Goldsmith House site, Goss Street, Chester, 1972

I Excavations

By Thomas Ward

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Demolition, prior to the proposed construction of an office block facing onto Goss Street, made available for examination a large area close to the Roman *principia*, and west of one of the medieval streets of Chester.[1] Part of the site had been examined by Mr. G. M. R. Davies in 1970 and 1971, and I have passed on to him details of Roman levels discovered during building operations, to add to his report.[2] The purpose of the present report is to publish a number of medieval pit groups found during the bulk excavation of a basement area (see fig. 2), although from the present state of knowledge of medieval pottery found in Chester it is only possible to date the pits from this site from the late thirteenth to the early fourteenth centuries.

During the mechanical excavation of a basement for the new building a number of rubbish pits were revealed cut into the bedrock.[3] The machine had disturbed the contents of these pits, but it was possible to discern *in situ* fills which were duly excavated. The presence of a white fabric of a type not previously noted in the city indicates that there was at least one more kiln supplying Chester apart from those at Ashton and Audlem.[4]

THE POTTERY:

In pit 2 were found fourteen fragments of pottery representing at least four vessels made of a distinctive creamy white fabric. This has considerable quantities of minute grit in the fabric, and is extremely well fired. All the vessels are of a large size, and with a single exception are green glazed. The quality of this glaze varies considerably (fig. 2 nos. 1, 2, 5 and 7).

Pit 2

1. Rim section: thumbed rim with three strap handles and indications of applied vertical decoration on body, hard creamy white gritted fabric with

[1] I wish to express thanks to the contractors, William Eaves of Blackpool, and in particular the site agents, Messrs. K. Royle and F. Parkinson, and also to Mr. R. Stevenson, who were all most helpful at all stages of the operation. I am indebted to Peter Alebon for drawing the pottery and plans, now in the Grosvenor Museum, Chester, to Dan Robinson for his help in writing this report, and to Mr. D. F. Petch, Curator of the Grosvenor Museum, for many helpful comments. Mrs. D. G. Wilson of the Department of Botany, University of Cambridge, has written a report on plant remains printed on pp. 55-67.

[2] To be published.

[3] The pits had only survived because they were cut at least 2m. into the sandstone. The Assay Office which once stood on this part of the site had removed any structures of medieval date which might have faced onto Goss Street.

[4] *Annals of Archaeology and Anthropology*, Vol.XX1. pl. ff. *Medieval Archaeology*, 1960, Vol. IV.109 p. ff.

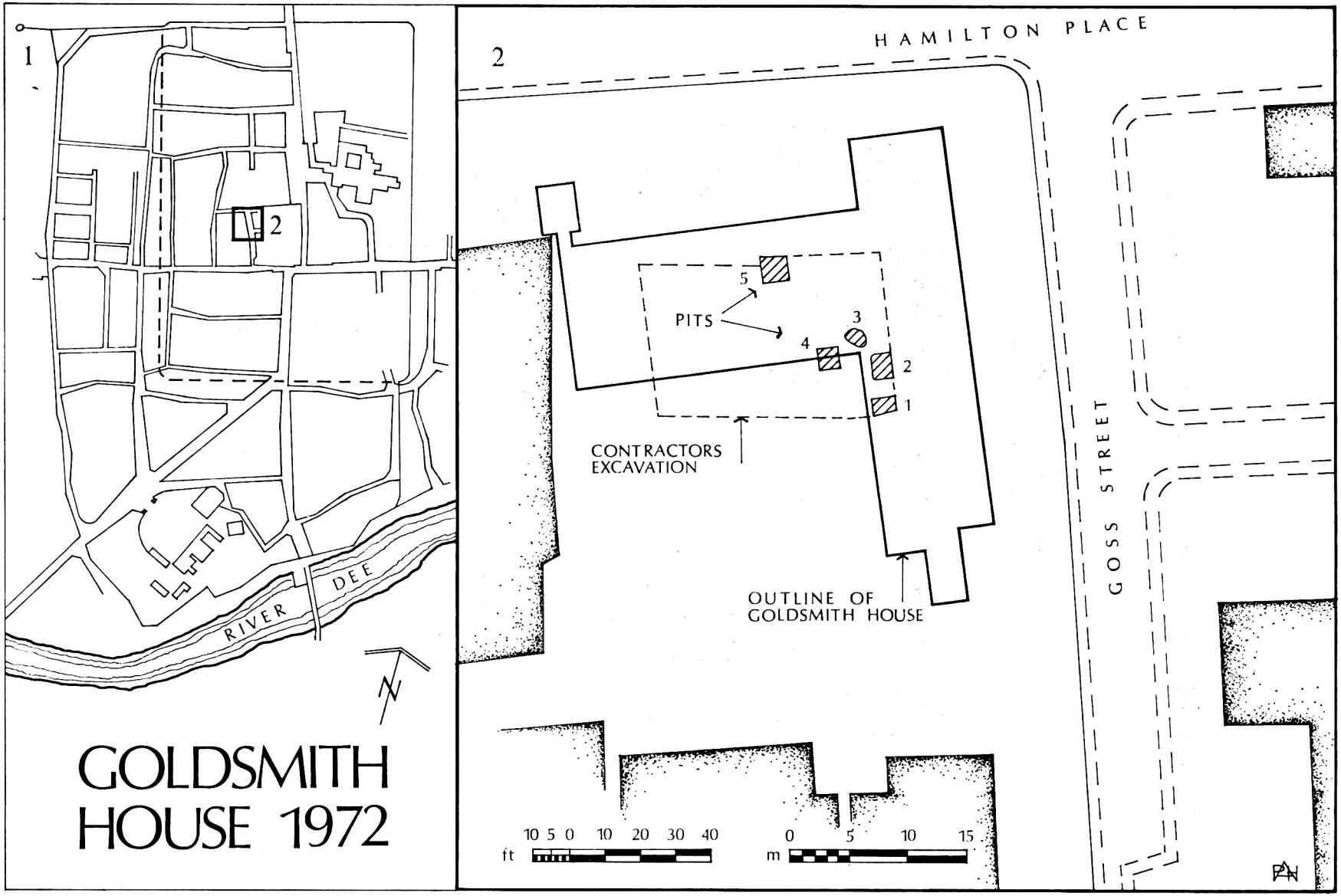

Fig. 1. Location and site plan

exterior green glaze thickening towards top. Unfortunately there was no spout.

2. Strap handle: hard creamy white gritted fabric with incised lines and holes; patchy light green glaze on the outside.

3. Base: buff/grey fabric, patchy green glaze on exterior.

4. Rim sherd: grey/brown fabric, patchy green glaze on exterior of body.

5. Body sherd: hard creamy grey fabric, olive/brown glaze with incised wavy lines.

6. Strap handle fragment: central spine pierced, olive/brown glaze.

7. Body fragments: hard creamy white gritted fabric with applied decoration. The strips of decoration have been stamped. Green glaze on exterior.

Pit 3

8. Base: pink/grey fabric, patchy dark green glaze on exterior; incised horizontal lines on body and 'pinched' base.

Pit 4

9. Body sherd: buff/orange fabric, incised horizontal lines, dark green glaze on exterior.

10. Pink buff fabric, applied decoration, olive green glaze on exterior.

Pit 5

11. Base: buff/pink fabric; incised horizontal lines, patchy green glaze on exterior.

12. Rim sherd: grey/brown fabric, unglazed.

13. Rim sherd: orange/buff fabric, patchy green glaze on exterior.

14. Handle fragment: buff/pink fabric, green glazed.

15. Body sherd: pink grey fabric, green glaze with incised horizontal lines.

16. Body sherds: orange fabric, orange glaze on exterior (not illustrated)

17. Body sherds: orange fabric, green glaze on exterior (not illustrated)

18. Two body sherds: pink/buff fabric, unglazed (not illustrated).

19. Small fragment of green glazed roofing tile (not illustrated).

20. Body sherd: pink/buff fabric, green glaze on exterior and interior (not illustrated).

This pit produced a quantity of twigs, two pieces of cut wood, a piece of leather and some plum stones. The report by Mrs. D. G. Wilson relates to this plum stone sample.

II Plant foods and poisons from mediaeval Chester

By D. Gay Wilson

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SUMMARY:

Some 40g of dried organic matter from a late thirteenth to early fourteenth century cesspit at Chester was sent to the author for botanical analysis. Special

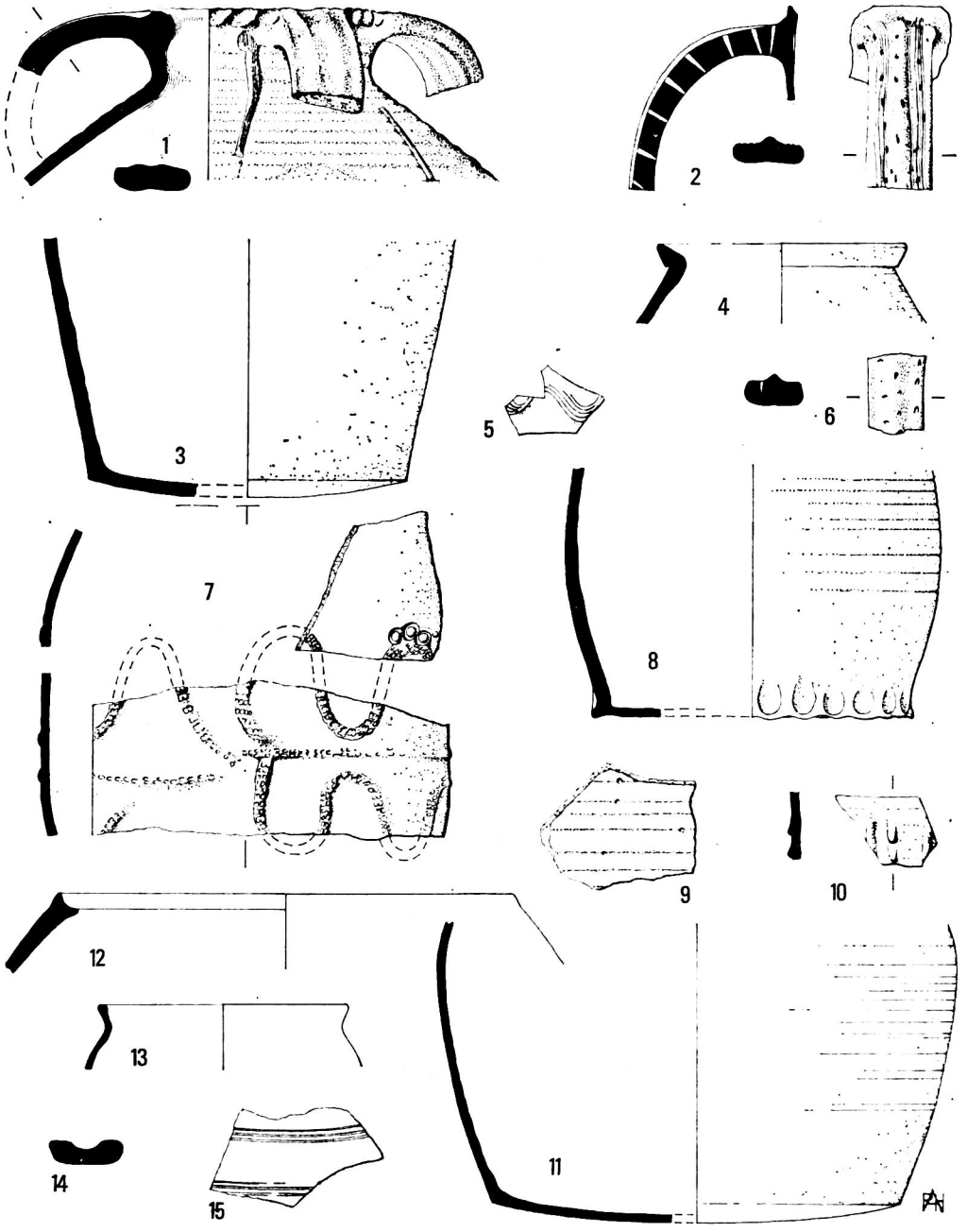

Fig. 2. Pottery, quarter size

treatment is described which enabled the plant remains to be extracted without damage. The bulk of the sample consisted of unbroken fruitstones of *Prunus domestica* ssp. *insititia* (L.) C. K. Schneid and *P.spinosa* L. (bullace and sloe) with intermediates. It is argued that the *Prunus* stones should be considered separately and that their matrix represents more accurately the contents of the pit in general. Fossils referred to 28 taxa were identified from the small amount of adherent matrix; and all were in fragmentary condition although otherwise well-preserved. It is suggested that they were deliberately ground up and were probably consumed. Seed fragments of *Agrostemma githago* L. were the most abundant. This species, like many others in the list, is poisonous and can be used medicinally. Many plants in the list may also have been used for food.

RESULTS AND DISCUSSION:

A mediaeval cesspit was excavated at the Goldsmith House site, Goss Street, Chester. The pit had been cut 2 m. into bedrock and was almost completely excavated by machine. Fruit-stones similar to small plumstones were observed in the filling, and a sample was sent to the author for examination.

The sample came from the bottom 0.5 m. of undisturbed filling, and is dated archaeologically to late thirteenth to early fourteenth century. It consisted mainly of the fruit-stones, with a small amount of adherent matrix, and totalled some 40 g. A sample of 1–2 kg. would have been preferable if circumstances of the excavation had permitted.

Special treatment was required because the sample had dried out before it reached the laboratory. The usual procedure with a wet sample is to soak it in water or, more usually, a suitable chemical solution. This separates the plant remains from each other, and from lumps of soil etc., without damage. Dried samples cannot be treated this way. When seeds and other plant remains have been preserved in a waterlogged environment, they shrink if they are allowed to dry out. On being made suddenly wet again, they crack and split. The Goldsmith House sample therefore needed pre-treatment to moisten it gradually before the particles could be dispersed in liquid. Laboratory tests carried out by the author have shown that gradual and careful impregnation of a dry sample with glycerine/alcohol mixture permits subsequent immersion in liquid without damage to the plant remains. This technique was used on the Goldsmith House sample. In this instance the particles then dispersed readily in water, so no further chemicals were required. Silt and clay particles were removed by careful sieving in water. The sieve had to be fine enough to retain all identifiable plant fragments and even the smallest of seeds, i.e. aperture no greater than 0.3 mm. The residue in the sieve was wet-sorted using a binocular microscope at $\times 25$ magnification, and identifiable plant remains were extracted with fine forceps or a size 00 paint brush for further study at higher magnifications. Nearly thirty taxa were identified, and they are listed in Table 1.

All identifications are based on detailed comparison with modern specimens.

TABLE 1. Plant remains identified from Goldsmith House

Botanical name (after Dandy, 1958)	Modern English name(s)	Number and type of remains found
†*Agrostemma githago* L.	corncockle	320 large +many small seed fragments
†*Anthemis cotula* L.	stinking mayweed	5 broken cypselas ("seeds")
*†*Atriplex* sp.	orache	1 broken seed
*†*Brassica* cf. *nigra* (L.)Koch	black mustard	2 seed fragments
* *Brassica* sp.		4 seed fragments
Bryophyta	mosses	leaves of several spp.
†*Centaurea* cf. *cyanus* L.	cornflower	9 cypsela fragments
* Chenopodiaceae, cf.*Chenopodium* sp.	goosefoot family	9 seed fragments
*†*Chenopodium album* L.	goosefoot, fat hen	1 seed, slightly broken
*†cf. *C.album* L.	" " "	1 seed, immature
Chrysanthemum segetum L.	corn marigold	6 cypsela fragments (all from disc florets)
*†*Corylus avellana* L.	hazel	3 pieces of nut shell
*†*Crataegus monogyna* Jacq.	hawthorn, May flower	3 pyrenes with mesocarp ("haws")
Galeopsis sp.	hemp-nettle	1 nutlet fragment
* Gramineae	grasses	2 carbonised caryopses ("grains")
* Gramineae	grasses	47 caryopses, mostly broken; uncarbonised
Juncus spp.	rushes	6 seeds
* *Lapsana communis* L.	nipplewort	2 whole cypselas + 2 broken cypselas
Leguminosae	vetch and pea family	12 pod fragments
* *Polygonum convolvulus* L.	black bindweed	4 nutlet fragments
* *P.*cf.*lapathifolium* L.	pale persicaria	6 nutlet fragments
†*Polytrichum* sp.	hair-moss	1 leaf
*†*Prunus* spp. (see text)	sloe and bullace	46 whole fruit-stones
†*Pteridium aquilinum*(L.)Kuhn	bracken	29 leaf fragments
* *Rumex* subgenus *Rumex*	dock, sorrel	3 nut fragments
*†*Rumex* cf. *acetosa* L.	sorrel	2 perianth segments, one broken
*† *Thlaspi arvense* L.	field penny-cress	1 immature seed
Umbelliferae	umbellifer family (parsley, Queen Anne's lace etc.)	1 vitta (resin canal from fruit)
*†*Vaccinium* cf. *myrtillus* L.	bilberry, whortleberry	4 seeds

*edible plants †medicinal and poisonous plants
(after Forsyth, 1968; Imbesi, 1964; Kingsbury, 1964).

Gross morphological differences and dimensions may be helpful for approximate determinations, but they are inadequate for diagnosis at species level, and may not be usable at all in broken seeds or fruits. Detailed microscopical examination of the surface cell pattern is essential to accuracy, especially in fragmentary material. Of the grass caryopses only two were carbonized; the remainder, which consisted only of the outermost layers, had lost all starch and inner tissues, thereby clearly revealing the surface cell pattern. In fresh caryopses of the Gramineae, however, these cell patterns are easily visible only after special chemical treatment to remove the inner tissues and to permit the translucent outer layers to be studied at suitably high magnifications (Körber-Grohne, 1964). In the absence of a complete set of suitably prepared reference material, no attempt could be made to identify the species of grasses present in the Goldsmith House sample.

The larger part of the sample, by volume, was of intact *Prunus* stones. They are identified as sloe (*Prunus spinosa* L.) and bullace (*P.domestica* ssp. *insititia* (L.) C. K. Schneid.). Intermediates are also present. Bullace is thought to have originated from a hybrid between sloe and the W. Asian cherry plum, *P. cerasifera* Ehrh. (Tutin et al., 1968). Like other subspecies of *P.domestica*, bullace is extremely variable, some plants being close in form to *P.spinosa*. The presence of intermediates in this sample might be taken to indicate hybridization between such a plant and one of *P.spinosa* (which is also variable); it is not especially remarkable.

There is reason to suppose that the sample examined is not representative of the pit-filling as a whole. Twigs and a piece of leather were retrieved from the pit, which have not been seen by the author. Only the largest fruits and seeds are likely to catch the eye during excavation, even when trowelling is possible, and the presence of small plant remains is likely to be overlooked. The Goldsmith House pit-filling was dug in circumstances requiring a mechanical excavator, and probably it was only the local concentration of fruit-stones which drew attention to the possibility of botanical analysis. *Prunus* stones will therefore be over-represented compared with other, smaller, plant remains, and the matrix in which they were found is likely to provide a less biassed picture of the contents of the pit in general. Even so, the stones are only third in numerical importance in the species list.

The most striking feature of the sample was the fragmentary nature of nearly all the plant remains. As explained above, this is unlikely to be the result of damage during the treatment of the sample in the laboratory. The plant debris was mostly compacted around the *Prunus* stones, and only a very small proportion of the plant remains can have been damaged when the sample was taken from its matrix on site. There are also further indications that the breakage occurred before the sample was taken from the pit. With the preparation and extraction methods described above, there is no significant loss of plant remains. Minute fragments may escape sorting or fail to be identified, and larger fragments lacking diagnostic features may not be identifiable. Nevertheless, if distinctive

seeds are broken during preparation of a sample, an approximately equal number of base and apex fragments will be found.

Yet in this sample, there were six basal fragments of *Centaurea*, but only two apical fragments; *Polygonum lapathifolium* was represented by four apices but only two small body fragments; the three fragments of *Corylus* were all from different nuts; only body fragments of Leguminosae pods were found. Fruits of Umbelliferae are recognisable even in fragmentary condition. They usually have five or more vittae (resin canals) per fruit, but only one solitary vitta and no body fragments at all were found in this sample. There were no whole seeds of *Agrostemma*, although 320 large pieces and innumerable smaller ones were found (the equivalent of more than 160 seeds). Whole seeds or fruits were only found of species with extremely small seeds (e.g. *Juncus*, *Vaccinium*), large, tough ones (e.g. *Prunus*, *Crataegus*), or where the seeds were immature and therefore resilient (e.g. *Thlaspi arvense*, cf. *Chenopodium album*). Among the Gramineae only a few of the smallest caryopses were intact.

The fragmentary state of the plant remains accords well with the excavator's interpretation of the pit as a cesspit. Grinding in a mortar during preparation for cooking would account for the comminuted state of the fruits and seeds; alternatively they might actually have been chewed. In either case the smaller seeds might be expected to have remained intact. Passage through the digestive tract would also account for the condition of the grass caryopses, although it must be noted that grass seeds preserved in waterlogged conditions are reduced to this state even when circumstances exclude the possibility of their having been eaten.

Debris other than sewage would also have found its way into the pit, for instance the twigs; and the forty-six *Prunus* stones are unlikely to have been swallowed. Even though commonly recognised food plants account for relatively few of the fossils identified, the remainder are too fragmentary to be thought of as mere garbage: one simply does not chew or pound rubbish before disposing of it.

Edible plants are marked with an asterisk in the list, and we shall consider them first.[1]

[1] At this period the edible plants may have been grown in a garden or orchard near the house. Mrs. E. K. Berry, Chester City Archivist, kindly provided the following information from the Chester City Quarter Sessions files for 1601–2: Presentment by the jury that Thomas Revington of Chester, beer-brewer, had lately built an outhouse adjoining his brewhouse in Watergate Street and in the same outhouse had built a chimney no higher than the slates of the same, with the result that since 1 Aug. 1602 the smoke from this chimney went into the orchard and garden of John Alderney, alderman, and into the orchards and gardens of his neighbours, so that the apple, pear and plum trees in these orchards were smoked and withered as were also the herbs and grasses in their gardens with the result that they were neither able to enjoy the scent and smell of the herbs and flowers nor eat the fruit from the said trees for fear of infection. Ref. QS.F/50/56. John Alderney, alderman, was a leading merchant in the city at this time and was mayor in the year 1603–4. It has not been possible to identify his house in Watergate Street, but this presentment gives a good description of the character of the street at the time which corresponds with G. Braun's map of c. 1580 and no doubt as far as the gardens were concerned, these had not changed very much from late medieval times.

Sloe and bullace are scarcely palatable before being cooked, unless they have been subjected to frost. They are mainly used for winemaking and for flavouring spirits. Bullace used to be cultivated, and wild sloes could be collected from hedgerows and scrub. *Vaccinium myrtillus* (bilberry) can also be used for wine-making. Sloe, bullace, bilberry and *Crataegus* (hawthorn) are all made into conserves, as jams or jellies. Hazel-nuts are now used mainly in confectionery or for dessert, but they can also be ground into a flour for baking, or pounded into a paste known as hazelnut butter. Seeds of Leguminosae were not found in the sample, but the presence of pod fragments may indicate the consumption of young pods before the seeds matured and this practice is continued today with certain kinds of peas and beans. *Chenopodium* and *Atriplex* species yield seeds which may be made into flour for baking or into meal for porridge (Hedrick, 1972). The green plants were regularly eaten in Ireland and the Western Highlands of Scotland until very recently (Lightfoot, 1777 I, 147; II, 638); and were popularly called *praiseach fiadhain* or wild pottage (Grigson, 1958). Wild plants of these two genera are still occasionally collected for use as a vegetable, and some varieties are even cultivated. They are used like spinach.

Several other plants marked as edible in Table 1 are rarely or never utilized at the present day, and they are now generally thought of as weeds. Many of them could have grown in arable fields or on disturbed ground. The seeds of these plants have, however, been found in archaeological excavations, either specifically as food, or else in bulk as hoards in domestic contexts. There is unequivocal evidence for the consumption of a wide range of 'weeds' and wild grasses (or their seeds) in former times, notably those found in the stomach contents of Iron Age corpses in Denmark (Helbaek, 1958), and in faecal remains from medieval Dublin (Mitchell, pers. comm.). Breakfasts of thick soups or gruels, made from a wide variety of 'weeds' and vegetables, were traditional in the Valais, W. Switzerland and neighbouring regions of France until the nineteenth century A.D., and they have been shown to be a survival at least from medieval times (Hauser, 1971). Weeds whose seeds have occurred as archaeological hoards include *Polygonum lapathifolium* (Helbaek, 1951; van Zeist, 1970) and *Chenopodium album* (Helbaek, 1960), and *Atriplex* seeds have been obtained in very large quantities in British excavations of Iron Age and Roman date (author, unpub.). From this we may infer that at least some 'weed' seeds were deliberately used for food. Others may have been eaten unintentionally when mixed with poorly cleaned grain. Weed seeds removed from seed-corn, or from grain destined for market, are in some places still used to feed the farmer's family (Steyn, 1933), a thrifty practice doubtless of ancient origin. Low-growing weeds, on the other hand, are unlikely to be reaped with a cereal harvest; they may have been collected as a catch crop of stubble fields or fallow land.

If the other plant remains in the Goldsmith House sample (i.e. those *not* marked with an asterisk) had indeed passed through the digestive system, the meal must have had serious after-effects. In particular, the seeds of *Agrostemma*

githago (corncockle) are poisonous to man and beast, yet they outnumber by far all the other species in the list, and represent the bulk of the sample excluding the *Prunus* stones.

Agrostemma seed capsules contain from twenty to forty seeds (Cornevin, 1893; Salisbury, 1961). The sample contained the crushed remains of well over 160 seeds, representing the contents of a minimum of four to seven capsules. *Agrostemma* is now rare in Britain, but it used to be an abundant cornfield weed, most usually associated with rye (Godwin, 1956) or with winter wheat (Muencher, 1962), and growing to three or four feet high. It is inevitably reaped with the corn, and most archaeological finds have been in grain samples (Szydlowski and Wasylikowa, 1973). Its seeds are bigger and heavier than most weed seeds, and may contaminate inadequately winnowed grain, but in a mixed seed assemblage such as this sample, they could easily have been separated by sieving. The poisonous properties of *Agrostemma* seeds when eaten in quantity have long been known. Whether or not they were ground up at the same time as the other seeds in the sample, they have clearly been deliberately reduced to fragments, and we must assume that they were in fact used.

The ripe seed would have been gathered after the showy red-purple flowers had withered, and whoever collected them may have done so in sheer ignorance of the plant's identity, or of its properties. Farmers and countryfolk would have recognized the plant, and probably its seed too; but a towndweller might easily have made a mistake.

Confusion could also arise from the variety of plant names in popular use before recent attempts at standardization. Many plants have different popular names in different regions, and mistakes could easily be made if a person from one region used or gathered plants on the instructions (or written recipes) of one from a different region. *Agrostemma githago*, for instance, has been called Poppy (in west Cheshire), Cockle, Hardheads, Bachelor's Buttons, and Darnel. Each of these names for *Agrostemma* can also refer to totally different species: Poppy is usually *Papaver* spp. or *Digitalis purpurea*; Cockle can be *Arctium lappa*; Hardheads also means *Centaurea nigra* (west Cheshire) or even *Plantago lanceolata*; Bachelor's Buttons may be *Centaurea nigra*; Darnel is *Lolium temulentum* in Cheshire and elsewhere, or the name may also refer to *L.perenne*, *Bromus secalinus*, or *B.mollis* (see Grigson, 1958; Britten and Holland, 1886).

We know that mistakes were indeed made. A seventeenth-century herbalist complained that physicians left the gathering of herbs to the apothecaries, who in their turn 'rely commonly upon the words of the silly Hearb-women, who many times bring them *Quid* for *Quo*, then which nothing can be more sad' (Cole, 1656). We even know specifically of a common mistake made about *Agrostemma*. Besides the names mentioned above, the plant could also be called Field Nigella, and we learn of 'Certayne fonde people which do use it in the stead of Iuray or Darnell, or for the right Nigella, to the great daunger and perill of the sicke people' (Lyte, 1578, xi, 160).

If we discount careless seed-cleaning, ignorance of field-botany, and nomen-

clatural confusion as explanations for the presence of ground *Agrostemma* seeds in the Goldsmith House sample, we are left with the possibility that they were intentionally collected and exploited for their drug or poison content. Like many poisonous plants, *Agrostemma* was, and is, used for medical purposes, and there is ample evidence for the effects the seeds could have had on the patient (or victim).

Agrostemma seeds contain a saponin called githagenin, which accounts for 5–7% of their weight. Presence of the seed coat reduces the availability of the poisonous principle, and the seeds are twice as poisonous when they have been ground up. Saponins occur in plants as amorphous glycosides, in which a 'sapogenin' is associated with one of several kinds of plant sugar. Some saponins irritate and injure the gastro-intestinal tract; they are then absorbed through the gut wall into the bloodstream, where they act by destroying the red blood corpuscles. Other saponins are not irritant; they are not readily absorbed (and are not toxic) unless they are accompanied by a separate substance that will damage the wall of the gut (Kingsbury, 1964; but see also Muencher, 1962). *Agrostemma* poisoning in man is usually caused by the consumption of contaminated bread, which smells unpleasant, tastes bitter, and has a grey or bluish tint. The toxic principle is not destroyed during baking (Cornevin, 1893). Flour containing more than 0.5% of cockle seed may be harmful (Szydlowski and Wasylikowa, 1973); it has been observed that a person eating 1,200 grains of bread containing 0.5% of *Agrostemma* seed 'would consume six grains of cockle seed, an amount which the author believes beyond a doubt to be poisonous' (Chestnut, quoted by Steyn, 1933). Since *Agrostemma* seeds weight on average 0.008 grammes (Cornevin, 1893) or 0.012 grammes (author's experiments), Chestnut's estimate is the equivalent of 32–49 seeds; it is, however, not clear whether this amount would cause chronic or acute poisoning. Chronic poisoning is called githagism, and results from small regular dosages of cockle seed; the symptoms are intestinal pains, chronic diarrhoea, vomiting, disorders of the nervous system, difficult breathing, weight loss, and weakness; the disease may escape correct diagnosis (Steyn, 1933). It is thought that githagism increases one's susceptibility to leprosy, a disease endemic in Britain in the Middle Ages (Godwin, 1956). Acute *Agrostemma* poisoning can be fatal. Lethal doses in animals vary according to species; from 0.9 g. per kg. live weight in dogs, upwards of 1 g. per kg. live weight in pigs and 2.5 g. per kg. live weight in calves (Cornevin, 1893), i.e. from c. 0.1% of the animal's weight in ground seeds. The principal symptoms are those of acute gastro-enteritis, and in pregnant animals abortion may occur (Kingsbury, 1964). The symptoms in man are similar to those of githagism, but more violent; in addition there may be headaches, fever, vertigo, pains in the spine, and impaired locomotion; the poisoning may end in delirium, coma and death (Steyn, 1933).

Agrostemma can, however, be used for medicinal purposes. The root may be used as an antihaemorrhoid and for eczemata; the seed is diuretic, expectorant and anti-helmintic (Steyn, 1933, quoting Rosenthal, 1862). It is administered

as a coarse powder in alcohol solution (U.S. Homoeopathic Pharmacopoeia, 1964). Modern usage of drug plants, however, is not necessarily the same as former usage. Some species which were once used as herbs and simples are no longer believed to have medicinal properties, and others which do contain drugs may have been used inappropriately. We can deduce what plant remedies would have been in use in thirteenth and fourteenth century Chester, and the possible uses of the species found in the Goldsmith House sample. The plant lore of the Middle Ages was largely based on knowledge handed down from Classical times; and even Renaissance herbals, which appeared in Europe from the fifteenth century onwards, owed much to earlier sources (Arber, 1912). *Agrostemma githago* is thought to be the plant called Wild Lychnis or *Lychnis agria* in herbals of the first century A.D.; the seeds were recommended as an antidote for stings and scorpion bites, for loosening the bowels and to 'expell by ye belly colericke matter' (Pliny, XXI, 171; Dioscorides, III, 115). The plant was also known to Celsus and Scribonius Largus (Imbesi, 1964); and to others, as Gerard informs us. This seventeenth-century herbalist said of Cockle (*Agrostemma githago*): 'what hurt it doth among corne, the spoyle unto bread, as well in colour, taste, and unwholesomeness . . . is better knowne than desired . . . The seed made up into a pessarie or mother suppositorie, with honey put up, bringeth down the desired sicknesse, as *Hippocrates* in his booke of womens diseases doth witnesse. *Octavius Horatianus* giveth the seed parched and beaten to pouder to be drunke against the yellow jaundice' (Gerard, 1633, p.1083). Gerard then refers to the confusion of Cockle with Darnell, in almost the same words Lyte had used earlier (see above). Indeed, *Agrostemma* would supposedly have the opposite effect to that intended, if given to a female patient instead of 'Darnell grasse' or Red Darnell. As Gerard says, quoting Dioscorides, 'Darnell . . . stayeth the flux of the belly, and the overmuch flowing of womens termes . . . Red Darnell, being drunke in sowre or harsh red wine, stoppeth the laske (*diarrhoea*), and the overmuch flowing of the flowers or menses . . . ' (ibid, p.79). The poisonous principle in darnel seed is in fact diuretic and purgative (Forsyth, 1968). It is produced by a fungus (Calvert and Muskett, 1945), and has long been known to have an intoxicating effect and to alleviate 'gowte sciatique' (Lyte, 1578, p.469). It is still used in America to cure neuralgia and rheumatism (Uphof, 1968).

Sloes, which were present in the Goldsmith House sample, may also have been used medicinally; the fruits have long been thought to be useful as astringents and good for tonsils, teeth and gums. Like darnel, they were thought to be effective against flux and haemorrhage (Pliny, XXIII, p.132; Dioscorides, I, p.174; Miller, 1722, p.360); the fruits and flowers of sloe, as well as of *Prunus domestica*, are still listed as officinal plants in many countries of Europe (Imbesi, 1964) and of America (U.S. Homoeopathic Pharmacopoeia, 1964).

In fact, nearly all the species in the Chester list were formerly thought to have medicinal properties. Most of them are still listed in official pharmacopoeias or are recognized as being poisonous, and are marked † in Table 1. Only a few

fossils of each species were found, however, and they can hardly be supposed to be significant; certainly any detailed discussion would be out of place here. Further information can be found in the works cited in the bibliography; but it is worth noting that many poisonous plants are harmful only if eaten in large quantities, or if particular parts of the plant are consumed; and that in former times there was less distinction made between food plants and medicinal plants than there is today. There is not necessarily any inherent contradiction in describing a species as edible, medicinal and poisonous. *Pteridium aquilinum* (bracken), which was present in the Chester sample, is a good example. The young shoots may be eaten as a green vegetable and the rhizome can be made into flour for baking; the mature leaves have tonic properties and are purgative, and infusions of the rhizome cure tapeworm infection; overdoses may result in gastro-intestinal lesion, convulsions and blindness. Seeds of *Brassica nigra* (Cruciferae family) provide the condiment black mustard, and the young leaves are used like spinach or in salads; mustard was, and still is, used medicinally; and the seeds are potentially toxic because they contain an allyl isothiocyanate. Similarly, *Thlaspi arvense*, another of the Cruciferae, is cultivated as an edible cress; the seeds are used medicinally; and overdoses of the seed cause gastro-intestinal damage. Gerard notes these effects of various Cruciferae: 'The seed of these herbes be so extreme hot and vehement in working, that being taken in too great a quantitie, purgeth and scoureth even unto bloud, and is hurtfull to women with child, and therefore great care is to be had in giving them inwardly in any great quantities' (Gerard, 1633, p.264).

Violent purging, and the resultant possibility of miscarriage, could actually have resulted from the use of *Agrostemma*, *Brassica*, *Thlaspi* and *Pteridium*. By contrast, other species in the Chester list are binding and astringent, including *Prunus*, *Corylus* and *Vaccinium myrtillus*; but it is doubtful if these species could 'stop womens termes' as was popularly supposed.

We have suggested that the sample is probably biassed, that the *Prunus* stones should be considered separately, and that the sample is too small to allow confident interpretation of the cesspit contents as a whole. Several poisonous and officinal species marked in Table 1, and others formerly used medicinally, have therefore not been discussed, as the fossils are not quantitatively significant. They have been used in the treatment of some thirty ailments or symptoms, and overdoses are known to disrupt body functions ranging from blood and bone formation to digestion and brain processes. We cannot surmise whether their presence in the sample had to do with these properties or whether the plants were merely taken as food.

Apart from the *Prunus* stones, only *Agrostemma* seeds were present in significant quantity, and they were deliberately chewed or ground up. We have described the effect the seeds would have had, but we can only speculate on the motive of the person who used them.

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