

Reconnaissance excavations on Early Historic fortifications and other royal sites in Scotland, 1974–84: 3, Excavations at Dundurn, Strathearn, Perthshire, 1976–77

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SUMMARY

As part of a long-term programme of research on historically documented fortifications, excavations were carried out in 1976–77 at Dundurn, Strathearn, principally on the defences. A complicated sequence, spanning the sixth to ninth centuries AD, was revealed in the citadel and encircling terrace rampart. The printed report gives a synthesis of the excavation results, and discusses the classification of hierarchically-organized forts and the material culture and economy of Dundurn. A fully detailed account of the excavation and finds will be found in the microfiche.

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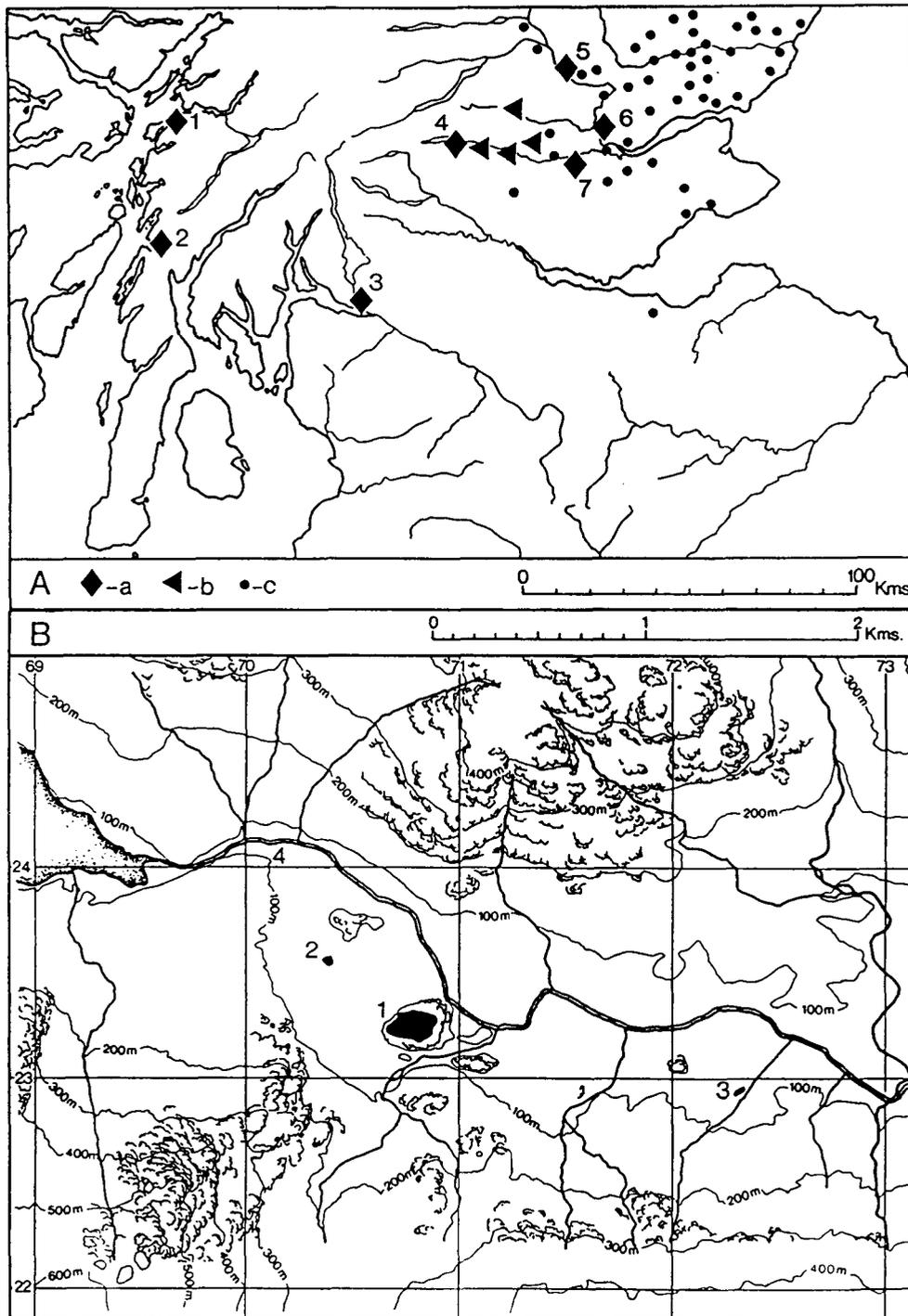
EXCAVATION SYNTHESIS

INTRODUCTION: CIRCUMSTANCES OF THE EXCAVATION

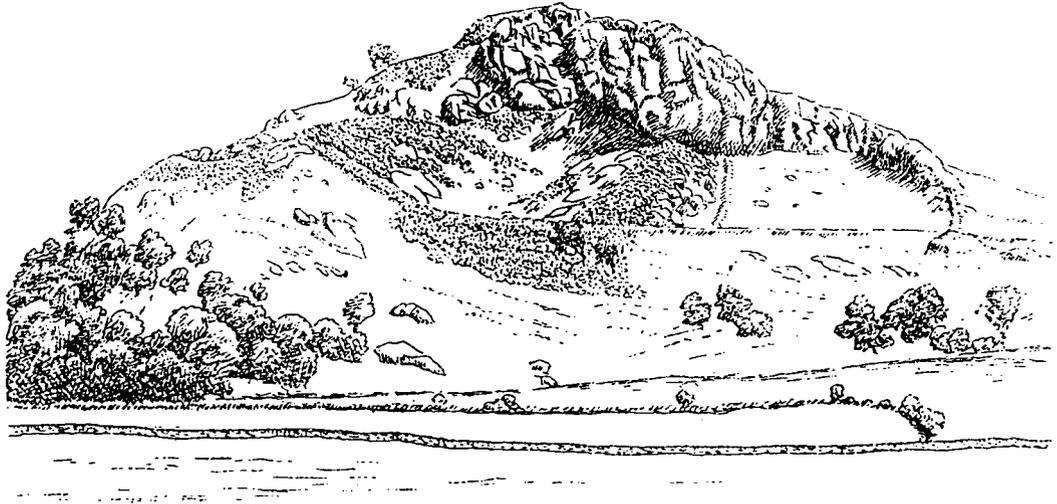
Dundurn (NGR NN 7023) (illus 1) was one of the first of the early historically-documented fortifications of Scotland to be recognized on the ground and to be systematically surveyed. In his Rhind lectures, delivered in 1894 and published in 1898, Christison noted that 'it has been identified by Skene as the capital of' [the Pictish kingdom of] 'Fortrenn', and described it as 'an altogether exceptional work' (1898, 208; illus 2). It was also a key site in Stevenson's determination of 'nuclear forts' as 'a definite type', identifiable as 'Dark Age capitals' (1949). Inevitably, therefore, it was an early objective for the Glasgow University programme of research on Early Historic fortifications: in fact, its excavation followed in 1976–77 immediately after work at Alt Clut/Dumbarton.

As with the other excavations in the series, work was on a small scale (illus 3), and concentrated on two points on the defences: the citadel (Cutting 000); and the walling of a terrace immediately below it, and the immediately adjacent interior deposits (Cutting 100/400). The tactics here were determined by the belief that bedrock must lie not far below the present ground surface; that traces of a circular stone house could be seen adjacent to the rampart; and that the relationships of the two could therefore be readily established.

Both these beliefs were wrong. The house was an illusion; and bedrock in 100/400 was over 2.80 m down as a result of some unexpected geological formation. The excavation was, frankly, under-resourced to explore such depths at all extensively. The unexpectedly large size and unstable condition of the terrace rampart caused further difficulties. It would have been possible to seek larger funding (probably as much as ten times more than had already been spent) and to excavate more widely in 1978; but it seemed preferable to maintain the overall strategy, so that the results from Dundurn would be quantitatively comparable with those from other excavations in the programme. As a result of this decision, we remain largely ignorant about the earliest history of Dundurn. As a major compensation, the deep layers in 100/400 were damp enough to yield important organic remains: evidence for defensive structures, environment and economy.



ILLUS 1 Location maps for Dundurn. A, the wider setting. a. major sites: 1. Dunollie, 2. Dunadd, 3. Dumbarton-Alt Clut, 4. Dundurn, 5. King's Seat, Dunkeld, 6. Scone, 7. Forteviot. B, chambered tombs of Clyde type in south-east Scotland. c. Pictish stones. B, the environs of Dundurn: 1. Dundurn, 2, possible ecclesiastical enclosure, 3. Kindrochat chambered tomb, 4, area of rig-and-furrow



ILLUS 2 Christison's view of Dundurn from the north-west

HISTORY AND GEOGRAPHICAL SETTING

There are two historical notices of Dundurn. The Annals of Ulster, here based on annals originally compiled at Iona, record for the year AD 682 (correctly 683):

Obsesio Duin Att & obsessio Duin Duirn:

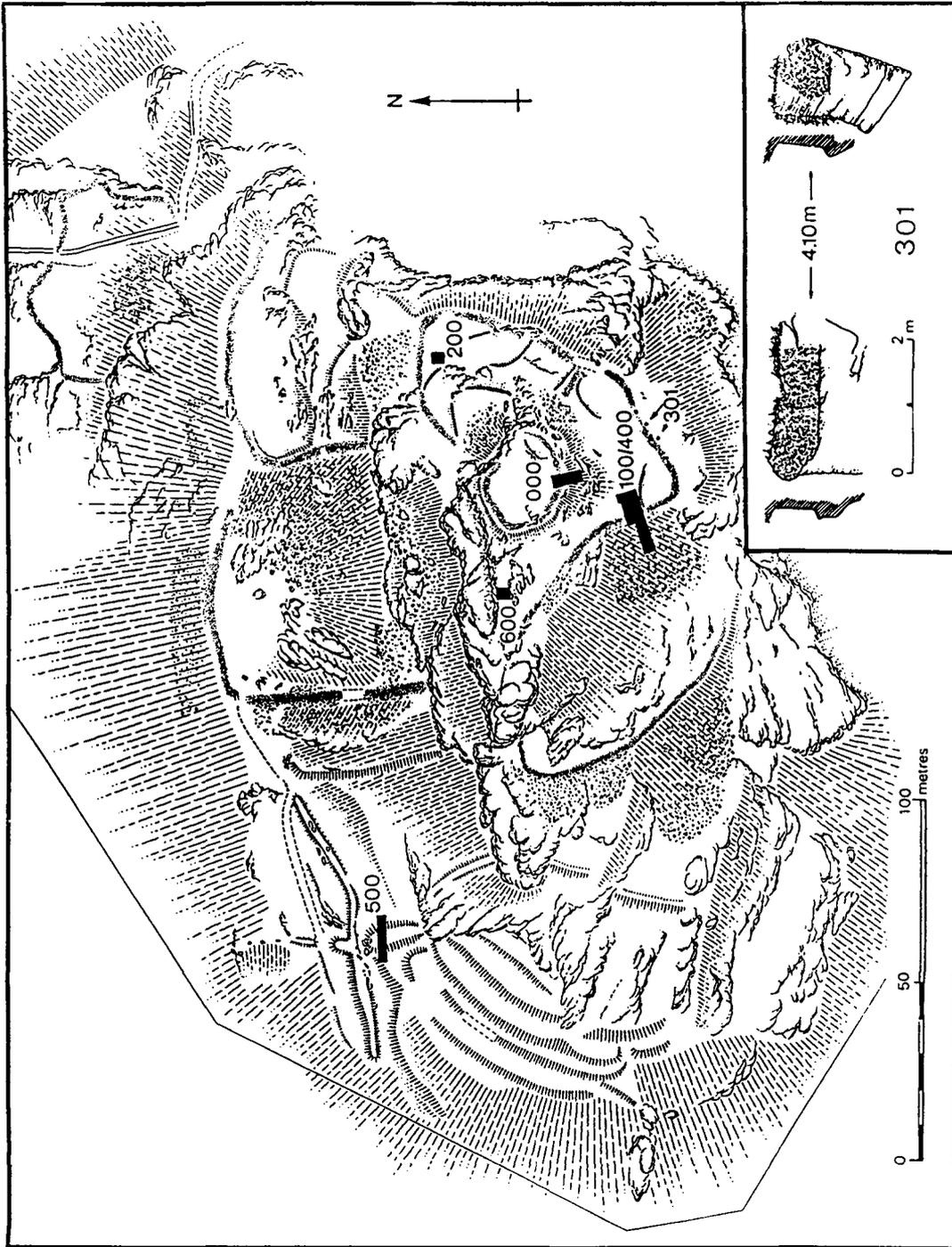
'The siege of Dun Att and the siege of Dun Duirn' (MacAirt & MacNiocaill 1983).

This serves only to tell us that sieges took place at these two forts in that year: it tells us nothing about the besiegers, or the reasons for or results of the sieges. Because Dun Att is confidently identified with modern Dunadd, and regarded as the capital of seventh- and eighth-century Scottish Dalriada, while Dundurn has been regarded as the capital of a Pictish province, it is tempting to see these two sieges as interlinked events in the long struggle between Picts and Scots for the hegemony of northern Britain.

Against this interpretation it must be urged, however, that the presentation of events in the Annals does not allow us to infer any historical logic of cause and effect between any two contiguous entries. In any case, the concept of a 'capital' – as opposed to a major royal stronghold – is quite anachronistic in relation to the political structure of the period. Finally: rather than marking the simple tit for tat of Picto-Scottish hostility, the siege of Dunadd could as well be an incident in the inter-kindred struggles for dominance in Dal Riata, and the siege of Dundurn could be the result of dynastic strife in Pictland, or even of British aggression from Strathclyde.

Despite the historical obscurity which envelops the siege of Dundurn, we are at least provided with credible evidence that in the late seventh century there was a fort (*dun*) at Dundurn capable of sustaining a siege which was important enough to have been noticed as far away as Iona. And though there has in the past been some discussion about the precise location of Dun Duirn, as between one hill and another (Christison 1898, 208; Stevenson 1949, 192 n 2) the present excavations have finally settled that debate.

The second historical notice is found in the Scottish Regnal Lists. Referring to Girg son of Dungal, it is stated that *mortuus est in Dundurn*, 'he died in Dundurn', at a date which may be



ILLUS 3 Dundurn: plan by Royal Commission on Ancient Monuments (*Crown Copyright*), showing 1976-77 excavations. Inset, detail of rock-cut grooves, 301: stipple indicates grooves



ILLUS 4 View of Dundurn from the valley floor looking west

calculated as AD 889 (Anderson 1973, 267, 274, 283; but see Smyth 1984, 216–17 for an account of the expulsion of Giric or Girg from the kingship in 889). The Regnal Lists in question – in fact a very elementary chronicle – descend from one known to have been in existence in Ireland in the 11th century; this in turn may have been based on earlier Scottish lists (Anderson 1973; 1980, 44 ff; Hughes 1980, 5). The reference to Dundurn demonstrates that in the 11th century the fort was regarded as having been a royal seat of the Scots in the half century after Kenneth's takeover of the kingdom of the southern Picts.

The defensive work thus identified occupies a craggy pyramidal hill, which rises in a series of steps or terraces for about 200 ft (60 m) from the valley floor of Strathearn (illus 2 & 4): the height above sea level is a little over 500 ft (152 m). At this point, just below the outflow of Loch Earn, the valley is narrow with rugged flanks, best suited to grazing, rising to heights around 2000 ft OD (600 m). Some 6 km to the east the hills decrease, and the valley begins to open out. At the same time, the quality of the land improves from the land capability classification of 4, around Dundurn itself (land that is capable in modern terms of producing only a narrow range of crops) to classes 3 and even 2 (capable of producing increasingly wide ranges of crops) in middle and lower Strathearn.

Strathearn itself merges into the good farming land along the Firth of Tay and into Strathmore (illus 1) (Walker *et al* 1982). This was the primary economic base of southern Pictland; here the elaborate sculptured cross-slabs are concentrated; and here were the major Pictish, and subsequently Scottish centres of Scone beside the Tay and of Forteviot in Strathearn itself (illus 1 A, 6 & 7).

In its narrow valley setting (illus 5), communications were no doubt of importance for Dundurn. In attempting to discern these, we may reasonably use the evidence of the 18th-century drove roads, formally anachronistic though they are (Haldane 1952). Given that there had been no major improvements in drainage or forest clearance in the intervening millennium, the drove roads show the possibilities for wheel-less traffic, on two or four legs: the traffic which, at the time of Dundurn, would have been represented by hostings and reivings, as well as by hunting and other peaceful social occasions.



ILLUS 5 View of Dundurn looking east down Strathearn

Down-valley links are obvious enough; but it also needs stressing that Dundurn stands at the point where a number of routes through the southern Highlands, from both the Clyde Valley and Argyll, debouch from the mountains and approach the fertile plains of southern Pictland (illus 1). Hostile forces could have come from the Dalriadic stronghold of Dunollie through the pass of Brander; from Dunadd by the head of Loch Fyne; and from the Strathclyde stronghold of Dumbarton along Loch Lomond (Scott 1951). All these routes converge in Strathfillan, and thence by Glen Ogle to Loch Earnside. That such routes had been exploited as much as three and a half millennia before the occupation of Dundurn is shown by the occurrence of an isolated group of three or more Neolithic tombs of Clyde type between the Earn and the Tummel. One of them, Kindrochat (illus 1, B 3), is less than 2 km east of Dundurn itself (Henshall 1972).

This evidence for ancient links with the south-west, and the high probability of communication with that quarter, are of importance when we consider the national affiliations of Dundurn. It has always been regarded as a Pictish stronghold, but there is nothing distinctive among the artefacts found there to support this attribution. In fact, it stands removed from the main area of Pictish culture. The nearest class I and class II Pictish stones are respectively 25 and 23 km distant to the east, and the next nearest respectively 45 km and a small cluster centred on 42 km. In Pictish terms, Dundurn would have to be seen as a frontier outpost; and once that is conceded, it is impossible to demonstrate that it was an outpost of Pictland rather than of Dalriada or more probably Strathclyde. Indeed, given the fluctuations of war and politics that we dimly discern among the Britons, the Picts and the Scots, Dundurn may have served each of the three nations at various times.

However that may be, a small military force – a thane and his warband – resident in Dundurn would be in a very strong position to inhibit the lifting of cattle from the rich lands to the east; and

even, if such a concept is not totally anachronistic, to levy tolls on any traffic making use of the passes leading through the southern Highlands to upper Strathearn.

For the local environment at the time of the occupation of Dundurn we have some evidence from pollen grains and macroscopic plant fossils, preserved in waterlogged deposits on the upper terrace (Cutting 100/400, layer 426). These suggest that the hill was less wooded than today, but with alder and hazel more prominent; oak was also present, but in general there was much meadow-land, and patches of bracken and scrub. Plants of woodland, meadow and riverside environments were all exploited, including wild cherry, raspberry and hazelnut (Brough 1980; Dickson & Brough forthcoming).

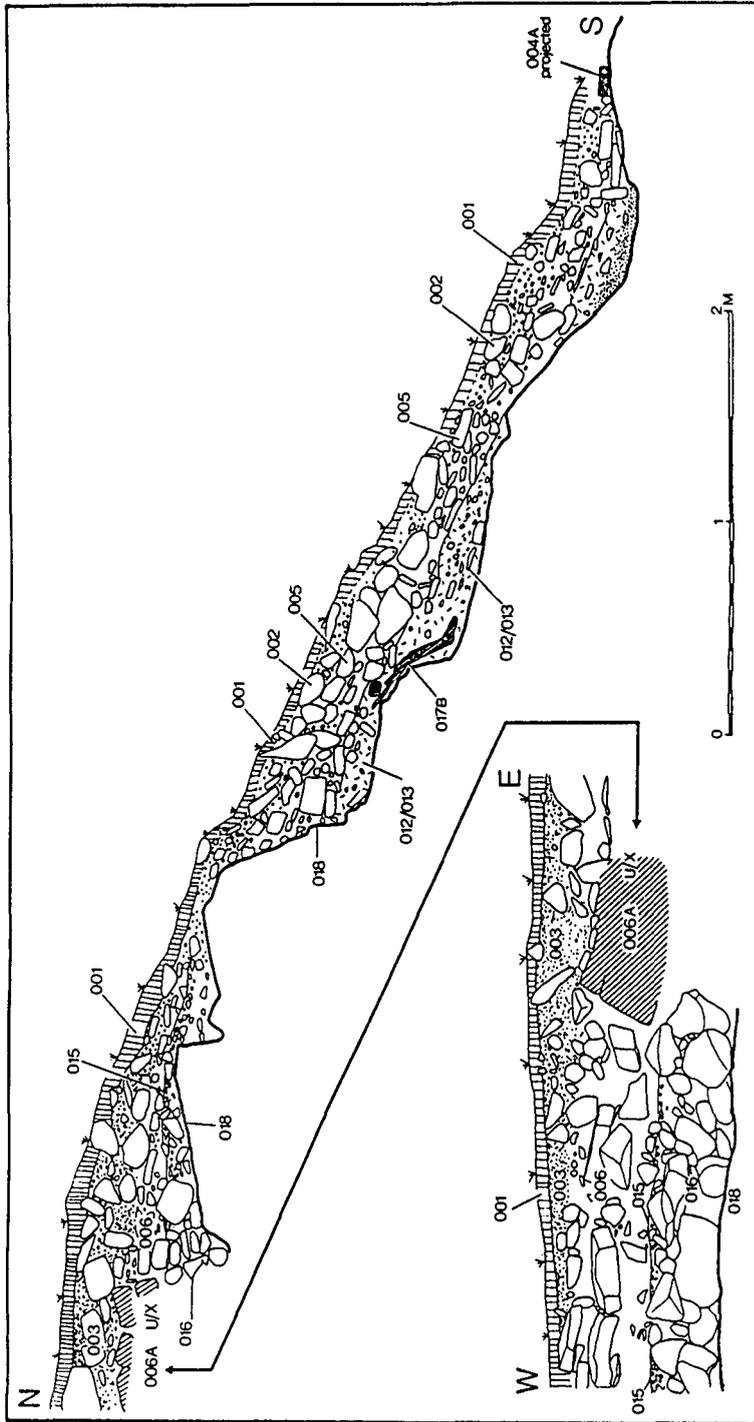
Finally, in this account of the geographical setting of Dundurn, we should notice that on the valley floor, some 500 m north-west of the fort itself, lies a graveyard whose wall overlies a very ruinous embanked enclosure of oval plan. This may mark the site of an ecclesiastical enclosure contemporary with the occupation of Dundurn itself (illus 1).

STRUCTURES AND SEQUENCE

Seen from the north, Dundurn appears as a massive boss of rock rising out of scatters of scree, with an earthwork enclosure at its north-west corner; beyond this, a further bank slopes down to the west. All these are well seen in Christison's engravings (1898, figs 76 & 77; illus 2 here). As the visitor approaches and climbs the hill, it becomes evident that the sloping bank, roughly revetted with large stone blocks, forms the lower side of a hollow-way. This is narrowed by rough pillars just as it enters the north-west earthwork enclosure. It is not certain whether this enclosure, together with five or more cultivation terraces to its south, belongs to early medieval Dundurn, or marks an uphill extension of pre-improvement cultivation, perhaps in the later 18th century. The earth and stone bank can certainly be matched on some trackways of that date. On the other hand, the continuation of the bank to the east integrates it with the main rubble-walled fort; the hollow-way has been seen as a processional entrance appropriate to a royal stronghold, and the cultivation terraces would not be out of place in the seventh–ninth centuries AD (Graham 1939). The earlier, rather than the later, dating, is therefore to be preferred. Unfortunately, a section cut across the western bank of the earthwork enclosure (Cutting 500) yielded no dating evidence to settle this point.

On closer examination of the scree-litter, it becomes evident that it cannot have been a scree formed *in situ* by the weathering of the mica-schist boss. In fact, it contains large numbers of rolled water-worn boulders, and even blocks of sandstone foreign to the hill. All of these must have been carried laboriously up from the valley-bottom, or in the case of the sandstone, from some distance away, in order to construct some artificial work. It is then seen that the spreads of stone are not haphazard, but surround natural terraces on the north, east and south of the summit boss. Despite intensive searching, no continuous wall faces can be found amid the scree; but it must none the less be regarded as collapse from rubble banks which had originally enclosed the terraces. Finally, on the summit boss itself, sufficient rubble can be seen poking through the turf to confirm that the summit itself had been enclosed.

The plan of Dundurn in its final phase, then, was of a roughly oval, walled citadel, with one high terrace and four lower ones enclosed by rubble ramparts, falling to an earthen enclosure and processional way on the north-west. During survey work in 1988–89, a team from the Royal Commission on the Ancient and Historical Monuments of Scotland discovered a further enclosure, marked by a rubble rampart, at the north-east corner of the hill (illus 3). Although the terrace walls do not physically link with the citadel, this plan conforms sufficiently to Stevenson's 1949 definition of a nuclear fort for him to have included Dundurn as a classic example of the type.



ILLUS 6 Cutting 000, the citadel: east and north faces

Four other minor features must be added to this basic description. (1) At the western tip of the upper terrace, a shallow rock basin, partly enclosed by dry-stone walling, is known as St Fillan's Well: Cutting 600 explored this, but produced no evidence that it was of any great antiquity. (2) At the time of the excavation, roughly built walling marked the last remains of an apparent stairway up the south face of the citadel: it has now been totally lost. (3) At several points grooves have been quarried in the rock, probably to hold horizontal timbers: notably at the edge of the upper terrace (illus 3, 301), where they are thought to be bedding slots for the phase 1 palisade; and on spurs running out from the summit boss, where they are attributed to the phase 2B citadel. (4) Finally, at the highest, western tip of the summit boss, a wide ledge has been laboriously sculpted from the living rock. This may likewise have been done to ease timbered defences round an awkward projection. On the other hand, the effect is that of a rock seat; it is traditionally known as St Fillan's Chair; and given that the eminence is widely visible from the valley floor, it is not fanciful to suggest that we have here an inauguration seat for the rulers of Strathearn.

These, then, are the visible remains of Stevenson's nuclear fort and Dark-Age capital. The excavations of 1976–77 concentrated on examining the defences of the summit boss, the supposed citadel (Cutting 000; illus 6), the upper terrace (Cutting 100/400; illus 7), and the lower earthwork enclosure (Cutting 500, already mentioned). In addition, Cutting 200 demonstrated the existence of occupation deposits towards the north-east end of the upper terrace; and Cutting 600 examined St Fillan's Well. Cuttings 000 and 100/400 demonstrated that there had been a complicated sequence of defensive structures, of both timber and stone. However complicated that sequence is in detail, and however fragmentary the evidence, we may none the less determine three major phases (illus 10) in the occupation and fortification of Dundurn, on the basis of two clearly-marked Horizon Events in the stratification of Cutting 100/400. Further significant structural events mark subdivisions of Phases 2 and 3 (table 1).

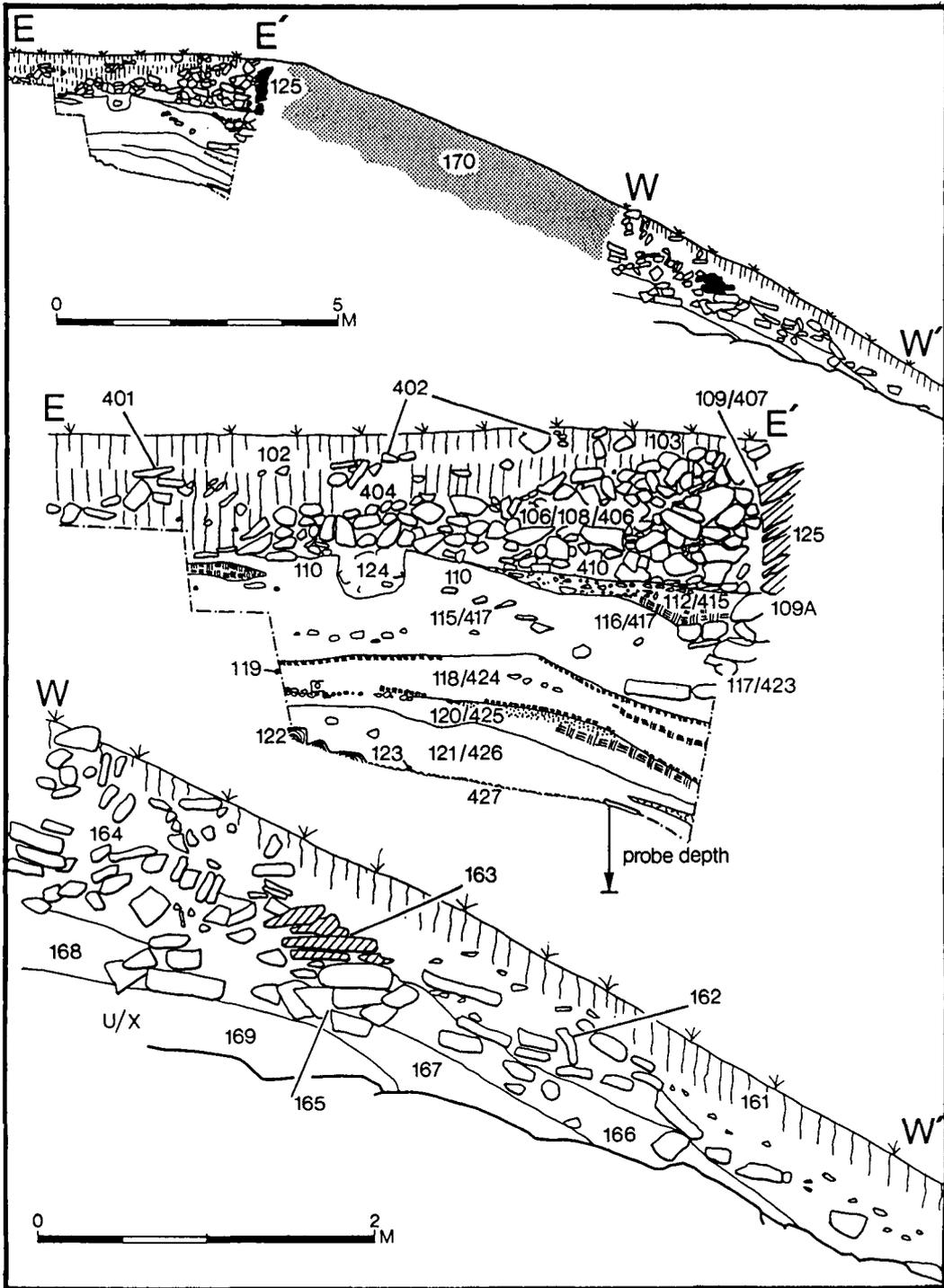
In what follows, when it is necessary to refer to major features and contexts, they are designated by 3-digit numbers, the first digit indicating the cutting in which the feature occurred.

TABLE 1

Major structural events and phases

Phase	Feature Nos	Structural Events	C14 dates AD	Remarks
3B	106/108/406	Reinforcement of Terrace Wall	640–910 630–900 590–850	Derived from earlier features
3A	005 109/407/125/170/163	Rebuilding of Citadel Defence Building of Terrace Wall		
HE 2	112/415	Destruction of Citadel 1	580–780	Derived
2B	417 012/013	Continued activity on Terrace Building of Citadel 1	640–910 615–885 600–865	Hazel twigs Hazel twigs Oak beams
2A	424/425/426	Activity on Terrace		
HE 1	122 123	Demolition of Palisade 1 Laying of wattle floor	570–760 410–615	Hazel twigs
1	427 (122)	Midden behind Palisade 1 Palisade 1	460–645 578–623	Animal bones High precision wiggle-matched

Notes: 1. C14 dates AD calibrated after Klein *et al* 1982
2. HE=Horizon Event

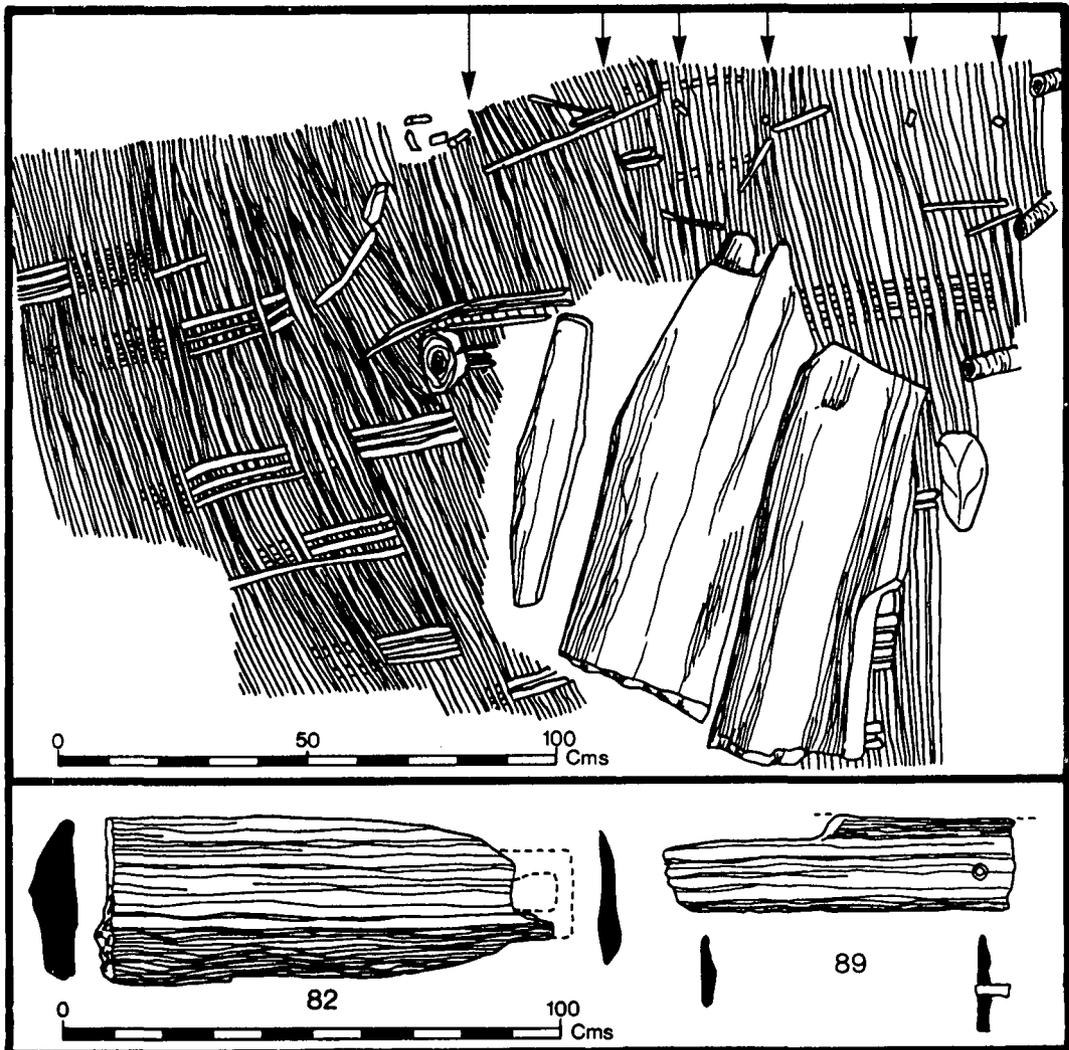


ILLUS 7 Cutting 100/400, the upper terrace and terrace wall: south face

PHASE 1

Dundurn 1 saw the upper terrace defended with a stout timber stockade. The existence of this is inferred in part from the build-up of midden material (427) to a depth of at least 0.5 m at the head of the slope in Cutting 100/400, the implication being that some obstacle prevented discarded animal bones and other refuse from sliding down the hill-side. Direct evidence for this obstacle lies buried under the later terrace wall.

Its character may be inferred, however, from timbers which lay discarded on a wattle floor which marks the phase 1/phase 2 interface (illus 7, 123; illus 8). These included a stout oak post (cat no 82), 330 mm wide by 95 mm thick, and a number of radially-split planks, mostly 225–120 mm wide by 35–25 mm thick. Some of these planks had holes which still contained wooden pegs (eg cat no 89),



ILLUS 8 Upper: the wattle floor, 123, and overlying timbers. 122: arrows indicate vertical stakes. Lower: timber beam, cat no 82, and plank with peg, cat no 89

while the upper end of the stout post had a large rectangular hole intended to form a crude joint. From this it appears that the palisade had been fixed together by means of rather rough woodwork joints, such as have been preserved by water-logging, for instance at the palisaded fort of Behren-Lübchin, Mecklenburg (Schuldt 1962). Certainly there was no evidence for iron nails as opposed to wooden pegs. It seems likely that the uprights of the stockade were set in horizontal beams at least 300 mm wide, which themselves were bedded in rock-cut grooves wherever they crossed outcropping ribs of rock along the edge of the upper terrace (Plan, *illus* 3, 301).

The construction of the palisade is dated by a high precision wigggle-matched radiocarbon date of 608 AD + 15 – 30, ie 578 – 623 AD. Animal bones from the midden below the wattle also give a radiocarbon age-estimate:

GU 1043 1435 ± 65 bp AD 460–645.

(The calibration here, and throughout this paper, is quoted at the 95% probability level, using the calibration tables of Klein *et al* 1982, for reasons set out in Alcock *et al* 1986, 260–1).

PHASE 2A

Dundurn 2A began with the dismantling or repair of the phase 1 palisade. It is marked in the stratigraphy of Cutting 100/400 by Horizon Event 1: the laying down of a wattle floor (*illus* 8, 123), which was pegged down, presumably to stop it sliding downhill. Two radiocarbon age-estimates have been obtained from hazel wattle-work:

GU 1042 1510 ± 60 bp AD 410–615
HAR 2519 1390 ± 60 bp AD 570–760.

These dates are statistically compatible with those already quoted for the phase 1 stockade and midden.

As has already been mentioned, a post (cat no 82) from the palisade was found lying on the wattle floor, and it is from this that we infer that the palisade had been dismantled, or at least repaired. If the former, then we have no evidence that the terrace was defended in phase 2; if the latter, then it would seem that the palisade defences were being properly maintained.

PHASE 2B

Dundurn 2B saw the first timber-and-stone fortification of the summit boss, and the creation, thereby, of Citadel 1 at Dundurn. The reason for placing the first citadel as late as phase 2B is that charcoal samples from its construction provided material for three radiocarbon age-estimates which are later than those from the wattle floor:

HAR 2000 hazel twigs 1190 ± 70 bp AD 640–910
HAR 2001 hazel twigs 1260 ± 70 bp AD 615–885
HAR 2002 oak beams 1310 ± 70 bp AD 600–865.

It is a matter of interest to consider how these age-estimates for the building of the first citadel relate to the recorded siege of AD 683. Statistically-speaking, the main weight of all three is later than that date, and this might lead to the conclusion that the citadel was first fortified after the siege, not before it. When, however, we bear in mind the dictum that

‘it is normally beyond the scope of radiocarbon dating to define absolute archaeological time-scales to better than within several centuries’ (Campbell *et al* 1979, 37),

we may conclude that the C14 age-estimates do not allow us to decide this issue. The balance of

historical probability is that it was indeed Dundurn 2B, with its fortified citadel which was the object of the siege in AD 683.

The first citadel defence had been burned, and the remains had then been dragged down across the upper terrace, thereby creating the stratigraphic link, Horizon Event 2 (illus 7, 110, 112/415). Despite this comprehensive destruction, there was enough evidence for the method of construction to be deduced. This evidence consisted of small rubble and soil, often heat-affected, from the core of a rampart (illus 6, 012/013); charred oak beams (eg 017A, 017B), some of them over 200 mm scantling; hazel twigs, probably from wattlework; and iron nails, of which over 100 were found in Cutting 000. These ranged in length from, exceptionally, 170 mm to 40 mm, the majority being 120–95 mm long (illus 15). They were thus significantly shorter than the iron ‘bolts’ which had ‘riveted together . . . the oak planks and logs’ of the timber-laced fort at Burghead. These were described as ‘rotten’, but despite this, a length of 200 mm and a breadth of 25 mm was estimated for them (Young 1891). It is evident that, in some details of its construction, the nailed-timbered rampart of Dundurn 2B differed from that at Burghead.

None the less, the combination at Burghead of logs apparently 150–230 mm square with hewn planks 50–80 mm thick by 250–300 mm wide gives a hint that the majority of Dundurn nails, those in the 95–120 mm range, could well have been used to fasten planks to oak beams 200 mm square like 017A. (Parenthetically, it is not easy to see how bolts only 200 mm long could have fastened beams up to 230 mm thick like those at Burghead.) On the Burghead pattern, in so far as it can be deduced from Young’s report, supplemented by Small’s observations (1969), the Dundurn beams and planks, nailed at right angles to one another, and perhaps infilled with wickerwork, would have been laid horizontally between layers of sand and rubble. The one thing lacking at Dundurn to complete the analogy with Burghead is the large squared blocks which provided the front and rear revetments at the latter fort. At Dundurn, the rampart backed on to the quarried scarp of the summit boss, so no rear revetment was needed. Large stones from the front face could well have been salvaged to be used in building the rampart of phase 3 which followed on the destruction.

The front of the rampart had been based on horizontal beams, set in rock-cut grooves where they crossed spines of rock (eg 004; 301); the rear was tied back into slots cut in the solid rock of the summit. Its overall width was 3.5 to 4 m, and it rose to a height of at least 2 m. It is possible that it then ran back level to the interior, perhaps with a wicker breastwork at its outer edge. Its overall plan and dimensions can be established on the basis of slight traces of stonework around the summit boss: an irregular oval, about 25 by 18 m internally.

So far this account of Dundurn 2 has concentrated on its defensive aspects. In Cutting 100/400, however, a stratified series of middens and floors suggested intense activity, both domestic and industrial, on the upper terrace in phases 2A and 2B (illus 7). On the wattle floor itself (123) stood a stone-slab water tank (428). This was overlain by a mass of vegetable matter, especially bracken, moss and wood chippings, with a slight admixture of human faeces, including a clump of 24 cherry stones (426). All this had probably been cleared-out from nearby (but undiscovered) buildings, where it had served as flooring or bedding (Dickson & Brough forthcoming). Over this, clay and sand lenses may represent discontinuous floors, or intermittent attempts to seal the midden (120/425, 118/424). Above these again (in 115/417), fragments of stone walls, floors and postholes all indicated the presence of structures, though no plans could be established.

On the more or less level area of the summit boss excavation was deliberately restricted, so as not to prejudice any future research by destroying stratification or structures. Consequently we have only tantalizing glimpses of possible structures in the interior of the citadel. In phase 2B the only evidence is a possible posthole linked to the beam slot 011, which in turn is considered to tie in to the timbered wall. The beam had certainly been burned, most probably when the 2B defence was

destroyed. This, in fact, provides the only link between structures in the interior of the citadel and the defences. The posthole itself suggests a timber building immediately behind the defensive wall; but given the limited extent of excavation, this suggestion carries little weight.

PHASE 3A

Dundurn 3A began with the burning of the nailed-timbered defence of Citadel 1. The charred and heat-affected remains, including some nails, were then dragged-down from the summit boss and across the upper terrace, occurring in Cutting 100 (112/415) and also Cutting 200. This material provides the only stratigraphic link between the defences of the citadel and those of the terrace: Horizon Event 2. On top of this destruction layer, new defences were raised around both the terrace and the summit boss.

In Cutting 000, the phase 3A defence immediately overlay the ruins of phase 2B, and it is reasonable to believe that it followed the same oval plan. Its major component was rubble (005), considerably more massive than that used for the 2B citadel. A few stones of the front revetment were still in position (eg 004), and they show that the overall width was again about 4.0 m. Intermittent lines of stones running through the rubble core parallel to the revetment hint that timber played some part in the make-up of this rampart; but because the phase 3A work was not fired, thereby preserving some of its supposed timbers as charcoal, it is by no means certain that there was any timber reinforcement. If there was, then iron nails were not used in its construction.

On the summit boss, the horizontal beam slot (011) related to the phase 2B timbered defence was overlaid by two periods of metallated path or yard, separated by sandstone blocks (illus 6). The earlier phase was of gravel and small stones (015) upon a pitched foundation (016). Lying upon this were jumbled sandstone slabs (006), which may have collapsed from a drystone building, of which only a corner lay within the trench (006A). These were then tidied over with another metallated surface on a foundation of boulders (003). Despite the difficulty of correlating these structural periods with the phases of the defences, it may tentatively be suggested that the sandstone building was contemporary with the phase 3A citadel.

The sandstone slabs themselves deserve further consideration. Some of them bore traces of mortar containing red tile aggregate, as did a cut block of tufa. The mortar is almost certainly Roman, and it is likely therefore that both the sandstone and the tufa had been robbed from a nearby Roman fort, either at Dalginross or Strageath.

Below the citadel, around the edge of the upper terrace, Dundurn 3A saw the erection of a massive rubble rampart, which made only doubtful use of timbering, and none at all of nails. At the rear, seven or eight courses (illus 7, 109/407) were still standing to a height of 0.80–0.90 m. They were in an irregular and indeed half-collapsed condition; and the occurrence of horizontal gaps in the wall-face suggest that this may have been caused by the decay of horizontal timber beams (illus 9). On the other hand, it may have been the result of poor masonry techniques, or even subsidence. It is true that the rear face was founded on large pitched boulders (109A) to a depth of half a metre; but below these (though the builders could not have known this) was a further metre and a half or more of damp, unconsolidated made ground.

The core of the rampart was an unconsolidated scree, largely of rounded boulders (illus 7, 125/170), lying just at the angle of rest, and hence dangerously unstable to excavate. The front revetment appeared to have been of sandstone slabs (163), founded like the rear on pitched boulders (165). These, however, had not been based on solid rock, but were merely dug into the soil of the hill (166/167/168). Given inadequate foundations, an angle of slope of about 20° from the horizontal, the lubricating effect of rain-water percolating through the rubble and down the slope, and the great weight of the rampart, it is not surprising that the front revetment had slid forward and collapsed.



ILLUS 9 Rear face of the terrace rampart, phase 3A

Despite this, it was possible to estimate the original width of the upper terrace wall as 8.0 m, and the minimum height of the front revetment as 4.0 m. It seems probable that the screens which bound the lower terraces of Dundurn mark the collapse of ramparts of similar large dimensions: in other words, that they had also been walled, thereby producing the classic nuclear-fort plan of Dundurn 3.

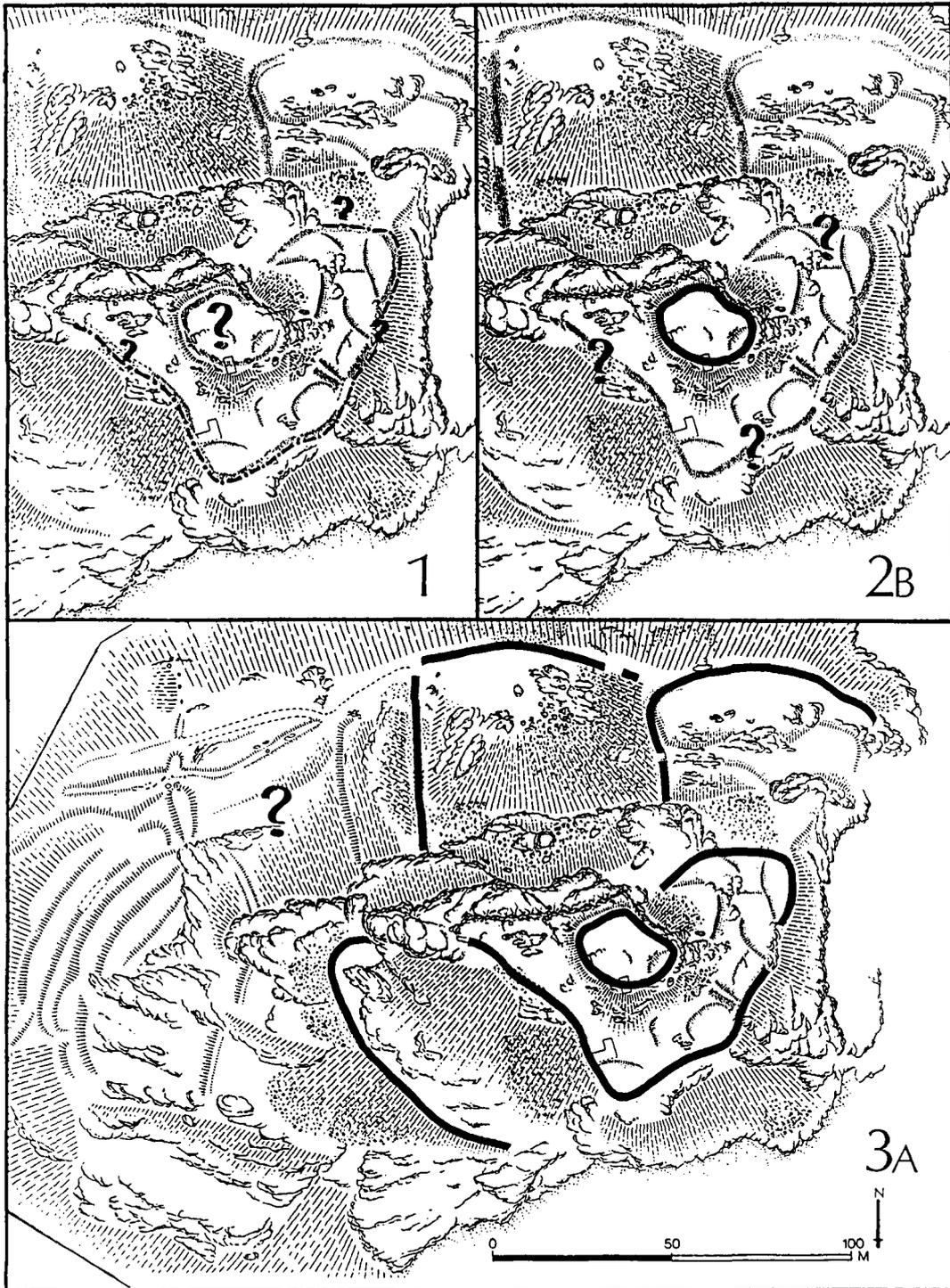
PHASE 3B

Dundurn 3B is a quite minor phase, represented only in Cutting 100/400. Some time after the building of the upper terrace wall, a solid wedge of boulders was packed against its inner face, as a reinforcement (illus 7, 106/108/406), presumably because it was already beginning to collapse.

Dundurn 3 is demonstrably later than the destruction of the phase 2B nailed-and-timbered citadel defence, because the debris from the burning of the latter underlies the terrace wall. No closer dating is available, however, because the radiocarbon age-estimates, which might have provided earliest-possible dates for the 3A terrace wall and the 3B reinforcement, are no younger than the dates from the beams and wicker-work of the 2B defence work. In other words, the charcoal from the later structures must all be derived from phase 2B.

Nor is any date available for the north-western earthwork enclosure and its associated entrance passage. Cutting 500 across the western bank and ditch suggested that there were two periods of construction, but these yielded neither artefactual nor radiometric dates. This is also true of the so-called St Fillan's Well, at the western tip of the upper terrace. Cutting 600 showed that here a natural hollow in the rock, which collected rainwater and seepage, had been walled round on two occasions; but neither could be dated.

To summarize the defence-sequence (illus 10; table 1): In *Dundurn 1*, around the beginning of the seventh century AD, the upper terrace of Dundurn was defended with a stout stockade, which may have enclosed a roughly triangular area, about 90 m along its longest side, which was based for part of its length on the northern precipice of the hill. Later in the century, in *Dundurn 2A*, the palisade was



ILLUS 10 The three main phases in the defences

repaired or even dismantled, and the activities carried out behind it were diversified. *Dundurn 2B* saw the fortification, for the first time, of the summit boss as a citadel with a nailed, timbered construction: radiometric age-estimates indicate that this did not occur until late in the seventh, or perhaps even into the eighth century. Historical probability suggests, however, that it was built before the annal-dated siege of AD 683. This phase ended with the burning and destruction of the citadel defence. In *Dundurn 3A*, the citadel was refortified, and an imposing rampart was built around the upper terrace, and presumably around the other terraces as well. *Dundurn 3B* saw a minor reinforcement of the terrace rampart.

From this it appears that it was no earlier than phase 3, perhaps as late as the eighth century, that Dundurn assumed the character of a classic nuclear fort. It is to the classificatory and functional problems of such forts that we now turn.

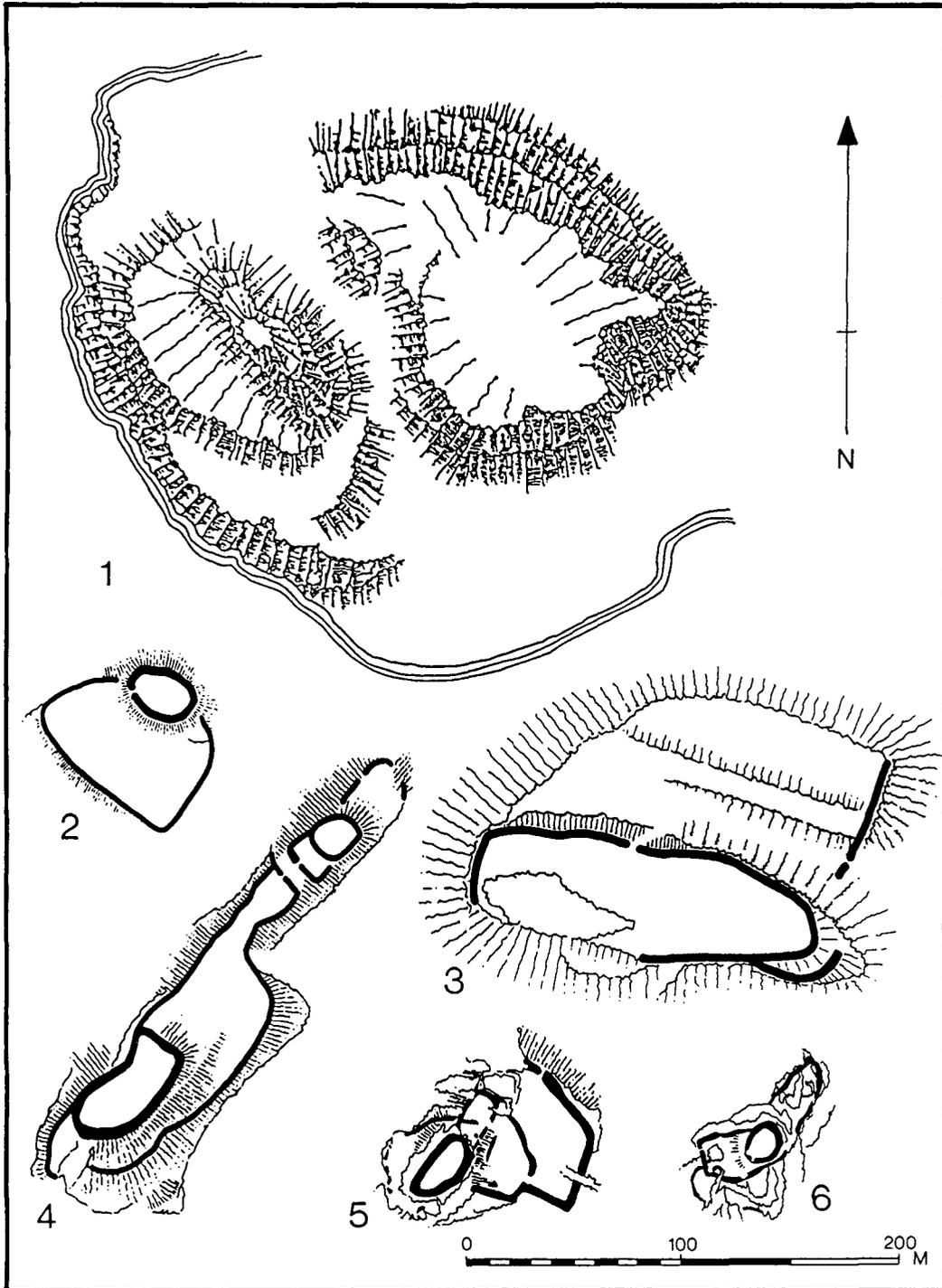
THE PROBLEM OF NUCLEAR FORTS (illus 11–13)

The concept of the nuclear fort as a definite and major type of Dark-Age monument was first set out 40 years ago by Stevenson (1949) in an article which has guided thinking on the topic ever since. The essentials of the type, as expounded initially at Dalmahoy, were: a massive fortification, forming a citadel, on the summit of a craggy hill, with a number of enclosures looping out from it, their shape being governed by the levels and crags of the hill; the whole being a single work of unitary design, fitted to a deliberately chosen site.

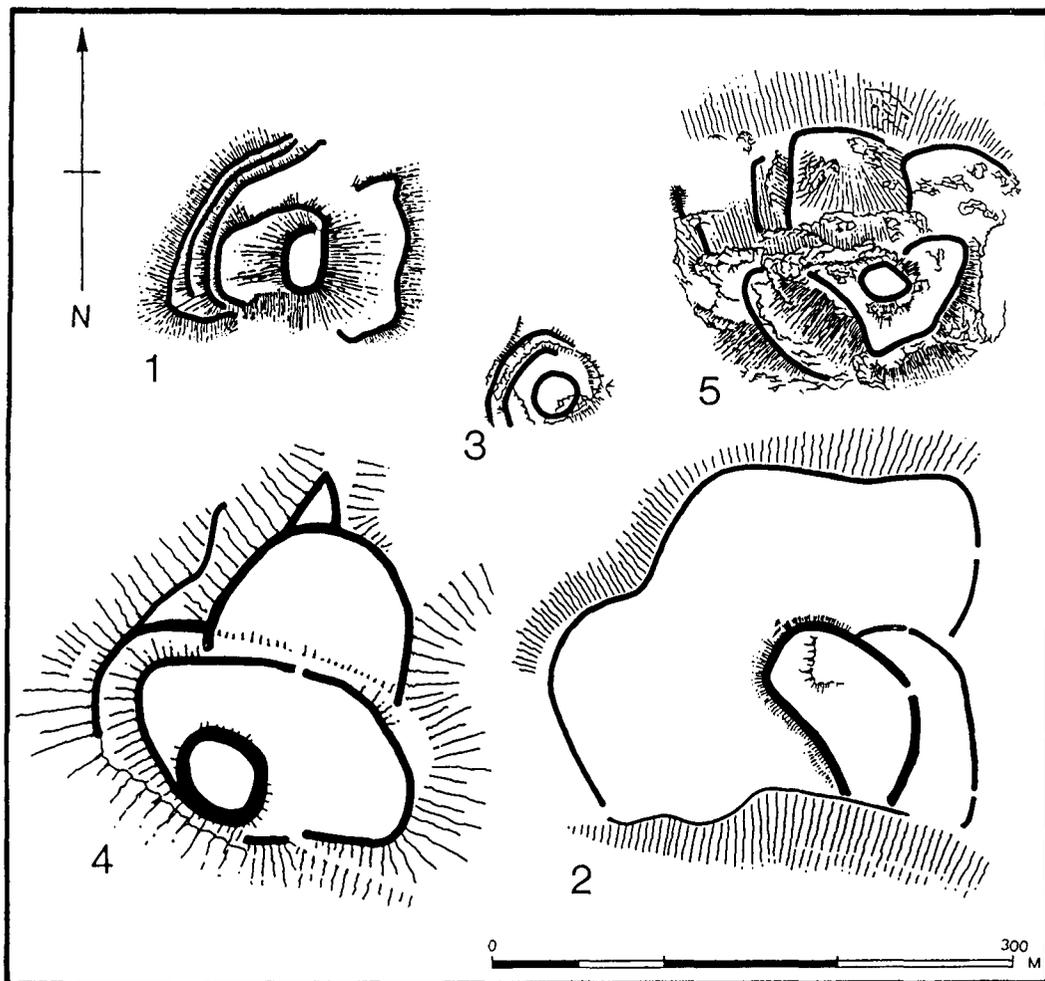
In addition to Dalmahoy, Stevenson cited Dunadd (illus 11, 5), Dundurn (illus 12, 5) and Ruberslaw; also Dumbarton (Alt Clut) (illus 11, 1), partly because of the 'isolated and craggy hill . . . to which the nuclear pattern of fortification was above all adapted'; Dunollie, following a suggestion of WD Simpson; and Edinburgh Castle Rock, 'another ideal site for a nuclear fort'. (Strangely, in view of the defences which he himself had recorded there (Stevenson 1947), he did not point also to Arthur's Seat). A Dark-Age date was demonstrated by historical references to Dumbarton, Dunadd, Dundurn, and Dunollie, as well as by artefactual evidence from Dunadd, and more dubiously from Dalmahoy. Ruberslaw was shown to be late Roman at the earliest by the incorporation of Roman dressed stones in its ramparts.

This date-range enabled Stevenson to speculate about the socio-political aspects of these forts, and to contrast the *oppida* of the pre-Roman Iron Age with these citadels of 'the proto-feudal world in which chiefs or kings of various degrees each with their retainers dominate the pattern of society'. The retainers would include the royal bodyguard and household servants, as well as craft-specialists such as bards and skilled workers of iron, bronze, jet and glass. In military terms, the forts 'were strongholds where dependants could gather when the main forces were away', and into which cattle could be driven in the event of raids.

The concept of the nuclear fort as a Dark-Age capital was endorsed and extended, especially in relation to the Picts, by Feachem (1955, publishing papers from a Summer School in 1952). He saw Dunadd and Dundurn as representing a late, and indeed final, development of the type. To the class as such, he added Moredun, Moncreiffe Hill (illus 12, 4; Feachem 1955, 80), where a citadel and a large outer court had been added to a pre-existing contour fort, in such a way that the original fort wall ran out from under the citadel wall. In contrast to the nuclear forts, where the citadel and outer enclosures were fully integrated, even if only in a secondary phase, Feachem also pointed to forts where strong ring-forts overlay outer works which were demonstrably earlier as at Turin Hill or Dunearn; or were free-standing within substantial contemporary outworks as he thought was the case at Dumyat. Even when the outworks were earlier, perhaps by some centuries, than the ringwork-citadel, the later builders had the advantage not only of a ready supply of stone, but 'perhaps more



ILLUS 11 Comparative plans of forts, western Scotland. 1, Dumbarton-Alt Cluì, 2, Cnoc nan Sroine. 3, Dunmore, Fintry, 4, Dun Mac Sniachan, 5, Dunadd, 6, Dun a Chrannag



ILLUS 12 Comparative plans of forts, eastern Scotland and Northumbria. 1, King's Seat, Dunkeld, 2, Humbleton Heugh, 3, Castle Craig, Tillicoultry, 4, Moredun, Moncreiffe Hill, 5, Dundurn phase 3

important, of existing lines of walling or ramparts fit to be used as enclosures or defences'. In brief, he saw the primary fort and secondary citadel as forming a unitary work in the later phase.

Concurrently, writing as an investigator of the Scottish Royal Commission on Ancient Monuments in its *Roxburghshire Inventory* (1956), Feachem inferred a Dark-Age date for no less than 10 forts 'because they are analogous in design or construction to known Dark Age sites in other areas'. The analogies were, in some cases, with nuclear forts, and in others with his wider class of citadel forts. In subsequent *Inventories*, however, such as *Stirlingshire* (1963) and *Peeblesshire* (1967), both classes disappear; and contrary to Feachem's earlier views, the unitary character of the citadels and enclosing works at Dumyat and Dunearn is expressly negated.

The reasons for this reversal of his previous interpretation were set out by Feachem in 1966 (but based on a conference in 1961). He now saw the 'citadels' as 'defensive enclosures', possibly centres of administration or overlordship 'which had developed after the days of hill-forts and *oppida* were over'. About half of the 'citadels' were set in larger hillforts or minor *oppida*, suggesting that 'the

status of the earlier works was being sought for the later'. Despite this, the larger fortifications 'were not being kept up after the "citadels" were built, so that the term "citadel" does not strictly apply'. Finally, he has this sweeping comment on Dunadd and Dundurn: 'the overwhelming probability must be that both are basically Early Iron Age hill-forts, re-used – perhaps sporadically – and possibly repaired or improved by indiscriminating or desperate persons until as late as the seventh century AD'.

Feachem's 1966 views on Dunadd and Dundurn can be decisively rejected on the basis of recent excavations. At Dunadd, the second major phase of the citadel overlies a sherd of E-ware which can hardly be earlier than the late sixth century AD. This would indicate a probable construction date in the seventh century or later. The first major phase, a roughly oval hill-top dun, seems unlikely to be earlier than the sixth century. At Dundurn, as we have seen, the earliest known defence was a palisade, dated 608 + 15 – 30 AD; none of the other defences is likely to be earlier than the late seventh century.

As for the erstwhile 'citadel' forts, the relationship between a 'defensive enclosure' and its outworks needs to be examined with care in each individual case. At Cnoc nan Sroine, Mull (illus 11,2), a citadel equal in size to that at Dunadd is linked to an outer enclosure likewise as large as that at Dunadd: the *Inventory* (RCAMS 1980) states that this is 'likely to represent the remains of a contemporary outwork'. At Clatchard Craig (Close-Brooks 1986), radiocarbon dates show that the inner 'defensive enclosure' is coeval with three outer lines. In these two examples, therefore, the 'defensive enclosure' and its outworks are certainly or probably of the same date. Another 'citadel' fort originally proposed by Feachem, but subsequently withdrawn, is that on Humbleton Heugh (illus 12,2) (Jobey 1965, 35, with n 33 for Feachem's original attribution). There, a larger, more lightly defended enclosure appears to have been added to a strong citadel and annexe. Although Jobey saw 'no compelling reason to regard it as a post-Roman structure', it is worth noting that the profile of the hill itself gives emphasis to the citadel: a criterion to which we shall return.

In other cases, in contrast to Humbleton Heugh, it can be shown that it is the 'citadel' which is later than the enclosure, and that the latter was already dilapidated when the 'citadel' was built, perhaps even using material quarried from the earlier defences. But even in these cases, Driscoll has argued with reason (1987) that the outer works could still have been functional in some respects; 'we should include all the structural features as belonging to a single plan' in the ultimate phase of the site. He has developed this point especially in terms of the interpretation of Moredun, Moncreiffe Hill (illus 12, 4), thereby, in effect, re-establishing Feachem's original position.

From the superficial evidence of site plans, a case could even be made for extending, rather than contracting, the list of nuclear forts. In an early medieval context, where the concept of a 'capital' is inappropriate, we should be looking in any one kingdom for a number of royal strongholds, among which the king would have made periodic circuits or progresses. Among these, there would be one or more principal strongholds: Dunadd and perhaps Dunollie in Dal Riata, for instance. But below this level, there may have been a ranked series of lesser, but still royal, strongholds, some of which might appear today as minor nuclear forts. In the east, King's Seat, Dunkeld (illus 12,1) would be a medium-sized example (Feachem's plan (1966, fig 11) does less than justice to the defences); and Castle Craig, Tillicoultry (illus 12, 3 after Feachem 1955, 73) might be a small one. In the west we should look for them among duns with outworks, some of which loop out from the citadel-dun in a manner wholly reminiscent of a classic nuclear fort: Dun a Chrannag (illus 11, 6), Dun a' Choin Dhuibh, and Dun Chonallaich, all in Mid-Argyll, would be excellent examples (RCAMS 1988, nos 266, 296 & 250). Outwith Argyll, Castle Haven, Borgue, Kirkcudbright is a dun with a walled outer court around three sides, which has produced a penannular brooch, spiral finger-rings and a glass bead; as a group, these are likely to date to the sixth to eighth centuries AD.

To the evidence of plans, we can now add that from the excavation of four of the sites in Stevenson's classic list of 1949. At Dunollie, it is difficult to see on the ground what Simpson might have taken as traces of a nuclear fort. Excavation has, indeed, demonstrated the presence, in the site's second phase, of a stone rampart around the northern and eastern sides of a precipitous stack. This may have enclosed an earlier dun, located on the highest point of the stack, thus creating a rather large dun-and-outwork plan; but no trace of the dun has survived the building of a late medieval tower-house on the site (Alcock & Alcock 1987).

At Dundurn, as we have seen, the nuclear fort was the product of a long period of growth. Throughout phases 1 and 2, the summit boss and at least the upper terrace were utilized; and from an early period, the terrace itself was enclosed by a timber stockade. It was only in phase 2B, however, that the nailed-timbered citadel-dun was built; and even later, in Dundurn 3 that the marriage of topography and defence plan came about to produce a classic nuclear fort (illus 12, 5). A long development seems also to have been the case with the nuclear fort at Dunadd. From an original defence around the summit alone, Dunadd is believed to have expanded in stages over the natural terraces of the hill. In other words, at both Dunadd and Dundurn, the defence plan was not fully conceived to fit the hill from the start: instead, it grew to fit it progressively. This negates what seems to have been Stevenson's original concept, that a nuclear fort had a unitary plan from its inception, and that its location was chosen to accommodate that plan.

The case of Alt Clut is also instructive, for here the banks and ditches, which had suggested the presence of a citadel and outworks, were shown by excavation to have been of various dates, none earlier than the 13th century AD. Indeed the only trace of early defences, in an admittedly restricted excavation, was a fighting platform overlooking the isthmus which linked Castle Rock to the mainland. Apart from this, Bede's *civitas Brettonum munitissima*, the 'very strongly defended political centre of the Britons' appeared to have relied on crags and water for its protection. This observation led Alcock (1981) to write in denigratory terms of Alt Clut's character as a *civitas*.

A more mature view (Alcock 1988) would compare favourably the total area of the level terraces among the crags at Dumbarton with that at Dunadd or Dundurn (illus 11). Moreover, all these sites demonstrate the practice of building a major stronghold on a hill which has a dominant rock boss surrounded by level terraces: the topography of the classic nuclear fort. Such a topography lends itself to a strongly hierarchical organization of the interior space. Alt Clut, with its flattish eastern summit, its level central gap, and its lower terraces (which may have been defended by ramparts that are no longer visible) is clearly well adapted to such a ranked internal organization. It is perhaps in this that we should see the material realization of the barbarian concept of a *civitas*.

What links these three major Celtic strongholds of the early middle ages is not the plans of their defences, but the stepped topography of the hills on which they were set. The hill was primary, the defences secondary, and the close relationship of hill and defences was something which evolved with time. The particular significance of the shape of the hill was that it lent itself to a hierarchical organization of space. This hierarchical organization can obviously be emphasized by banks, walls or palisades newly built for that purpose. But as Feachem originally – and surely correctly – perceived, and as Driscoll has stressed in relation to Moncreiffe Hill (1987), it can also be reinforced by incorporating a central strongpoint within earlier walls. Whether or not those walls were still defensible – and the slightest obstacle is defensible in necessity – they marked out the boundaries of enclosures, they made the approach to the citadel more impressive, and they emphasized its superiority.

Parenthetically, we should notice here a small sub-class of sites where fortifications of two or more periods are linked by the topographical constraints of a narrow, steep-sided ridge, as well as by an outer, all-embracing line of defence, often in a very dilapidated condition: Dun Mac Sniachan

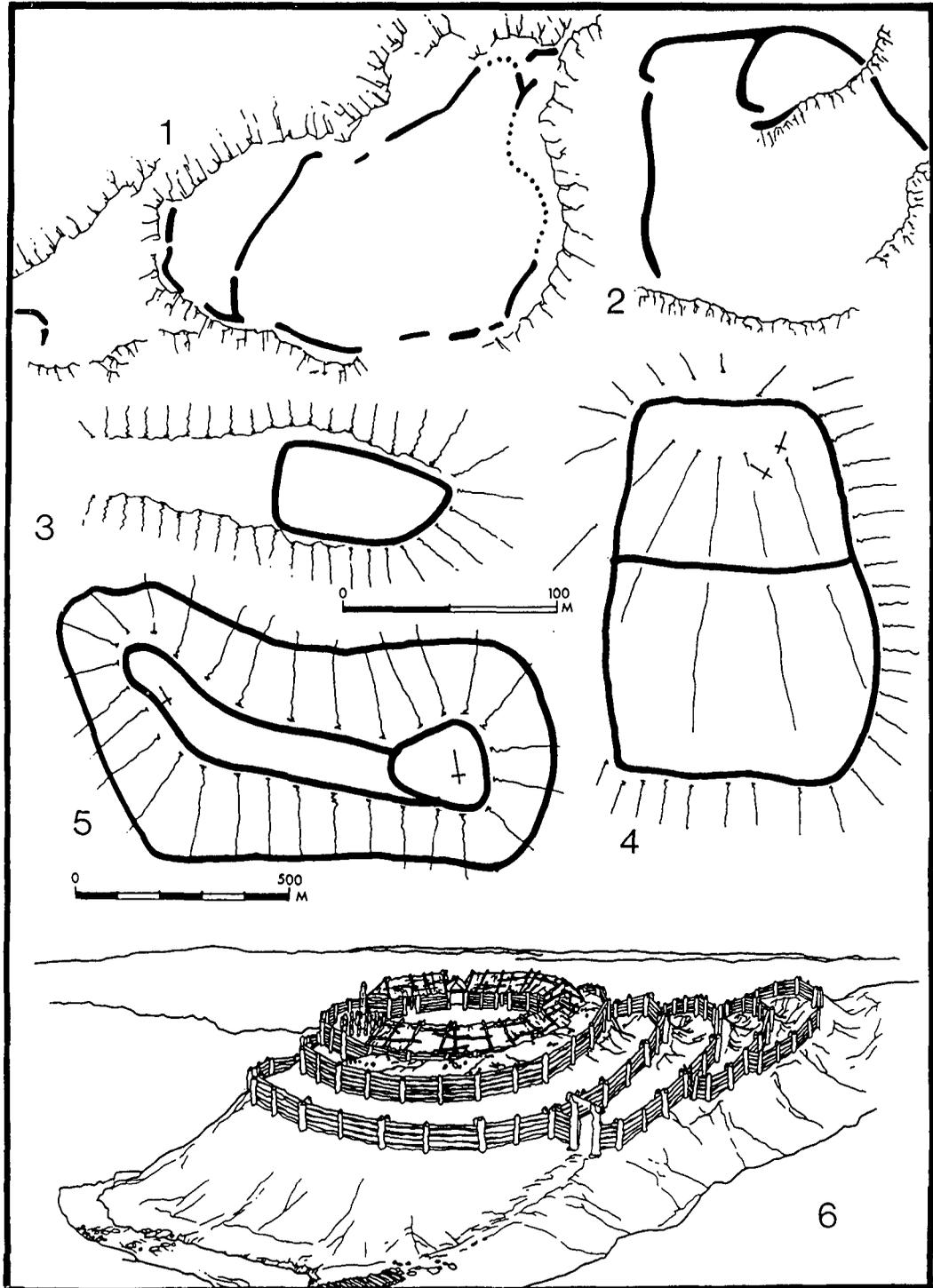
(illus 11,4 after RCAMS 1974, no 136), Dun Skeig (RCAMS 1971, no 165) and The Torr, Shielfoot (RCAMS 1980, no 160) are the classic examples. However ruinous the earlier forts or duns may have been, it would have been impossible for the later occupants on the ridge to have been unconscious of their existence. At Dun Mac Sniachan in particular, where the 'old work' and the 'new work' face one another across a slight saddle, the scope for elaborate ceremonials, especially related to the ancient fort builders as the historical or mythical founders of the dynasty, are abundantly clear.

Returning to the sub-classes of nuclear and citadel forts detailed by Feachem (1955), it is surely valid to treat them all as a single broad class, where the hierarchical organization of space is what matters, not one type of plan or another. Within that broad class, plans might include classic nuclear forts (Stevenson 1949): ring-forts with outworks, or inserted within earlier works, as well as citadel forts (Feachem 1955); so-called defensive enclosures with outworks (Feachem 1966); and duns with significant outworks. Feachem included Clatchard Craig among his 'defensive enclosures'. Burghead, with its major division into an upper and a lower fort, might be regarded as hierarchically organized in its final plan (Hogg 1975, 146–8); as also might Dunmore, Fintry (illus 11,3 after RCAMS 1963, no 77).

The significance of this broader classification is that all the excavated examples have proved to be post-Roman or early medieval foundations. They are Alt Clut, Burghead, Clatchard Craig, Dunadd, and Dundurn; and also Dunollie if it rightly belongs in the class. No example is known of a fort of this class in the pre-Roman Iron Age. Admittedly, there is a subjective element in the classification, which is ultimately based on a modern interpretation of the fort-builders' perception of the topography of a hill and of the layout of the defences and enclosures: the two in combination creating a tiered or ranked arrangement of space which was evidently considered an appropriate setting for kingship. The presence of kings is indicated by the historical notices of Alt Clut, Dunadd, Dundurn and Dunollie.

The nuclear fort and related classes have been treated so far as though they occurred only in northern Britain. It is indeed the case that parallels are difficult to find elsewhere, whether in the southern British pre-Roman Iron Age, or among forts with historical references, or shown by excavation to be Early Historic in date. Three examples may, however, be cited from north Wales. At Dinas Emrys (illus 13,1) a fort may have been built in the late-Roman period; it was certainly occupied around the sixth century AD on the evidence of imported pottery of Class B. The main work is a single ramparted fort, standing on a craggy hill-top, with its entrance on the west. Below the entrance, a ridge falls in craggy steps, and walls have been drawn across the ridge to form two small outer courts (Savory 1960; Edwards & Lane 1988, 54–7). At Castell Degannwy, a crag-girt citadel looks across a lower bailey to a minor detached summit. The citadel has yielded late Roman material including coins and pottery, as well as one certain and other possible sherds of sixth-century amphorae. It is quite uncertain how these relate to a drystone defence around the citadel (Alcock 1967; Edwards & Lane 1988, 50–3). Thirdly, at Bryn Euryn, Dineirth (illus 13,2), an oval citadel stands at one corner of a larger enclosure, and slightly above its general level. The name Dineirth has been considered as a reference to the fort of the tyrant Cuneglasus, mentioned by Gildas in the mid-sixth century (Jackson 1982; Edwards & Lane 1988, 27–8, with incorrect dimensions). These three examples – of which the third, in default of excavation, is questionable – serve to emphasize the general dearth of hierarchically-organized forts in southern Britain.

If we now turn briefly to Europe, we see that the fortification or refortification of hill-tops in the Early Historic or Migration period and through into the High Middle Ages were common (Uslar 1964; Herrmann 1981; Fehring 1987). The concept of the nuclear fort as such is, however, absent from the continental literature; nor will the use of craggy hills with well-defined summit bosses and lower terraces be found in Uslar's study of Early Historic (*frühgeschichtliche*) fortifications between



ILLUS 13 Comparative plans of some Welsh and continental forts. 1. Dinas Emrys, 2. Bryn Euryn, Dineirth, 3. Runder Berg by Urach, 4. Höfe by Dreihausen, 5. Aberinesburg by Heidelberg (note change of scale), 6. Tushemlya, upper Dneiper (scale not known)

the North Sea and the Alps, nor in Mildenerger's somewhat slighter study (1978) of Germanic forts. None the less a basic twofold hierarchical division is not uncommon, between a *Fürstenburg* (princely fort) or *Hauptburg* (citadel) and a *Vorburg* (bailey or outer enclosure). In some cases, indeed, there are two (or rarely more) outer enclosures, arranged one beyond the other, especially along a ridge or spur. Here a parallel might be drawn between Castle Hill, Ancrum, which has been claimed as a nuclear fort (RCAMS 1956, 35, 58–9), and the fort Höfe by Dreihausen (illus 13,4 after Fehring 1987, illus 28), the Hünenburg of Stöttinghausen, or the much larger Bennigser Burg (Uslar 1964, 78, 115).

Sometimes, as in the case of Höfe, the ground does fall markedly from the *Hauptburg* to the *Vorburg*. On the other hand, the well known Alamannic and Frankish fort of the Runder Berg by Urach (illus 13,3; accessible summary in Christlein 1978) was situated on an almost level whale-back ridge, and social differentiation was achieved by cutting off the eastern half of the ridge with a timber-reinforced stone wall. It is this physical division, as much as the presence of a large timber hall in one phase of the enclosure, which has led to the Runder Berg being classed as an *Adelssitz* or nobleman's seat. Despite its social importance, the Runder Berg is small in area when compared with many of the contemporary forts of northern Britain. Other continental examples are huge by comparison: the Aberinesburg by Heidelberg (Fehring 1987, illus 26) is drawn here (illus 13,5) at one-fifth the scale of other German and British fortifications to stress this point.

Similar layouts, including both bi-partite and tripartite examples, can also be found in royal and noble contexts among the Slavs. Favoured situations were level spurs or bluffs above deep-cut rivers. A revealing instance is that of Gneizno (Herrmann 1981, 151–3), where, in the eighth century, a large unenclosed settlement grew up in the shadow of a bi-partite enclosure; only later was this settlement enclosed and laid out on a regular plan. This inevitably leads us to speculate on the possibility of extramural settlements in northern Britain, undiscovered because unlooked for. Gneizno, of course, is a truly urban site, which is not the case with any of the British examples. But for an altogether more primitive work, a veritable nuclear fort in timber, we may consider the sixth-century fort of Tushemlya on the upper Dneiper (illus 13,6; most accessible account in Váňa 1983). Within the uppermost defensive circuit is a pagan shrine, which immediately recalls the ritual and ceremonial focus on the terrace below the citadel at Dunadd.

This may also remind us that continental forts very frequently (though not universally) enclose one or more churches or monasteries, as is the case with the Aberinesburg and the Höfe illustrated here. By contrast, no nuclear fort is known to contain a church. The possibility of an early ecclesiastical enclosure on the valley floor below Dundurn has been mentioned above. But only one Early Historic fort in northern Britain is known to have had a church, namely Bamburgh. There the evidence comes not from archaeology but from Bede's *Ecclesiastical History* (iii, 6).

At this point it is appropriate to return to Stevenson's analysis of the social context of one major sub-class of hierarchically-organized fort: the nuclear fort. He saw the plans of Dalmahoy and Dunadd as 'a reflection of the proto-feudal world in which chiefs or kings . . . with their retainers dominate the pattern of society'. It is not clear what Stevenson meant by 'proto-feudal'. He had earlier commented on the resemblance of Dalmahoy to a Norman motte and bailey (1949, 191 n 1); and he tentatively implies that the nuclear fort was a primitive or originative form of motte and bailey. His further implication seems to be that, as such, it is appropriate to a primitive mode of feudalism.

Our knowledge of the social and administrative arrangements of early medieval kingship in northern Britain is no doubt shadowy; but it would be difficult to see them as representing even a primitive form of military feudalism in any valid sense of the term. Indeed, it is more reasonable to see the social arrangements of north Britain, including Northumbria, as still pre-feudal up until the introduction of Norman-inspired feudalism during the 11th and 12th centuries (Maitland 1890; Jolliffe 1926; Barrow 1973; Kapelle 1979).

A somewhat different interpretation of the term 'proto-feudal' also deserves discussion: namely, that the nuclear fort reflects the incipient feudalism of a society on the path to military feudalism. It is true that among the forts of the western Slavs, for instance, just such a development has been discerned at Spandau and especially at Tornow (Brachmann 1983; Herrmann 1981; Váňa 1983). In the two structural phases of Tornow, the rising military power of a land-holding nobility is reflected in the increasing strength of the defences of a dun-like fort; in its internal arrangements, and especially the provision for both military retainers and the storage of grain; and in the depressing of the farming community outside the fort.

The first difference that we should notice between Tornow and the forts under discussion here is a major social one: Tornow is a noble, not a royal fort. But an even more important one is to be seen in their respective paths of development. At Tornow we see, during the seventh to ninth centuries, the strengthening of noble military power at the expense of the farmer. At Dunadd and Dundurn, by contrast, there is an increasing elaboration of the architectural framework of kingship over much the same period: but after that, nothing. The latest historical notices of hierarchically-organized fortifications are 870 for the Hiberno-Norse destruction of Alt Clut; and 889 for the death of Girg son of Dungal at Dundurn.

There is indeed no evidence that the occupation of any of the forts of northern Britain lasted into the 11th century; and though some early medieval forts were overlaid by castles of the 13th and later centuries, this is because of a new need for the kind of locations which they had occupied, not because of any political, social or military continuity. The nuclear fort and its cognates were a short-lived phenomenon; and though we may reasonably speculate on the social needs which they served, we cannot at present explain their demise. We should, however, notice that in Argyll, where the evidence is clearest, the occupation of duns was coming to an end at the same time as that of nuclear forts: that is, by about AD 900.

THE MATERIAL CULTURE AND ECONOMY OF DUNDURN

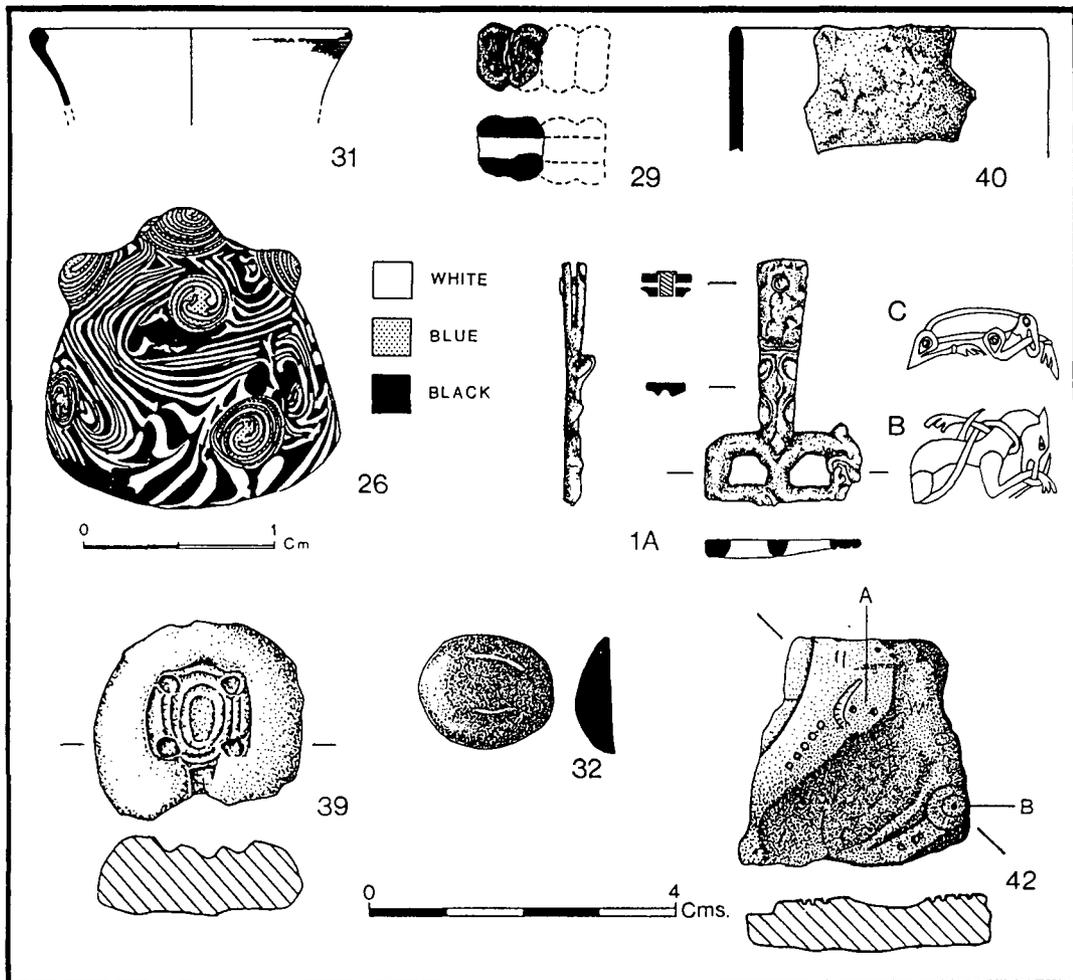
Any attempt to write a synthesis of the material culture and economy of Dundurn must take into account the bad preservation conditions in most layers of the site. It is not surprising that wood and leather were only preserved in the deeper, damp levels such as 426 and 428. What is more remarkable is that it was only in these damp conditions that bone and antler were preserved, and correspondingly only there that artefacts of skeletal material were recovered. In higher levels, the only traces of bone were in the form of carbonized fragments. Glass, on the other hand, appears to have been well preserved at all levels, though unfortunately it occurred only sparsely, and normally in very small fragments. A sherd of hard-fired wheel-thrown pottery (cat no 36) was indeed found at a high level (105), whereas less well-fired crucibles and moulds were recovered only from the damp lower levels. Iron was normally in a very poor state, the principal exception being the nails from the burned phase 2B citadel. It may be that either the burning itself, or the quantities of charcoal which this created in layers 012/013, had acted as a preserving agent. The same environment may also have helped to preserve the only bronze object that was found; namely, the silvered bronze dangle (cat no 1). It should be recalled, however, that only two fragments of bronze were recovered at Dunollie (Alcock & Alcock 1987), and none at all is recorded from the Early Historic levels at Alt Clut (Alcock 1976). Finally, stone appears to have been largely unaffected by its depositional environment, except for a quern of garnet-schist which was flaking badly.

The finds include both imported and locally produced objects. To begin with imports: the only pottery recovered was two hard-fired body-sherds in distinctive fabrics, but otherwise featureless. One (cat no 37) is of E-ware, commonly found in both western Britain and Ireland on sites of the

seventh and eighth centuries, and believed to originate somewhere in north-western Europe, perhaps between the Loire and the Seine. Of the other (cat no 36), Catherine Coufts of the Department of Archaeology and Prehistory, University of Sheffield, kindly comments:

‘the fineness of the fabric suggests that it is most likely to be from a Carolingian ware made in the Central Rhineland . . . The thin-section analysis supports a ninth-century Rhenish source’.

Given the probable Continental source of both these pots, it might be thought that they had reached southern Perthshire directly by the Tay estuary. However, the distribution of E-ware is so overwhelmingly weighted to the west that both the Dundurn example, and the others known in the east from Craig Phadraig (1 example), and Clatchard Craig (2 sherds, possibly from a single vessel), are far more likely to have entered Britain by the Lorn or Clyde routes. They would then have passed



ILLUS 14 Dundurn, glass and fine metalworking: 1A, silvered bronze dangle with self-biting beast; B, C, parallels from Book of Durrow and Sutton Hoo great gold buckle; 26, decorative glass boss (note scale); 29, segmented blue glass bead; 31, glass beaker rim; 32, glass inlay; 39, mould for head of stick pin; 40, thin-walled crucible; 42, mould and motif-piece showing two ribbon animals at A and B. (Numbers refer to full catalogue)

up the Great Glen or by the routes through the southern Highlands mentioned above (p 195). This may also be true of the Rhenish Carolingian vessel.

The second group of imports comprises two glass sherds. The first is from the rim of a beaker, or possibly a squat jar, dark olive green in colour, with a rim diameter of c 60 mm (illus 14, cat no 31). The other is a minute sherd of crimson glass, no more than 6 mm in its longest dimension, and about 0.25 mm thick, which none the less displays enough curve to prove that it comes from some sort of vessel, probably a beaker (cat no 28). The ultimate origin of both of these is thought to lie on the Continent, probably in the Rhineland, or further south in Gaul, in which case their route to Dundurn would have been similar to that of the E-ware vessel. A date centred on the sixth century seems appropriate for the beaker no 31.

It has frequently been suggested that such sherds of glass, found especially on fortified sites in western Britain, had been imported not as actual vessels, but as scrap glass or cullet, intended to be re-cycled to make beads, bangles or vitreous inlays. This interpretation owed much to the initial failure to find joins among the 256 sherds in the exceptionally large collection from Dinas Powys (Alcock 1963, 178; 1987a, 142). Recently, however, Ewen Campbell has reconstructed part of a cone beaker from among the Dinas Powys sherds. Moreover, small sherds similar to the site finds from western Britain have now been recovered from Scandinavian forts such as Eketorp (Näsman 1984), whereas the neighbouring cemeteries with furnished graves (such as are lacking in north and west Britain), produce complete beakers and other glass vessels. This new evidence must lead us to consider it highly likely that actual vessels were being imported to western and northern Britain as well.

None the less, it is likely that scrap glass became available simply through breakage; and two finds display the use which might be made locally of such cullet. The lesser one (illus 14, cat no 32) is an oval object 12 mm long, plano-convex in section, with a highly polished upper surface, and a bubble-pocked lower surface, in a brown or olive-green glass not unlike that of the beaker. This was most probably an inlay for a brooch or a casket, a glass substitute for the more common amber or gemstone. It is not known whether or not such high quality objects were ever actually present at Dundurn.

The other (illus 14, cat no 26) is the most remarkable object discovered at Dundurn: a virtuoso work of craftsmanship, in the form of a boss of swirls of white and dark brown glass, inlaid with five vitreous discs and surmounted by five lesser bosses of white and blue spirals. The occurrence of spiral-ornamented knobs surmounting bosses, for instance on the Nigg, Ross, cross-slab in the panel above the left arm of the cross, is a version in stone of the Dundurn design. Bosses with further ornament superimposed on them may also be seen on both the St John's and St Oran's crosses on Iona, and the Kildalton cross on Islay. This leaves open, therefore, the question whether the Dundurn boss should be attributed to Pictish or to Scottish influence; but in either case, an eighth- or early ninth-century date is likely. A copper-alloy tube or rod had been set into its base, suggesting that it had been fixed to some larger object such as a cross, crosier, chalice or reliquary casket.

Other, less distinguished examples of probably Insular glass-working include fragments of two blue beads, one cylindrical or barrel-shaped (cat no 27), the other segmented (illus 14, cat no 29). For these, a date-range from the second to seventh centuries AD may be suggested (Guido 1978).

Other local crafts include bronze-working, witnessed by small featureless fragments of crucibles (cat nos 38 and 41), and also by a rimsherd from an exceptionally thin-walled cylindrical crucible (illus 14, cat no 40). More informative than these are two mould fragments. One, bearing an oval design with four peripheral pellets, appears to be for the head of a stick pin (illus 14, cat no 39). The other is too fragmentary to show its form as a mould; its interest lies in its primary use as a motif piece. While the clay was still damp the heads and bodies of two ribbon animals were sketched out

(illus 14, cat no 42, *A & B*). To judge from the line of dots leading from the one head, the intended design would have been carried out either in filigree, or in a cast imitation of it. The moulds come from phase 2A, and demonstrate the bronze smiths' skill at that period. The animals on the motif piece should date to the early seventh century or later.

The only actual bronze object that was recovered was a silvered bronze dangle, intended to be suspended from a cloth or leather strap (illus 14, cat no 1A). This was decorated on the stem with a highly stylized horse-head, reminiscent of those on early Anglian cruciform brooches. At the dangling end was a beast biting its forepaw, a characteristic motif of Insular art, seen, for instance on a carpet page (folio 192 v) of the Book of Durrow (1B), or as the cowering beast at the toe of the great gold buckle from Sutton Hoo (1C, after Bruce-Mitford 1978, fig 406). These examples suggest an early to mid seventh-century date. The Dundurn dangle was found in the burned debris of the phase 2B citadel defence, which suggests that it had become incorporated in the body of the rampart while it was being built.

It is important here to notice that the only two artistically-determinate objects found at Dundurn, the dangle and the motif piece, both reflect the Germanic or Anglo-Saxon element in Insular art. Stylistically, they are quite distinct from the essentially realistic animals portrayed on the Pictish Class I stones, or on the Burghead and East Lomond plaques, with which they overlap in date. They seem to represent an Anglian, and specifically Northumbrian, influence north of the Forth, half a century or more before the appearance of Lindisfarne-related animals and interlace on the Pictish Class II cross slabs.

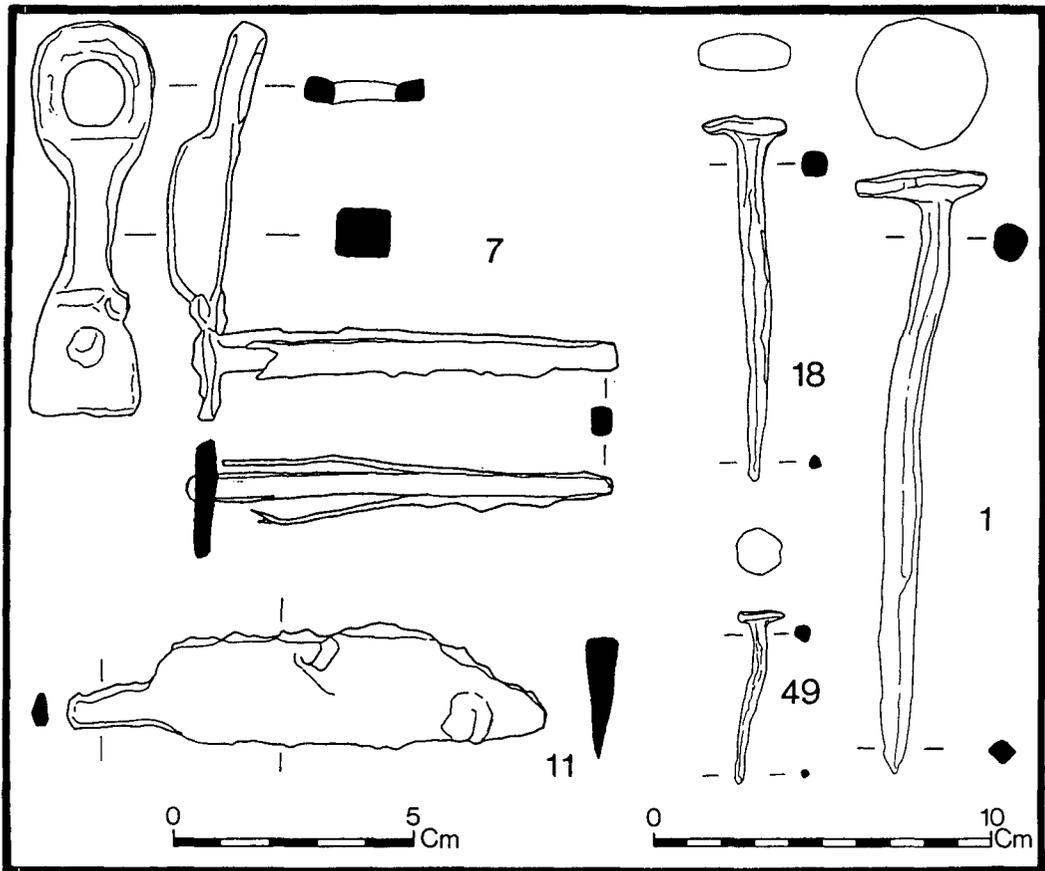
No evidence for iron production, in the form of ores, slags, blooms, scale or furnaces was recovered, but it seems reasonable to believe that artefacts of iron had been made on site. Overwhelmingly these consisted of nails, of which more than 150 were recovered. It may be inferred that at least 2500 nails had been present on the site, implying a ready supply of iron. In length they ranged from 170 to 40 mm (illus 15), but predominantly they lay in the range 120–95 mm. All were hand-forged, and showed some variation in the form of their heads and points, presumably adapted to specific wood-working tasks.

Of particular interest among other iron objects were two fragments from barbed-bolt padlocks, one with its spring blades still in good condition (illus 15, cat no 7). A knife with thick back, square shoulder and sharply angled blade (illus 15, cat no 11) could well be of the ninth century or later. Other iron objects included an awl (cat no 25), a possible scribe (cat no 24), and two pin or needle shafts (cat nos 15, 16).

Despite the quantities of animal bone recovered in the lower levels, artefacts of bone and antler were rare and of remarkably poor quality. There was none of the composite antler combs which are normally ubiquitous on Insular sites, and no fine pins. The most ambitious was an extraordinary animal head, crudely carved on the end of the *ulna* of a sheep (illus 16, cat no 47). Apart from this, there were a fine point, perhaps from a needle (cat no 43), a simple pin (illus 16, cat no 44) and a crude point (cat no 46). These can all be attributed to Dundurn 2B, as can a sawn-off antler tine, only 45 mm long (cat no 48).

In marked contrast in terms of craftsmanship was a complete leather shoe from phase 2A (illus 16, cat no 50). This was of one piece construction, with an over-all stamped design, supplemented by inlaid stamped strips, on its upper. It is without parallel in northern Britain; but very close comparisons can be made with the design of Irish shoes of the period (Lucas 1956). Its elaborate decoration suggests that it had been worn by a person of rank, until it was discarded because of a large hole in the sole. The damp conditions of layer 426 had also preserved a number of off-cuts of fine leather (cat nos 51–58), but none of them is informative about the products from which they are the waste.

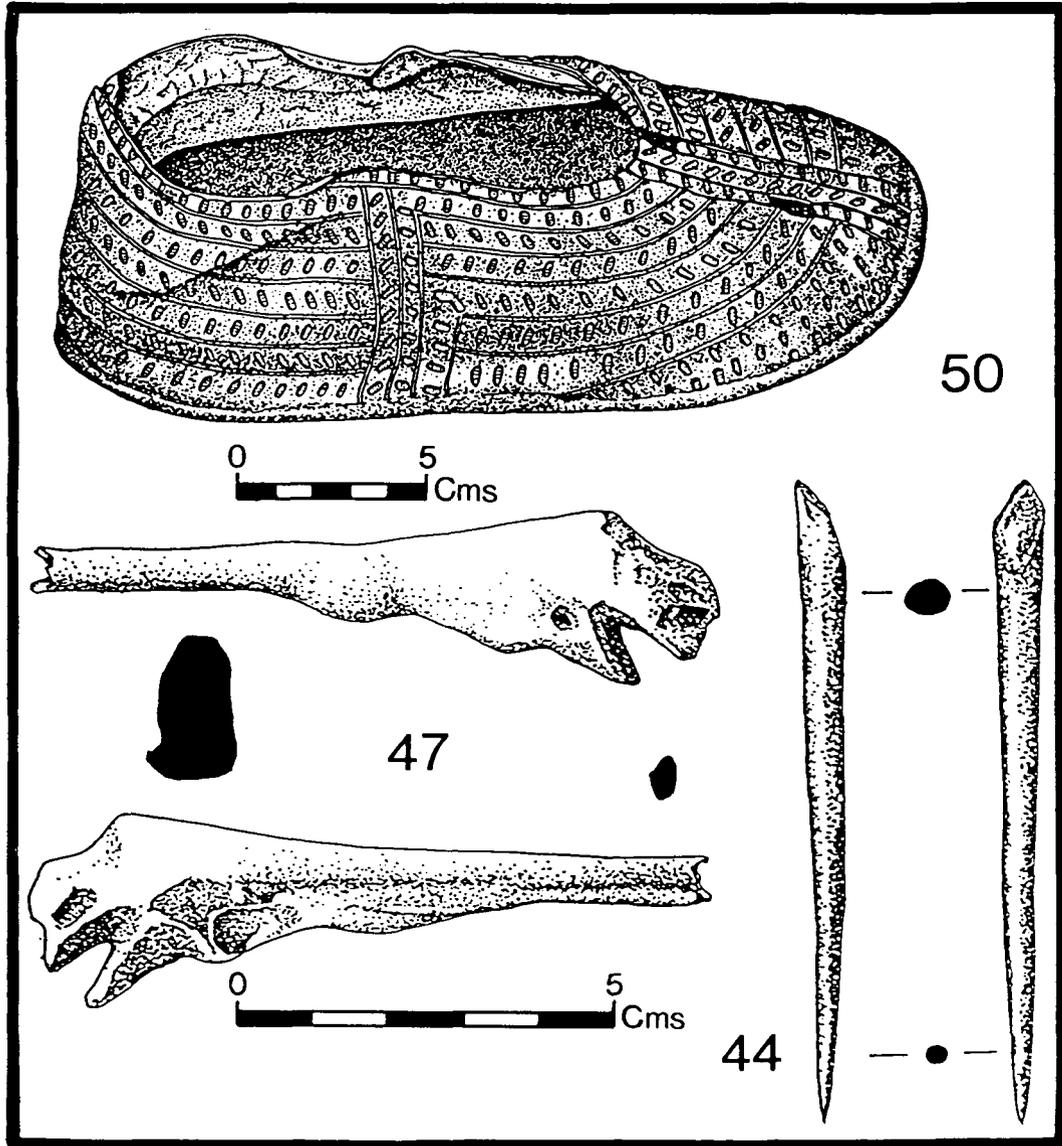
The evidence for carpentry and other uses of wood from the phase 1/2A interface echoes the



ILLUS 15 Dundurn, objects of iron: 7, spring-mechanism of barbed-bolt padlock; 11, knife blade; representative nails. (Numbers refer to the full catalogue; nails are numbered separately from other finds)

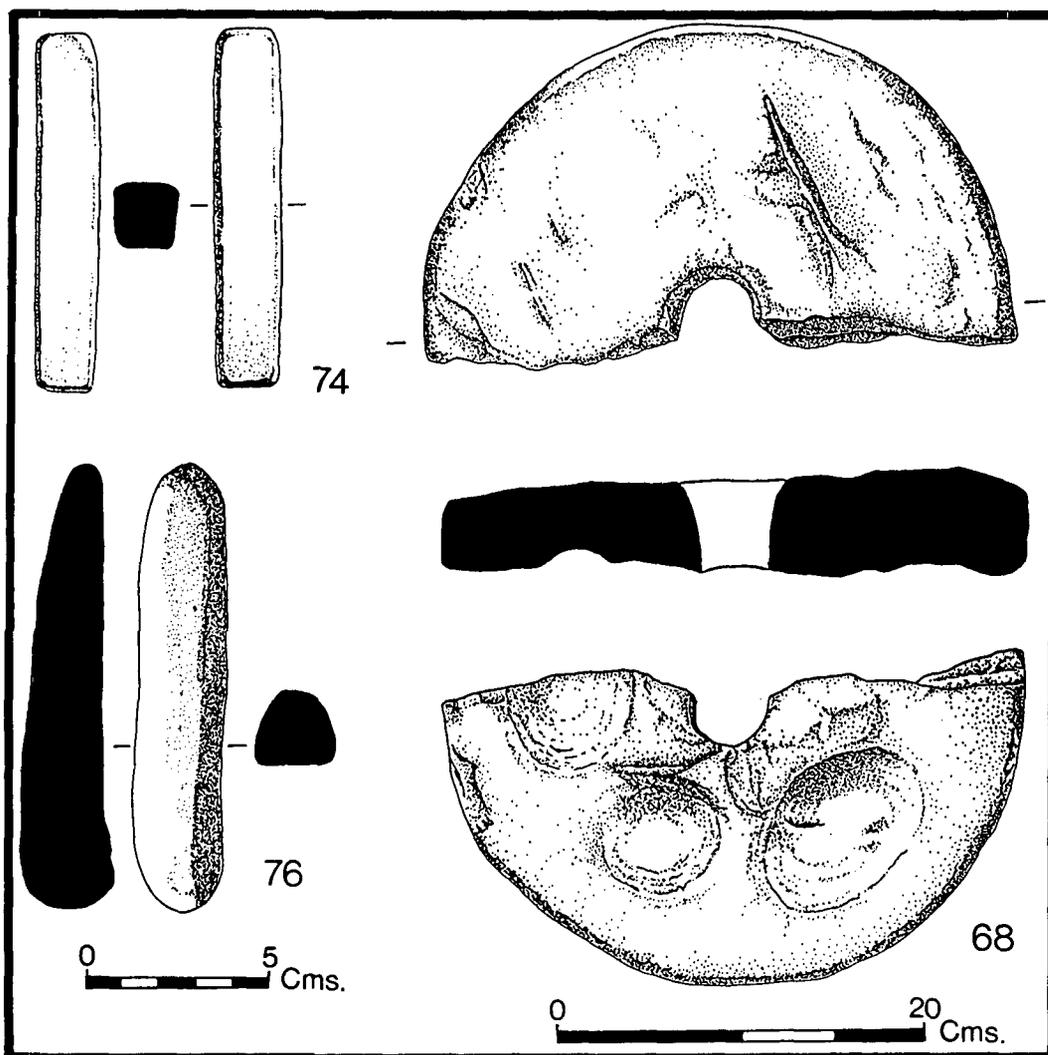
coarseness of the bonework from Dundurn. The only wooden object to be recovered was a handled bowl or ladle (cat no 96). This was so roughly carved that, although the external depth of the bowl was 70 mm, the effective internal depth for holding liquid was no more than 15 mm. An example of the rough jointing employed in the stockade of Dundurn 1 has already been noticed (illus 8, cat no 82). The wattle-work of the floor was also coarsely woven (illus 8). On the other hand, oak planks appear to have been split to a reasonably regular shape and thickness (eg illus 8, cat no 89).

Stone objects were well preserved at all levels. Indeed, from the very latest period at Dundurn, among material on the back of the 3B reinforcement of the terrace rampart, came an exceptionally fine sandstone whetstone of regular squared section, probably datable to the ninth century or later (illus 17, cat no 74); fragments of a large slab of fine-grained sandstone with smoothed upper and lower surfaces incised with pin-sharpening grooves (cat no 78); and a long pebble of trapezoid cross-section which had been used as a hammer- and polishing-stone (cat no 79). These would appear to demonstrate high-quality metal-working in the terminal phase at Dundurn; unless, indeed, they had been derived from some earlier level. Two other, cruder whetstones made on finger-like pebbles (eg illus 17, cat no 76) come from phase 2B. So does a rectangular plaque, which may originally have been an amulet bearing an incised design, perhaps of a cross; unfortunately, this had suffered badly through secondary use as a small whetstone (cat no 75).



ILLUS 16 Dundurn: 44, simple bone pin; 47, zoomorphic pin; 50, leather shoe. (Numbers refer to the full catalogue)

Among larger objects of stone were pieces from the upper stones of two querns. One, of garnet-schist, had evidently been much used, because the garnets on the grinding surface had been ground flat; this came from a superficial level in cutting 200 (cat no 69). The other, in a fine-grained mica-schist, was well stratified in phase 2B (illus 17, cat no 68). It had a vertical rim 50 mm deep which had become highly polished in use. This indicates that it had been the upper stone of a pot quern; that is to say, one with a recessed or basin-like lower stone. Examples have not been recorded frequently, but it is thought that they are a post-Roman type (Curwen 1937), which is certainly consistent with the occurrence of this one in Dundurn 2B.



ILLUS 17 Dundurn: 74, 76, whetstones; 68, half of upper stone of a pot quern. (Numbers refer to the full catalogue)

Of minor objects of stone, particular interest attaches to a fragment of a spindle whorl (cat no 73), because these have not normally been recovered in any abundance on sites of this period in northern Britain, such as Dunadd, Dunollie, and Buiston Crannog. This argues for a lack of any strong interest in spinning, and by implication in weaving wool; an inference which is consistent with the belief that at this time sheep were not kept principally for their wool. The present example comes from a very late level, 106. There were also a few stone discs of varied degrees of roughness, including one of silvery shining mica-schist, only 16 mm in diameter, which presumably was a gaming piece or counter (cat nos 70 – 72). Curiously, the superficial levels in cuttings 000 and 100 yielded some 40 slingstones.

Finally, consideration must be given to the 17 pieces of flint, some of which had been deliberately retouched. In his report in the Catalogue of Finds, Antony J Pollard assigns a late

Mesolithic date to some of these, but accepts the possibility of a later date – by implication, coeval with the Early Historic occupation of Dundurn – for others. As long ago as 1963, it was argued that many of the flints from Dinas Powys must have been used in the fifth to seventh (or as we might now think, eighth) centuries AD (Alcock 1963, 168–75). This interpretation has recently been reinforced by Harper’s demonstration (1974) that over half the excavated Irish raths of this period produce flints. It now appears that, in publishing Dunollie, it was wrong to discount an Early Historic date for the 13 or 14 flints from that site (Alcock & Alcock 1987). Plainly there is much work to be done before we can establish a typology for flintwork of this period; but the first need is to recognize the probability of its very existence.

This account of the artefacts from Dundurn has revealed variation between the high standards of competence and even artistry represented, for instance, by the glass boss, the silver-plated bronze dangle, the iron barbed-bolt padlocks, or the leather shoe on the one hand, and the poor quality of the bone-work, to say nothing of the gross incompetence of the wooden-handled bowl, on the other. The weave of the wattle floor, and the rough jointing of the supposed palisade upright, reinforce an image of local clumsiness.

This appears to be true in other aspects of the defences as well. The front of the terrace rampant of phase 3A was, it seems, not founded on solid rock, but on a steep slope of water-lubricated soil, despite the great weight of the stonework behind it. Whether or not the rear of the wall had collapsed as a result of the decay of timber reinforcing beams, it was evidently a shoddy piece of work, which had to be propped up in phase 3B. In any case, the masons cannot have been helped to build sound wall-faces by the use of rounded, water-worn stones from the bed of the river Earn. No doubt labour was readily available to carry tens of thousands of such stones up the hill. Moreover, considerable effort had been devoted to quarrying grooves across ribs of bedrock in order to bed horizontal timber beams in both Dundurn 1 and 2B. What was lacking was skill and intelligence in the building of dry-stone walling. Questions of human skills and competence are not often discussed under the heading of material culture, but at Dundurn they cry out for such discussion.

The activities of craftsmen and fort-builders, whatever their degree of competence, would have required the support of surpluses from the basic food-producing economy. Indeed, it was the ambition of kings, whether for power, or ostentation, or military glory that provided the driving force in the economy. To the evidence for that economy we now turn.

In discussing Dunollie, it was necessary to argue a case for the arable potential of the fort’s hinterland (Alcock & Alcock 1987, 91–2). This is not so at Dundurn. Although to the west it is impressively ringed by mountains up to 640 m high, to the east the valley of the Earn gradually opens up into increasingly fertile arable land. Indeed a tongue of land suitable for raising barley and oats reaches to the foot of the Dundurn hill (Alcock 1987b, fig 2); and on the valley floor, traces of ancient rig-and-furrow can still be seen on the nearby golf course. More directly pertinent, Graham (1939) recognized 50 years ago that the lower western slopes of the Dundurn hill had been terraced for cultivation. He argued, very reasonably, that such cultivation terraces, which are common throughout south-east Scotland, are of Anglian origin, and belong to the period of Northumbrian political expansion up to the Firth of Forth. This suggests that the Dundurn terraces were very probably cultivated during the period of the fort’s occupation. It may be added that recent fieldwork by the Royal Commission on Ancient Monuments, Scotland (RCAMS forthcoming) has shown that such terraces extend at least as far north as Spittal of Glenshee on the southern slopes of the Mounth. This suggests that, in terms of farming practices, Northumbrian influences extended considerably farther north than has previously been realized.

Examination of pollen from the damp deposit DN 426 gives lower values of tree pollen than those from the modern pollen rain, implying that in the seventh century the surroundings of the fort

were less well-wooded than they are today; alder and hazel were, however, more common. Macro-fossils from DN 426 reveal the gathering of hazel-nuts, raspberries, and wild cherries for food, as well as of large quantities of bracken for bedding and litter, and mosses for personal hygiene. Actual cereal grains were very rare; but carbonized specimens from DN 110 comprise 2 grains of Hulled six-row barley, 1 grain of Naked six-row barley, and 1 grain of oats, either wild or cultivated. The occurrence of pollen of *Plantago lanceolata* also implies cereal cultivation (Dickson & Brough forthcoming).

Scanty though the evidence for cereals was, that for the role of animals in the economy was relatively plentiful in the damp layers, DN 426 and 428. The bone collected from 428 was only enough to provide a sample for a radiocarbon date; but DN 426 yielded 727 identifiable bones. Only three of these were from wild animals: two of deer and one possibly from a heron. Of the remainder, a count of fragments of identifiable bones showed that 61% were from cattle, 31% from pig, and a mere 8% from sheep or goat. These figures make comparisons possible with other British and Irish sites of Early Historic date. The most striking feature of such comparisons is the normal preponderance of cattle in terms of the number of animals represented; the relative proportions of pig and sheep/goat vary from site to site.

The Dundurn cattle appear to have been small, even in comparison with cattle from a range of Iron Age and Early Medieval sites. A single horn-core had come from a bull, but otherwise it was not possible to sex the specimens. Estimates of age at death show that 72% had lived beyond 2½ years, and of these, 52% lived beyond 3½ years. It should be stressed that these estimates are based on epiphyseal fusion. The absence of complete jaws prevented ageing by tooth-eruption, and in consequence it has not been possible to divide the cattle younger than 2½ years into age groups. It has not, therefore, been possible to determine a killing-peak for calves, or to establish the existence of a dairy-farming economy on the Irish pattern demonstrated by McCormick (1983).

Pig, at 31% of the total, may be under-represented by comparison with cattle, simply because their more delicate bones are more subject to attrition. But even if it were assumed that the numbers of cattle and pigs consumed had been roughly equal, it is obvious that cattle made by far the larger contribution to the diet, simply because of their greater carcass weight. While the majority of the pigs had been fully mature when they were slaughtered, there were also several piglets in the sample. Finally, the few sheep or goat appear to have been short, stocky animals which added little to the diet.

The importance of this collection of animal bones is that it is the only one available from Early Historic Scotland south of the Mounth. Its very existence is the result of the remarkable preservation conditions in the deep layers of Cutting 100/400. It would be unreasonable, however, to claim too much for its significance. In quantity, it is more than double the collection of comparable data from Dunollie: a total of a mere 307 fragments (Alcock & Alcock 1987, 92). But this must be set against totals of 'some 7000 bone-fragments identified' from Buckquoy (Noddle *in* Ritchie 1977, 201–9), or the 13847 fragments examined, and 6713 positively identified, from Brough of Birsay (Seller *in* Hunter 1986, 208–16). Given also the minute quantity of grain recovered, and in the absence of any directly relevant documentary evidence, it would be premature to attempt any general account of the early medieval economy of the area. That must await either further exploration of the deep levels at Dundurn, or the discovery of other sites with equally good preservation conditions, but preferably in more accessible levels. This requirement should be seen as a powerful stimulus to research.

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