7 PLANT REMAINS M FRASER AND J H DICKSON

An analysis of botanical samples from 42 St Paul Street and Queen Street Midden Area

INTRODUCTION

Plant remains from the excavations at 42 St Paul Street and Queen Street Midden Area were examined to provide information on the environment of medieval Aberdeen and on the importance of plants in the economy and diet of its inhabitants. Large scale investigations of the palaeobotany of medieval urban sites have been undertaken in a number of English cities but so far no comparable work has been published on medieval urban sites in Scotland. Thus the results of this study should provide a useful basis for comparison with future work on Scottish sites.

SAMPLING

The bulk of the Aberdeen material has been preserved under waterlogged conditions where the anaerobic environment reduces decomposition to a minimum. The majority of samples had a pH value in the range 4.0-5.0, the high acidity increasing the resistance of tanning complexes present in the plant material to decomposition. A few cereal grains, weed seeds and shoots and leaves of heather (*Calluna vulgaris*) and bog heather (*Erica tetralix*) were however carbonised.

The plant remains were recovered by wet sieving of soil samples. In total, thirty-two samples were examined. Samples taken from 42 St Paul Street cover a wide range of archaeological contexts and a timespan from early 13th century to late 14th century. Samples were examined in subsamples of 100 cm^3; three replicate 100 cm^3 subsamples were looked at from Area A and Area C samples and two from Area F samples. The material was washed through a sieve of mesh width 250 μm using a gentle stream of warm water. Samples were previously dispersed if necessary in a dilute solution of NaOH. The resulting plant remains were sorted and identified by comparison with modern reference material and subsequently preserved in a fluid consisting of equal volumes of methanol, glycerol and formaldehyde.

Nomenclature of plants follows Clapham et al (1962) and Smith (1978). Table 45mf is a species list of plants from 42 St Paul Street and Queen Street Midden Area. The plant species are divided into the following groupings: plants useful to man; trees; weeds of waste places and arable land; heathland plants; plants of wet habitats. The boundaries between these groupings are not rigid and some plants fit into more than one category while others do not fit well into any. Table 46mf is a species list for selected samples from 42 St Paul Street and Queen Street Midden area showing the numbers of plant parts recovered. The full sample analysis is in archive.

DISCUSSION

INTEGRATION OF RESULTS WITH ARCHAEOLOGICAL CONTEXT

42 St Paul Street

Most of these samples contained a range of seeds of weedy plants which either grew on the site or

were present in nearby arable fields and subsequently brought into the town with produce. The seeds of some of these plants may also have been gathered in times of scarcity.

Heathland plants including mosses were well represented although usually only by small fragments. Peat was probably brought in from nearby bogs for use as fuel. Heather, bracken and mosses may also have had other uses such as thatching, bedding or packing.

Rush seeds were present in almost all samples along with small numbers of other plants of wet habitats. Little can be deduced from the number of rush seeds in any sample since large quantities are produced by each flowerhead.

Scattered representatives of plants potentially useful to man were found. The bulk of the material from sample AS229 (Layer A228: Phase 5), which came from below and around the hearth of the post-and-wattle building SAN, consisted of carbonised florets and floret bases of oats (*Avena sativa*). This may be a result of accidental burning during parching of the oats to release the grain from the surrounding husks. Many small pieces of charcoal were also present; hazel and alder were identified. Sample AS239 (Layer A247: Phase 2) which came from the fill of pit TAH likewise contained a lot of burnt material.

Two samples (AS237, Layer A212: Phase 3 and AS245, Layer A233: Phase 3) consisted of subsoil directly over the natural. These samples contained primarily weed seeds, probably part of the natural seed bank of the soil, and small quantities of heathland plants which may have been blown in.

Sample CS48 (Layer C163: Phase 9), the fill of pit BE, was of interest being the only sample from 42 St Paul Street to contain fig seeds. Eighty-seven were recovered from the subsample, this number however is only a small proportion of the number of seeds contained in one fig. Other food plants were present: one carbonised grape pip, raspberry and blaeberry seeds, uncarbonised grain fragments of wheat and oats. There is therefore a distinct possibility that this pit was used as a cess pit. Sample CS66 (Layer C234: Phase 5), which filled a slot along the outside of a wattle wall in building CO, contained large quantities of short lengths of hair. These were matted together and may have been used to bind wall cladding.

The bulk of the organic material in CS68 (Layer C270: Phase 5), which came from a yard build-up layer, consisted of delicate transparent grains of oats

Three samples from pit UG in Area F were looked at. Sample FS715 (Layer F59: Phase 7) was a very thin layer in the base of the pit sealed by silting of natural sand and therefore might be expected to provide information about the original use of the pit. However, although a wide variety of plants including some food plants, were recovered no specific function for the pit was indicated, suggesting that either it was a general purpose cess/rubbish pit or that the sample consisted of secondary rubbish fill, the primary fill having been removed or destroyed. The legume seed coat fragments and the single opium poppy seed fragment from this sample are noteworthy. Other samples of fill from the same pit consisted of secondary rubbish fill above the silted sand. They contained a much smaller range of plants and very few useful ones.

The pit UUA (Phase 3), also in Area F, which contained extremely smelly cess-fill did not produce much in the way of food plants with the exception of occasional uncarbonised grain fragments of wheat.

Queen Street Midden Area

The richest botanical material produced from the Aberdeen excavations came from Queen Street Midden Area, FN 57/ 57A/57B. The samples were from two medieval pits cut into subsoil and filled with organic material.

Six 100 cm^3 subsamples were looked at, these contained a variety of plants of economic use as well as many weeds. Mosses were present in large quantities in three of the subsamples. From the combination of possible food plants present (figs, raspberries, brambles, blaeberries, uncarbonised grain fragments of cereals) there is a strong possibility that the pit was used as a cess pit. A large proportion of the organic material in the subsamples was cereal debris which was similar in appearance to material from a ditch at Bearsden Roman fort which has been shown by biochemical means to be sewage (Knights et al 1983). Further evidence supporting this hypothesis comes from the presence of numerous eggs of the roundworm parasite *Trichuris* which were seen on slide preparations of cereal grain-fragments and on leaves of the moss *Rhytidiadelphus loreus*. One egg of another worm,

Ascaris, was also seen. *Ascaris* and *Trichuris* are common intestinal parasites of man and his domestic animals, especially pigs. Also present in these subsamples were large numbers of fly puparia which suggest the presence of stagnant conditions (Pike 1975). Other animal remains found included quantities of small bones, feather fragments and animal hair.

Robust hypnoid mosses (eg *Hylocomium splendens, Rhytidiadelphus loreus, Hypnum cupressiforme*) were abundant in most of these subsamples. These are heathland and woodland mosses and may have been utilised as toilet 'paper'.

The large number of flax seeds is interesting and may indicate a local textile industry. No flax fibres were however observed and it is possible that flax was grown for its oil-rich seeds. Two seeds of weld or dyer's rocket (*Reseda luteola*) were also found; other plants which may have been utilised for dyeing, in addition to other possible uses, included blaeberry, (*Vaccinium myrtillus*), heather (*Calluna vulgaris*), tormentil (*Potentilla erecta*), bracken (*Pteridium aquilinum*), blackthorn (*Prunus spinosa*), bramble (*Rubus fruticosus*), fat hen (*Chenopodium album*) and redshank (*Polygonum persicaria*).

NOTES ON SOME SPECIES OF INTEREST

Oats (Avena sativa)

Five carbonised grains and one fragment were recovered, three of which were sufficiently well-preserved for measurement (dimensions of range 4.0-5.0 × 1.4-1.9 × 1.4-1.7 mm). One very well preserved carbonised floret was found in the Queen Street samples but the diagnostic lemma tips were broken off. The hearth sample AS229 (Layer A228: Phase 5) contained an abundance of carbonised florets and floret bases while sample CS68 (Layer C270: Phase 5) contained many uncarbonised grains and the Queen Street samples (Midden Area: FN57) were rich in uncarbonised grain fragments.

The evidence from the material recovered points towards the oats belonging to *Avena sativa L.* (common white oat). Sample AS229 (Layer A228: Phase 5) which contained many floret bases had none with a distinctive suckermouth base such as is characteristic of *A. fatua L.* (wild oat). Neither were any of the floret bases noticeably prolonged into a short stalk as they are in *A. strigosa Schreb.* (bristle-pointed oat). On the better preserved florets no sign of an awn was seen. *A. sativa* bears a short weakly twisted awn on its lower floret but the upper floret is always awnless, in contrast to *A. strigosa* and *A. fatua* which have awns on both lower and upper florets.

According to Handley (1953) *A. sativa* (white oat) was uncommon in the Highlands until after 1746, while in the rest of the country it was confined to the infields of the best farms for a considerable time after the Union of 1707. However Anderson (1794 in Findlay 1956) in his *General View of the Agriculture of the County of Aberdeen* states that 'the great corn included all the diversities of the common oat cultivated throughout this Island (*Avena sativa*)'. *A strigosa* (also known as the grey or small oat) was sown on the poorest soil in the outfield in the high-lying districts (see Findlay 1956); it is much more resistant to adverse weather although much less productive than *A. sativa.*

Barley (*Hordeum vulgare*)

Only one carbonised grain (4.1 × 2.6 × 1.8 mm) and a fragment were found while uncarbonised grain fragments were occasional in a few samples. A number of rachis segments (from the axis of the spike) were also recovered which indicated that the lax-eared variety (bere) with grains in four longitudinal rows was probably grown (*Hordeum vulgare tetrastichum, H. tetrastichum* Kcke.). This was more tolerant of soil acidity than two-row barley *H. distichum L,* which apparently did not come into common use until liming was practised (Symon 1959).

Wheat (*Triticum aestivum s.l.*)

No carbonised grains of wheat were found although the distinctive uncarbonised grain fragments were abundant in the postulated sewage from the Queen Street samples. Wheat was cultivated only on the best of the infield land.

Fig (*Ficus carica*), Grape (*Vitis vinifera*)

Both figs and grapes are examples of food plants that must have been imported. They were probably imported as dried products, the grapes as raisins. Figs were an important source of sugar in medieval times and have been frequently found at medieval sites such as Hull (Williams 1977), Southampton (Dimbleby 1975) and Dublin (O'Riordain 1971). In Scotland they have been recorded from the Roman fort at Bearsden (Knights et al 1983) and work in medieval Elgin has produced a large number of seeds. Only one carbonised grape pip was recovered from the samples; more however have been found in Elgin samples. It is most unlikely that the climate in NE Scotland was ever sufficiently warm and sunny for figs or grapes to ripen.

Opium Poppy (*Papaver somniferum*)

One fragment of a seed was recovered from the primary fill from the base of pit UG in Area F (Phase 7). Seeds of this plant have long been used as an opiate and sedative and have been found at other medieval sites (Hull: Williams 1974; Dublin: Mitchell unpub.) and at the Roman fort of Bearsden in Scotland (Knights et al 1983). Opium was used to alleviate malaria (ague) in the Fenland and poppyhead tea was often given to children during teething (Godwin 1978). Trail (1923) mentions opium poppy as 'a frequent casual on town refuse and on waste ground around Aberdeen'. The poppy seed was probably imported and the plant grown for the opium which is obtained from the latex of the capsule.

Flax (*Linum usitatissimum*)

A small patch of flax was raised in most places for domestic purposes (Handley 1953), each family making its own linen. It was not however until the 18th century that linen manufacture became Scotland's greatest industry (Turner 1972). Flax was commonly grown as an alternative to oats or as a companion crop for grasses.

Weld, Dyer's Rocket (*Reseda luteola*)

According to De Wit in Godwin (1975) the family *Resedaceae* is not naturally part of the British flora: *Reseda luteola* probably having been introduced intentionally as a dye plant and *R. luta* (wild mignonette) adventitiously.

Dickie (1860) mentions weld as being rare and found in waste places. He lists five sites for Aberdeenshire including three in Aberdeen itself. Trail (1923) mentions that it is 'not native near Aberdeen, probably surviving as little more than a casual, from the time when it was cultivated as a useful plant'. Weld, which produced a yellow dye, was one of the three staples of the dyer's craft along with madder (*Rubia tinctoria*) and woad (*Isatis tinctorum*) (Grigson 1958). Thurstan (1949) states that it produces the best and most permanent of all vegetable dyes. Weld seeds have also been found in medieval York (Godwin and Bachem 1959) and Roman London (Willcox 1977). Willcox comments that weld seeds, unlike woad seeds, occur at the place of dyeing. It is interesting to note that Thurstan recommends that care should be taken to collect weld before it seeds as otherwise the colour is very poor. Grigson also mentions that English farmers in the 18th century followed the odd practice of sowing weld with corn (barley or oats). It would be interesting to find out if this was also practised in Scotland.

Corn Cockle (*Agrostemma githago*)

This was formerly a very common and troublesome weed. Its seeds containing a toxic saponin, githagenin, which makes bread and flour unpalatable. Godwin (1975) mentions it as being very closely associated with rye crops although Gardiner (1847) in his *Flora of Forfarshire* states that it is very plentiful in wheat fields but seldom seen among other cereal crops.

Most of the seeds were recovered as fragments. The presence of corn cockle in the samples may be due to poor seed cleaning of cereal crops, some of the seeds remaining with the grain after winnowing. In the Queen Street samples the seed coat fragments were found in association with uncarbonised grain fragments of wheat and oats suggesting that the seeds had been ingested, doubtless with adverse effects on the consumer. The seeds were also used for medicinal purposes. Wilson (1975) gives much detail on the poisonous nature and possible uses of corn cockle.

Blaeberry (*Vaccinium myrtillus*), Rowan (*Sorbus aucparia*)

Blaeberry seeds were numerous in samples postulated as cess pits (CS 48: Layer C163: Phase 9 and Queen Street Midden Area FN57) and were probably gathered in surrounding moorland areas. Rowan seeds were also common in these samples and it seems likely that they were consumed. Rowan berries can be used to make jellies etc (McNeill 1974). A few rowan seeds were found in cess pits in medieval Southampton (Dimbleby 1975) and medieval Dublin (O'Riordain 1971).

Bramble (*Rubus fruiticosus*), Raspberry (*Rubus idaeus*)

Brambles and raspberries probably grew locally and formed an important seasonal item of diet.

Corn spurrey (*Spergula arvensis*)

This very common weed has been used as an utility plant in Denmark and has been ground into meal in Shetland in historic times (Jakobsen 1932). Godwin (1975) mentions it as being a constant weed in flax crops.

Fat Hen (*Chenopodium album*), Nipplewort (*Lapsana communis*), Black Bindweed (*Polygonum convolvulus*), Pale Persicaria (*P. lapathifolium*), Wild Radish (*Raphanus raphanistrum*), Charlock (*Sinapis arvensis*), Chickweed (*Stellaria media*), Nettle (*Urtica dioica*).

It is likely that the carbohydrate-rich seeds of many of these plants and in some cases their green leaves were gathered in times of scarcity to supplement produce from cultivated plants (see for example Helbaek 1960, Lucas 1959, McNeill 1910).

Bog Myrtle (*Myrica gale*)

Distinctive glandular leaf fragments of bog myrtle were found in a number of St Paul Street Area A samples. One carbonised fruit was recovered from the hearth sample (AS 229 Layer A228: Phase 5) and anthers, identified by their pollen grains, were found in another sample. Fruits and seeds of bog myrtle have also been found in medieval Oslo (Griffin 1977) although leaf fragments are not mentioned. Bog myrtle may have been employed in a number of ways; for example in beer-making, for use as brooms, repelling insects and as a dye. Use of the plant as a broom may account for the carbonised fruit in the hearth sample.

Mosses

Mosses were found in varying quantities in nearly all the samples, the largest quantities being from Queen Street Midden Area pit FN57.

Hylocomium splendens was the most frequent and abundant moss; this is so in other archaeological contexts eg Vindolanda (Seaward and Williams 1976). Other large hypnoid mosses were also well represented (*Hypnum cupressiforme, Rhytidiadelphus spp, Pleurozium schreberi*) and large acrocarpous species (*Aulacomnium palustre, Dicranum scoparium, Polytrichum spp*) were found in smaller quantities. *Sphagnum,* a moss which still has economic uses, was frequent in many samples.

Since it is unlikely that any of the mosses found (with the possible exception of *Ceratodon purpureus*) were actually growing on the site, the mosses may have been gathered fortuitously with heather etc, but it is probable that many were gathered for use as packing materials or for their absorbant qualities (cf Queen Street pits).

Polytrichum commune, which was found in a few samples, has in the past been twined to make small ropes (Dickson 1973) but no evidence of this was found here.

Ulota crispa, shoots of which were found in one sample, is rather different from the other mosses present since it is characteristically epiphytic, occuring in small tufts on branches of trees and shrubs (Smith 1978).