CONTENTS

9.5.7 COINS AND JETTON (Not illustrated) N HOLMES

A total of 40 coins and 1 jetton were submitted for identification, the full list being as follows. (B = Burns 1887, N = North 1960, S = Stewart 1967).

FINDS FROM PRE-FRIARY CONTEXTS

Scottish

254. ALEXANDER III silver penny, 2nd coinage, type E (1280-6+). Probably Edinburgh mint (4 x 5 - pointed mullets in reverse angles, with point to right of mullet in second quarter, and points above right and below left of mullet in fourth quarter): cf B 166, S p21. Moderate wear. Context 5100, Period 2.

255. DAVID II silver halfpenny of 1st coinage, 1st issue (?1329-33): cf B 248, S p195. Very slight wear, bent. Context 6661, Period 2.

English

256. EDWARD II silver penny of Durham, class XIa (1307-11). Cross moline initial mark on obverse, and broken fleur at left side of crown: cf N 1060. Very worn. Context 7032, Period 2, Phase 4.

257. EDWARD III silver penny of London, 4th coinage, pre-treaty period, series C (1351?-2). Annulet between pellets in all 4 angles of cross on reverse: N 1149. Generally slight wear, but poorly struck on one side. Context 7054, Period 2, Phase 4.

FINDS ASSOCIATED WITH CONSTRUCTION AND OCCUPATION OF FRIARY DURING PERIODS 3 AND 4

English

258. EDWARD I, silver penny of London, class Xc (1302-10): N 1040. Very worn. Context 6091, Period 3, Phase 12-14.

Scottish

259. ROBERT II silver groat of Edinburgh (1371-90). Fairly well worn, with some surface corrosion. Context 7175, Period 3, Phase 8.

260. JAMES I billon penny of Edinburgh, group B, C or D (1424-51). Very worn, especially reverse. Context 6263, Period 3, Phase 12-14.

261. Probably JAMES I or II, fragments of a billon penny. Probably of the period 1424-60 on the basis of the size of the coin and the silver colour of the metal in section. Extremely worn. Context 7137, Period 3.

262. Probably JAMES II, contemporary plated forgery of a billon penny. Probably in imitation of an issue of the 'crown groat coinage' (1451-60). Very much debased metal beneath a silvery wash. Extremely worn. Context 6634, Period 3, Phase 12-14.

263. JAMES III billon penny: class Cii (1475-c1482). Reverse and probably obverse die as Glenluce hoard 51 (Stewart 1959). Slightly bent and very worn. Context 6151, Period 3, probably Phase 10-14.

264. JAMES III billon penny: class Ciii (or possibly Cii) (1475-c 1482). Unevenly struck, with moderate wear, but chipped and/or corroded at edge. Context 6086, Period 3, Phase 10-14.

265. JAMES III copper 'black farthing', first issue (1465-6): S 113. Surfaces much corroded, but reverse appears to be relatively unworn. Context 6093, Period 3, Phase 10.

266. As 265. Small, squarish flan, little wear, but corroded at edge. Context 5044, Period 3, Phase 10.

267. As 265. Square, unusually thick, flan, only slight wear. Context 6054, Period 4.

268. JAMES III copper 'black farthing' of the type usually referred to as 'ecclesiastical issue, type I'. Possibly c 1480-2, or somewhat earlier: S 100. Badly struck as usual, but apparently little wear. Context 6088, Period 3, Phase 10-14.

269. JAMES IV billon penny, 2nd issue, type III (probably c 1500-10): S 133. Very worn, chipped and slightly bent. Context 6066, Period 4.

270. JAMES IV billon penny, 2nd issue, type IV (probably c 1500-10): S 134. Moderate wear, but edge much damaged (or struck on very small flan). Context 6081, Period 3, Phase 10-14.

271. JAMES IV billon penny, 2nd issue, type II, III or IV, but probably IV (probably c 1500-10). Obverse surface corroded, moderate wear on reverse. Context 6074, Period 3 or 4.

FINDS FROM DECAY AND DESTRUCTION LAYERS ASSOCIATED WITH FRIARY CHURCH

272. JAMES III or IV, contemporary forgery of a billon penny of uncertain type. Apparently unclothed bust on obverse, reverse mostly illegible, but the legend appears to be nonsensical, and there are points between the pellets in all 4 angles of the cross. Fairly worn. See discussion below. Context 6053, Period 4.

273. JAMES IV billon penny, 2nd issue, type III (c 1500-10): S 133. Extremely worn, bent and corroded. Context 7029, Period 4.

274. MARY billon plack (1557): S 157. Weakly struck in places, and with moderate wear. Context 7012, Period 4.

FINDS FROM S RANGE AND NEARBY

275. FRANCIS and MARY billon lion/hardhead (1559), type 2 (dolphins looking left). No countermark, misshapen flan, with slight wear. Context 8003, Period 4.

276. Probably CHARLES I: apparently a copper turner, second issue (1632): S 237. Very thin and highly corroded. Context 8038, post Period 4.

FINDS FROM CONTEXTS POST-DATING DESTRUCTION OF FRIARY

English

277. EDWARD III silver half-groat of London, 4th coinage, pre-treaty series G (1356-61): obverse has cross type 3 and legend commencing EDVARDVS (sic): N 1204, but stop on obverse appears to be a pellet rather than an annulet. Fairly well worn, edge much clipped. Context 6602, post Period 4.

Scottish

278. JAMES I billon halfpenny, group C (1424-37): S 88, cf B 479A and 480 but no die-links. Moderate wear, slightly bent, reverse struck off centre. Context 6606, post Period 4.

279. JAMES III, contemporary forgery of a copper 'black farthing': obverse bears crowned IR, as on the second issue, but reverse bears a large saltire flanked by smaller ones, as on the first issue. Very crude workmanship, with small saltires misshapen. coin mis-struck (especially reverse) on an under-sized, squarish flan. Apparently little wear. Context 6000, unstratified.

280. JAMES IV billon penny, second issue, type IV (probably c 1500-10): S 134. Slight to moderate wear, with all-over silvery appearance. Context 6003, post Period 4.

281. JAMES VI copper twopence, post-Union first issue (1614): S 216. Very worn and corroded. Context 7015, post Period 4.

282. JAMES VI or CHARLES I copper twopence/turner (1623 or 1629 issue): S 217 or 235. Very worn, surfaces corroded. Context 6606, post Period 4.

283. CHARLES I copper turner, first issue (1629): S 235. Extremely worn. Context 6000, unstratified.

284. CHARLES I copper turner, second issue (1632): S 237. Moderate wear. Context 5000, unstratified.

285. CHARLES I or II copper turner (1642-50 or 1663): S 239 or 243. Extremely worn, surfaces corroded. Context 5000, unstratified.

286. As 285. Very corroded, degree of wear uncertain. Context 7078, post Period 4.

287. CHARLES II copper turner (1663): S 239 (now attributed to Charles II, not Charles I: Murray and Stewart 1978). Very worn. Context 5000, unstratified.

288. As 287. Moderate wear, very corroded. Context 5000, unstratified.

289. As 287. Probably well worn, very corroded. Context 6003, post Period 4.

290. As 287. Extremely worn, bent and corroded. Context 6002, modern.

French

291. Provincial double tournois of Bouillon and Sedan (1640). Issued by Duke Godfrey Maurice (1636-40): Higgins 1892, 14-15. Extremely worn, with surface corrosion. Context 6620, post Period 4.

Jetton

292. Nuremberg jetton of the 16th century
obverse: a conventional single-masted vessel at sea, with a flag and streamer fore and aft: above the yard is a G:around is the legend VOLGUE : LA : GALLEE : DE : FRANCE. Barnard 1917, 210, pl XXIX, no 8.
reverse: a field of France-ancient within a granulated inner circle: legend reads - crown (?) GARDES : VOVS : DE : MESEMPTES. cf Barnard 1917, 120, pl VI, no 58.
Context 6003, post Period 4.

FIND FROM CLEANING AFTER MACHINE CLEARANCE TO E OF E RANGE

293. EDWARD I silver penny of Durham, class IIIg (1280-1):N 1022 with early form of S and comma contraction marks:M formed of two upright strokes converging towards the bottom. Generally moderate wear, with some letters flattened. Context 6072, unstratified.

FIND FROM MODERN DRAIN TO W OF CHURCH

294. EDWARD I silver penny of London, class IXb (1300-2): N 1037. Fairly well worn. Context 7082, post Period 4.

ARCHAEOLOGICAL SIGNIFICANCE OF THE COIN FINDS

The discovery of a comparatively large number of coins in the course of the friary excavations, and the fact that a good percentage of them are from stratified contexts, have allowed the numismatic evidence to be used to a greater than usual extent as an aid to dating the occupation of the site.

9.5.7 LINLITHGOW MED/POST-MED SMALL FINDS (cont) COINS

The largest concentration of stratified coins relates to the life of the friary, but a few of the earlier finds may also be of significance. The pennies of Edward II and III (256 and 257) found in pre-friary contexts within the chapel had probably been lost by about 1375. The Edward II penny is very worn, but the Edward III much less so. Unfortunately the 2 early Scottish coins (25 and 255) are from less securely stratified contexts outside the chapel, but their presence on the site should not be ignored. The Alexander III penny is of a type which may have been issued until as late as c 1296, and these coins must have continued to circulate throughout the reigns of John Baliol and Robert Bruce, neither of whose coins are common, and probably well into the reign of David II, but the condition of the Linlithgow coin is such that, barring unusual circumstances, it had probably been lost by c 1320. The halfpenny of David II can scarcely have circulated for more than a year or so, and had almost certainly been lost by 1335.

14 stratified coins were associated with the construction or occupation of the friary buildings, and all but 2 of them are minor denominations of the reigns of the first 4 Jameses. The exceptions are the redeposited penny of Edward I (258) and the groat of Robert II (259), and the latter is important in that it was found in the foundation trench of the N wall of Building 2 at the W end of the church. The coin shows a fair amount of wear, and there is some surface corrosion, which adds to the difficulty of estimating an approximate date of loss. Assuming that the groat had circulated continuously from the time it was issued until its loss, it would seem reasonable to date the latter event to the period between c 1385 (if the coin was minted early in Robert II's reign) and c 1420 (if it was a late issue), but even this information is of limited value, as the coin may have been redeposited in the backfill of the foundation trench.

One of the James III 'black farthings' (256) was found in a soil deposit possibly associated with the construction of the E range of the friary, and if this attribution is correct, the inference must be that this phase of construction occurred no earlier than 1465. On the basis of the absence of wear on the less corroded reverse of the coin, it may be suggested that it had fallen out of circulation by c 1475-80, but the unpopularity of these coins at the time must lead to caution about the length of their circulation and the date and method of loss of many examples.

The remaining 11 coins in this group all appear to relate to the period of occupation of the friary, and they are of interest not only as dating evidence but also for the insight they give into the sort of coinage which must have been in regular use in the friary. All are billon or copper denominations - the 'small change' of the period - dating from the period 1424-c1510. Of the 3 earliest coins, a penny of James I and a counterfeit penny of James II type (260 and 262) came from the area of the cloister, and a fragmentary penny of James I or II (261) came from Building 2, W of the church.

Coins of James III and IV came from the church itself and from the E range. This is unlikely to be of any significance, however. The 3 earliest pennies all showed evidence of considerable wear, and they may well have been in circulation at the same time as the later 15th-century coins. The question of the period of circulation of 15th-century billon is somewhat complicated, with many minor varieties and a number of devaluations later in the century, but it is likely that all the billon coins of James I, II and III from friary contexts (260 - 264) had been lost by c 1500. The distinctive 'crown and lys' reverse design of the James IV second issue pennies (c 1500-10) is probably an indication that earlier issues were to be distinguished easily and withdrawn from circulation. These James IV pennies probably circulated through the reign of James V, who issued no pennies, and into that of Mary, whose

pennies are all rare. Of the 3 examples in the 'friary period' group, 269 is very worn and 270 and 271 are moderately worn, indicating that all had circulated for some time prior to loss.

The 3 copper 'black farthings' (266 - 268) were all issued between 1465 and 1482. These coins were always unpopular and distrusted, and they are unlikely to have circulated for very long, although a few examples have turned up in hoards buried as late as 1500+. The 3 'friary period' specimens are all relatively unworn and were probably lost or discarded within a few years of striking.

The fact that the numismatic evidence for a century and a half of occupation at Linlithgow friary is entirely in the form of the most debased and lowest value denominations issued during this period is worthy of some comment. The situation is perhaps less surprising than might at first appear, as silver coins of the 15th and early 16th centuries are rare among isolated finds from any sites, secular or religious. Most discoveries of such coins are in the form of hoards. More noteworthy is the absence of billon placks, which were first issued under James III around 1470, and bawbees, which appeared in the last coinage of James V and in the reign of Mary. These 2 denominations occur frequently as site finds on excavations, and their absence from a site which has yielded so many lower value base metal coins is perhaps an indication that only the smallest financial transactions were customary within the friary confines. There is certainly no evidence for the existence of any form of 'treasury'. If such had existed, its contents would undoubtedly have been kept for the most part in the form of good silver coinage, which could be relied upon to maintain its bullion value in times of inflation and coinage debasement.

Of the coins associated with the destruction of the friary and the post-Reformation use of the site, a number are clearly survivals from earlier periods (272, 277-280, 293, 294). The Edward III

half-groat is an example of a type of coin which circulated for an inordinately long time in Scotland, probably because of the scarcity of Scottish coins of the same denomination. This coin is very worn and much clipped at the edge, and it may well have been lost in the second or third quarter of the 15th century. 2 similar coins formed part of the Leith hoard, which was deposited between 1470 and 1475 (Holmes 1983).

The coins of the later 16th and 17th centuries are all of common types which occur frequently as finds on sites of all types in Scotland. The 2 coins of Mary - a plack of 1557 and a lion of 1559 - both lack the heart and star countermark which was applied to coins passed as genuine in 1573, and both are relatively unworn. Both are therefore likely to have been lost before 1573. The copper turners of James VI and Charles I and II are mostly very worn. It is not certain how long these coins circulated, but they may still have been in use well into the 18th century, despite the official ending of a separate Scottish coinage after the Union of 1707. The French double tournois is a provincial issue of a denomination more commonly found in Scotland in the form of issues of the French kings. These coins are of similar size and appearance to Scottish twopences of the same period, and they were clearly allowed to circulate as such. (It is of course from the French name tournois that the Scottish term 'turner' for these copper twopences was derived). The absence from this site of coins dating from later than the reign of Charles II may be a result of the removal of topsoil by machine before the excavation commenced.

NUMISMATIC SIGNIFICANCE OF THE FINDS

Apart from the evidence which the coin finds may provide for the history of the occupation of the site, there are a number of points which are worth noting from a numismatic view point. Not the least of these is the fact that another excavated site in Scotland has yielded a group of 15th-century base metal coins. These issues,

in particular the billon of James I and II and the 'black money' of the reign of James III, have traditionally been regarded as rarities, but it is now becoming clear that they are likely to be found fairly frequently when sites of the relevant period are excavated, regardless of the nature of the occupation of the site. Copper farthings were found in midden deposits used for shoreline reclamation at Bernard Street, Leith, in 1980 (Holmes 1985), and more copper farthings and a billon penny of James I or II were found in excavations within St Giles' Cathedral, Edinburgh, in 1981 (Holmes forthcoming). Linlithgow friary has now yielded 3 billon pennies and a halfpenny of the reigns of James I and II and 4 'black farthings'.

Of particular note among the late medieval minor denomination coins are the 3 contemporary forgeries. The earliest of these (262) appears to be an imitation of a penny of James II's second coinage, second issue (the 'crown groat' coinage of 1451-60), although it may just possibly be based on an issue of James I. It has a much debased core beneath a bright silver surface wash. A somewhat later counterfeit penny (272) is of uncertain derivation. The apparently unclothed bust of the king on the obverse and the points between the pellets in the angles of the reverse cross would suggest that the coin was intended to imitate an early issue of James III, of class Aa2 or Ab2 (Holmes 1983, 87-8), but these features are also similar to those of a penny found in the Glenluce hoard (number 109), which was described as 'coarse work, perhaps contemporary forgery James IV' (Stewart 1959, 381). If this attribution for Glenluce 109 is correct, then it must have been an imitation of a James IV penny of the 1489 issue - first series, type 2, without annulets. These coins bore an unclothed bust, but they are not known with points between the pellets on the reverse. James III class A pennies with points on the reverse were apparently unrecorded until the discovery of the Leith hoard in 1980. however, and it now seems more likely that both Glenluce 109 and Linlithgow 272 are imitations of

these issues and belong in the period c 1465-71.

Perhaps the most surprising of all the 3 counterfeit coins from Linlithgow is the forgery of a copper 'black farthing' (279). It seems astonishing that a counterfeiter should have considered it worthwhile to expend money and effort, not to mention running the risk of severe punishment if apprehended, in order to produce copies of coins which were of so low a value and so generally distrusted. The only factor in favour of such an enterprise may have been that the official issues were so badly produced that it would have been easy to introduce crudely made copies into circulation, but this particular counterfeiter proceeded to lay himself open to immediate suspicion by producing a 'mule', with the obverse of the second issue and the reverse of the first.

2 other coins are worthy of individual mention on account of their rarity. The silver halfpenny of David II's earliest issue (255) is not only an extremely rare item today, but it is in remarkably unworn condition, although somewhat bent. The billon halfpenny of James I's class C (278) is also rare. Unfortunately neither of these coins has die-links with other published specimens.

The Nuremberg jetton (292) combines the obverse and reverse designs of 2 distinct types published by Barnard (1917). The obverse design was probably used initially for jettons made for export to France, but they spread widely and are commonly found in Britain. They were evidently produced in large numbers during the 16th century and possibly later, with the antique lettering being retained as a convention. The reverse appears on a jetton which has been attributed to the Dauphine and dated to 1483-1547, with the crown initial mark appearing on the earlier examples. Roman (1894) considered the jetton to be of Parisian manufacture, but Feuardent (1904-7) considered it to be German. The juxtaposition of this type

with a Nuremberg obverse suggests that the latter conclusion is probably correct.

9.5.8 WALL PLASTER, PIGMENT CONTAINERS AND PIGMENTS W J LINDSAY

With a contribution by H Howard

Large quantities of painted faced lime mortar from internal wall surfaces were recovered during the Linlithgow excavations. Although in general only single coats of white paint are present on pieces believed to be of friary date, several layers of white, off white and cream paint are visible on fragments believed to have been associated with the Period 2 chapel. Joyce H Townsend, formerly Conservation Scientist with Glasgow Museums and Art Galleries, has identified white paint on 2 examples as being pure lime. 1 piece appears to have been overpainted or sized with a proteinaceous medium perhaps in preparation for further painting.

Only 4 examples of coloured overpainting have been definitely identified. All were recovered from the area of the pre-friary chapel: one from a Period 3, Phase 6 context and the others from Period 4 decay and destruction horizons. It is therefore possible that they may have been associated with the pre-friary chapel rather than the friary church. All possess traces of red ochre, while 1 example (295) has also an area of yellow ochre. The painted areas are very patchy, but on 296 can be seen part of what may be a masonry pattern.

2 oyster shells and 1 scallop shell have traces of coloured pigments on their internal surfaces, while 3 sherds (2 joining) of pottery vessels bear vestiges of a red pigment identified as vermilion. All were recovered from Period 4 rubble deposits as if they had been disturbed during destruction of the friary. As these deposits lay within the area of the E range this would appear to be

the most likely storage location. These objects may be compared with the oyster shell used as an artist's palette found during restoration work at Boyston parish church, Wiltshire in 1956-62 (Alexander and Binski 1987, 391, no 440).

In addition to the pigment containers from Linlithgow, 5 samples of pigment were recovered from Period 4 and later horizons. These have been identified as red ochre (307, 308) and indigo or woad (306). It must be stressed that the Linlithgow pigments could have been used for a number of purposes and may not be related specifically to wall painting. Vermilion, for example, tends to darken in contact with sunlight and would not therefore be entirely suitable for wall painting (Thompson 1936, 107-8).

PAINTED PLASTER (Not illustrated)

295. 40 x 33mm. Red and yellow ochre over thin limewash layer. Context 7008, Period 4.

296. 31 x 30mm. Red ochre over thin limewash layer. Traces of masonry pattern. Context 7004, Period 3, Phase 6.

297. 51 x 42mm. Traces of red ochre over thin limewash layer. Context 7004, Period 4.

298. 2 fragments. 42 x 41mm;32 x 16mm. Faint traces of red ochre over thin limewash layer. Context 7005, Period 4.

PIGMENT CONTAINERS (see frontispiece)

Shells

299. Oyster shell containing deposit of vermilion. Context 6054/6024, Period 4.

300. Oyster shell with thin line (brush stroke?) of red lead. Context 6074, Period 4.

301. Scallop shell containing layered deposits. 1. Vermilion mixed with white lead. 2. synthetic copper green. Context 6122, Period 4.

Pottery

302. Potsherd (26 x 25mm) with traces of vermilion. Context 6026, Period 4.

303. 2 joining potsherds (52 x 21mm) with traces of vermilion. Pigment covers only part of interior surface of sherds, ? indicating use of sherds rather than vessel as container for pigment. Context 6029, Period 4.

PIGMENTS (see frontispiece)

304. Small sample containing particles of azurite. Context 6074, Period 4.

305. Small sample containing particles of azurite (natural azurite ? mixed with a little of synthetic equivalent). Context 6089, Period 4.

306. Lump of indigo/woad mixed with sand. 30 x 30 x 11mm. Context 5000, unstratified.

307. Lump of red ochre 52 x 23 x 19mm. Context 5000, unstratified.

308. Lump of red ochre. 35 x 20 x 17mm. Context 5000, unstratified.

EXAMINATION OF LINLITHGOW PIGMENTS H HOWARD

Examination was undertaken of 10 pigment samples from painted plaster, shell palettes and small pigment deposits excavated at Linlithgow. The range of pigments established include: vermilion, red lead, azurite, indigo, red and yellow ochre. The vermilion appears to be of quite high quality and contains large particles of

the mineral pigment. All the pigments are consistent with the period of the excavated material.

METHODOLOGY

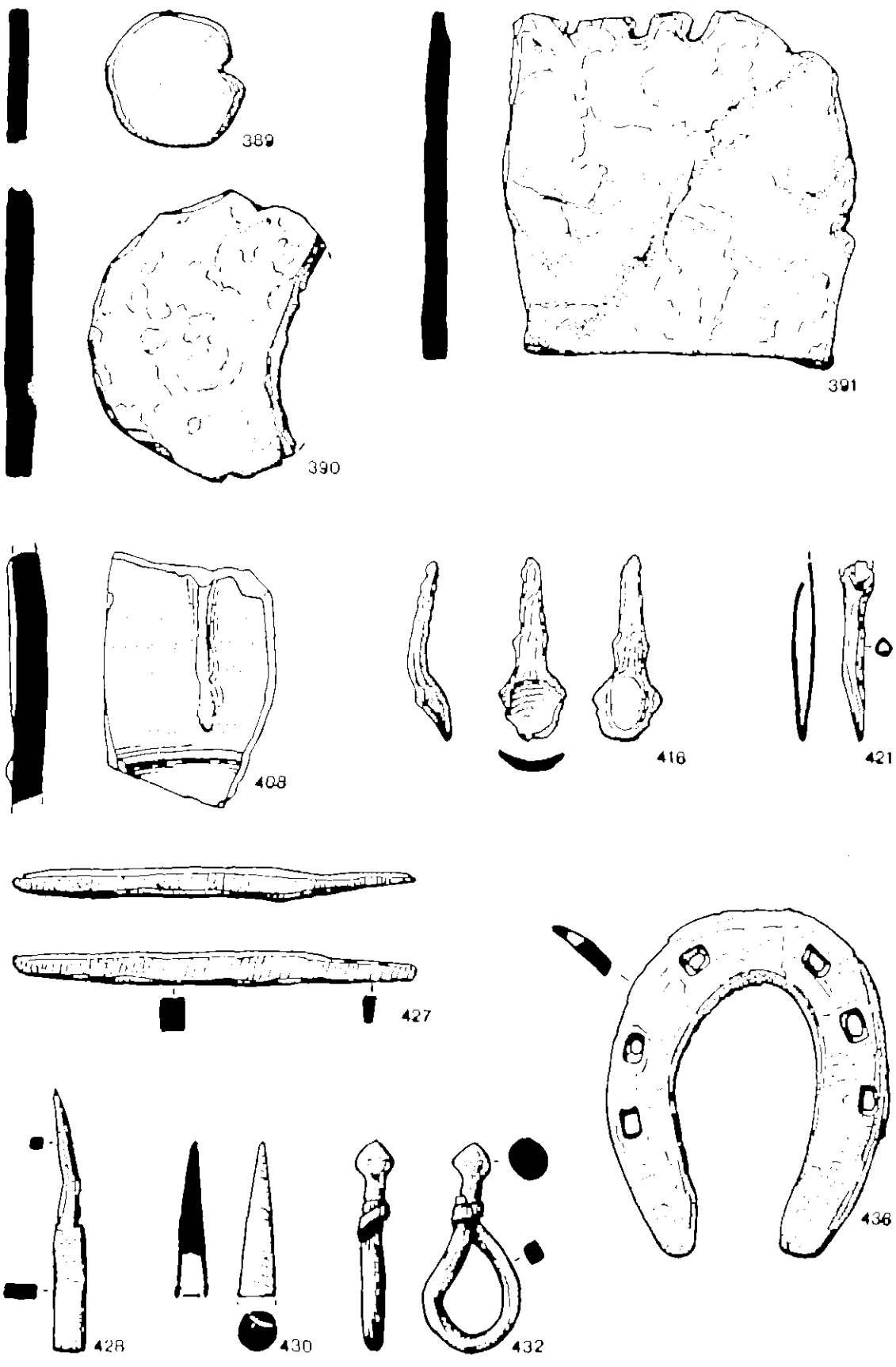
The pigments were mounted as dispersion samples in D.P.X. mountant and examined in transmitted light at 200x magnification. Chemical spot tests were carried out as appropriate.

1. Addition of a saturated solution of dihydroxy-3-cyclobutene dione. The presence of copper is indicated by the formation of yellow crystals on the pigment particles.
2. Addition of 3M hydrochloric acid. The presence of red lead is indicated by the formation of a white precipitate of lead chloride.
3. Addition of concentrated hydrochloric acid followed by a drop of potassium ferrocyanide. The presence of the Fe^{3+} ion is indicated by the formation of a blue precipitate.

Results of the visual examination and of all tests are given in Table 68mf.

Table 68mf. Pigments. Examination of dispersion samples
VISUAL EXAMINATION - PIGMENT IN TRANSMITTED LIGHT 200X

CATALOGUE NUMBER	Colour: Plane polarised light	Colour: Crossed polars	Isotropic	Anisotropic	Pleochroic	Birefringent	Structure	CHEMICAL SPOT TESTS	PIGMENT	COMMENTS	CATALOGUE NUMBER
295							Granular	Positive test for Fe^{+++} ion	Red and yellow ochre	Plaster fragment, pigment applied over thin lime-wash layer	295
296							Granular	Positive test for Fe^{+++} ion	Red ochre	Plaster fragment, pigment applied over thin lime-wash ayer	296
299	Dark cherry red/black	Intense cherry red		X	X	X	Granular	3M HCL - pigment unaffected	Vermilion	Oyster shell palette with traces of vermilion	299
300	Deep red/ brown	Opaque deep red/brown		X	MILD	MILD	Granular	3M HCL - pigment dissolved and then formed white PPT	Red lead	Oyster shell palette with traces of red lead	300
301	Dark cherry red/black	Intense cherry red		X	X	X	Granular	3M HCL - pigment unaffected	Vermilion	Oyster shell palette. Lower pigment layer consists of vermilion mixed with white lead.A thick white/yellow-ish layer separates this from the trace of green found above	301
301	Pale green	Pale soapy green					Agglomerates of granular structure	Positive test for copper	Synthetic copper blue		301
304	Large particles deep blue, small, pale blue	Intense blue		X	X	X	Crystalline-conchoidal fracture	Positive test for copper	Azurite	Natural copper carbonate	304
305	Large particles deep blue, small, pale blue	Intense blue		X	X	X	Crystalline-conchoidal fracture	Positive test for copper	Azurite	Natural azurite possibly mixed with a little synthetic equivalent	305
306	Dark blue/ black	Dark-mid blue					Agglomerates of granular structure	Negative tests for copper	Indigo/woad	Blue pigment mixed with sand to form a large solid lump	306



III109mf Perth. Stone, ceramic, lead, copper alloy and iron objects.
Scale 1:2 except *421* (1:1)

(at A4 page size)

9.6 PERTH SMALL FINDS

CONTENTS

9.6.1 GLASS OBJECTS

B FORD

WINDOW GLASS (Ill 93)

104 separate fragments of medieval glass were recovered. They are all flat window glass. Most of the fragments are very badly corroded. The surfaces have been altered by weathering, producing in many cases a brown opaque patina, and in others a mottled brown and white patina. The weathering crust has penetrated the whole of many of the pieces, but in a number of instances the central core of the glass still remains in its original state. Where visible this appears to be plain, clear glass with a green tint. The green tint is caused by the glass becoming contaminated with iron impurities during manufacture. 317 is a piece of glass which is possibly amber in colour. However, the excessive weathering of this fragment makes definite identification impossible.

Window glass was made of potash or forest glass from about the 11th to the 16th centuries. This is formed from mixing silica with flux from the ashes of organic material such as wood or bracken. This reduced the melting point of the silica. Potash glass is particularly prone to weathering as can be seen in this collection.

There were 2 methods of manufacturing medieval window glass, the crown process and the cylinder or muff process. For detailed descriptions of these methods see Frank 1982; Ford forthcoming. There has yet been only 1 fragment of glass from Perth which could definitely be identified as having been manufactured using the crown process (Ford forthcoming a). There are no examples amongst this group that can be ascribed to this method. However, a number of pieces can be regarded as having been made using the cylinder method. Glass manufactured using the cylinder method can be recognised by striations in the glass as in 314 and 375. The edges of cylinder glass can be fire-rounded. 349 and 378 both have cut and fire rounded edges. Another characteristic of the cylinder method of manufacture is that the process involves quite a lot of manipulation of the glass which can cause uneven surfaces like that seen on 343. Further pieces of glass manufactured using the cylinder method have been identified from Blackfriars, Perth (Ford forthcoming a).

On the whole, the fragments are from a variety of shaped pieces of glass, with only 321, being complete. The shapes were formed by scoring the sheet with a hot iron and cracking the surface by applying water. The scored lines seen on 311 may be from marking out a shape which was then abandoned. If the edges were rough they were then pared down using a 'grozing' iron or pincers. Many of the fragments have edges where the marks of these pincers or 'grozing' irons may be seen. The panels of glass would have been held together by H-sectioned lead cames, three examples of which were also found on the site (411, 412, 413).

The glass falls into 2 main categories; those pieces with painted decoration and those pieces which are plain and undecorated.

Because of the badly weathered state of the collection, many pieces, which now appear to have no painted decoration, may once have had some. Despite this, it is possible to identify some pieces which were probably never decorated. These form a small group of fragments, probably from plain borders (320, 360, 382). These pieces are all parts of rectangular shaped panes. 360 is still in reasonable condition and, although it is now translucent, it is still possible to see its original colour.

The remaining glass, except for 321, is decorated with designs consisting of linear, curvilinear and ring and dot decoration. Some also have areas of cross-hatching. This decoration has been painted on to the inner surface of the glass, and in all cases the paint is now coloured reddish brown. All these designs are commonly used in 'grisaille', a type of decoration formed by painting natural foliate designs with stems, leaves and trefoils on to plain glass. Sometimes this decoration is set in a plain border or in borders with decoration such as ring and dot, like on 310, and geometric designs. Although the majority of the fragments are very small, it is still possible to discern some of the overall pattern. The patterns are made up of stylized foliate designs consisting of stems, stalks, leaves and trefoils which would have formed an overall pattern of intertwined foliage and flora, surrounded by areas of cross-hatching.

'Grisaille' was a popular form of decoration in the 13th and 14th centuries. The earlier examples favoured stylized decoration such as trefoils and cross-hatching. As the style progressed cross-hatching became less popular and the stylized decoration was replaced by decoration which was more natural in appearance. The collection from Perth Carmelite friary contains pieces mainly from

the earlier tradition. However, 3 fragments have a more natural leaf decoration (326, 327, 358). On 326 the leaf is combined with an area of cross-hatching. It is possible that these fragments mark a transitional phase from stylized to more natural decoration. The general composition of the decoration as a whole suggests that the glass is of a late 13th - 14th century date. Further fragments decorated with 'grisaille' have been recovered from both the Carmelite friaries at Aberdeen and Linlithgow.

321 is almost complete but of rather an irregular shape. It has been decorated with a geometric design consisting of a central cross surrounded by a number of borders with pawn-like and semi-circular extensions.

Similar pieces with geometric design have been recovered from excavations at Linlithgow (171-174). They have been dated to the early 15th century (see Chapter 9.5.1). Another similar design can be seen on the border of a rectangular panel of Austrian origin dated from the late 14th century (Burrell Collection, Catalogue no 206). Another design in the border of the same window has been paralleled by a piece found at excavations at Canal Street II, Perth and a panel originally from Glasgow Cathedral dated to the 14th/early 15th century (Ford 1987, 152 no 161). 321 could date from the late 14th - 15th centuries.

There are 5 fragments of glass which are much thinner than the majority of the group. They range in thickness from 1 - 1.4mm. They are very fine plain fragments which have not corroded in the same way as the bulk of the collection and are probably of 14th - 16th century date.

The friary is thought to have been founded in about 1262, shortly after the Carmelite friars first came to Scotland in 1260. The friary at Perth was their first foundation in Scotland, although the exact site of the original foundation can not definitely be attributed to the site at Tullilum The first firm evidence of the Carmelites at Tullilum does not occur until 1365. However, there may have been a chapel on this site since the late 12th century (see Chapter 6.1). During the excavation, parts of 3 structures were uncovered. Although only small sections of each building were unearthed, it is thought that all 3 relate to the friary, and tentative functions have been ascribed to each. Building 1 may be the friary church or part of the chapter house. Building 2 may be the sacristy or reredorter, and Building 3, part of the E range (see Chapter 6.2). During the life-time of the friary we know that a certain amount of repair and building work took place. However, there is only 1 firm reference to any glass work being repaired or installed. This was in 1513 when glass work on the greater window in the hall is recorded as having cost £1 17s 8d (Chapter 6.1, Dunk Rent, 227-8). It is unfortunate that this is the earliest reference and that no documentary evidence relates to the large amount of glass work which must have taken place in the 13th and 14th centuries, the date of the bulk of the material found on the site.

It is not known exactly when the friary was destroyed. It is thought to have escaped immediate destruction during the Reformation by the timely intervention of Lord Ruthven. When its final destruction took place is not known (see Chapter 6.1).

A large amount of the stratified glass, 67 fragments in all, was recovered from 3 contexts all associated with Building 1, the possible church. 10 fragments came from context 3, a layer of

demolition rubble, over the E wall. 29 fragments came from context 30, and 28 from context 31, both contexts being wide spreads of material over the structure. However, the majority of the glass in both contexts is known to have been collected from close to the E wall. 1 of the fragments of lead window came was also recovered from this structure from a robber trench cutting context 30.

It would seem plausible, therefore, that the glass found in these contexts came from a window in this wall which could possibly have been the great E window of the church. From the glass fragments we can say that it was decorated in 'grisaille', probably with plain and geometric borders.

Of the remaining stratified glass, 2 more fragments came from contexts associated with Building 1. 372 was found in the fill of a disturbed grave, and 373 in the fill of a much later grave dug into the demolition rubble over the structure. 23 fragments were recovered from contexts associated with Building 2 (376 - 380). These fragments are in a very corroded state and only one, 378, has any painted decoration. All these fragments were found in the top fills of ditch 141 immediately to the E of Building 2. 2 fragments, 375 and 382 were associated with Building 3, the E range. 375 is of the later type of glass, of possible 14th - 16th century date and was found in the backfill of the robber trench of the E wall. 382 came from occupation debris over floor surface 147 within the structure, where it was associated with a Scarborough Polychrome jug dating from the early 13th century.

Although the collection of glass recovered is quite small, it is still possible to say something concerning its relation to the friary. It is probable that the majority of the glass came from the

E window of the church, and that the window was decorated with 'grisaille' with plain and geometric borders. The glass was probably installed in the late 13th or early 14th centuries, with the possibility of some additional work having been done in the late 14th or 15th centuries with the addition of geometric border panels such as 321.

309. Thickness 2.70mm. Very corroded fragment, now opaque. Painted linear stem-like decoration. 2 grozed edges. Unstratified, (Accession N11A).

310. Thickness 2.90mm. Very corroded fragment, now opaque. Painted ring and dot decoration surrounded by cross-hatching. Unstratified, (Accession N11B).

311. Thickness 3.90mm. Very corroded fragment, now opaque. Laminated surfaces exposing core which is plain with a green tint. 2 scored lines on upper surface. 1 grozed edge. Unstratified, (Accession N251). Not illustrated.

312. Thickness 2.30mm. Very corroded fragment, now opaque. Painted curvilinear decoration. Possibly part of trefoil. 1 grozed edge. Unstratified, (Accession N271). Not illustrated.

313. Thickness 2.40mm. Very corroded fragment, now opaque. Laminated surfaces exposing core which is plain with a green tint. Context 2, (Accession N075). Not illustrated.

314. Thickness 1.40mm. Corroded fragment. Pale green, clear. Striations visible. Iridescent. 1 grozed edge. Context 2, (Accession E267). Not illustrated.

315. Thickness 2.65mm. 3 co-joining, very corroded fragments, now opaque. Context 3, Period 3, (Accession N007A/N270B). Not illustrated.

316. Thickness 2.70mm. Very corroded fragment, now opaque. 1 grozed edge. Lead staining along 2 edges. Context 3, Period 3, (Accession N007B). Not illustrated.

317. Thickness 2.50mm. Very corroded fragment of possible amber glass. 1 grozed edge. Context 3, Period 3, (Accession N007C). Not illustrated.

318. Thickness 3.20mm. Very corroded fragment, now opaque. Painted with curvilinear foliate style decoration. 3 grozed edges. Context 3, Period 3,(Accession N007D).

319. Thickness 2.90mm. Very corroded fragment, now opaque, surfaces laminating. Context 3, Period 3, (Accession N007E). Not illustrated.

320. Thickness 4.70mm. Fragment from a plain border? Very corroded, now opaque. Lead staining along 3 grozed edges. Context 3, Period 3, (Accession N007F). Not illustrated.

321. Thickness 3.20mm. 2 co-joining very corroded fragments now opaque. Complete pane with 2 chipped corners. Painted geometrical decoration. The centre is a cross, surrounded by a lozenge-shaped panel with, on each side, an internal pawn-like extension. This is surrounded by 2 further lozenge-shaped panel borders, the outer one having on each side an external semi-circular extension. Traces of lead staining on the 4

grozed edges. Context 3, Period 3, (Accession N007G).

322. Thickness 3.10mm. 4 co-joining fragments, now opaque. Painted linear and curvilinear stem-like decoration with beginning of trefoil or leaf. Lead staining on 2 grozed edges. Context 3, Period 3, (Accession N012A). Not illustrated.

323. Thickness 3.50mm. Very corroded fragment, now opaque. Core plain with a green tint. 1 grozed edge. Context 3, Period 3, (Accession N012B). Not illustrated.

324. Thickness 2.20mm. Very corroded fragment, now opaque. Painted curvilinear and cross-hatched decoration, possibly part of a trefoil. 2 grozed edges. Context 3, Period 3, (Accession N270A). Not illustrated.

325. Thickness 3.90mm. 3 co-joining very corroded fragments, now opaque. Central core plain with a green tint. Painted foliate design possibly part of a trefoil. Context 24, unstratified, (Accession N014). Not illustrated.

326. Thickness 3.10mm. Very corroded fragment, now opaque. Painted curvilinear leaf-like decoration and cross-hatching. 1 grozed edge. Context 30, Period 4, (Accession N024A).

327. Thickness 4.60mm. Very corroded fragment, now opaque. Painted curvilinear leaf-like decoration. Context 30, Period 4, (Accession N024B).

328. Thickness 4mm. Very corroded fragment, now opaque. Laminated surfaces exposing core which is plain with a green tint.

Painted linear stem-like decoration. One grozed edge. Context 30, Period 4, (Accession N024C). Not illustrated.

329. Thickness 4.20mm. Very corroded fragment, now opaque. Core of glass plain with a green tint. Curvilinear and cross-hatched decoration, possibly part of a trefoil. Context 30, Period 4 (Accession N024D). Not illustrated.

330. Thickness 2.70mm. Very corroded fragment, now opaque. 1 grozed edge. Context 30, Period 4, (Accession N024E). Not illustrated.

331. Thickness 3.30mm. Very corroded fragment, now opaque. Painted curvilinear decoration. Context 30, Period 4, (Accession N024F). Not illustrated.

332. Thickness 4.30mm. Very corroded fragment, now opaque. Context 30, Period 4, (Accession N024G). Not illustrated.

333. Thickness 2.80mm. Very corroded fragment, now opaque. Fragmentary painted linear decoration. Context 30, Period 4, (Accession N024H). Not illustrated.

334. Thickness 3.20mm. Very corroded fragment, now opaque. Fragmentary painted curvilinear decoration. Context 30, Period 4, (Accession N024I). Not illustrated.

335. Thickness 3.50mm. 2 fragments. Very corroded, now opaque. Context 30, Period 4, (Accession N024J, K). Not illustrated.

336. Thickness 3.40mm. Very corroded fragment, now opaque. 1

grozed edge. Context 30, Period 4, (Accession N024L). Not illustrated.

337. Thickness 3.10mm. Very corroded fragment, now opaque. 1 grozed edge. Context 30, Period 4, (Accession N024M). Not illustrated.

338. Thickness 2.90mm. Very corroded fragment, now opaque. Fragmentary painted curvilinear decoration. 1 grozed edge. Context 30, Period 4, (Accession N024N). Not illustrated.

339. 6 laminated fragments, very corroded, now opaque. Context 30, Period 4, (Accession N024O-T). Not illustrated.

340. Thickness 4mm. Very corroded fragment, now opaque. Fragmentary painted decoration. Lead staining on 1 grozed edge. Context 30, Period 4, (Accession N065). Not illustrated.

341. Thickness 6.60mm. Very corroded fragment, now opaque. Badly laminated exposing core which is plain with a green tint. Painted linear stalk-like decoration and cross-hatching. Context 30, Period 4, (Accession N066).

342. Thickness 1mm. Badly laminated fragment. Plain clear glass, heavily bubbled. Context 30, Period 4, (Accession N076). Not illustrated.

343. Thickness 4mm. Very corroded fragment, now opaque. Core plain with a green tint. Painted linear, curvilinear and cross-hatched decoration showing foliate design of stalk and part of trefoil. 1 grozed edge. Slightly warped. Context 30,

Period 4, (Accession N117A).

344. Thickness 3.10mm. Very corroded fragment, now opaque. Painted curvilinear stalk-like decoration and cross-hatching. Context 30, Period 4, (Accession N117B).

345. 3 very corroded and badly laminated fragments, now opaque. Context 30, Period 4, (Accession N117C-E). Not illustrated.

346. Thickness 5.10mm. Very corroded fragment, now opaque. Laminated surface exposing core which is plain with a green tint. Painted curvilinear decoration and fragmentary cross-hatching. Probably stalk and part of trefoil. 2 grozed edges. Lead staining on all edges. Context 30, Period 4, (Accession N246).

347. Thickness 2.50mm. 2 co-joining fragments. Very corroded now opaque. Core plain with a green tint. Painted trefoil decoration. Context 31, Period 3, (Accession N021).

348. Thickness 2.80mm. Very corroded fragment, now opaque. Painted curvilinear decoration. 1 grozed edge. Context 31, Period 3, (Accession N022A). Not illustrated.

349. Thickness 3.35mm. Very corroded fragment, now opaque. 1 grozed edge. 1 cut and fire-rounded edge. Context 31, Period 3, (Accession N022B). Not illustrated.

350. Thickness 2.90mm. Very corroded fragment, now opaque. Painted linear stalk-like decoration. 1 grozed edge. Context 31, Period 3, (Accession N022C). Not illustrated.

351. Thickness 3.10mm. Very corroded fragment, now opaque. Fragmentary painted decoration. Context 31, Period 3, (Accession N022D). Not illustrated.

352. Thickness 3.35mm. Very corroded fragment, now opaque. Laminated surfaces exposing core which is plain with a green tint. Context 31, Period 3, (Accession N022E). Not illustrated.

353. Thickness 3.40mm. 2 fragments. Very corroded, now opaque. Each has 1 grozed edge. Context 31, Period 3, (Accession N022F, G). Not illustrated.

354. Thickness 3.40mm. Very corroded fragment, now opaque. Painted linear stem-like decoration. Context 31, Period 3, (Accession N026A). Not illustrated.

355. Thickness 3mm. Very corroded fragment, now opaque. Lead staining along 2 grozed edges. Context 31, Period 3, (Accession N026B). Not illustrated.

356. Thickness 3.30mm. Very corroded fragment, now opaque. Painted linear stem-like decoration. 2 grozed edges. Context 31, Period 3, (Accession N26C). Not illustrated.

357. Thickness 3.20mm. Very corroded fragment, now opaque. Context 31, Period 3, (Accession N026D). Not illustrated.

358. Thickness 3.30mm. Very corroded fragment, now opaque. Laminated painted curvilinear leaf-like decoration. 1 grozed edge. Context 31, Period 3, (Accession N026E). Not illustrated.

359. Thickness 3.20mm. 2 co-joining fragments. Very corroded, now opaque. 1 grozed edge. Context 31, Period 3, (Accession N026F). Not illustrated.

360. Thickness 3.90mm. Almost complete pane, 2 co-joining fragments of a plain border. Corroded, now translucent. Plain with a green tint. Lead staining on 4 grozed edges. Context 31, Period 3, (Accession N027A). Not illustrated.

361. Thickness 3.80mm. Very corroded fragment, now opaque. 2 grozed edges. Context 31, Period 3, (Accession N027B). Not illustrated.

362. Thickness 3.60mm. Very corroded fragment, now opaque. Core plain with a green tint. Painted trefoil decoration. Lead staining on 1 grozed edge. Context 31, Period 3, (Accession N031A). Not illustrated.

363. Thickness 3.40mm. Very corroded fragment, now opaque. Painted trefoil decoration. Context 31, Period 3, (Accession N031B).

364. Thickness 3.40mm. Very corroded fragment, now opaque. Fragmentary painted linear decoration, possibly a stem. Lead staining on 2 edges, 1 grozed. Context 31, Period 3, (Accession N031C). Not illustrated.

365. Thickness 2.90mm. Very corroded fragment, now opaque. Core plain with a green tint. Fragmentary, painted linear decoration. Probably a stem. 1 grozed edge. Context 31, Period 3, (Accession N031D). Not illustrated.

366. Thickness 3.60mm. Very corroded fragment, now opaque. Laminated surfaces exposing core which is plain with a green tint. Painted linear decoration. Context 31, Period 3, (Accession N031E). Not illustrated.

367. Thickness 2.60mm. Very corroded fragment, now opaque. Painted linear decoration. 1 grozed edge. Context 31, Period 3, (Accession N031F). Not illustrated.

368. Thickness 3.40mm. 3 very corroded fragments, now opaque. 1 fragment has 2 grozed edges. Context 31, Period 3, (Accession N031G-I). Not illustrated.

369. Very corroded fragment, now opaque. Laminated. 1 grozed edge. Context 31, Period 3, (Accession N031J). Not illustrated.

370. Thickness 2.60mm. Very corroded fragment, now opaque. 1 grozed edge. Context 31, Period 3, (Accession N031K). Not illustrated.

371. Thickness 1.20mm. Plain clear fragment, pale green tint Heavily bubbled. Iridescent. 1 grozed edge. Context 31, Period 3 (Accession N031L). Not illustrated.

372. Thickness 1.40mm. Plain clear fragment, pale green tint. Heavily bubbled. Iridescent. 1 grozed edge. Context 55, Period 1 (Accession N032). Not illustrated.

373. Thickness 3.60mm. Very corroded fragment, now opaque. Lead staining on 2 edges. Context 84, Period 4, (Accession N182A). Not illustrated.

374. 4 very corroded laminated fragments, now opaque. Context 84, Period 4, (Accession N182B-E). Not illustrated.

375. Thickness 1.10mm. Plain fine glass with a green tint. Striations visible. Context 108, Period 4, (Accession N139). Not illustrated.

376. Thickness 3.10mm. Very corroded fragment, now opaque. 1 grozed edge. Context 128, Period 3, (Accession N162). Not illustrated.

377. 5 very corroded laminated fragments, now opaque. Context 129, Period 3, (Accession N196). Not illustrated.

378. Thickness 3.40mm. Very corroded fragment, now opaque. Painted linear stem-like decoration. 2 grozed edges, 1 cut and rounded edge. 3 edges have traces of lead staining. Context 129, Period 3, (Accession N197). Not illustrated.

379. Thickness 2.50mm. Very corroded fragment, now opaque. Context 129, Period 3, (Accession N198). Not illustrated.

380. 15 fragments. 13 very corroded and laminated, now opaque. 2 fragments of core plain with a green tint. Context 129, Period 3, (Accession N199). Not illustrated.

381. 3 very corroded laminated fragments. Context 136, Period 3. (Accession N183). Not illustrated.

382. Thickness 4.20mm. Fragment of plain border? Very corroded, now opaque. 3 grozed edges. Context 168, Period 2, (Accession

N126). Not illustrated.

VESSEL GLASS (Ill 102)

383. Thickness 0.50mm. Fragment of very thin-walled vessel. Possibly from a wine glass or beaker. Clear, colourless slightly bubbled glass. Part of a curved trail remains. Trench 5, Context 31, no period assigned (Accession N025).

BEAD (Not illustrated)

384. Length 9mm. Badly corroded. Amber opaque glass. Oval shaped. Now broken in half. Context 52, Period 4, (Accession N077).

9.6.2 STONE OBJECTS B FORD

With a contribution by G Stell.

Geological identifications (roof slates) G H Collins; (389-394) M Taylor.

Among the dressed stones recovered from this site is the decorated base of a ridge finial (385). Unfortunately it was found during a watching brief but may have derived from the E end of the roof of Building 1. Of the other dressed stones from the site only a chamfered rybat (387) and a fragment of window mullion (388) are worthy of special mention.

Two roughly fashioned discs, 389 and 390, were recovered. 389 from the backfill of trench 107, the E wall of Building 3 and 390 from the fill of trench 149 from a post-friary wall. They could have been put to a number of uses, such as counters, lids, and gaming pieces. They are both of sandstone from the Lower Devonian (Lower Old Red Sandstone) and are almost certainly of local origin. It is possible that they were fashioned out of discarded roof slates.

391 is of unknown function. It is made from sandstone from the Lower Devonian (Lower Old Red Sandstone) and is almost certainly of local origin. Like the counters 389, 390 it may have been made from discarded slate. A similar item from Leicester (Mellor and Pearce 1981, 67, fig 19, no 26) has been identified as a trial piece for testing methods of piercing slate.

392, a possible mortar fragment, was found in the fill of robber trench 188, the S wall of Building 3. Its surfaces are very abraded and flaky. It is made from a limestone probably imported from the S or NE of England. A number of other medieval mortars of limestone have been found during excavations at Exeter (Allan 1984).

393, a possible bowl fragment, is decorated with a trefoil motif at its corner. It was recovered from a clay spread directly overlying the demolition rubble of the E wall of Building 1.

394, a whetstone, is perforated at one end for suspension, possibly for attachment to a belt. Other perforated whetstones have been found on Perth sites at Kirk Close and 1-5 High Street (Ford 1987b, 147, ill 80, nos 140, 141, 144). 394 shows signs of wear on all 4 faces, probably resulting from the sharpening of knife blades. The shallow grooves also present are possibly for the sharpening of the points of needles or knives. The whetstone is fashioned from a fine grained quartzite, another example, of quartzite has been recovered from King Edward Street, Perth which is probably of Scottish origin (Ford forthcoming b). 394 was recovered from a ditch to the E of Building 2, possibly filled with kitchen midden material. It was associated with pottery of 14th-15th century date.

ARCHITECTURAL FRAGMENTS (Ill 45, 91) G STELL

385. Decorated base of ridge finial. c 45mm square at base, height c 37mm. Large block of red sandstone. Top centre of stone contains a 115mm square socket with a 25mm wide rim. Faces are carved with blind gabled canopies crowned with tri-lobed fleur-de-lis ornament. Canopies on 2 opposite faces are decorated with cinquefoil cusping. Face 2 has trefoil cusping wrought with a more pronounced internal chamfer. Face 1 has plain rebated face designed to accommodate the ridge of a roof with a 50° pitch. The gabled canopies are of a similar pitch.

The structural context for this stone is suggested by the nature and direction of faces 1 and 2 and is shown in Ill 45. It is possible that it could have served as a gablet of a buttress backed by a minor ridged roof, but, given its size, its uniqueness and its relatively elaborate character among the other finds on this site, it is much more likely to have occupied a position at the E end of the main roof. It probably accommodated a cross finial or similar device, and may have surmounted a carved niche. Late 13th or 14th century. Unstratified. Found during watching brief E of Building 1.

386. Hood mould. 39 x 23mm. Width across opposing faces 27mm. Local sandstone. Cavetto-moulded hood and 1 corresponding (re-worked) face are slightly curved. Other faces show evidence of tooling. Rear of stone is chamfered at 1 angle, and a later rebate has been formed probably to receive a wooden window or door frame. There is a small mortar-filled slot of uncertain purpose at the head of stone. Late medieval, possibly 15th century. Context 41, Period 3. Not illustrated.

387. Chamfered rybat. Length 64mm. Context 115, Period 4. Not illustrated.

388. Fragment of window mullion. 35 x 25mm. Context 136, Period 3. Not illustrated.

ROOF SLATES

A number of fragments of roofing slates were recovered from context 8, demolition material overlying the graves in Building 1, and 155, the fill of a linear slot cutting the top of a clay dump in Building 3. They are all medium grained micaceous sandstone from the Lower Devonian (Lower Old Red Sandstone). They are very similar to slates found at Kirk Close and Canal Street II, Perth. The slates from all 3 sites have been matched to specimens from a disused quarry at Aberlemno (Ford 1987 b, 149). The slates from Aberdeen and Linlithgow are likely to be from a similar source.

The number of roofing stones is very small. There is a general dearth of demolition rubble associated with the structures. This may be due to the later levelling of the site and landscaping which took place in 1740 (see Chapter 6.1). However, despite the small number of slates recovered, the friary building may still have been roofed or partially roofed in stone.

COUNTERS OR LIDS (Ill 109mf)

389. Width 48mm (max); thickness 7mm. Flat disc cut into a roughly hexagonal shape. Broken at 1 edge. Medium grained micaceous sandstone. Context 108, Period 4, (Accession J207).

390. Diameter 101mm (max); thickness 10.6mm. Flat disc, broken across 1 side. Fine-grained micaceous sandstone. Context 150,

Period 4, (Accession J092).

WORKED STONE (Ill 109mf)

391. Length 126mm (max). Width 120mm (max). Max Thickness 9mm (max). Flat, shaped stone with 3 cut notches in 1 edge. Fine grained micaceous sandstone. Trench 6, Context 11, no period assigned, (Accession J268).

MORTAR? (Not illustrated)

392. Thickness 34mm (max). Abraded fragment possibly from the wall of a mortar. Thickness narrows towards the bottom of the fragment. The inner surface has been smoothed although no traces of any tooling marks remain. Cream gritty limestone. Context 189, Period 4, (Accession P217).

BOWL? (Ill 103)

393. Length 73mm. Width 51mm. Thickness 28mm (max). Part of bowl with trefoil decoration at corner. Fine grained metamorphic rock. Context 6, Period 4, (Accession J076).

WHETSTONE (Ill 104)

394. Length 91.50mm. Width 13.50mm. Thickness 12.90mm (max). Complete. Tapers towards 1 end. Pierced for suspension at the other end (diameter of hole 6mm). Hole cut from both sides. Stone shows signs of wear on all 4 faces, but particularly on the wider faces. There are a number of small shallow grooves on all 4 faces. Very fine grained quartzite. Context 129, Period 3, (Accession J163).

9.6.3 CERAMIC OBJECTS D W HALL

FLOOR TILES (Not illustrated)

395. 3 fragments. Most complete piece 30mm thick and 107 x 67mm. Hard fabric, orange/red in colour. Largest fragment has traces of green glaze on its surviving edge. Context 104, Period 4.

396. Fragment. Thickness not available. Hard fabric, orange/red. 1 surviving bevelled edge. Context 128, Period 3, (Accession P345).

ROOF FURNITURE

The major concentration of tiles at the Perth friary were recovered from the backfill layers of ditch 141. The proximity of this feature to the E end of Building 2 may suggest that the tile fragments came from this building. Artefactual evidence from the demolition levels across the 3 buildings suggest that the roofs were covered with larger stone roof tiles, but the presence of these ceramic tile fragments may suggest a mix of roof coverings on some of the buildings. Excavations at Perth High Street (PHSE unpublished) and Mill Street, Perth (Holdsworth forthcoming) have suggested that the buildings in the medieval burgh were roofed with thatch with tiled ridges and borders. The evidence from the Carmelite friary may suggest that some of the friary buildings had tiled ridges, mixed stone and tile roofs.

It is possible that the ceramic tiles may link with Bishop George Brown's rebuilding of parts of the friary in the 16th century (see Chapter 6.1).

PEG TILES (Not illustrated)

397. 1 fragment. Thickness 14mm. Hard fabric, orange/brown with grey core. Top surface glazed green. Context 124, Period 2, (Accession P116).

398. 1 fragment. 105 x 76mm, thickness 8mm. Hard fabric, orange with grey core. Both surfaces glazed green. Context 128, Period 3, (Accession P089).

399. 2 fragments. Thickness 12mm. Hard fabric, orange/red with grey core. 1 glazed green on upper surface, second piece glazed orange/yellow on upper surface. Context 128, Period 3.

400. 1 fragment. 146 x 92mm, thickness 15mm. Hard fabric, orange/brown with grey core. Top surface glazed green. Bottom surface shows signs of smoothing. Context 129, Period 3, (Accession P222).

401. 4 fragments. Thickness 12mm. Hard fabric, orange/red. 3 fragments have green glaze on upper surfaces. Context 129, Period 3.

402. 1 fragment. Thickness 10mm. Hard fabric, light brown. Top surface has traces of brown glaze. 1 surviving edge. Context 129, Period 3, (Accession P167).

403. 2 fragments. 15 and 12mm thick. Hard fabric, orange/red with grey core. Top surfaces glazed green on 1 piece and brown on other. Context 142, Period 3, (Accession P104).

404. 2 fragments. 12 and 14mm thick. 1 fragment hard orange/red

fabric with grey core. Top surface glazed green. 1 surviving edge. Second fragment in hard grey fabric. Top surface glazed yellow/green with brown decoration. Bottom surface glazed green. Context 8, Period 4, (Accession P175).

405. 1 fragment. 54 x 51mm. Thickness 15mm. Hard fabric, orange/brown. Top surface glazed amber/green with signs of wiping on clay. 2 surviving edges, 1 glazed amber over linear scored line 5mm wide. Context 30, Period 4, (Accession P064).

406. 2 fragments. Thickness 12 and 15mm. Hard fabric, orange/red with grey core. Top surfaces glazed green. 1 piece has 1 surviving edge glazed green. Context 30, Period 4, (Accession P231).

407. 1 fragment. Thickness not available. Hard grey fabric. Top surface glazed green. Context 30, Period 4, (Accession P185).

RIDGE TILE (Ill 109mf)

408. 1 fragment. 80 x 62mm. Thickness 12mm. Hard grey fabric. 1 surface glazed green/brown over 2 raised decorative strips. Opposing surface glazed yellow/green. Context 128, Period 3, (Accession P140).

409. 1 fragment. 75 x 76mm. Thickness 12mm. Hard grey fabric. Upper surface glazed green. Under surface has smoothed channel that may be a 'keying' position for its location on the roof ridge. Context 128, Period 3. Not illustrated.

PAN TILE (Not illustrated)

410. 1 fragment. Thickness 12mm. Hard orange/red fabric. 1

surviving lug. Context 30, Period 4.

9.6.4 LEAD OBJECTS B FORD

6 objects of lead were recovered from the Perth site. These included 3 fragments of window cames (411, 412, 413). They all have the typically H-shaped cross-section. They were probably cast in a two-part mould. 411 was recovered from the fill of a robber trench cutting layer 30. A large quantity of window glass was also recovered from layer 30. The glass is thought to have been from the E window of Building 1. 412 was recovered from the upper fill of ditch 141, where it was also associated with fragments of window glass. 413, which would have surrounded a complete pane of glass, was found in the fill of a possible room division in Building 3, and was associated with occupation debris.

414, a small disc with an incised cross on one surface, was recovered from demolition material over the buildings.

415, a fragment of lead sheeting, was recovered from a demolition layer overlying the graves in Building 1. 416, a spoon, is very badly chipped. It was recovered from an context which was not assigned to a period.

WINDOW CAMES (Ill 94)

411. Length 78.50mm. Width 8mm (max). Thickness 4.70mm. Bent and distorted. Context 109, Period 4, (Accession E161). Not illustrated.

412. Length 45.50mm. Width 3mm. Thickness 2.50mm. Bent and distorted. Context 129, Period 3, (Accession E200). Not illustrated.

413. Length 40mm (max). Width 4.40mm. Thickness 3mm. Triangular shaped, slightly distorted. Context 155, Period 2, (Accession E159).

DISC (Not illustrated)

414. Diameter 29mm (max). Thickness 1.20mm. Flat disc with incised cross on 1 surface. Reverse plain. Context 103, Period 3, (Accession E069).

SHEET (Not illustrated)

415. Length 14.10mm. Thickness 3.60mm. Triangular shaped fragment of cut sheet. Context 8, Period 4, (Accession E033).

SPOON (Ill 109mf)

416. Overall length 64.50mm; length of bowl 22.50mm. Crudely fashioned, handle bent. Bowl chipped and broken around edges. Trench 7, Context 19, no period assigned, (Accession E020).

9.6.5 COPPER ALLOY OBJECTS B FORD

With a contribution by J Cherry

6 copper alloy objects were recovered from the site, including a seal matrix (417), from a robber trench at the junction of the E and S walls of Building 1. The remaining 5 objects were 2 pins (419 and 420), sheet fragments (421, 422), and a pair of tweezers (418).

The pins and sheet fragment (422) were recovered from contexts which could not be assigned to a period. The pin (420), has a wire wound head, a type common throughout the medieval and post-medieval periods. There are pinch marks below the head formed when the head was stamped into position. 418 and 421, were recovered from

contexts in the earliest phase of the site, dated to the late 13th century. 421, possibly part of a rivet, was found in the fill of a disturbed grave and 418, overlying the foundation cut of wall 134.

418 is a pair of tweezers with wide flat terminals. The loop on the arms was possibly to hold the terminals together by sliding it down the handles, thus clamping the jaw shut or was possibly for attaching them to a loop perhaps for suspension from a belt. Another pair of tweezers with wide flat terminals has been recovered from the excavations at Meal Vennel, Perth, while a number have been found elsewhere, for example Northampton (Oakley and Webster 1979, 256). An example from Swan Lane, London, has been interpreted as a clip to hold sheets of parchment in place, perhaps in a scriptorium (Alexander and Binski 1987, 384, Ill 426).

SEAL MATRIX (Ill 95, Table 64mf) J CHERRY

417. Length 40.40mm. Width 25.50mm. Pointed oval in shape. The front is stamped around the edge with the legend S' PRIORIS: FRATRUM:CARMEL:DEPERT. The central scene shows a friar kneeling to left under a pointed arch above which is the Virgin feeding the child. On either side of the arch is a framework, possibly representing a screen, on which there stands to left a candle, to right a fleur-de-lis. The back is plain with a loop handle at the top. Context 183, Period 4, (Accession E151).

The importance of the seal matrix is two-fold. Firstly it appears to be the only seal matrix of the Carmelites surviving from medieval Scotland. Secondly it provides evidence not only for the prior's seal of the Perth house but the matrix itself may well date from the early years of the foundation, possibly to the late 13th century.

Both the identification and the date of the seal depend on the inscription. The epigraphic characteristics of the inscription, the rounded C and E, the serifs at the top of the bar in the A, and the slightly raised lower part of the L, all point to a date in the second half of the 13th century or the early years of the 14th century.

The only reference to a seal of the Perth house is in 1488 although I have not been able to examine the original (Edwards 1910, 75: see also Laing Chrs, nos 92, 119; ER, x, 393). The richer and larger Carmelite communities had 2 seals - the seal of the community and the seal of the prior. It is possible that smaller houses may have had only 1 seal. For 3 English houses, Appleby, London and Oxford, both seals are recorded (for Appleby an impression of the community seal is in the collection of the Society of Antiquaries of London, and the prior's seal in Birch 1881, no 2560; for London the Community seal is Birch 1881 no 3571, the prior's seal no 3572; for Oxford, the Community seal is no 3812 the prior's seal nos 3814, 3815). Perth is the only Scottish Carmelite house to have had both seals, the seal referred to above and the matrix of the prior's seal now discovered.

None of the other seal impressions recorded for the Carmelites in Scotland are specifically indicated by their inscription to be that of the prior of the house. A list of those impressions to which I have found reference appears in Table 64mf as a basis for further research.

There are however 5 English Carmelite houses where the prior's seal survives either in matrix or impression. They are

Appleby, Chester (Birch 1881, no 2923; Pedrick 1902, 51, pl 34), London, Marlborough (2: the earlier is Tonnochy 1952, no 846, the later Birch 1881, no 3618), and Oxford (2). All have the Virgin and Child and some have additional local features such as St Paul on the London prior's seal, or an ox on the Oxford prior's seal. One of the Marlborough seals has a mount with a tree on each side of the Virgin and Child, and Chester has the Virgin flanked by candlesticks. All except Chester show a friar kneeling in prayer. There appears to be no satisfactory dating for any of the seals except for epigraphic evidence and the attachment of the second Oxford prior's seal to a charter of 1416.

No other Carmelite matrices are known to me from Scotland although matrices of other orders of friars do survive. The matrix of the Dominicans of Perth is in the National Museum of Antiquities (Laing 1866, no 1174). No matrices of the seal of the community have survived in England but of the 7 seals of the priors known from English houses, 4 matrices are known, the 2 for Marlborough, 1 for Oxford, and 1 for Chester. The matrix of 1 of the Oxford prior's seals (Birch 1881, no 3814) is in the Ashmolean Museum, Oxford (R14). The Chester matrix is now lost; the only reference to it is on the back of the impressions in the Society of Antiquaries collection. This says 'taken by Thomas Townshend of the city of Chester from a seal found 39 years since when digging the foundations of a building. March 1801'. Both the Marlborough matrices are post 1316 and it is therefore clear that the Perth find is a considerable addition to our knowledge of Carmelite matrices.

No research appears to have been carried out on the

development of the iconography of Carmelite seals in England and Scotland. One of the great difficulties is the lack of evidence for the close dating of the seals. The 2 seals of the priors of Marlborough must be later than 1316 when the house was founded. The second prior's seal of Oxford must date from before 1416. The seal of the community at Hitchin must be later than 1340 on account of the royal arms used (for the seal of the house of Hitchin see the impressions in the Society of Antiquaries collection). In contrast to the simple iconography of the prior's seal, the seals of the communities often display a more elaborate iconography, for instance the seal of the Oxford Carmelites shows the friars kneeling before Henry III. The depiction of the arms of the king is a feature that often occurs on the seal of the community but not on that of the prior.

The discovery of the seal of the prior of the Carmelites in Perth is a valuable addition not only to the evidence for Carmelite seals in Scotland but also for the consideration of the role of the prior's seal as opposed to the community seal among the Carmelites.

TWEEZERS/PARCHMENT CLIP? (Ill 96)

418. Length 41.40mm. Very corroded. Now in 2 fragments. Made from a single piece of folded sheet cut to shape. Wide flat terminals. Small copper alloy loop wrapped around handle. Context 125, Period 1, (Accession E160).

Table 69mf. Seal impressions of Carmelite houses in Scotland

1. The brothers Carmelite in Scotland. Laing 1866, no 1184. A round seal with a well executed design of St Andrew on the cross, crowned with the nimbus. At each side is a branch of foliage: a crescent and mullet above, and in the lower part a friar kneeling at prayer, within a niche. Used by Robert, provincial general of the order in Scotland in 1492.

2. Aberdeen. Prior. Laing 1866, no 1109. A singular design representing the Resurrection. Beneath a Gothic canopy, a figure of the Saviour with a cruciform nimbus, a cross in his left hand, his right hand pointing upwards, stepping out of a tomb. Used by the prior and convent in 1411, though the inscription does not make it absolutely clear that this is the prior's seal.

3. Aberdeen. Chapter. Laing, 1866, no 1108. A double niche: in the dexter a full length figure of the Virgin holding the infant Jesus in her arms. In the sinister, a bishop robed and mitred. In the centre above, is the Saviour on the cross, and in the base of the seal a friar praying. Used in 1437.

4. Aberdeen. House. Laing 1866, no 1110. A round seal. A geometrical figure of intersecting triangles, or rather a mullet of 5 points merely in outline, and the letters M.A.R.I.A. in the external spaces.

5. Banff. Laing 1866, no 1116. Salutation of the Virgin, and below is a friar praying.

6. Perth. Edwards 1909-10, 75: see also Laing Chrs, nos 92, 119: ER, x, 393.

7. Queensferry. Laing 1866, no 1175. A figure of the Virgin with the infant Jesus in her arms, standing on a crescent, surrounded by an aureole. Used in 1564.

8. Linlithgow. Laing Chrs, no 490. Seal attached, Virgin and Child

(on left arm). Legend 'COMMUNE SIGILLUM MONASTERII [DE LIN] LITHCU'.

9. Linlithgow. Lairg Chrs, nos 621, 715. Seal, larger than 8 (above), Virgin with Child on right arm. Legend 'S. COMMUNE MONASTERIJ DE... EL'.

PINS (Not illustrated)

419. Length 64.50mm. Diameter of shank 4.80mm. Width of head 11.70mm. Thickness of head 4mm. Circular perforated head with 2 moulded decorative bands below. Circular cross-sectioned shank terminating in a blunt end. Tinned. Context 2, subsoil, (Accession E109).

420. Length 33.10mm. Diameter of shank 1.30mm. Width of head 2.90mm (max). Depth of head 2.60mm. Tightly wound wire head of 2 complete turns. Pinch mark below head. Circular cross-sectioned shank. Tip missing. Context 63, modern, (Accession E23).

MISCELLANEOUS (Ill 109mf)

421. Sheet fragment. Length 32mm. Rolled to form a tube, tapered at 1 end, opens out at the other, which is broken. Context 55, Period 1, (Accession E015).

422. Sheet. Length 76.50mm. Width 9.50mm. Thickness 1.60mm. Fragments of a cut sheet. Curved and bent. Context 2,

subsoil, (Accession E225). Not illustrated.

9.6.6 IRON OBJECTS B FORD

With a contribution by A Walsh

423 is a pricket candlestick. The pricket spike on to which the candle would have been impaled is now broken. It is decorated with 2 side scrolls. It has an angled stem which is similar to that on a candlestick recovered from excavations at Mill Street, Perth, from a context of 13th-14th century date (Ford forthcoming c, no 214), and one from London of c 14th-century date (Henig 1974, fig 38, no 71). 423 was recovered from a layer underneath floor surface 147 within Building 3.

424, is a small key, possibly from a box. It has asymmetrical wards so, therefore, could only have been used from 1 side of a lock. It was recovered from the backfill of robber trench 107, the E wall of Building 3.

425, a D-shaped buckle, is of a type found throughout the medieval period. It was found overlying laid stones 173, E of robber trench 107, the E wall of Building 3. Similar D-shaped buckles in copper alloy have been found in Perth and an elongated D-shaped iron buckle was recovered from a 14th/15th century context at Methven Street, Perth (Ford 1987 a, 131, ill 65, no 66).

A number of woodworking tools were found during the excavation. 426, a spoon bit, is an example of a common type of auger bit used to bore holes in wood. A similar incomplete example was found at excavations at Kirk Close, Perth (Ford 1987 a, 134, ill 67, no 95) and many examples have been found on medieval sites such as Sandal

Castle (Goodall I H 1983, 240, fig 4, nos 35-40). 426 was recovered from a disturbed context. 427, a reamer, is a tool used for enlarging a previously bored hole. The tang was probably inserted into a wooden cross handle. It was recovered from subsoil. Another smaller reamer was found at excavations at Mill Street, Perth from a context of 15th - c 18th century date (Ford forthcoming c, no 209). Other reamers similar to 427 though generally with thicker blades, have been found on a number of sites, 1 from Hangleton, W Sussex is of 13th - 14th century date (Hurst and Hurst 1964, 137, fig 13, no 11) and 1 from Northampton is dated 1410-20 to c 1500 (Goodall I H 1979, 273, fig 119, no 62). 428, a file probably used for the smoothing and shaping of wood, has a whittle tang for insertion into a bone or wooden handle. Files are uncommon finds from medieval contexts. 428 was recovered from the backfill of robber trench 107, the E wall of Building 3. 426, 427 and 428 are an interesting group of objects, although it is unfortunate that on the whole they were recovered from unstratified or disturbed contexts. We know from the documentary evidence that a certain amount of repair and maintenance work was carried out at the Carmelite friary in the early 16th century. A major refurbishment of the Bishop of Dunkeld's residence in Perth was begun in 1507 with some work being carried out on the friary buildings at the same time. In 1509 more work was carried out at the friary, and this continued on through 1512 when records show that masons, slaters, carpenters and sawyers were all being employed. The last reference to building work is in 1515, although it is possible that it may have continued after this date. However, there is no documentary evidence to support this (see Chapter 6.1). It may be that the group of woodworking tools belongs to this period of intense activity at the friary.

429 is an unidentified strip with chisel-cut end. It was

recovered from the fill the grave of SK 11 which was a plank lined grave within Building 1, and could be part of a tool or coffin fitting.

430, a socketed point, was recovered from probable demolition material. It could possibly be a chape from the end of a wooden stick.

431 is a fragmentary U-shaped staple, a type common throughout the medieval period. Many more complete examples of this type have been recovered from Perth (Ford 1987a, 138, nos 110-3; Ford forthcoming c).

The swivel hook 432 was found in subsoil. It is very similar to one found on earlier excavations in Perth at Canal Street II, from a context dated to the early 14th century (Ford 1987a, 134, ill 68, no 99). Swivel hooks were often attached to the ends of chains to give more freedom of movement to objects such as cauldrons. Swivel hooks were also used on horse fittings as with a group from Urquhart Castle (Samson 1982, 466, nos 3-6). A very similar swivel hook to 432, still attached to its ring, was found at Goltho, Lincs dated from the late saxon to the late 14th century (Goodall I H 1975, 87, fig 41, no 108). Another was found at Somerby, Lincs, dating from the mid 15th to the mid 16th century (Mynard 1969, 81, fig 11).

433 was recovered from subsoil. It is possibly part of an iron vessel such as a bucket.

2 knives were recovered, 434 from demolition material overlying the graves in Building 1, and 435 from linear slot 192 at the N end of cobbled surface 182, beneath Building 3, a possible cobbled

courtyard associated with Building 1. 435 is a small fragment of a handle from a scale tang knife. Traces of wood are still adhering secured in place by copper alloy rivets. 434 is a fragment of a knife with a bolster between the scale tang and blade. This is a technique introduced into knife construction in the 16th century. It has a rivet hole in the scale tang for the attachment of a wooden or bone handle. An interesting group of knives with bolsters between tang and blade were found at excavations at Sandal Castle, and 434 has a similar simple bolster to 1 in this collection (Goodall I H 1983, 242, no 77).

436 is a horseshoe of a later medieval type, known to have been introduced before the middle of the 14th century (Clark 1986), but still in existence in the 17th century. It is characterised by tapering square or rectangular nail holes which would have used nails like 437. The inner arch of 436 is slightly pointed, which is also a characteristic of these later types of horseshoe (Clark 1986). It has an arrangement of 3/3 nail holes. The width of the shoe is quite narrow and is comparable to that of a horseshoe from Seacourt, Berkshire (Biddle 1961-2). 438 is a horseshoe nail used with horseshoes of an earlier type, examples of which have been found in Perth (Ford forthcoming c). 436 and 438 were recovered from the backfill of robber trench 107, the E wall of Building 3. 437 is from a context which could not be assigned to a period.

439 is an iron bar which was recovered from demolition material.

440 is an unidentified strip which could be part of a tool. It was recovered from the fill of a cut feature which had been heavily disturbed.

CANDLESTICK (Ill 98)

423. Length 70.40mm. 2 co-joining fragments of a pricket candlestick with 2 side scrolls. The pricket spike is broken. Angled stem, now bent. Context 224, Period 2, (Accession E189).

KEY (Ill 98)

424. Length 45.60mm. Width of bit 13mm. Ring bow now broken. Solid moulded stem with projecting tip, end missing. The bit is cut by 2 horizontal wards. Context 108, Period 4, (Accession E125).

BUCKLE (Not illustrated)

425. Length 29.50mm. Width 22.80mm. D-shaped. Circular cross-sectioned pin bar. Rectangular cross-sectioned frame. The iron pin is made from a tapering strip curve around the buckle. It has slipped from the pin bar around the frame. Context 172, Period 4, (Accession E114).

SPOON BIT (Ill 104)

426. Length 137mm. Width of blade 9mm. Very corroded spoon-shaped blade. Rectangular cross-sectioned shank. Lanceolate terminal. Context 122, Period 2, (Accession E082).

REAMER (Ill 109mf)

427. Length 145mm. Width of shank 11mm (max). Thickness 10mm (max). Tapering shank with rectangular cross section. Tang broken. Context 2, subsoil, (Accession E111).

FILE (Ill 109mf)

428. Length 92mm. Width of blade 10.50mm. Thickness of blade 5mm. Whittle tang file. Blade has rectangular cross section, broken

at end. Parallel cut teeth on all 4 faces. Context 108, Period 4, (Accession E124).

STRIP (Ill 104)

429. Strip with chisel-cut end. Length 65.30mm. Width 12mm (max). Thickness 4.50mm (max). Rectangular cross section. Tapers towards 1 end. Context 164, Period 1, (Accession E25?).

SOCKETED POINT (Ill 109mf)

430. Length 53.50mm. Diameter 14mm (max). Made from a rolled sheet, tapers to 1 end. Context 30, Period 4, (Accession E254).

STAPLE (Not illustrated)

431. Length 59mm. U-shaped staple. The straight arms have a diamond cross section. 1 arm missing. Unstratified, (Accession E249).

SWIVEL HOOK (Ill 109mf)

432. Length 73mm. Width of loop 35mm. Oval pointed head. Square cross-sectioned shank. Tip has been flattened and wrapped around the shank below the head to form a loop. Context 2, subsoil, (Accession E108).

VESSEL (Not illustrated)

433. Length 94mm. Thickness 1mm. 2 corroded iron sheet fragments. Slightly curved. Joined by an overlapping joint. Context 2, subsoil, (Accession E051).

KNIVES (Ill 104)

434. Length 39mm. Very corroded fragment of a scale tang knife. Bolster between tang and blade, forged in 1 piece with tang and blade. Both tang and blade are broken. Rivet hole in scale

tang. Context 8, Period 4, (Accession E058).

435. Length 29mm. Width 13.70mm. Thickness 8mm (max). Fragment of a handle from a scale tang knife. Wooden handle fragments still attached by 2 copper alloy rivets. Context 125, Period 1, (Accession E157). Not illustrated.

HORSESHOE (Ill 109mf)

436. Width 100mm. Inner profile has pointed arch. 6 rectangular tapering nail holes. Context 108, Period 4, (Accession E209).

HORSESHOE NAILS (Not illustrated)

437. Fragmentary. Flat topped expanded head. Trench 5, Context 26, no period assigned. (Accession E042).

438. Fiddle-headed nail with flat top. Width of head, no wider than shank. Context 108, Period 4, (Accession E128).

MISCELLANEOUS (Not illustrated)

439. Bar. Length 170mm. Width 18mm. Thickness 14mm. Very corroded iron bar tapering to 1 end. Context 104, Period 4, (Accession E203).

440. Strip. Length 76mm. Width 15mm. Thickness 8.50mm. Rectangular cross-section. Tapers to a bent point at 1 end. Context 67, Period 4, (Accession E255).

NAILS A WALSH

A total of 280 nails were recovered from the excavation, of these 12 were unstratified and 103 came from contexts which could not be assigned to a period. The majority of the nails were badly corroded

and have not had any conservation treatment. However, some classification has been attempted using visual examination and X-ray. The classification follows that used by Ford and Walsh (1987, 139).

A Circular, oval, square or rectangular flat head, with square or rectangular cross-sectioned shank.

B Circular, oval, square or rectangular domed head, with square or rectangular cross-sectioned shank.

C Circular, oval, square or rectangular flat head, with circular cross-sectioned shank.

D Circular, oval, square or rectangular domed head, with circular cross-sectioned shank.

E Flat L-shaped head with square or rectangular cross-sectioned shank.

F Flat T-shaped head with square or rectangular cross-sectioned shank.

G Flat figure-of-eight shaped head with square or rectangular cross-sectioned shank.

H Square or rectangular flat head formed by flaring rectangular or square cross-sectioned shank.

I Faceted head, with square or rectangular cross-sectioned shank.

J Horseshoe nails (see above, 437 and 438).

Table 70mf. Distribution of recognised nail types by period.

Nail Type	Period 0	1	2	3	4	No period	Unstratified	Total
A		3	17	23	58	37	6	144
B			1					1
C						5		5
F			1	1	10	20		32
H			2					2
I				1		5		6
J					1	1		2
Unidentified	1	2	10	11	23	35	6	88
Total	1	5	31	36	92	103	12	280

Period 1

2 nails came from burials, 1 from grave 231 (SK 21), outwith the building, the other from grave 237 (SK 6), an internal burial. Neither grave contained a coffin. 1 nail was found in context 7, the mortar through which all the burials were cut. None of the 3 coffins present used nails in their construction so it is unlikely that these nails are associated with the skeletons. It is possible that they were dropped during construction of the building although the fact that 5 were broken and the only complete example has wood remains attached suggests prior use.

2 nail shanks were recovered from 125, fill of a possible boundary to the cobbled surface 182 (see Chapter 6.2).

Period 2

16 nails were recovered from grave 190 (SK 16) of which 9 have wood remains attached. On 8 examples the grain of the wood is at right angles to the shank. On 1 example the angle is oblique. 3 identifiable types are present; type A (11 nails), type B (1 nail) and type H (1 nail). The latter has no wood remains attached. It is most likely that these nails are the remains of a nail built coffin. 1 nail (type H) was found in grave 158 (SK 9).

6 nails, 2 complete, came from layers within Building 2. 7 came from internal layers of Building 3, 3 from one post-hole. 1 nail was found externally, under the robber trench 106.

Period 3

4 nails were recovered from the demolition debris of Building 1, the friary church. These were type A (2 nails), 1 shank (rs), and type I (1 nail). Such a small quantity of nails found supports the hypotheses that the roof was removed some time before the collapse or demolition of the walls.

32 nails came from layers making up the backfill of ditch 141. It is unlikely that they represent the remains of a coffin for SK 13. They are probably part of the general debris cleared up to backfill the ditch. 3 of these nails were complete (44, 56 and 62mm long), and 1 had wood remains attached with the grain running at an oblique angle to the shank.

Period 4

20 coffin nails came from grave 87 (SK 5). All except 3 had wood remains attached to the shank, 14 with the grain running at right angles to the shank and 3 with the grain running in the same direction as the shank. All the nails were positioned in a rough rectangle around the skeleton suggesting that they were all used in the construction, ie none appear to have been used for attaching handles or other fittings. There were 19 type A nails and 1 shank (rs). Just 1 nail was complete on examination (length 68mm) but they were all of a similar size in head and shank widths.

1 nail came from each of 3 graves - 92, 98 (both empty) and 72 which contained SK 3. These graves cut layer 8 which yielded 17

nails, so it is likely that the nails from the graves are residual.

The rest of the nails from this period come from the various small pits, the backfill or robber trench and the fills of other miscellaneous small features.

The nails from Trenches 4, 5, 6 and 7, the subsoil and the unstratified layers have not been discussed, although a full catalogue is in archive.

9.6.7 BONE OBJECTS (Not illustrated) B FORD

441. Offcut. Length 47.70mm. Width 16mm. Cut rectangular fragment of large mammal long bone. All 4 sides have been roughly filed. Context 2, subsoil, (Accession K202).

9.6.8 COIN (Not illustrated) B FORD

442. Unidentified. Extremely worn. Trench 1, unstratified, (Accession E101).

10.2 LINLITHGOW. THE OWL PELLETS R RALPH

Two owl pellets were recovered from context 5025, a Period 4 decay horizon within the area of the chancel of the friary church at Linlithgow.

These specimens are full of the remains of small mammals, limb bones, vertebrae, skull fragments and teeth. The remains can be identified with certainty from the teeth patterns. There are two small mammals represented, the field vole Microtus agrestris, and the common shrew Sorex araneus. The field vole has flattened grinding teeth with a characteristic pattern of whorls; the common shrew has much sharper teeth with many cusps that are often tinted a reddish colour. Pellets are produced by all predatory birds, owls and birds of prey like kestrels. The two pellets here contain no identifiable remains of other small mammals or insects. The dominant prey item in them is the vole. There have been many studies on pellets and the composition of these two specimens suggests that they come from tawny owls. These owls prey primarily on voles but take shrews as well in the ratio of about six voles to one shrew. This ratio is roughly represented in these two pellets. In one specimen there is a preponderance of young shrew remains, this is clear from the unworn state of the teeth, suggesting that the pellet was produced in the summer.

10.3 PERTH. THE ANIMAL REMAINS C SMITH

CONTENTS

1. METHODS AND MEASUREMENT

The animal bones were identified by direct comparison with modern defleshed specimens.

Ribs, unidentified butchers' chips and vertebrae other than the first two cervical vertebrae were merely examined for evidence of butchery but were not included in the total number of bones identified. Unidentified vertebrae are referred to in the text as being either 'cf cattle' or 'cf sheep'. Thirty nine loose teeth were assigned to species but were not included in the total numbers of bones identified. Because of the difficulties in distinguishing between sheep and goats, bones of these species were classified as sheep, goat or sheep/goat. Bird bones were identified only as to the bone and not as to species. Fish bones were not included in the total number of bones identified. The scheme of measurement follows that of von den Driesch (1976).

2. NUMBERS OF BONES IDENTIFIED

A total number of 415 bones of mammals and birds were identified from Periods 1 to 4 of the site of Perth Carmelite friary. In addition 517 bones were identified from contexts which could not be assigned to a period.

10.3 PERTH. THE ANIMAL REMAINS (cont)

3. SPECIES PRESENT

Bones of cattle, sheep, goat, sheep/goat, pig, horse, dog, cat, roe deer, small mammal and bird were recovered from Periods 1 to 4. Oyster shells occurred in Periods 3 and 4. Bones of red deer, dog/fox, rabbit and fish were found only in contexts which were not assigned to a period.

4. RELATIVE FREQUENCIES OF SPECIES

The numbers of bones identified from each species for each period is given in Table 71mf.

The minimum number of animals present, based on a bone which was common to each period for each species, is given in Table 72mf. Table 73mf gives the percentages of bones of food-forming species from Whitefriars and other sites excavated in Perth. This data indicates that, despite the small sample size, and the fact that Whitefriars was a religious rather than a secular site, the order of reliance on the domestic species does not diverge greatly from that of other medieval sites in Perth.

Cattle and sheep/goat were the most heavily utilised species. However, the number of pig bones is very low, compared with the other sites in Perth.

Several alternative explanations may be offered to account for this low uptake of pig meat; one that pork was indeed eaten but in the form of bacon or cured salt pork, which would leave no trace in the archaeological record if the meat had been cured elsewhere. A second explanation may be that the occupants of the site may have preferred other meats to pork on the grounds that the pig is an 'unclean' animal. Clutton-Brock (1981, 77) has said that no other animal has been subject to so many religious taboos as has the pig. Thirdly, the soil conditions may not have been conducive to the preservation of pig bones. Decomposition is accelerated by fat

(Noe-Nygaard 1977, 234) and since the pig generally bears more fat than cattle or sheep it might be expected that pig bones would decompose more readily than those of other domestic mammals.

A single bone of roe deer was found in Period 3, while red deer was only present in a context where no period was assigned. This low utilisation of game animals is in accordance with other sites within the burgh of Perth (see Table 73mf). It would appear that the friars had little access to the luxury of venison as did the more common occupants of the burgh. The absence of fish bones from Periods 1-4 seems surprising in view of the religious nature of the site. Some religious precepts decreed an abstinence from meat during Lent and on ember days, as well as on Tuesday, Friday and Saturday in every week (Pullar 1972, 96). However in the case of the Carmelites at least, it seems that by the 15th century, if not before, there had been considerable mitigation of these regulations (Baudrillart 1949, 1084).

In addition since soil sieving did not take place it is possible that fish bones were present at the site but went unnoticed due to their small size. The scarcity of small mammal bones may have occurred for the same reason.

10.3 PERTH. THE ANIMAL REMAINS (cont)

Table 71mf Numbers of bones identified from each species, by period

	Period					
	1	2	3	4	No period	Total (in Periods 1-4)
Cattle	12	20	128	66	258	226
Sheep	1	2	2	5		10
Goat	-	1	1	-		2
Sheep/goat	3	11	71	48	219	133
Pig	-	1	-	1	7	2
Horse	-	1	5	3	4	9
Roe deer	-	-	1	-	-	1
Red deer	-	-	-	-	1	-
Dog	-	-	2	3	-	5
Dog/fox	-	-	-	-	2	-
Cat	-	-	-	2	3	2
Rabbit	-	-	-	-	12	-
Small mammal	-	-	1	-	-	1
Bird	1	16	4	3	11	24
Fish	-	-	-	-	*	-
Oyster	-	-	*	-	-	*
Total	17	52	215	131	517	415

(The presence of fish and oyster is indicated by a *)

Table 72mf Minimum numbers of animals present in each period

		Period			
	Based on	1	2	3	4
Cattle	L. femur	1	-	2	2
Sheep/goat	L. tibia	-	-	6	2
Pig	R. mandible	-	1	-	-
Horse	R. metacarpal	-	-	1	-
Roe deer	L. metatarsal	-	-	1	-
Dog	L. femur	-	-	1	-
Cat	L. tibia	-	-	-	1
Small mammal	L/R. radius	-	-	1	-
Bird	R. coracoid	-	3	1	-

Table 73mf Presence of bones of food-forming mammals from nine sites in Perth (12th to 16th century levels only).

SITE	Cattle	Sheep/ Goat	Goat	Pig	Horse	Deer
High St	63.5	22.2	4.9	8.3	1.0	0.1
St Ann's Lane	57.6	32.8	*	8.9	0.4	0.2
Canal St I	58.2	32.1	0.1	5.8	3.6	-
Canal St II	67.7	27.1	*	3.4	1.8	-
Methven St	81.5	17.3	*	1.2	-	-
Kirk Close	76.1	18.7	*	4.8	0.1	0.1
Mill St	62.8	27.9	2.7	3.5	2.7	0.4
Kinnoull St	63.1	29.3	*	7.6	-	-
Carmelite friary 1-4	59.0	37.3	0.5	0.5	2.3	0.3

(* sheep and goat are expressed as one figure because of the difficulties in distinguishing between the two species).

5. AGE OF ANIMALS AT DEATH

a. Cattle and sheep/goat

Because of the small sample size, evidence of the ages of animals at death was meagre. However, bones and mandibles of cattle and sheep/goat which yielded the appropriate evidence of tooth eruption and wear and/or epiphyseal fusion were grouped into the following categories:

CATEGORY	AGE
F	Foetal/neonatal
J	Juvenile
J/I	Juvenile/immature
I/A	Immature/adult
A	Adult

The approximate modern equivalents as regards cattle would be F=newborn, J=less than 18 months, I=c 18 months-4 years A=4 years and over. Tables 74mf and 75mf give the distribution of cattle and sheep/goat bones in each of the categories.

Table 74mf Numbers and percentages of cattle bones classified as to age category and period.

	Period									
	1		2		3		4		Overall	
AGE CATEGORY	No.	%	No.	%	No.	%	No.	%	No.	%
J/I	-	-	5	55.6	15	39.5	4	16.0	24	31.2
I/A	2	40.0	2	22.2	12	31.6	14	56.0	30	39.0
A	3	60.0	2	22.2	11	28.9	7	28.0	23	29.9

Table 75mf Numbers and percentages of sheep/goat bones classified as to age category and period.

	Period									
	1		2		3		4		Overall	
AGE CATEGORY	No.	%	No.	%	No.	%	No.	%	No.	%
F	1	33.3	-	-	-	-	-	-	1	1.5
J	-	-	-	-	1	3.1	-	-	1	1.5
J/I	-	-	2	40.0	8	25.0	4	15.4	14	21.2
I/A	1	33.3	1	20.0	10	31.3	13	50.0	25	37.9
A	1	33.3	2	40.0	13	40.6	9	34.6	25	37.9

Apparently a substantial number of both cattle and sheep/goats survived into adulthood. Among the cattle, no foetal/neonatal animals were recorded, while only one sheep/goat bone was found in this category. However, differential preservation may have played a part in obliterating evidence of the more fragile young bones and mandibles, thus biassing the evidence in favour of the denser bones of older animals. High numbers of loose teeth are usually indicative of poor overall bone preservation, however in the case of Whitefriars, the total number of loose teeth recovered (thirty nine teeth) was not high. Of these, only two were deciduous ie from young animals. However, Maltby (1982, 82) has warned that small deciduous teeth, incisors and heavily worn teeth may tend to be missed during the excavation. Therefore, the interpretation of the available evidence must be treated with caution. In addition, in order to make comparisons between periods it must be assumed that conditions of

preservation and recovery in all four periods were similar. Bearing these assumptions in mind, comparisons between Periods 1 to 4, although based on small sample numbers, apparently show that more young animals died in Period 2 than in Period 3. The trend towards older cattle and sheep/goats appeared to continue in Period 4, ie the post-friary period.

b. Other animals

Pig - There was no evidence available as to the age of the pigs.
Horse - All of the bones came from adult animals.
Dog - One radius from an immature animal was found in Period 4, Context 184.
Cat - One tibia with an unfused proximal epiphysis (Context 8, Period 4) showed that a kitten had died.
Roe deer - There was no evidence as to the age of the roe deer.

6. BUTCHERY

Bones bearing evidence of butchery were plentiful. Some of these are described below under the headings primary, secondary and tertiary butchery, as defined by Armitage (1978).

Primary butchery

i. Removal of head. The occipital region of a cattle skull (Context 108, Period 4) was sliced across the condyles, showing how the head had been removed from the neck, by chopping between the head and the first vertebra of the neck (atlas). Several cattle axis vertebrae (second neck vertebrae) from Period 3 (Contexts 128 and 129) had suffered oblique or transverse blows, showing that the head had been removed by chopping between the atlas and the axis.

ii. Splitting of the carcass. Ten of cattle and three of sheep vertebrae were split in the sagittal plane, indicating that the carcasses from which they came had been divided into equal halves or sides, while two of cattle and five of sheep vertebrae had their

lateral edges chopped off, indicating that the carcasses had not been divided into sides. In the case of the sagittally split vertebrae, the animals had probably been suspended in order to aid butchery, while in the case of the laterally chopped vertebrae, the carcasses had probably been divided on a table or floor (Armitage 1982, 98).

iii. Removal of limbs. This process was indicated by the presence of chopped femur heads (Context 48, Period 2 and Context 142, Period 3), probably severed when the hind limb was removed from the innominate (pelvis). In modern butchery practice, the femur would be removed cleanly from the joint with the innominate by cutting the ligament by which the two bones are attached together (Gerrard 1977, 285).

Secondary butchery

i. Disjointing ie production of joints of meat.

Five cattle innominates showed evidence of chopping and hacking which had probably occurred during disjointing. One example (Context 108, Period 4) had been chopped twice (once at the acetabulum and once at the ilium) while the remainder had been chopped only once (Context 175, Period 3; Context 129, Period 3; Context 142, Period 3; and Context 52, Period 4). A cattle radius (Context 130, Period 1) had been chopped across the shaft, the joint produced perhaps being similar to the modern shin of beef.

Tertiary butchery

i. Cutting of flesh from the bone. Knife cuts, probably the result of cutting flesh from the bones, were observed on nine bones of cattle, sheep/goat and pig. Those bones most frequently affected were the distal humeri and proximal metapodials, although the cuts on the low meat yielding metapodials may have arisen during skinning.

ii. Marrow splitting. Many of the long bones of cattle and sheep/goat were split in the sagittal plane, probably due to deliberately cracking the bones open to extract the marrow.

BUTCHERY OF HORSE AND DOG

There was evidence of horses having been butchered in Periods 3 and 4. A horse scaphoid (wrist bone, Context 142, Period 3) had been deliberately sliced, while a horse distal humerus (Context 8, Period 4) showed evidence of knife cuts on the shaft. Whether the horse meat was consumed by humans or prepared as food for dogs is not known, although there is evidence that the early Christian church frowned on the practice of eating horseflesh as a 'practice fitting only for thieves' (McCormick 1981, 315). Butchered horse bones have also been found in medieval contexts at Perth, Kirk Close; Perth, Mill Street; Inverness, Castle Street; and Inverkeithing, 5/7 Townhall Street. In the case of dog, two bones, a distal tibia and tibia shaft (Context 8, Period 4) exhibited knife cuts. These marks could have arisen during skinning of the carcass, there being documentary evidence of dog skins having been exported from Scotland to England during the 17th century (Hodgson 1980, 65) but there remains the possibility that dogs may have been eaten in medieval Perth. Dog bones displaying similar knife cuts have been found at Perth, Canal Street I and Perth, High Street. During the times of economic hardship or dearth, the incentive to eat dog meat may have been great (ibid).

7. BONE GNAWING

There was evidence of bones having been gnawed by carnivores such as dogs, and by rodents such as rats. Details are given in Table 76mf.

Table 76mf Bones gnawed by dogs or rodents.

NUMBER AND PERIOD		SPECIES	BONE	GNAWED BY
Context 129	Period 3	Cattle	Femur	Dog
Context 129	Period 3	Cattle	Femur	Dog
Context 30	Period 4	Cattle	Unciform	Rodent
Context 2	No Period	Sheep/goat	Scapula	Rodent
Context 2	No Period	cf cattle	Shaft	Dog
SK 2	Period 4	Cattle	R innominate	Dog

10.3 PERTH. THE ANIMAL REMAINS (cont)

8. PATHOLOGY AND ABNORMAL BONES

a. Abnormal cattle phalanges (toe bones)

Six cattle first phalanges from Period 3 and Context 2 (no period) showed evidence of non-pathological depressions in both proximal and distal articulatory surfaces similar to those described by Baker and Brothwell (1980, 109-12). Type 1 depressions (oval marks mainly orientated in an anteroposterior direction), Type 2 depressions (narrow slits of variable length between the articular facets), and one Type 3 depression (narrow slits of variable length running across the articular facets in an oblique direction) were represented. Similar defects have also been noted in cattle phalanges from Perth High Street and Perth Kinnoull Street (Smith forthcoming). One phalanx from Whitefriars (Context 2) displayed, in addition to several non-pathological depressions, an extended proximal peripheral facet and slight eburnation (polishing) of the proximal surface, possibly indicative of osteoarthritis. A further cattle first phalanx (Context 8, Period 4) showed a small patch of eburnation on its distal surface. One cattle third phalanx (Context 2) exhibited a Type 1 depression.

b. Other pathological specimens

A cattle metacarpal (Context 142, Period 3) or cannon bone, was seen to have a small accessory metacarpal V, which is normally a separate bone, completely fused on, perhaps indicating that the individual from which it came was of advanced age. A sheep distal humerus (Context 104, Period 5) displayed a small lesion on the trochlea. A cattle lateral cuneiform (tarsal) (Context 2) showed a small Type 1 lesion on the posterior surface.

9. CARCASS ANALYSIS

Table 77mf gives the anatomical distribution of the various elements of cattle and sheep/goat as would be expected if the whole animal was

retrieved, and the actual numbers and percentages of bones found in Periods 1 to 3.

Recovery of the smaller elements such as carpals and sesamoids was very poor, despite the relatively high retrieval rate of metapodials, with which they would have been associated. Recovery of bones of small mammals and fish was similarly poor. However, the numbers of high meat yielding bones such as the humerus and femur (cattle total=35) compared with the low meat yielding metapodials (cattle total=21) gives a ratio which is greater than that obtained for a complete skeleton. This, together with the relative scarcity of skull fragments and horn cores, suggests that the refuse was domestic rather than commercial/industrial in origin.

10. SIZE OF ANIMALS

The dimensions of the bones of cattle, sheep/goat and horse fell within the size ranges of those already published for medieval Scottish burghs (Hodgson 1983).

A dog metatarsal III (Context 142, Period 3) had a greater distal breadth (13mm) than any previously encountered from medieval Scotland.

Table 77mf Expected and actual numbers and percentages of cattle and sheep/goat from Periods 1 to 3.

	EXPECTED		ACTUAL			
			Cattle		Sheep/goat	
	No.	%	No.	%	No.	%
Horn core	2	2.2	-	-	1	1.1
Skull	1	1.1	4	2.5	-	-
Premaxilla & maxilla	4	4.3	2	1.2	1	1.1
Mandible	2	2.2	7	4.4	7	7.7
Atlas	1	1.1	-	-	-	-
Axis	1	1.1	3	1.9	-	-
Scapula	2	2.2	12	7.5	7	7.7
Humerus	2	2.2	20	12.5	15	16.5
Radius	2	2.2	14	8.8	8	8.8
Ulna	2	2.2	2	1.2	1	1.1
Carpals	10	10.8	-	-	-	-
Innominate	2	2.2	14	8.8	5	5.5
Femur	2	2.2	15	9.4	7	7.7
Tibia	2	2.2	11	6.9	21	23.1
Patella	2	2.2	2	1.2	-	-
Os malleolare	2	2.2	1	0.6	-	-
Astragalus	2	2.2	5	3.1	1	1.1
Calcaneum	2	2.2	9	5.6	3	3.3
Naviculo-cuboid	2	2.2	1	0.6	-	-
Lateral cuneiform	2	2.2	1	0.6	-	-
Metapodial	4	4.3	21	13.1	11	12.1
1st phalanx	8	8.6	6	3.8	3	3.3
2nd phalanx	8	8.6	6	3.8	-	-
3rd phalanx	8	8.6	4	2.5	-	-
Sesamoid	18	19.3	-	-	-	-
Total			160	100.0	91	100.1