The environmental archaeology of garderobes, sewers, cesspits and latrines.

by James Greig

The residues from sewage disposal are commonly found in urban excavations. In the countryside the lower population density was insufficient to justify elaborate latrines except in large buildings like castles. A whole Roman sewer was recently found at York, and a Roman sewage filled ditch at Bearsden, but the medieval period is the one most associated with frequent finds of latrines and cesspits from towns, especially from the 15th and 16th centuries (see CA 68, page 284).

Ernest Sabine's classic compilation of documentary evidence of latrines and cesspools in London shows that garderobes and privies were often set over running water or even sometimes (illegally) over a street. Otherwise the filth might be piped into a cesspit, or in the case of poorer households, the privy might be built over such a pit. The cesspits were often substantially constructed of pebble, brick or tile, or lined with an old barrel. This lining allowed drainage of the liquids (sometimes to the detriment of neighbouring cellars and water supplies) and periodic cleaning out, which took place at night. The contents of cesspits have sometimes been the subject of a misnomer in archaeological literature and described as "cess" although this word has a totally different meaning according to the Oxford English Dictionary. Cesspit contents can more properly be described as sewage now, although a range of terms was current in the past, such as ordure, filth, dung, putredines . The sewage from cesspits was carried away

in pipes (barrels) by very well-paid workmen and disposed of in watercourses or on farmland and market gardens outside towns. It was probably also buried in pits within towns.

Once they fell into disuse cesspits were apparently not emptied, but covered over to save the cost. Likewise some drains appear to have kept some of their original filling. This fill may include organic matter of a borwn and peaty nature, with only a faint musty smell and little other resemblance to faeces until disaggregated in the laboratory. The best preservation is usually the result of waterlogging. However a large mass of organic matter such as a full cesspit can be preserved just by its very impermeability and mass even though smaller organic objects have not survived in the same layers. It appears that after initial decay of sugars starches and other easily decomposed substances, large masses of organic matter in the ground become inert and sterile. They are then preserved in a manner similar to the much more extensive organic medieval occupation layers which survive in places like York and Dublin. Even in fairly well-drained soils the remains of sewage may survive by mineralisation, whereby parts of the seeds are replaced by calcium phosphate formed from the residues of urine and lime. Mineralised seeds can be hard to identify and the evidence from such deposits is therefore less extensive that that from organically preserved ones.

Some Roman sewage has been studied (e.g. Bearsden, CA 82, pp. 345-6) but far more work has been done on the contents of medieval and post medieval cesspits from places like Chester Plymouth, Southampton, Tauntom, Winchester, Worcester and

York in England, as well as from various sites in Norway, Denmark, Germany and the Netherlands. Most of these studies have concentrated on the botanical or parasitological material, and some have been based on small samples of sewage. Such results show the potential interest of such deposits, but their full significance can only be realised when all the identifiable remains are studied and the results put together, usually by a group of specialists working in collaboration. The botanical work on sewage includes the study of pollen, seeds, mosses and any other diagnostic plant remains which survive. The zoological work covers bones (and sometimes hairs) of mammals, bones (and sometimes feathers and eggshells) of birds, bones and some other parts of fish, insect remains which are mainly from beetles and flies, worms in the form of parasite ova, creatures such as and other the odd spider or two. There is usually archaeological evidence to be taken into consideration, such as the architecture of the cesspit and its associations, and from finds like cloth. All this information, when integrated, can provide information about the most obscure aspects of past life, even to the extent of providing evidence of the possible sex of the users of a latrine in Bergen! This environmental evidence can then very usefully be compared with evidence from historical sources.

As might be expected, food remains are usually present in sewage. A surprising amount of these remains can be identified, such as the microscopic residues of bran from wholemeal cereal food like bread and porridge which can show the types of grain that were being consumed. Pollen can also show this, although cereal pollen in such deposits could all too easily

have come from chaff or straw as well. Other bulk foods like peas and broad beans, which are supposed to have been staples in the past, leave few obvious traces. The exceptions are a few pollen grains and fragments of seed coats. Likewise, meat appears to leave little direct trace, but remains like animal hairs and biochemical residues can provide clues to that part of the diet. There is an encouraging prospe that further fragmentary food remains may yet prove to be identifiable, perhaps using techniques derived from food analysts or forensic scientists. Another potentially useful technique is scanning electron microscopy, for work on modern sewage by P.H. Beckett and Barrie Juniper has revealed well preserved food remains like tiny pieces of egg shell, probably unknowingly eaten, and tomato skin along with the clearly identifiable fibres of lavatory paper.

Perhaps the most numerous remains in ancient sewage, in both numbers of individuals and also numbers of taxa are seeds, many of which have hard testas and survive well. Not surprisingly, seeds of edible plants are very abundant, particularly fruit. This type of seed assemblage has been named a "medieval fruit salad", or a "medieval Christmas pudding" because the large range of fruit seeds and stones present. It is not known in what form this fruit was eaten, although contemporary recipes provide some ideas. Remains of grapes, raspberries, blackberries, strawberries, pears, apples, figs, mulberries, bilberries, and gooseberries occur in Britain (see photos) and more exotic fruit from post-medieval cesspits such as in Amsterdam where trade was evidently active. The sheer quantity of fruit

represented by the vast numbers of seeds is shown by testing the seed content of some modern fruit. On this basis, for example, sewage from Taunton contained the remains of about 3 figs per pound weight of deposit which proved to contain a range of other rubbish, so the sewage was by no means pure. At least part of the fruit was imported, for "Mayster Ion Gardener" writing in the fifteenth century does not mention fig cultivation, although he devotes part of his poem to "setting of vynys". Documentary evidence shows that much of the home grown grape crop was used for making wine as well as verjuice (a vinegary substance) rather than for fruit. The evidence is mainly early 12th and 13th century. There is substantial documentary evidence for the import of a vast range of exotic produce (including figs and raisins) through ports like Southampton in the Middle Ages. These imports were in general expensive; the cheapest of them, figs, cost 1½d. per lb. in the later Middle Ages, equivalent in c. 1300 to the daily wage of a labourer. Perhaps as a reflection of their relative cheapness, the remains of figs are easily the most widespread in sewage residues, so maybe they were regarded more as a necessity than as a luxury.

Herbs and spices are also usually well represented by their remains in sewage, such as poppy, mustard, mallow, linseed, coriander, caraway, dill and fennel. Somewhat surprisingly some herbs, grown for their leaves like savory and parsley, are represented by their seeds, perhaps from herbs gathered in autumn and dried. Exotic imports from the tropics have taken place at least since Classical times, according to documentary sources, but the biological evidence of this, in the form of peppercorns found in pits at Taunton and by Mark Robinson from the privy of the Provost of Oriel College Oxford are post-medieval in date, perhaps a sign of a high c

diet. Some of the most interesting plant remains are only present in sewage in very small numbers, so large samples need to be examined before they have much chance of being of being found.

Drink also seems likely to leave identifiable traces, such as remains of plants used in brewing like hops and bog myrtle. Pollen analysis can serve to suggest the remains of honey or mead and perhaps also the residues of wine and ale. Some plants whose flowers were consumed, like borage and mallow, are also detectable by pollen analysis.

The use of medicinal plants, such as purgatives and against worms, is very difficult to prove because the sewage has often been mixed with other plant rubbish so that it cannot always be shown clearly whether some plants were eaten, or were merely present as weeds. Also, a great many plants have been credited with some sort of healing power, so it is all too tempting to suggest that their presence is the result of use. Being more cautious and perhaps a little more realistic, it may be difficult to separate casual occurrence from possible use in the case of some plants like henbane and deadly nightshade. Chaucer certainly gives us a good list of possible purgatives in the story about Chanticleer, and although the abundant evidence of fruit eating suggests that these ought not to have been necessary, there is even evidence that purgatives were imported.

Further evidence of a medical nature comes from the microscopic remains of the eggs of parasitic worms, which are often extremely abundant. These eggs provide good evidence of the presence

of faeces, as opposed to discarded food remains. The two commonest types, the roundworm and the whipworm, do not always cause severe symptoms to their hosts in cases of light infection. This may be just as well since they would appear to have been almost endemic in the populations whose cesspit contents have been studied. Remains of tapeworms and flukes do not appear to survive so well, but are also of great interest.

Apart from human ordure, cesspits and sewers often seem to have been used for the disposal of other waste, such as that from kitchens. This is very well illustrated by the drains of Barnard Castle from which Andrew Jones got remains of twenty types of fish and three of molluscs. James Rackham identified fourteen bird and nine edible mammal taxa in the same material, which was poor in plant remains. The botanically-rich cesspits commonly have evidence of other rubbish such as food waste and herbs used for floor covering. This adds to the bonanza for the environmental archaeologist, but the mixing of different kinds of waste material makes interpretation more difficult. Evidence of remains of hay and straw is common, along with the inedible parts of food like nutshells of hazel and walnut, fruit stones of sloes, plums and cherries (see photos), bones of mammals, birds and fish, mollusc and egg shells, and animal hairs, which add still further to the dietary information available. The hay and straw may have got into the cesspits as part of general rubbish disposal, or possibly to make the "ordure and other horrible liquids" there less offensive. Moss remains are sometimes found in

cesspits, having presumably been used for wiping.

These cesspits would have hummed with flies, especially in the summer. The precise habitat preferences of some flies give clear indications of conditions. The most abundant puparia from one sample from Taunton belong to a species (Teichomyza fusca) according to Kenneth Smith of the British Museum (Natural History), that is usually associated with liquid excrement and which has recently been recorded in such large numbers on the continent as to block sewage pipes. The thirteen other fly taxa (such as the Scathophagidae) also indicated the presence faeces and rotting plant matter.

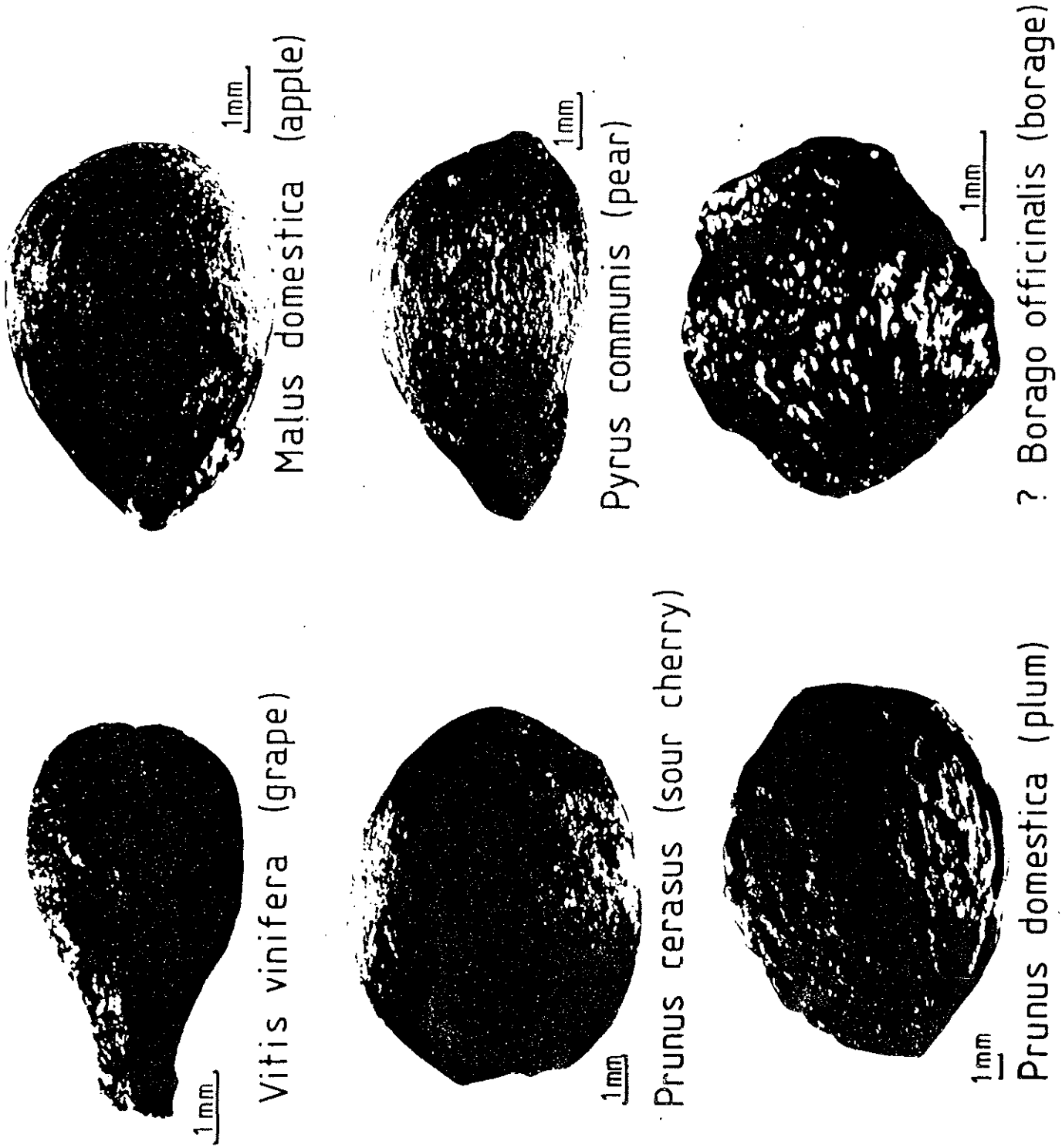
The cesspits would also have contained many kinds of beetles whose identifiable fragments can indicate further aspects of the deposits. Some of the grain weevils, for example, could easily have come from bulk foodstuffs. Peter Osborne has made a practical demonstration to show that grain weevils can pass through the human gut undamaged. It is therefore probable that some of the remains of stored products pests found in ancient sewage represent the eating of infested grain, peas, beans etc. Some other beetles would appear to have lived in the decaying filth in the cesspits as suggested by a second practical demonstration by Peter Osborne. He examined the residues from a chemical toilet and found that it had a distinctive beetle fauna which included some of the species which are abundant in ancient sewage as well, although they are not common today. Evidently the disinfectant chemicals quickly lose their effect when the sewage has been buried in the ground, permitting the development of a natural beetle fauna. Fleas and lice, which have been

found by Maureen Girling in London cesspits, would appear to have fallen to their fate from their human hosts. Other insects found in sewage, such as those which live in structural timbers, basketwork and decaying vegetation appear to have found their way into the deposit either by accident or with the disposal of general rubbish.

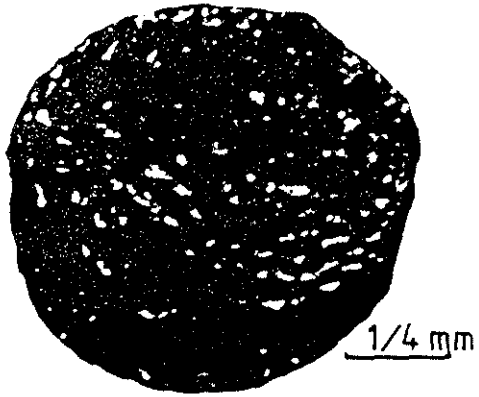
These first results show the potential for studying this kind of deposit, which can only fully be realised when sufficiently large samples are studied by groups of environmental archaeologists in collaboration. Further work is needed on sewage from different places and of different ages to try to answer a number of questions. Is it possible to tell whether a cesspit was used by rich or by poor people, or did the servants of the rich perhaps use their masters' privies and so confuse the issue? Can one tell any difference in diet between summer and winter, between Lent and harvest? Did the diet in Britain change over the ages, and were plants gradually introduced? Norbert Paap's work on sewage from Amsterdam shows a distinct pattern of plant introductions through the Middle Ages and later, culminating in the arrival of peanuts in the 19th Century, so it would be very interesting to see what pattern emerges for Britain. Another useful comparison is between these environmental results and those from historians working on evidence for trade, diet, gardening and cooking etc. There is, for example, a forthcoming article by Christopher Dyer on English diet in the Later Middle Ages in which the detailed historical evidence might well be compared with the proportions of food represented in ancient sewage by bran, seeds and pollen.

It is hoped that this article will draw attention to these "archaeo-scatological" studies because this is an area where environmental archaeology can find out more of direct human relevance than perhaps any other. It is to be hoped that more deposits of the contents of garderobes, sewers, cesspits and latrines can be thoroughly and scientifically examined in the future.

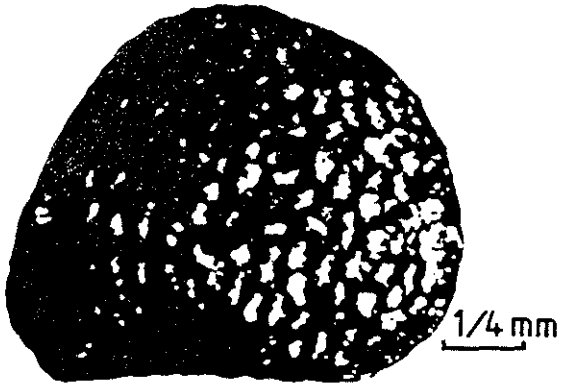
Plate 1. Plates 1 & 2: A selection of seeds representing the remains of fruit and spices which had been eaten. Henbane and deadly nightshade seeds may represent weeds, or could have been eaten as medicine, and borage is a garden herb. From the 15th C. barrel latrine at Worcester. (Photo: J. Greig).



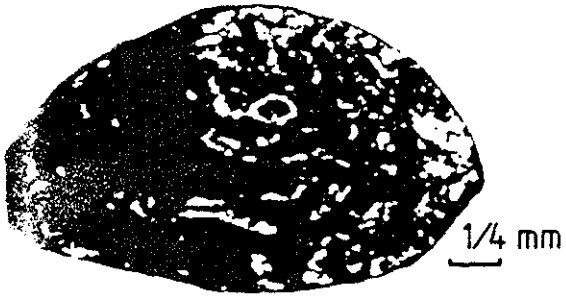
Rubus fruticosus (bramble)



Brassica sp. (e.g. mustard)



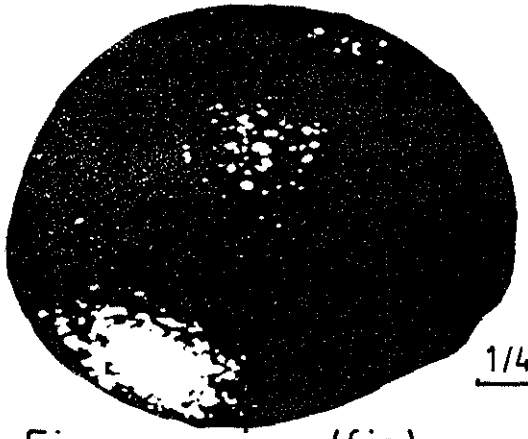
Atropa bella-donna
(deadly nightshade)



bes uva-crispa (gooseberry)

Foeniculum vulgare (fennel)

agaria vesca (strawberry)



Ficus carica (fig)

Hyoscyamus niger (henbane)

Plate 3. A selection of pollen grains which are probably the residues of food and drink, and the ova of intestinal parasites. From the privy of the Provost of Oriel College, Oxford, 16th C. (Photo: J. Greig