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Excavations at Kelso Abbey

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With contributions on the ceramic material by Eoin Cox, George Haggarty and John G Hurst

'Here are to be seen the Ruines of an
Ancient Monastery founded by King David'
(John Slezer, *Theatrum Scotiae*)

SUMMARY

The following is a report on an archaeological investigation carried out in 1975 and 1976 on garden ground a little to the SE of the surviving architectural fragment of this Border abbey. Evidence was forthcoming of intensive occupation throughout the monastery's existence from the 12th to the 16th centuries. The area, first utilized perhaps as a masons' lodge during the construction of the church and cloister, was subsequently cleared before the close of the 12th century to accommodate the infirmary hall and its associated buildings. This capacious structure, no doubt badly damaged during the Wars of Independence, had largely been abandoned by the end of the 15th century when its remaining walls were partially taken down and another dwelling erected upon the site. This too was destroyed in the following century, the whole area becoming a handy stone quarry for local inhabitants before reverting to open ground.

INTRODUCTION

It is a source of regret that Kelso, the oldest, the wealthiest and the most powerful of the four Border abbeys, should have been the one to have survived the least unimpaired. Nothing of the cloister save the outer parlour remains (illus 4), but what survives of the church has been described 'of surpassing interest as one of the most spectacular achievements of Romanesque architecture in Scotland' (Cruden 1960, 60). A detailed analysis of this fragment, consisting of little more than the W end of the abbey church (illus 1), founded in 1128 by David I and dedicated by David de Bernham, Bishop of St Andrews, more than a century later, is given in the *Roxburghshire Inventory* (RCAMS 1956, 240–6).

The abbey was colonized by monks brought from the mother-house at Tiron, near Chartres. They had initially been invited to Selkirk in or about 1113 where they remained for 15 years before transferring to Kelso, directly across the River Tweed from the royal burgh of Roxburgh

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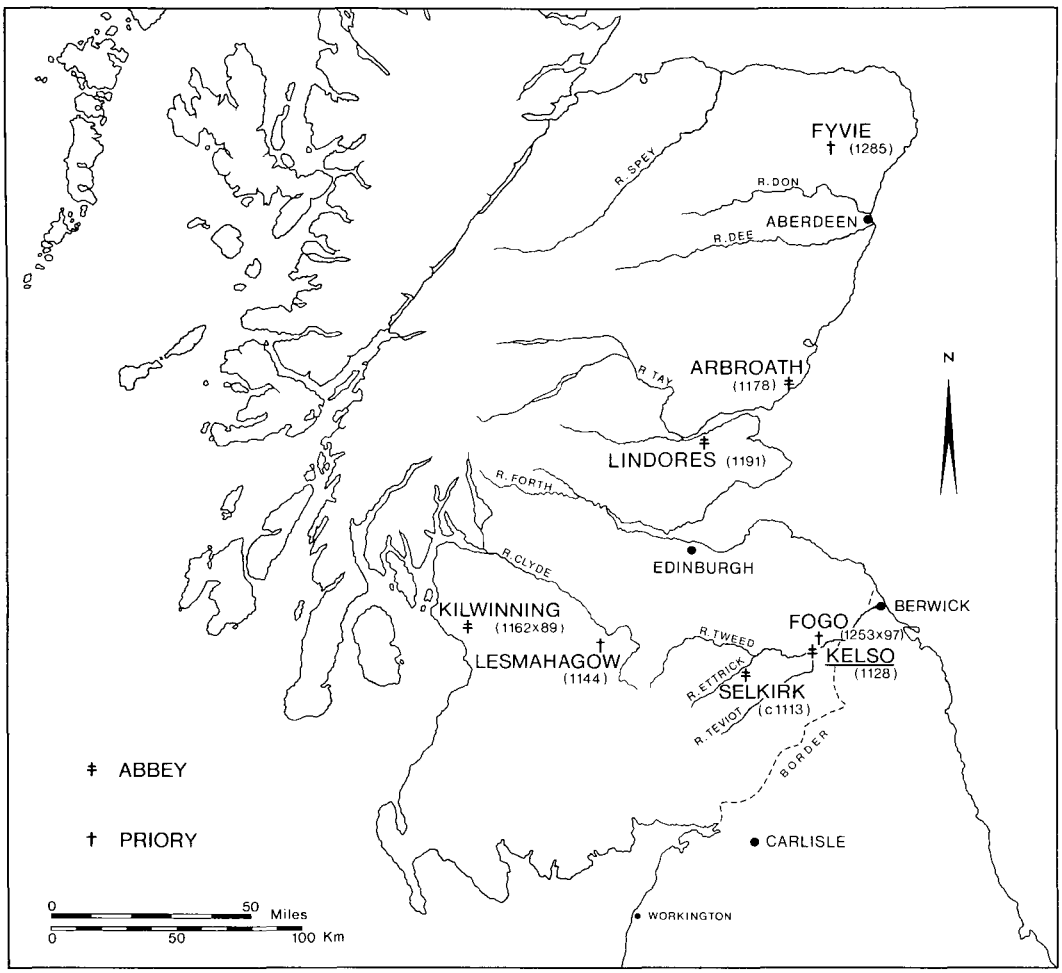
ILLUS 1 The ruined W end of the abbey church viewed from the former cloister to its S

(*Sym Mon,* II, 247, 281). The order of Tiron (Tironensians, or Tironians, as they have come to be known) were an autonomous congregation within the Benedictine order. Founded in the first decade of the 12th century by St Bernard of Abbeville, the order laid emphasis on the simple life and the importance of manual labour, and each of the brethren was required to practice 'whatever mechanical art he knew, both to preserve him from the corrupting power of idleness and to provide, by useful industry, for the maintenance of the Community' (Gordon 1868, 436). Thus, craftsmen were attracted into its ranks, men who were encouraged to continue to use their skills 'within the discipline of a cloistered and contemplative life'. The order never grew to any appreciable size but, unaccountably, it came to be exceptionally well represented in Scotland (illus 2), with four major houses – Kelso, Kilwinning, Lindores and Arbroath – and an influence out of proportion to its overall size (Cowan & Easson 1976, 66–71).

Kelso became one of the largest and wealthiest religious houses in Scotland, and yet it was inevitable, given its situation so close to the Border with England, that it suffered severely, and repeatedly, 'through the fury and impiety of enemies'. The community were troubled right from the outset of the Wars of Independence and, c 1316, the place is described as having suffered so badly that the monks were reduced to begging for food and clothing at other religious houses (*Kelso Liber,* 249). Again, in 1343, several buildings had been so damaged by fire that special permission was granted to the abbey for the felling of oaks in nearby forests to facilitate urgent works of repair (Robertson 1798, 63).

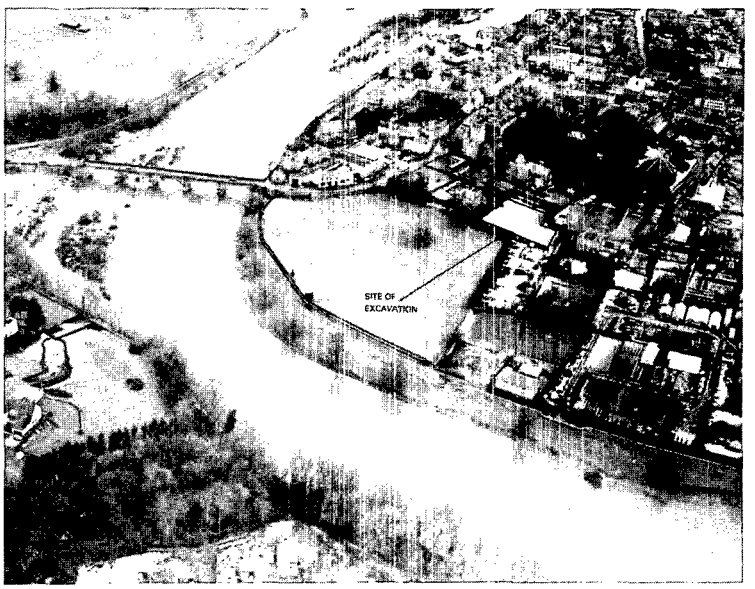


ILLUS 2 Houses of the Tironensian Order in Scotland (date of foundation in parentheses)

The following century brought little improvement. A petition of 1420 refers to its precarious situation on the Border, where it was frequently severely despoiled by hostile incursions (Lindsay & Cameron 1934, 177). In 1461, it was alleged that the abbey had remained unvisited by its superior officers for a century owing to the English occupation of nearby Roxburgh Castle (Cowan & Easson 1976, 68). It was the recapture of Roxburgh by the Scots in the previous year which resulted in an occasion of rare pomp and majesty for the community, the crowning of the young king James III in the abbey church. Sadly, only some 17 or 18 monks were in the monastery at that time to witness the ceremony (Ross 1962, 237).

In the aftermath of Flodden, events moved swiftly towards a conclusion. In 1523, Lord Dacre's army wrought havoc throughout the Border country, destroying many buildings, including the abbey's gatehouse-tower (Brewer 1864, III^2, 1317, no 3147). Norfolk's army continued the despoliation 19 years later (*Hamilton Papers,* 292), with Hertford's men inflicting yet further damage shortly after (Brewer 1864, XX^2, 198, no 456). A member of that particular

raiding party heard 'my lord commandyt to briek the abbey and thake of the leied, and outer myen the towres and srong places, and to owaier trowe all' and witnessed 'the abbey... razed, and all put to royen, howsses and towres and stypeles' (Laing 1854, 271–9). The community were still about a dozen in number in 1560 when the supporters of the Reformation broke into the hallowed precinct and completed what the English armies had begun (Leslie 1894, II, 443; McRoberts 1962, 434). Surprisingly, the community lingered on and the damaged buildings were apparently repaired at great expense to the commendator (*Reg Mag Sig,* V, 2440). By 1587, however, Parliament had officially declared that 'the haill monkis of the monastrie of ye abbey of Kelso ar deciessit' (*Acts Parl Scot,* III, 454).



ILLUS 3 Aerial view of burgh and abbey from the S with area of 1975–6 excavation outlined (*Crown Copyright*)

The surviving fragment of abbey church (illus 1, 4.2) is insufficient in itself to enable a picture of the overall ground-plan of the church in particular to be drawn, far less the arrangement of claustral and extra-claustral buildings grouped around it. A description of the monastery as it appeared to John Duncan, a cleric of the diocese of Glasgow, in 1517 (Theiner 1864, 527–8), before the major destructions took place, is somewhat more informative in that the general disposition of the various elements is given, together with more detailed observations concerning the fabric. From this it is clear that the cemetery lay on the N side of the church and the cloister on the S. Clustered around the cloister 'are many houses and lodgings: there are also guest-quarters common to both English and Scots. There are granaries and other places where merchants and the inhabitants store and keep safe from enemies their corn, merchandise and goods. There is also an orchard and a beautiful garden'. (*Sunt multe domus et partes, est locus hospitalis tam Anglis quam Scotis communis. Sunt horrea et loca alia, ubi mercatores et accole servant et tuentur ab hostibus frumenta, merces et divitias suas. Hortus etiam habet et viridaria pulchra*). The gatehouse-tower destroyed by Dacre six years later is not specifically referred to.

Previous archaeological investigations have concentrated on the enigmatic E end of the abbey church. Those by HM Office of Works in 1933 (unpublished) yielded no definite evidence and those undertaken by the present writer on behalf of the Department of the Environment in 1971 (illus 4.2) proved only marginally more informative (Tabraham 1972, 248–51). The latter, nevertheless, produced evidence to indicate the probable position both of the eastern transepts and the E range of the cloister, suggesting a cloister court measuring overall some 30 m from W to E and thus precisely comparable to those still surviving at Kilwinning (MacGibbon & Ross 1896, II, 77), Lindores (RCAMS 1933, 215–20) and Arbroath (Mackie & Cruden 1982, 5). A second opportunity for the writer to excavate in the vicinity of the surviving fragment of the abbey presented itself at the outset of 1975 in advance of new building construction. The area of ground in question, situated some 100 m to the SE of the surviving W end, was considered to be outwith the abbey cloister (illus 3). Notwithstanding, given the undoubted wealth and importance of Kelso Abbey throughout the medieval period and armed with the eye-witness description of John Duncan, it was appreciated that excavation might well uncover remains of extra-claustral buildings.

There is nothing surviving outwith the cloisters at the other Tironensian houses in Scotland to provide likely analogies for the arrangements at Kelso save at Arbroath. Here the exceptions are the gatehouse-range and the abbot's house, both placed to the W of the cloister (Mackie & Cruden 1982, 5). Only at St Dogmael's Abbey near Cardigan (the only other Tironensian abbey to be established in Britain, founded 1120) does there survive, eastward of the cloister, a building identified as the infirmary (Radford 1962, 20). This is in addition to a guest-house W of the cloister in a position broadly similar to that occupied by the gatehouse-range at Arbroath.

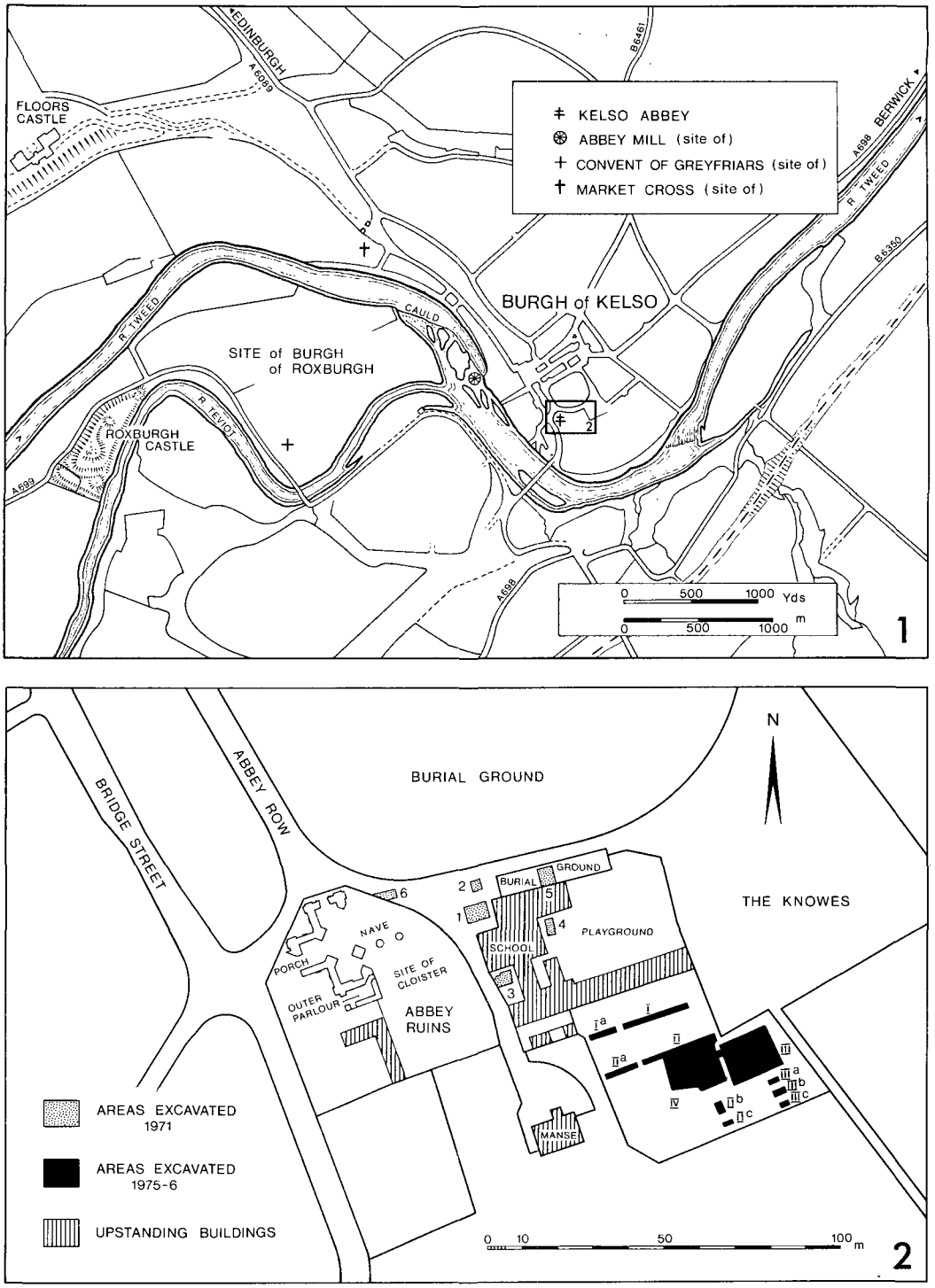
THE EXCAVATIONS (illus 4)

Uncertainty as to the true archaeological potential made for a cautious opening. Two long, narrow trenches (Trench I/IA; Trench II/IIA) were excavated across the area from W to E. Traces of medieval activity were found in both, sufficient to inspire further effort, the discovery of masonry in the eastern half of Trench II, in particular, prompting a major extension in this area. This Area II was later extended to the W as Area IV without any permanent dividing section. Area III to the E was separated by a section 1·5 m wide. Five *sondages* (Trenches IIB and IIC; IIIA, IIIB and IIIC) were excavated further to the S, the whole operation taking place between January and March, 1975. A further, very limited, exercise was undertaken in December, 1976, immediately prior to building works, at which time the section between Areas II and III was partially removed. Not all of the archaeological evidence was recovered. Work in Trenches I, IA and IIA merely scratched the late medieval surface. Areas II and IV were largely completed but a greater part of Area III was not taken down to the natural gravel terrace. Consequently there are gaps in the evidence, particularly with regard to the earlier period of activity.

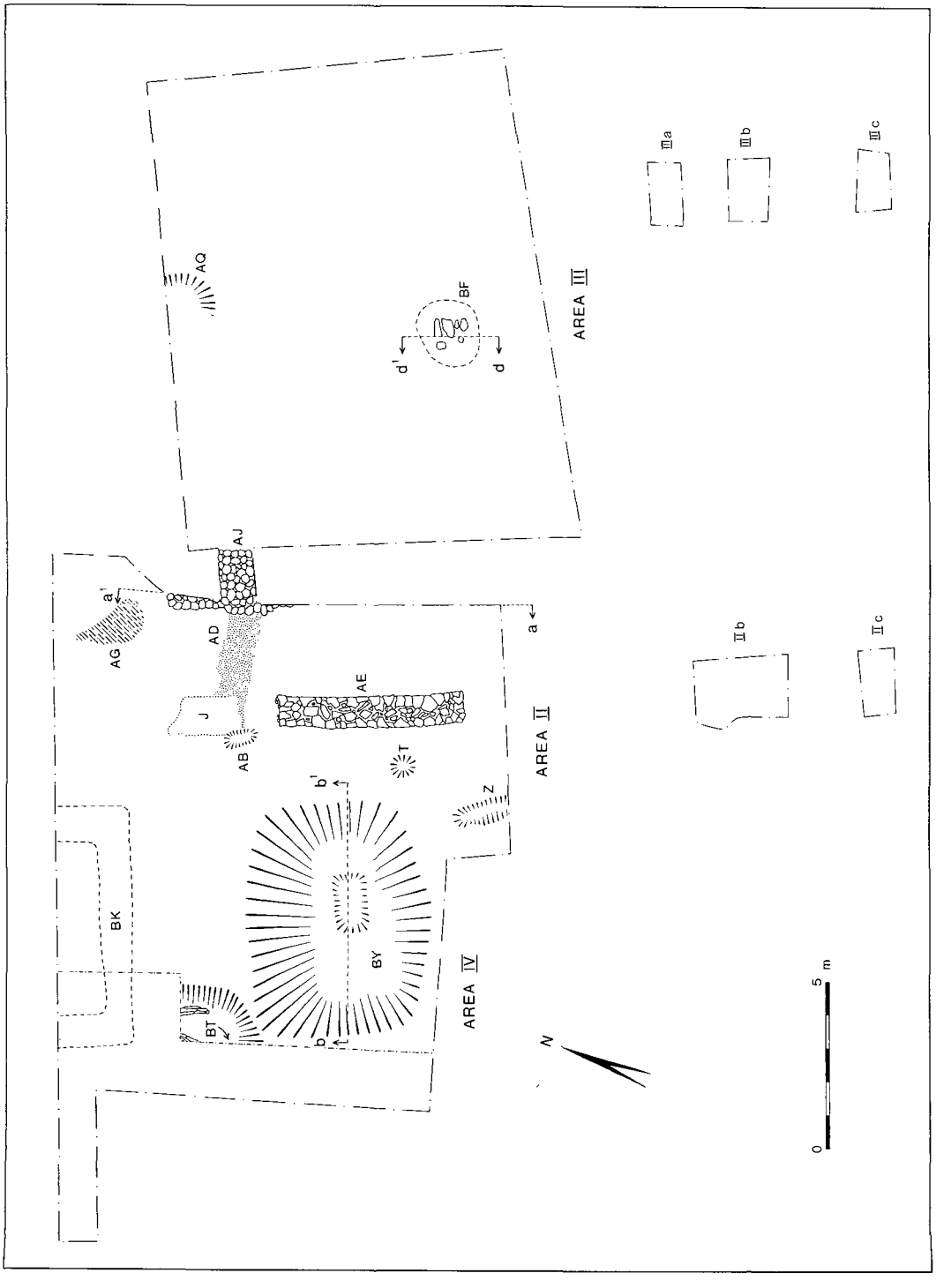
For ease of reference, the excavated evidence can usefully be ascribed to any one of four phases of activity:

Phase 1: early 12th century.
Phase 2: later 12th century–14th century.
Phase 3: 15th and 16th centuries.
Phase 4: 17th century and later.

Features are denoted by letters, eg (BT), layers by numbers, eg (20), as per the original site notification. For economy of space, these are not indexed in full in this report; sufficient description, where relevant, is provided in the text.



ILLUS 4 Kelso Abbey: location plan showing abbey ruins and areas excavated in 1971 and 1975–6



ILLUS 5 Kelso Abbey: ground-plan of Phase 1 features

PHASE 1: EARLY 12TH CENTURY (illus 5)

A variety of features, both cut into, and lying directly upon, the natural gravel terrace, can be regarded as having related to the earliest period of monastic activity. Nothing to indicate man's presence at a time previous to this was positively identified.

The drain, BT, had been formed from a gully, 1·5 m deep and over 1·8 m wide, cut through the natural river gravels. It had been lined on either side with thin sandstone blocks randomly coursed but there was nothing to indicate how it had been covered. The short 2 m stretch discovered makes it difficult to determine with confidence the course it ran, though clearly the drain changed alignment from N to W at the point found. A single potsherd recovered from its masonry sides (NMAS acc no MEE 52; illus 21), identical in fabric to a sherd found in the pit, BY (MEE 51; illus 21) and other scraps of pottery from the bottom of the foundation-trench, BK, at the point where it crossed over the drain, confirms the early date for its construction, though the rubble and silt from within produced nothing to indicate at what date it ceased to serve its function.

Immediately to its SE a large sub-rectangular pit, BY, 7·2 m by 5·6 m, had been cut into the gravel, its steeply sloping sides reaching to a depth of 2 m (illus 7, section b^1–b). A further pit within its bottom, 1·8 m by 1 m, had near-vertical sides descending a further 600 mm. Quite why the pit had been dug it was not possible to determine from the intrinsic evidence. It was clear, however, that the void had been backfilled with a variety of soils and waste over a very brief period towards the end of this phase for from within came a considerable quantity of ceramic material that may be regarded as being contemporaneous (illus 12, 13, 16, 17). This collection is fully reported upon below.

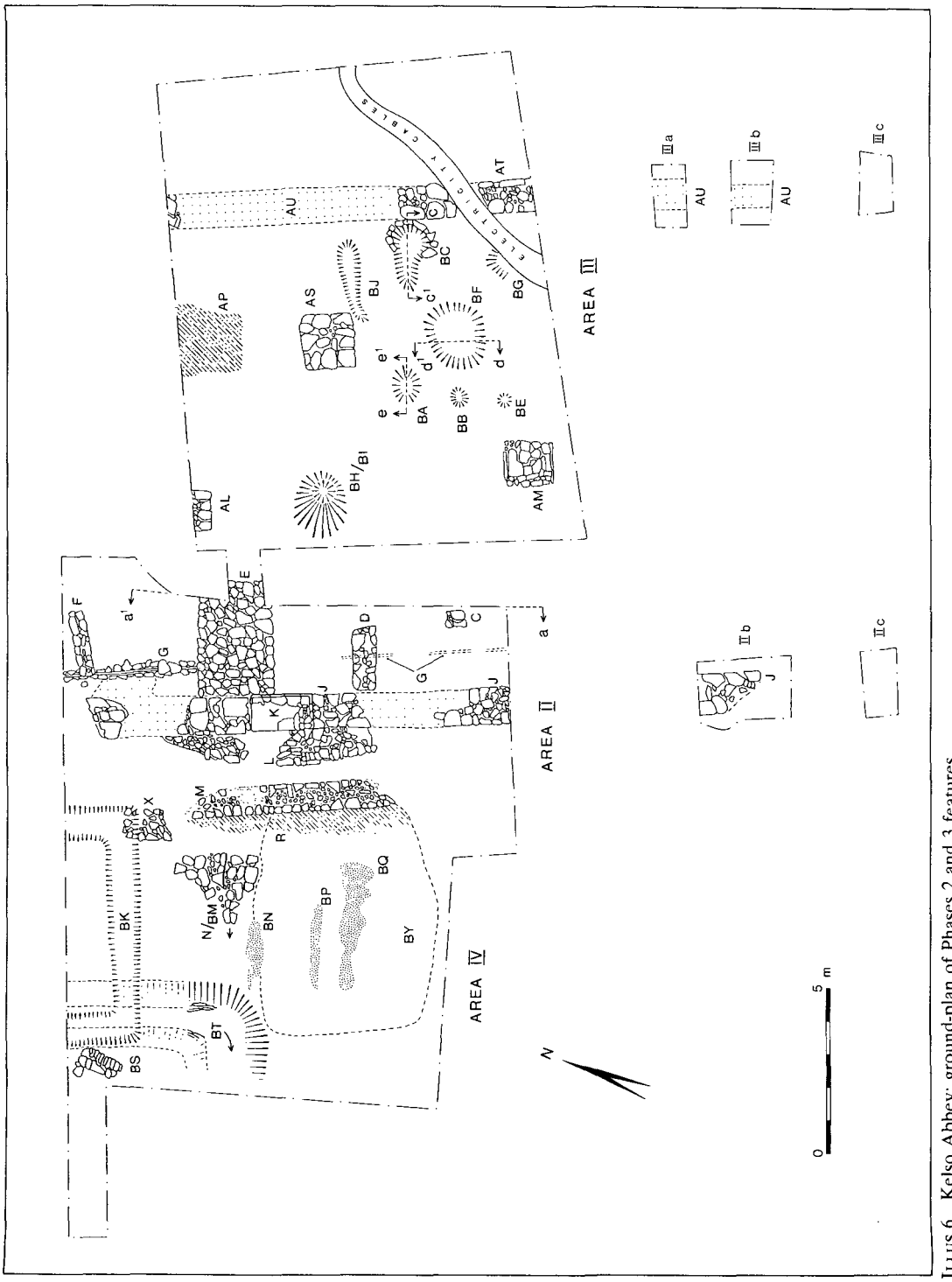
The main structural feature discovered was a 5·6 m stretch of sandstone walling, AE, averaging 1 m in width and standing one course high (illus 8). It stood in isolation, there being no indication that it continued either N or S, or turned to the E or W. The strange absence of associated walling may be due to a number of factors, including thorough stone robbing at a later date. It is also possible that the failure to complete the full excavation of Area III is in part responsible; at the bottom of a later feature, BF, came traces of a concentration of sandstone blocks (illus 7, section d^1–d) which may have pertained to a wall.

A further concentration of stones, AJ, was found underlying the section between Areas II and III (illus 7, section a^1–a). Unlike the wall AE, which comprised roughly squared sandstone blocks with small pinnings set in a clay matrix, this feature, AJ, was composed of water-worn rounded boulders without any bonding material. Though only partially revealed, it would appear to have measured some 4 m from N to S by 2 m transversely. Directly associated with it on its W side was a clay feature, AD, 1·2 m wide and slightly concave in section. It had formerly been bounded to N and S by a sandstone kerb, though its W edge was destroyed at a later date. The function of these two features is open to debate. A drain, AD, and soak-away, AJ, perhaps? The regularly shaped course of water-worn boulders, on the other hand, is not dissimilar to the foundation-raft discovered in the E range of the cloister during the 1971 excavations (Tabraham 1972, 249–50).

Of the remaining features associated with this phase little useful can be said. The stone-filled posthole, T, which produced two rimsherds (MEE 54, 55; illus 21), the shallow gully, Z, the small pit, AB, and the amorphous spread of hard-packed sandstone chippings and mortar, AG, existed in isolation; so too the shallow pit, AQ, in Area III, partly destroyed in a later phase. From within its sandy fill came straight-sided cooking pots identical to those from pit BY (MEE 56; illus 21). From the band of debris lying immediately on top of wall AE came a rim of a globular cooking-pot (MEE 53; illus 21) identical to one from posthole T.

PHASE 2: LATER 12TH CENTURY–14TH CENTURY (illus 5 & 6)

Whatever may have been the function of the large pit BY, or indeed of the structures represented by the wall AE, posthole T and gully Z, all were considered redundant and disposed of. The work of backfilling the pit and dismantling the structures was followed by a comprehensive building programme. The excavation brought to light parts only of two quite separate structures, both of which had, during the course of their use, undergone substantial alteration before finally being abandoned. Thereafter, wholesale robbing of the stonework, coupled with the detrimental effects of agricultural activity, have combined to denude the architectural remains so severely that any statement as to the likely appearance of the buildings must perforce be restricted, by and large, to a definition of the ground-plan alone.



ILLUS 6 Kelso Abbey: ground-plan of Phases 2 and 3 features

The more elaborate of the two structures – undoubtedly the infirmary hall – was defined, on the W, by wall J which lay directly over the phase I wall AE (illus 8), and, on the E, by wall AT, giving an overall width of 16·2 m. The southern limit of the building was not properly ascertained but the absence of walling material in the two most southerly *sondages* (Trenches IIC and IIIC) suggests that it may have lain between those trenches and Trenches IIB and IIIB to their N. The northern limit, likewise, was not defined; and all that can be said is that the building had formerly been in excess of 21 m in length.

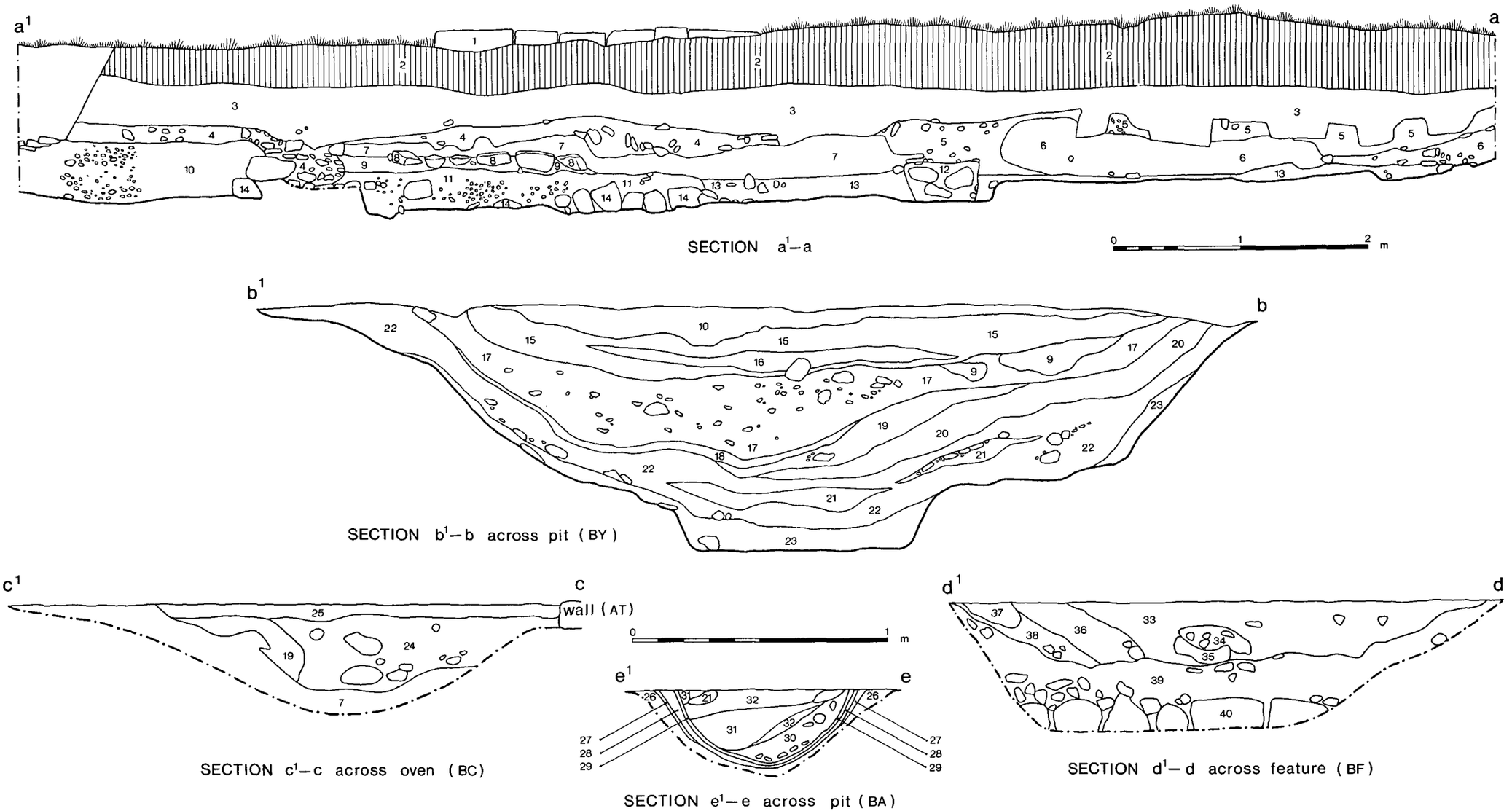
Both walls, 1·1 m wide, comprised roughly squared sandstone blocks (no more than two courses survived in any one place) with smaller pinnings bedded in a weak lime mortar matrix. Each had been founded on a 'carpet' of crushed stone aggregate, AU, green in colour, up to 200 mm thick in places. This aggregate foundation mirrored precisely the plan dimension of the wall above it and the fact that this same aggregate projected eastward of wall J, at its N end in Area II, may just suggest that here lay the building's northern terminal wall.

This capacious building had evidently been designed as unicameral, its internal space broken only by the presence of stone pillars, which would have supported stone arcading. The precise arrangement was not made entirely clear from excavation. Just one complete foundation plinth, AS, was found. It comprised a setting of rough hewn sandstone blocks 1·6 m square. The putative remains of a second, AL, protruded from the N section in Area III, this two courses high, not one as with plinth AS and measuring only 1 m along its E–W axis. There must be some dubiety over this second plinth, AL, serving as a foundation for an internal pillar, not solely on account of its smaller dimension, but also from its position relative to the remainder of the building.

The eastern edge of plinth AS is 2·7 m from the inside face of wall AT, whereas the western edge of plinth AL is 5 m from the inside face of wall J. Building logic would dictate that the two dimensions should be identical, furnishing the building with two narrow side aisles flanking a wider central nave. The ghosting of the plinth immediately to the N of plinth AS survived as a prepared sub-foundation of small tightly packed stones in a sandy matrix, AP. The stone plinth itself had obviously been robbed. The southern edge of feature AP, which had cut into the phase 1 pit AQ, was 1·9 m from the northern edge of plinth AS, and its eastern edge was similarly 2·7 m from wall AT. Plinth AS was not removed to confirm the existence of a similar sub-foundation.

Precisely where one would expect the pillar adjoining AS on its S is the feature BF, which, at the time of excavation, was considered to be a pit of unknown function. Its position and dimensions would

ILLUS 8 Relationship between Phase 1 wall (AE) and Phase 2 wall (J) in Area II



ILLUS 7 Kelso Abbey: sections. c^1–c, d^1–d and e^1–e are enlarged to twice the scale of a^1–a and b^1–b

DESCRIPTION OF LAYERS

1 Garden path edging (modern).
2 Turf and top-soil.
3 Buried market-garden humic soil.
4 Poorly sorted soil, with much broken freestone, mortar and other debris.
5 Well sorted red clay-rich soil, with stone and other debris.
6 Black humic soil, with much stone and other debris.
7 Dark brown/black soil, with much burning.
8 Sandstone paving (E).
9 Dark brown soil.
10 Red/brown soil, with much pebble.
11 Red/brown clay-rich soil.
12 Green/black soil, with water-worn boulders (AK).
13 Orange/brown clay-rich soil.
14 Water-worn boulders (AJ).
15 Yellow/brown charcoal-rich silt, with well-sorted gravels.
16 Grey/brown stony silt.
17 Red/brown gravels, with yellow clay lens and poorly-sorted stone.
18 Dark brown soil and gravel.
19 Well-sorted silts and gravel.
20 Light brown silts, with occasional gravel.
21 Red/brown gravel.
22 Dark brown humic silts, with gravel and stones.
23 Dense black humic soil.
24 Poorly-sorted brown soil, with broken sandstone slabs (from the drying floor).
25 Red/brown charcoal-rich silt.
26 Light brown plastic clay, unbaked.
27 Dark red/brown clay, partially baked.
28 Dark grey/black clay, heavily baked.
29 Dark grey/black clay, heavily baked, with encrusted lead slag.
30 Poorly-sorted soil, with baked clay lumps.
31 Concentration of lead slag, with charcoal.
32 Lead slag.
33 Black silt, with mortar and stone.
34 Light brown clay, with stone.
35 Black clay, with oyster shell.
36 Dark brown clay, with charcoal.
37 Yellow sand and clay.
38 Light brown clay, with mortar and stone.
39 Dark brown clay, with mortar, stone and charcoal.
40 Sandstone blocks.

[facing page 374]

suggest, perhaps, that it may represent the thorough robbing of both the plinth and the sub-foundation (see the Discussion below for a detailed analysis of the infirmary-hall's plan).

Mercifully, the later stone robbers left behind them sufficiently tantalizing evidence to hint at the former architectural sophistication of the infirmary's superstructure. From dense rubble deposits within the building came several sandstone blocks, four evidently elements from the supporting piers of the arcading (artefacts nos 106 & 107; illus 11). Other fragments of building stone from similar destruction layers bear the same distinctive signs of fine tooling, so characteristic of masonry at this early date.

Little else can usefully be written about the structure, other than that it was provided with a freshwater supply, brought in via a lead pipe laid in a shallow stone-lined gully, G, capped with sandstone flags. A short stretch only of lead piping (artefact no 39; illus 10) survived in the NE corner of Area II, but traces of the clay into which it had been bedded were found in places further to the S. Quite when this utility was introduced into the building is not known.

The situation regarding subsequent alterations to the interior of the building is far from clear. It is just conceivable that some of the elements noted below as pertaining to an entirely separate structure – eg the fireplace K, partition wall D and paving E – were firstly incorporated into the fabric of the still functioning infirmary hall, late on in its existence, before being retained during the demolition and amalgamated into the building that replaced it on the site. However, there is no positive archaeological evidence that this was the case. The nebulous post-pit AK, observed only in section (illus 7, section a^1–a), is the sole feature that can be held to belong to the period of the infirmary's existence.

Of the second building to the W – which, by analogy, may be presumed to have served as either infirmary kitchen or misericord – far less can meaningfully be written. What is clear, however, is that the structure had clearly been affected by settlement of the contents of the recently backfilled pit BY directly beneath it, and suitable action was taken to remedy the situation shortly thereafter. It is impossible to determine the original dimensions of the first building for only a 1·8 m stretch of wall X survived the subsequent alteration. A band of green aggregate, BQ, identical to that found forming the base for the walls (J & AT) of the other building, may conceivably mark the original S gable of this structure. The precise relationship between the substantial foundation trench BK and the remainder of the structure to its S is not clear, but it would appear that, on the failure of that part of the building directly over the pit, the structure was foreshortened by some 6 m and a new S gable formed at BK suitably distanced from the offending pit. The origin of the bands of blue clay, BP and BN, the latter a replacement for a similar band beneath 58, is not known.

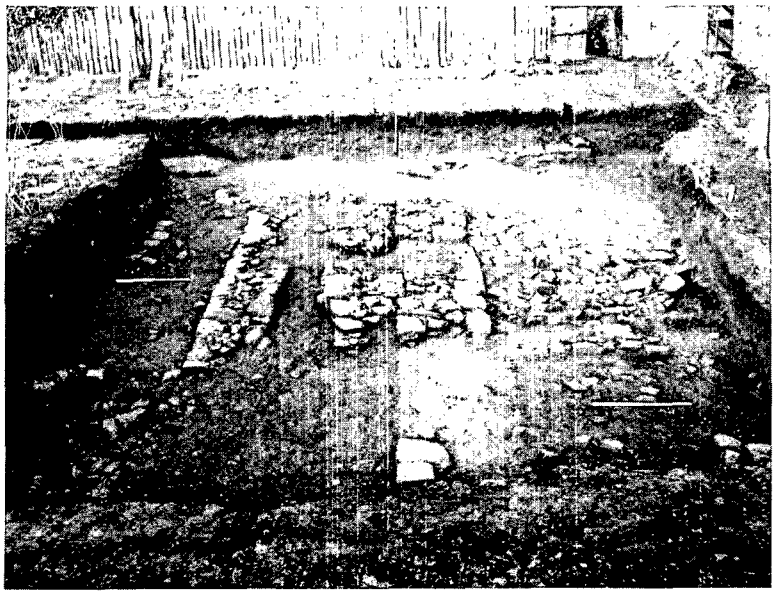
The foundation trench BK was far from insubstantial, in excess of 0·35 m deep, almost as if the builders were making doubly sure that the new construction would not share a similar fate to its predecessor. The overall width of the building was 7·2 m though the masonry walling presumed to have stood within the foundation trench was entirely gone. The course of the drain BT ran beneath the floor of this building.

PHASE 3: 15TH AND 16TH CENTURIES (illus 6 & 9)

The area of ground above and immediately around the pit BY, which had previously been the cause of so much structural damage, was subsequently built over. The archaeological evidence forbids any detailed description of the character of this building, the existence of which rests solely on the discovery of a linear stone scatter, R, 6·8 m long, extending in a line S from the wall X. Such a scatter may have been either a sub-foundation for a superincumbent wall or the denuded remains of a wall itself. It was subsequently replaced by another wall, M, which in the main overlay it. Both stretches of walling existed in isolation and nothing further can be written with regard to the dimensions of the buildings to which they are presumed to have pertained. A small area of stone paving, N/BM, within the building formed partly by wall M did, however, survive. Set into it was an open drain, or gutter, 0·6 m wide and 0·12 m deep, falling from E to W. Its contents presumably debouched into the drain BT.

The alterations to the infirmary hall and the date at which they were carried out are not entirely clear. The work was clearly of a wholesale nature and would seem to have followed the abandonment, in its entirety, of the infirmary hall. Much of its stonework was robbed at this time, particularly wall AT, and some of it, at least, reused in the construction of a smaller building sited upon a part of it.

This new building retained a section of wall J as its W wall. Within that stretch fireplace K, 1·76 m broad and 1 m deep, was inserted. The chimney flue was carried up in stonework, L, projecting westward from wall J a distance of 1·1 m. The hearth had been formed from five sandstone blocks (one



ILLUS 9 The principal Phase 3 features in Area II, looking N (*Crown Copyright*)

bearing a mason's mark) each with a raised nib around the front face. The fireplace showed extensive signs of use. The dimensions of the chamber it served were not clear. A stretch of wall D would seem to have served as the S wall, but the limits to E and N were not readly forthcoming owing to later disturbance. Immediately in front of the fireplace lay a well preserved area of sandstone paving, E, which had cut through a section of the lead pipe, G. Subsequent robbing had removed more of this paving to its S (illus 7, section a^1–a) but it obviously originally abutted wall D. The edges to E and N were clearly defined and, if these are taken as the limits of the building, the dimensions give a chamber 4·7 m from N to S by 3·5 m transversely. It is unlikely that such a structure would have stood in isolation and a square stone base, C, to its S – possibly a foundation for a timber post – and a stretch of wall, F, to the N may have been parts of structures associated with it. The stone feature AL, previously ruled out as being a part of the original aisled infirmary, may pertain to this phase: so too an isolated stretch of wall, BS, in the far W of Area IV. The discovery of a tripod pipkin (MEE 65; illus 4) from the vicinity of the paving N/BM and a sherd of chafing dish from the Saintonge (MEE 64; illus 4) sealed directly beneath the post-base C would suggest that this drastic alteration was carried out some time early in the 16th century and not before.

Though the area of ground covered by the new building work cannot be defined in more detail, it is clear that a greater part of the area occupied by the former infirmary hall was not built upon but left as open ground. A section of it, in the southern half of Area III, had been utilized, for a short while, for the purposes of lead working. The small pits BA, BB and BE were clearly lead-smelting (more specifically, remelting) hearths, for each contained quantities of lead slag and waste window cames within their clay-lined sides (illus 7, section e^1–e). Their overall diameters were 1 m, 0·5 m and 0·42 m, their depths 0·35 m, 0·12 and 0·06 m respectively. For a typical reconstruction, see Platt and Coleman-Smith (1975, I, 298). Immediately to their SE a 1·3 m square stone setting, AM, had been subjected to intense heat. Droplets of waste lead, mixed with strips of cames, suggest that it had been used as a hearth in the lead-working process.

Of other features discovered, the functions of pits BG, BH/BI and BJ could not be defined. Feature BC, on the other hand, had clearly been an oven, or kiln, its stone-edged bowl, measuring 0·98 m by 0·8 m, heated from a fire lit within a 1·2 m long flue to its W (illus 7, section c^1–c). Its function is not known, but, of the scraps of pot-sherds from within its heavily charred interior, one (MEE 63) is from a German stone-

ware jug, dated to the 15th century. The other sherds, local to Scotland, are not inconsistent with this date, including a single sherd, from a reduced green-glazed jug, from one of the lead-smelting pits (BE).

PHASE 4: 17TH CENTURY AND LATER

The occupation of the phase 3 buildings does not appear to have continued beyond the 16th century. That which had made use of wall J had been destroyed by fire, though only after part of the paved area E had been removed (illus 7, section a^1–a). Further pillaging of the stonework was in evidence elsewhere. Thereafter, further damage to the structures was occasioned by agricultural activity (note the bedding trenches towards the S of section a^1–a in illus 7). The area had subsequently been enclosed within the policies of the manse, built in 1801 (*New Stat Acc* 1845, 336), and become garden ground and, by the time of the excavations, the humus had accumulated to a depth of c 1·5 m. From the far western corner of Trench 1A, adjacent to the former manse stable, came the skeleton of a pony, or small horse, buried in a shallow pit, and dated by a late Victorian clay-pipe bowl (artefact no 2) – obviously the minister's faithful mule.

THE ARTEFACTS

Note. All artefacts recovered have been deposited in the National Museum of Antiquities of Scotland. The items of metalwork and stonework have been apportioned a single museum accession number (MEE 68) but are identified here by their unique small-find numbers given to them immediately upon discovery. Artefacts marked with an asterisk are illustrated in illus 10. The pottery, on the other hand, is identified here simply by its museum accession number (all numbers likewise prefixed by the letters MEE) and not by the layer or feature from which it came. This has been found necessary as a result of the conjoining of sherds from different layers to form either complete vessels or profiles. L=Length; D=Diameter; Wt=Weight; H=Height.

COIN

3 Billon plack, James III. Obv: crowned shield in three arc tressure in spandrels; cross fourchee each side of shield. Rev: floreate cross fourchee with saltire fourchee in central panel and crown in each angle – reading VILLA (DE) EDINBURGH. Minted only in Edinburgh (Stewart 1955, 143). *Phase 4*

COPPER ALLOY

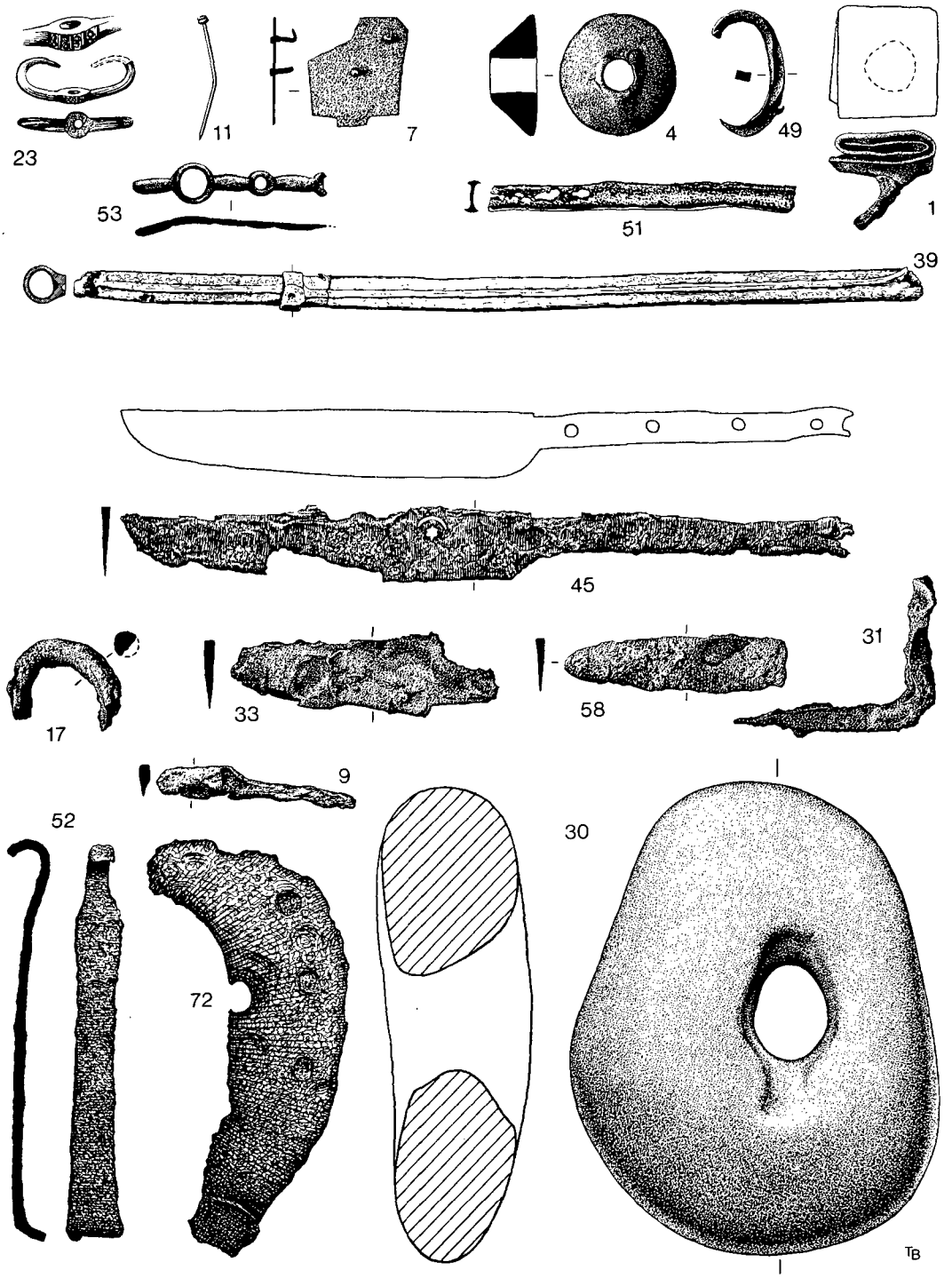
23* Hook. Rough incised decoration around central hole. D 3 mm. *Phase 3*
11* Pin. L 37 mm. *Phase 3*
7* Plate. Possibly a belt mount or hinge plate. 32×30 mm. *Phase 3*
53* Mount (?). L 58 mm. *Phase 3*
Not listed: 3 sheet metal fragments (nos 8, 27 & 43) from *Phase 3* levels.

LEAD

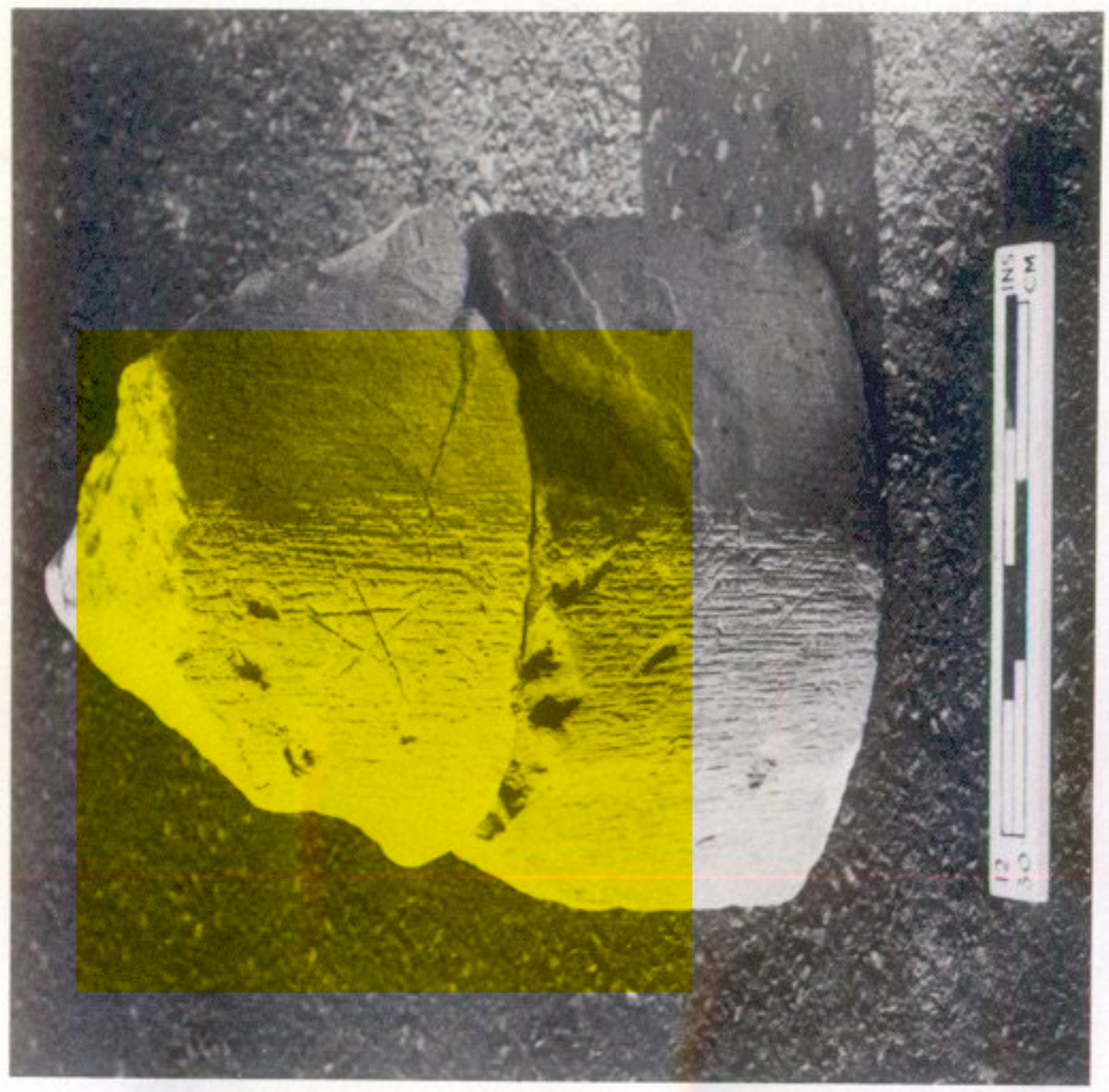
4* Weight. D 35 mm, H 14 mm, Wt 74·3 gm. *Phase 3*
49* Strip. Possibly scrap metal. L 23 mm. *Phase 1*
1* Sheet metal. Folded and pierced by an iron nail. Possibly a weight. 32×30 mm, Wt 66·85 gm. *Phase 4*
51* Strip of window came. L 92 mm. *Phase 3*
39* Pipe. A single sheet of lead folded to form a tube, internal D 40 mm. A lead clamp encircles pipe. L 1224 mm. *Phase 2*
101 Rod. L 102 mm, D 5 mm. *Phase 1/2(?)*
26 Disc. D 21 mm, Wt 6·65 gm. *Phase 3*
Not listed: 3 fragments (nos 34, 56 and 87), 2 strips of window came (nos 57 & 69) similar to no 51, and a quantity of scrap/slag, from *Phase 3* pits (BA), (BB) and (BE).

IRON

45* Knife. With flat tang and four rivet holes, grips missing. Six-pointed star and crescent moon inlaid in silver on blade. L 220 mm. *Phase 3*



ILLUS 10 Kelso Abbey: artefacts (non-ceramic) (scale 1:2, except n 39 scale 1:10)



ILLUS 11 The octagonal and circular pillars (artefact nos 106 and 107) from the infirmary-hall (*Crown Copyright*)

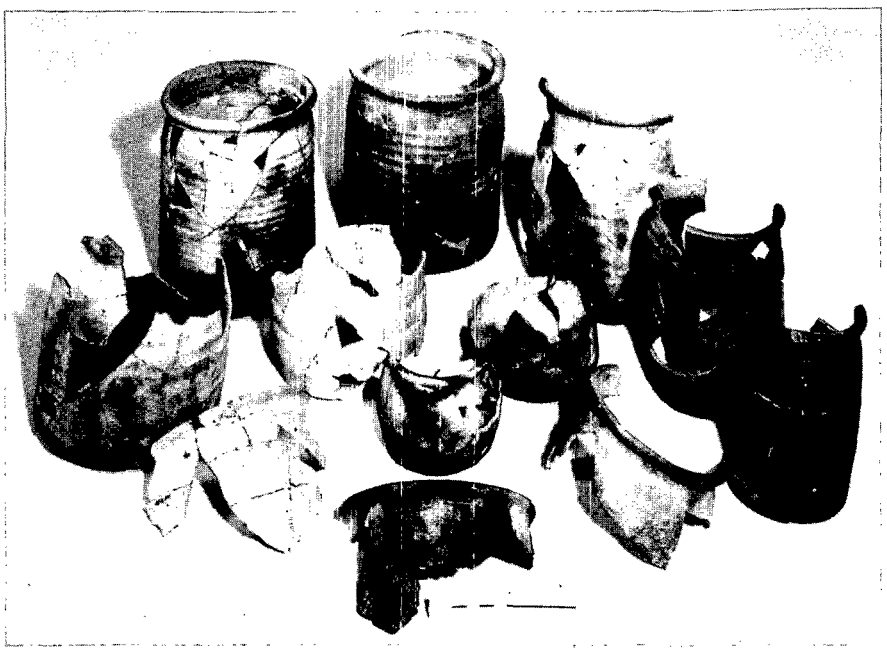
17* Fragment of ring. D 31 mm. *Phase 3*
33* Piece of knife blade. L 79 mm. *Phase 2*
58* Piece of knife blade. L 66 mm. *Phase 3*
31* Pintle (?). Overall L 106 mm. *Phase 3*
9* Piece of knife(?). Includes part of tang. L 58 mm. *Phase 3*
52* Hook. L 126 mm. *Phase 3*
72* Part of horseshoe. With four nail-holes visible but no calkin. L 126 mm. *Phase 3*
Not listed: 3 pieces of knife blade, minus their tangs from *Phase 3* levels, 9 nails and 4 fragments (unidentified).

STONE

30* Weight. 143×44 mm, Wt 917 g. *Phase 4*
37 Piece of cannon-ball. D 60 mm (2·4 in), Wt 127·4 g. *Phase 4*
106 Half of octagonal pillar (illus 11). Horizontal and diagonal tooling on all faces. D 510 mm. *Phase 3*. A second, identical, was not retained.
107 Part of circular pillar (illus 11). Vertical and diagonal tooling on face with incised mason's mark in the form of a pentagram. *Phase 3*. A second, identical, but without the mason's mark, was not retained.
Not listed: several pieces of building-stone. They include a broken gutter or slop chute (no 25) from *Phase 3* wall (M). 7 flint/chert flakes.

MISCELLANEOUS

2 Clay tobacco-pipe bowl. Marked CORK and decorated with a harp and patriotic slogans. Rouletted rim; bore size 5/64. Probably dated c 1850–1880 (Oswald 1975, 89–90). *Phase 4*
Not listed: 2 clay tobacco-pipe bowls and several fragments of window and bottle-glass.



ILLUS 12 Selection of cooking pots from Phase 1 pit (BY)

CERAMIC MATERIAL

With contributions by Eoin Cox, George Haggarty and John G Hurst

Sherds were recovered from all phases and many of the layers and features. In the main they took the form of small, abraded sherds and, with the notable exception of material from the phase 1 pits, BY and AQ, it was not possible to reconstruct profiles. The intensive occupation of the area, including on occasion major structural alterations, had so affected the stratigraphy that a good deal of the material must be considered disturbed. Sherds from all stratified layers have been examined under a X20 microscope and sorted into fabric types. All the material, incorporating a full reference collection, has been deposited with the National Museum of Antiquities of Scotland, Edinburgh. Because of the undoubted importance of the large, homogeneous assemblage from the phase 1 pit, BY and, to a lesser extent, the far smaller groups from other phase 1 features, eg the drain BT and pit AQ, a more detailed scientific examination of their fabrics has been undertaken by Eoin Cox and his full report is included here, accompanied by the catalogue. The dating and distribution of the forms represented therein are discussed by George Haggarty. The remainder of the material is so nebulous that the following report includes analyses only of small groups of securely stratified sherds, together with observations, by John Hurst, on the imported finewares present.

CATALOGUE OF CERAMIC MATERIAL FROM PHASE 1 PITS GROUPS BY, BT AND AQ (illus 12–21)

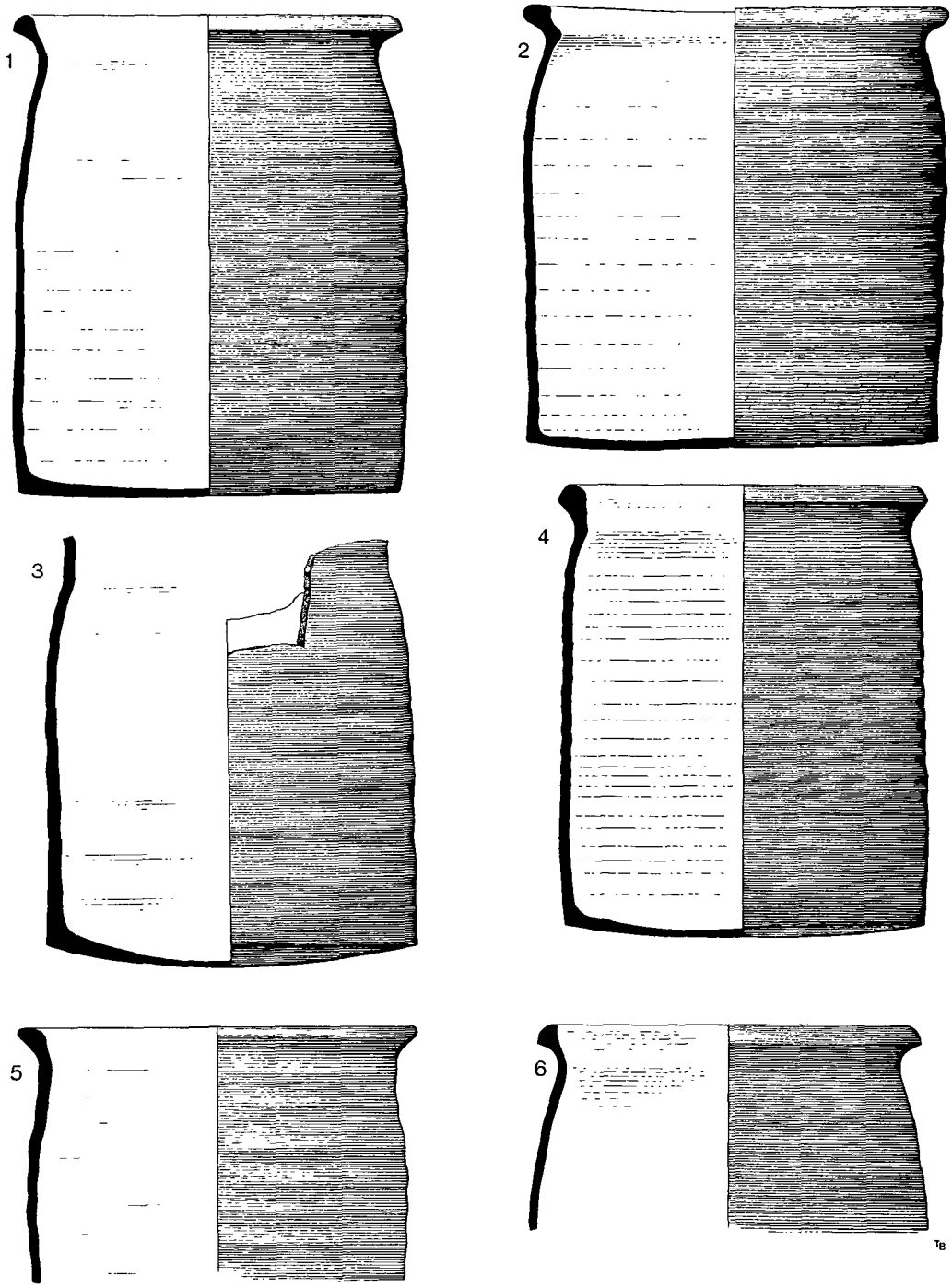
The sherds recovered from the fill of pits BY, BT and AQ, when reconstructed, were found to comprise vessels of two basic forms. The total weight of 18 kg contained a minimum of 34 vessels, 21 classified as cooking pots, 10 as jugs.

Legend

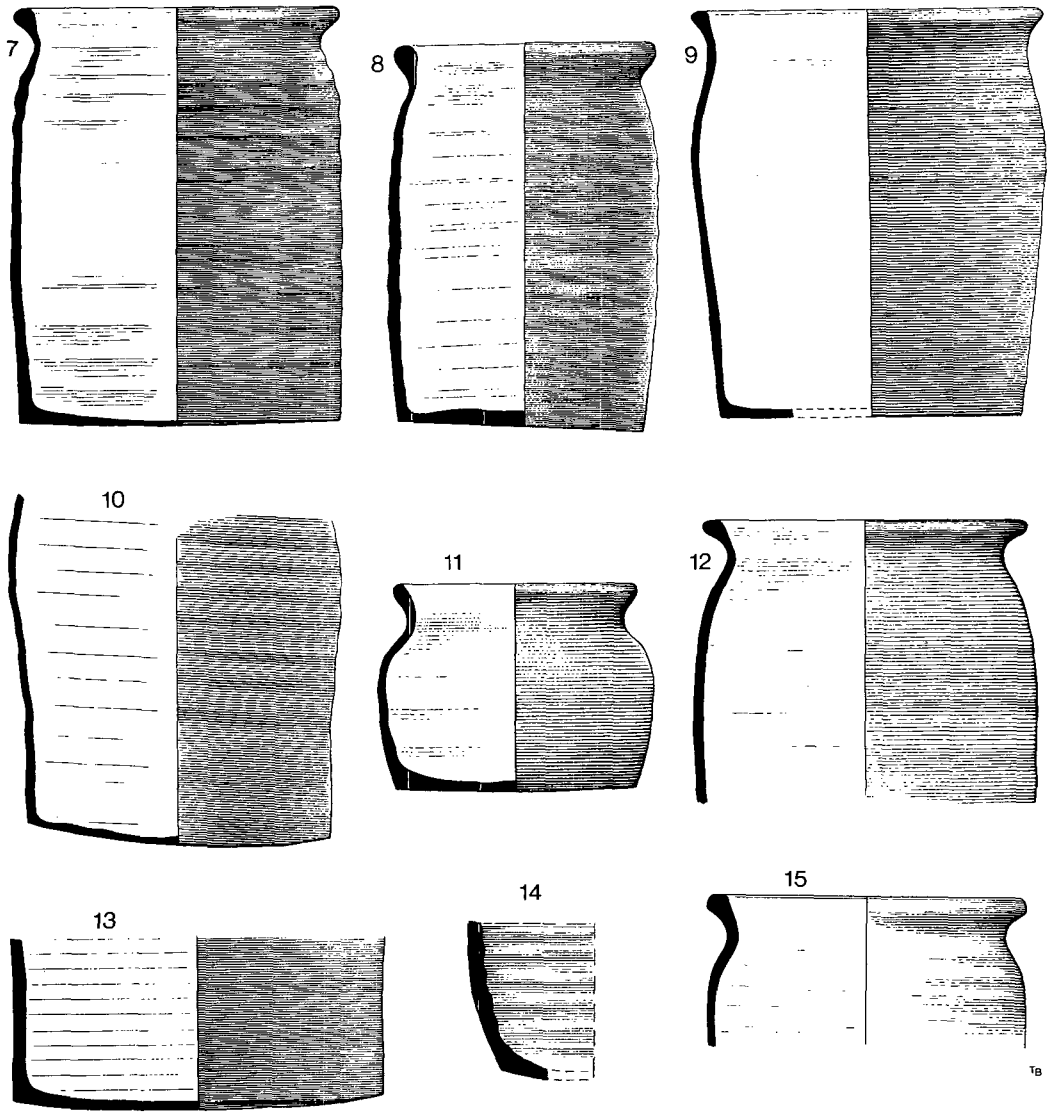
NMA=National Museum Accession Number (all numbers prefixed MEE); F=Fabric; L=Layer (or Feature); H=Height; RD=Rim Diameter; MD=Maximum Diameter; C=Capacity (cc). All dimensions in millimetres.

ILLUS 13 Straight-sided cooking pot MEE 4 (*Crown Copyright*)

NMA	F	L	H	RD	MD	C	Description
1	1	BY	205	155	170	3868	Straight-sided cooking pot
2	1	BY	188	182	185	4890	Straight-sided cooking pot
3	1	BY	195	145	160	3220	Straight-sided cooking pot
4	1	BY	195	148	160	3354	Straight-sided cooking pot
5	1	BY	–	160	–	–	Straight-sided cooking pot
6	1	BY	–	154	–	–	Straight-sided cooking pot
7	1	BY	165	126	132	2057	Straight-sided cooking pot
8	4	BY	150	95	108	1063	Straight-sided cooking pot
9	1	BY	160	132	141	2189	Straight-sided cooking pot
10	1	BY	–	–	132	–	Straight-sided cooking pot
11	1	BY	83	95	111	588	Small globular cooking pot
12	1	BY	–	112	–	–	Straight-sided cooking pot
13	1	BY	–	–	147	–	Straight-sided cooking pot
14	12	BY	–	–	87	–	Cooking pot
15	1	BY	–	126	–	–	Straight-sided cooking pot
16	–	BY	–	–	–	–	Sherd from thin-sectioning programme (not illustrated)
17	2	BY	–	–	230	–	Jug
18	1	BY	–	115	–	–	Jug
19	1	BY	320	125	220	–	Jug
20	1	BY	–	–	146	–	Jug
21	1	BY	–	–	–	–	Jug
22	1	BY	–	–	–	–	Jug handle
23	1	BY	95	–	150	1678	Refashioned from taller jug; present rim crudely smoothed
24	8	BY	–	–	–	–	Jug sherd with notched decoration
25	2	BY	–	–	200	–	Jug
26	5	BY	155	–	180	–	Small jug
27	3	BY	294	–	230	–	Jug
28	1	BY	–	–	115	–	Jug
29	1	BY	–	–	–	–	Jug handle
30	1	BY	–	–	–	–	Jug handle
31	1	BY	–	–	–	–	Jug handle
32	1	BY	–	–	–	–	Jug handle
33	1	BY	–	–	–	–	Jug handle
34	1	BY	–	–	–	–	Jug handle
35	1	BY	–	–	–	–	Jug rim
36	1	BY	–	–	–	–	Jug rim
37	1	BY	–	–	–	–	Jug rim
38	1	BY	–	–	–	–	Jug rim
39	1	BY	–	–	–	–	Jug rim
40	1	BY	–	–	–	–	Jug rim
41	1	BY	–	–	–	–	Jug rim
42	1	BY	–	–	–	–	Jug rim
43	1	BY	–	–	–	–	Jug base
44	1	BY	–	–	–	–	Straight-sided cooking-pot base
45	1	BY	–	–	–	–	Cooking-pot base
46	1	BY	–	–	–	–	Jug base
47	1	BY	–	–	–	–	Jug base
48	1	BY	–	–	–	–	Straight-sided cooking-pot base
49	1	BY	–	–	–	–	Jug base
50	1	BY	–	–	–	–	Jug base
51	6	BY	–	75	–	–	Cooking-pot rim
52	6	BT	–	–	–	–	Cooking-pot base
56	1	AQ	174	160	162	3498	Straight-sided cooking-pot
57	1	AQ	–	135	–	–	Straight-sided cooking-pot rim
58	1	AQ	–	170	–	–	Straight-sided cooking-pot rim
59	1	AQ	–	170	–	–	Straight-sided cooking-pot rim



ILLUS 14 Kelso Abbey: ceramic material from pit BY; cooking pots MEE 1–6 (scale 1:3)



ILLUS 15 Kelso Abbey: ceramic material from pit BY; cooking pots MEE 7–15 (scale 1:3)

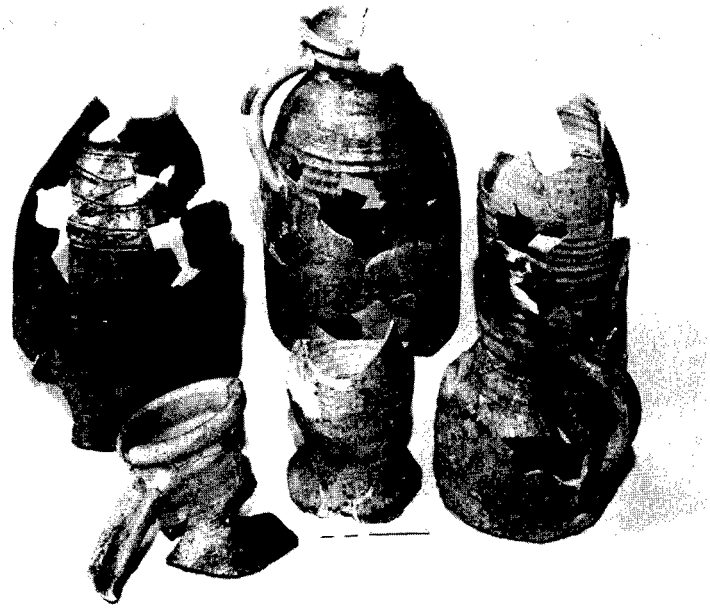
Cooking pots

The term 'cooking pot' does not necessarily imply a vessel used in the cooking process (Moorhouse 1981, 116), but the majority of vessels are fumed and so can be presumed to have been so used. With two exceptions (MEE 11 & 14), all are straight-sided, their bases usually flat, sometimes slightly sagging. The walls are wafer-thin, rarely exceeding 4 mm, implying a technique of some sophistication. Decoration is altogether absent, with just the regular 'rilling' produced during the throwing process. The near-complete vessels stand to heights varying from 150 mm to 200 mm. Their overal widths vary likewise, from 108 mm to 185 mm, and so affecting each vessel's capacity:

1 @ 1–2 litres (MEE 8)
2 @ 2–3 litres (MEE 7 & 9)

4 @ 3–4 litres (MEE, 1, 3, 4 & 56)
1 @ 4–5 litres (MEE 2)

The principal exception is a globular vessel (MEE 11), the smallest of them all with a capacity of 588 cc.



ILLUS 16 Selection of jugs from Phase 1 pit (BY) (*Crown Copyright*)

ILLUS 17 Jug MEE 19 (*Crown Copyright*)

Jugs

The jugs present more variety of form, from the squat (MEE 26), through the tall and slender (MEE 20) to the tall and wider bodied (MEE 27). The bases are generally sagged and the side walls are a good millimetre thicker than the cooking pots. The pinched spouts (eg MEE 18) and strap-handles (eg MEE 18, 19, 22 & 26) are simply executed. A feature of particular note is the slight splay to the rim. Indeed, apart from the lead-based glazes and thumb impressions on the handles, there is minimal decoration – a crudely incised horizontal wavy line on one near-complete vessel (MEE 27), a trace of wedge-shaped rouletting on a single sherd (MEE 24). The glazes vary from a crazed lustrous green (5Y 6/8–7–5 YR 5/8 (Munsell 1975)) to a blistered pale yellow (10YR 7/6). Within the glaze, rutile and epidote have both been identified in thin section. Uncrushed grains of opaque material, probably galena, and surface grits of quartz are also present. One or two of the jugs bear stacking scars (MEE 19 & 27).

PETROLOGICAL EXAMINATION OF THE CERAMIC MATERIAL FROM PITS BY AND AQ

Eoin Cox

Solid and drift geology

In order to establish the use of a local clay in the manufacture of the pottery, the overall surface geology of the Tweed and Teviot Basins must be considered. Previous petrological analyses of Scottish clay artefacts have been confined to material from sites in Orkney (Williams 1979, 94–6) and the medieval kilns at Colstoun, East Lothian (Brooks 1980, 364–403). Both studies confirm the use of local raw materials. Geologically the neighbourhood of Kelso is complex and any information gained from the pottery must be interpreted cautiously in the knowledge of the glacial disturbance and resulting hydrogeography of the area.

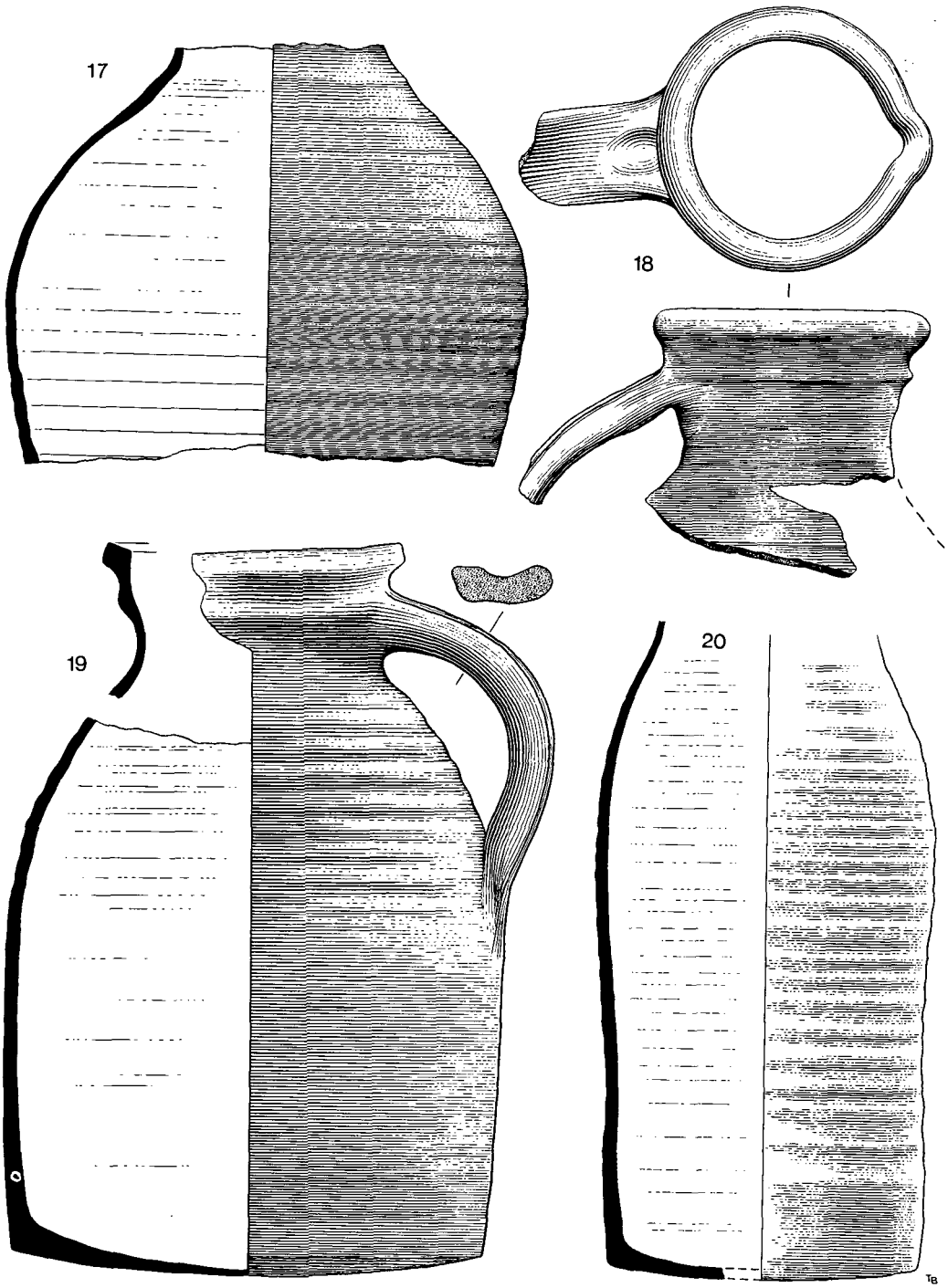
During the period of maximum glaciation, the Pleistocene ice cover was massive and moved in a SW to NE direction across the Southern Uplands. Subsequent erosion and melting of the ice sheet resulted in complex drift profiles. The parent material of the boulder clays is of a diverse nature (illus 22). It is essentially an erosional product of the Upper Old Red Sandstone (UOR) sediments, of the Silurian and Ordovician greywackes and shales, and of the extrusive lavas and basalts of the UOR and Carboniferous periods (Greig 1935).

The soils of the Kelso till plain are essentially solifluction deposits, ie fluvioglacial sands and gravels, the silts and clays being deposited during the later stages of ice decay. The clays of the region are derived from either the fine-textured boulder clays or from the stony drift formed by solifluction; the first giving rise to clay loams and clays, the second to loamy sands and sands. River alluvium occurs as generally unsorted deposits along most water passages, whilst lacustrine alluvium or peat alluvium deposits occur as localized silts and saturated clays, indicating former slack water or loch sites. A simplified drift distribution is illustrated in illus 23.

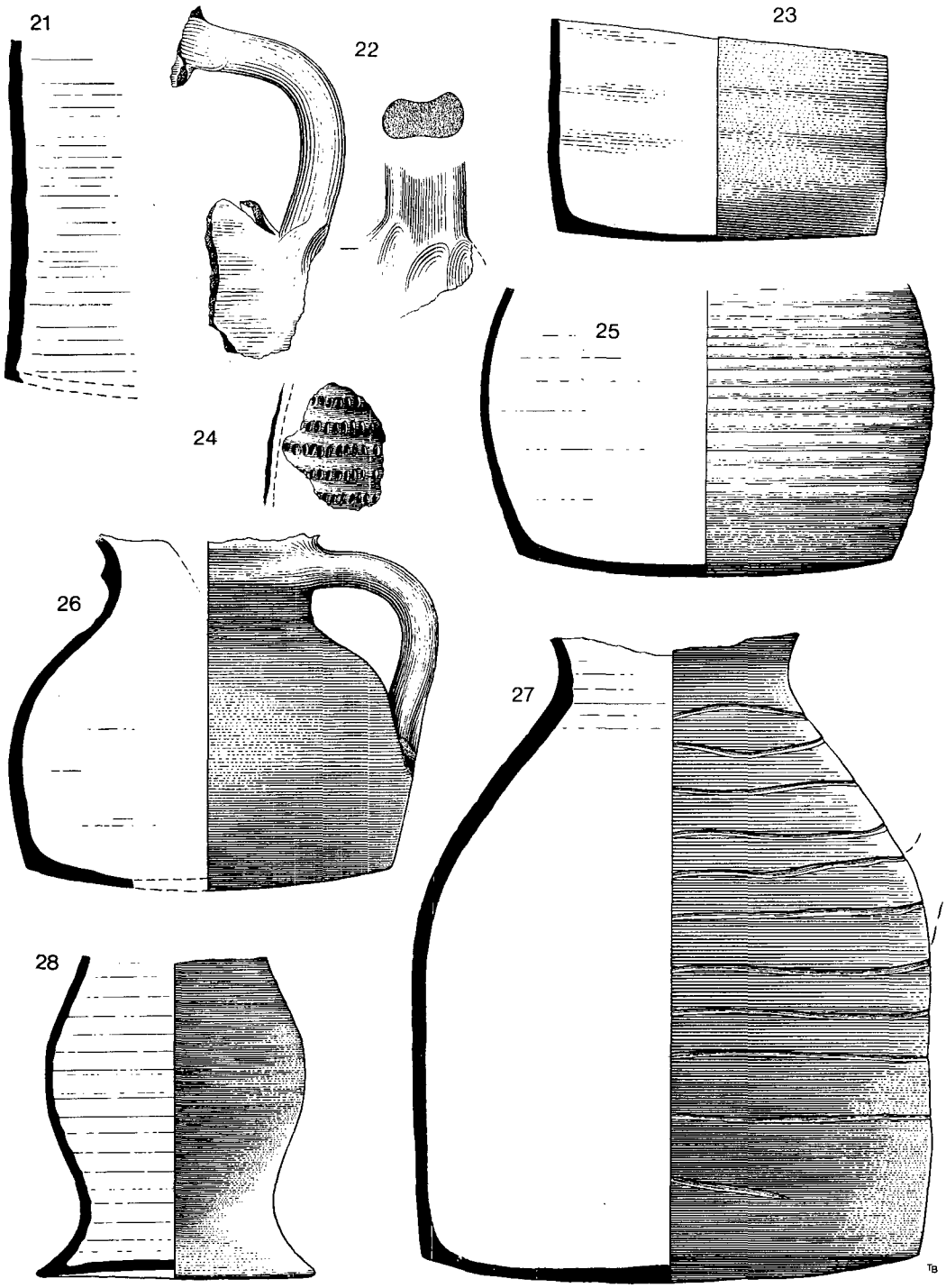
The predominant soils in this area belong to the Whitsome, Ettrick, Hobkirk and Eckford Associations (illus 24). For detailed descriptions of the soil series see Muir 1956, Ragg 1960 and Ragg and Futty 1967. Within these associations occur numerous deposits of workable clay. Early mining activity can be inferred from an 18th-century reference to a medieval tile industry near Melrose (Richardson & Wood 1949, 6). Lacustrine clays were of economic importance in the brick and tile manufacturing industry during the 18th and 19th centuries, delving of the peaty clay taking place at Fallside (NGR NT 6842), Whitrigbog (NT 6234), Pinnacle (NT 5926) and Fangrist Burn (NT 7048) (Douglas pers comm). Alternative sources of clay are exposed as stone-free beds within the boulder clay along most river sections.

Methods of physical examination

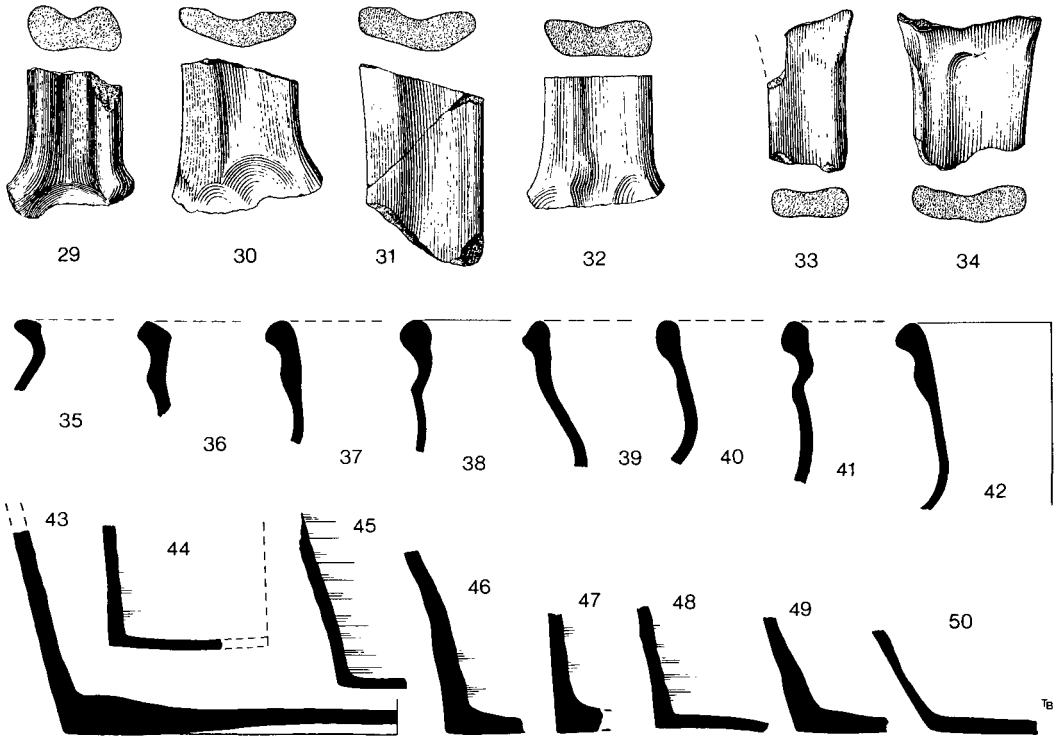
The sub-aerial variation of diagnostic minerals such as quartz, feldspar and ferromagnesians is myriad. Since these constituents and larger rock fragments are present in most medieval pottery, the method of assessing the relative presence or absence of a species within a given fabric is critical. For the purposes of this report the stratified group of near-complete pots was the subject of scientific study. Laboratory techniques are listed below with observations.



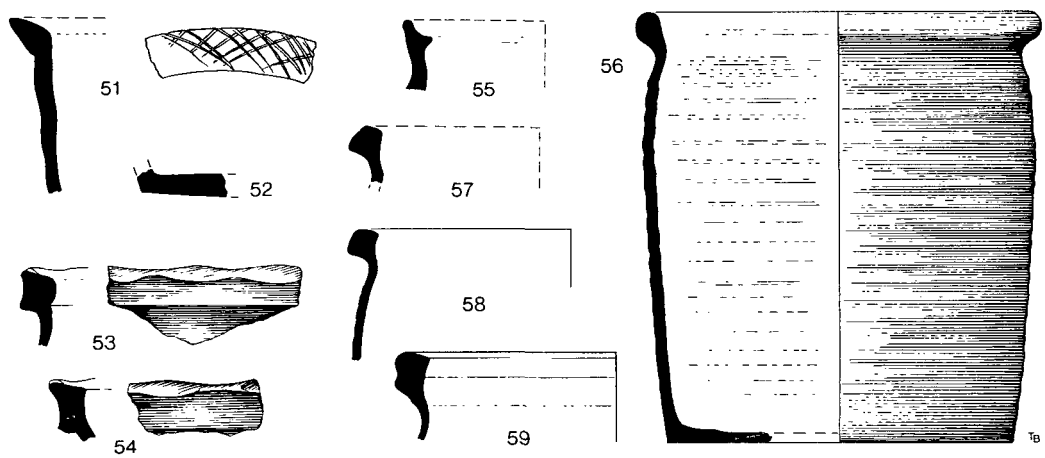
ILLUS 18 Kelso Abbey: ceramic material from pit BY; jugs MEE 17–20 (scale 1:3)



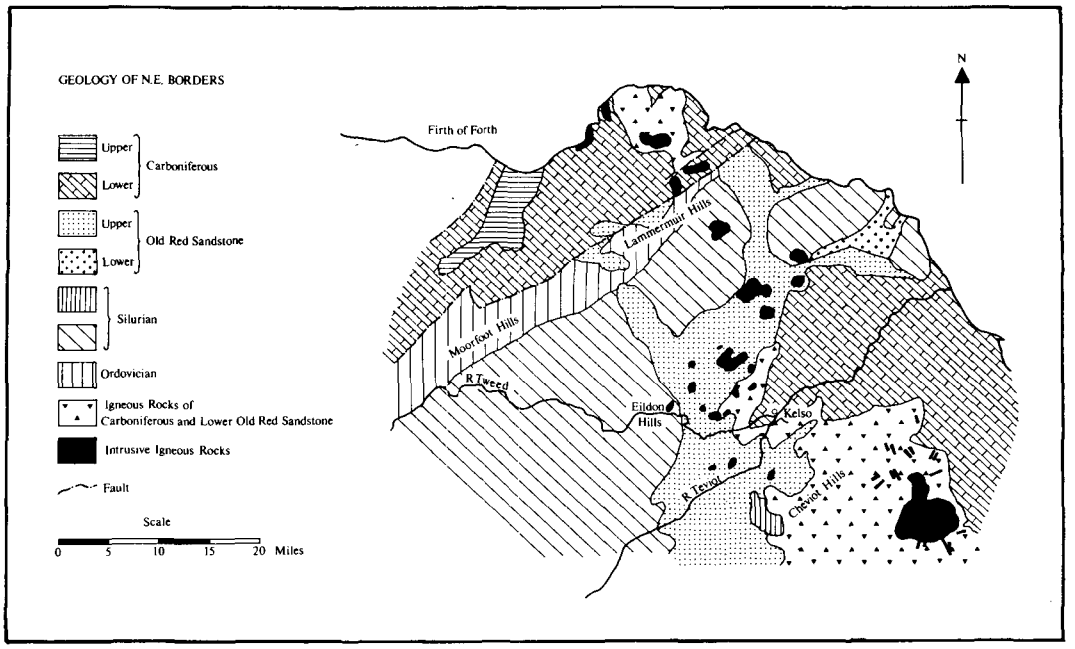
ILLUS 19 Kelso Abbey: ceramic material from pit BY; jugs MEE 21–28 (scale 1:3)



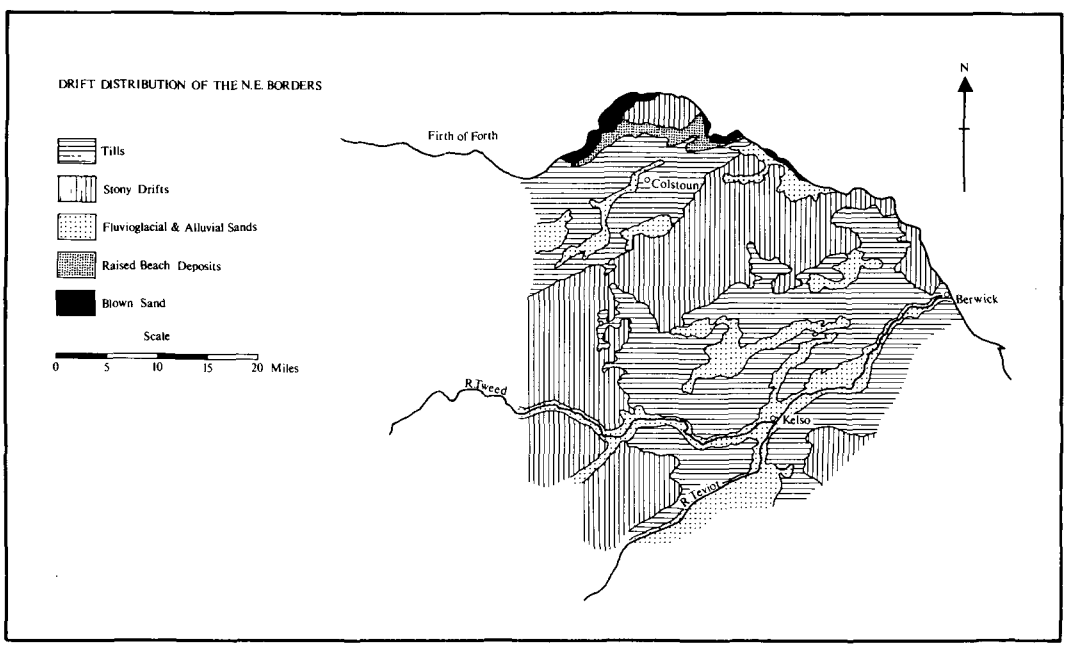
ILLUS 20 Kelso Abbey: ceramic material from pit BY; assorted handles, rims and bases MEE 29–50 (scale 1:3)



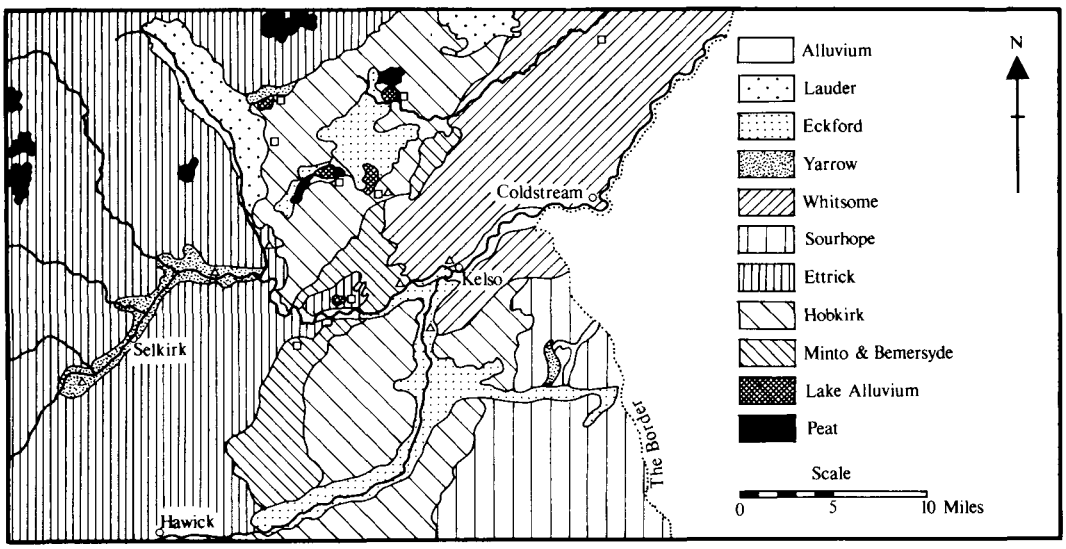
ILLUS 21 Kelso Abbey: ceramic material; assorted cooking pot forms MEE 51–59 (scale 1:3)



ILLUS 22 Geology of the NE Borders



ILLUS 23 Drift distribution of the NE Borders



□ Commercially worked clay beds.
△ Clay samples taken for heavy mineral analysis.

ILLUS 24 Soil associations of the Kelso area; after Muir (1956) and Ragg (1960)

Macroscopic identification

Sherds were examined under the microscope at X20 magnification to establish any predominant fabric. Forty different fabrics were observed throughout all the material on the basis of non-plastic content, texture, hardness and colour. This quantitative technique is suitable as a comparative method of studying a collection of pottery but, with regard to provenance, not sufficiently controlled to be pursued further.

Microscopic identification

Of the 40 fabrics represented in the collection random samples of each were thin-sectioned. From each fabric type, where possible, rim, body and basal sherds were analysed. Strap handles were also examined. Pottery from disturbed levels was not sectioned. The quantitative nature of petrological examination reduced the number of fabrics at first thought to exist from 40 to 20. The pit BY itself produced 13 fabrics. Initial observation at X20 magnification does not allow the clay matrix, accessory minerals or rock fragments to be positively identified and may statistically over- or under-weigh any interpretation of the pottery found on any one site. Modal analysis using the method of Hutchison (1974) was completed on most thin-sections to give a quantitative value of fabric content. The variables employed were quartz, plagioclase, alkali feldspar, rock fragments, clay matrix and heavy minerals. These are detailed in Cox (1983).

Heavy mineral analysis (HMA)

In thin section some heavy minerals are difficult to identify as they can be masked by the amorphous nature of some clay bodies. As shown by Peacock (1967, 96–100) heavy mineral content is a method of finger-printing the clay body from which the fabric was thrown. Individual grains are not of any direct aid in identifying the area of origin, but taken as components in association with other heavy minerals, this suite then becomes a method of assessing the rock types most likely to have liberated them on erosion. The fabric was hand-crushed and separated, after Hutchison (1974), and examined under the microscope.

X-ray diffraction (XRD)

This non-destructive method allows the fabric to be semi-quantitatively analysed and the fabric inclusion not distinguishable under the microscope to be identified. Relative mineral percentages can be calculated, and results from thin-section and heavy mineral analyses confirmed. Additional information on firing temperatures gained from the presence or absence of certain clay minerals indicates techniques employed or conditions of manufacture. Instrumental conditions are as used by Cox (1978) and a full description given in Cox (1983).

Scanning electron microscopy (SEM)

Photographs obtained by this explorative technique establish the foreign or inherent nature of the composite grains and individual particles within the clay body.

Fabric description based on macro and microscopic analyses

All colour values given in the fabric descriptions below are based on soil colour chart values of Munsell (1975). Grain shape and size are in accordance with Powers (1953, 117–19). Descriptions of the mineral inclusions most commonly encountered in the dominant fabric are listed below. Where any variation in optical property or mineralogical content occurs, these features are discussed within the relevant fabric description.

Mineralogy

The principal constituent minerals display the following properties.

Quartz: Occurs as sub-angular grains between 0·8 and 1·5 mm, displaying undulose and straight extinction indicating metamorphic/sedimentary and granite parent material. Frequent inclusions of rutile and other accessory minerals can be seen within the quartz grains presumably of acid igneous origin. Quartz appears as the most abundant of the plastic constituents and may be derived from a variety of sources – granites, sandstones, greywackes and pegmatites.

Feldspar: Present as angular to sub-angular grains between 0·8 and 1·5 mm. It is seen mostly as plagioclase and microcline. Weathering and alteration (sericitization) occurs in many of the feldspars, although microcline is generally fresh, the abundant nature of the crystals accompanying quartz pointing to a very arkosic parent material. The occasional perthite can also be recognized as with infrequent grains of albite and sanidine.

Mica: The two most frequent members of this group visible in the paste are seen in the matrix itself. Muscovite and chlorite both abound. Muscovite appears white and colourless in the paste and within composite grains in association with quartz and feldspar. Chlorite, the predominant clay mineral in the matrix, is green and elongate; a typical sedimentary or metamorphic product.

Opaques: A few irregular shaped grains of haematite or magnetite are present as isolated segregations. They are mostly seen, however, as probable alteration products of the notably absent ferromagnesian minerals. The average size of the weathered crystals is 0·5 mm.

Rock fragments: Composite grains up to 2 mm are seen as red and white sandstone, greywacke, green shale, chert, dolerite, basalt and granite. Mica-schist and coarse sandstones occur in minor amounts.

Heavy minerals: No minerals in this group are larger than 0·4 mm across, occurring as sphene, zircon, apatite, epidote and tourmaline. Few ferromagnesian minerals other than biotite or sparse olivine are seen, probably due to the extensively weathered parent materials from which the clay body was derived.

Organic inclusions: Many of the fabrics contain varying amounts of unburnt wood, grass etc. Pollen has been identified in some sections, birch, hazel, oak and heathers all recognizable. Fresh water diatoms have also been fossilized in the fabrics.

Fabric 1

A well sorted, fine grained paste. Colour ranges from white oxidized (10Y 8/1) to grey reduced (2–5YR 4/0). Hard, brittle, and voidless with an irregular fracture. Quartz, feldspar and a ferric oxide stain can be seen in all fresh breaks. Under cross-nicols the anisotropic clay matrix has varying amounts of chlorite, muscovite, quartz, feldspar, opaques and heavy minerals in the ground-mass. These

non-plastic inclusions are bimodal in the fabric, that is, they occur both in the ground-mass and also as large discrete grains up to 1·5 mm in size. Most thin-sections have varying amounts of coal/carbonaceous material as an inherent component of the paste. The paste appears as a residual bulk of quartz and feldspar with minor amounts of altered ferromagnesian silicates, displaying a very arkosic texture and composition, typical of the breakdown of sandstone, greywacke and granite. Transportation of the clay body does not appear to have been over a great distance as there is a relative absence of grain rounding. This was established under the SEM. However, the clay does have a strong mineralogical maturity owing to the lack of amphiboles and pyroxenes.

This fabric is represented by a minimum of 21 vessels.

Straight-sided cooking pots – MEE 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 15. Basal sherds from similar pots are illustrated, as in MEE 44, 45 and 48. Ten other rimsherds (MEE 16: not illustrated in this report) were used in thin sctioning.

Jugs – MEE 18, 19, 20, 21, 22, 23, 28; strap handles MEE 29, 30, 31, 32, 33, 34; rimsherds MEE 35, 36, 37, 38, 39, 40, 41, 42, and basal sherds MEE 43, 46, 47, 49, 50 are also from this type of vessel.

Fabric 2

A white (10YR 8/2) soft, well sorted paste with sparse sub-angular to rounded inclusions of quartz, feldspar and rock fragments up to 0·75 mm across. The quartz grains have an obvious coating of ferrous oxide possibly liberated from a sandstone or iron-rich alluvium. In thin section it appears as an open matrix with a predominance of angular/sub-angular grains of quartz and feldspar. The bonding medium of chloritic/micaceous clay is lacking, giving the paste a very sandy appearance.

Rock fragments are identified as polycrystalline grains of sandstone and composite grains of quartz exhibiting undulose extinction. As in Fabric 1, a metamorphic or sedimentary environment is a probable source for this paste. Geologically the two fabrics are not far removed from each other as the heavy mineral suites are comparable.

This fabric is represented by a minimum of two vessels; jugs MEE 17 and 25.

Fabric 3

A medium to coarse, unsorted reddish brown (5YR 5/6) paste, hard and irregular in fracture. Quartz and rock fragments up to 1·0 mm across are abundant. In thin section rock fragments of mica-schist, red sandstone, coarse quartz-rich sandstone, olivine basalt, trachyte and greywacke are all identifiable within the anisotropic matrix, the more basic rock types being badly altered as an inherent part of the paste. Haematite staining up to 1·5 mm across with weathered ferromagnesians is common. Muscovite is the most abundant identifiable mineral in the clay bonding. Minor amounts of apatite, zircon, and epidote are present.

This fabric is represented by a minimum of one vessel; jug MEE 27.

Fabric 4

A fine-grained pink to brown (7·5YR 8/4) oxidized paste with sparse quartz and rock fragments up to 0·5 mm across. Sub-angular to rounded grains with a ferrous oxide coating are seen under X20 magnification. In thin section the ground-mass is a very quartz- and feldspar- rich matrix with a very sandy texture. Apaptite and rutile are observed in minor amounts. Metamorphic, granitic and sedimentary quartz is visible, accompanied by polycrystalline grains of quartzite and greywacke.

This fabric is represented by a minimum of one vessel; straight-sided cooking pot MEE 8.

Fabric 5

A medium to coarse grained paste. A white (10YR 8/2) oxidized fabric with vesicular fracture is seen in hand specimen. Rounded inclusions of quartz and a few haematite grains are sparse but vary in size from 0·8 to 1·2 mm in size. In thin section the grains appear very water-worn imbedded in a muscovite-rich clay matrix. Quartz and microcline are the main constituent of the sparse ground-mass. Rock fragments present are coarse sandstone, quartzite, and greywacke. Epidote, hornblende and apatite are the most prominent heavy minerals.

This fabric is represented by a minimum of one vessel; jug MEE 26.

Fabric 6

A very gritty pink (7·5YR 8/4) paste with numerous large quartz grains and rock fragments up to 2·5 mm across, sub-angular to rounded appearance set in a hard voidless matrix. It has a rough unglazed surface finish. In thin section the anisotropic clay matrix embraces a diverse rock type. Greywacke, red and white sandstones, olivine basalts, trachytes, mica-schists and granites are all visible, most in an altered condition. Large singular grains of microcline, albite and quartz are held in an angular silt with some muscovite and biotite within the matrix. Heavy minerals present are garnet, epidote, apatite and magnetite. SEM studies suggest river alluvium as a source material.

This fabric is represented by a minimum of one vessel; MEE 51 (cf MEE 52 from drain BT, which may be part of the same vessel, and also scraps of sherds (not illustrated) from feature BK).

Fabric 7

A sandy, clear quartz-rich paste. White (10YR 3/3) oxidized vesicular matrix with few visible rock fragments. Hard and irregular in fracture with a smooth unglazed, fumed finish. It is relatively iron-free in thin section with angular granitic quartz, held in a muscovite-rich clay body.

This fabric is represented by a minimum of one vessel (MEE 16: not illustrated).

Fabric 8

Brittle red (2·5YR 6/8) fine grained paste with sparse inclusions of quartz and feldspar. Some rock fragments visible give it a roughish finish. Basalt and sandstone are predominant amongst the composite grains.

This fabric is represented by a minimum of one vessel; jug MEE 24.

Fabric 9

Very fine grained white (10YR 8/1) paste free of visible inclusions in hand specimen. Hard, vitrified and conchoidal in fracture. In thin section the fabric is a well-sorted quartz and feldspar-rich sub-angular sand held by a chlorite/muscovite matrix. No heavy minerals or evidence of iron-bearing minerals are present.

This fabric is represented by a minimum of one vessel (MEE 16: not illustrated).

Fabric 10

Fine grained, hard, red (5YR 6/6) paste. Relatively free from visible inclusions other than very sparse rock fragments up to 0·4 mm across. A smooth, unglazed finish is acheived on a very thin walled fabric. In section sub-angular to rounded fragments of mica-schist, trachyte, and olivine/augite basalt are held in a dense anisotropic clay. Quartz and microcline are present in minor amounts. No heavy minerals other than infrequent magnetite are visible.

This fabric is represented by a minimum of one vessel (MEE 16: not illustrated).

Fabric 11

Fine grained reddish yellow (5YR 7/8) fabric. Vesicular and brittle in fracture with a well sorted ground-mass. Some opaques, probably magnetite/haematite, are visible. The paste is essentially homogeneous in nature except for the very occasional rounded milky quartz grain up to 0·8 mm across in size.

This fabric is represented by a minimum of one vessel (MEE 16: not illustrated).

Fabric 12

Orange-cream (10YR 3/3) vesicular fabric. A vitrified micaceous matrix holding sparse inclusions of quartz and rock fragments 0·5 mm in size. The amorphous nature of the ground-mass made further identification difficult.

This fabric is represented by a minimum of one vessel; MEE 14.

Fabric 13

Sparse rock fragments with coarse to sub-angular quartz grains held in a well-sorted white (10YR 8/1) matrix. A friable fabric with irregular fracture, unglazed and thick in section.

This fabric is represented by a minimum of one vessel (MEE 16: not illustrated).

Conclusion

Of the 18 kg of pottery recovered from the pit BY and associated layers, 90% of the material, on the basis of evidence gathered from the thin sectioning and investigative programme, belongs to common parent material(s). Mineralogical variation within the dominant fabric, Fabric 1, is minimal allowing for the diverse nature of the till plain from which the clay body was extracted. Thin sections taken from tiles, field-drains and bricks manufactured from local raw materials in the NE Borders reveal a similar petrology to the bulk of the fabrics analysed. Quartz, microcline, albite, in association with weathered basalt, mica-schist, red sandstone, and greywacke fragments all display similar optical properties in the 19th- and 20th-century products as in their medieval counterparts. These rock types are known to exist in the vicinity of the Eildon, Moorfoot, Lammermuir, and Cheviot Hills and are well documented by Macgregor and Eckford (1952, 230), Tomkeieff (1952, 53; 1953, 95) and Eckford and Ritchie (1939, 464).

The heavy mineral assemblages observed in Fabric 1 are indicative of two main rock types: an acid/basic igneous source and a coarse sedimentary source. Both are common to the NE Border area. XRD traces of Fabric 1 revealed quartz, non-swelling chlorite, muscovite, and biotite common to the soils of the Ettrick, Hobkirk and Whitsome Associations. SEM confirmed that the fabric had not been artificially tempered and that the sub-angular grains seen in thin section were inherent members of a glacially derived clay body.

Methods of firing the dominant fabric and subsequent physical appearance can be indicative of clay source and ease of working. The clear cream colour on external surfaces with grey wall interior suggest a prevalent carbonaceous clay body. The light-grey surface with dark-grey wall interior is a result of partial oxidation of a similar clay. Surface textures on most of the pit group pottery points to a plastic clay, readily worked with hard-wearing properties in keeping with such fine utility ware.

Sufficient evidence has been gained from the analytical methods employed in this study to indicate the use of a local carbonaceous clay for Fabrics 1, 2, 3, 4, 5, 10 and 12, the area of provenance most likely being E of Kelso (ie down river) within the upper levels of the grey boulder clays associated with the Whitsome series. A lake alluvium held within this massive clay would be a ready source. Some working of the local coarse river alluvium is obvious in the manufacture of the vessels of Fabric 6.

OBSERVATIONS ON THE CERAMIC MATERIAL FROM PHASE I PITS BY AND AQ

George Haggarty

Around the year 1100, Scotland experienced the beginning of a new, and profoundly influential, influx of newcomers. This peaceful invasion of her shores was to continue for almost 200 years, ending only with the crossing of the Border by the army of Edward I of England in 1296. The revolutionary changes brought about by this introduction into Scotland of feudalism, most notably by David I (1124–53), Malcolm IV (1153–1165) and William the Lion (1165–1214), were many and varied. The granting of large parcels of land to families, chiefly of Anglo-Norman stock, so changed a country that had, until then, been on the periphery of mainland Europe and in many respects lagged behind in terms of its material culture. It is unfortunate that much of this settlement was at an unchronicled level but, in the train of the new lords, came an array of merchants, craftsmen, farmers and servants (Barrow 1980, 7).

It is conceivable that the advent of the new monasticism from the Continent was instrumental in introducing major changes to Scotland, not solely restricted to the spiritual sphere but equally revolutionary in the economic area. The reformed Benedictine orders such as the Cistercians were quick to capitalize on the generous grants of land that came their way, channelling their efforts principally into coarse wool production for export to the main European Staples. The religious houses soon developed a shrewd business acumen which exhibited itself in other ways, and it is possible to argue that the monasteries could have been the first to recognize the need and capitalize upon the opportunities presented by producing and trading locally made wheel-thrown pottery in

areas which had formerly been aceramic but which were becoming dependent upon pottery imported from production centres elsewhere, eg SE England and the Low Countries (Murray 1982, 116–26). In this regard it might be poignant to recall the importance attached to the practising of common craft-work, such as the making of pottery, by the early Tironensians in particular. Bernard, their founder, appears to have made this a central tenet of their monastic life, 'He received all who came to him and commanded them to exercise within the monastery the crafts which they had independently acquired.' (*Hic omnes ad se venientes suscipiebat et artes quas noverant legitimas infra monasterium exercere praecipiebat*) (Robert of Torigni, *Tractatus de Immutatione Ordinis Monachorum,* written c 1154, and quoted in Knowles 1963, 201).

It is against this background that the ceramic material from the pits BY and AQ should be seen. This is a remarkable assemblage. It must be regarded as a reasonably comprehensive cross-section of the range of ceramic vessels in daily use by the monastic community at the time of its disposal. Precisely when this was the pits themselves failed to resolve, for only one piece of window-glass accompanied the ceramic. That the pit BY was backfilled over a very brief period has already been noted and the conjoining of sherds from all horizons within confirms this. The pit had been filled up, levelled over and built upon with indecent haste, or so it would seem judging by the action of settlement on the new structures.

In the absence of intrinsic dating evidence, parallels for the ceramic must be sought from better dated contexts. To do this properly, certain attributes must be used and these are set out very well by Dunning (1968, 35). The distinctive straight-sided form of the cooking pots lends itself to this type of study, fulfilling as it does Dunning's three criteria.

Straight-sided pottery vessels were first recognized as a Scottish regional type by Laing. He even went so far as to postulate the influence of this style on the locally produced 12th/13th century pots at Jarlshof, Shetland (Laing 1973, 183–216). This thesis is not impossible given our knowledge that there was an extensive trade in this period from as far south as the Thames Valley in basic utilitarian cooking pot-type vessels, a trade reaching as far north as Norway (Dunning 1968, 35–58), where white quartz-tempered straight-sided pottery is known from excavations in Bergen (Dunlop pers comm).

The pottery from Kelso must be examined within the framework of a much larger ceramic industry, commonly called the Scottish East Coast white gritty ware (SECWGW). On evidence presently available there would seem to be three distinct regional areas – Fife, Lothian and Tweeddale. The northern boundary for the production of SECWGW was very likely the River Tay. To its N are found the iron-rich pottery industries of NE Scotland, apparently centred upon the main burghs, eg Aberdeen, Elgin and Inverness. Archaeological evidence would indicate that these northern industries were generally later developments (Murray 1982, 116–75).

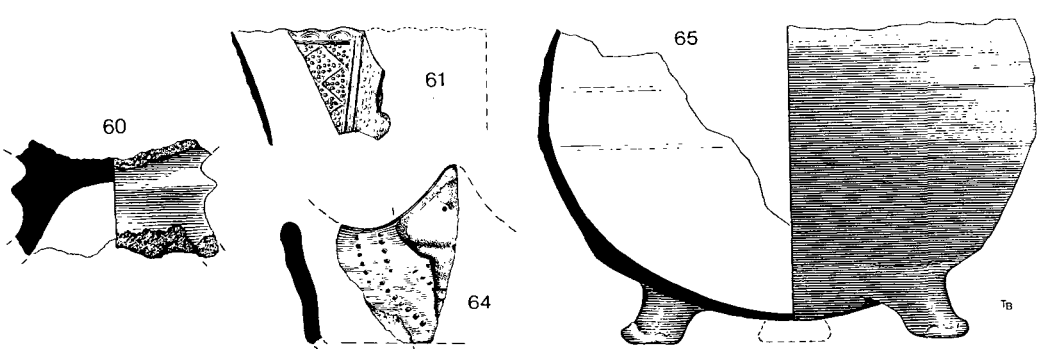
The quartz-tempered industry in Fife is not sufficiently understood at present; the only evidence for it being the material from excavations within St Andrews (as yet unpublished) and the important collections from fieldwalking done by the late Daniel Henderson and now housed mainly within the National Museum of Antiquities of Scotland. In general this material is much grittier than that from south of the Forth and there is no evidence that the straight-sided thin-walled pots were being produced in this region. It would be premature, at this stage, to dismiss this possibility out of hand considering the great amount of work that requires to be done on regional characteristics.

The only centre in the Lothians known to date producing quartz-tempered straight-sided pottery is at Colstoun, East Lothian, a multi-kiln site where a group of unstratified and undated material has been recovered both from fieldwalking and excavation over a number of years (Brooks 1980, 364–403). Thin sectioning has proved conclusively that this ware is geologically

divorced from the material discussed here from Tweeddale (Cox pers comm); indeed it may be possible to differentiate the regional characteristics of the two types by rim form alone. It is not our intention to expand upon these differences here; they will be developed in a future paper.

Fieldwalking in Tweeddale has singularly failed to locate a production centre, but, in addition to the Kelso ceramic, similar material has recently been recognized from a number of sites, in particular from excavations at The Hirsel, beside Coldstream (Young & Clark 1982, 217). A re-examination of earlier discoveries from the area has shown that identical material exists in museum collections, eg some of the sherds from the ditch at Hawick motte (now in the Hawick Museum). This material will form part of the content of the future paper.

The trade in straight-sided pots from Tweeddale is well attested for it has now been identified in excavation material from a number of Scottish east coast burghs. From the beginning of the 12th century a near monopoly would seem to have existed in sand- and shell-tempered wares which were exported in large quantities to burghs like Aberdeen and Perth from the great ceramic production centres of SE England and, possibly, the Low Countries (Verhaege pers comm). The distinctive utilitarian English sand- and shell-tempered wares were ousted totally after the introduction of white quartz-tempered pots some time in the 12th century, leaving the import trade open only to the highly decorated jugs, etc, mainly of later Scarborough ware. At Elgin straight-sided cooking pots occurred within the earliest archaeological features (Lindsay pers comm). In Edinburgh, the type was found in possibly late 12th-century deposits beneath St Giles Cathedral (Holmes pers comm), whilst in Berwick-upon-Tweed it was stratified below a blue/grey ladle (Moorhouse 1982, 99–123). Perhaps the best dating evidence would seem to come from Aberdeen where it is associated with developed Stamford Ware at the St Paul's Street site (Murray 1982, 125–6). From Perth, straight-sided cooking pots have been found beneath a timber building on the N side of the High Street dated dendrochronologically to 1150–2 (PHSEC forthcoming). It can be seen from all this evidence that a date in the second or third quarter of the 12th century for the production of these very distinctive vessels is in keeping with the archaeological evidence from Kelso where the pit contents immediately predate the construction of the stone infirmary which can with good reason be held to have taken place in the third or fourth quarter of that same century (see below). There is little evidence as yet to indicate when production ceased, or how the straight-sided pottery fits into the 12th-century SECWGW industry in general. Returning to Colstoun, although straight-sided pottery was published along with globular cooking pots and copies of Scarborough ware face-mask jugs this does not imply a later date as there are at least seven kilns at the site, suggesting a lengthy period of production.



ILLUS 25 Kelso Abbey: ceramic material; lamp cresset MEE 60 and imported finewares MEE 61, 64–5 (scale 1:3)

REMAINDER OF THE POTTERY

Generally, there is little that can usefully be written about the remainder. With the exception of a few well-stratified, and reasonably diagnostic sherds, the ceramic material from the majority of the layers and features comprised either a few scraps of unidentifiable body sherds or large amounts of sherds, similarly anonymous and with varying amounts of residual material amongst them. The few artefacts recovered are singularly unhelpful in corroborating any dates suggested by the pottery.

1. Coarsewares

NMA	F	L	RD	Description
53	1	AF	75	cooking-pot rim
54	1	T	110	cooking-pot rim
55	1	T	72	cooking-pot rim
60	1	20	–	lamp cresset

53–55 Rims from globular cooking pots. *Phase 1*

60 Part of a lamp, or cresset, of the double-shelled form (Jope *et al* 1950, 57–60) covered externally in a green glaze. Although fairly common on archaeological sites in England, they are surprisingly rare in Scotland. *Phase 3*

2. Imported finewares

with a contribution on the stonewares from John Hurst

NMA	L	Description
61	40	stoneware rim
62	35	stoneware rim (not illustrated)
63	44	stoneware rim (not illustrated)
64	S	chafing dish rim
65	13	part of tripod pipkin

61 Single rimsherd from an exceedingly fine, exotic and thin light-grey stoneware vessel, possibly a very wide bowl. Highly decorated in a trellis design with multiple crosses within the diamonds. The place of manufacture is by no means clear. Its fineness would tend to rule out either Langerwehe or Raeren; in which case it may be from one of four possible sources – Beauvais, Cologne, Hanover (ie Duingen) or Siegburg. The decoration is one not known from the Rhineland but the trellis design, usually with a single fleur de lis or cross, is typical of Beauvais. It is found on buildings in the town as well as on the Beauvais chafing dishes, though these are in earthenware. It is conceivable, therefore, that this sherd is from an unusual, large decorated Beauvais bowl, manufactured in the early 16th century at a time when there was a sudden upsurge in the production of fine quality decorated stonewares (Fay & Fourest 1973). Many Scottish sites have produced Beauvais or Loire types (Thoms 1983, 254) demonstrating the close contacts throughout the 15th century, much more so than anything in England. *Phase 3*

62 Single sherd from a stoneware vessel, made either at Langerwehe (Hurst 1977, 221–4) or Raeren (Hurst 1964, I, 142–3) in the 15th century. The rough surface is suggestive of Langerwehe; c 1450. *Phase 3*

63 Single rimsherd from a Langerwehe type IV/I stoneware jug, with a single rim form slightly inturned and with rilling (Hurst 1977, 231–3). The manner in which the glaze has peeled off or is patchy is typical of Langerwehe; early 15th century. *Phase 3*

64 Single rimsherd from a type I chafing dish made in the Saintonge (Hurst 1974, 233–43); early 16th century. *Phase 3*

65 Almost complete pipkin, with two of the three feet surviving. Made in a hard orange fabric with a patchy orange-brown glaze internally and externally. *Phase 3*

DISCUSSION

Cleric John Duncan's description of the abbey precinct as he viewed it on the occasion of his visit in the year 1517 portrays Kelso as a thriving centre, not solely of religion but also for business. The monastic complex appears large and densely populated, with considerable domestic and commercial offices clustered around the spiritual core of church and cloister. Considering the abbey's undisputed wealth and importance from the time of its foundation early in the 12th century through to the date of Duncan's visitation, we can do no other than to assume that the situation pertaining in 1517, generally speaking, was very much that which existed formerly – that is, one of intensive spiritual and temporal activity. The excavations reported upon here have, perforce, done no more than shed a little light upon developments over some five centuries in a small corner of that once-sprawling precinct.

A number of factors have combined to limit further the story we are able to gain from the excavated evidence. Principal among these is the fact that no complete ground-plan was obtained for any of the structures revealed, a problem further compounded by the severe mutilation, for whatever reason, of much of the upstanding remains. Sadly, that which had fortuitously survived the ravages intact cannot be closely dated, though the general sequence of activity seems clear enough. The one coin, minted in the reign of James III, came from the much disturbed market-garden soil, whilst the majority of the other artefacts, principally ceramic, are of little chronological assistance, given the present state of knowledge.

Clearly, one of the first tasks of those charged with constructing the monastic complex was the provision of an adequate drainage and sewerage system, as the pot-sherds associated with the drain, BT, demonstrate. The drain's precise function was not ascertained but it is highly likely that it was designed to carry soiled water away from this corner of the precinct westward towards the river. The overall form and function of the buildings served by this drain is likewise unknown, the traces of stone and timber structures revealed making little sense in this regard.

The pit, BY, may conceivably have been a quarry for gravel, a raw material used by the abbey's masons as a temper in lime mortar and so forth. This and the amorphous spread of sandstone chippings and mortar, AG, possibly waste from a stonemason's work-bench, might suggest that this area had been part of the construction yard, or masons' lodge, at this early period. It is positioned sufficiently close to, but not in conflict with, the area of ground upon which the founding members had determined to erect their principal buildings, the church and cloister.

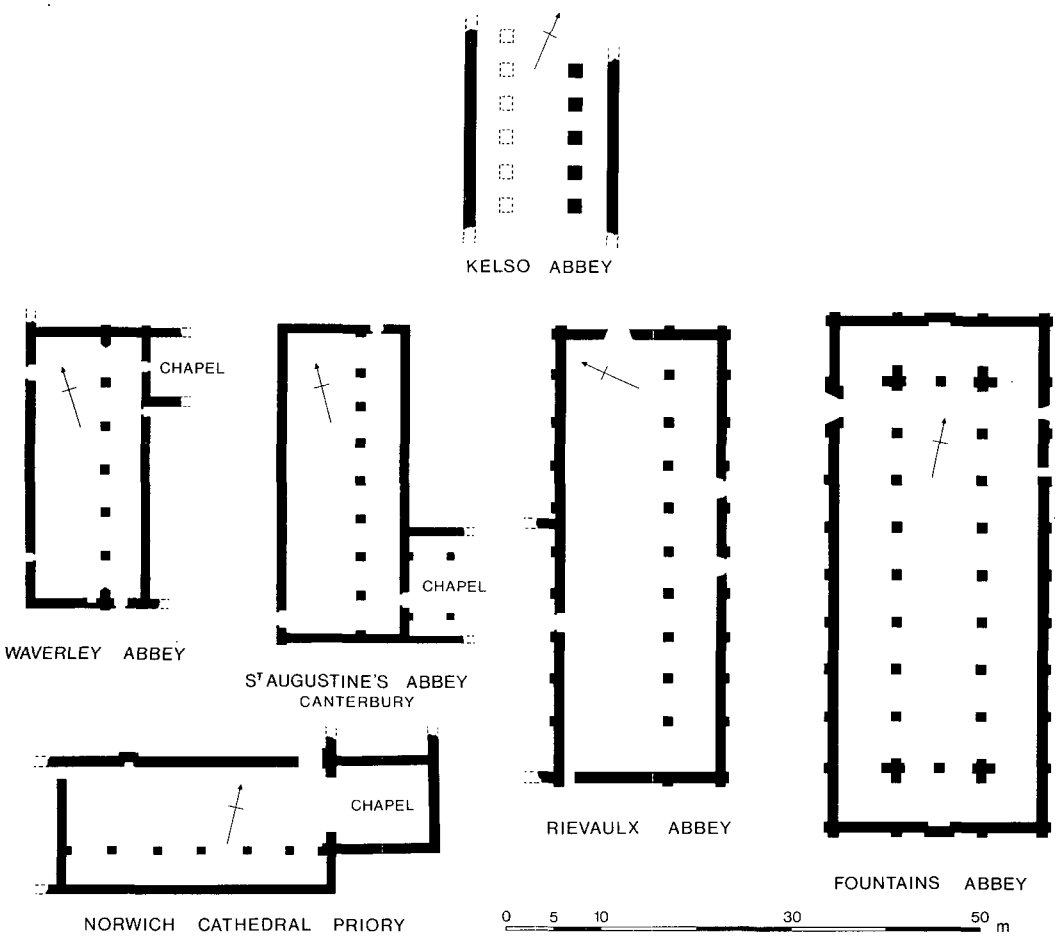
It was doubtless upon the completion, or near completion, of these buildings that work proceeded apace on the construction of the remainder of the complex. Arguably the most important of these extra-claustral structures was the infirmary (*infirmitorium, domus infirmaria*). This was not solely a place for the accommodation of the sick; it was, in addition, the dwelling place of those who were too infirm to continue to partake in the regular routine of the cloister. It was also generally used by the *minuti*, or brethren who were undergoing their periodical bleeding (*minutio*) for their health's sake (Thompson 1913, 113–21). Such a building must have been provided for the brethren at the outset, in which case it is most likely to have been constructed in timber, as at Waverley Abbey, Surrey (Brakspear 1905, 59). Its transmutation into stone would have followed in due course and, when that time duly arrived at Kelso, the structures standing in our corner were dismantled and the pit, BY, filled in to prepare the ground for the construction of the infirmary hall, its chapel, kitchen and related offices – in particular, the misericord.

The precise date of construction is unknown but the separate strands of evidence, taken together, would suggest that this is likely to have been towards the close of the 12th century.

Intrinsic dating evidence comes from two sources – the ceramic material from the filled-in pits BY and AQ and the fragments of pillar (artefact nos 106–7; illus 11). Extrinsic evidence comes from drawing analogies with infirmary complexes elsewhere.

The fragments of pillar can cautiously be ascribed to the same period as the ceramic material. They are clearly Romanesque in form but their chief interest lies in the fact that they would suggest that the infirmary arcading was supported on piers alternately octagonal and round, a scheme identical to that observed in the nave of Worksop Priory, Notts, and dated to c 1180 (Clapham 1934, 97; pl 19). A similar, though not identical, scheme of alternating piers was noted by Repton (1806, 333–7) in the course of demolition, in 1804, of the greater part of the infirmary hall at Norwich Cathedral Priory, Norfolk, a building constructed, it is averred, during the episcopacy of John of Oxford c 1175 (Stewart 1875, 25).

The dating of the construction of the Kelso infirmary by drawing on analogous structures elsewhere is no more precise. Rather, it tends merely to corroborate the intrinsic evidence. The infirmary at Kelso is in the minority in being orientated N–S for, generally speaking, infirmary halls were placed on an E–W axis similar to the church, with the hall or 'nave' on the W with the

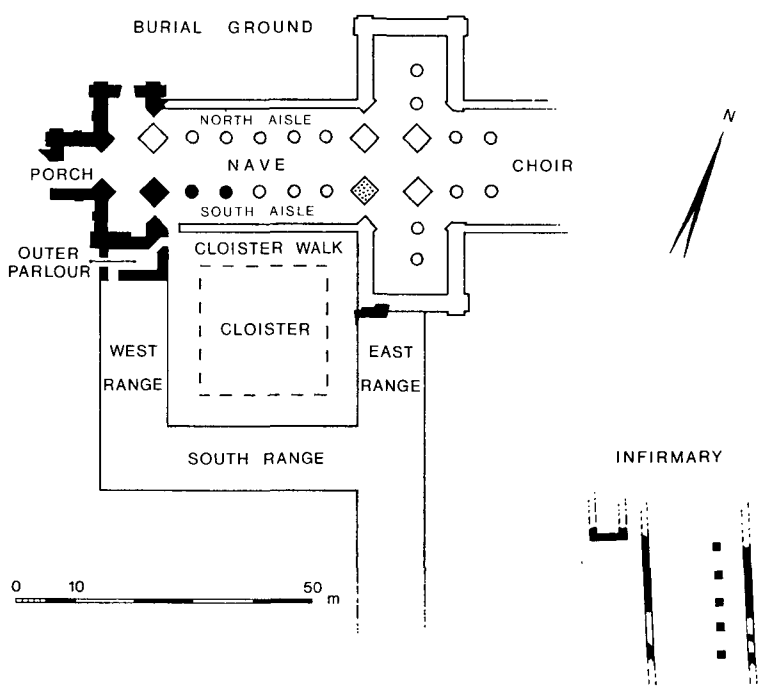


ILLUS 26 Plan size of Kelso Abbey's infirmary-hall in relation to those from Waverley Abbey; St Augustine's Abbey, Canterbury; Rievaulx Abbey; Fountains Abbey; Norwich Cathedral Priory

beds of the inmates placed in the aisle(s), and the chapel in the 'chancel' to the E, as at Norwich (illus 26). It would seem reasonable to assume that the 'church-orientated' type of plan is the original (Gilyard–Beer 1959, 34), though the transition to a less rigorous arrangement is, without question, of some antiquity. Both Cluny Abbey, Burgundy (Conant 1959, 112) and St Augustine's Abbey, Canterbury (Thompson 1934, 185) possessed infirmaries similarly orientated to that at Kelso by the mid 12th century at the latest. The most closely analogous infirmaries to Kelso are, in addition to that at St Augustine's Abbey, Canterbury, those at the Cistercian houses of Rievaulx, Yorkshire, dated to the late 12th century (Peers 1967, 14) and Waverley, completed by 1201 (Brakspear 1905, 58) (illus 26). The altogether more capacious infirmary hall at Fountains Abbey, Yorkshire has been ascribed to the period of John of Kent's abbacy, 1220–47 (Hope 1900, 52). Considering that the monastery at Kelso was established in the same year as that at Waverley, and three years before that at Rievaulx, we may be forgiven for assuming a contemporaneity with regard to the construction of their permanent infirmaries.

The infirmary hall at Kelso would appear to have been provided internally with a hall c 10 m wide and an eastern aisle c 3 m wide, the stone piers supporting the arcade alternating between octagonal and circular shafts. There was no archaeological evidence to suggest that there had ever been a western aisle, though it must be noted that the likely alignment of piers forming it coincides precisely with the permanent section between Areas II and III. The reconstructed ground-plan (illus 26) shows this hypothetical alignment in broken line, though the overall width of the infirmary hall would seem to confirm the former arrangement of hall and single aisle (illus 27).

The lead water-pipe from the gully, G, it is reasonable to assume, brought a freshwater supply into the hall, though no evidence for the wash-basins (*lavatorium*) served by this supply



ILLUS 27 Kelso Abbey: relationship of infirmary-hall to abbey church and cloister, surmized from excavation in 1971 and 1975–6

was found (cf St Augustine's Abbey, Canterbury (Thompson 1934, 185) for such a feature). This apart, there was nothing to indicate the presence of original entrances or fireplaces.

Similarly, little can be meaningfully written concerning the nature and function of the building to the W of the infirmary hall. It must surely have formed an integral part of the infirmary complex – though not the chapel, which would have lain to the E of the hall. The presence of a main drain or sewer running beneath the building would suggest that it may have been the infirmary kitchen (Thompson 1913, 120–1), and not the misericord.

The subsequent structural history of the infirmary is unclear from the available evidence. There are plentiful examples at infirmaries elsewhere (eg Fountains, Rievaulx, etc,) of internal alterations to the original open layout. Principal among them was the subdivision into smaller rooms (*cameras privatas*), often with their own fireplaces. This was usual by the beginning of the 15th century; it is known to have been done at Meaux Abbey, Yorkshire before 1396 (*Chron Melsa*, III, 224). A similar development may have occurred at Kelso, as demonstrated by the introduction of the fireplace, K, and chimney stack, L, partition wall, D and paving, E. However, the admittedly tenuous archaeological evidence – in particular, the lead-smelting pits and oven/kiln – would tend to suggest that the infirmary hall had largely become abandoned during the 15th century and replaced in part by smaller, free-standing structures. Such was the case at Westminster Abbey where, during the 14th century, the infirmary-hall was removed and a number of separate rooms were arranged round a cloister (Thompson 1913, 120). The structures built upon the demolished infirmary-hall at Kelso were also domestic in function and one is reminded of the eye-witness account of John Duncan in which he recalls the 'many houses and lodgings' clustered around the cloister.

ACKNOWLEDGEMENTS

The excavation was made possible only by the kind permission of the then owners of the ground, the Church of Scotland General Trustees and the Congregational Board of the Parish of Kelso. Encouragement and practical assistance were gratefully received from the Town Council of the Burgh of Kelso and its successor, Roxburgh District Council. The excavation team comprised Alice Carlin, David Carmichael-Stewart, Gordon Ewart, George Haggarty, Reg Hughes, Charlie Hoy, John Lewis, the late Tom Robertson, Betsy Tabraham and George Williams.

The ceramic material was conserved by Hugh Ritchie, Dundee Museum and Tom Bryce and staff at the National Museum of Antiquities of Scotland. Eoin Cox, George Haggarty and John Hurst were largely responsible for the report thereon, and Eoin Cox and I would wish to record our indebtedness to the staff of the Department of Geology and Mineralogy, Royal Scottish Museum, for their readiness to aid the petrological examination.

All the illustrations accompanying this report, with the exception of illus 22–24 which were drawn by Eoin Cox, were produced by the pen and artistry of Tom Borthwick. Incidental help on cataloguing was received from Henry King and John Lewis. My colleague, Richard Fawcett, gave helpful comments on the infirmary plan, though all the observations thereon are my own.

May I place on record here my grateful thanks to them all.

DISPOSAL OF FINDS AND DOCUMENTS

The artefacts are in the National Museum of Antiquities of Scotland; the note-books, field-drawings, photographs and other material have been deposited with the National Monuments Record of Scotland.

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