclusions

The analysis of the fill of pit 18 (sample 614) provides little information other than that the pit was back-filled with a mixture of peat and peat ash which presumably originated from a nearby hearth.

The conclusions from the analysis of the contents of pit 17 are much more interesting and, with respect to the social status of the contributors to the latrine material, are also rather conflicting. On the one hand the presence of black mustard and opium poppy seeds and the possible evidence for consumption of venison and mutton suggest a lifestyle above that of the average commoner (Donaldson 1794, cited in Fraser forthcoming), whilst on the other hand the abundance of fragments of so-called famine food species suggests the contrary. It may be that these fragments just represent the normal level of contamination in flour available at that time or that the latrine material was from persons of mixed social status. The presence of the whipworm eggs is of little value in resolving this question as these worms probably afflicted rich and poor alike.

The wads of flax and other plant fibres from this pit are interpreted as having been used as 'toilet paper' and small squares of cloth recovered from the pits during the excavation may well have served a similar purpose. It has been alternatively suggested (C. A. Dickson pers. comm.) that the cloth squares could have been used as pessaries as described by Dioscorides in A.D. 65 (Gunther 1933) and as widely used since that time. There are no plant remains present which may have been used in connection with the pessary but this is hardly surprising as an extract of the plant rather than the plant itself is likely to have been used. A further possibility is that they represent tampons or sanitary towels, as has been suggested from medieval Bergen by Krzywinski et al. (1983). Although obviously organic in content, samples 856 and 863 are remarkable for their high sand and silt content. This could have had its origins in the sand into which the pits are cut. It is also possible that deliberate covering of the faecal material with sand took place. This would reduce the odour from the material and promote its breakdown by micro-organisms. This practice was the basis on which earth closets, which were used in country areas until relatively recently, functioned efficiently.

Acknowledgements

I would like to thank Bill Lindsay (Falkirk), H. M. Appleyard (Halifax) and Camilla Dickson (Glasgow) for their helpful comments and suggestions regarding this work. The research took place at Glasgow University in 1985 and was funded by the Scottish Development Department (Historic Buildings and Monuments), Edinburgh. The excavation at 26-28 South College Street took place in 1977 under the auspices of the Elgin Archaeological Heritage Trust with monies provided by the Manpower Services Commission and the Scottish Development Department, Ancient Monuments Division.

References

Clapham, A. R., Tutin, T. G. and Warburg, E. F. (1981). Excursion flora of the British Isles (3rd edn) Cambridge: University Press.

Dickson, J. H., Dickson, C. A. and Breeze, D. J. (1979). Flour or bread in a Roman military ditch at Bearsden, Scotland, Antiquity, **53**, 47-51.

Donaldson, J. (1794). A general view of the agriculture of Elgin and Moray. London.

Drury, S. M. (1984). The use of wild plants as famine foods in 18th century Scotland and Ireland, pp. 43-60 in R. Vickery (ed.) Plant lore studies, Folklore Society Mistletoe Series 18 London.

Fraser, M. J. (1981). The botanical remains from three medieval Scottish sites. Unpublished MSc Thesis, University of Glasgow.

Fraser, M. J. (forthcoming). The botanical remains, in W. M. Lindsay, Excavations in Elgin, Proceedings of the Society of Antiquaries of Scotland.

Fraser, M. J. and Dickson, J. H. (1982). Plant remains, pp. 239-43 in J. C. Murray (ed.) Excavations in the medieval burgh of Aberdeen 1973-81. Society of Antiquaries of Scotland Monograph 2. Edinburgh.

Gunther, R. T. (1933). The Greek herbal of Dioscorides. Oxford.

Hedrick, U. P. (1972). Sturtevant's edible plants of the world. New York.

Hemingway, J. S. (1976). Mustards, pp. 56-9 in N. W. Simmonds (ed.) Evolution of crop plants. London.

Krzywinski, K, Fjellidal, S. and Soltvedt, E.-C. (1983). 'Recent palaeoethnobotanical work at the medieval excavations at Bryggen, Bergen, Norway', pp. 145-69 in B. Proudfoot (ed.) Site, Environment and Economy. Symposia of Association for Environmental Archaeology 3, British Archaeological Reports, International Series 173. Oxford.

Lindsay, W. M. (forthcoming). Excavations in Elgin, Proceedings of the Society of Antiquaries of Scotland.

Robinson, D. E. (in press). The botanical remains, in Excavations in Perth 1978-82, Society of Antiquaries of Scotland Monograph Series Edinburgh.

Robinson, D. E. (forthcoming). The botanical remains, in M. Brann Excavations at Mill Street, Perth, Society of Antiquaries of Scotland Monograph Series. Edinburgh.

Watson, E. V. (1981). British mosses and liverworts. (3rd edn) Cambridge.

Wilson, D. G. (1975). Plant foods and poisons from medieval Chester. Journal of the Chester Archaeological Society, 8, 55-67.

Winton, A. L. (1916). The microscopy of food plants (2nd edn). New York.