Excavations at the Catstane, Midlothian 1977

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with reports on the skeletal material by D A Lunt and A Young

SUMMARY

Limited excavations were carried out prior to the proposed removal of the Catstane. The area surrounding the stone was found to have been extensively disturbed presumably in the course of the excavations in 1860. Trenches were opened to investigate anomalies recorded by a resistivity survey. All or parts of 52 cists were located: a number showed obvious signs of disturbance in keeping with known antiquarian activity on the site, but others appeared to be undisturbed. Apart from the contents of some shale-lined cists, however, bone preservation was extremely poor.

INTRODUCTION

The impressive inscribed standing stone known as the Catstane has recently been the subject of study by A Rutherford and J N G Ritchie (1974). As these authors described the antiquarian accounts of the stone and provided a tentative reading of the inscription, the present report is concerned primarily with recent excavations carried out by the Central Excavation Unit of the Inspectorate of Ancient Monuments. No discussion of the inscription seemed appropriate in advance of a paper by Professor K H Jackson, who differs from the above authors in certain points. Reference, however, will be made to earlier sources conveniently discussed, and illustrated, by Rutherford and Ritchie.

The Catstane was at the time of the excavation *in situ* near Kirkliston, Midlothian, now in the City of Edinburgh District, Lothian Region. The stone consists of an impressive rounded whinstone boulder standing on a slight fluvio-glacial ridge c 75 m from the right bank of the River Almond at a point c 1 km north of the new terminal complex at Edinburgh Airport (NGR: NT 148743) (pl 9a). Prior to the construction of the present, main, E–W runway at Edinburgh, the stone stood in cultivated ground outside the airport perimeter. Since the construction of the runway, however, the stone has become virtually inaccessible to the general visitor, isolated by the construction of the flightpath some 70 m away on the south, and by the erection of the airport perimeter fence on the north, alongside the bank of the River Almond (fig 1).

The inaccessibility of the site and the presence of a potential safety hazard in the form of a large upright boulder close to a major runway prompted the British Airports Authority (Edinburgh) to instigate proposals for the removal of the stone to a new location in the area of the terminal complex, then shortly due to open. The presence of some minor flaws on the face of the Catstane, in the area containing the inscription, suggested that removal to a more sheltered location might be beneficial to the preservation of the lettering. Agreement to the move was therefore given, conditional upon the prior or concurrent excavation of the immediate area of the stone, and, if possible, the presumed site of the long cist cemetery first investigated in 1864. In view of the

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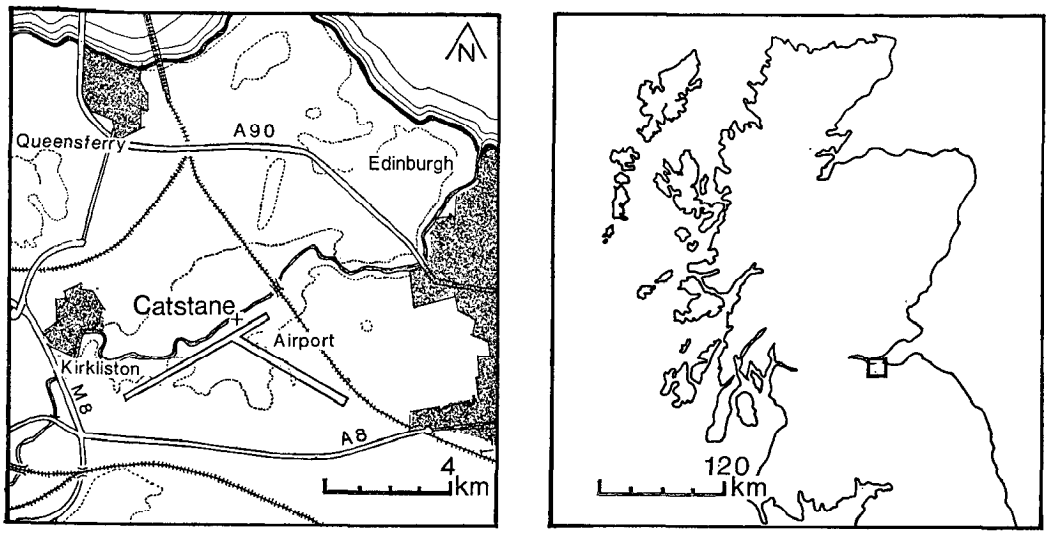


FIG 1 The Catstane: location maps (Based on OS Map: Crown Copyright reserved)

highly sensitive nature of the situation of the stone the Airport Authority was justifiably reluctant to permit large-scale operations, and the extent of the excavation was in turn to be conditional upon the results of a geophysical survey of the presumed site of the cemetery. The Central Excavation Unit (Scotland) was notified of the proposed removal of the stone and associated excavation in late March 1977 and the work described was undertaken under the direction of the writer from mid-April to late May of that year.

The archaeological aims of the excavation were threefold. The primary aim was to investigate the base of the stone in order to assess whether or not any original features had survived the gross disturbance of 1860 (Simpson 1862, 122). Secondly, it was hoped that trial excavations of the areas in which anomalies were revealed by the geophysical survey would clarify the form, extent and lay-out of the long cist cemetery also investigated about that time (Hutchison 1866), information that would prove valuable in the event of future proposals for development of the runway margins. Thirdly, it was hoped that the excavation would present the opportunity to test the suggestion made by Rutherford and Ritchie that the stone had been erected in the Bronze Age as part of, or in association with, a putative kerbed cairn (1974, 185–7).

EXCAVATION

The results of the excavation can be described most conveniently by detailing in turn the excavation of the area around the Catstane; the long cist cemetery; and, finally, the other significant features recovered. Brief details of individual features are given in Appendix 1: the excavation records, including a full photographic survey of the stone and its inscription, and full details of the individual features, are housed at the Central Excavation Unit, and may be consulted there on prior application.

The Catstane (Grid Squares C1/C2; D1/D2) (figs 3, 4)

The major aim of the excavation was to investigate the immediate area of the Catstane. Prior to excavation, the stone could be seen to protrude to a height of 1·20 m above a grass-covered knoll of stones and earth, elevated above the surrounding area at the verge of the runway.

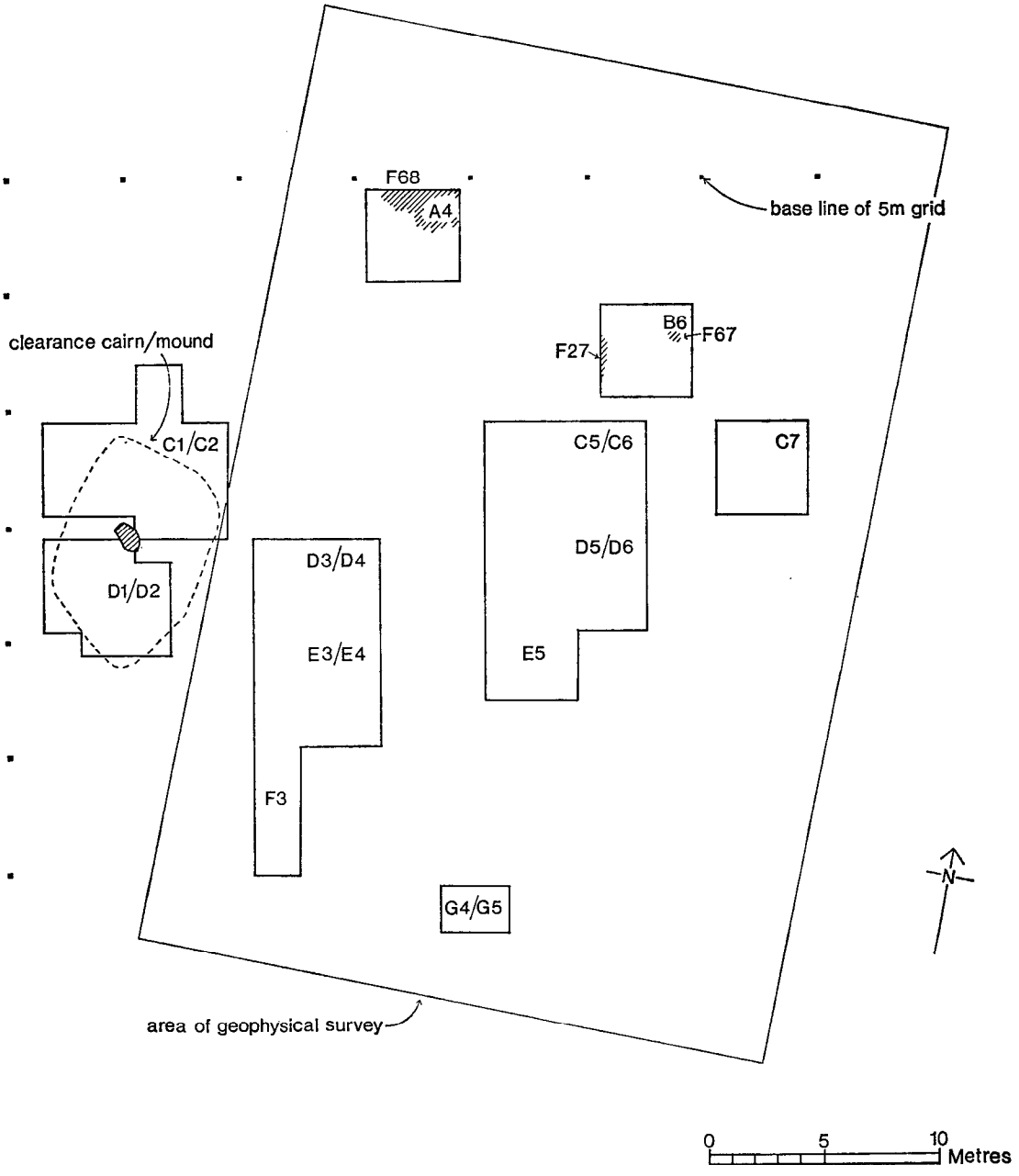


FIG 2 The Catstane: site plan showing lay-out of excavation trenches and area of resistivity survey, and positions of minor features

Superficially the isolation of this knoll appeared to be the product of ploughing and levelling of the surrounding area, so as to leave an undisturbed island of material, around, and protecting, the stone. Around the base of the stone, accretions of boulders, slabs and smaller stones won from field clearance could be seen lying scattered on, or protruding through the grass.

In planning the excavation of the area around the Catstane, the major consideration was safety. Given that contemporary sketches suggested that a good deal of the material surrounding the stone had been disturbed in the 19th century and perhaps earlier (Simpson 1862, 122 & fig 1) it was felt that very little reliance could be put on the superficial stability of the stone, which has an estimated weight of over 3 tons. The approach adopted therefore was to divide the area around the stone into four quadrants, aligned on the site grid. In view of the relatively small proportion of the stone that protruded above the grass, temporary props alone were not felt to be safe, and therefore excavation proceeded in such a way that on completion of the excavation 2m by 1 m wide baulks remained, clamping the base of the stone on the E and W as support, but minor enough to be archaeologically checked concurrently with the projected removal of the stone.

It is clear that ploughing had isolated a raised area of soil around stone, onto which had been cast, at various times, field-clearance stones, to form a roughly oval mound 11·5 m by 7 m (Feature No 1 (=F1)) (fig 2). Among the stones of this clearance heap was found the broken upper half of a rotary quern (SF20) and numerous slabs taken to derive from the destruction of cists by ploughing (cf Ashmore 1974, 188).) A list of the small finds (eg SF1) will be found on p 196.)

Removal of the field-clearance stones, and turf and topsoil up to a depth of 0·65 m (fig 4, layers 1 & 2) revealed a variable subsoil of brown sandy loam with a marked clayey component, and, in places, the underlying gravel rising to the surface in patches or bands (layer 4). Against this background, a number of features became apparent in the course of the excavation (fig 3). Excavation revealed around the base of the stone evidence of large-scale disturbance which it is reasonable to associate with the investigations in 1860 for reasons discussed below (p 181). The disturbance was deepest in the NE quadrant (F51) where it consisted of an irregular hole, extending up to 3·20 m eastwards from the Catstane and at least 1·15 m deep below subsoil level (pl 9b). The disturbance was traced to a depth of c 0·75 m below the base of the standing stone before excavation was discontinued for reasons of safety. The fill of the feature (fig 4, layer 3 (=F51)) consisted of mixed gravel, clay and loam, and stones of various sizes, and was clearly largely the backfilled material dug from the hole. The outline of the disturbance was traced to the S, but there the feature was left unexcavated. A spit of undisturbed subsoil separated these areas of disturbance from a further shallower disturbance on the W side of the stone (F35/40). The disturbance in this quadrant had again undermined the stone, the base of which lay some 0·35–0·40 m above the limit of the intrusion. Apart from directly beneath the stone, and apart from the point at which the spit of subsoil meets the stone on the S, the only other area where an intact remnant of the original stone-hole *may* survive is therefore to the N, where the small area within the baulk may only be examined in safety after the stone is removed.

The disturbed areas produced no finds nor any indication of the original form of the stone-hole or associated features, although the quantity of suitable rounded stones in the fill suggests a substantial amount of stone-packing may have been involved. Given the present position of the stone it is possible to infer that a deep stone-hole was not involved: indeed, it is possible, but unfortunately not demonstrable, that the shallower disturbance (F35/40) may represent the disturbed area of the stone-hole from which the stone may have slumped forward and canted a little, perhaps in the course of unrecorded disturbance prior to 1860. The Catstane itself is at least 2 m high with an apparently flat or slightly tapered base and is irregularly trapezoidal in horizontal cross-section. The inscription is on the E face.

Excavation of the area surrounding the stone revealed the existence of several cists but owing to pressure of time it was unfortunately not possible to investigate all of these fully; in particular

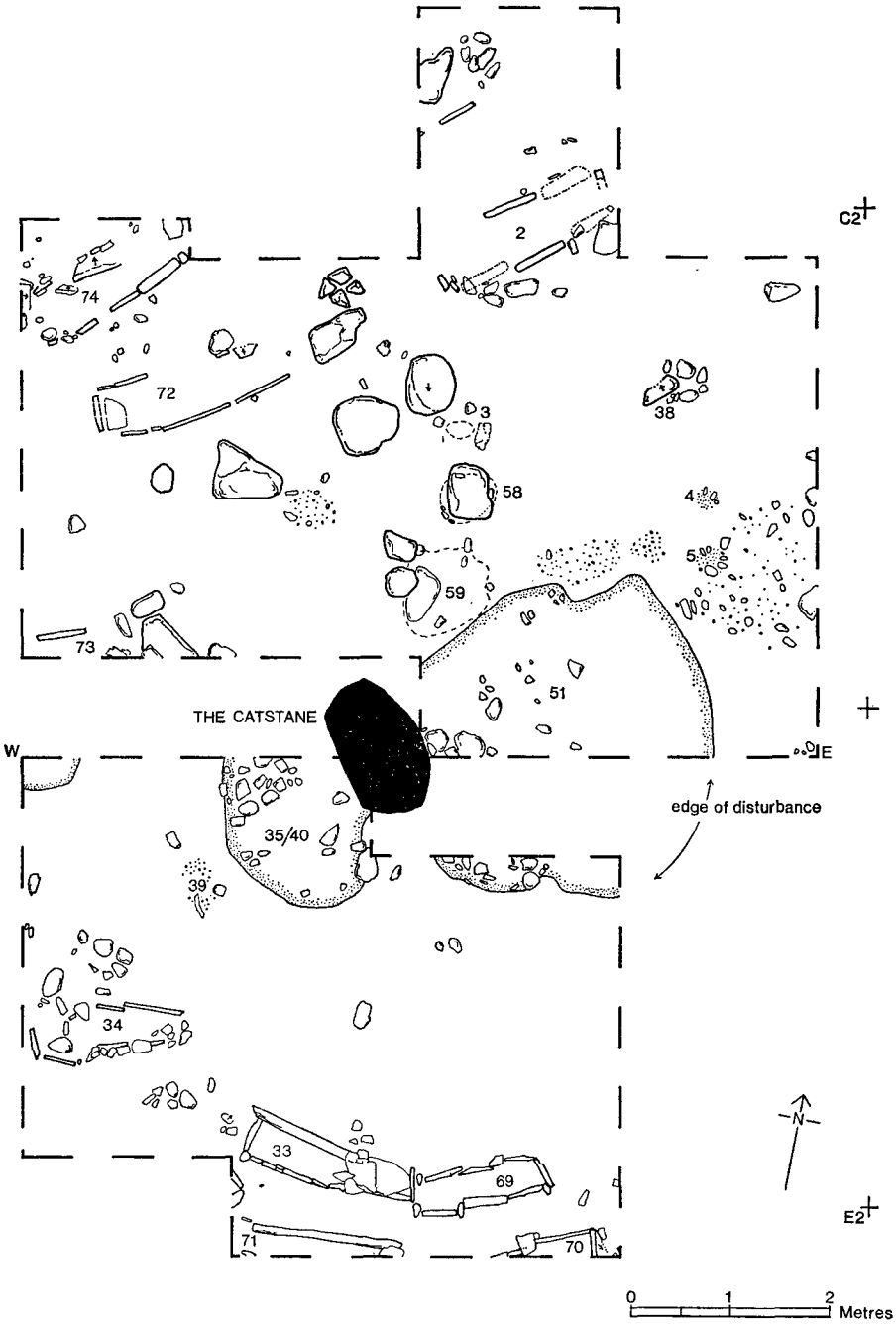


FIG 3 The Catstane: grid squares C1/2, D1/2, showing locations of features in the area around the stone

the cists to the S of the stone (F 33, 69, 70, 71) (see Appendix 1), revealed only at the end of the excavation, have not been completely excavated.

The cists around the stone stand out from those described below because of their aberrant

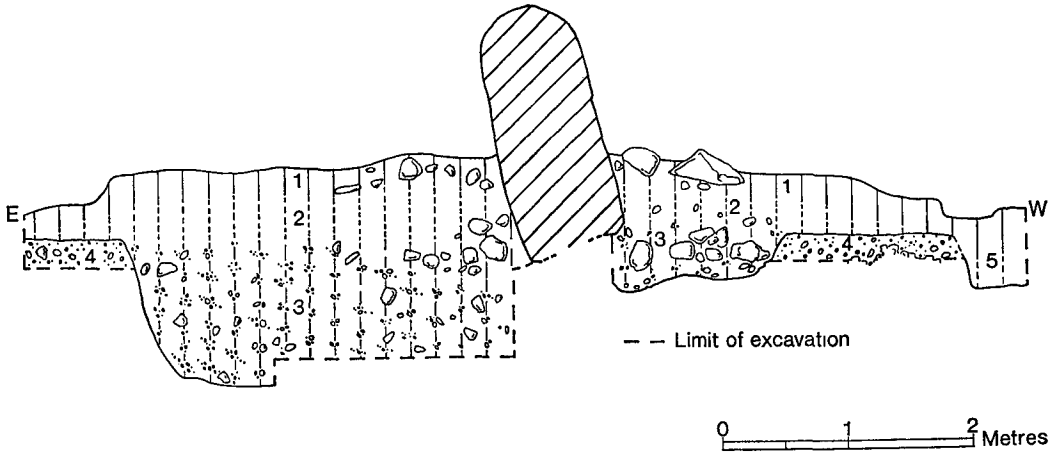


FIG 4 The Catstane: section E–W through F51, the Catstane, and F35/40

orientations but in most respects, such as construction, they compare with the cists in the main cemetery area to the E. It was noticeable, however, that, although severely damaged, F 2, 72 and 74 were larger than average in comparison to those in the cemetery. These, and the other cists around the northern margins of the knoll, had suffered heavily from plough damage and/or from disturbance in the past. F 2, 72, 73, 74 all lacked capstones, one or more side-slabs, and some or all of their basal slabs (had these ever existed). None of the cists investigated fully in these grid squares produced skeletal material but a skull fragment protruded from the unexcavated fill of F33.

Finally, mention should be made of a number of other features shown on the plan (fig 3). The presence of gravel bands near to and breaking the subsoil surface gave rise to the presence of several spurious features which initially resembled post-holes (eg F 4, 5). Percolation of ground water down the sides of the larger stones sitting in gravel had also created natural staining resembling stone-holes or sockets (eg F38), but in the event only one convincing stone-hole was located in these trenches (F58). A rounded boulder of no great size c 0·50 m in diameter by 0·35 m in height, was found to rest in a shallow depression, pinned with small angular stones. The stone-hole was approximately 0·60 m in diameter, with a fill of dark brown gravelly loam up to 0·17 m deep in the subsoil.

A further possible stone-hole was located immediately N of F58. This, F3, consisted of an oval shallow pocket of dark loam to one side of an obviously displaced rounded boulder, c 0·60 m in diameter, which may originally have been set in the depression. Apart from one other displaced boulder for which no original socket was apparent, the other boulders in these grid squares appeared to be natural stones lying *in situ* in, or protruding from, the underlying clay and gravel bands.

The Cist Cemetery (Grid squares C5/6, D5/6, E5; D3/4, E3/4, F3) (figs 2, 5–8)

Prior to excavation the area surrounding the stone consisted of a slight grassed-over elongated knoll falling away gently to the airport perimeter fence, and river bank, on the N, and the graded verges of the runway on the S. Some 80 m and 150 m away to the E and W the ground drops away to large culverts leading water off the airfield. It was in the area immediately S and E of the stone that Hutchison of Carlowrie was supposed to have discovered a cemetery of 51

cists, but approval for work away from the stone itself was conditional upon the results of a geophysical survey, carried out by Mr P Griffiths of the Ancient Monuments Laboratory of the Department of the Environment.

Trial excavations in 1974 by Mrs F Ashmore had revealed the presence of an apparently undisturbed cist approximately 17·5 m east of the Catstane, but no further evidence of the location of the cemetery was found in the course of trial trenching further to the E (1974, 187). It was therefore decided to concentrate the resistivity survey on the area immediately SE and E of the stone, but because of the limited access available at the time an area of only c 1110 m² was covered. The extent of the area traversed is indicated on the site plan (fig 2).

Initially trenches were opened up only over the approximate centres of the soil resistance anomalies but as the features – principally long stone cists – emerged during the course of the excavation, trenches were extended as the limitations of time, access and manpower allowed. The end result was the investigation of two main cuttings and four minor trenches opened to investigate less obvious anomalies or to test the limits of the cemetery once its location had become apparent.

The removal of the present turf and former ploughsoil revealed a variety of features lying in the subsoil of brown sandy loam, which was scored in places by ploughmarks, mainly running approximately WNW to ESE. Although archaeologically receptive when damp, this subsoil contained a marked clayey component and consequently dried out and cracked in the dry conditions prevailing in May 1977. As no water supply was available, some features surviving only as soil marks may well have been overlooked as a result.

The cemetery consisted of long stone cists assumed to have contained skeletons laid on their backs and, with only a few exceptions, orientated E to W with the heads at the west end (pl 10a). It is not proposed to describe each cist in detail, but rather to summarise the main elements of their construction and condition, their contents and the lay-out and extent of the cemetery.

Construction and Condition of the Cists. All or parts of at least 42 cists were revealed in the two main cuttings. At an early stage of the excavation it became apparent that a number of cists were clearly undisturbed, that others had very clearly been deliberately disturbed and that the remainder showed variable degrees of disturbance but on the whole of a kind more in keeping with accidental interference during agricultural activity on the site.

The undisturbed cists were, not unexpectedly, located lower down the slight slope of the knoll, where they had presumably been given a measure of protection by accretions of up to 0·20 m of ploughsoil removed from the crest. These cists included F13, 17, 19, 24, 25, 32, 36, 47, 52, 53 and 54 all of which had some or all of their capstones *in situ* (figs 5, 6). Of these cists only F25 (fig 6) appears definitely to have been located before, in the course of Mrs F Ashmore's trial excavations in 1974 (1974, 187) although it was not possible for the grave to be investigated at that time. F17 lay at a slightly lower level than its neighbours and had accordingly escaped damage by the plough. F19 and 24 were only partially revealed and were therefore left unexcavated.

A number of cists showed unequivocal signs of deliberate disturbance: these included F28–31, 37, 41–45, 65 and 66 (fig 5). These cists lay in a row within the confines of a backfilled trench approximately 2 m wide, and thus only just wider than the length of the cists themselves. Between, in, and around the cists, stones and slabs representing the disturbed remains of packing, side-slabs, capstones and basal slabs lay in considerable disarray together with occasional teeth and bone fragments obviously divorced from their original contexts. Although not shown on the plan a small extension of the cutting to the N (at the very close of the excavation) revealed no further cists (N of F45) and also the return of the edges of the disturbance. The significance of these features will be discussed below in the light of the known antiquarian activity of 1864.

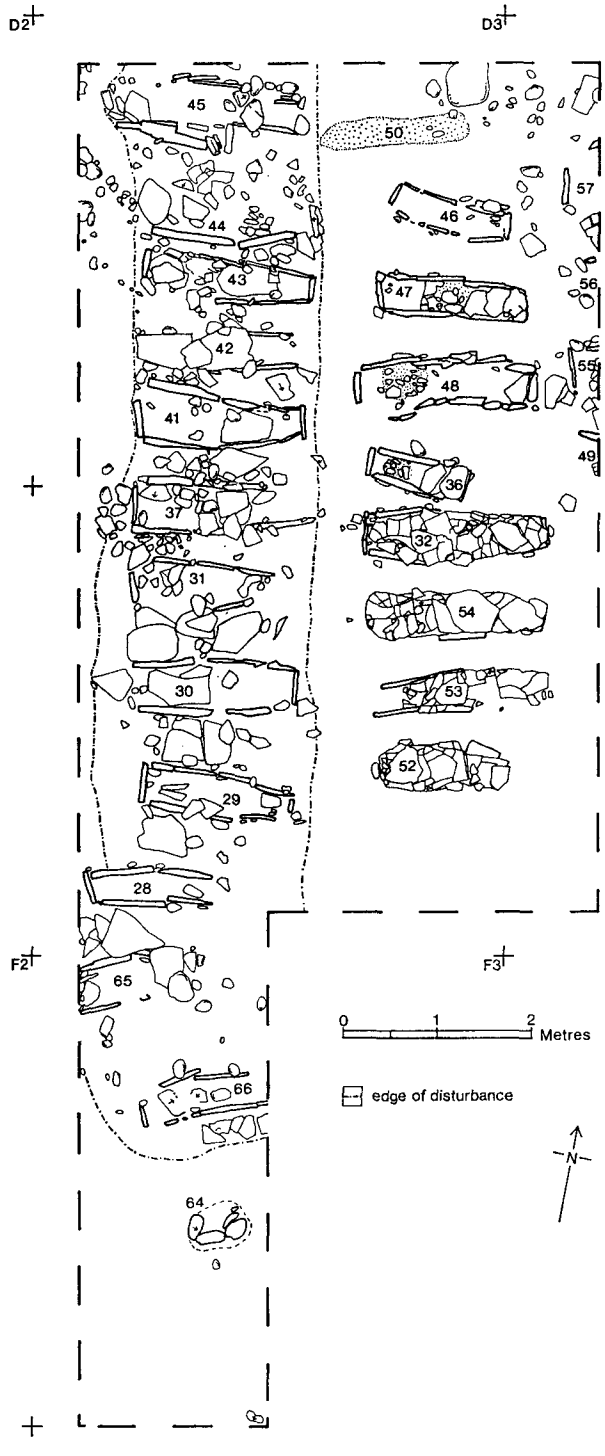


FIG 5 The Catstane: grid squares D3/4, E3/4, F3, showing location of features, prior to excavation

The remainder of the cists proved to contain more variable signs of disturbance. No other signs of recent deliberate or methodical disturbance in the form of disarranged slabs or stones were located, nor any other clear signs of previous trenching at least not into the subsoil. A number of cists, however, which only just protruded into the more westerly cutting and were therefore left unexcavated (F49, 55–57 (fig 5)) may fall into this category. Deliberate interference rather than plough damage probably accounts for the absence of the N side slabs of F20 and 23 but their removal may have taken place in antiquity during the insertion of the neighbouring cists F16 and 18 to the N.

Most of the remaining cists showed signs of disturbance most likely to have been caused in the course of the prolonged agricultural activity on the knoll which appears to have truncated or almost totally removed several features. The depth of the ploughsoil decreased markedly on the crest of the ridge and the obliteration of or damage to features at this point (eg F6, 8 & 62) is readily explicable in this way. Ploughmarks were traced in the subsoil in several locations aligned approximately WNW to ESE and in several cists damage to or removal of slabs, removal of the capstones, and post-mortem injury to the human skeletal material could be correlated with the ploughing of the knoll.

In some other cases, deliberate interference with the cists may have been involved – for instance in order to remove the slabs of F48 – but here the evidence suggests a less methodical disturbance than that already referred to, and removal of obstructions in the course of ploughing provides the likeliest explanation (cf Ashmore 1974, 188).

The cists fall into three groups on the basis of the materials used in their construction, namely shale and sandstone, though with minor differences in detail. Cists which utilised *predominantly shale* included F6, 8, 12–17 (fig 6), and probably F33, 69–71 (fig 3), which remained unexcavated. Cists in this category were constructed entirely of shale apart from the end-slabs which were either of sandstone or shale. In none of the excavated examples were the capstones intact, but the evidence of F19 suggests that shale and sandstone cover slabs were used.

In a number of cists both *shale and sandstone* had been utilised as major elements in the construction: these included F7, 18, 20, 23 and 60 (fig 6), in which the flooring of the cists consisted of shale fragments and the sides of sandstone, and F42–45 (fig 5) in which parts at least of the sides and floor were of shale, and the remainder sandstone. In no excavated case, however, did a cist incorporating shale side or end slabs have a sandstone base. With the exception of one cist (F34 in which a blue-grey shaley sandstone had been utilised) the remainder of the cists were constructed nearly exclusively of *sandstone* (including F25, 28–32, 36, 46–48, 52–54, 65, 66) (figs 5, 6).

A local source in the Upper Calciferous Sandstone series of rocks of Carboniferous age would seem to account for all the material used in the basic construction of the cists, including the shale, while local fluvio-glacial deposits would have provided a ready source for the smaller stones used as packing and pinning-stones (cf MacGregor & MacGregor 1948, 34).

Where information was available, the cists were either paved with sandstone or floored with laminated shale chips or fragments, and in only one case were both materials definitely used. In one or two cases, where the bases of the cists had been extensively disturbed the nature of the flooring was in doubt, but in only one cist (F2) (fig 3) where some traces might have been expected to survive were there no traces of any flooring at all. Sandstone paving was apparently confined to those cists constructed entirely of sandstone, whereas shale flooring occurred in cists of shale and sandstone or predominantly shale construction.

As mentioned above, capstones remained *in situ* only on cists whose relatively greater depth had afforded them protection from plough damage. The surviving capstones consisted of variably

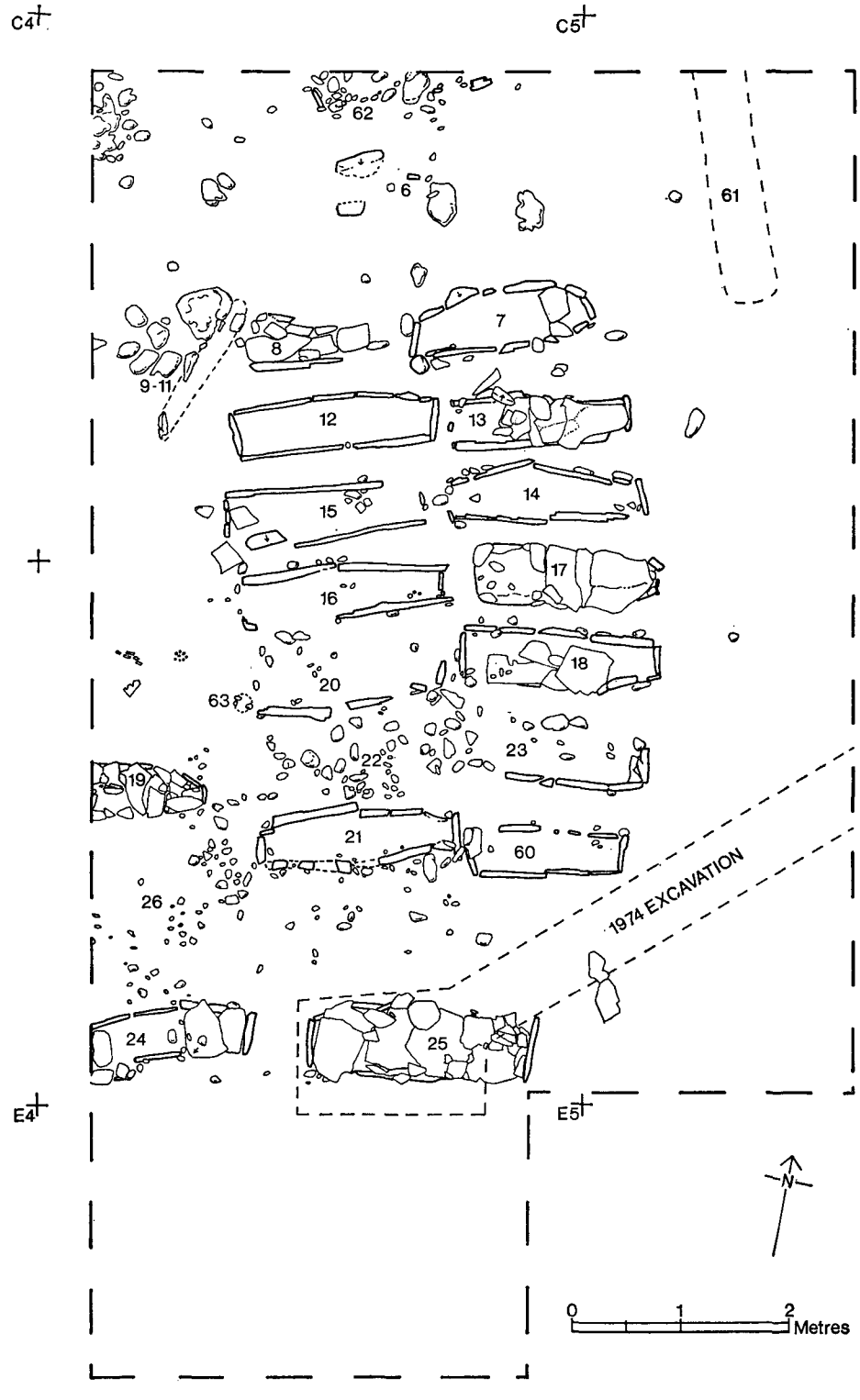


FIG 6 The Catstane: grid squares C5/6, D5/6, E5, showing location of features, prior to excavation

sized slabs of sandstone and, less commonly, shale. The presence among the disturbed cists of shale slabs which are clearly displaced capstones would suggest that they were commonly used, and it seems likely that the softer friable nature of the shale slabs tended to militate against their survival in the event of any plough damage.

The cists varied in size and shape. In general, they were somewhat wider at the W end than at the E end, the usual internal measurements of width being between 0·30–0·40 m at the head, and 0·20–0·30 m at the foot. The lengths of the cists apparently reflected the length of the inhumation: internal measurements for the length varied from as much as 1·97 m (F32) down to 1·17 m for a

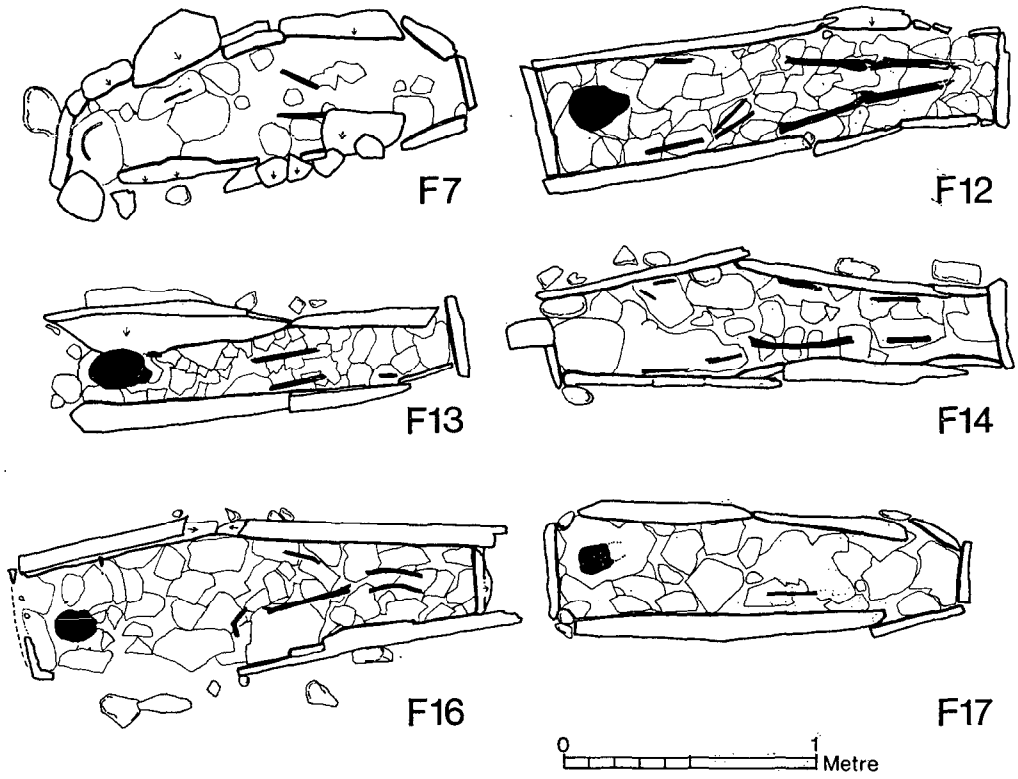


FIG 7 The Catstane: detailed plans of cists showing *in situ* areas of bone

cist (F46) which presumably accommodated a child. On average the internal length was in the region of 1·70 m.

Most of the cists tapered relatively evenly from W to E but a few (eg F32 (fig 8)) were built in a coffin shape originally expanding between the shoulder and the hips before narrowing to the foot; these were constructed in both shale and sandstone. A few of the wholly sandstone cists were practically rectangular in plan: these included F25, which stands out because of its relatively greater proportions (1·90 m by c 0·55 m internally), its isolated position and the carefulness of its construction (figs 6, 8), and also F36 and 53. Other minor variations in shape were noted but these would appear to be due as much to the size of slabs used as to deliberate intention on the part of the builders. In general the cists were constructed with one stone at the head (W) and one at the foot (E), and the sides consisted of 2–5 slabs of variable size, 3 or 4 being the usual number.

The side and end slabs were commonly pinned externally, and occasionally internally, with

small rounded igneous stones or fragments of slabs (eg figs 7, 8). The arrangement of the side slabs varied: in a number of cases (eg fig 7, F12) the W end of the cist was composed of opposed large slabs, and the E end of several smaller slabs or stones, while in others (eg fig 7, F13) the slabs were all more evenly matched in size. The slabs frequently overlapped, in some cases in an obviously careful fashion (eg fig 8, F32), but straight butt-joints also occurred. F7 (fig 7) was exceptional in the roughness of its construction as most of the cists had apparently been built with a measure of care.

The extremely dry conditions prevailing during the excavation rendered the pits into which the cists had been set virtually undetectable in plan, and therefore given the time available no

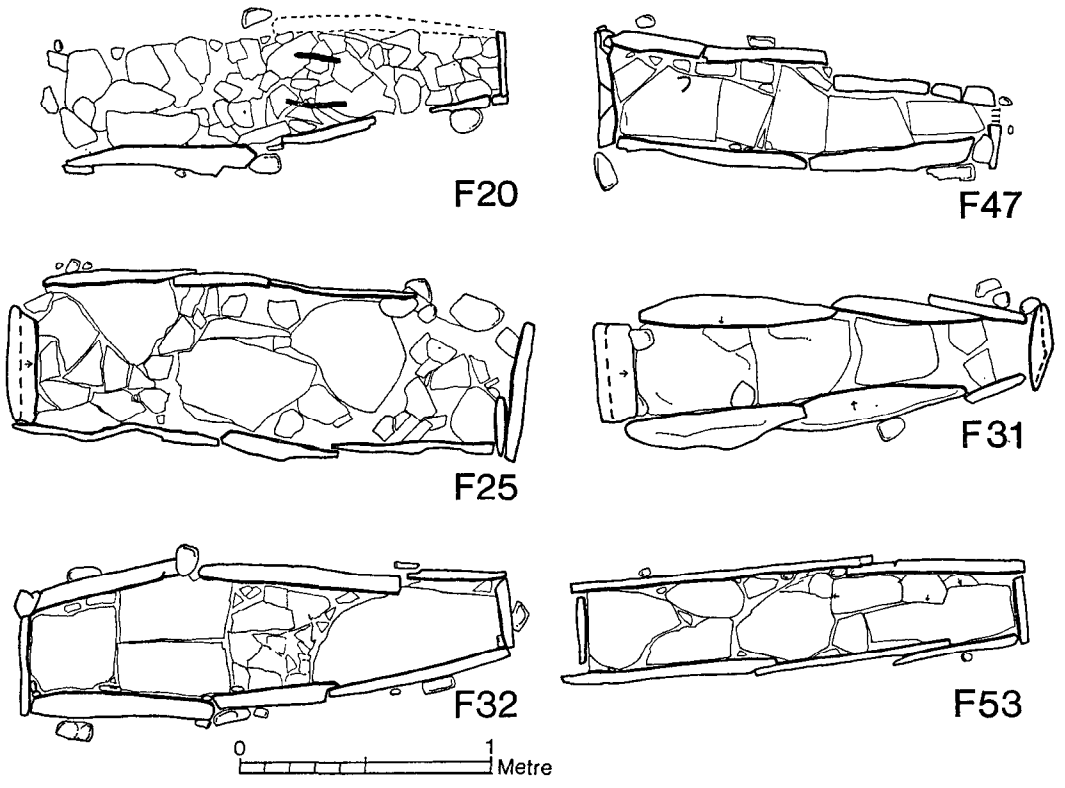


FIG 8 The Catstane: detailed plans of cists showing *in situ* areas of bone (F20 and 47) and selected cists of sandstone construction

attempt was made to investigate these in every case. Where sectioned, it is clear that the pits had been dug through the sandy subsoil, penetrating slightly the underlying clayey gravel, and were only just large enough to accommodate the main structural slabs. In every case examined, the shale or sandstone flooring was set directly onto the natural clayey gravel or clay.

The orientation of the cists varied but the majority (accounting for 36 out of the 44 in which the orientation could be taken) lay with their long axes within 10° of an E–W (magnetic) alignment. The exceptions included F36 and 46 taken to be the graves of children on account of their diminutive size, and F2, 33, 69, 70, 72 and 74 which stand together as a group clustered around the Catstane.

Contents of the Cists. Most of the cists were filled with dark brown sandy loam, with

variations in texture and stone content. The cists in the W row in grid squares D3/4, E3/4 and F3 were filled with large quantitites of displaced stones and slabs, pitched into the cists in the course of their deliberate investigation or backfilling (fig 5). The fill of the other cists was largely stone-free, apart from flecks of shale and sandstone incorporated in the material naturally. In the case of the cists disturbed by ploughing the upper part of the fill clearly consisted of ploughsoil introduced after the removal or destruction of the capstones. In the case of the undisturbed cists, the fill very closely resembled the natural subsoil, if slightly less compacted, but in no case was it clear whether this had been placed in the cist prior to the sealing of the graves. On balance, however, the soil fill would appear to be the product of infiltration after the capstones had been set in place.

The skeletal remains were disappointing and bone preservation was without exception very poor. A detailed description and commentary on the human remains is provided by Dr A Young and Dr D A Lunt and only their main conclusions are referred to here.

The following cists produced skeletal material apparently *in situ*: F7, 12, 13, 14, 16, 17, 20 and 47 (see figs 7, 8 & pl 10b) but unassociated fragments of bone and teeth were also recovered from the areas of disturbed subsoil in grid square D3. As Dr Young points out, the quality of the skeletal material is such that there is virtually no evidence available for estimations of height, age or sex, although the evidence of the dentitions is more informative. Without exception the bones were fragmentary, brittle and friable and at an early stage it was decided to submit them for radiocarbon determination following study. For this reason they were left untreated, and removed as intact as possible, still in blocks of soil where necessary. With the exception of one or two possible fragments of minor bones (see p 191, eg F12), only the major long bones survived to any degree. Even then, without exception, no vestiges of the articular ends survived, an absence that is perhaps more readily explicable when taken into consideration with Dr Lunt's evidence for the relatively young age at death of the individuals studied.

Dr Lunt has also drawn attention to the apparent presence of the remains of more than one individual in certain cists (eg F43) but this is best seen as the result of the disturbance and dispersal of the contents of the cists in question. Dr Young has recorded his doubts about the undisturbed positions of the skull in F16 in particular, and possibly F12 and 17 as well. Disturbance of F16 is perhaps also suggested by the evidence of the dentitions in the grave, but the removal of the SE slab(s) could account for the disturbance of the contents and incorporation of extraneous bone. Although Dr Young's suggestion that the skeletal remains may represent only partial or disarticulated burials must be borne in mind, the disturbance of the bones by animal activity, especially prior to the infiltration of soil into the cists, and the hostile soil conditions could account for the differential survival of the skull elements in question.

The condition of the skeletal material was closely correlated with the type of cist, or perhaps more specifically with the type of flooring material. With one exception, bone surviving *in situ* was recovered only from shale-floored cists. It is striking therefore that none of the undisturbed cists produced intact skeletal remains. Indeed, of the cists paved with sandstone, only two produced any skeletal material at all: F53 contained a few fragments of unidentifiable bone in the filling, while F47 contained the remnants of an apparently *in situ* array of tooth crowns of a young individual.

The reasons for this marked difference in survival are not entirely clear, but two major factors are almost certainly involved – the permeability of the flooring materials and the inherently less acidic composition of the shale. The fills of the cists were not markedly different in terms of their present soil acidity, but agricultural improvement over the last century will almost certainly have altered soil conditions on the site, and in this respect it is worth recalling that

Hutchison also noted the generally poor bone preservation (1866, 188) and removed for study portions of only four skulls of which three consisted mainly of calvaria (Turner 1866, 195–8).

The Lay-out and Extent of the Cemetery. The limitations of the excavation made it impossible and undesirable to excavate the area of the knoll totally, and the exact extent of the cemetery must therefore be taken as unconfirmed. Nevertheless, a number of factors suggest that the *probable* limits of the cemetery have been ascertained. In the first place, excavation of grid squares A4, B6, C7 and G4/5 and the trial trenches of Mrs Ashmore all failed to reveal any trace of cists (with the exception of F25 found in 1974) either surviving or in the form of broken-up slabs or stones in the ploughsoil. To this must be added the evidence of the resistivity survey which revealed no anomalies outside the areas subsequently tested by excavation.

Obviously the small areas involved invite caution but other factors suggest that at least on the N, E and S of the site, the approximate limits of the cemetery have been defined. On the E, especially, in grid squares C5/6 and D5/6 the group of cists, F7, 13, 14, 17, 18, 23, 60 are arranged in such a fashion that their E ends respect an arc. This arrangement of cists suggests a strong measure of respect on the part of their builders for a now absent feature delimiting the site in some way. Evidence for the nature of such a feature has not survived archaeologically, at least in the areas investigated, but earlier – though decidedly ambiguous – accounts do suggest the presence on the site of a much better defined mound in the area S and E of the Catstane (see discussion, p 182 below). Indeed a loss of some 0·30–0·40 m of soil in places is suggested by a comparison of the present condition of the site with Hutchison's account (1866, 185). The negative evidence of the lay-out of the cists themselves is perhaps supported by the presence of a truncated gulley in the eastern part of the cutting (F61) and it is unfortunate that this feature could not be traced further in the time available. Evidence for the suggestion that the periphery of the cemetery was reached on the S is based partly on the absence of any features in the small trial trench G4/5 and partly on the apparent termination of the rows of aligned cists to the N with F66 and F52 respectively.

On the W and N of the Catstane neither resistivity survey nor extensive trial excavations could be carried out, and the limits of the cemetery are therefore unknown: the available evidence might suggest a small, perhaps focal, cluster of aberrantly orientated cists around the Catstane rather than a westerly continuation of the systematically arranged rows of graves. The oddly featureless area around the Catstane itself, apart from the few possibly deliberately set boulders, may suggest the presence of another now fugitive feature in this area, which was respected by the cist-builders at this point, and this could then account for the exceptional orientations of the graves. In view of the absence of stone, a small mound or boulder setting rather than a cairn would seem to be the likeliest feature but subsequent disturbance of the stone and its surrounding area has left the nature of any such feature in doubt (see discussion p 186).

The cemetery, as excavated, would therefore appear to have covered an area of approximately 20 m by 25 m and to have consisted of long stone cists laid mainly in rows, aligned – with only few exceptions – on a near E to W orientation. As mentioned above the main exceptions may owe their aberrant orientation to the former existence of a feature near or around the Catstane. Two other cists – F36 and F46 – diverge from the usual orientation but their small sizes suggest child or juvenile inhumations – perhaps buried in proximity to relatives (F36 & F32, and F46 & F47 going together?).

Within the cemetery a major distinction can be made between the shale cists and the sandstone cists and this is reinforced by the distribution of these types (fig 9). 'Shale' cists and cists of mixed sandstone and shale construction form a coherent group on the eastern periphery of the site, but the significance of this is unclear. Other, presumptively shale, cists occur in the cutting

immediately S of the Catstane and stand apart on account of their unorthodox orientations, but a less regular arrangement of shale and sandstone cists occurs in the disturbed western row of grid squares D3/4 – E3/4 (F42–45). Otherwise shale occurs as only a sporadic component of cist construction.

The truncation of the vertical stratigraphy has resulted in a lack of evidence for the priority of the graves, apart from the two possible cases mentioned above (see p 174: F22, 23 earlier than F16, 18?), the probable insertion of a grave onto an existing grave in grid square D3 (F45), the probable disturbance of F60 by F21 in grid square D6, the probable truncation of F69 by F33 in grid square D2 and the possible disturbance of F13 by F12 in grid square C5. The nature of the development of the cemetery is therefore in some doubt, but whatever the case, it would seem unlikely that all the cists were constructed at one time in the manner in which Hutchison had speculated (1866, 185).

Other Features. A number of other features were investigated in the course of excavation, or inspection of minor soil resistance anomalies, and the more important of these are briefly described below (see also Appendix 1).

F61 consisted of a shallow U-bottomed gulley extending into the trench (C5/6) for a distance of approximately 2·10 m, before terminating in a butt end. Although it is possible that the feature, perhaps in association with an upcast bank, demarcates the eastern limit of the cemetery at this point (see p 179) its full course and original function remain obscure.

F63 consisted of a small post-hole, conceivably the remains of the socket for a wooden grave-marker for the cist (F20) immediately to its E (fig 6).

F64 was located c 1·40 m from F66, at the southern end of the row of disturbed cists in grid square E3 (fig 5). A group of boulders, including a stone rubber, were found to lie in a dark loam-filled pit, cut into a clayey sand and gravel subsoil, with a pronounced natural band of decomposed shale at the base. The pit was c 0·77 m by 0·50 m and cut to a depth of 0·20 m from the base of the ploughsoil. The feature showed signs of previous disturbance, and taking into consideration its size and position in relation to a disturbed row of cists, it seems reasonable to equate it with the 'short cist' discovered by Hutchison in 1866 (186–7). The interpretation as a short cist is doubtful however, and it is *tentatively* suggested that it could instead represent the disturbed remains of a stone-packed stone-hole.

F67 located in grid square B6 (fig 2) consisted of a rounded triangular piece of stone, clearly the truncated base of a larger whinstone boulder, set in a stone-packed stone-hole. The pit was c 0·60 m in diameter, and filled with a featureless brown sandy loam, and rounded packing stones.

F68 consisted of a spread of small stones lying on, and just into, the subsoil in grid square A4 (fig 2) over an area (within the trench) of c 3·0 m by 1·70 m. Apart from some variation in the size of the stones, there was no depth to the feature and no obvious structure to the spread. Its original form and interpretation therefore remain in doubt, but the possibility that it represents the robbed and spread remains of a wall must be borne in mind, especially in view of Hutchison's reference to traces of walls on the N of the cemetery (1866, 189).

F27 located in grid square B 6 (fig 2), consisted of an area of burnt subsoil. The full extent of this feature was not traced but once again its presence is worth noting in view of Hutchison's reference to traces of burning on the N of the cemetery (1866, 189).

The possible stone-holes are perhaps the most interesting of these features, and it is unfortunate that the location of further stone sockets and the recovery of a full outline plan was, and is likely to remain, impracticable. Nevertheless it is tempting to suggest that these features could represent the remains of an arrangement of upright stones or boulders, which included the Catstane, set around a now ploughed-out mound. This suggestion, discussed more fully in due

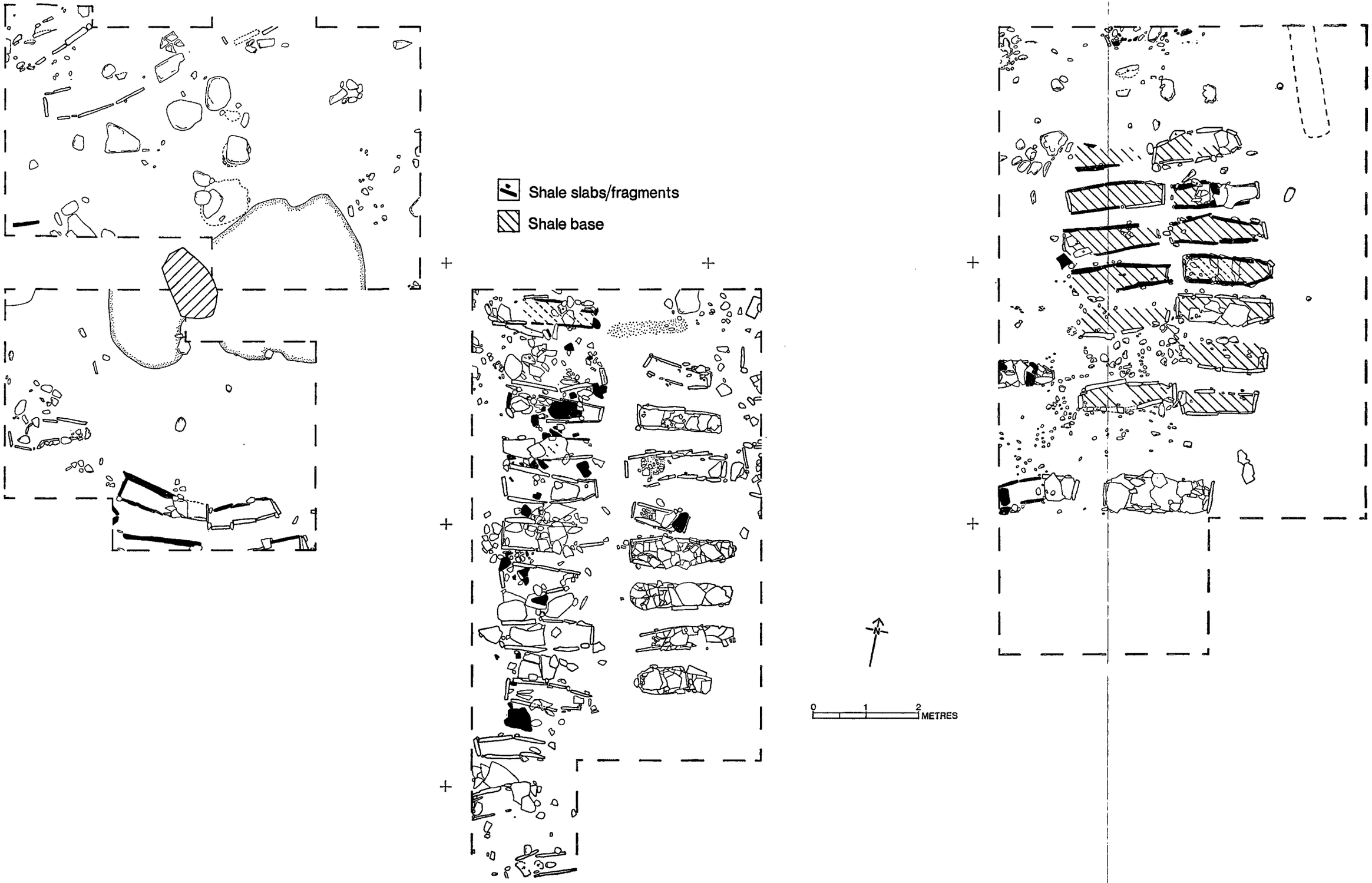


FIG 9 The Catstane: plan of excavated areas of cemetery showing overall distribution of shale

course, is perhaps given some support by the earlier accounts of the site, but in view of the lack of evidence is merely speculation.

The presence of the possible marker-post at the head of F20 is of interest since such features must be under represented in the existing archaeology of long cist cemeteries. At the Catstane, the dry conditions militated against the recognition of further features such as F63 but the careful lay-out and mutual respect of most of the cists does strongly suggest the presence of grave-markers of some kind. The presence of stone scatters between some of the graves – bearing in mind the loss of soil from the mound – may represent the remains of low partition walls or low cairns around certain burials (eg F21) a suggestion given a small measure of support by a remark by Hutchsion which implies that he made a similar observation (1866, 187).

In summary, the excavation revealed the presence of a large disturbance around and even underneath the Catstane, which may have removed all traces of the original stone-hole and any associated burial or other features. Arranged around the stone, and in more regularly orientated rows to its E and SE, was a cemetery of long stone cists, generally carefully constructed of shale and sandstone. On the basis of the available evidence, it is very tentatively suggested that the cemetery may have extended over an area of perhaps 20 m by 25 m and have respected a roughly circular area of ground, perhaps originally covered by a mound. The cemetery may have been bounded by a gulley and/or wall or bank, and an unknown number of upright boulders may have been spaced out about the periphery of the mound.

DISCUSSION

The Catstane and its associated cemetery have long figured in discussions of Early Christian archaeology. That this has been possible is due to the relatively full account – for its time – of the work carried out by Hutchison of Carlowrie in 1864, following his earlier investigations in the company of Professor J Y Simpson in 1860.

Rutherford and Ritchie have discussed and interpreted the work carried out by Simpson and Hutchison in 1860, referring not only to their written accounts (Simpson 1862; Hutchison 1866) but also to the contemporary sketches made by James Drummond (figured conveniently in Rutherford & Ritchie 1974, pl 10; and in Simpson 1862, 122, fig 1: woodcut prepared, with some alterations, from original sketches).

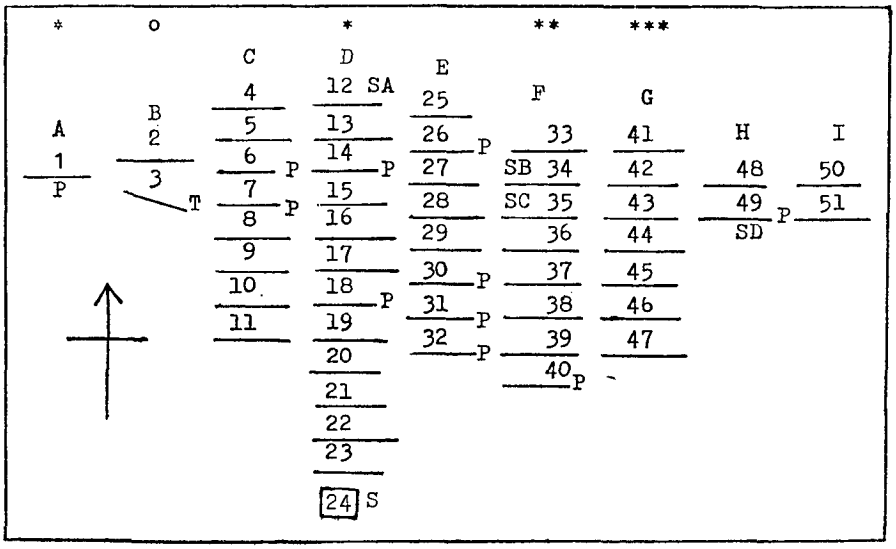
In the context of the present discussion the Drummond sketches are of great interest since they appear to depict tolerably closely the area of disturbance around the stone encountered and partially re-excavated in 1977. Whether or not the attribution is correct, the disturbance was thorough enough to undermine and obscure the nature of any original features associated with the base of the stone, and the interpretation of the 'built stone grave' investigated in 1860 must remain in doubt. Rutherford and Ritchie have discussed some of the likely possibilities (1974, 186–7) and these are considered below in the light of the recent work.

Prior to the levelling of part of the runway margins to the SE of the stone, the work of Mrs Ashmore presented the first opportunity in recent times to investigate the general area of the Catstane: despite the severe restrictions on the scope of her work, Mrs Ashmore's trial trenching was sufficient to cast doubt on the validity of the Hutchison account (1974, 187–8). The 1977 excavations have confirmed these doubts and serve once again as a warning against the uncritical acceptance of antiquarian sources. Outwardly the work of a relatively careful and percipient observer, Hutchison's account would at first sight seem to correlate reasonably well with the overall cemetery plan recovered in 1977. In detail, however, the antiquarian account is largely

inconsistent with the recent results, though the difficulty in correlating the two accounts is in part due to the limitations on the excavation.

Hutchison's location of his site may be paraphrased as follows: the general area of the cemetery was a little to the eastward of the 'Catstane', where the appearance of the ground a few yards distant from the stone assumed the form of a slope or knoll, the 'lie' of the ground being to the S and E, the stone itself having been apparently placed at the NW corner of this tumulus (1866, 184). An additional general point of information is presented further on, in the course of his general discussion when he comments on the situation of the cemetery on the dry – by implication, the S – side of the tumulus (1866, 190).

To aid understanding of the discussion which follows Hutchison's schematic plan of his discoveries is here reproduced, together with a summary of his results:



STONE CISTS DISCOVERED NEAR THE 'CATSTANE', KIRKLISTON

* Low walls ° Catstane ** Four large stones *** Traces of a large fire
P Shale cists

(*after* Hutchison 1866, 193)

Fifty long cists were discovered (Hutchison's nos 1–23, 25–51) and one smaller feature described in terms of a short cist (24). The long cists were constructed of two materials, namely shale and sandstone, and in no case had both materials been used in the building of the same grave. The shale cists were the smallest cists found, with an average length of 5 ft $4\frac{2}{12}$ in, in marked contrast to the average length of 6 ft $1\frac{5}{12}$ in for the freestone cists. Despite the differences in length, it was assumed that both types of cist had accommodated the inhumations of adults, partly on the basis of their similarity in breadth, and partly because of the similarity of the dentitions found in the graves.

Hutchison felt that the evidence tended to indicate that the shale 'coffins' contained 'the bodies of a people, or race, distinct from those interred in the large cists of freestone' (1866, 186), and sought support for this theory from the results of the examination of portions of the crania taken from some of the graves, which were all found to contain abundant 'very much decayed' bones (1866, 188). The cists lay in regular rows (A to I) to the S and E of the Catstane. They were

orientated due E, with only one exception (3) which was felt to have been disturbed at some later date, rather than built at odds with the rest. Hutchison felt that the cists had been constructed at the same time and that a mound had then been raised over the site. No doubt with the earlier travellers' accounts in mind he suggested that 'monoliths were probably set to mark the site and the boundary of the place of interment' (1866, 188).

The short cist stood apart from the others physically as well as in its construction: set some 4 ft from the nearest grave (23) at the S end of row D, the cist referred to measured only '2 feet 4 inches in length, 12 inches in breadth and 20 inches in depth, being thus considerably deeper and shorter than any of the rest' (1866, 188). The feature was said to have been regularly *built* of stones, rather than slabs, to have lacked a stone bottom, and to have had traces of burning at its base, but no firm interpretation of this 'curious little grave' could be offered.

At the NE corner of the burial ground at a distance of about 20 yds (*sic*) from the nearest cist, traces of a large fire were discovered 'upon the natural soil' and also along the N side of the site fragmentary portions of a rude encircling wall were found which appeared to be respected by the cists (1866, 189).

The general location of the site investigated in 1864 is clearly to the S and E of the Catstane. Unfortunately only two measurements are given in the account: the first cist encountered (Hutchison's cist 14) was struck about one foot down at a point about 20 yds from the Catstane. Further digging revealed the cists on either side and then the others in the same row, resulting in the discovery in all of a row of 12 long cists (Hutchison's row D) terminating at the foot of the 'knowe' with the short cist singled out for fuller description (1866, 185).

The clearest indications of deliberate disturbance found in the 1977 season were in the western row of cists in grid squares D3/4, E3/4 and F3 (see p 172 & fig 5): there 12 cists lay in a row within the confines of a clearly backfilled trench and at the S end of the row, approximately 1·25 m (ie c 4 ft) from the nearest grave (F66) was a further disturbed feature (F64) corresponding reasonably well with Hutchison's so-called 'short cist'. In the number of cists, and the relationship of the 'short cist', this row corresponds well with the row first uncovered by Hutchison. However, the distance of F43, which ought to equate with Hutchison's cist 14 is in the region of 20 ft (just over 6 m) from the Catstane rather than 20 yds. Since it is virtually certain that the Catstane is in the same position, an alternative suggestion might be, that Hutchison's measurement should be taken at face value, and his cemetery located in the region of 20 yds from the stone. Weighing against this, however, is the negative evidence of the resistivity survey, Mrs Ashmore's trial trenches and the more easterly and southerly trenches of the 1977 excavation, all of which failed to reveal any signs of cists in this area.

The probable correlation of Hutchison's row D with the disturbed cists (F45–66) (fig 5) involves the implicit acceptance of a major flaw in the antiquarian account at the outset, and with this exception, very little else falls into place. Despite the many omissions (eg measurements of the spaces between the rows) and a number of contradictions and errors in the account, a considerable amount of detailed information is provided about the individual cists located in 1864. The size of each cist; the marked distinction between cists of shale and cists of sandstone, in size as well as construction; the almost complete orthodoxy of the alignment of the cists; and the poor quality of the skeletal remains are all noted by Hutchison, in a way that suggests first-hand observation and relatively careful inspection following total exposure and evacuation of the cists investigated.

On nearly every count, however, the evidence of the recent excavation is at odds with the antiquarian report. Even making allowances for gross generalisations on the part of Hutchison, little or no correlation of the evidence is possible in detail: the cists uncovered in 1977 were on

average smaller internally than those listed by Hutchison; no absolute distinctions existed between cists of shale and sandstone either in terms of average size of construction technique; only in the shale floored cists did bone preservation appear to be favoured; and finally not one but several aberrantly orientated cists were present.

In one respect Hutchison's account was perhaps borne out; emphasis was laid on the care with which the cists were emptied (1866, 188) and, granted that the disturbance mentioned above is attributable to the antiquary, the cists had clearly been thoroughly cleaned out. No obvious pockets of undisturbed fill or *in situ* bone were traced. There is perhaps also some archaeological support for two features recorded by Hutchison on the north of the site: F68, a spread of stones in grid square A4, and F27, an area of burnt subsoil in grid square B6, (see p 180 & fig 2). These could only be partially revealed in the recent excavations but they could represent the surviving traces of the supposed enclosure wall and area of burning revealed in 1864 (1866, 189).

In the end, therefore, it is not clear exactly what area or features the antiquary investigated nor how he recorded what he found: allowing that he was responsible for the deliberate disturbance of the cists mentioned (the row F45–F66) further disturbance could perhaps be traced along the very easternmost edge of the same cutting (fig 5, F49, 55–57). If F49, 55–57 are part of a row to be equated with Hutchison's row E, there would hardly be sufficient space for the remaining cists discovered by the antiquary (his rows F–I) solely in the unexcavated area between the main cuttings. In the face of this evidence, therefore, it is suggested that the majority of Hutchison's cists (his rows E–I) may have been between *and* to the N of the main cuttings, E of the Catstane (fig 2), where destruction of cists has been recorded in the past (cf Ashmore 1974, 187) and can be inferred from the condition of the surviving remains on the crest of the knoll. The remainder of his cists (rows A–C) are presumed to have been S of the Catstane. By trenching rather than stripping areas, Hutchison's workmen clearly failed to locate whole areas of the cemetery, but in this connection the greater depth of soil or mound material in the 1860s ought to be borne in mind. Nevertheless, although there are general similarities between the excavated evidence and the antiquarian report, the inconsistencies are such that Hutchison's account and plan must be treated as unreliable in detail. Quite why so much ostensibly accurate information was included is unclear, but what is certain is that there is little substance in the suggestion of thoroughness in his statement to the effect that he had 'discovered all the graves which ever existed to the east and south of the "Catstane" . . .' (1866, 185). At least in part, Hutchison's gross generalisations, for instance about the differences in the cist sizes and construction and the skull types, may have been prompted by a desire to substantiate his theories on a racially mixed burial population (1866, 190–2).

The antiquarian accounts are clearly to be treated with caution. Nevertheless, they have a strong bearing on our understanding of the site, and thus no interpretation can be offered without much qualification, and reiteration of the ambiguous nature of the evidence.

One aim of the recent work was to follow up Rutherford and Ritchie's suggestion that the Catstane had been erected as part of a small Bronze Age kerb cairn, which lay to the west of the later cemetery (1974, 185–7). Their suggestion was based upon critical appraisal of the accounts of the site by early travellers such as Edward Lhwyd and James Paterson and of an anonymous sketch of the site in the British Library Stowe MS; these sources appeared to combine to show the Catstane as having once stood on the perimeter of an oval setting of smaller horizontally laid stones surrounding a low cairn or mound. In the light of the excavations their hypothesis must be modified, but it should be stressed that the interpretation here offered is no less tentative owing to the limitations of the archaeological work on the site – namely unscientific investigations and disturbance in the past and today's physical restrictions on large scale excavation. The earlier sources and the results of the recent excavation allow the former presence on the site of a number

of structural elements to be inferred, but the original form, date and relationships of these are unknown.

It is proposed to discuss in turn the possible former existence of the following:

(i) a 'large mound' to the S and E of the Catstane, and covering the site of the cemetery. Owing to its truncation by agricultural activity the relationship of the cists to the mound is unknown;
(ii) a 'smaller feature' – a mound, cairn or open area around the Catstane – observed by the irregularly orientated cists (F2, 33, 69, 70, 72, 74 (fig 3));
(iii) 'upright stones' set in sockets on the periphery of the 'large mound';
(iv) horizontally laid stones or boulders around the 'smaller feature', and possibly incorporating the Catstane.

There are now no obvious surface remains in the vicinity of the Catstane but at least until the later 19th century the stone appears to have stood on the NW periphery of a mound of uncertain height and dimensions. To the evidence of Hutchison, already cited, must be added the descriptions of earlier travellers such as Lhwyd, quoted in full by Rutherford and Ritchie (1974, 188 for all references). Taken together with the disposition of the apparently easternmost graves of the cist cemetery (see p 179 above) there is strong evidence for the former existence of a more pronounced mound than the truncated knoll surviving today, yet the somewhat conflicting earlier reports offer no coherent picture of the size and nature of this mound. On the basis of the lay-out of the graves a diameter of c 15–20 m is suggested (the possible 'large mound') but this is at odds with the available measurements of '7 yards' (Lhwyd) and '14 pieces long, 12 broad' (Stowe MS drawing) both of which would be more in keeping with a smaller feature to one side of, or around, the Catstane. Therefore, as in the case of the Hutchison account, the degree of accuracy achieved by the antiquaries in recording their observations poses a major problem to interpretation.

There is also conflicting evidence for an arrangement of stones around the periphery of a mound on the site: to the written accounts of the earlier travellers, Lhwyd and Paterson, must be added an anonymous drawing in the British Library Stowe MS (Rutherford & Ritchie 1974, fig 1a). By the mid-19th century the stones had been cleared, but Hutchison may have relocated several of them, though no longer in their original positions (1866, 189). Pointing to Cairnpapple in West Lothian as the nearest analogous site, Rutherford and Ritchie very reasonably interpreted the available descriptions and sketch as representing a small cairn surrounded by horizontally laid kerb stones (1974, 185–7). In the recent excavations, however, the only deliberate arrangements of stones revealed appear to be those of sockets for upright stones (F64? (fig 5); F67 (fig 2)) and low boulders (F3, F58 (fig 3)). It would be incautious to do more than suggest the possibility that, together with the Catstane, some or all of these were set on the periphery of a perhaps sizeable mound. Given such a possibility, it might then be suggested that, with the exception of the Catstane, the early sketch referred to shows fallen uprights around the possible 'large mound' rather than a laid kerb, but in truth the shape and size of the stone setting is unclear.

This interpretation is complicated, however, by a certain amount of evidence, discussed further below, which suggests the former existence of a smaller feature which could originally have been edged by boulders and horizontally laid stones. If such a feature existed this could then have been what was noted by Lhwyd and Paterson, and depicted on the Stowe MS sketch, thereby accounting for the smaller dimensions recorded in these sources. If this was the case, and it is only speculation, it would be necessary to assume that few if any surface traces of the presumed setting of upright stones around the 'larger mound' existed by the 18th century. It must again be stressed, however, that the destruction of the evidence by antiquarian activities and ploughing – not to

mention the unknown factor of the possible removal or re-use of stone by the builders of the long cist cemetery – defeat at the outset any attempt to produce a firm interpretation of the site.

The reinterpretation of what appears to have been Hutchison's 'short cist' as a possible stone hole removes a further piece of supporting evidence for Bronze Age activity on the site. Furthermore, no evidence of a stone cairn was found in the area of the Catstane: given the amount of disturbance of the knoll in the course of agricultural activity on the site, it is possible that a small or low cairn could have been totally removed without record. On the other hand the Catstane at least appears to have remained *in situ* and some vestige of a stone cairn might be expected to have survived in its immediate area.

To summarise, the case for prehistoric constructional activity on the site is wholly circumstantial, the few unstratified finds noted below being of little value in this context. If there was any prehistoric activity on the site incorporating the Catstane, it *may* have involved not only the erection of upright stones and smaller boulders spaced about a 'large mound', but also – perhaps subsequently – the construction of a smaller, kerbed feature of which equally little trace has survived. Certainly, as good a case can be made for relating the feature around the stone to the cemetery rather than to earlier, undocumented, activity. Nevertheless, the possibility of more than one phase of activity on such a site must be borne in mind, while the continuity of use or re-use, of prehistoric sites is a well enough attested phenomenon for Rutherford and Ritchie's basic suggestion to remain attractive (1974, 187; Thomas 1971, 52–66). As there is no firm evidence for the original form of the monument, it would be impracticable, if not dangerously misleading, to seek detailed comparisons.

If the nature and indeed the existence of the putative prehistoric activity on the site remains an open case, the long cist cemetery at least is better defined. Even so, there is no stratigraphical evidence for the relative dates of more than a handful of the graves nor are absolute dates yet available for the skeletal remains. The nature of the development of the cemetery and its date is therefore largely a matter of conjecture (but see Appendix 4).

Central to any discussion of the cemetery is the Catstane itself with its commemorative inscription discussed by Rutherford and Ritchie (1974, 183–5). If not the first, the 1860 disturbance around the base of the stone (Simpson 1861, 122) appears to have been thorough enough to obscure the original form and consequently the cultural context of any associated features. Nevertheless, a feature of potential significance in the area of the Catstane is the apparent respect, by the builders of those cists which are aberrantly orientated, for an area c 7–8 m in diameter. Within this area there are one or possibly two sockets for set boulders of no great size (F3, 58), and another, unassociated boulder, but otherwise the area is apparently devoid of archaeological features.

As already mentioned above, the status of this now fragmentary boulder setting is unclear. If it represents the vestigial remains of an arrangement of boulders around or linked to the Catstane, Thomas' reference to Early Christian circular grave surrounds may yet be of relevance (1971, 59–63). Although a modified version of Rutherford and Ritchie's interpretation of this area as a Bronze Age feature remains attractive, a more striking analogy for the evidence observed at the Catstane is to be found in the long cist cemetery at Hallowhill, St Andrews, Fife, recently excavated by Mrs E Proudfoot. There, a richly furnished *dug grave*, lined with stones, was surrounded by cists respecting a now featureless area (Proudfoot, E pers comm). The existence of a dug grave of this type would not be out of place at the Catstane and could then explain the hitherto puzzling depth to which the nineteenth-century investigators had undercut the stone. Furthermore, such a feature could well be reflected in the contemporary description of the discovery of a 'built stone grave.'

Whatever its original form and chronological position, the cist builders appear to have respected a pre-existing feature of some kind, perhaps over and/or around the site of a grave, significantly demarcated in any case by the striking standing stone at its end. Alternatively, although the removal of any traces would be understandable, the area respected by the cist builders need not have been defined by a physical enclosure or feature. Given the commemorative nature of the inscription it may be that an area around the stone was simply kept free of secondary burials to permit access to the stone for worship and dedication.

The date of the inscription has not been finally settled, but Rutherford and Ritchie have suggested a date in the late 5th or early 6th century AD (1974, 184). Thomas has proposed the differentiation of undeveloped and developed Early Christian cemeteries on the basis of the presence or absence of associated religious structures (1971, 50): although this distinction may be a reflection of variable recovery of the evidence, the cemetery at the Catstane would, on the available evidence fall into Thomas' first category. It is perhaps possible that the earlier burials in the cemetery are grouped around the focal point offered by the stone, with a progression of orderly rows of orientated graves in due course to the limits of the supposed pre-existing 'large mound', while the possibility of a low, walled or embanked enclosure on the site must also be borne in mind (Hutchison 1866, 189; and see p 180 above; F61, 68). In view of the regular lay-out and mutual respect of the majority of the cists it would seem unlikely that the cemetery was in use over a long period. On the other hand, the original size and lay-out of the cemetery is uncertain given the partial nature of the excavations: a maximum of 52 graves are represented in the excavated areas but as many as 80 or more burials may originally have been present on the basis of correlation with the 1866 account.

The bone preservation was disappointing, as Hutchinson had noted in 1866; as mentioned above, the reasons for the rather better state of preservation of the bone in the shale-floored cists are not entirely clear, but it is tempting to consider that the difference was noted during the period of use of the cemetery, and led to the greater or preferred use of shale. Full details of the burial population are thus not available: some interest attaches nevertheless to the relatively young age at death of the individuals whose remains could be studied in more detail, since these came from a coherent group of predominantly shale cists, but it is difficult to assess the significance of such a small and skeletally incomplete sample.

Once again, however, the recent results appear to be inconsistent with those of Hutchison who not only recorded the presence of more adult skeletal remains and dentitions, but also appears to have uncovered a greater number of large cists, although the discrepancies in his account may mean this is of little significance. Furthermore, the value of the earlier anatomical identifications is dubious and clearly the skeletal record of the site is altogether inadequate for an understanding of the population represented. More light may be thrown on the site as larger and better preserved skeletal assemblages become available for comparative study (eg the rich collection of skeletal remains from the Hallowhill cist cemetery referred to above).

The partial nature of the excavation of the long cist cemetery means that there is call for only brief comment on comparative sites, there being little to add to Henshall's survey of the evidence (1956, 265) and Thomas' more recent general review (1971, 48). The form and plan of the long cist is virtually predicated by the selection and use of large elongated slabs, and, not unexpectedly, the basic construction techniques of the cists are matched on a number of sites. Closely comparable sandstone cists were recovered from, for example, Parkburn Sand Pit, Lasswade, Midlothian (Henshall 1956, 252); Addinston, Lauder, Berwickshire (Wallace 1968, 119) and Hallowhill, St Andrews, Fife (Proudfoot, E pers comm). Shale is more unusual as a component of long cist construction, but this is perhaps best seen as a reflection of the local availability of this easily

worked material. Mixed shale and sandstone cists were investigated at the site of a cemetery at Wyndford, Uphall, West Lothian – also in the Lothian shale belt – (Primrose 1901, 325), while shale-floored cists of sandstone were excavated at Woodend, Stenton, East Lothian (Richardson 1905, 441). Where it does occur, it is tempting to wonder if the shale was invested with some special significance, along the lines tentatively suggested above.

There is more scope for the variability in the lay-out of the cemeteries, but as Henshall has pointed out, the circumstances of discovery and recovery of the evidence in the past has meant that in practice few details are available for the bulk of the sites (1956, 265). Among the better documented sites, the lay-out of the cists at the Catstane is unusual, although earlier, somewhat ambiguous, accounts of graves laid out in regular rows have clearly to be borne in mind, while regularly arranged groups of graves may form an element of larger, more dispersed cemeteries, such as Parkburn (Henshall 1956, 257) or Hallowhill (Proudfoot, E pers comm).

The limited excavations carried out at the Catstane in 1977 have, therefore, clarified a number of points, such as the extent and lay-out of the cemetery, but a great deal remains uncertain and it is unlikely that even total excavation would do much to elucidate the earlier activity on the site. Such larger scale operations might, however, throw light on the extent and true nature of the Victorian investigations which did so much to obscure the archaeological record of the site, but the confidence with which Simpson and subsequently Hutchison interpreted their discoveries must give way to an admission of doubt as to the original form and development of the site.

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APPENDIX 1

SUMMARY OF FEATURES (figs 3, 5, 6)

Feature no	*Grid square*	*Description*
1	C1/2, D1/2	Field-clearance stones and earth mound around Catstane: c 11·5 m by 7 m (fig 2).
2	C2	Cist, c 1·70 m by 0·48 m internally, badly disturbed. No flooring material.
3	C2	Shallow depression (c 0·30 m by 0·20 m) filled with dark brown loam; a rounded boulder (c 0·60 m in diameter) immediately to its W may possibly have been displaced from the feature.
4	C2	Spurious feature: effect of gravel rising to surface to create circular patch c 0·20 m in diameter.
5	C2	Spurious feature: cf F4.
6	C5	Cist: site of almost totally destroyed cist.
7	C5	Cist, c 1·60 m by 0·35 m, unusually rough construction of smaller stones but badly disturbed by ploughing. Bone *in situ* (fig 7).
8	C5	Cist, ? by c 0·35 m, badly disturbed by ploughing.

Feature no	*Grid square*	*Description*
9–11	C5	Spurious feature: group of natural rounded stones protruding from underlying gravel band.
12	C5	Cist, c 1·78 m by 0·44–0·32 m internally, predominantly shale construction; bone *in situ* (fig 7).
13	C5	Cist, c 1·50 m by 0·30–0·20 m internally, predominantly shale construction; bone *in situ* (fig 7). Possible priority over F12?
14	C5	Cist, c 1·73 m by 0·30 m internally, predominantly shale construction; bone *in situ* (fig 7).
15	C5	Cist, c 1·85 m by 0·35 m internally, predominantly shale construction, with disturbance at W end.
16	D5	Cist, c 1·80 m by 0·40–0·28 m internally, predominantly shale construction; bone *in situ* (fig 7). Some disturbance of SW side.
17	D5	Cist, c 1·60 m by 0·40–0·25 m internally, predominantly shale construction; bone *in situ* (fig 7). Capstones intact.
18	D5	Cist, c 1·70 m by 0·40–0·20 m, shale and sandstone construction.
19	D5	Cist, capstones *in situ*? Unexcavated.
20	D5	Cist, c 1·85 m by 0·40–0·22 m internally, shale and sandstone construction; bone *in situ* (fig 8). Possible grave marker (F63) at W end?
21	D5	Cist, c 1·76 m by 0·25 m internally, shale and sandstone construction; disturbed.
22	D5	Spread of stones around F20 and 21.
23	D5/6	Cist, c 1·60 m by 0·50–0·27 m internally; shale and sandstone construction.
24	D5	Cist, capstone *in situ*? Unexcavated.
25	D5	Cist, c 1.90 m by 0·50 m internally, sandstone construction, capstones *in situ* (fig 8); (cf Ashmore 1974, 187).
26	D5	Spread of stones in SW corner of trench; cf F22.
27	B6	Area of burnt subsoil (orange, blackened sand with charcoal flecks) traced at W edge of square. Extent unknown (see fig 2 for location).
28	E3	Cist, c 1·30 m by 0·25 m internally, sandstone construction; disturbed.
29	E3	Cist, c 1·66 m by 0·36–0·23 m internally, sandstone construction; disturbed.
30	E3	Cist, c 1·60 m by 0·45–0·28 m internally, sandstone construction; disturbed.
31	E3	Cist, c 1·56 m by 0·38–0·20 m internally, sandstone construction (fig 8); disturbed.
32	E3	Cist, c 1·97 m by 0·30 m internally, sandstone construction (fig 8); capstones *in situ* – undisturbed.
33	D1	Cist, c 1·70 m by 0·40 m externally, unexcavated but predominantly shale?
34	D1	Cist, at least 1·60 m by 0·40 m internally, blue-grey shaley sandstone; badly disturbed.
35/40	D1	Disturbed area around Catstane, cf F51 for details.
36	E3/4	Cist, c 0·97 m by 0·32–0·22 m internally, sandstone construction; some capstones intact?
37	E3	Cist, c 1·80 m by 0·43–0·25 m internally, probably of sandstone construction; disturbed.
38	C2	Spurious feature: dark patch of soil c 0·40 m by 0·18 m caused by water percolation down side of adjacent stone lying in gravel.
39	D1	Spurious feature: natural gravel spread breaking surface of subsoil.
40	D1	cf F35: part of disturbed deposit around Catstane.
41	D3	Cist, c 1·70 m by 0·45–0·28 m internally, probably of entirely sandstone construction; disturbed.
42	D3	Cist, c 1·70 m by 0·45 m internally, shale and sandstone construction; disturbed.
43	D3	Cist, c 1·75 m by 0·35–0·28 m internally, shale and sandstone construction; disturbed.
44	D3	Cist, c 1·85 m by 0·45 m internally, shale and sandstone construction; disturbed.

Feature no	*Grid square*	*Description*
45	D3	Cist, c 1·90–2 m by 0·45 m overall, shale and sandstone construction; disturbed but possibly two-period cist, with shale replacing sandstone construction.
46	D3	Cist, c 1·15 m by 0·25 m internally, sandstone construction; disturbed by ploughing?
47	D3	Cist, c 1·50 m by 0·35–0·20 m internally, sandstone construction; tooth crowns *in situ* (fig 8).
48	D3	Cist, c 1·70 m by 0·40 m internally, sandstone construction; disturbed.
49	D4	Cist: unexcavated. Possibly disturbed.
50	D3	Spurious feature: area of decomposed stone, initially taken to be capstone of cist.
51	C2	Disturbed area around Catstane extending at least 3·20 m eastwards from the stone and 1·15 m below subsoil level. Fig 4, Layer 3 = F35/40 and 51.
52	E3	Cist, c 1·25 m by 0·30 m internally, sandstone construction, capstones *in situ*; undisturbed.
53	E3	Cist, c 1·72 m by 0·32–0·25 m internally, sandstone construction, capstones *in situ*; undisturbed (fig 8).
54	E3	Cist, c 1·70 m by 0·36–0·25 m internally, sandstone construction, capstones *in situ*; undisturbed.
55–57	D4	Cists: unexcavated; possibly disturbed.
58	C2	Boulder (c 0·50 m in diameter by 0·35 m high) apparently set in prepared socket consisting of a shallow depression (c 0·60 m in diameter by 0·17 m deep) edged by small angular pinning stones.
59	C2	Spurious feature: dark patch in subsoil c 0·60–0·70 m in extent, initially interpreted as possible stone-hole but shown on excavation to be decomposed stone.
60	D5	Cist, c 1·27 m by 0·25 m internally, shale and sandstone construction; possible priority over F21?
61	C5/6	Shallow U-bottomed gulley extending 2·10 m into trench before terminating in butt end; width 0·40–0·45 m, depth 0·30 m from subsoil level; homogeneous fill of brown sandy loam with gravel.
62	C5	Cist: only partially revealed; badly disturbed by ploughing.
63	D5	Post hole: c 0·20 m in diameter by 0·15 m deep from subsoil level. Possible grave marker associated with F20.
64	F3	A group of stones including a stone rubber lay in the dark loam fill of a pit c 0·77 m by 0·50 m up to 0·20 m deep into the subsoil: the feature had been disturbed (= Hutchison's 'short cist' (his cist 24)?).
65	F3	Cist, over 1·20 m by 0·30 m internally, sandstone construction; disturbed.
66	F3	Cist, c 1·32 m by 0·30–0·21 m internally, sandstone construction; disturbed.
67	B6	Truncated base of whinstone boulder of indeterminate original size apparently set in shallow depression c 0·60 m in diameter with packing of smaller stones. Excavated in very dry, unfavourable conditions.
68	A4	Spread of small stones in N half of grid square lying on and just into subsoil: extent within trench c 3 m by 1·70 m but edges poorly defined.
69	D1/E1	Cist, c 1·30 m by 0·35 m externally, unexcavated but predominantly shale?
70	D2/E2	Cist: unexcavated.
71	E2	Cist: unexcavated.
72	C1	Cist, c 1·90–1·96 by ? externally; badly disturbed by ploughing.
73	C1	Cist: site of almost totally destroyed cist?
74	C1	Cist, at least 1·60 m by 0·60 m; badly disturbed.
75	C2/B2	Cist: site of almost totally destroyed cist?

APPENDIX 2

REPORT ON THE SKELETAL MATERIAL

Dr D A Lunt and Dr A Young

The bulk of the material was extremely friable. Much was embedded in hard-dried sandy soil and simply disintegrated as it was being freed. Probably the best preserved elements were teeth and three skulls (from F12, 13 & 17). A noticeable fact was the complete absence of any recognisable vestiges of vertebrae, ribs or the ends of any long bones. Thus it was impossible to give any estimate of the height or age of individuals, although Dr Lunt's reports on the dentitions provide indications of the latter.

The material from the individual features was identified as follows:

Feature No 7 (Cist)

Skull: many of the skull fragments are too small and fragile for identification, but parts of a calvarium, a small torcula, and a small (R) petrous temporal bone can be recognised. No teeth were present.

Radius/ulna: some very friable fragments are possibly from forearm bones.

Femora: fragments of the shafts of two long bones are possibly from the femora of a small person.

Feature No 12 (Cist)

Skull: the skull had been lying on its base. Most of the skull appeared still to be present, but it had been severely crushed and compressed in a vertical direction and was partly embedded in soil. The jaws, which were visible on the surface of the mass, had also been crushed and the anterior teeth had been either crushed or broken off. The posterior teeth in both jaws were still *in situ* and were in occlusion with each other. Several anterior teeth were recovered from the soil near the jaws. Other teeth, found separately in the cist, are similar in morphology and degree of wear to those in the skull and are probably from the same individual.

The greater part of the permanent dentition is present: altogether 27 teeth have been recovered. These may be charted as follows:

R	L
8765432 |	1 3 5678
8765432 |	1 345678

All the permanent teeth had erupted fully into function, and the roots of the third molars had been completely formed. This indicates that the individual was probably over 20 years at death.

The attrition facets on the third molars are, however, extremely small and this indicates that the teeth had been in function for only a short time. The degree of wear of the remaining teeth is also relatively slight and an age at death in the early twenties may be suggested: perhaps 20–24 years.

X-rays show that the pulp chambers of the molars are very large, and this indicates that the individual was still quite young. The X-rays also show that the third molars are mesotaurodont.

The teeth are fairly small but are well formed and well calcified. There is no evidence of dental caries. The alveolar bone is extremely friable and in many areas has crumbled away, but the appearance of the bone in the best preserved section (the mandibular left molar area) suggests that the individual had not suffered from periodontal disease.

Arm bones: various fragments possibly represent the lower end of a (?R) humerus and some forearm bones.

Femora: at least one pair of femora are represented by fragments of shafts.

Tibia/fibula: various fragments – one piece is definitely from a L tibia.

Tarsal bones: fragments of some tarsal bones.

All the long bones lacked their articular surfaces. Many other small fragments were unidentifiable but one may be part of the margin of either an orbit or a scapular glenoid fossa.

Feature No 13 (Cist)

Skull: when received, the skull was still embedded in a mass of soil lying over to its left side with the right side facing up – possibly its original burial position. The outlines of the skull and facial bones could be seen clearly.

On the right side of the jaws $\frac{76543|}{765|}$ were still in their correct positions and in occlusion. $\overline{8}|$ was lying at a lower level, unerupted but apparently just about to emerge. The anterior part of the jaws had been damaged and the incisors, together with some of the premolars and canines, were lying loose below the skull. Twenty-seven permanent teeth were present, either *in situ* in the jaws or loose: the latter quite clearly belonged to the same individual. Five teeth, recovered separately in the cist, fill the gaps in the dentition and match their opposite numbers exactly in size and morphology. They are quite certainly from the same individual, whose permanent dentition has survived intact, all 32 teeth being present. The dentition may be charted as follows:

R	L
$^{8}7654321$	1234567^{8}
$_{8}^{}7654321$	1234567_{8}

The second permanent molars have erupted fully into function, and their roots have been completely formed. This indicates that the individual was probably aged over 15 years at death. The third molars have begun to emerge from their crypts but have not yet reached a functional position. Their roots are not complete, and based on the degree of root formation rather than the fact that the teeth are erupting, the most probable age at death would appear to be in the range 16–19 years. The relatively slight amount of wear of the erupted permanent teeth supports this age estimate. There is evidence neither of dental caries nor of periodontal disease. A slight hypoplasia line is visible on the canine and premolar crowns and suggests a minor metabolic upset or systemic illness at the age of approximately 5 years.

Femora: the shafts of the two femora, probably a pair from a child or small person.
Other bone fragments are possibly from arm bones.

Feature No 14 (*Cist*)
The identifiable bone fragments from this cist were all from major long bones.
Humerus: fragments of a L humerus.
Radius/ulna: fragments from R side.
Femora: pieces from the shafts of R and L femora – lacking both articular ends.
Tibiae: the shaft of a R, and fragments probably from a L tibia.
Fibula: some pieces may be from a R fibula.

Feature No 15 (*Cist*)
Unidentifiable fragments.

Feature No 16 (*Cist*)
Skull: the skull elements seem to consist mainly of the calvarium and upper orbital elements. It seems to have been crushed vertically downwards – yet the mandible and skull base are apparently absent, and the calvarial interior is packed solid with an intimate mixture of sandy soil, tiny bone fragments and some grains of charcoal. This 'stuffed calvarium' sat horizontally on a pad of soil on the flat surface of the shale paving. It is tempting to wonder if this skull and those of F12 and 17 as well, were indeed buried as parts of intact bodies or as bones, or perhaps had been disturbed at some later date. Only the upper portion of the cranial vault has survived reasonably intact, though badly shattered and still attached to a mass of soil. There is no trace of the facial bones or jaws.

Four isolated teeth and fragments of another five teeth are present.
The teeth which can be identified are as follows:
Maxillary right and left permanent central incisors
Maxillary left permanent lateral incisor
Mandibular left permanent lateral incisor
Maxillary left first and second premolars
Maxillary right first premolar.

The remaining two specimens are an unidentifiable fragment of root, and a small fragment of a crown, possibly from an upper molar.

The incisors all show a similar amount of wear and are almost certainly from the same individual. The maxillary right premolar also shows a corresponding degree of wear and is probably from the same dentition. The maxillary left premolars, however, both show very much less wear, to the extent that it is not certain that these teeth belonged to the same individual as the others. If these premolars did derive from the same individual, then there must have been some anomaly of the occlusion which caused the premolars on one side to wear much faster than those on the other side. In the absence of all the other posterior teeth, it is not possible to establish whether such an anomaly existed, and the question must remain open.

It is unfortunate that none of the molars has been recovered, as these are the teeth from which age estimates based on attrition can most reliably be made. The incisors and maxillary right premolar are quite heavily worn and suggest an age at death in the 30s. The wear of the maxillary left premolars is relatively slight and suggests an age in the early to mid 20s.

None of the teeth show any evidence of dental caries, nor is there any sign of hypoplasia.

Part of the glabellar area of the skull has survived and seems to show relatively slight development: the individual may perhaps have been female.

Long bones: among the other bone fragments it was possible to identify the shafts of a possible pair of femora from a small person – perhaps female – and fragments from a (R) radius and ulna.

Feature No 17 (Cist)

Skull: part of a much crushed and damaged skull was received, still embedded in earth. Like that from F12, the skull was lying on its base on a flat surface. Apparently only the top of the cranial vault had survived. No bone was visible in the facial region, but three groups of well preserved tooth crowns were seen on the surface of the soil: those of the left maxilla from canine to first permanent molar, those of the right maxilla from first premolar to second permanent molar, and in the area of the right mandible a premolar and first and second permanent molars. In each group, the teeth were still in their correct positions. The mandibular teeth did not, however, occlude with those in the maxilla. In the anterior regions some fragments of incisors could be seen. The crown of the mandibular right third molar was lying separately beside the skull mass.

The roots of the teeth had been almost completely destroyed by soil action. As the teeth which were visible on the surface of the soil mass were removed, the maxillary right third molar was found in the soil beneath the right mandibular teeth. The left mandibular teeth from second incisor to second molar were discovered lying deeper in the soil mass. They were still in the correct positions relative to one another, and it was hoped that the mandibular left third molar might also be *in situ*: unfortunately no trace of this tooth was found.

Four loose teeth were recovered from F17. These teeth fill the gaps in the dentition and match the latter exactly in morphology: they are certainly from the same individual.

Twenty-four recognisable human permanent teeth are present, together with some further small fragments of incisors. The teeth may be charted as follows:

R	L
$^{8}7654\ 2$	1234567^{8}
$_{8}^{}76\ 4$	234567

The permanent teeth, up to and including the second permanent molars, have erupted into function: the individual was almost certainly over 12 years old. Had the roots of the teeth survived, some further indication of age might have been obtained from their stage of development. However, the wear facets on the second molars are very small and it seems probable that these teeth had been in occlusion for a relatively short time.

The third molars had been unerupted at death, but in view of the post mortem destruction of dentine and cementum, it is difficult to determine how far development of these molars had proceeded. The enamel of these teeth, particularly in the upper jaw, appears to be immature and it is probable that little more than the crowns had formed. On the basis of the probable stage of tooth development, the most likely age at death appears to be c 13–17 years. Wear of the teeth other than the second molars is also slight and supports this age estimate.

The teeth are well formed and calcified, and there is no evidence of hypoplasia. Nor is there any evidence of dental caries.

The portion of the cranial vault which has survived includes the area of the glabella. There is quite pronounced development of bone in this region, and the individual may therefore possibly have been male.

Long bone: part of the shaft of a major long bone from a fairly small individual or child.

Feature No 20 (Cist)

Teeth: portions of five permanent teeth are present, of which four can be identified with reasonable certainty.

F20 also produced some small tooth fragments which are too small to identify, and it is impossible to say whether they derived from the same individual as the other five teeth.

The four teeth which can be recognised are the upper left first premolar, the upper right second premolar, the lower left second premolar and the lower left second permanent molar. The fifth tooth is most probably the lower right canine, but cannot be identified with certainty. The teeth may be charted as follows:

R	L
5	4
	5 7

The teeth have all suffered from post mortem destruction of dentine and their roots have disappeared, with the exception of $\underline{5}|$, which still retains about a quarter of its roots. Root development can therefore give no assistance in assessing age of the individual.

Wear facets on the second mandibular molar crown show that this tooth had been in function for at least a few years after eruption. However, the amount of wear of this tooth and also of the premolars is very slight, and suggests that the individual was probably in the teens or very early twenties at death.

None of the teeth shows any evidence of dental caries or hypoplasia.

Long bones: fragments probably from the shafts of the femora of a small person (? female).

Other small fragments are unidentifiable.

Feature No 42 (Cist)

Unidentifiable fragments.

Feature No 43 (Cist

Eight isolated teeth are present. These have been identified as follows:

Maxillary right *deciduous* canine
Maxillary right permanent lateral incisor
Maxillary right first premolar
Mandibular right permanent canine
Mandibular right permanent first and second molars
Mandibular left second premolar
Mandibular left permanent third molar.

All of the teeth, with the exception (very strangely) of the deciduous canine, have suffered from post-mortem erosion of the roots.

It seems highly improbable that all eight teeth could have derived from the same individual. The crown of the maxillary lateral incisor shows no trace of wear: unless there was some malocclusion which prevented this tooth coming into normal function, this would indicate that the tooth was unerupted or very recently erupted and should indicate an age at death not later than 8–9 years.

The two premolars are also completely unworn, but the mandibular premolar root is fairly well formed. This suggests that the teeth were just erupting or had just erupted into position and indicates an age of 10–11 years at death.

The mandibular second molar shows early but definite wear facets and had therefore been in function before death. An age of 12+ would be suggested by this tooth. There is not a great disparity between the age suggested for this tooth and the age suggested for the premolars. However, the upper

premolar should have erupted well before the second molar and should therefore show at least slight traces of wear. Examination under a dissecting microscope shows no wear at all of the premolar. The teeth may however have belonged to the same individual if there had been either anomalies of eruption or anomalies of tooth position.

The mandibular first permanent molar shows a degree of attrition which might be expected by 11 or 12 years and may therefore be associated with either the premolars or the second molar. On grounds of size, the two molars accord well together.

The mandibular third molar crown is complete, but the appearance of its pulpal surface suggests that very little of the root had formed. This stage of development is usually reached between 12 and 16. On grounds of morphology this tooth fits quite well with the other two mandibular molars.

The maxillary deciduous canine should have been shed before 11 years. However, this specimen is unusual in having extreme attrition of the crown together with a completely unresorbed root. This suggests that the permanent canine which should have replaced it had become embedded in an abnormal position deep in the jaw and could not erupt. The deciduous canine had then been retained beyond the time at which it should normally have been lost. Maxillary permanent canines are not infrequently embedded in this fashion.

If some anomalies of tooth eruption and/or tooth position are envisaged, it would just be possible to suppose that all seven teeth so far described could have belonged to one individual aged c 11–12 years. However, the remaining mandibular permanent canine shows quite heavy wear and must have come from an adult dentition, perhaps in the mid 20s or perhaps older.

None of the teeth shows evidence of hypoplasia or of dental caries.

Long bones: some pieces are perhaps from a humerus. These seemed noticeably less friable than the remainder of the human bone from the site.

Feature No 45 (Cist)

Two fragmentary mandibular permanent molars are present. One can be recognised as the left second molar. The other is too badly damaged to allow of definite identification, but may be the corresponding tooth from the right side. The molars are fairly heavily worn and are those of an adult, aged perhaps in the late 20s, or early 30s.

Feature No 47 (Cist)

The specimen consists of extremely small crown fragments. Only three teeth can be recognised:
Mandibular left first permanent molar
Mandibular right second premolar
Mandibular second permanent molar, damaged.

The second premolar and second molar both show very small early wear facets, suggesting an age at death in the early to mid teens. The degree of attrition of the first molar is in accordance with this age estimate (c 12–15 years).

Feature No 53 (Cist)

Unidentifiable fragments of bone.

From disturbed subsoil between Feature No 42 and Feature No 43 (Grid square D3)

Teeth: three teeth are present:

Maxillary left permanent central incisor
Maxillary right and left third permanent molars.

The third molars have been unerupted. Parts of the roots have been formed, but as they have been largely destroyed by post-mortem soil action, the exact stage of root development cannot be assessed. The individual was probably aged between 14 and 20 at death.

The incisor shows relatively little wear and could well have belonged to the same individual.

The stage of molar development is more advanced than that of the third molar from F43, but these teeth could have come from the same individual or they may represent another individual.

From disturbed subsoil in grid square D3

Teeth: the specimen consists of the crown of a worn mandibular second premolar. The degree of attrition suggests that the individual was probably an adult. The tooth could have come from one of the adults already represented.

Conclusions (Dr D A Lunt)

Study of the dentitions suggests that the probable number of individuals represented, and the most likely age of each at death is as follows:

Feature no	*No individuals*	*Probable age*
12	1	20–24
13	1	16–19
16	?2	(a) early–mid 20s
		(b) 30s
17	1	13–17
20	1	teens–early 20s
43	?2–4	(a–c) 8–13+
		(d) mid 20s
45	1	late 20s–early 30s
47	1	12–15
Between 42, 43 (grid square D3)	?1	14–20
(grid square D3)	?1	adult

A notable feature of the Catstane material is the number of teenagers and young adults. There is no evidence of very young children: indeed with the sole exception of the unworn maxillary lateral incisor which *may* suggest a child of about 8 years, but which may equally well represent an anomaly of occlusion, there is no evidence of any individual younger than 11–12 years. There are at least four individuals aged between 12 and 20, and at least three individuals probably aged between 20 and 25. Only from cists 16 and 45 is there evidence of individuals more likely to be in the 30s, and there is no evidence at all of any really elderly people.

As would be expected in view of the age of the individuals there is no evidence of dental disease. The teeth are also well formed and well calcified, only one individual showing a very mild degree of hypoplasia of the enamel.

Note: (T Cowie)

On account of the extremely friable and fragmentary nature of the skeletal material, it was decided to utilise the bone for radiocarbon determinations. The skulls and dentitions have, however, been preserved and have been deposited with the remainder of the finds for future reference.

APPENDIX 3

THE FINDS

Although they are unstratified and their original contexts are obscure, the finds described below are of interest as evidence for human activity in the immediate area of the site from a comparatively early date. Together with some miscellaneous objects of post-medieval and modern date (Find nos (SF nos) 1, 4, 10, 16, 17 and 19) omitted from the catalogue, the material has been deposited in the National Museum of Antiquities of Scotland.

FLINT AND CHERT

Notes

1 Measurements (in mm) are given in the order – length: breadth: thickness.

2 All the chert referred to is of a dark olive-green colour.

SF 2 (grid square D3): *unworked chert lump* 27:12:10; *4 flakes, 5 blades and 6 chips of chert* mostly secondary, flakes average less than 20:10:7, blades less than 33:10:3, chips less than 17:10:–; *chert core* 19:30:14, single artificial platform, one-sided, 3 strikes; *flint flake* secondary, 20:21:3, light brown, slightly patinated.

SF 3 (grid square D3): *chert core* 30:20:15, single artificial platform, one-sided, 5 strikes (fig 10.2); *chert chip* 12:11:–; *retouched chert blade* 12:10:3 broken – proximal end surviving, edge retouch at proximal and distal ends of left and right sides (fig 10.3); *chert blade* 24:10:5 secondary; *retouched flint flake* 23:23:2 grey-white irregularly triangular flake with inverse edge retouch across distal, and coarse retouch on other sides, corticated (fig 10.9).

SF 8 (fill of F23): *retouched chert blade* 21:8:2 inverse retouch on right side (fig 10.7).

SF 9 (fill of F32): *backed blade of chert* 15:5:2 snapped distal surviving – notch formed by inverse retouch on right edge, retouch on left side and distal end (fig 10.4).

SF 12 (grid square E3): *chert lump – core*? 20:25:25, 3 strikes off rounded pebble (fig 10.5); *chert core* 20:17:10 artificial platforms, strikes from all directions, flawed chert, *chert core* 20:20:22 double platform – one artificial, several strikes, flawed chert (fig 10.8); *chert core* 31:28:17 artificial platforms, strikes from several directions, rough flawed lump (fig 10.1); *chert petit tranchet arrowhead* 15:20:2 atypical form made on stout flake, proximal end retains bulb, right and left edges retouched, blunt distal edge – angle 57° (fig 10.6).

SF 13 (fill of F20): *flint flake* secondary, 41:30:4 light brown/khaki colour, slightly corticated.

The quantity of chert and flint from the site is insufficient to merit detailed discussion: cultural labelling of such an inadequate sample is unsatisfactory, not only because of the small quantity of material recovered but also because the small size and quality of the parent material, namely nodular lumps (eg SF 2), will have controlled the form of the resulting products. The superficially 'Mesolithic' attribution which the industry invites may therefore be misleading, the more so in view of the presence on the site of Neolithic sherds of pottery. Albeit equally unstratified, these at least suggest the possibility of a later date for the chipped stone.

POTTERY

Prehistoric

Miss A S Henshall has contributed the following note on three small rim sherds from the site. In each case the sherds are too small to be sure of the rim angle, and all the surfaces are worn.

SF 6 (grid square C2): Thickened rim, of fairly hard ware with a moderate amount of gritting with a speckled rock; grey-brown in colour but partly scorched pink, with a fine slip outside. The scorching has caused the outer layer of clay to flake away to a consistent depth showing that the rim was formed by the addition of extra clay. There is a hint that the pot may have been fluted but insufficient remains to be sure. Traces of carbonised matter remain in the angle below the rim (fig 10.10).

SF 11 (grid square A4): Rolled rim of similar but thinner ware with little or no slip; horizontal tool marks are faintly visible inside. The outer edge of the rim is very worn and has been somewhat reduced (fig 10.11).

SF 14 (F6, grid square C5): Bevelled rim, of more heavily gritted dark grey ware. Inside are traces of burnishing and remains of carbonised matter. There is little horizontal curvature so the vessel appears to have been quite large (fig 10.12).

The first two sherds are characteristic (as far as they go) of the early western Neolithic pottery from Scotland, and the third would readily fit into this classification too. The first sherd appears to have had a burnished slip. In form the bowls are likely to have been vertical or open at the neck, and the first two in particular could have been carinated. Although pottery of this type is hardly abundant in eastern Scotland, one can point to a number of sites which have produced sherds of similar vessels: Bantaskine, West Lothian (Callander 1929, 33, 56–7); Dalladies, Kincardineshire (Piggott 1972, 38–9); Hedderwick, East Lothian (Callander 1929, 35, 71, fig 47, 26, 27 but other sherds unpublished); Boysack, Angus (unpublished). In more general terms the simple rim forms and good quality of the ware allow comparison with the pottery groups from Pitnacree (Coles & Simpson 1965, 41–3); Boghead and Easterton of Roseisle in Moray, and Atherb and some other sites in the north east (Henshall forthcoming). Carbon 14 dates from Dalladies, Pitnacree and Boghead indicate a possible date range at least through the first half of the 3rd-millennium bc.

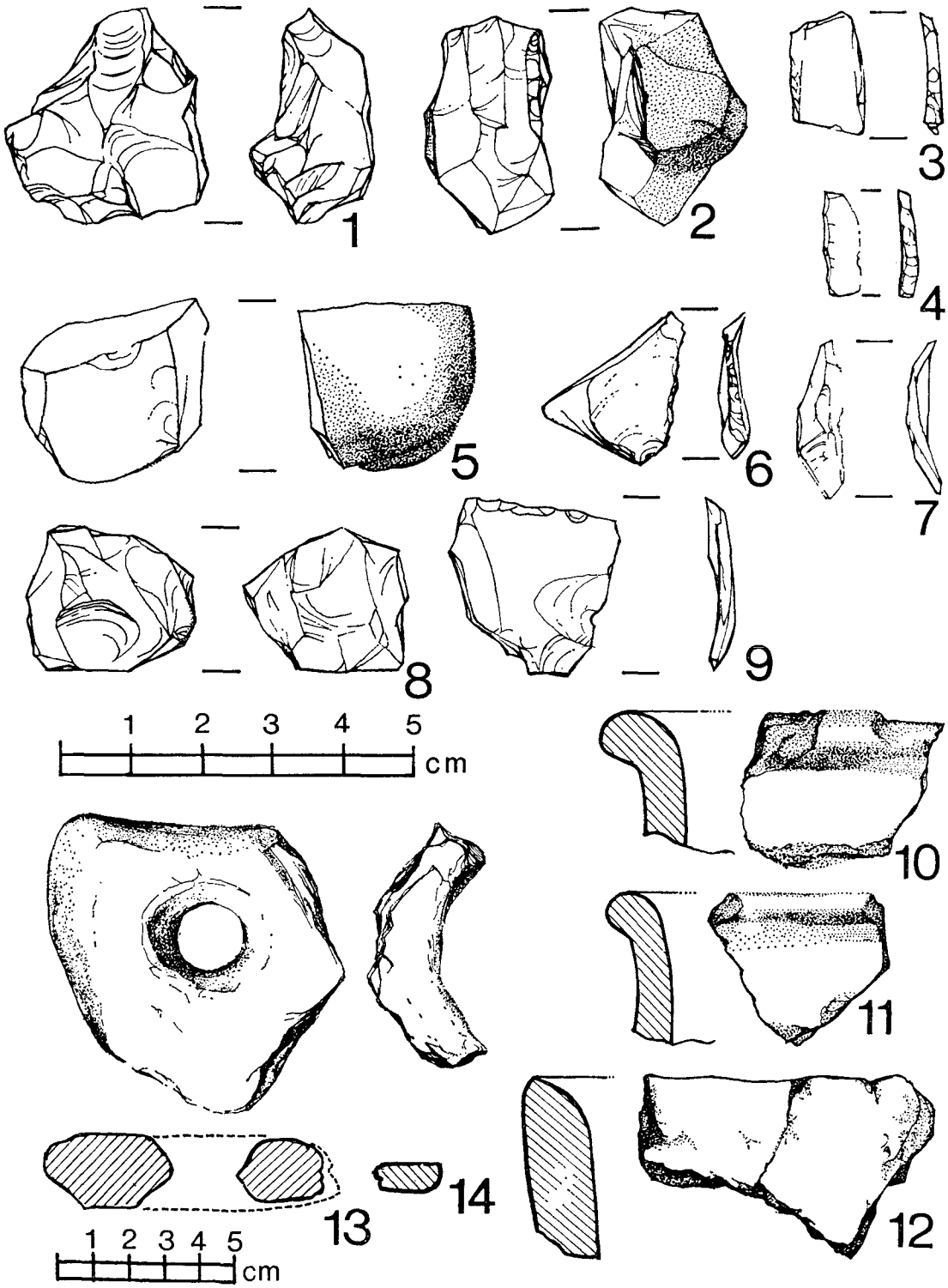

FIG 10 The Catstane: small finds of chert, flint, pottery and shale.

Medieval

SF 18 (grid square E3): 2 sherds including 1 rim fragment: cream coloured gritty external surfaces, blue-grey core, unglazed. Cooking pot – early 14th century AD? (Haggarty, G pers comm).

SHALE

SF 5 (grid square C5): Fragment of shale ring; outer edge abraded and irregular. 70 mm long: 15–20 mm in width: 10–13 mm thick (fig 10.14).

SF 15 (grid square B6): Irregularly shaped piece of shale, 95 by 76 mm, with waisted perforation c 20 mm in diameter; thickness variable, up to 20 mm. Possibly originally more triangular, having broken and subsequently weathered (fig 10.13); broken shale disc c 60 by 42 by 20 mm, possibly fractured in course of perforation (not figured).

Made from the locally available and easily worked laminated shale, these objects are insufficiently diagnostic to warrant discussion but general comparison may be made with the abundant, if imperfectly provenanced, shale objects from Traprain Law, East Lothian.

STONE

SF 20 (surface find, F1): Broken half of 'bun-shaped' upper stone of rotary quern (fig 11); present size 460 by 230 by 115 mm; well cemented arenaceous sandstone. The fragment has broken across the central perforation (grain hopper) but the weathered surfaces suggest this damage was sustained in the past.

Retrieved from the field-clearance stones around the Catstane, the quern fragment is only doutbfully associated with the site. In the absence of any other instances in the cists uncovered, there are no grounds for supposing that the quern had been incorporated in the construction of a now destroyed cist as had been the case at Parkburn, Lasswade (Henshall 1956, 256), a site which nevertheless provides a convenient local parallel for the Catstane fragment (*idem* 262, fig 4c).

APPENDIX 4

RADIOCARBON DATES

Since going to press, the series of bone samples submitted for radiocarbon dating at Glasgow University has been processed, with the following results:

Lab No	*Description of Sample*	*Date* (radiocarbon years ad) (Libby half-life)	*Calibrated date* (*after* Clark, *Antiquity*, 49, 1975, 251–66)
GU–1155	Human bone from cist (F14)	430 ± 70	455 ± 85
GU–1156	Human bone from cist (F7)	365 ± 85	400 ± 100
GU–1157	Human bone from cist (F16)	585 ± 80	625 ± 95
GU–1158	Human bone from cist (F12)	400 ± 70	430 ± 85
GU–1159	Human bone from cist (F13)	615 ± 120	650 ± 130

Discussion

Three of the dates (GU–1155, 1156 and 1158) are rather earlier than anticipated: conventionally, the so-called Early Christian long cist cemeteries are dated to the 6th–8th centuries AD (cf Henshall 1956, 252–83). As can be seen the remaining two dates fall into place within this expected span. It should, however, be stressed that statistically the dates are not significantly different.

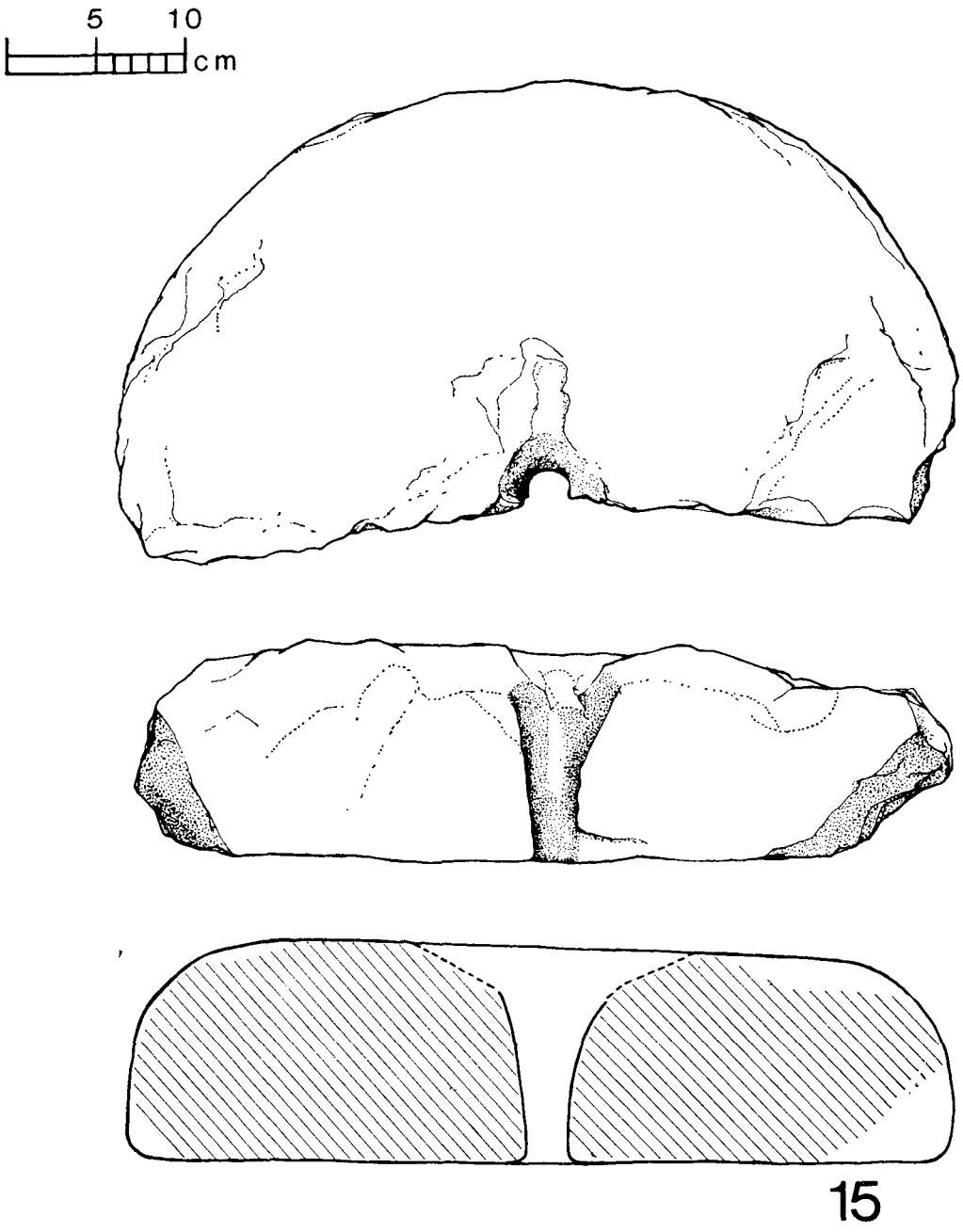

FIG 11 The Catstane: quern fragment (SF 20)

There is no reason to doubt the validity of the series of dates, as a whole, as a guide to the approximate date of the cemetery. The dating of the inscription has hitherto provided the only indication of the date of the site: strictly speaking, however, there is no archaeological association between cists and inscription. There is thus no reason why the inscription should not have been added to the stone later in the span of the use of the cemetery, as a *commemorative* rather than a *dedicatory* inscription.

At the same time it must be stressed that the series of dates are derived from samples secured *only* from graves that produced enough skeletal material to meet laboratory sampling requirements. By an unfortunate combination of archaeological survival and the circumstances of the excavation, the cists to which these dates apply are in a single group (shale cists) at the eastern periphery of the site (see p 174 above). The presence of both early and late graves in this single group of cists does mean that the suggestion of an orderly, eastwards expansion of the cemetery from the Catstane (see p 187 above), while still attractive, must be treated with due caution in the absence of a series of dates representative of the whole cist cemetery. The dates do however reinforce the suggestion that the graves must have been demarcated above ground in some way.

In summary, the available radiocarbon dates suggest that ordered deposition of orientated burials in long cists had commenced on the site by the early 5th century AD. The advent of full Christianity to this area of South Scotland, would, on present reckoning, seem unlikely to have been as early, but in the absence of further evidence, the spiritual beliefs of the cist builders must remain obscure.

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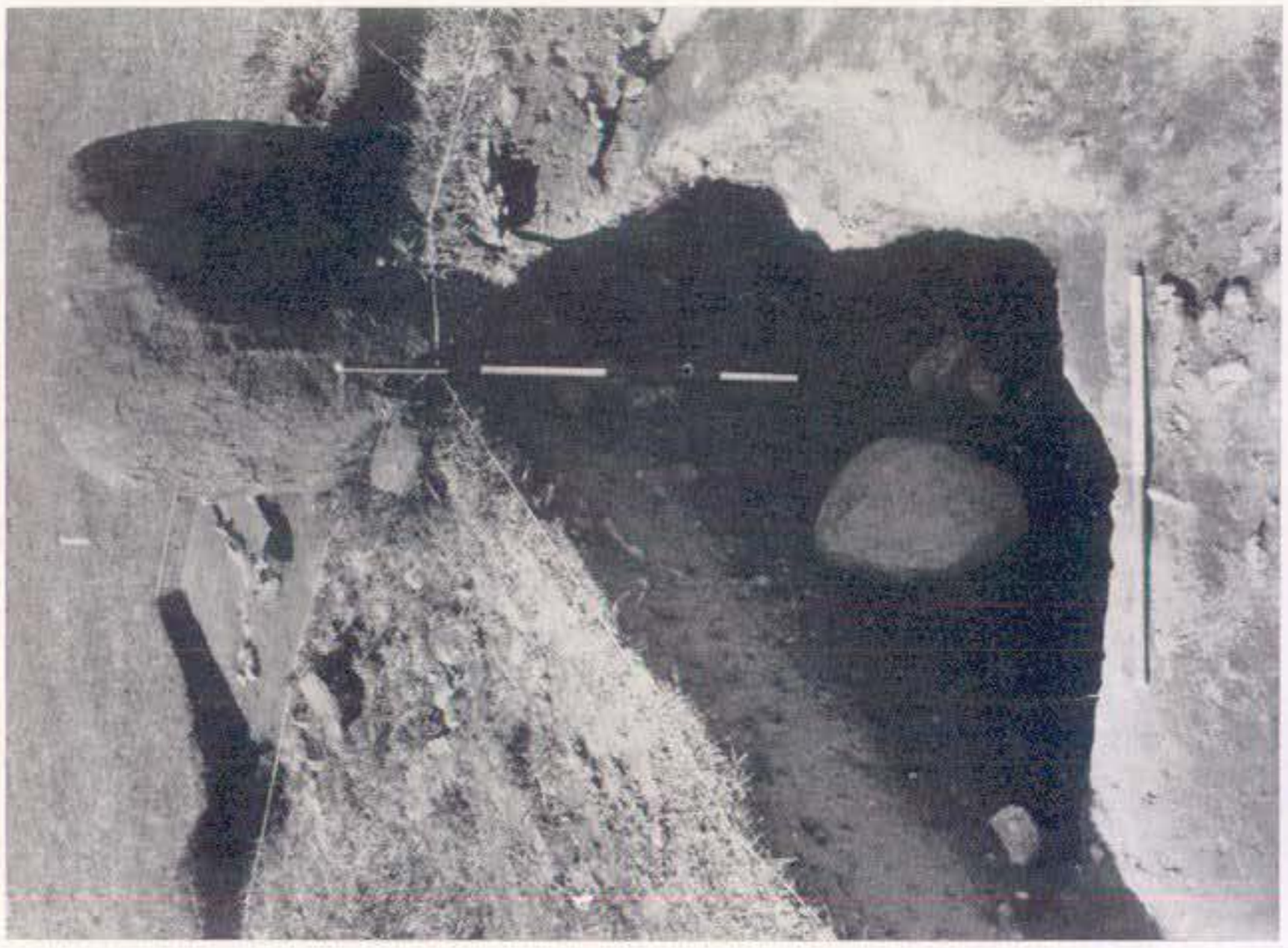
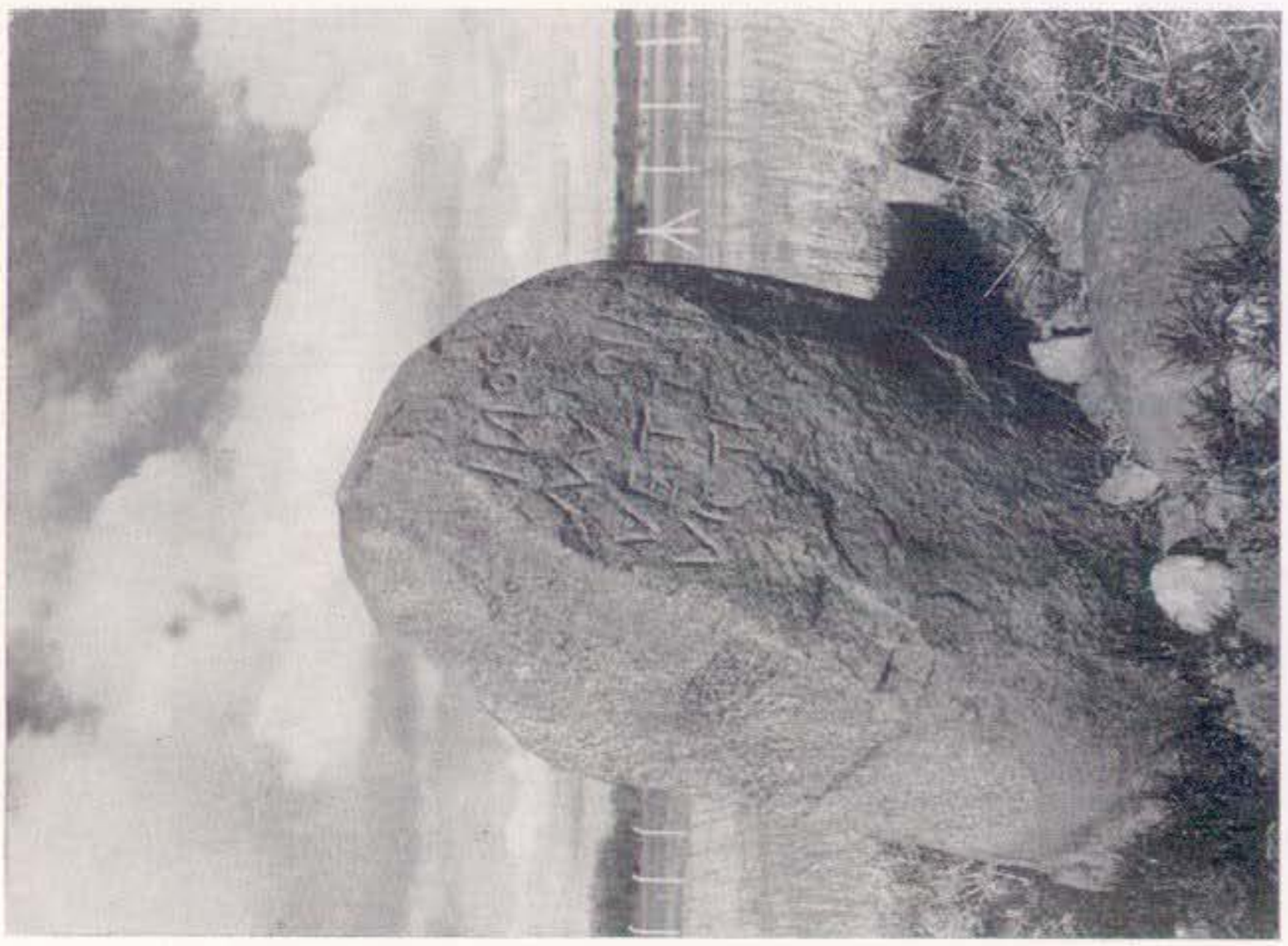
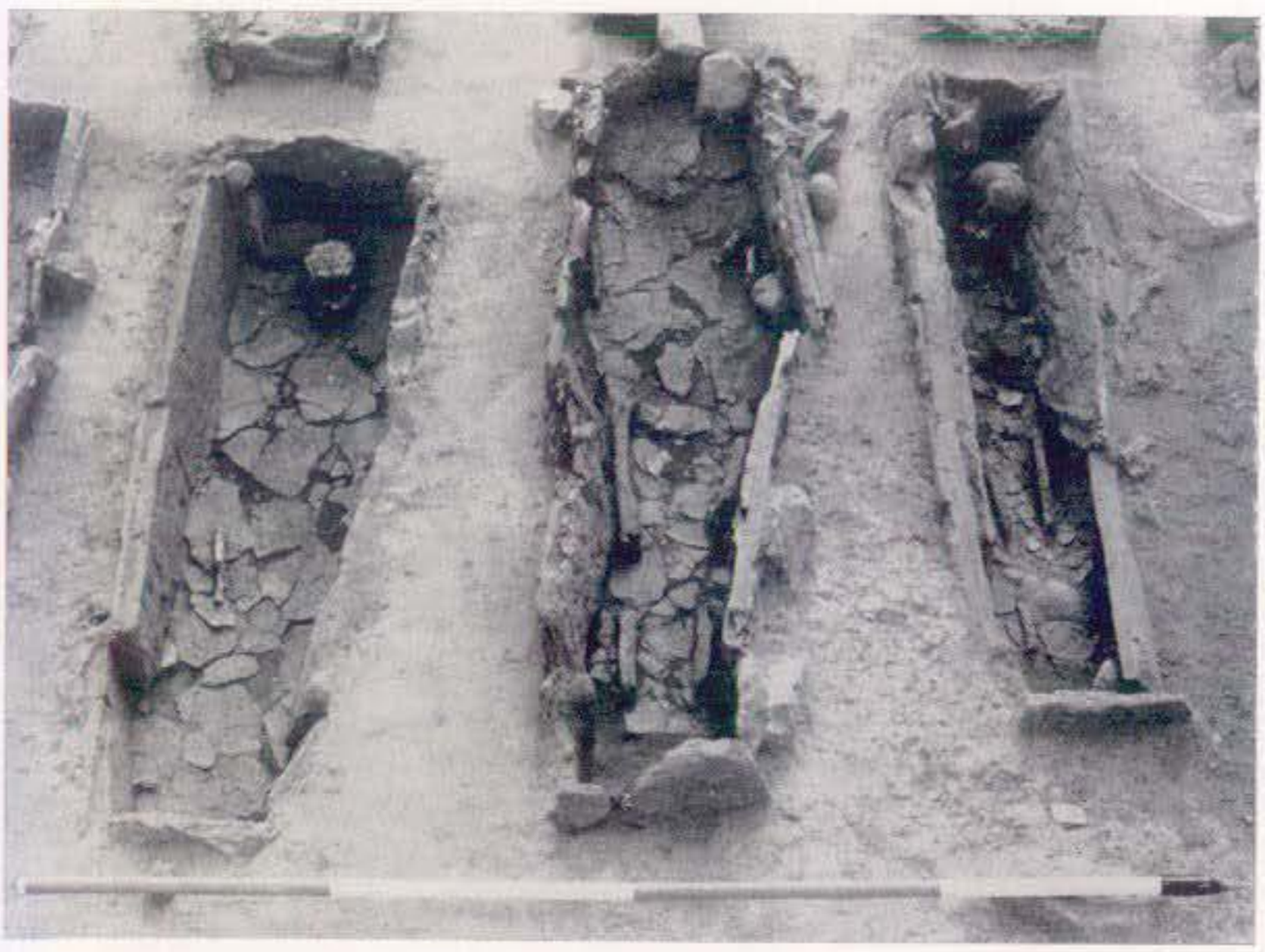


b The Catstane: disturbance around the base of the stone, viewed from NE



a The Catstane: view of stone prior to excavation (from SE)

a The Catstane: view of excavations in progress from the E



b The Catstane: skeletal remains *in situ* in cists of shale construction (from left, F17, 14, 13)