From the *Transactions* of the
Bristol and Gloucestershire Archaeological Society

Excavations near Birdlip, Cowley, Gloucestershire, 1987-8

by C. Parry
1998, Vol. 116, 25-92

Trans. Bristol & Gloucestershire Archaeological Society **116** (1998), 25–92

Excavations near Birdlip, Cowley, Gloucestershire, 1987–8

By CHARLES PARRY

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Introduction

From October 1987 to April 1988 excavations were undertaken along the proposed route of the Birdlip bypass, a realignment of a portion of the Gloucester–Cirencester (A417) trunk road. Three sites were selected for excavation (Fig. 1). Sites 1 and 2 were suspected Bronze-Age round barrows which proved upon investigation to be features of modern and natural origin respectively (Wills 1988; Parry 1989a and 1989b). Site 3, represented by a complex of crop marks, forms the subject of this report.

Site 3 (centred on O.S. Nat. Grid SO 932143) is located *c.* 350 m due east of Birdlip village in the parish of Cowley. It is situated *c.* 1 km east of the Cotswold escarpment on the south-facing slope of a low ridge projecting eastwards from Birdlip village and lies at *c.* 285 m above O.D. on Upper Inferior Oolite limestone (O.S. Geological Survey of Great Britain, sheet 234, Gloucester, 1972). The ridge would not appear to be a favourable location for settlement for it is waterless and unsheltered from the prevailing west wind and its high altitude encourages severe frosts and heavy snowfalls in the winter.

In 1987 the site lay within a featureless arable field (O.S. land parcel no. 1233) which has since been amalgamated with a field to the east by the removal of the dividing hedge. In 1841 (Glos. R.O., MF 1126/59: microfilm copy of Cowley tithe map) the site was in a 10-acre field called 'Rowe Field' (the land use was not recorded). The place-name 'Rowe' (meaning 'rough': Smith 1964, 157) could be interpreted as meaning ground made uneven or difficult to plough due to its archaeological component.

Site 3 was discovered by aerial reconnaissance in July 1984, when separate sorties over the locality were undertaken by Gloucestershire County Council's Archaeology Service (photographs in the custody of the County Sites and Monuments Record, one of which is reproduced as Fig. 2) and the Royal Commission on Historical Monuments, England (RCHME, NMR SO 9314/1, 4 and 5). The crop marks visible on the aerial photographs suggested the presence of a later prehistoric or Roman settlement formed by several adjoining enclosures. The complex was discovered after the completion of a programme of fieldwalking undertaken by the Western Archaeological Trust in 1983 and 1984 along the proposed route of the Birdlip bypass (Darvill 1984), when several foci of Roman occupation were identified in areas to the east and north of the crop marks (see Fig. 20). The discovery of the crop marks prompted further archaeological investigations of the proposed bypass; firstly, by a geophysical (magnetometer) survey made in October 1984 by English Heritage (David 1985) and, secondly, by a trial excavation carried out in the autumn of 1985 by Crickley Hill Archaeological Trust (Courtney 1985 and 1986).

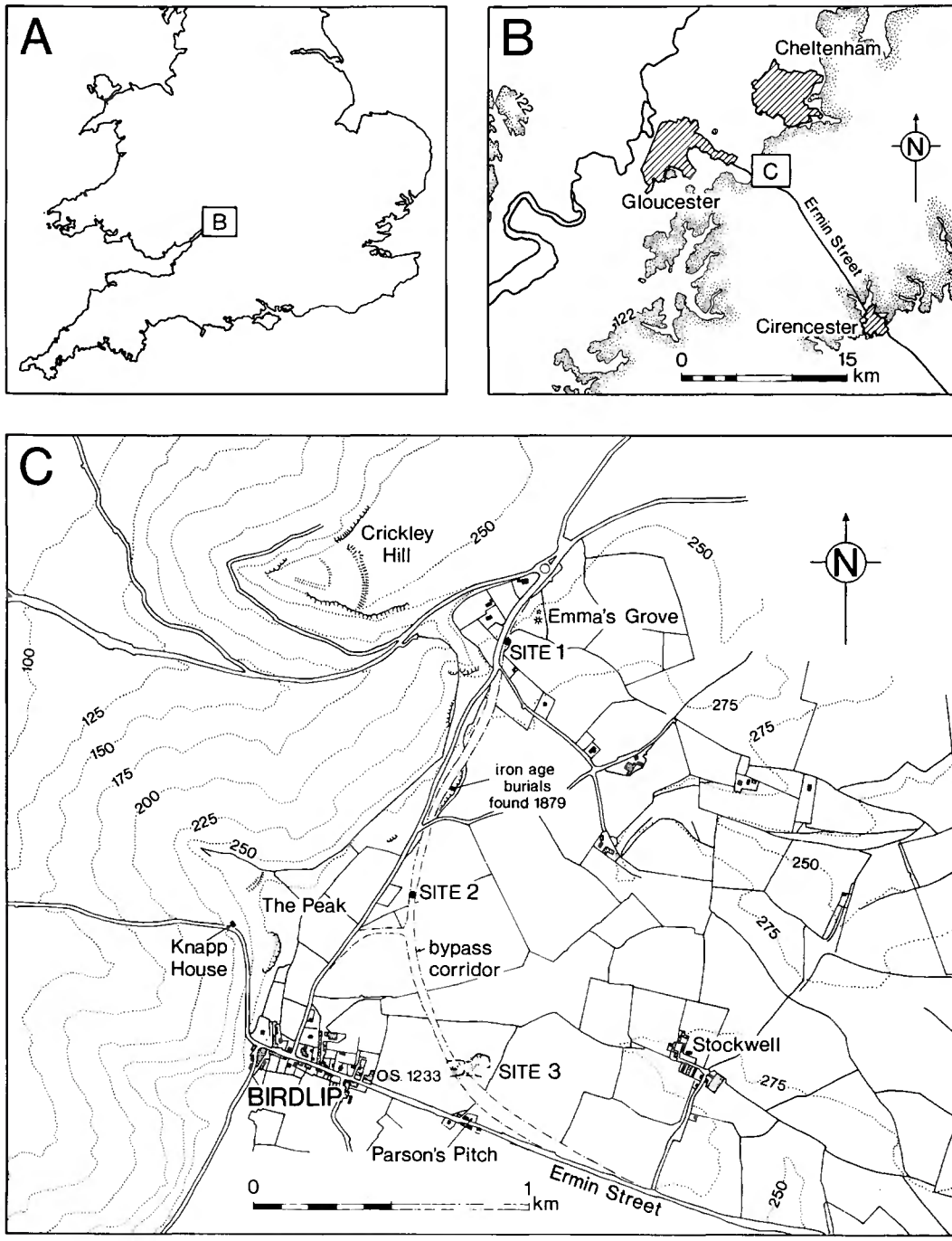

Fig. 1. Location of the Birdlip bypass (A417) road and excavation sites 1–3 (contours in metres above O.D.).

Fig. 2. Aerial photograph of crop mark enclosures at Site 3, dated 18 July 1984, looking west. On the left is the Cirencester–Gloucester (A417) trunk road leading to Birdlip. The road, now superseded by the Birdlip bypass, formed part of Roman Ermin Street (Gloucestershire Sites and Monuments Record: photograph by S. Dorey).

Site 3: Description

A plan of Site 3 (Fig. 3) has been transcribed from the crop marks visible on the aerial photographs of 1984 and from additional information provided for the westernmost portion of the site by the geophysical survey of 1984. The evidence indicates the presence of three adjoining enclosures together enclosing *c.* 1 ha. For ease of description the enclosures have been designated I, II and III. Enclosure I and a small portion of Enclosure III were transected by the bypass route and sampled by excavation within the areas designated A, B and C. The crop mark record also suggests the presence of smaller features interpreted as pits or postholes which appear to be clustered discretely within the enclosures and on their peripheries. As the 1987–8 excavations confirmed that the southern and northern peripheries of Enclosure I were occupied

by pits and other structural features, the settlement size of *c.* 1 ha must be considered a minimum. If the peripheral features observed during excavation are typical of the complex as a whole, then the site can be estimated to cover *c.* 2.5 ha.

The western boundary of Enclosure I was mostly absent from the crop mark record but if projected from an apparent return at the north-west corner the enclosure would form a rectangle measuring *c.* 56 by 67 m and covering *c.* 0.35 ha. An eastern entrance gap suggested by the crop marks may be illusory for an apparent northern gap was tested by excavation in Area B, where a continuation of the enclosure ditch was found to be present. The crop mark record also suggested the presence of a penannular ditch positioned centrally within the enclosure, and its presence was confirmed by excavation in Area A: the feature is interpreted as an early prehistoric ritual or funerary monument unrelated to the enclosure complex.

On the eastern side of the complex, Enclosure II is delimited by an irregular rectilinear crop mark open to the south, perhaps with an eastern entrance. Projecting a line between its southern terminals, the area enclosed measured *c.* 40 by 68 m and covered *c.* 0.23 ha. The space between Enclosures I and II appears to have been demarcated to the north and partly to the south by boundaries forming Enclosure III (perhaps open to the east), measuring *c.* 52 by 75 m and covering *c.* 0.42 ha. To the east of Enclosure III's southern boundary a curvilinear crop mark may represent a portion of another enclosure.

Excavations at Site 3: Method of Work

The excavations were undertaken between December 1987 and April 1988 by Gloucestershire County Council's Archaeology Service, funded by English Heritage and aided by a workforce provided by the Crickley Hill Archaeological Trust (Manpower Services Commission Agency). The work was confined to the corridor of the proposed road and financial restrictions meant that only a proportion of the affected area was examined. The four areas selected for excavation (Fig. 3) covered a combined total area of *c.* 1550 m^2, amounting to *c.* 6% of the estimated 2.5 ha of occupation represented by the crop marks. Area A (773 m^2) and Area C (715 m^2) were opened to examine areas where the geophysical survey of 1984 had suggested high archaeological potential. Areas B and D investigated smaller areas to resolve specific problems of interpretation raised by the results of the geophysical work.

The trial excavation of 1985 had revealed no evidence for archaeological preservation above the level of the natural limestone. Therefore, at the commencement of the excavations in December 1987 the ploughsoil within Areas A, B, C and D was stripped under archaeological supervision down to the surface of the limestone by using a 360°-machine equipped with a toothless bucket. The surface of the natural limestone was then cleaned by trowelling, to reveal archaeological features as soil marks.

Linear features were sampled by removing segments of fill at intervals. Discrete features such as pits and postholes were fully excavated, after the removal of one half of the fill in order to record deposits in section. Each feature was recorded in plan at a scale of 1:20, both before and after excavation. Sections across features were drawn at a scale of 1:10, and drawing conventions were used to indicate soil composition: conventions used for the published section drawings are explained on Fig. 4. A written description of each feature or deposit was recorded on *pro forma* context record sheets. All context numbers were assigned a prefix corresponding with the area of excavation (i.e. A, B, C or D; in addition the prefix WB was used for contexts deriving from a watching brief undertaken during road construction). Area prefixes to the context numbers are used in the text below, but these are omitted from the figures.

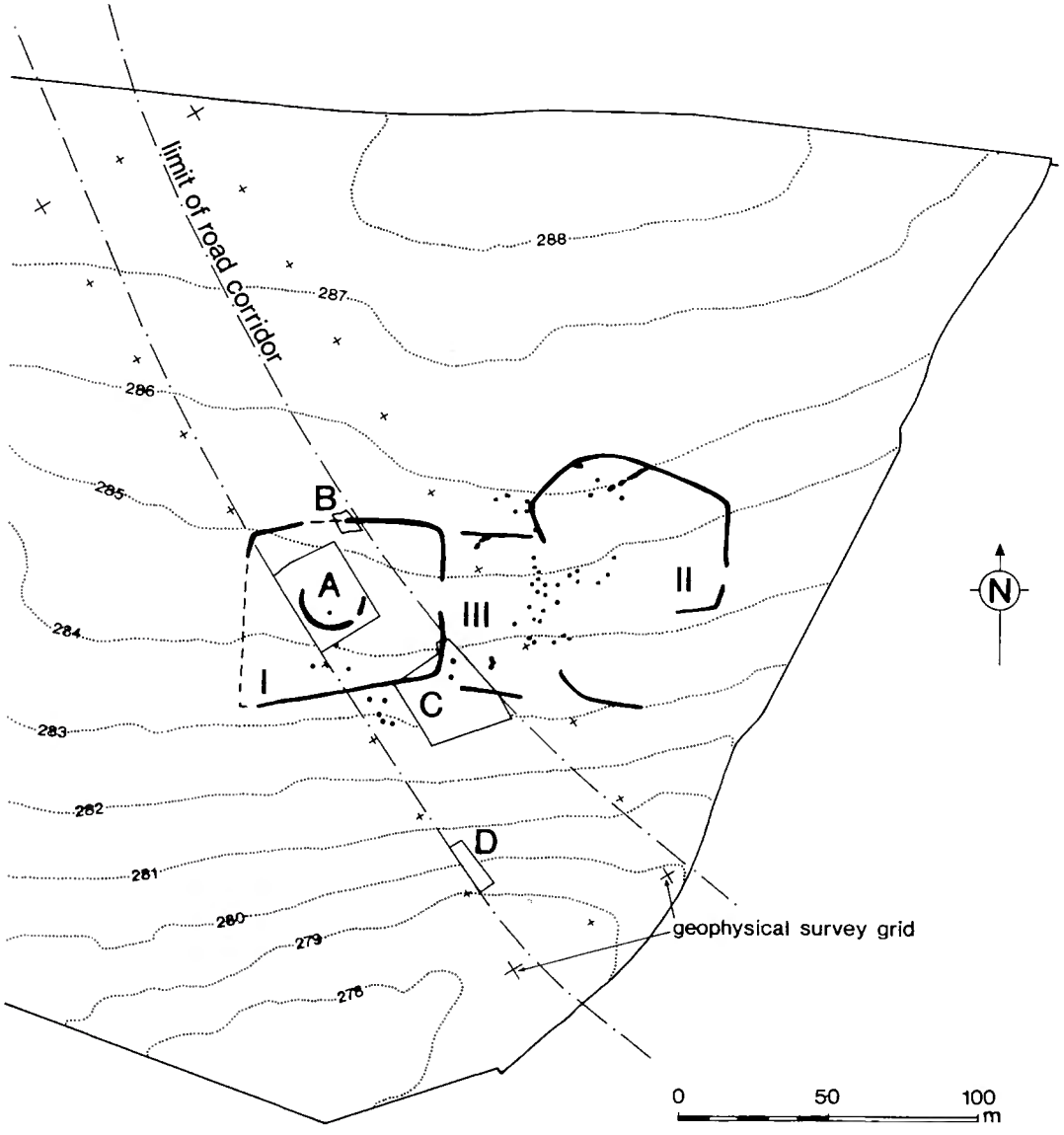

Fig. 3. Site 3: plan of crop mark enclosures I–III and excavation areas A–D.

Excavation: Description

Area A

Area A, which measured a maximum of 31 by 25 m, was opened to examine the interior of Enclosure I, where crop mark and geophysical survey evidence predicted the presence of a penannular ditch. All features located in Area A are shown in plan on Fig. 5.

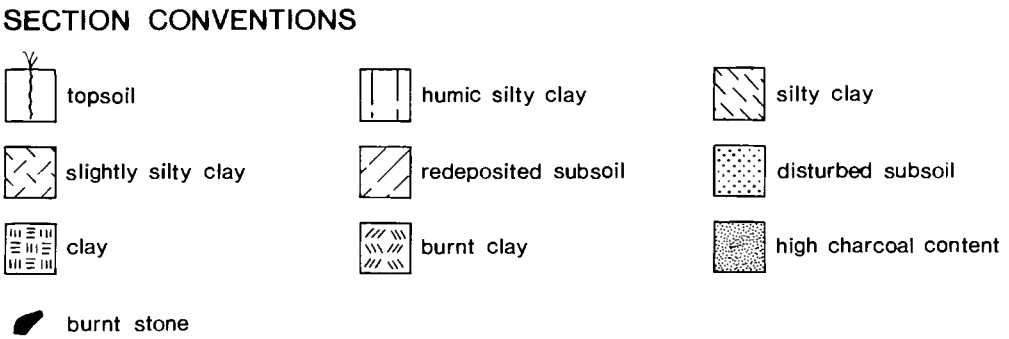

Fig. 4. Drawing conventions used for excavated sections.

Pits A12 and A14

On the eastern edge of the area lay pit A12. It measured 2.04 by 1.36 m and was 0.14 m deep and filled with a greyish-brown silty clay, A13 (Fig. 6). It incorporated fragmentary sherds of Early or Middle Bronze-Age pottery, many tiny unretouched flakes of flint (most of them burnt) and copious small pieces of burnt clay and charcoal. The charcoal produced a radiocarbon date (OxA 2544: Table 5) of 1160–540 Cal B.C. at two sigma. The combined evidence of the radiocarbon date and the pottery suggests that a Middle Bronze-Age date for the pit is most likely.

Pit A14, a small sub-circular pit, measured 0.45 m across and 0.1 m deep (Fig. 6). No dating evidence for this feature was recovered.

Penannular ditch A29/142

The penannular ditch (Figs. 5 and 7) formed a semi-circle open to the north, the chord between the centres of the two northern terminals measuring exactly 20 m. To the south-east the ditch was interrupted by a 2.1-m wide causeway separating the greater length of the ditch (A29) from the shorter portion (A142). The ditch was sampled by excavating 14 segments of fill along its length (including one segment previously excavated in 1985), the intervening baulks providing transverse sections (Fig. 8).

The profile of the ditch was varied in form, with rounded (section K) or vertical (section J) sides and a flattish or irregular base. The ditch varied in depth, demonstrating a gradual but constant deepening from its shallow northernmost end towards the terminal adjacent to the entrance causeway. At the northernmost baulk, Section A, a depth of only 0.04 m and a width of 0.72 m was recorded. At Section G the depth was 0.22 m, the width 1.41 m. From this point to the terminal alongside the causeway the ditch enlarged considerably, and at Section L the ditch measured 2.14 m wide by 0.68 m deep, its maximum dimensions. The 6-m length of ditch designated A142 was relatively shallow, measuring a maximum of 0.3 m deep by 1.28 m wide (Sections M, N and O).

Most baulk sections demonstrated the presence of a primary deposit of soft, reddish-brown clayey silt incorporating concentrations of small limestones (e.g. section G, context A121). The stones appear to represent material weathered from the edges of the ditch when it was newly cut. Within the southernmost portion of A29 three circular or oval pits (A91, A96 and A108) had been cut through the primary fill. The largest, pit A108, was cut into the terminal of the ditch adjacent to the causeway; it measured 2.2 m long, 0.92 m broad and 0.62 m deep, and was filled with a stony deposit (A105). Pits A91 and A96 were less substantial, but they too had stony infills. Sealing the pit deposits, and elsewhere lying over the primary fill of the ditch, was a deposit of soft reddish-brown silt containing a few stones. Again this was deepest at section L (A104), where it was 0.35 m deep.

No evidence was recovered to date ditch A29/142 or pits A91, A96 and A108. A few small, abraded sherds of Roman pottery found incorporated in the uppermost part of the fill of A29/142 are interpreted as material introduced by modern ploughing.

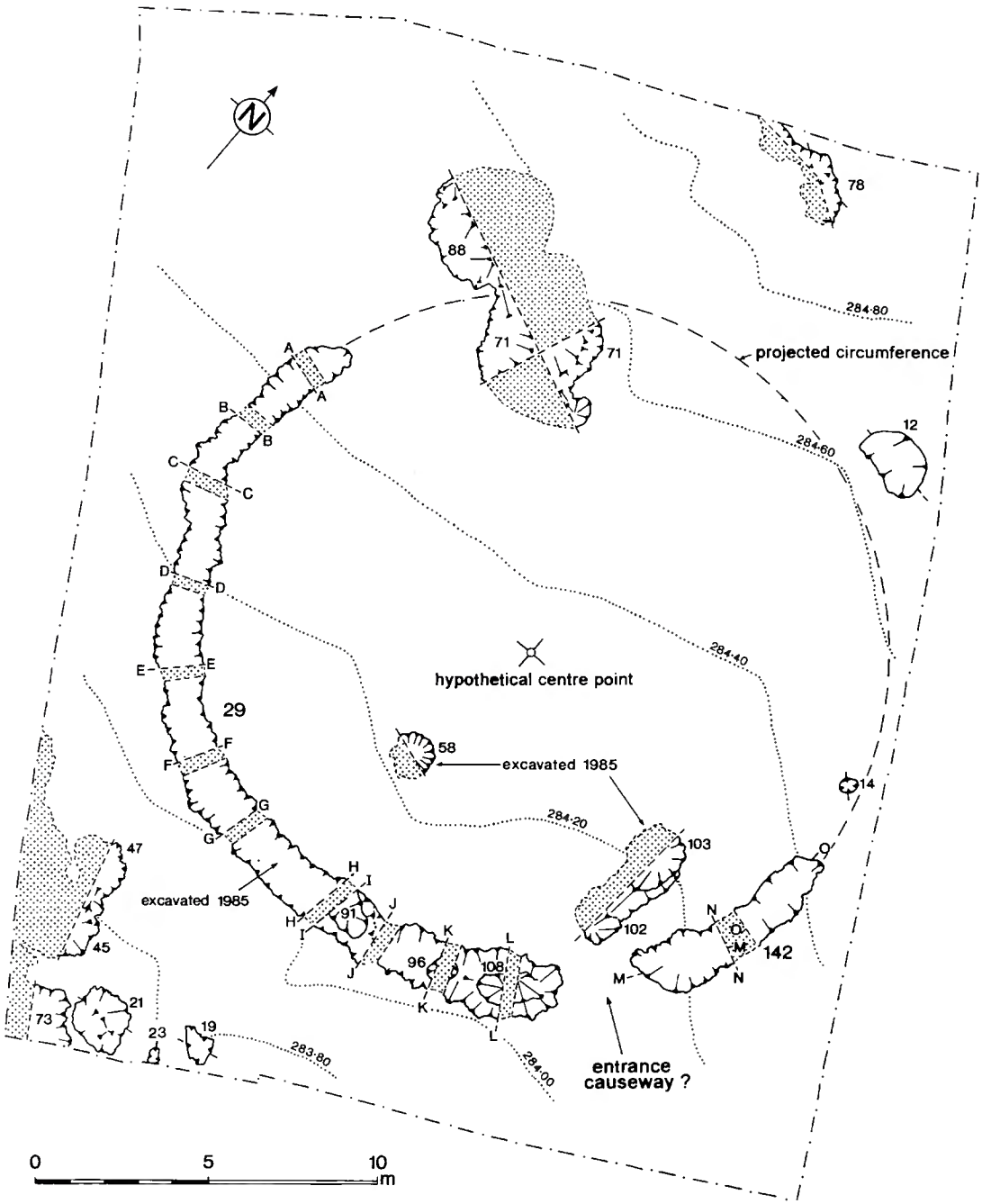

Fig. 5. Area A: plan of all features.

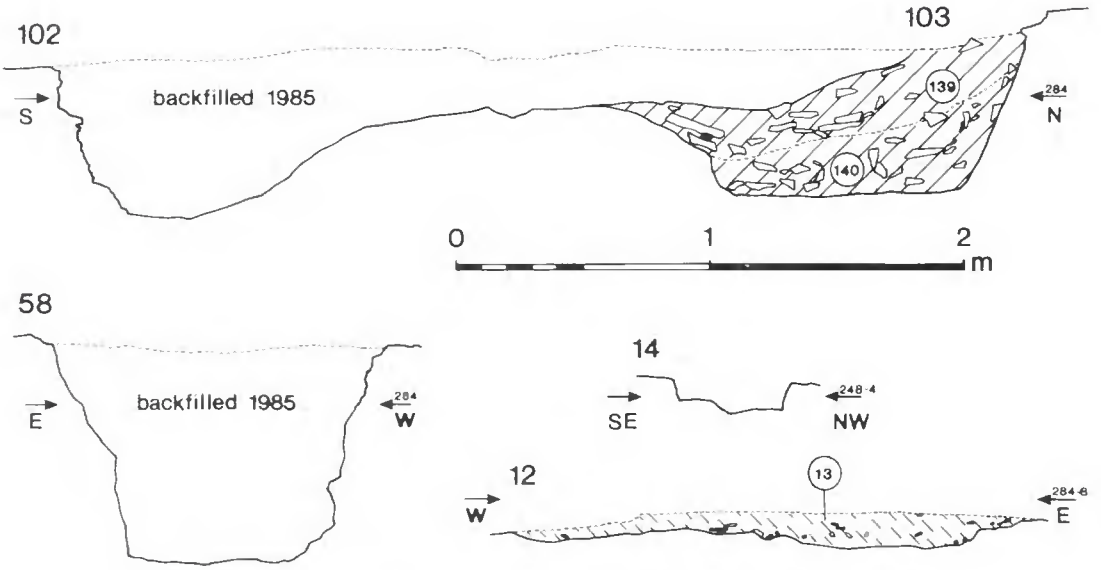

Fig. 6. Area A: sections across features A12, A14, A58 and A102/103.

Fig. 7. Area A: view of the penannular ditch A29/142 looking west (photographed by Jon Hoyle for Gloucestershire County Council).

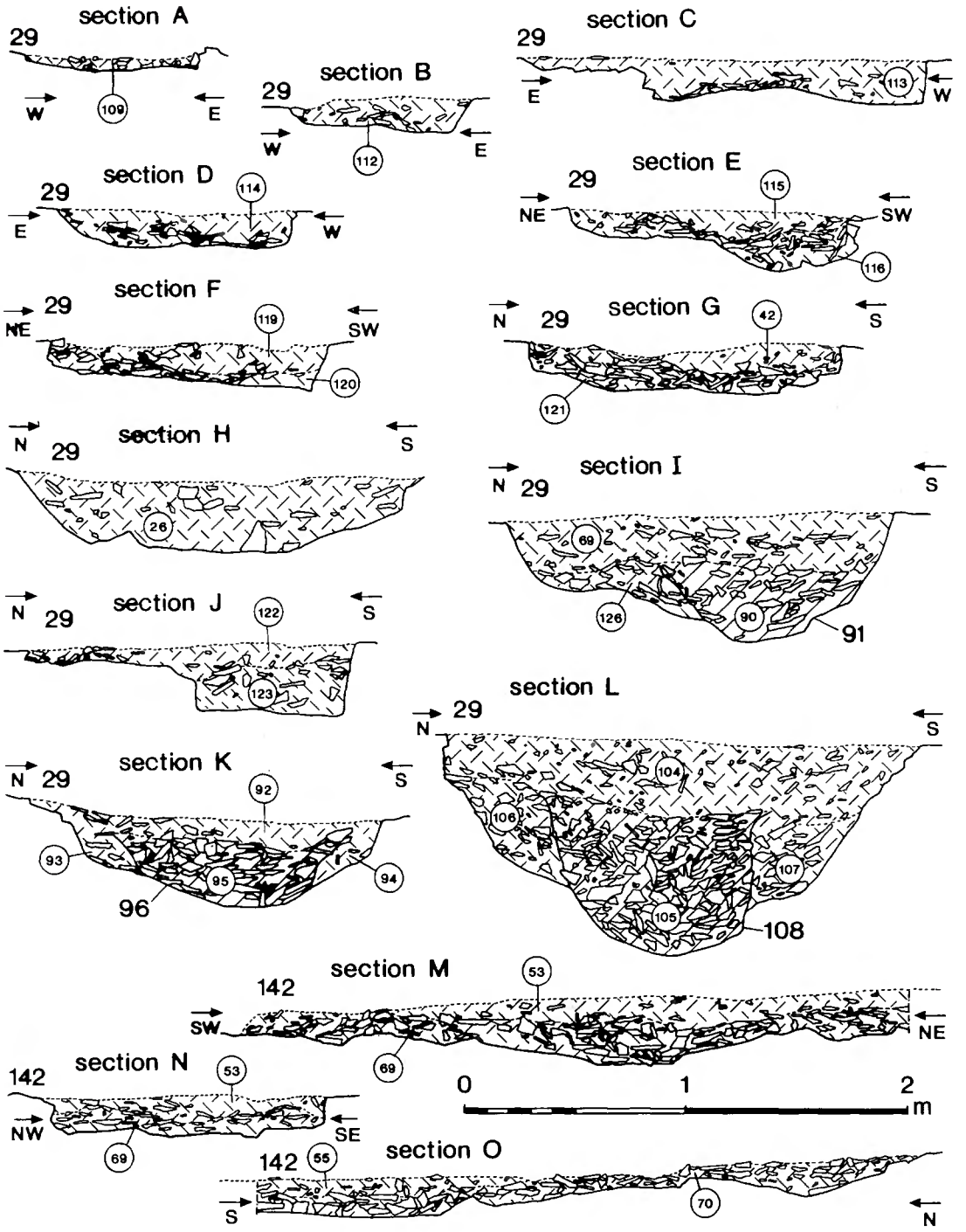

Fig. 8. Area A: sections across penannular ditch A29/A142: all datum reference points = 284.2 m above O.D.

The reddish-brown silts forming the primary and secondary fills of the ditch were encountered in no other feature excavated at Site 3. A smear of this distinctive deposit could be observed continuing the circumference of A29 *c.* 3.5 m north of the terminal shown on Fig. 5, but its removal left no edges which could be planned. This evidence strongly suggests that the northern half of the ditch had been eroded (presumably by ploughing) and that it may have been fully circular when first constructed (Fig. 5 shows the ditch with a northern circumference projected). Pit A14, lying on the projected alignment of the ditch, may be interpreted as a portion of its base. In addition, there appears to be a clear spatial relationship between the Bronze-Age pit, A12, and the projected circumference of the ditch. This suggests that the pit may also have formed part of the ditch circumference, or alternatively was constructed close to the ditch and respected its edge. Thus, although the function and date of ditch A29/142 is open to question it can be interpreted, tentatively, as a structure dating to the early prehistoric period, with pit A12 representing either a truncated portion of the ditch or a secondary construction on its periphery.

Features A58 and A102/103

Within the area enclosed by A29/142 lay features A58 and A102/103. These had been excavated during the trial trenching of 1985 and their backfills were removed in order to record their profiles and any remaining fills (Fig. 6). All three features are interpreted as pits which were not contemporary with A29/142. Pit A58 resembled the later prehistoric pits investigated in Area C. In 1985 feature A102/103 (representing two adjoining pits?) produced a sherd of Middle Iron-Age pottery and also finds of the 1st century A.D. The latest finds, together with the erroneous identification of A102/103 as a continuation of A29, prompted a suggestion that a Late Iron-Age roundhouse gully was represented (Courtney 1986; also reported by Darvill 1987, 173).

Area A: ground anomalies (Fig. 5: sections not illustrated)

In the southern corner of Area A an amorphous spread of dark brown silty clay was sampled, revealing shallow hollows in the subsoil measuring no more than 0.2 m deep. These hollows (A19, A21, A23, A45, A47 and A73) are interpreted as recent plough disturbances of the soft, brashy limestone subsoil present at this location. However, it should be noted that an assemblage of carbonized plant remains from feature A21 was similar to that found in ditch A29/142. In addition, feature A45 incorporated a flint piercer dated to the Late Mesolithic or Neolithic. Alternatively, therefore, one or more of the hollows could represent activity related to ditch A29/142. North of ditch A29/142 lay two conjoining sub-circular features (A71 and A88) which measured up to 0.46 m deep. Their irregular edges did not suggest deliberate construction and a natural formation, perhaps as tree-throw hollows, can be suspected. On the northern edge of Area A, feature A78 contained a bright reddish-brown clay, and a geological origin can be assumed.

Area B

Area B (measuring 7.4 by 5.5 m: Fig. 9) was positioned to sample the northern boundary of Enclosure I where the geophysical survey of 1984 had predicted a gap also apparent from the crop mark record. The enclosure ditch (B201) measured 1.6 m across and 0.85 m deep and was filled to a depth of 0.7 m with layers of redeposited limestone subsoil (B282–6) incorporating sherds of Middle Iron-Age pottery. Cutting through these fills was pit B204, measuring 2.2 m across and 0.7 m deep. The fill of the pit was sealed by B207/281, a layer of humic silty clay containing burnt limestones, which lay below a 0.2-m-thick layer of redeposited limestones (B203) interpreted as cobbling laid to consolidate the soft ditch infills. This thickly-packed layer apparently masked the enclosure ditch from the crop mark record and from the geophysical survey. Pit B204, layer B207/281 and the cobbles, B203, incorporated pottery dating to the 1st century A.D.

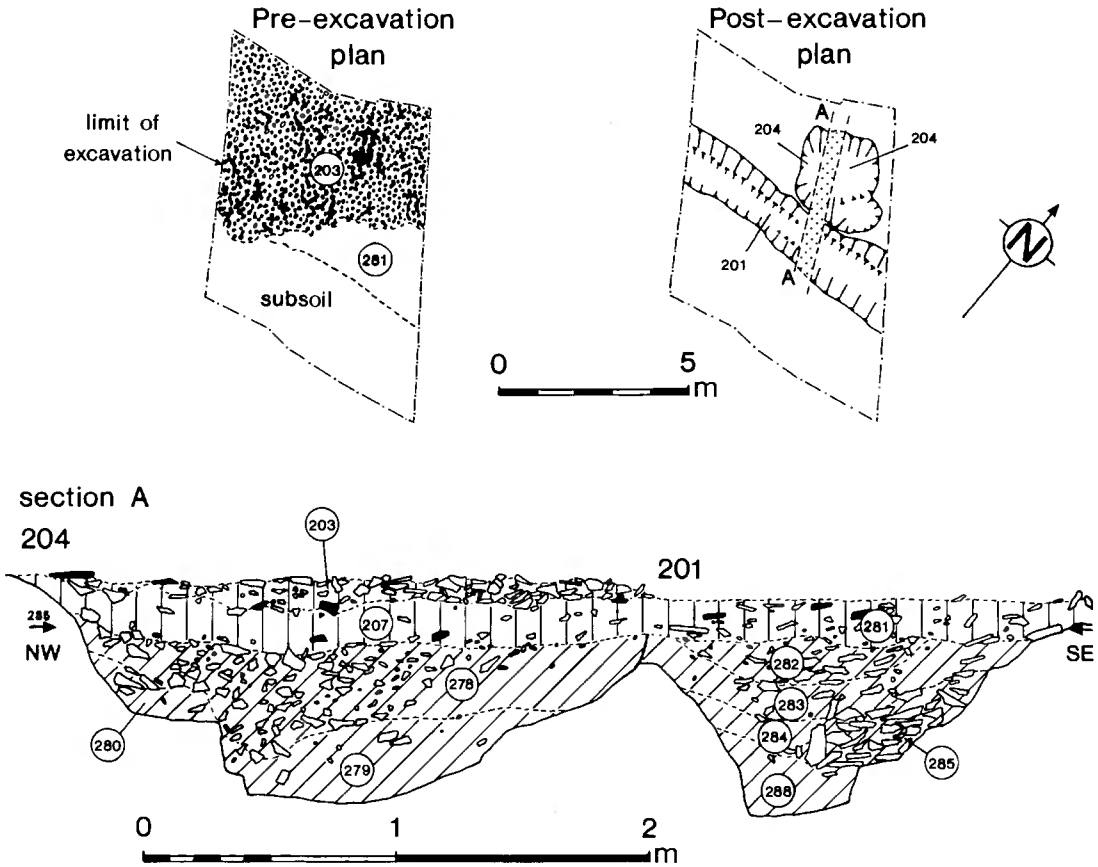

Fig. 9. Area B: plans and section.

Area C

Area C (measuring a maximum of 33 by 25 m) was opened to examine a dense concentration of ground anomalies predicted by geophysical survey. The aerial photographic evidence indicated that this area incorporated the south-eastern corner of the crop mark Enclosure I and a portion of the southern boundary of the adjacent Enclosure III. A plan of all features located during excavation is presented on Fig. 10; a photograph of Area C is presented on Fig. 11.

Ditch C315

An approximately 23-m length of the ditch forming the south-east corner of the crop mark Enclosure I lay within Area C; it was sampled by removing three segments of fill (Fig. 12). The ditch (C315) measured 1.8–2.1 m across and 0.88–1.13 m deep and had an open 'V' profile with a (more or less) vertically-sided flat-bottomed basal cleaning slot. In places the edges of the ditch were very weathered and irregular. All of the excavated segments contained a primary infill of clean, relatively stone-free, redeposited limestone clay (e.g. Section B, C371) up to 0.35 m deep, which filled the basal slot and extended up the lower edges of the ditch. Above was a secondary fill (e.g. Section B, C370) of redeposited limestone subsoil, which was slightly darker in colour than the clay forming the primary fill and contained concentrations of loose

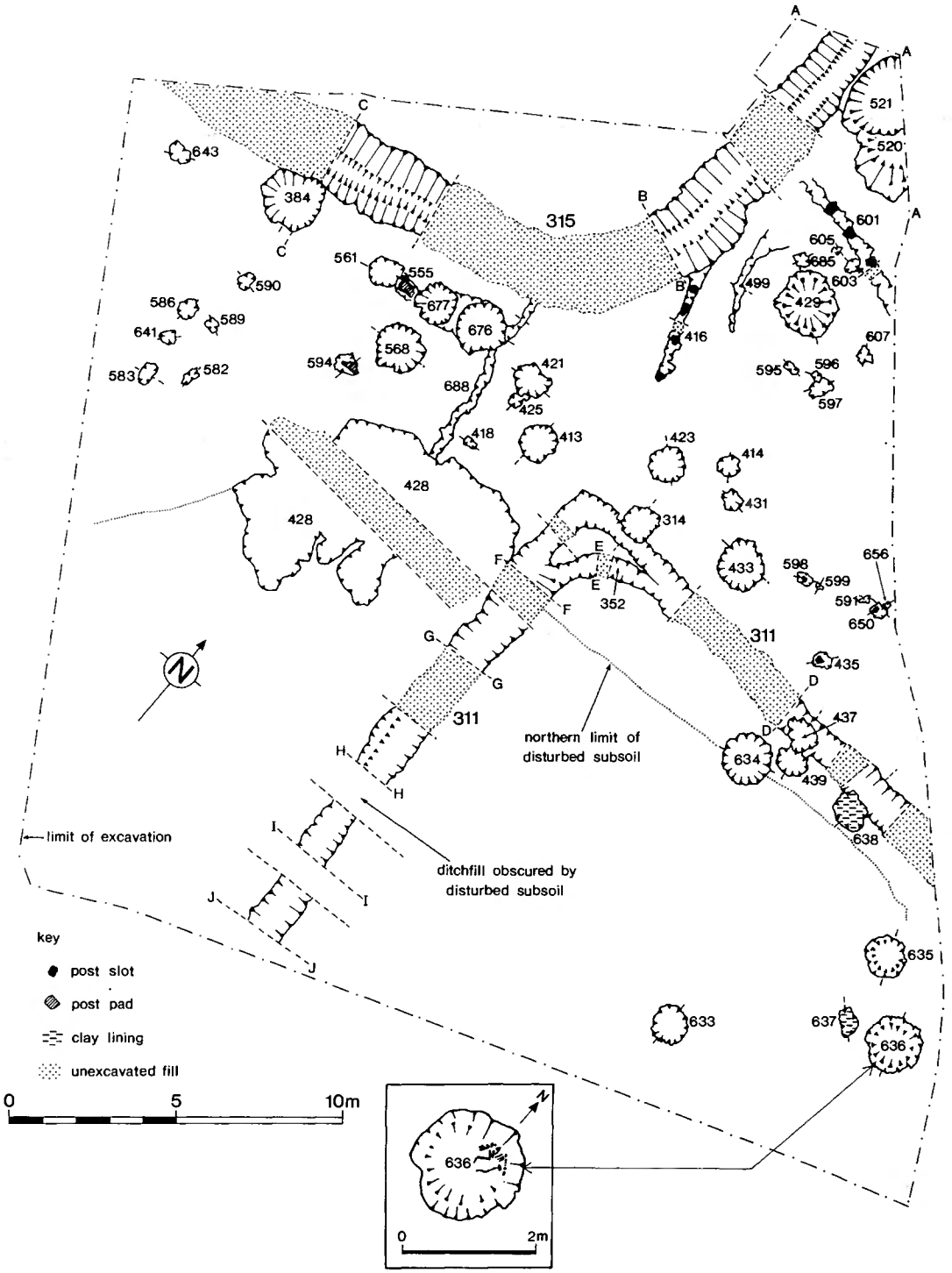

Fig. 10. Area C: plan of all features.

Fig. 11. Area C: general view looking south (photographed by Jon Hoyle for Gloucestershire County Council).

limestones. This deposit may have been partly comprised of material weathered from the edges of the ditch, but the sizes of the stones it incorporated (up to 0.25 m long) suggest tumble from an adjoining bank. The stones were most concentrated on the northern side of the ditch and this may indicate that they had tumbled from an internal bank. The primary and secondary fills of ditch C315 incorporated Middle Iron-Age pottery. The uppermost, tertiary, fills of the ditch were very different in character to the primary and secondary fills. They comprised deposits (e.g. Section B, C368 and C369) of humic dark grey silt up to 0.6 m deep and incorporating large quantities of burnt limestones. These fills incorporated pottery dating to the 1st century A.D.

Features C520 and C521

In the northern corner of Area C features C520 and C521 (Fig. 12) were partly revealed on the limit of excavation. Neither feature was fully defined in plan although both appeared to be approximately circular. The earlier feature, C520, measured *c.* 1.3 m deep and had steep sides descending to a flat base. It was infilled with redeposited limestone clay incorporating many loose chips and blocks of limestone (C500 and C515–18). The width of the feature is uncertain, since after it had become infilled its northern side was truncated by a similar feature, C521. This measured *c.* 2.5 m across and had the same steep sides and flat base as C520. It too was infilled with redeposited limestone clays and stones (C503, C504 and C509–11). Pottery from their lower fills indicated that both C520 and C521 were infilled during the Middle Iron Age; their incomplete plans mean that their functions must remain obscure. Above the stony infill of C521 lay humic dark grey silts (C502 and C395) deposited in the 1st century A.D., which also infilled the top of ditch C315. Above this deposit was C394, a relatively stone-free ploughsoil of unknown date, and this was sealed by modern ploughsoil (C300).

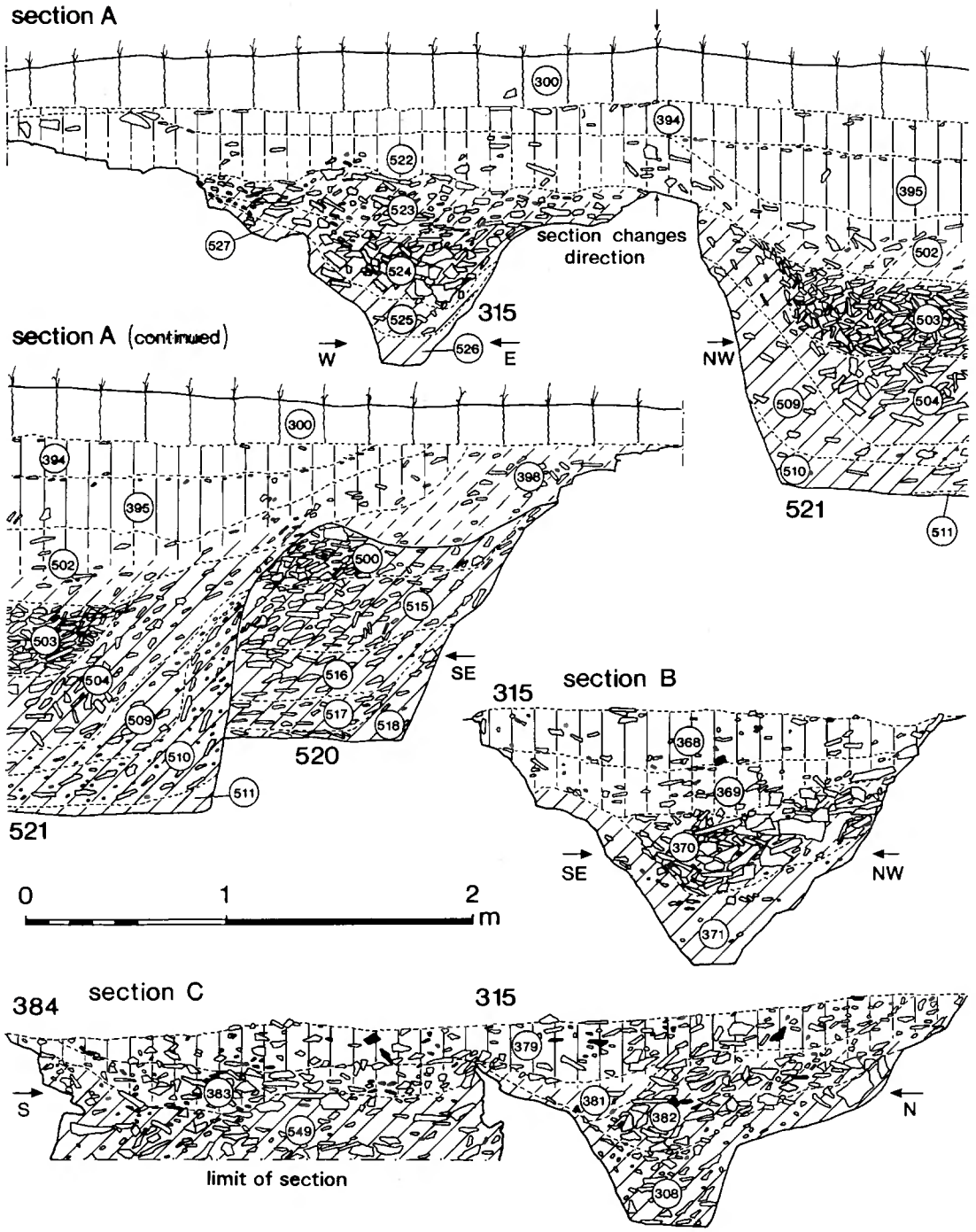

Fig. 12. Area C: sections across ditch C315, pit C384 and features C520/521: all datum reference points = 283 m above O.D.

Area C: the pits

Introduction: method of excavation

South of ditch C315 lay 19 large pits (Figs. 13–14) all but two of which formed part of a linear group aligned approximately NW–SE. The majority of the pits were investigated by removing one half of the fill as a single deposit, recording the section, and then excavating the second half of the fill stratigraphically. This strategy was designed to aid rapid, yet controlled, investigation of the pit deposits. Thirteen of the pits contained upper deposits which arrived much later than their lower and basal fills, the dating being confirmed in each case by finds recovered from securely stratified deposits excavated from the second half of the pit.

Pits: dimensions and forms

The dimensions of the pits are plotted on Fig. 15a. Their average depth was 0.93 m, their average diameter 1.3 m. The average dimensions mask a great variety in size, the smallest pit (C637) measuring 0.32 m deep and 0.9 m in diameter, and the largest pit (C429) measuring 1.48 m deep and 2.03 m in diameter.

Three pit forms—cylindrical, conical, and barrel-shaped—were recognized (located by type on Fig. 16). In addition, two clay-lined pits were present. These are forms observed in assemblages of Iron-Age pits excavated in the county and further afield (see below). Discussion of the forms of the pits is hampered by the fact that they had evidently suffered erosion: the diameters of the pits had been enlarged by weathering of their edges; pit depths had been reduced by the erosion of contemporary ground surfaces resulting from later agricultural activity.

Fourteen pits are interpreted as originally having cylindrical forms, constructed with flat bases, vertical sides, and approximately equal mouth and basal diameters. No pristine example was preserved, but in several cases (C413, C433, C561, C568 and C636) the original diameter appeared to be substantially preserved in the lower, unweathered part of the pit. Using these basal diameters an attempt has been made (Fig. 15b) to restore to the group of cylindrical pits their original diameters. For loss of depth from agricultural erosion, it has previously been suggested by Saville (1979, 136) that *c.* 0.3 m should be added to the vertical dimensions of pits found on limestone subsoil subjected to ploughing. An additional 0.2 m of vertical measurement (0.1 m less than Saville's allowance) is represented by the depth adjustment line shown on Fig. 15b: this indicates that several pits (C423, C633 and C634) are likely to have been more deep than wide when originally constructed.

Using the adjusted dimensions represented on Fig. 15b, two groups of cylindrical pits can be distinguished. Seven larger pits (designated Group 1) demonstrate a narrower size range compared to the seven smaller pits designated Group 2. In Group 1 the depths ranged from 1.12 m (C568) to 1.35 m (C676), the average depth being 1.23 m. Basal and lower diameters were between 0.82 m (C348) and 1.17 m (C676), the average being 0.99 m. Setting aside the shallowest (C568) and deepest (C676) pits of Group 1, there is a marked clustering around a depth of *c.* 1.23 m and a diameter of *c.* 0.92 m. The smaller cylindrical pits of Group 2 had depths ranging from 0.42 m (C439) to 0.87 m (C421), averaging 0.69 m. Basal and lower diameters were between 0.55 m (C421) and 0.98 m (C634), averaging 0.78 m. As Fig. 15b indicates, most Group 2 pits had diameters measuring greater than their depths, whereas Group 1 pits were generally more deep than wide. Interestingly, there is a range of depth (0.87–1.12 m) not occupied by the cylindrical pits of either group. This might indicate that the depth of any pit was not random but deliberately selected in accordance with its intended function. If so, it can be suggested that the larger pits assigned to Group 1 functioned differently from those of Group 2.

Pits C429 and C677 are best described as conical, having wide mouths and inwardly-sloping sides. The more certain example, C429, stood apart from the linear group of pits (Fig. 16) and its depth (1.48 m) and diameter (2.03 m) were well in excess of any other pit (Fig. 15a). This pit lay asymmetrically within a circular arrangement formed by a number of stake/post settings and a gully (described below), but there can be no certainty that the pit and the circular structure were contemporary and related. Pit C677 had a profile similar to pit C429 but was shallower (1.1 m), and it lay within the linear pit group, being contiguous to the cylindrical pit C676.

A single example of a barrel-shaped pit, C314, was present: its mouth and basal diameters (*c.* 1.02 m) were approximately similar, but it had bowed sides. The form may not be intentional, for the apparent

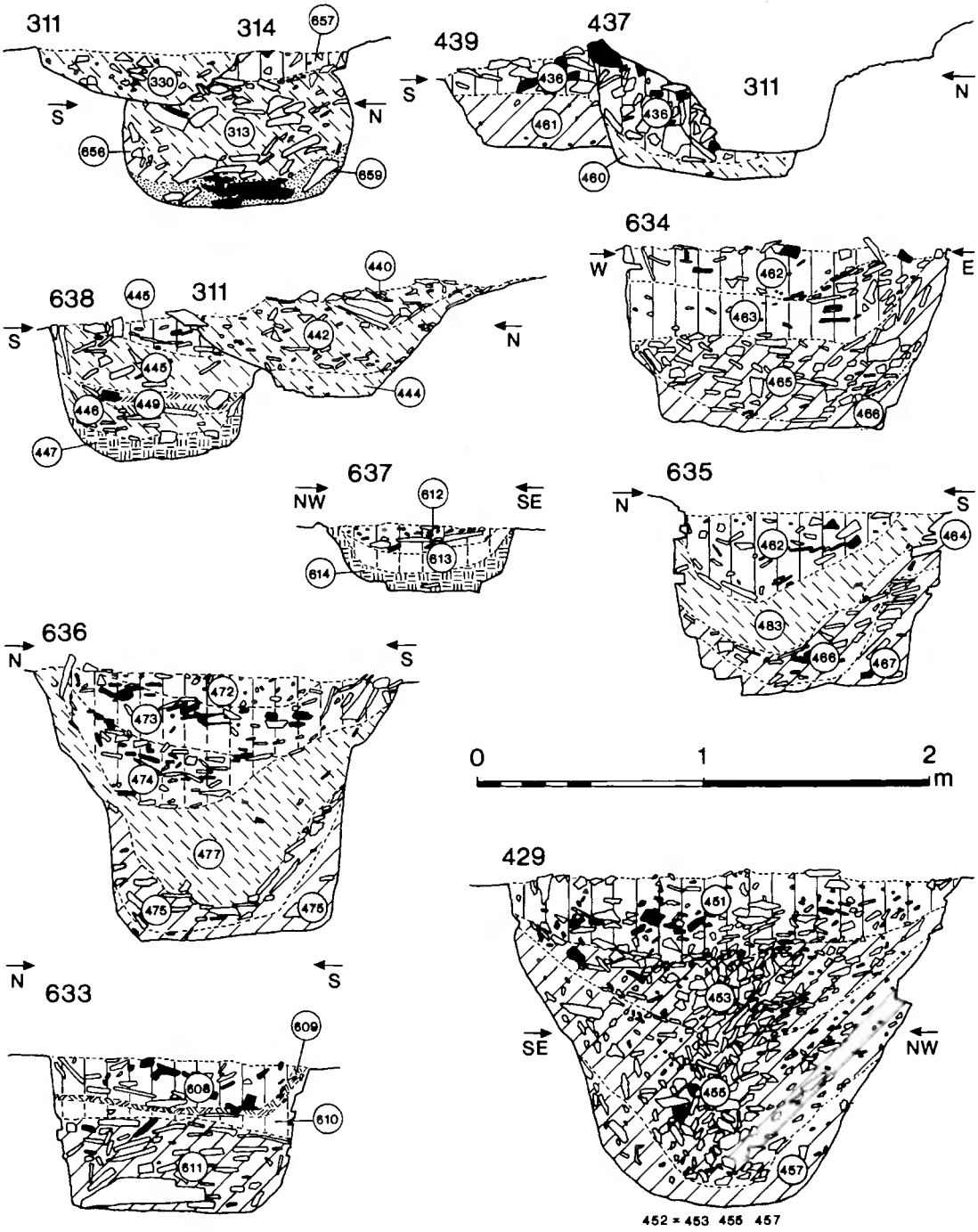

Fig. 13. Area C: sections across pits (southern sector of pit group and pit C429): all datum reference points = 283 m above O.D.

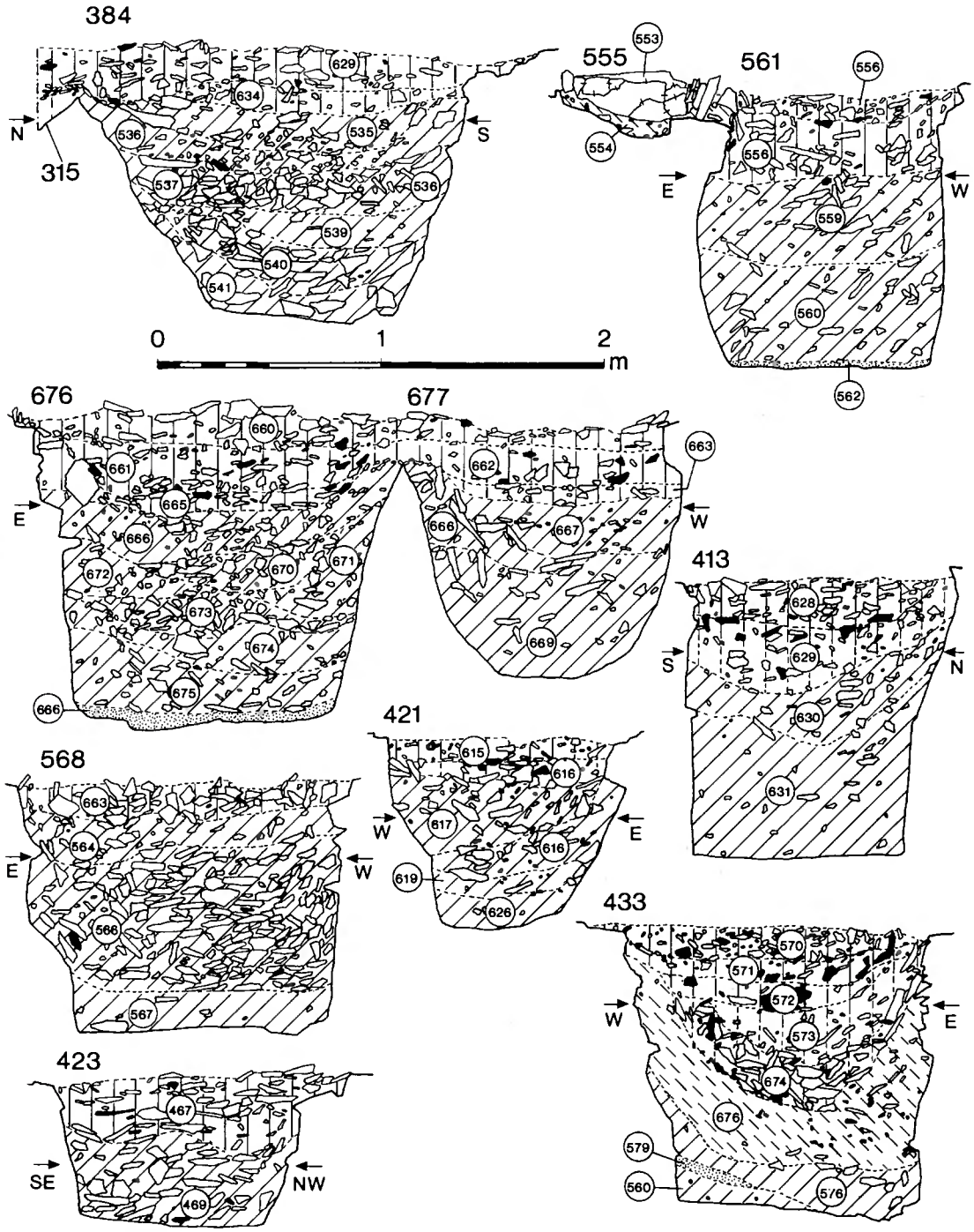

Fig. 14. Area C: sections across pits (northern sector of pit group): all datum reference points = 283 m above O.D.

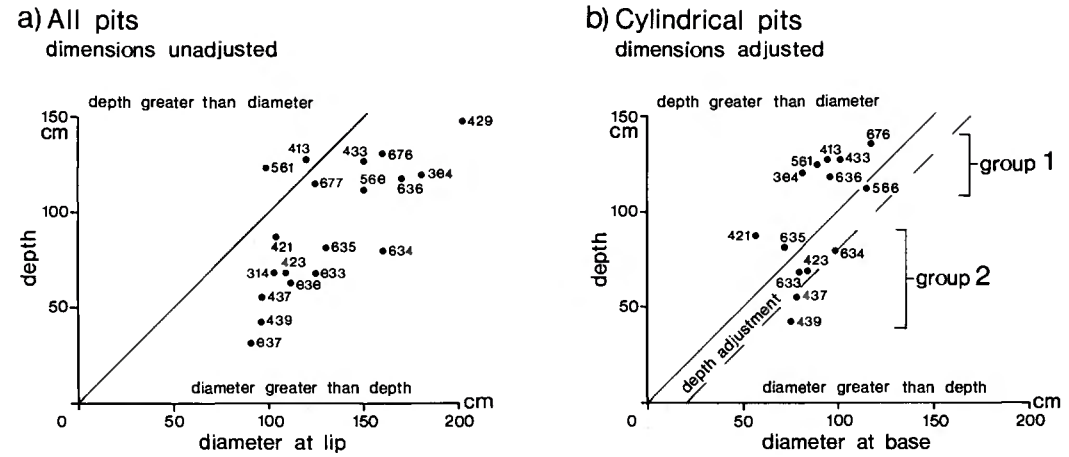

Fig. 15. Area C: graphs showing: (a) dimensions of all pits; (b) adjusted dimensions of cylindrical pits.

undercutting could have been caused by natural weathering of a cylindrical form. If originally cylindrical, its depth (0.68 m) would place it amongst the smaller Group 2 pits.

Two pits with clay linings were present. Pit C638 was comparable in size with the smaller cylindrical pits, but its profile was rounded and it had an irregular base designed to support and key-in the clay forming the lining. The lining was preserved as a 0.1-m-thick layer of clay adhering to the base and lower wall of the pit. The second pit, C637, was rectangular in plan (0.9 by 0.54 m) and very shallow (0.32 m deep). At its base was a notch, measuring 0.06 m deep and 0.42 m across, which may also represent a device to key-in its clay lining.

There would appear to be some correlation between pit form and spatial distribution (Fig. 16). The outlying pit C429 had an unusual size and conical form. Four pits at the northern end of the linear scatter (C384, C561, C568 and C676) were deep cylindrical pits assigned to Group 1, while the nearby pit C421, although assigned to Group 2, had much the same depth/basal–diameter ratio as its Group 1 neighbours. Of the seven Group 1 pits, only C636 was located at the southern end of the linear scatter where the Group 2 pits and the clay-lined pits were concentrated.

Pits: infills

Three types of deposit found in the lower portions of the pits are interpreted as accumulations deposited rapidly following disuse of the pits as storage containers during the Middle Iron Age. In three pits a charred organic material was present as a primary deposit. Pit C561 had only a smear of charcoal on its base but pits C676 and C314 had a charcoal-rich, dark-brown silt. In pit C314 this deposit (C659) was up to 0.15 m thick and it incorporated several large burnt limestones. The organic basal deposits were atypical, however, for most pits (setting aside the clay-lined examples) had basal and lower infills composed of redeposited clay derived from the natural subsoil. These deposits were often largely stone-free at the base, but incorporated various concentrations of limestones higher up. The stones ranged in size from chippings to large blocks and they were sometimes deposited loose without any surrounding clay matrix. The largely stone-free clays found at the very base of some pits (e.g. deposits C578–80 in pit C433) may represent material weathered from the edges of the pit. Some of the stonier material could also have arrived in this way but the large quantities present in many pits suggests a deliberate partial backfill, perhaps with spoil created during the construction of neighbouring pits. This interpretation is reinforced by the sizes of some of the stones concerned. In pit C633, for example, a large limestone block (visible in section: Fig. 13) must have been deliberately thrown-in. Three pits (C433, C635 and C636) did not contain significant quantities of stony material, but instead incorporated secondary fills of dark yellowish-brown, clayey silts incorporating very few stones (contexts C576, C483 and C477 respectively). These may represent deposits of naturally

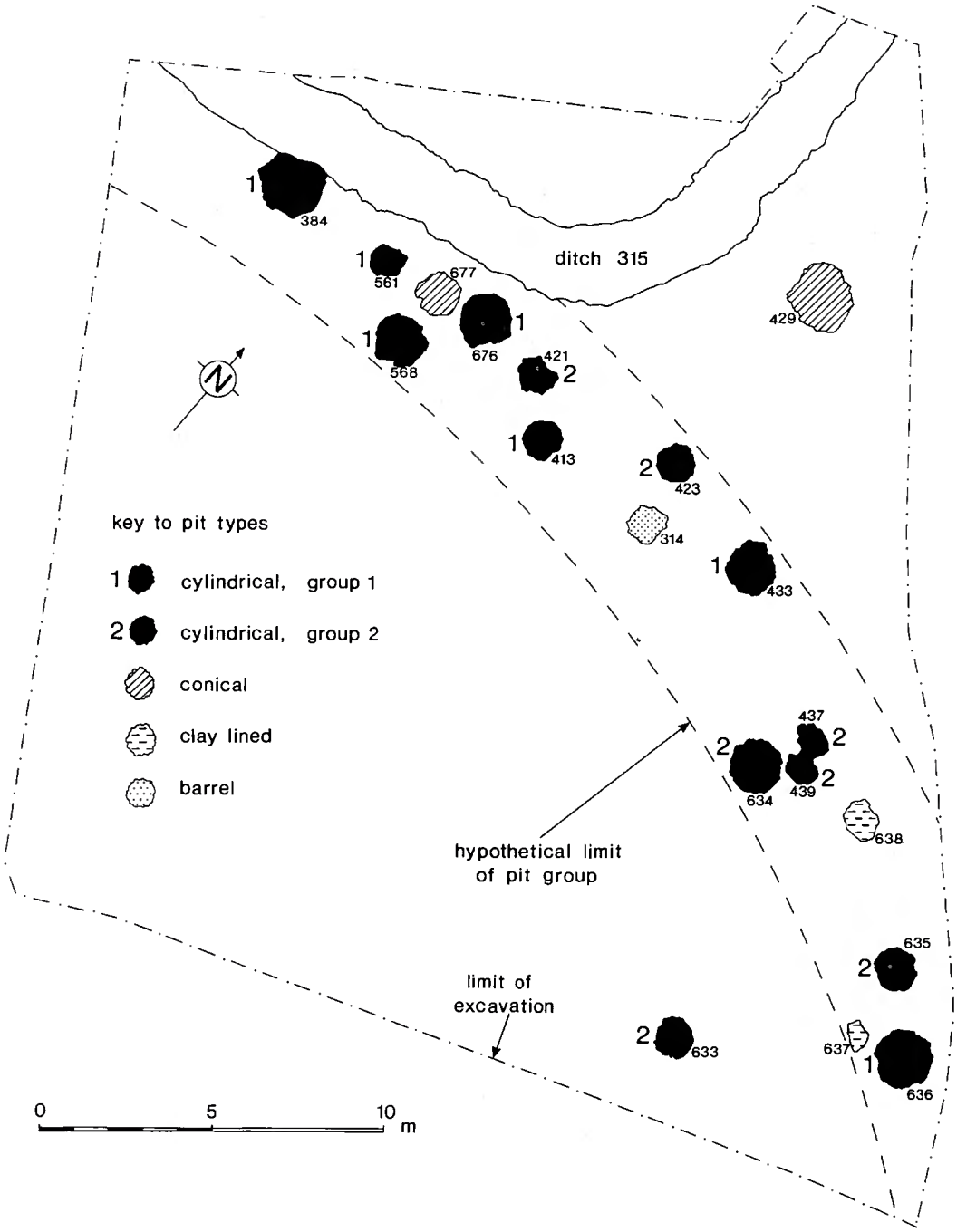

Fig. 16. Area C: interpretative plan of pit group.

accumulating silt, although the presence of a complete articulated dog skeleton within context C477 (not visible in section; located in plan on inset, Fig. 10) might imply the contrary, since it seems likely that this was deliberately thrown into the pit. The basal and lower deposits described above incorporated a quantity of domestic refuse, principally Middle Iron-Age pottery and animal bone, and the pits appear to have served a secondary use as repositories of rubbish.

The uppermost fills of the pits were quite distinct from the lower and basal fills. Typically, these were humic dark grey silty deposits incorporating copious fragments of small limestones burnt blue or red. In some pits fine textural differences suggested the presence of several layers. The significance of these apparent contextual divisions is uncertain, for the composition of each layer was similar, if not identical. The depth of the upper fills varied considerably. In pits C421 and C429, for example, only *c.* 0.2 m was present. Within the pits containing a silty, secondary fill described above the uppermost fills (e.g. pit C433, contexts C570–4) were present in quantity.

Although the upper pit fills appeared similar in character, there is evidence to suggest that three episodes of infilling occurred. One pit, C439, was backfilled in advance of the construction of pit C437, presumably when the group of pits functioned during the Middle Iron Age. Five pits, C314, C437, C634, C635 and C638, comprised a distinct group which were cut by, or located in close proximity to, ditch C311. They appear to have been backfilled in preparation for the construction of the ditch and an accompanying bank. The dating evidence recovered from their upper fills (which gives a *terminus post quem* for the construction of ditch C311) suggests that they were backfilled in the Middle Iron Age. The upper fill of pit C437 contained no finds; the upper fill of pit C635 incorporated only pottery of Middle Iron-Age type. The majority of the sherds from the upper fills of pits C314, C634 and C638 were also Middle Iron Age, but these fills also each incorporated a few small fragments of pottery dating to the 1st century A.D. However, the amounts involved were minuscule, amounting to three sherds weighing 10 gm from pit C314 (context C657); two sherds weighing 7 gm from pit C634 (context C463), and two sherds weighing 2 gm from pit C638 (context C445). It is surmised that these late sherds were introduced by modern ploughing.

Thirteen pits had upper fills which incorporated large quantities of pottery and other finds dating to the 1st century A.D. (i.e. pits C633, C636 and C637 to the south of ditch C311; pits C384, C413, C421, C423, C429, C433, C561, C568, C676 and C677 to the north of ditch C311). The pottery (622 sherds weighing 3539 gm) is characterized on Table 4: aside from a quantity of (residual?) Middle Iron-Age pottery the range of fabrics is characteristic of the mid–late 1st century. Since typologically late pottery was found stratified within the lowest layers of the upper fills, the evidence is against the material accumulating gradually within the pits over a period of time. Instead, it would appear that the pottery was mixed together (perhaps in a midden) before the introduction of the deposits as backfills into the pits around the end of the 1st century A.D.

Pits: function

Pits of the type found on Area C at Birdlip are common elements of Iron-Age settlements in southern England. There is a general consensus that the majority were utilized for the storage of foodstuffs, principally grain. The first detailed analysis of pit form and function was undertaken by Bersu (1940). Subsequently, different interpretations have been put forward (Ellison and Drewett 1971; Evans 1982), but experimental work has tended to confirm the postulated grain storage function, since all sizes of pit are capable of storing grain for considerable periods of time if properly sealed (Bowen and Wood 1967; Reynolds 1974). In addition, experimental work has suggested that pit form was an important contributor to the preservation of the foodstuffs stored (Reynolds 1974, 126–7).

The majority of the pits at Birdlip conform to Bersu's small and large cylindrical forms (A and C). Analyses of pit assemblages from sites such as Gussage All Saints, Wiltshire (Jefferies 1979), and Danebury, Hampshire (Whittle 1984), have amalgamated Bursu's cylindrical forms, since both sites produced a continuum of pit sizes difficult to separate functionally, although Whittle (1984, 131) pointed out that it was not easy to interpret pits at the upper and lower end of the cylindrical dimension range as functioning identically. The problem of function is related to the cylindrical form itself. Reynold's work (1974, 126–7) established that cylindrical pits are among the *least* efficient for grain storage, since considerable wastage

results from contact of grain with the seal at the mouth of the pit. Pits with constricted mouths (Bersu's bell, barrel and beehive forms) would, therefore, appear to be more suitable for grain storage.

For cylindrical pits, the depth/diameter relationship would appear to be crucial if grain was the item intended to be stored. At Birdlip the depths of the cylindrical pits exceeded the diameter in at least eight out of fourteen examples (Fig. 15b). While this ratio appears to be significant there was some other factor present at Birdlip, since the cylindrical pits divide into two groups. For the larger pits of Group 1 a diameter less than depth is consistently found. In contrast the smaller pits of Group 2 are ranged near the depth/diameter median, and their diameter seems less important than the fact that all were (as excavated) below 0.9 m in depth.

Of the types of pit identified by Reynolds as being most efficient for storage only a single example of a barrel form (Bersu's type F) could be recognized (pit C314). The barrel form could not be defined as a separate entity at Danebury (Whittle 1984, 130), and as noted above the example at Birdlip could represent a weathered cylindrical pit.

Some of the Birdlip pits are not types normally associated with food storage. Clay-lined pits such as C637 and C638 have been interpreted as water containers, and some as clay-puddling pits associated with pottery manufacture (Ellison and Drewett 1971). A link with clay-puddling has also been suggested for some conical pits (Ellison and Drewett 1971, 184): at Danebury a total of five such pits (out of over 1000 examples) were similarly interpreted (Whittle 1984, 244).

Ditch C311

Cutting east to west across the line of the pits was a linear boundary, ditch C311 (Fig. 17), equivalent to the southern boundary of the crop mark Enclosure III. Not predicted by the crop mark evidence was a

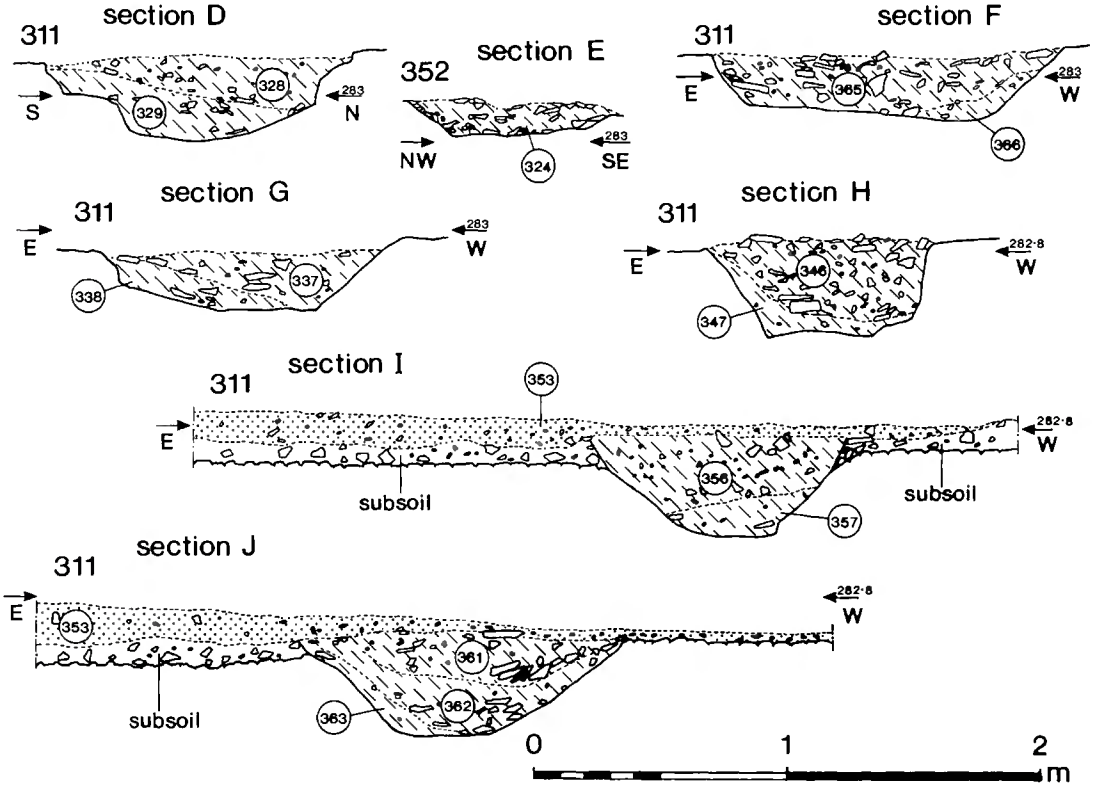

Fig. 17. Area C: sections across ditch C311.

southward return of the ditch which ran for 16 m and continued beyond the southern limit of excavation. The southern portion of the ditch was sealed by a compact layer of disturbed subsoil formed by modern ploughing (Fig. 17, sections I and J), and this may explain its absence from the crop mark record.

Ditch C311 was sampled by excavating seven segments of fill. The ditch measured a maximum of 1.35 m wide by 0.4 m deep, and in most segments had steeply-sloping sides descending to a flattish base. The angle of the return of ditch C311 was demarcated by two apparently contemporary narrow ditches (the smaller one designated C352), for no evidence for intercutting could be observed at this point.

In all segments the fill was a uniform dark brown clayey silt, incorporating varying quantities of medium and small-sized limestones. Most baulk sections offered some slight textural evidence for layering, but these apparent divisions were usually suggested by stone densities rather than soil colour or texture: the homogeneity of the fill might suggest that it was deposited as backfill.

The fills of ditch C311 incorporated an assemblage of pottery dating to the 1st century A.D. The composition of this assemblage was very similar to the pottery of the same date found within the upper fills of thirteen of the storage pits, ditch C315 and features C520/521 (Table 4). However, a date of construction for ditch C311 is suggested by its stratigraphic relationship with the pits (C314, C437 and C638) cut by its construction, which appear to have been backfilled when only Iron-Age pottery was current, and therefore at some point during the Middle, or possibly Late, Iron Age. In addition, only pottery of Iron-Age type was found securely stratified within pits C634 and C635 to the immediate south of ditch C311, the evidence suggesting that these pits too were backfilled before being covered by a bank accompanying the ditch, and this is the basis for the bank postulated on Fig. 19.

Area C: other features

Approximately thirty small features interpreted as pits, post/stake settings, post-pads and foundation gullies were present on Area C (Figs. 10 and 18). The distribution of these features appeared to coincide with the presence of a hard, stony subsoil characteristic of the northern part of Area C: to the south of a natural division (plotted on Fig. 10), the subsoil was less stony with more clay and had evidently been eroded more deeply by ploughing. Indeed, immediately south of the natural division between the hard and softer subsoils was an irregular hollow (C428) measuring up to 7.5 m wide by 0.4 m deep and interpreted as a discrete area of modern plough disturbance. The upper fill of the hollow (C531) contained abraded pottery and fragmentary copper-alloy and iron objects, apparently introduced by ploughing. The evidence suggests, therefore, that the apparent concentration of small features in the northern part of Area C may not be spatially significant.

A group of stake/post settings (C595–7, C603, C605, C607 and C685) appeared to form a circular structure around the Iron-Age pit, C429, the arrangement being continued on the north-west side by a curving gully (C499). To either side of the circular structure were two linear gullies (C416 and C601) incorporating slots for posts or stakes. The gullies are firmly dated to the Roman period (see below). It is possible that the circular structure was contemporary and related with the gullies, and that the apparent relationship with the pit is coincidental.

To the south of the features described above was a cluster of features. Three large post-holes (C435, C598 and C650) had a slot cut into their base and appeared to form an equilateral triangle with sides of *c.* 2.4 m. Perhaps related were three small post/stake settings (C591, C599 and C656). Nearby were two small pits (C414 and C431).

In the western part of Area C two staggered lines of three post-holes spaced *c.* 1.7 m apart were apparently aligned N–S, and parallel with each other. The post-holes in the eastern line (C582, C589 and C590) were generally smaller and more irregular in plan than those in the line to the west (C583, C641 and C586). Another structural arrangement some 3 m to the east appears to be represented by two features containing large blocks of limestone (C555 and C594), set 2.2 m apart and interpreted, tentatively, as post-pads. These two groups of features were aligned parallel with one another, and some relationship may be suspected. A narrow gully (C688) was similarly aligned close to ditch C315's return.

Dating evidence for the features described above was generally poor. Features C431, C582, C583, C597 and C607 incorporated a few small and abraded sherds of Iron-Age pottery: the character of this material

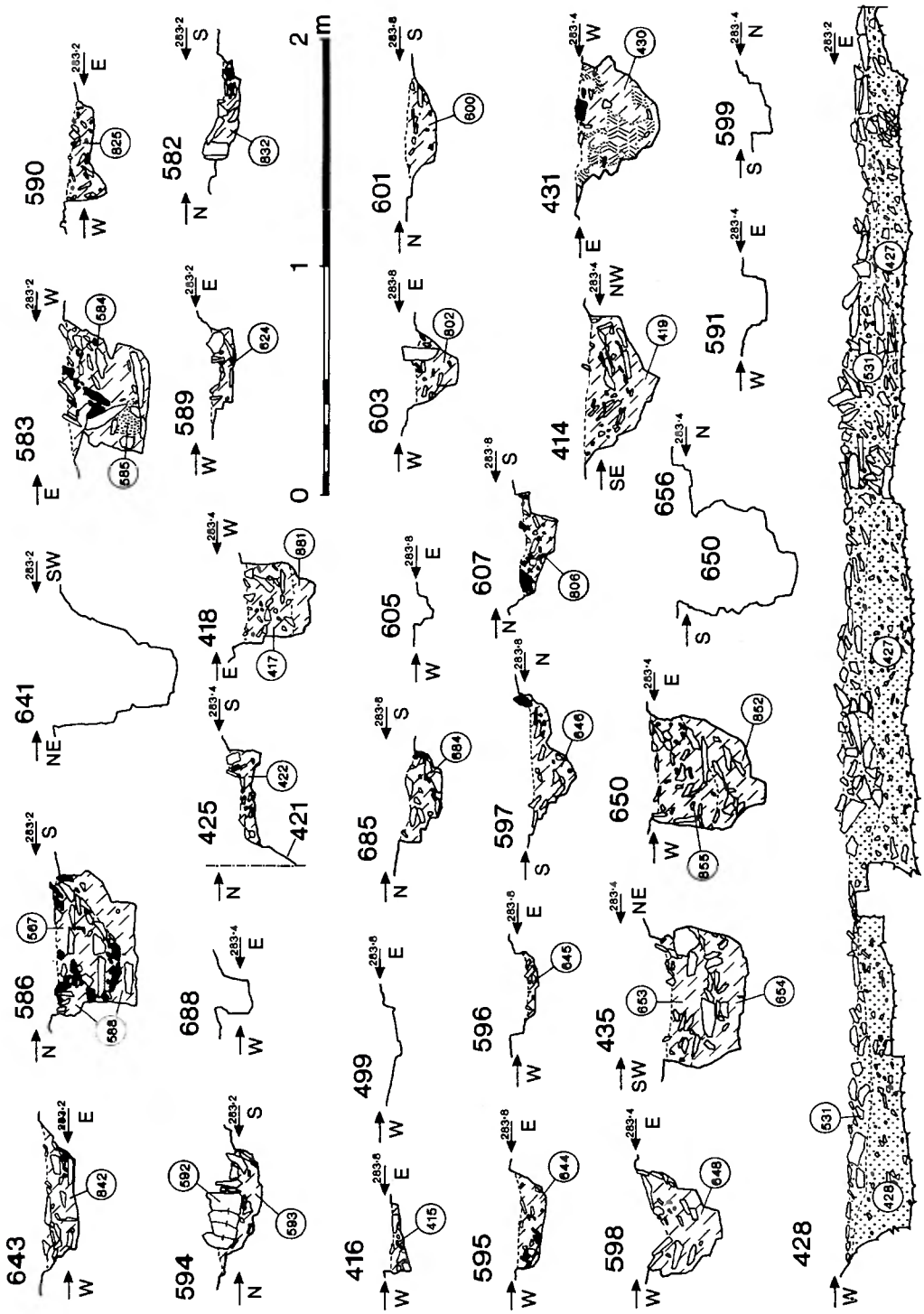

Fig. 18. Area C: sections across stake/post settings, gullies and hollow C428.

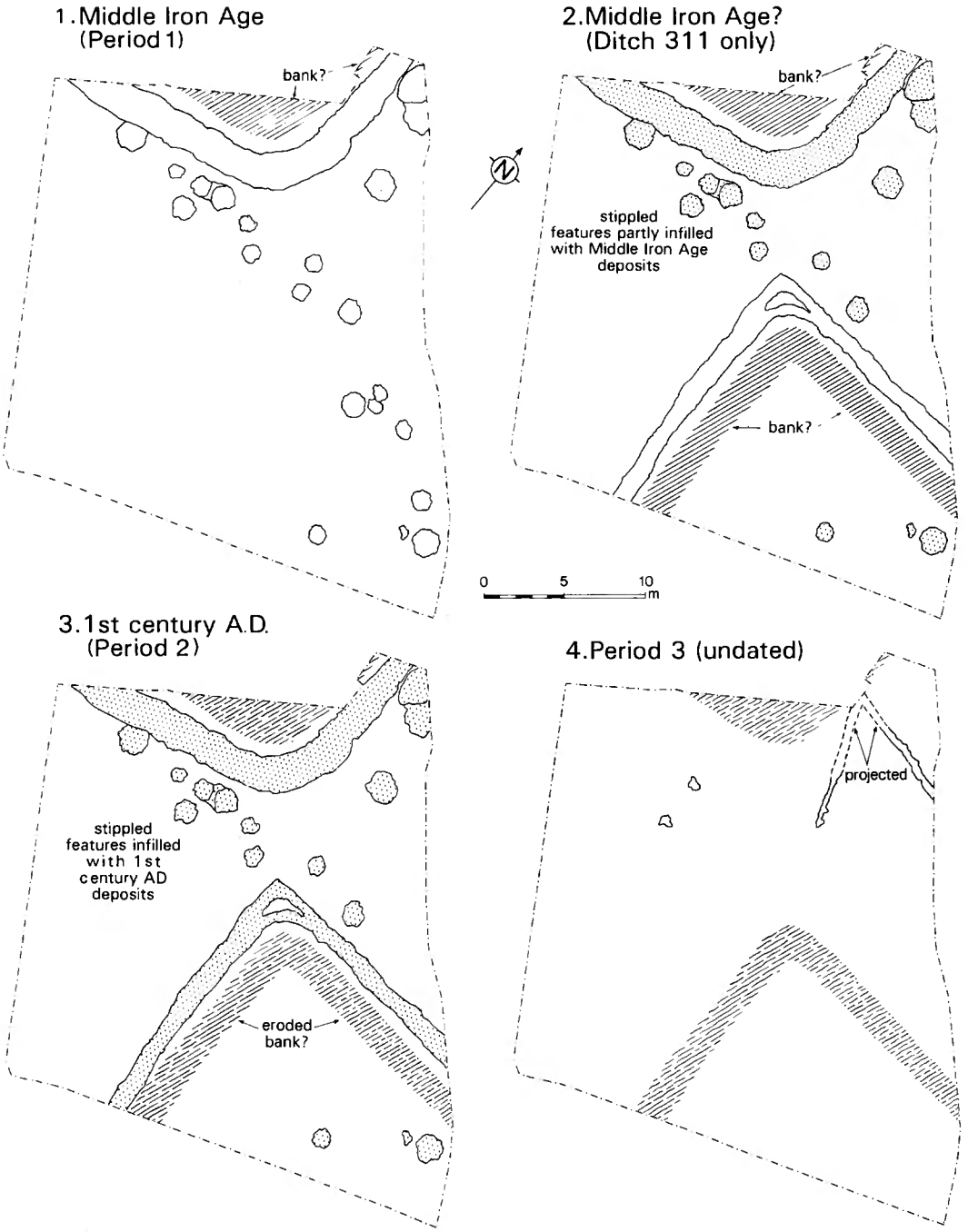

Fig. 19. Area C: interpretation of development.

suggests that it may be residual and unrelated to the date of origin of the features concerned. Two gullies, C416 and C601, and one pit, C643, incorporated sherds of the 1st century A.D. All other features produced no finds. Stratigraphic relationships indicate that at least three of the features cannot have been constructed before the end of the 1st century A.D. The suspected post-pad C555 was cut into the upper fill of pit C561 (Fig. 14); this can be presumed to provide a date for the similar post-pad, C594. Gullies C416 and C601 were cut across the upper fill of ditch C315. The stratigraphic evidence indicates some re-use of the area (designated Period 3 on Fig. 19), of uncertain character and date. Whether any other of the small features was contemporary with this activity must remain uncertain.

Area C: dating and discussion

An interpretation of the development of Area C is illustrated on Fig. 19. Ditch C315, features C520 and C521, and the group of 19 large pits contained lower and basal fills in which only pottery manufactured in the Middle Iron-Age tradition was present. This dating is consistent with radiocarbon dates obtained from samples of animal bone incorporated in three of the lower pit fills. These indicate (at the two sigma range: Table 5) a date of deposition at some point during the 4th–2nd centuries Cal B.C. A further indication of date for a Period 1 context was supplied by a glass bead recovered from a lower fill (C477) of pit C636; its period of manufacture is placed in the 2nd, or early 1st, century B.C. (Henderson below).

No stratigraphic evidence was present to indicate which of the Period 1 features was constructed first. Where feature C520 and pit C384 adjoined ditch C315 (Fig. 12) the sections did not demonstrate the construction sequence and proved only that their upper fills were contemporary. However, the temporal relationship of the pits with ditch C315 may be indicated by the arrangement of three pits (C561, C676 and C677), since these formed a row positioned parallel with the edge of the ditch, as if respecting it. The primary construction of ditch C315 may, therefore, be thought likely even though conclusive proof was not recovered.

No trace of a bank accompanying ditch C315 was observed. The absence of any feature on the north side of the ditch and the presence of the pits adjacent to its south and east side strongly suggest that a bank was once present on the ditch's northern (i.e. internal) edge. This supposition is also supported by the large stones found incorporated within the fill of the ditch: their positions suggest that they tumbled from an internal bank.

No evidence for any domestic focus of occupation belonging to Period I was found. The interior of Enclosure I was examined during investigation of Area A but no certain Iron-Age features were defined there. However, Area A was found to be severely plough-eroded and this could explain the absence of small structural features indicative of domestic occupation. Alternatively, such features may have lain in the internal areas of Enclosure I that were not examined by excavation.

The arrangement of 17 of the storage pits in an apparently linear grouping is of some interest. The arrangement suggests that the pits were constructed in an area delimited by boundaries, although no evidence for such boundaries was found. Hypothetical boundaries are postulated on Fig. 16, which suggests that the group of pits occupied a *c.* 4-m-wide space curving W to SE across the area. If correctly interpreted, the apparent regularity of the arrangement would imply that there was a need to separate the pit group from functionally distinct areas to either side.

Considering the Period 1 features as a group there is little evidence to indicate the period of time over which these were constructed and used. The square-profiled slot at the base of ditch C315 implies that this was periodically cleaned out: the excavated fill of the slot presumably represents the last in a series of such deposits. Experimental work suggests that individual storage pits would not normally be in use for more than a few decades (Reynolds 1974). However, while

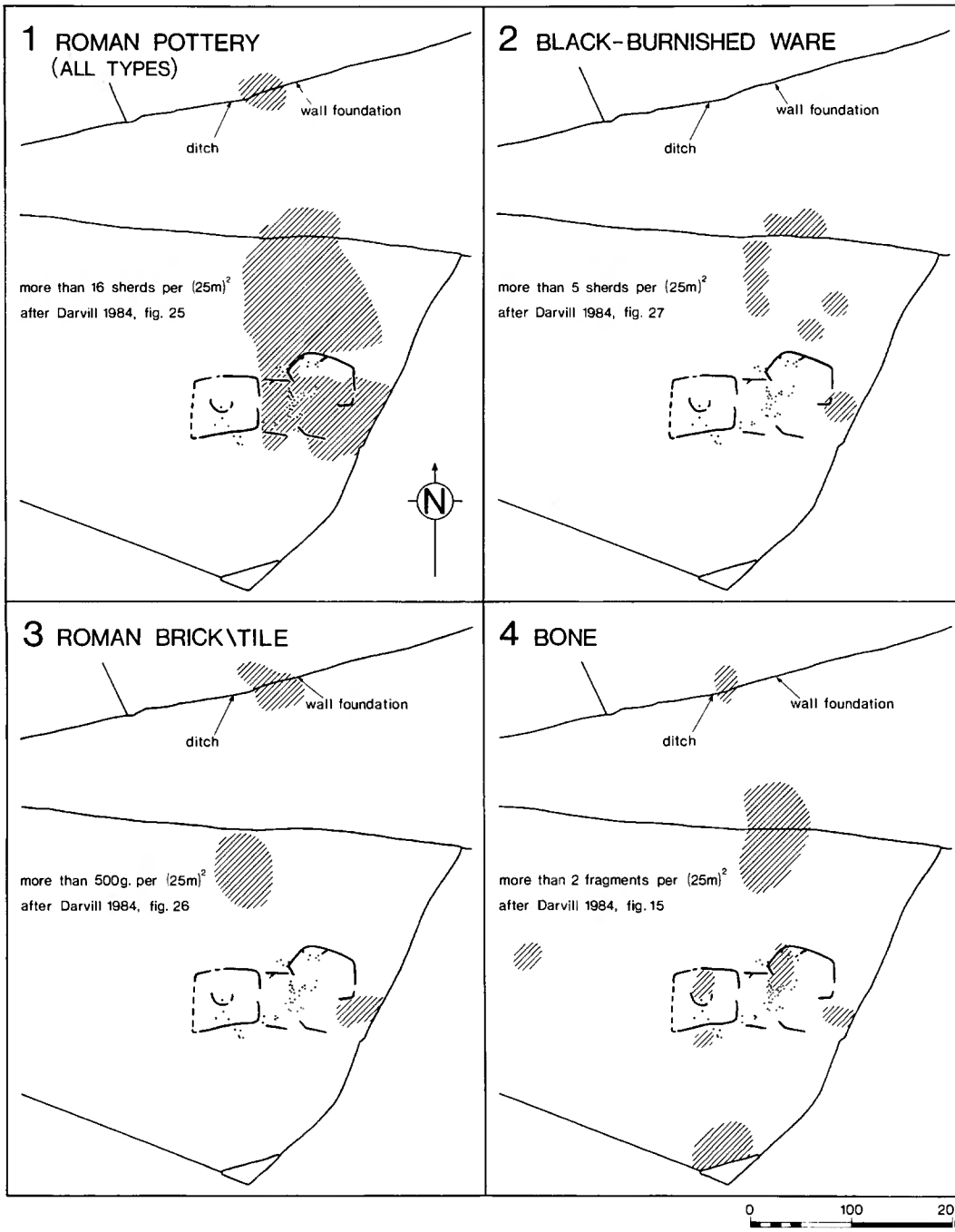

Fig. 20. Site 3: relationship of site to selected categories of surface finds recovered during fieldwalking in 1983–4.

the linear grouping of the pits indicates broadly contemporary use the intercutting of pits C437 and C439 indicates that individual pits within the group were in use at different times.

The evidence relating to the infilling of the Period 1 features indicates that these were disused and lay partly open for a lengthy period. Indeed, the radiocarbon dates obtained from the pits indicate that they functioned no later than the middle of the 2nd century B.C., and that several centuries elapsed before their final infills arrived late in the 1st century A.D. In addition, the presence of the open pits at a time when ditch C311 was in existence suggests there was no activity relating to the ditch occurring within the area during this time. On this evidence it can be argued that ditch C311 is closely related in date to the Period 1 features, and that it represents an enclosure added during the Middle Iron Age, with the settlement being abandoned soon after it was constructed.

However, it must be acknowledged that the evidence for a lengthy abandonment of the Period 1 features and ditch C311 is problematic, if only because it is difficult to believe that they could have remained open for so long without filling-up, whether naturally with rain-washed and wind-blown soil, or with material deriving from later activity in the locality. In addition, there can be no certainty that ditch C311 belongs to the Middle Iron Age, for the stratigraphic evidence indicates only that it originated before the introduction of early wheel-thrown pottery to the region. This would allow a date of construction for ditch C311 within the first half of the 1st century A.D. (on the basis of the earliest date currently accepted for the introduction of such pottery to the region: Timby 1990). To sum up, there are some aspects of the stratigraphic sequence which cannot easily be explained.

No features excavated in Area C are assigned to Period 2, which is represented by the final infills of the Period 1 features and the fills of ditch C311. These deposits are interpreted as backfills dumped in a single operation around the end of the 1st century A.D. Evidence to support this interpretation comes from the composition of the pottery incorporated in the various Period 2 deposits (Table 4), since these contained similar assemblages with typologically late sherds not current until the end of the 1st century mixed with earlier wares. The dumping may represent an operation to level uneven ground within and around the earlier features and implies a reuse of this area perhaps related to the few undated features assigned to Period 3. Such activity may also be represented by the sequence obtained in Area B, where a pit and a cobbled surface were constructed over the Period 1 enclosure ditch. However, the finds from these features were indistinguishable from those incorporated in Period 2 deposits and they are, tentatively, also assigned to Period 2.

The location of the settlement from which the Period 2 deposits derived is uncertain. However, because the deposits incorporated material spanning the mid–late 1st century but did not arrive until the end of that period, it can be argued that the focus of any settlement must have lain some distance away from the areas examined by excavation. Some information relevant to the possible location of 1st-century settlement may be provided by the surface find scatters recovered during fieldwalking undertaken in 1983 and 1984 (Darvill 1984). The distributions of selected surface finds are shown on Fig. 20, plotted at densities which appear to relate meaningfully to the crop mark and excavated evidence. Pottery of the 1st century formed part of the surface assemblage assigned to the Roman period. At the density selected for illustration (Fig. 20.1), there is a suggestion that the distribution of the Roman pottery was related in some way to the eastern boundary of Enclosure I, as though this feature was preserved (as a bank?) well into the Roman period. On this evidence Enclosures II and III may also have had recognizable boundaries during the Roman period, especially since the southern limit of the pottery scatter appears to relate with the southern limit of Enclosure III. In addition, there is some evidence to indicate that Roman settlement was located away from the enclosures. Among the latest

artefacts found in the Period 2 deposits was Dorset black-burnished ware pottery which probably did not reach the area until the late 1st or early 2nd century. Its surface distribution (Fig. 20.2) provides strong evidence for the presence of three foci of domestic occupation located to the east and north of the enclosures, and the presence of such foci appears to be confirmed by the distribution of brick/tile (Fig. 20.3) at the same locations. One or more of these foci is, therefore, a likely source of the latest finds incorporated within the Period 2 deposits. What must remain uncertain is whether the early wheel-thrown pottery found in the Period 2 contexts also derived from these areas.

Investigation in Area D: Observations During Road Construction

To conclude the description of the excavations at Site 3 the results of minor episodes of work undertaken in Area D and during the watching brief maintained during the early stages of construction should be noted.

To the south of Site 3, Area D was excavated to investigate a linear ground anomaly predicted by geophysical survey. The anomaly was found to be natural in origin, deriving from the division formed by limestone subsoil with a layer of colluvium. This approximately corresponded with the 280-m contour, and the colluvium (up to 0.65 m deep in the area examined) infilled a dry valley south of this point.

A watching brief during the commencement of road construction began in February 1988 when those areas not investigated by excavation were stripped of topsoil by machine scrapers and bulldozers. The subsoil exposed during this process rapidly became churned by the tracks of machines and it was found difficult to identify archaeological features in plan. Better results were achieved by observing the excavation of drainage ditches flanking the new carriageway, where archaeological features could be seen in section. This work identified the ditch forming Enclosure I, where this was cut across by the drain on the western edge of the road. Few discrete features such as pits or postholes were visible, although on the eastern side of the road, *c.* 7 m north of Area B, two pits (WB700 and WB706: neither illustrated) were found in close proximity to one another. They were similar in dimension to the storage pits found during excavation in Area C, and they incorporated pottery and other finds dating typologically to the Middle Iron Age. The presence of such features is of some interest since they provide evidence for another area on the periphery of Enclosure I which was occupied by pits dug for storage purposes.

General Discussion of the 1987–8 Excavations

The early prehistoric period

Within the areas examined by excavation at Site 3 one feature, pit A12, can be assigned to the Middle Bronze Age on the evidence of pottery (Woodward below) and a radiocarbon date (Table 5). The spatial relationship of the pit with ditch A29/142 suggests that the two features were related. Evidence for the date and function of ditch A29/142 is weak, since no artefacts were recovered from it. However, a suggestion of date is provided by the archaeo-botanical assemblage recovered from A29/142, which is of a type characteristic of the Late Neolithic or Early Bronze Age (Straker below). In addition, it may be relevant to note that the majority of struck flint was found in Area A (Table 1): although much of the material was unstratified its presence may allude to an area of early prehistoric activity. On these grounds, and taking into consideration the ditch's penannular form, it is conjectured that the most likely interpretation of A29/142 is that it represents the ploughed-down remains of an early prehistoric ritual or funerary monument. The Birdlip area is rich in archaeological sites of the early prehistoric period (see

Fig. 1). Neolithic occupation is attested at The Peak (Darvill 1981 and 1982) and at Crickley Hill (Dixon 1988), and *c.* 1.5 km north of Site 3 a Bronze-Age barrow cemetery is located within Emma's Grove (O'Neil and Grinsell 1960, 109).

Support for the conjectured date and function of A29/142 is provided by a close structural parallel from the Cotswolds. At Huntsman's Quarry, Naunton (Foster 1994), a circular ditch measuring 18 m in diameter has been excavated: like A29/142 this was interrupted by an entrance causeway through the eastern part of its circuit. Although not closely dated the ditch incorporated Bronze-Age pottery and it encircled an undated cremation burial. A possible parallel for the Birdlip and Naunton ring-ditches may be provided by a ring-ditch measuring *c.* 16 m in diameter (with a single entrance on the north side) excavated at Shorncote in the Upper Thames Valley. The feature has been interpreted as a henge which perhaps originated during the Late Neolithic or Early Bronze Age, although modified during the Middle Bronze Age to form an enclosure for a cremation cemetery (Barclay *et al.* 1995, 48–9 and fig. 9).

If ditch A29/142 was a funerary monument, the absence of any human remains might be explained by the severe erosion that Area A had evidently undergone by later ploughing. The possible former presence of one or more inhumations may, however, be indicated by a concentration of bone closely associated with A29/142, which was retrieved as a surface scatter during the programme of fieldwalking undertaken in 1983 and 1984 (see Fig. 20.4). Alternatively, this scatter could represent animal bone related to later prehistoric or Roman activity within Enclosure I: similar scatters elsewhere within the enclosure complex are predicted by the surface finds.

The tentative dating of A29/142 to the early prehistoric period is of considerable interest for the later phases of occupation on the site since its approximately central location within Enclosure I suggests it may have been preserved as an earthwork when the enclosure was constructed around it during the Iron Age. However, there is no firm evidence for this, and its siting could be coincidental.

Later prehistoric and 1st century A.D.

The Iron-Age Enclosure I examined in Areas B and C can be compared with a number of similar enclosures scattered sparsely over the limestone uplands of the Gloucestershire Cotswolds which are interpreted as late prehistoric farmsteads (cf. RCHM 1976, xxxix). These sites are known mostly from crop mark evidence, and their simple forms appear very different to the extensive and morphologically complex contemporary farming settlements of the Upper Thames Valley (Leech 1977). The contrasting settlement morphologies are thought to denote profound differences in socio-economic organization between these two areas (Hingley 1984).

As Cunliffe (1991, 228–34) has pointed out, there is a paucity of excavated evidence for later prehistoric farmstead-type settlement in the Cotswolds, in contrast to the Upper Thames where widespread excavation has taken place. However, a growing number of Cotswold sites have now been investigated by excavation (Fig. 21). The work is beginning to confirm that late prehistoric farmsteads are liberally scattered over the landscape, as Cunliffe (1984 and 1991) has previously conjectured. It should, however, be stressed that no farmstead has yet been examined in its entirety and comparatively little is known of their character. In addition, all sites so far examined have been truncated by plough-erosion, with the result that little evidence for small structural features indicative of domestic occupation has been found.

The results of excavations undertaken at Guiting Manor Farm, Guiting Power (Saville 1979), and The Beeches, Cirencester (Reece 1990, 9–25), have been published (and Guiting Manor Farm has also been extensively excavated more recently: Vallender and Catchpole 1997). Summaries of the results of excavations are available for settlements examined at Winson (Smith 1986; Smith with Cox 1986, 8–9), The Bowsings, Guiting Power (Marshall 1994 and 1996),

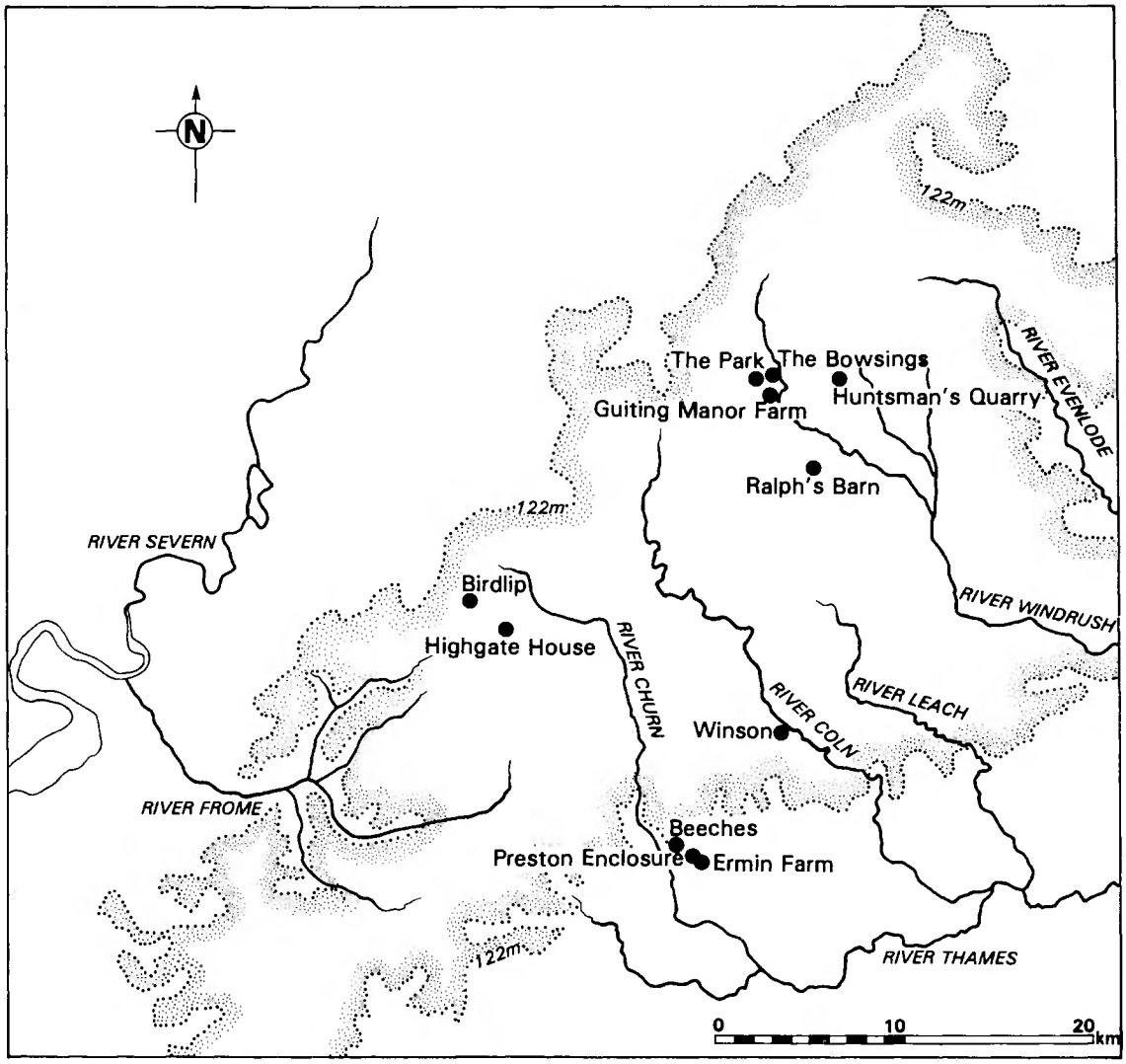

Fig. 21. Middle Iron-Age farmstead-type settlements investigated by excavation in the Gloucestershire Cotswolds.

The Park, Guiting Power (Marshall 1995), Huntsman's Quarry, Naunton (Foster 1994), and Ralph's Barn, Naunton (Catchpole 1994). In addition, the corpus of excavated sites has been augmented more recently with the investigation of three late prehistoric settlements (Highgate House, Cowley, Ermin Farm, Preston, and Preston enclosure, Preston) during construction of the A417/A419 road across the Cotswolds (Lupton and Williams 1997). One of these—Highgate House—lies only 2 km SE of Site 3 at Birdlip, and may provide valuable comparative information.

With the possible exceptions of The Park (where a circular hut with a hearth has been found) and Guiting Manor Farm (where a circular post-built structure is represented), none of the

enclosures so far examined has revealed evidence for a domestic focus of occupation. Indeed, very little is known of their internal structural arrangements. At The Park, The Bowsings and Guiting Manor Farm, the interior of the enclosure was partly occupied by discrete clusters of pits. This suggests that a proportion of the activity within the enclosure was non-domestic in function.

The multiple enclosures attested by crop mark evidence at Birdlip are of some interest. One element, Enclosure I, is dated to the Middle Iron Age but there can be no certainty that all of the enclosed areas belonged to this period: as noted above, Enclosure III (as represented by ditch C311) could be an addition of the Late Iron Age and Enclosure II was not investigated. No crop mark complex closely comparable to Site 3 is known on the Cotswolds, although at Temple Guiting (RCHM 1976, 117–18) at least two undated crop mark enclosures similar in form to Enclosure I are located in close proximity to one another. Evidence for multiple enclosures has also been found at a few of the other sites examined by excavation. At Ermin Farm two adjacent enclosures were present in the small area examined during road construction. At The Park a small enclosure formed an annexe to the main one.

There is a growing body of evidence to indicate that the land immediately surrounding the settlement enclosure was utilized for a variety of purposes. Clusters of pits are frequently found on the periphery of the enclosure (e.g. at Birdlip, Guiting Manor Farm and Winson) presumably in areas deliberately set aside for storage. The linear pattern of the pits found at Birdlip is, so far, unusual although whether this arrangement is atypical can only be confirmed by the examination of more sites. There is also some evidence for the presence in areas immediately adjacent to the enclosures of linear boundaries perhaps representing divisions between fields or paddocks. Examples of these are attested at Ermin Farm and Preston enclosure, and possibly also at Birdlip by ditch C311's southward continuation. In addition, the evidence from Birdlip clearly demonstrates that the periphery of the enclosure might undergo reorganization and development over time. It seems clear, therefore, that the morphologies of later prehistoric Cotswold farmsteads may be complex, with activity extending and developing well beyond the presumed focus of domestic occupation.

The economies of these sites are not well characterized, although the evidence so far indicates that a mixed arable/pasture farming regime was generally practiced. Cereal production is, of course, suggested by the presence of storage pits common to most of the sites examined by excavation, and the stone querns and rubbers used in food preparation (Roe below). Only at Winson and Birdlip (Straker below) has detailed information regarding arable crops been obtained. Animal husbandry has been examined at Guiting Manor Farm, The Beeches and Birdlip (Dobney and Jaques below), where the evidence consistently points to the importance of sheep and cattle. However, more assemblages are required in order to understand the later prehistoric farming economy of the Cotswolds and any local variations in the pattern over time and space.

The excavated sequence at Birdlip has been interpreted as indicating that the occupation ceased at some point during the Middle Iron Age and that the site was disused until settlement commenced anew in the locality around the mid 1st century A.D. Abandonment and reoccupation of another Middle Iron-Age settlement may be indicated by the stratigraphic sequence found at The Bowsings where (like Birdlip) the enclosure ditch and at least one pit remained open into the Roman period. A pit from The Beeches also demonstrated this sequence of infilling. It must remain uncertain whether these few examples are significant for our understanding of the development of later prehistoric settlement within the Cotswolds, especially since it is conceivable that the occupation at Birdlip spanned the Iron Age–Roman transition. However, in this context it may be noted that no farmstead-type settlement has yet produced conclusive

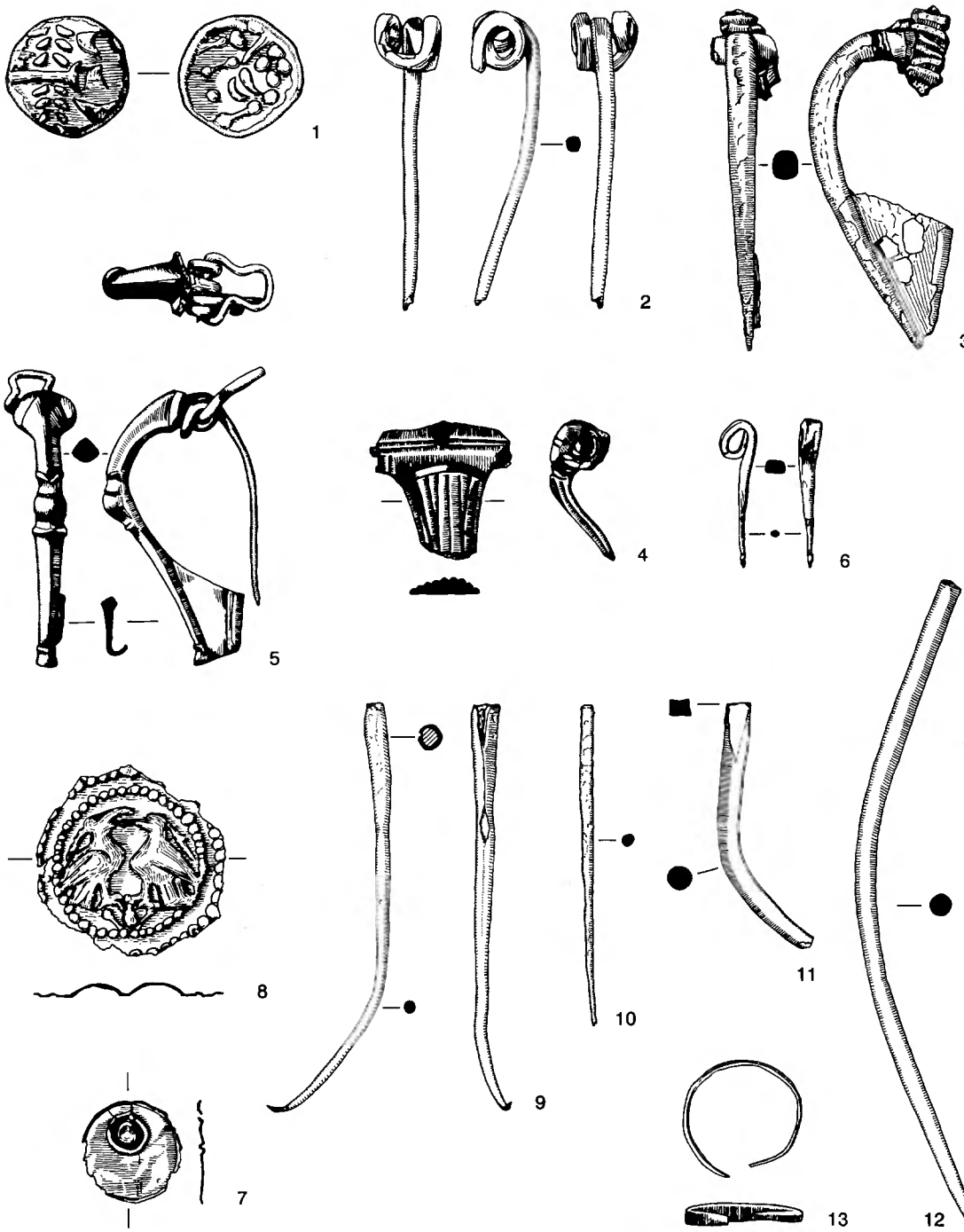

Fig. 22. Durotrigian coin (scale 1:1); copper-alloy objects (scale 1:2).

evidence for an uninterrupted sequence of Middle Iron-Age, Late Iron-Age and early Roman occupation.

The location and character of the occupation of the 1st century A.D. at Birdlip is difficult to assess for, although finds of this period were plentiful, only a few contemporary structures (in Area B) were identified. The Period 2 finds are paralleled within Gloucestershire by those found at the high-status sites of Bagendon (Clifford 1961), Salmonsbury, Bourton-on-the-Water (Dunning 1976), and Ditches hillfort, North Cerney (Trow 1988); from early urban settings at Cirencester (Wacher and McWhirr 1982) and Kingsholm, Gloucester (Hurst 1985); and from a rural (but probably religious) context at West Hill, Uley (Woodward and Leach 1993). The limited range of the Period 2 pottery assemblage from Birdlip is, however, strongly suggestive of a rural farming settlement of low status. Few settlements on the Gloucestershire Cotswolds have been investigated in detail and little of their character is known. Two rural Cotswold sites of the 1st century A.D.—Duntisbourne Grove, Duntisbourne Rouse, and Middle Duntisbourne, Duntisbourne Abbots—examined recently during improvement of the A417 road (Lupton and Williams 1997), may provide further insights.

An alternative reading of the 1st-century occupation at Birdlip is that its proximity to the Roman road of Ermin Street (Figs. 1 and 2) is functionally significant. A recently excavated Roman settlement at Birdlip Quarry (Lupton and Williams 1997), *c.* 1 km east of Site 3, may have provided roadside services since it lay directly alongside Ermin Street. The Birdlip Quarry site appears to have flourished during the later Roman period, and it is conceivable that earlier roadside facilities were provided by the settlement at Site 3.

Lastly, in view of the presence of 1st-century occupation at Site 3, it must be mentioned that the Birdlip area is associated with two significant finds of this period. A Dobunnic gold coin (RCHM 1976, 40) was found somewhere in the locality during the 19th century. The Birdlip Late Iron-Age cemetery, found in 1879 during quarrying at Barrow Wake (Green 1949; Staelens 1982), lies *c.* 1 km to the north of Site 3 (see Fig. 1). However, the cemetery is conventionally dated to *c.* A.D. 20–40, and there can be no certainty that Site 3 was occupied at that time.

The Finds

Introduction

Categories of finds are reported on below by the named specialist reporters. All finds are assigned to the context and feature from which they derive, and stratified finds are assigned to period (i.e. Period 1 = Middle Iron Age; Period 2 = 1st century A.D.).

COINS by C. Parry

Fig. 22, no. 1. Durotrigian struck stater, silver/copper (Mack 1975, no. 318). Diameter 17.5 mm. C451 (upper fill of pit C429: Period 2). Conservation no. SW88039.

The coin lies outside the normal distribution of Durotrigian coins (Selwood 1984), although the same type has been found locally at Bagendon (Clifford 1961, plate 38, no. 18). The type appears late in the development of Durotrigian coinage and has been found in contexts dating to the late 1st century A.D. (Allen 1968). In the same context was a sherd of Dorset black-burnished ware pottery, which is unlikely to have arrived at Birdlip much before the end of the 1st century A.D., if not later.

Not illustrated. *As* of Domitian, FORTUNAE AUGUSTA. (A.D. 87, *Roman Imperial Coinage* II, 198, no. 353B). C300 (unstratified). Conservation no. SW88038.

Not illustrated. Farthing of James I. 1614–25. BM 1960, Type 3B, no. 56. Area D (unstratified). Conservation no. SW88040.

BROOCHES by C. Parry

Fig. 22, no. 2. Brooch pin, gunmetal. Length 44 mm. C300 (unstratified). Conservation no. SW88051.
Perhaps from a Nauheim derivative type (cf. Coles with Avery 1987, fig. 3, no. 14).

Fig. 22, no. 3. Colchester type, brass. Length (distorted) 48 mm. C531 (fill of hollow C428). Conservation no. SW88042.
The head of the bow is bent. Four coils of a corroded iron spring are preserved. The triangular catch-plate is pierced with irregular perforations. The type can probably be viewed as a product of the first decades of the 1st century A.D., although current later (Mackreth 1988, 45).

Fig. 22, no. 4. Langton Down type, gunmetal. Length (broken) 23 mm. C300 (unstratified). Conservation no. SW88043.
The reeded bow is broken. Two incised arcs are present at the junction of the bow with the springcase, which has two parallel incisions across it. A Late Iron-Age/early Roman type (Mackreth 1988, 46).

Fig. 22, no. 5. Trumpet type, leaded bronze (the pin is bronze). Length 40 mm. C628 (upper fill of pit C413: Period 2). Conservation no. SW88052.
This type is found predominantly in south-western Britain, and is thought to have been current *c.* A.D. 70–120. A similar example has been found locally at Haymes (Mackreth 1986, 80–1).

COPPER-ALLOY OBJECTS by C. Parry

Fig. 22, no. 6. Belt pin? (no XRF analysis). Length 22 mm. A20 (plough-disturbed subsoil). A tapering square-sectioned strip.

Fig. 22, no. 7. Mount, bronze. Diameter 15 mm. C300 (unstratified). Conservation no. SW88047.
Disc with a stamped circle, off-centre.

Fig. 22, no. 8. Mount, leaded gunmetal. Diameter 28 mm. C300 (unstratified). Conservation no. SW88046.
Repoussé technique. Two facing birds, encircled by a double ring of contiguous pellets, stand on pelleted rods. On the wings and tails of the birds fine incisions represent plumage.

Fig. 22, no. 9. Handle (for toilet article?), bronze. Length (distorted) 62 mm. C300 (unstratified). Conservation no. SW88044.
The broad end of the handle measures 3 mm in diameter and tapers to a point. The socket (18 mm long) contains a tang broken flush with the top.

Fig. 22, no. 10. Pin. (no XRF analysis). Length 48 mm. C300 (unstratified). Conservation no. SW88049.

Fig. 22, no. 11. Pin/handle. (no XRF analysis). Length (distorted) 38 mm. C531 (fill of hollow C428). Conservation no. SW88041.

Fig. 22, no. 12. Pin/handle, bronze. Length (distorted) 95 mm. C531 (fill of hollow C428). Conservation no. SW88041.

Fig. 22, no. 13. Toe or finger ring, bronze. Diameter 15 mm. C571 (upper fill of pit C433: Period 2). Conservation no. SW88048.

Formed from a flat strip, the bezel (3 mm broad) tapers to pointed terminals (one is broken off). Similar rings dating to the 1st century A.D. have been found at Salmonsbury (Dunning 1976, 84–5, 112, fig. 26, nos. 3 and 4).

ANALYSIS OF NON-FERROUS METAL OBJECTS by Justine Bayley

Twelve objects were analysed non-destructively by X-ray fluorescence (XRF) by Michael Heyworth in 1988. This note provides a discussion and interpretation of his results. Apart from the coin from C451, all the objects were copper alloys. These are described as bronzes (mainly copper and tin), brasses (mainly copper and zinc) and gunmetals (copper with significant amounts of both tin and zinc). In addition, one mount (SW88046) from C300 contained a little lead and the trumpet brooch from C628 rather more.

Large numbers of Late Iron-Age and Roman brooches have been analysed (Bayley 1990) and the results suggest that individual brooch types preferentially were made of a particular alloy. The results obtained from the Birdlip brooches can be compared with this database. The brooch spring/pin from C300 may be from a Nauheim derivative brooch, which were most often made of bronze, although brasses and, to a lesser extent, gunmetals are not uncommon (Bayley 1990, fig. 3).

One piece Colchester (Colchester A) brooches like that from C531 are almost always brasses (ibid.), and this example is no exception. Langton Down brooches like that from C300 are also normally brasses, but most contain more than a trace of tin, so that some, as here, contain enough to be reclassified as gunmetals. Brass was commonly used for brooches in the mid 1st century A.D., but was far less common at other periods.

Trumpet brooches were made of a range of different alloys but each was restricted to a specific sub-type. Examples like that from C628, with a loose head-loop and a half-round moulding on the bow, are normally leaded bronzes. Leaded alloys cannot be used to make springs which explains why the pin/spring attached to this brooch is unleaded bronze.

The Durotrigian coin from C451 appears to be of debased silver (i.e. silver alloyed with copper or bronze). It is possible, however, that it had a copper core: non-destructive XRF analysis cannot distinguish between these two options.

OBJECTS OF IRON by C. Parry

A total of 81 iron objects weighing 580 gm was recovered. Two unidentifiable fragments (not illustrated) weighing 16 gm came from Period 1 contexts; 26 objects weighing 240 gm came from Period 2 contexts. The remainder were unstratified.

Fig. 23, no. 1. Knife blade. Length 43 mm. C339 (fill of ditch C311: Period 2).

Fig. 23, no. 2. Clamp. Length 33 mm. C339 (fill of ditch C311: Period 2). An incomplete 'T' clamp (cf. Manning 1985, 131–2, plate 62).

Fig. 23, no. 3. Brooch pin and spring fragment. Length 45 mm. C530 (upper fill of ditch C315: Period 2).

Fig. 23, no. 4. Clamp. Length 36 mm. C531 (fill of hollow C428) (cf. Manning 1985, 131–2, plate 62).

Fig. 23, no. 5. Unidentified. Length 65 mm. C531 (fill of hollow C428).

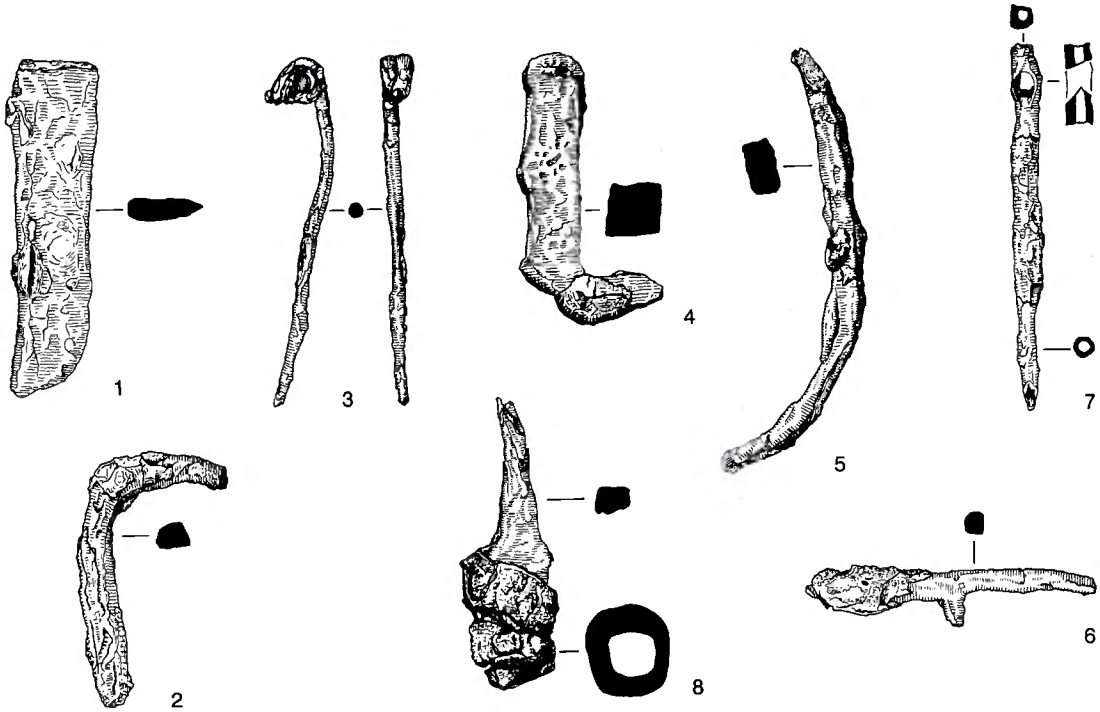

Fig. 23. Iron objects (scale 1:1).

Fig. 23, no. 6. Key. Length 38 mm. C531 (fill of hollow C428). (cf. examples illustrated by Manning 1985, plates 40–1).

Fig. 23, no. 7. Needle. Length 48 mm. C571 (upper fill of pit C433: Period 2). Conservation no. SW88088.

The end containing the eye is square in section; this might suggest a function as a packing-needle (cf. Manning 1985, plate 15).

Fig. 23, no. 8. Ox goad. Length 39 mm (length of spike 19 mm). C660 (upper fill of pit C676: Period 2). Conservation no. SW88084.

The goad conforms to Rees's Type 1 (spiral) which occurs in the Late Iron Age and throughout the Romano-British period (Rees 1979, 75–9, fig. 3). Similar goads have been found locally associated with 1st-century A.D. settlements at Bagendon (Clifford 1961, plate 48, no. 1), Salmonsbury (Dunning 1976, fig. 26, no. 7), and Ditches hillfort (Trow 1988, fig. 26, no. 12).

Not illustrated. Thirty nine carpentry nails weighing 242 gm were found. No complete example was present and the maximum preserved length did not exceed 80 mm. Thirteen nails weighing 97 gm came from Period 2 contexts, the remainder being unstratified. Of the nails from Period 2 contexts, seven came from the upper fills of pits on Area C; six came from fills of ditch C311.

Not illustrated. Three hob nails; one from C324 (fill of ditch C352: Period 2) and two from C472 (upper fill of pit C636: Period 2).

THE FLINT by Alan Saville

Fig. 24, no. 1. Piercer. A43 (Feature A45: plough-disturbed subsoil?).

Fig. 24. no. 2. Barbed-and-tanged arrowhead. Unstratified. 'Sutton b' type (Green 1984, 29).

The total collection of 185 pieces of struck flint is itemized on Table 1. Unretouched flakes and tiny chips predominate, and many of them are burnt. The waste material, mainly from Area A, lacks any distinctive attributes, and can only be classified in a broad sense as the result of prehistoric knapping activity.

Apart from the unstratified find of an Early Bronze-Age barbed-and-tanged arrowhead from a contractor's drainage ditch, the only typologically diagnostic pieces are from Area A. These comprise two scrapers (one discoidal, the other a small 'button' end scraper) and a miscellaneous retouched piece (a small fragment from a plano-convex knife or similar type of implement). These three artefacts (not illustrated), each of them unstratified within Area A, are probably all of Bronze-Age date. The piercer from context A43 is a blade with an oblique distal truncation (blunting retouch) forming a simple distal point. The blade has been struck from a blade core and its morphology, as well as the type of retouch, indicates a Late Mesolithic or Early/Middle Neolithic date for this piece.

The only context to produce any concentration of flint artefacts was A13, the fill of a Bronze-Age pit (A12), which contained 83 pieces. However, with a total weight of only 38.4 gm it can be appreciated that these were mostly very small chips, most of them burnt, which owe their recovery to the use of wet-sieving. The pieces are all unretouched flakes and chips, and it is not possible to suggest a date for this context on the basis of the flintwork.

Preliminary fieldwork (Darvill 1984) made clear the existence of a medium to low-level scatter of struck flints along the proposed line of the Birdlip bypass road. The recovery during that fieldwork of specific implement types, such as microliths and arrowheads, indicated a chronological range from the Late Mesolithic to the Bronze Age for the prehistoric activity responsible for the now-scattered lithic debris. The flint artefacts from the excavated areas confirm this picture without adding any further detail, and it must be concluded from the small number of flints recovered that the excavated areas were outside any precise location of earlier prehistoric settlement.

STONE WEIGHTS by C. Parry

Fig. 24, no. 3. Weight. Diameter 67 mm. C445 (upper fill of pit C638: Period 1?).

The weight is centrally-pierced with a conical hole, the wider part representing the point of entry of the bore. The exit point of the bore has next to it a rounded depression which suggests an attempt to pierce a hole in the opposite direction.

Fig. 24, no. 4. Spindle whorl. Diameter 26 mm. C466 (basal fill of pit C634: Period 1).

The weights have chipped, irregular surfaces. Fossilized material preserved on their exteriors indicate that both were fashioned from fossil echinoids, which provided the basic shape. The echinoid can be identified as *Clypeus ploti*, which is common to the Inferior Oolite limestone of the Birdlip area (BM 1972, 132–3). Many unutilized fossil echinoids were observed during the excavations in 1987 and 1988. A weight fashioned from a fossil echinoid has been noted from the Middle Iron-Age phase at Bredon Hill, Worcestershire (Hencken 1938, 86, fig. 11, no. 7).

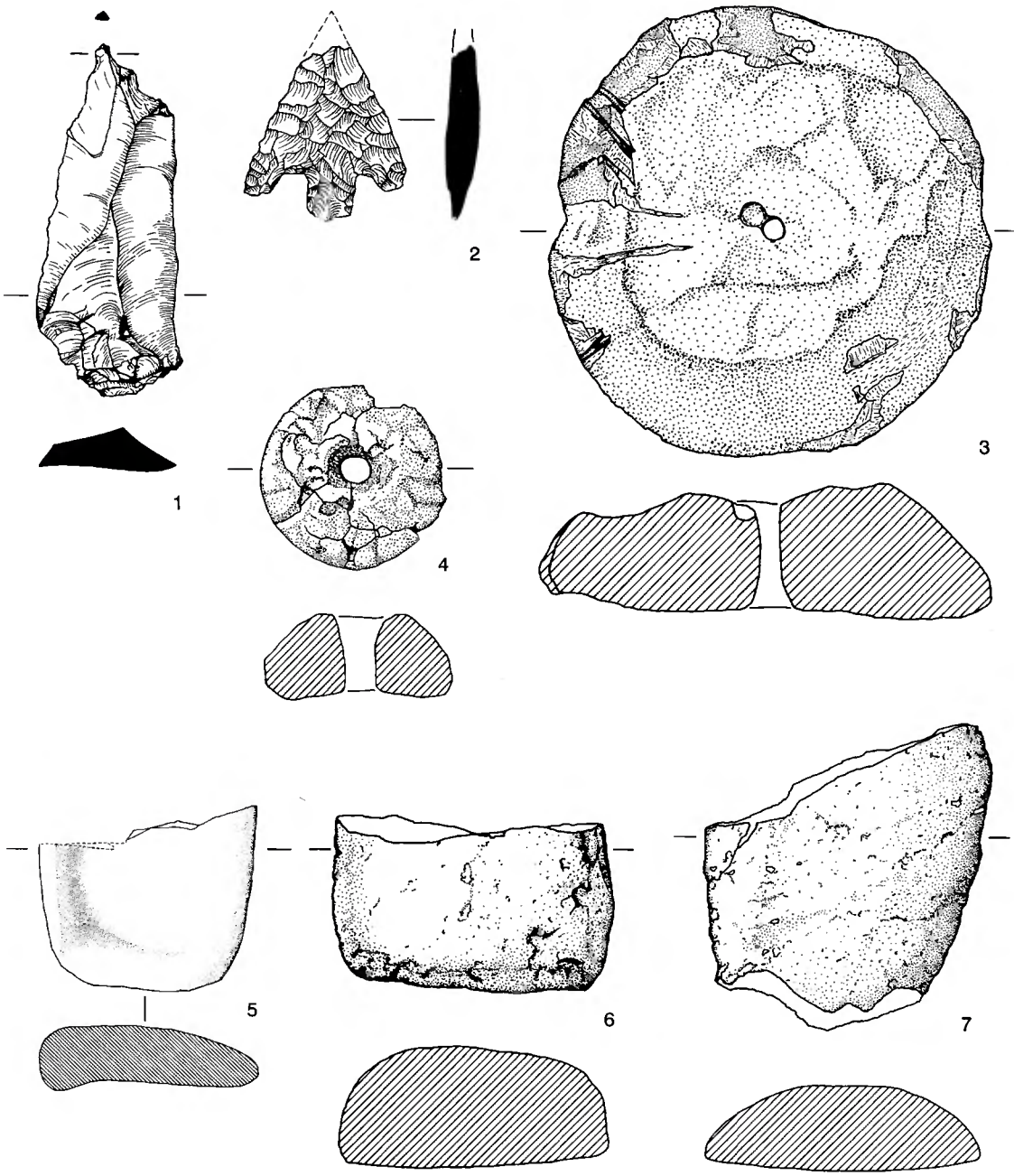

Fig. 24. Stone objects. 1–2 flint (scale 1:1); 3–4 weights (scale 1:1); 5 whetstone (scale 1:2); 6–7 quernstones (scale 1:4).

WORKED STONE by F. E. S. Roe

Fig. 24, no. 5. Whetstone fragment. Fine grained micaceous sandstone. C657 (upper fill of pit C314: Period 1?).

Fig. 24, no. 6. Rubber fragment. May Hill sandstone. C313 (lower fill of pit C314: Period 1).

Fig. 24, no. 7. Rubber fragment. May Hill sandstone. C402 (unstratified in pit C634).

Not illustrated. Quern or rubber fragment. May Hill sandstone. C405 (unstratified in pit C429).

Not illustrated. Quern fragment. May Hill sandstone. C448 (lower fill of pit C638: Period 1).

Not illustrated. Quern or rubber fragment. Upper Old Red Sandstone. C533 (lower fill of pit C384: Period 1).

The six pieces of stone examined were retrieved from the fills of Iron-Age pits. Three stones (from C313, C448 and C533) were found stratified in Middle Iron-Age contexts; the context containing the whetstone fragment (C657) may also belong to the same period. Two pieces (from C402 and C405) were not securely stratified.

Two varieties of coarse sandstone were used for querns or rubbers, May Hill sandstone and Old Red Sandstone. The May Hill sandstone outcrops both in the Malverns and in the May Hill area, the latter location being the more likely source for Birdlip since it is only 24 km (15 miles) away. Two rubbers (from C313 and C402), are made from this sandstone; both were originally of the flattened bun shape suitable for use with saddle querns. The same stone was used for a piece of quern (from C448), not clearly identifiable as being either of the saddle or rotary variety, and a further worn fragment (from C405) belonged either to a quern or a rubber.

Evidence has now emerged for extensive use of May Hill sandstone during the earlier part of the Iron Age in both Gloucestershire and Worcestershire (Roe 1990, 43), with an extension of sites into Oxfordshire (Roe 1995, 84). Some twenty occurrences of this variety of quernstone from Iron-Age or probable Iron-Age contexts have currently been recorded. There are large assemblages from Beckford and Crickley Hill, and there are also a number of finds from Salmonsbury. At Beckford the majority of the querns and rubbers came from Middle Iron-Age contexts, with only a few later examples (Roe forthcoming).

The Upper Old Red Sandstone was obtained west of the Severn, either from the Forest of Dean or from the Penallt area to the west of the River Wye in Gwent. This source would have enabled river transport of the stone for most of the way, down the Wye and up the Severn. The single fragment of Old Red Sandstone (from C533) appears to have been worked, but cannot be identified further since it is both weathered and burnt. It is likely to have been part of a rotary quern. A radiocarbon date for its context (Table 5) indicates a date of deposition within the Middle Iron Age.

The information that is gradually accumulating suggests for the Upper Old Red Sandstone a period of use mainly after the Middle Iron Age. At Beckford, however, 12.5% of the quern and rubber fragments made of this material has been attributed to the Middle Iron Age (Roe forthcoming). There are also a few pieces from Salmonsbury, and these include a large saddle quern made from quartz conglomerate. At West Hill, Uley, the finds of Upper Old Red Sandstone are Later Iron-Age or later in date (Roe 1993, 199). It would seem that May Hill Sandstone was the preferred quern material during the earlier part of the Iron Age, certainly in and around Gloucestershire, although some Old Red Sandstone was also utilized.

The whetstone fragment from C657 is made from a pebble of fine-grained, slightly micaceous sandstone. Petrological examination indicates a Palaeozoic sandstone and, although an exact source cannot be suggested at present, an origin in the West Country is possible.

MISCELLANEOUS FINDS by C. Parry

Fig. 25, no. 2. Pin, made from bone. Length 58 mm. C313 (lower fill of pit C314: Period 1).
The pin is circular in section; the central portion has a notch 19 mm long.

Fig. 25, no. 3. Loomweight. WB702 (fill of pit WB700: Period 1).
Fragmentary triangular loomweight of poorly-fired clay (cf. Trow 1988, fig. 27, no. 7).

THE GLASS BEAD by Julian Henderson (Fig. 25, no. 1)

A cobalt blue annular glass bead with opaque yellow wave decoration derived from the secondary fill (C477: Period 1) of pit C636, which also contained Middle Iron-Age pottery and a dog skeleton. It is a type for which a wide variation of glass colour combinations were used in the Iron Age (Guido 1978, group 5). Cobalt blue is the most popular colour of glass used in Middle and Late Iron-Age Britain and Europe, and opaque yellow is commonly used for decorating other glass beads.

The cross-section profile of the bead and its annular shape infer that it was manufactured by spinning a gob of fluid glass around a pointed metal implement. This manufacturing technique is characteristic to beads made from about the 2nd century B.C. onwards and, although it may be classified with other beads having opaque yellow wave decoration, the technique of production and the glass chemical composition provide a means of refining the typology.

The chemical composition

The chemical analysis of the bead was carried out by using electron probe microanalysis (EPMA). A microsample of the bead matrix and its decoration was removed, mounted in epoxy resin and given a polish with diamond paste. The samples of glass were analysed using an automated Cambridge microscan 9 electron microprobe at 15 kV and 40 nA, with a defocused beam of *c.* 80 microns. Full analytical conditions are described elsewhere (Henderson 1988a).

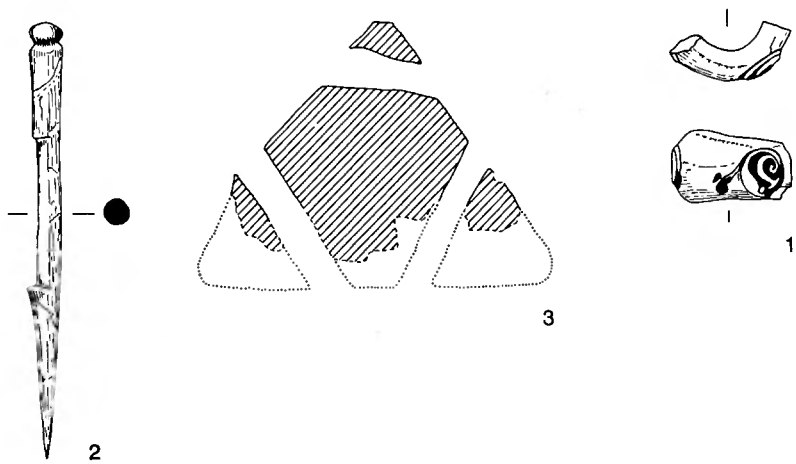

Fig. 25. 1 Glass bead (scale 1:1); 2 bone pin (scale 1:1); 3 baked clay loomweight (scale 1:4).

The chemical compositions of the blue and yellow glasses are given in Table 2. The two glasses would have had very different working properties, the blue glass softening at a higher temperature than the decorative yellow glass (a difference of some 200°C between *c.* 750°C and *c.* 550°C) making the yellow glass ideal for decorating the bead.

The blue matrix is a soda-lime-silica glass, with a relatively low magnesia level (0.5%) typical of the Iron Age. The glass colour is due to cobalt oxide; the original cobalt-bearing mineral ore used probably contained nickel, copper, and possibly manganese, which were also detected in the glass. The level of cobalt oxide detected (0.05%) has been rounded up to 0.1% in Table 2 in order to conform with the expected statistical counting error when using EPMA. As the most powerful transition metal colorant in glass, even this low level of cobalt oxide will dominate the colour which other oxides (copper, manganese, iron and nickel) detected in the glass could potentially modify.

The opaque yellow glass is a lead oxide-soda-lime-silica composition. The glass probably owes its colour to lead antimonate crystals which, at the same time as colouring the glass, render it opaque. A lower level of calcium oxide than found in the blue soda-lime-silica glass might suggest that the lead oxide was added to a soda-lime-silica composition. However, it is more likely that separate recipes were used in the manufacture of the blue and yellow glasses, because the alumina and magnesia levels would have been lower (diluted) if lead oxide was added to the glass used for the bead matrix.

Discussion

A series of Early–Middle Iron-Age blue-wave-decorated beads derived from excavations at Wetwang Slack, North Humberside (Dent 1982; Henderson 1988b). In all the Wetwang examples the decoration had fallen out, leaving an empty groove in the glass. A selection of the Wetwang beads has been chemically analysed using X-ray fluorescence, and without exception the level of sodium and ferric oxides was found to be higher, and manganese oxide lower, than detected in the Birdlip bead. Comparison with the analysis of a very similar bead of the same type (Guido 1978, group 5A) from Danebury, Hampshire (Henderson 1984, 396, no. 6.6, fig. 7.43), shows, however, a close similarity with the Birdlip composition for the translucent blue and the opaque yellow glasses. Although the level of iron oxide in the blue glass in the Danebury bead is higher, the relatively high potassium oxide level for soda-lime-silica glass, and the relatively low sodium oxide level, provide a means of characterizing the glass.

The opaque yellow glasses in the Birdlip and Danebury beads are also close in composition. The level of manganese oxide (0.5%) in the opaque yellow wave of the Birdlip glass infers that the glass was made in the 2nd century B.C. or later (Henderson and Warren 1983). The Danebury bead was derived from a phase dated to 230–80 B.C., so both composition and context infer a 2nd–1st-century B.C. date for the Birdlip bead. Another bead of the same spun annular type decorated with an opaque yellow wave with a colourless matrix derived from Hayling Island, Hampshire (unpublished). A relatively high potassium oxide level was also found in the yellow glass of this bead.

Late Iron-Age opaque yellow glasses are compositionally quite distinct from the opaque yellow glass used at Meare Lake Village, Somerset. The latter is characteristic to the earlier Iron Age in Britain and was used at Meare to manufacture a range of glass bead types (Henderson 1987). The Meare opaque yellow glass contains more lead oxide and a negligible manganese oxide content when compared to that found in the Birdlip bead. Lead antimonate was used at Meare as a colorant and opacifier as found in the Birdlip bead, and its continuing use in the manufacture of later glass is an example of a technology which continued in spite of major social and economic changes in Iron-Age Europe in the 4th to the 2nd and 1st centuries B.C. It is,

however, evident that a change in the types of glass beads made in this period does to some extent reflect the changing political conditions. It is probable that the Birdlip bead was imported from continental Europe in the 2nd/1st centuries B.C.

BRONZE-AGE POTTERY by Ann Woodward

Fig. 26, no. 1. Plain rim sherd with an ill-defined internal bevel.

Fig. 26, no. 2. Simple base angle.

Fig. 26, no. 3. Wall sherd with traces of twisted cord diagonal lines.

Fig. 26, no. 4. Small wall sherd, possibly from a plain shoulder or collar base.

A group of 24 sherds weighing 70 gm was recovered from the filling (A13) of pit A12. The sherds were all in a similar fabric which contained sparsely distributed and ill-sorted fragments of grog. The fabric was soft and the sherds displayed orange exterior surfaces, orange or grey interior surfaces, and a grey or black core. The variety of sherd thicknesses suggested that at least two vessels are represented. Four featured sherds could be recognized.

These diagnostic sherds, taken together with the evidence of fabric, indicate that the pottery is of Early or Middle Bronze Age date and that the urns represented belong to the Collared or Biconical traditions.

The radiocarbon date obtained for A13 (Table 5) would confirm a Biconical Urn attribution. In the Upper Thames Valley biconical vessels occur regularly alongside urns of bucket shape within Middle Bronze-Age assemblages, and it seems likely that a similar pattern of Biconical survival prevailed in the Cotswolds.

Biconical urns from Gloucestershire, such as those from Swell barrow 1 or Bevan's Quarry (Temple Guiting barrow 8), contain fossil shell inclusions, while examples from Tynings Farm and Chard in Avon and Somerset are grog-tempered (Tomalin 1983). At Brean Down, some of the grog-filled biconical wares also contained limestone inclusions (Woodward 1990), and south Welsh examples from Ogof-yr-Esgern (Brecknock) and Nottage (Glamorgan) were similarly tempered with rock fragments (Tomalin 1983). Late Bronze-Age pottery from the Severn region

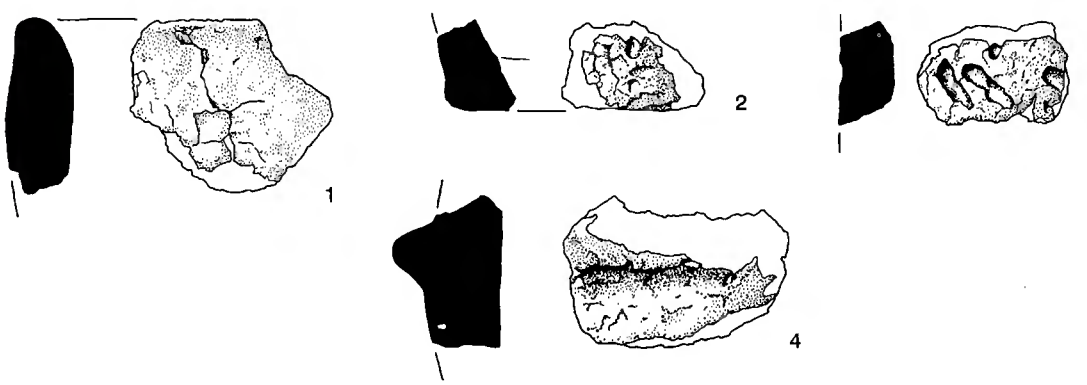

Fig. 26. Bronze-Age pottery from pit A12 (scale 1:1).

is usually characterized by much harder fabrics tempered liberally with calcite or shelly limestone. Such assemblages have been recorded from Combe Hay, Avon (Price and Watts 1980), Brean Down, Somerset (Woodward 1990, Unit 4), and Beckford, Worcestershire (unpublished). However, in south Wales a grogged assemblage from Chapeltump II, Gwent, may have been in use during the Middle Bronze Age (Woodward in Trett, forthcoming).

The radiocarbon date obtained for the charcoal found in context A13 is in accord with a Middle Bronze-Age dating of the pottery, although it does fall at the later end of the date range for this period. At two sigma, the calibrated date range overlaps with the Middle Bronze-Age dates for the pottery from Chapeltump II and coincides well with the calibrated date ranges for the Biconical and Trevisker-related assemblages from Brean Down (Bell 1990, 110, fig. 82, Units 6 and 5b).

SAMIAN WARE by G.B. Dannell

All sherds are South Gaulish.

Area A

A1 (unstratified). Drag 27; pre-Flavian. Ritt 8 (?); pre-Flavian. Drag 18; Flavian. Drag 27; Flavian.

Area B

B200 (unstratified). Plate; pre-Flavian. Drag 27; Nero–Vespasian.
B203 (layer: Period 2). Drag 18; Flavian. Drag 29; Flavian (?).
B205 (fill of pit B204: Period 2). Curle 11 or Ritt 12; 1st century A.D. Jar; 1st century A.D.

Area C

Unstratified
C300. Ritt 12; Neronian. Drag 18; Flavian. Drag 30; Flavian.

Fills of ditch C311: Period 2
C302. Drag 18(?); Flavian. Drag 30; Flavian.
C309. Drag 18; Flavian.
C339. Drag 30; Flavian.
C542. Unidentified chip; 1st century A.D.

Upper fills of storage pits: Period 2
C628 (pit C413). Drag 18; Flavian (?).
C661 (pit C676). Drag 18R; Flavian.
C678 (pit C676). Drag 18R; Flavian.

SAMIAN STAMPS by Brenda Dickinson

1. B200. Unstratified. [O]PASEN, with E and N ligatured, on form 27g. Pass(i)enus of La Graufesenque, Die 18b.

This stamp was used only on cups, including the pre-Flavian forms 24, Ritterling 8 and Ritterling 9. It occurs at the Kingsholm site at Gloucester (Wild 1985, S11). *c.* A.D. 50–65.

2. B203 (layer: Period 2). PATR[ICIMA], with M and A ligatured, on form 15/17 or 18. Patricius i of La Graufesenque, where the die (9a) is known to have been used.

This is one of his less-common stamps, and probably one of his earliest, since it occurs in a dump of burnt samian of the early 60s A.D. at Oberwinterthur, Switzerland (publication forthcoming). As yet there are no examples from Flavian foundations, and the die is likely to have had a relatively short life *c.* A.D. 60–70/75.

IRON-AGE AND ROMAN COARSE POTTERY by C. Parry

A total of 3,334 sherds weighing 21.101 kg was recovered. The assemblage was not generally well preserved as the average sherd weight of 6.32 gm indicates. Of the total assemblage only approximately half (*c.* 50% by number, 54% by weight) was securely stratified. A large number of unstratified sherds (881, representing *c.* 26.5% of the total assemblage) were recovered during hand-cleaning of Areas A, B and C. Other unstratified pottery derived mainly from deposits excavated in Area C, where, due to the difficulty of separating deposits of Periods 1 and 2 during excavation, some cross-contamination of contexts occurred.

Fabrics

Forty five pottery fabrics were identified macroscopically and with the aid of a ×8 hand-lens. Fabrics 1–39 are wares of Iron-Age or Roman date; Fabric 50 is a Bronze-Age fabric (Woodward above); Fabrics 95–8 are medieval and post-medieval sherds; Fabric 99 was reserved for untyped sherds. The fabrics were compared with the fabric series held for reference by Gloucester City Museum and Corinium Museum, Cirencester. The Iron-Age, Roman and later fabrics have been assigned to 11 groups (A–L) consisting of either a single type or a number of related types. The incidences of the groups within the total pottery assemblage is presented on Table 3. Summary descriptions of the fabrics represented within the groups are presented below (except for fabrics in Group L which was reserved for post-Roman material, all of it unstratified).

Group A Fabrics 1, 6 and 7

Fabrics 1, 6 and 7 are equated with Peacock's (1968, 421–2) Palaeozoic limestone-tempered (B1) fabric and are presumed to originate in the Malvern area. The majority of the sherds assigned to the group belong to Fabric 1, which was used to manufacture hand-made globular/barrel-shaped jars or bowls in the Iron-Age tradition. Fabric 6 was similar to Fabric 1, but is paralleled more closely by Gloucester Type Fabric 34 and Cirencester Type Fabric 25B. Fabric 7 appears to have been used for wheel-thrown vessels during Period 2, and is very similar to Gloucester Type Fabric 33. Saville (1984, 157) has summarized the incidence of Peacock's B1 fabric at Middle Iron-Age sites in Gloucestershire. The fabric is also found in 1st-century A.D. assemblages from Ditches hillfort (Trow 1988: Fabric 1) and West Hill, Uley (Leach 1993: Fabric Group A).

Group B Fabric 2

Limestone- and/or fossil-shell-tempered ware used to manufacture hand-made globular/barrel-shaped jars or bowls in the Iron-Age tradition. The tempering is perhaps local to Birdlip. The fabric was first identified by Peacock (1968, 422–3: B2 fabric) and has been identified at the Cotswold Middle Iron-Age sites of Guiting Power (Saville 1979; Morris 1981b) and Uley Bury hillfort (Morris 1983).

Group C Fabrics 8, 9 and 10

Soft argillaceous/grog-tempered fabrics used to manufacture necked and carinated bowls, finding equivalents in Gloucester Type Fabric 2A, Cirencester Type Fabric 3 (= Williams 1982: Fabric C), Ditches hillfort (Trow 1988: Fabric Group B), and West Hill, Uley (Leach 1993: Fabric Group B).

Group D Fabric 20 (incorporating Fabrics 19 and 25) and Fabric 21
Early Severn Valley wares. Fabric 20 was used to manufacture a variety of forms (beakers, carinated cups/bowls and large storage vessels), reduced sherds from which were assigned to Fabric 19. The group includes sherds comparable with Gloucester Type Fabrics 11D (inclusion-free) and 17 (carbonaceous), the latter equivalent to Cirencester Type Fabric 4. Early Severn Valley ware is present at Ditches hillfort (Trow 1988: Fabric Group D) and West Hill, Uley (Leach 1993: Fabric Groups C and D). Fabric 21, a limestone-tempered ware used for storage jars, is similar to the late 1st-century Gloucester Type Fabric 23, a coarse Severn Valley ware variant.

Group E Fabrics 11, 12 and 28
Savernake-type wares (Annable 1962) paralleled in Gloucester and Cirencester (Fabric 6 in both type series), Ditches hillfort (Trow 1988: Fabric 11) and West Hill, Uley (Leach 1993: Fabric 6). At Birdlip Fabric 11 is a typical Savernake fabric; Fabric 12 is a variant found also at Beckford, Worcestershire (Wills forthcoming: Fabric 49). Fabric 28 is equivalent to Gloucester Type Fabric 30A. Most, if not all, the sherds from Birdlip were from large storage vessels.

Group F Fabric 22 (incorporating Fabric 35)
Soft, oxidized sherds representing a largely inclusion-free flagon fragment, perhaps equivalent to Cirencester Type Fabric 9.

Group G Fabrics 13, 14, 15, 16, 23 and 24
Sandy wares. The oxidized versions (Fabrics 23 and 24) are paralleled by Cirencester Type Fabric 16. The remainder are reduced versions best paralleled within Cirencester Type Fabric 17. At Birdlip the only identifiable form was a bead-rim jar.

Group H Fabric 17
A wheel-thrown black-burnished ware, identical to Gloucester Type Fabric 201B. It appears to be included within the range of Cirencester Type Fabric 5. No forms were defined.

Group I Fabric 18
Black-burnished ware category 1 (Williams 1977).

Group J Amphorae and fine wares Fabrics 36, 37, 38 and 39
Fabric 36, Dressel 20; Fabric 37, Camulodunum 186A; Fabric 38, terra nigra; Fabric 39, samian.

Group K Miscellaneous and untyped sherds
Fabrics 3, 4 and 5 (unidentified prehistoric? fabrics); Fabrics 26, 27, 29, 31, 33 and 34 (all probably Early Severn Valley ware); Fabric 30 (= Gloucester Type Fabric 19C, early wheel-thrown Malvernian ware); Fabric 32 (= Gloucester Type Fabric 5, micaceous grey ware); Fabric 99, unidentified/untyped.

Catalogue of illustrated Iron-Age and Roman pottery

Fig. 27. Pottery from Period 1 contexts

1. C308 (lower fill of ditch C315). Rim, decorated with an oblique incision across the top; natural pitting on exterior wall? Fabric 2.

2. WB702 (fill of pit WB700). Rim, decorated with two oblique incisions across the top and an incision on the exterior wall. Fabric 2.
3. C313 (lower fill of pit C314). Rim. Fabric 1.
4. C313 (lower fill of pit C314). Rim. Fabric 2.
5. C313 (lower fill of pit C314). Rim. Fabric 2.
6. C477 (lower fill of pit C636). Rim. Fabric 2.
7. C483 (lower fill of pit C635). Rim. Fabric 2.
8. C533 (lower fill of pit C384). Rim. Fabric 1.
9. C566 (lower fill of pit C568). Rim. Fabric 1.
10. C567 (basal fill of pit C568). Rim. Fabric 2.
11. C576 (lower fill of pit C433). Rim. Fabric 2.
12. C579 (lower fill of pit C433). Rim. Fabric 1.
13. C659 (basal fill of pit C314). Rim. Fabric 2.
14. C457 (basal fill of pit C429). Jar. Fabric 2.
15. C466 (basal fill of pit C634). Rim. Fabric 2.
16. C566 (lower fill of pit C568). Rim. Fabric 2.
17. C313 (lower fill of pit C314). Base. Fabric 2.
18. C313 (lower fill of pit C314). Base. Fabric 2.
19. C560 (lower fill of pit C561). Base. Fabric 1.

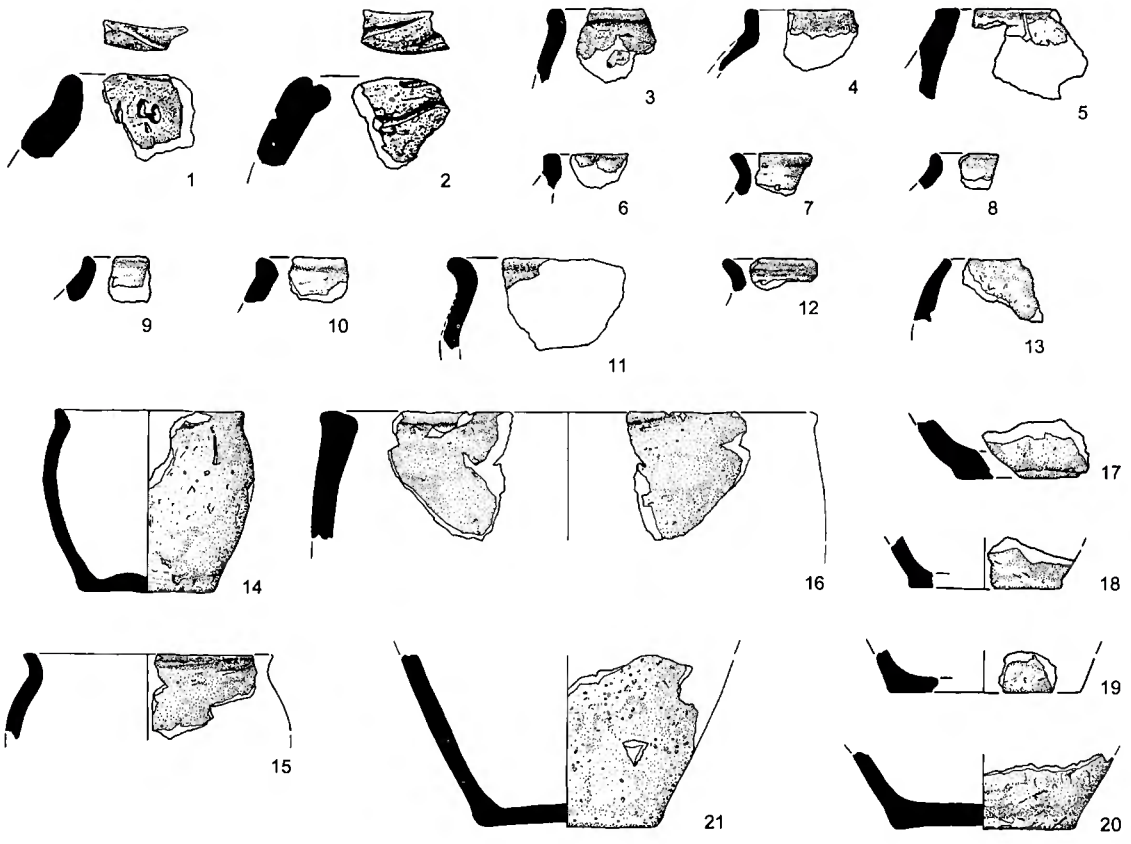

Fig. 27. Pottery from Period 1 contexts (nos. 1–2 scale 1:2; otherwise scale 1:4).

20. C611 (lower fill of pit C633). Base. Fabric 2.
21. WB701 (fill of pit WB700). Base. Fabric 2.

Fig. 28. Iron-Age tradition pottery from Period 2 contexts

22. C301 (fill of ditch C311). Wall sherd, decorated with four impressed dots parallel with an incized line above. Fabric 1.
23. C324 (fill of ditch C352). Wall sherd, with two ?scratched lines. Fabric 1.
24. B262 (upper fill of ditch B201). Rim, decorated with three oblique incisions across the top. Fabric 2.
25. C301 (fill of ditch C311). Rim. Fabric 1.
26. C304 (upper fill of ditch C315). Rim. Fabric 1.
27. C330 (fill of ditch C311). Rim. Fabric 1.
28. C330 (fill of ditch C311). Rim. Fabric 1.
29. C342 (upper fill of ditch C315). Rim. Fabric 1.
30. C451 (upper fill of pit C429). Rim. Fabric 1.
31. C467 (upper fill of pit C423). Rim. Fabric 2.
32. C467 (upper fill of pit C423). Rim. Fabric 2.
33. C467 (upper fill of pit C423). Rim. Fabric 2.
34. C472 (upper fill of pit C636). Rim. Fabric 2.
35. C482 (upper fill of pit C635). Rim. Fabric 2.

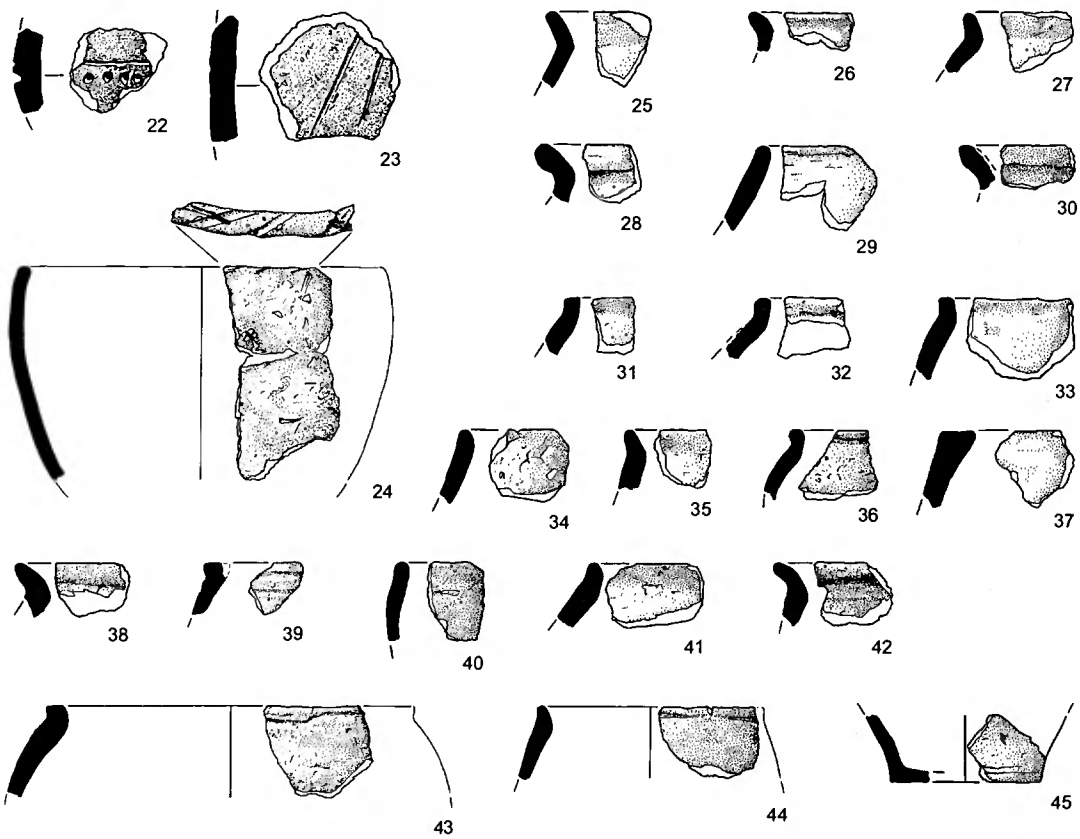

Fig. 28. Iron-Age tradition pottery from Period 2 contexts (nos. 22–3 and detail of no. 24 scale 1:2; otherwise scale 1:4).

36. C482 (upper fill of pit C635). Rim. Fabric 2.
37. C542 (fill of ditch C311). Rim. Fabric 2.
38. C570 (upper fill of pit C433). Rim. Fabric 1.
39. C573 (upper fill of pit C433). Rim. Fabric 2.
40. C628 (upper fill of pit C413). Rim. Fabric 1.
41. C628 (upper fill of pit C413). Rim. Fabric 1.
42. C660 (upper fill of pit C676). Rim. Fabric 1.
43. C304 (upper fill of ditch C315). Rim. Fabric 2.
44. C661 (upper fill of pit C676). Rim. Fabric 1.
45. C542 (fill of ditch C311). Base. Fabric 2.

Fig. 29. Other pottery from Period 2 contexts
46. C323 (upper fill of feature C521). ?Beaker. Fabric 7.
47. C542 (fill of ditch C311). Beaker. Fabric 20.
48. C412 (upper fill of pit C413). Beaker. Fabric 20.
49. B203 (layer). Necked bowl. Fabric 20.
50. B206 (= B207, upper fill of pit B204). Necked bowl. Fabric 20.
51. C320 (fill of ditch C311). Necked bowl. Fabric 10.
52. C323 (upper fill of feature C521). Necked bowl. Fabric 20.
53. C409 (upper fill of pit C637). Necked bowl. Fabric 10.
54. C570 (upper fill of pit C433). Necked bowl. Fabric 10.
55. C305 (fill of ditch C311). Carinated bowl. Fabric 8.
56. C323 (upper fill of feature C521). Carinated bowl. Fabric 20.
57. C570 (upper fill of pit C433). Carinated bowl. Fabric 20.
58. B207 (layer). Bead-rim bowl. Fabric 16.
59. C323 (upper fill of feature C521). Bowl. Fabric 18.
60. C467 (upper fill of pit C423). Flanged bowl. Fabric 30.
61. C302 (fill of ditch C311). Storage jar. Fabric 11.
62. C302 (fill of ditch C311). Storage jar. Fabric 12.
63. C302 (fill of ditch C311). Storage jar. Fabric 21.
64. C303 (upper fill of ditch C315). Storage jar. Fabric 20.
65. C316 (fill of ditch C311). Storage jar. Fabric 20.
66. C467 (upper fill of pit C423). Jar. Fabric 18.
67. C316 (fill of ditch C311). Flagon. Fabric 22.
68. C305 (fill of ditch C311). Base. Fabric 19.
69. C305 (fill of ditch C311). Base. Fabric 22.
70. C660 (upper fill of pit C676). Fabric 20.

Fig. 30. Unstratified pottery
71. C300. Wall sherd decorated with two incized lines. Fabric 1.
72. C543 (unstratified within pit C638). Rim. Fabric 5.
73. C300. Platter. Fabric 1.
74. C300. Carinated bowl. Fabric 20.
75. C300. Flanged bowl. Fabric 1.
76. C300. Bead-rim bowl. Fabric 19.
77. C300. Flanged bowl. Fabric 20.
78. C300. Flanged bowl. Fabric 20.
79. C300. Storage jar. Fabric 20.
80. C300. Storage jar. Fabric 20.
81. C300. Flagon. Fabric 22.
82. C300. Handle. Fabric 20.
83. C300. Base. Fabric 19.

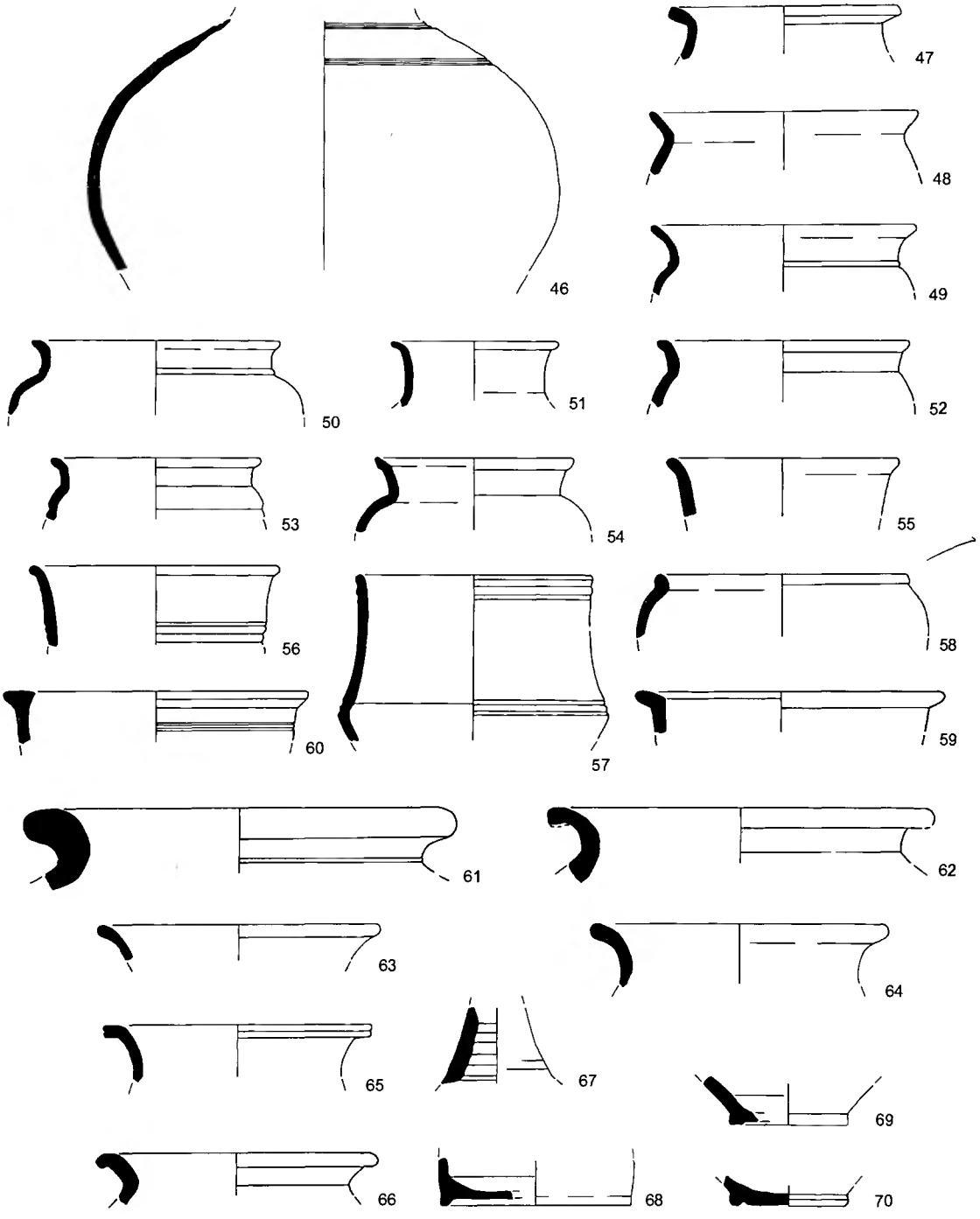

Fig. 29. Other pottery from Period 2 contexts, (scale 1:4).

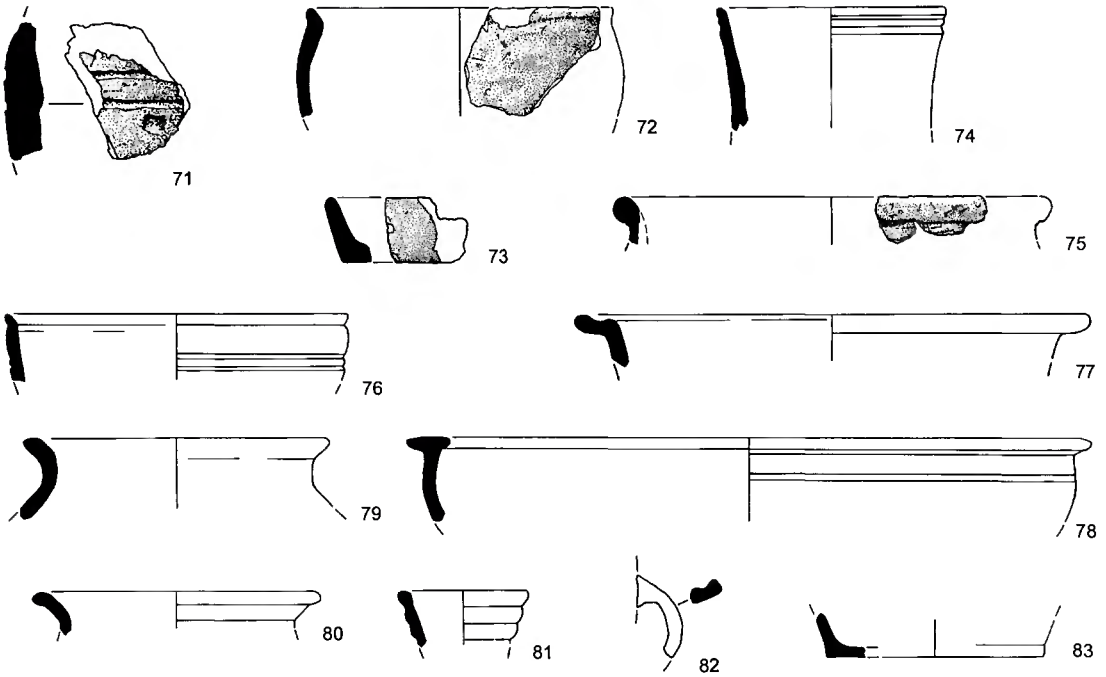

Fig. 30. Unstratified pottery (no. 71 scale 1:2; otherwise scale 1:4).

Discussion of the Iron-Age and Roman pottery

The Period 1 assemblage

The assemblage of pottery recovered from Period 1 contexts comprises 404 sherds weighing 3.001 kg. Selected sherds are illustrated on Fig. 27. The material is fragmentary and only one full vessel profile, that of a small jar (no. 14), was recovered. This form and the numerous rims can be paralleled within the Cotswold Middle Iron-Age pottery assemblages found at Guiting Power (Saville 1979) and Salmonsbury (Dunning 1976). The Middle Iron-Age date of the Birdlip assemblage is confirmed by three calibrated radiocarbon dates obtained from Period 1 contexts, indicating (at the two sigma range) occupation dating between the 4th and 2nd centuries B.C.

The majority of the sherds forming the Period 1 assemblage (86% by number, 90% by weight) were manufactured with a limestone- and/or fossil-shell temper (Fabric 2). This tempering is local to the Cotswolds and was the dominant fabric at Guiting Power (Morris 1981b). The remainder of the sherds were tempered with Palaeozoic limestone (Fabric 1) originating from the Malvern area (Peacock 1968: Fabric B1). The proportion of Palaeozoic limestone-tempered vessels from Period 1 at Birdlip (*c.* 10% by weight) lies between the range found at Guiting Power and Salmonsbury (15% and 8% respectively: Saville 1984, 157). Palaeozoic limestone-tempered pottery from the Malverns is found over a wide region during the Middle and Late Iron Age and its distribution is interpreted as evidence for a trade and exchange network covering the West Midlands and extending southwards into Gloucestershire (Morris 1981a and 1982). It is often accompanied by other regional products such as Malvernian 'A' fabric pottery (Peacock 1968) and Droitwich briquetage. Neither of these products could be recognized within the ceramic assemblage from Birdlip.

Decoration on the Period 1 vessels was sparse. No burnishing or other surface treatment could be identified but this may be due to the fragmentary nature of the assemblage rather than to its absence. Two sherds (nos. 1 and 2) belonging to Fabric 2 had decoration consisting of incisions cut obliquely across the top of the rim, and one of these also had oblique incisions just below the rim. There are no local parallels for this type of decoration. One (residual?) sherd also with a decorated rim (no. 24) came from a Period 2 deposit.

The Period 2 assemblage

This assemblage of pottery recovered from Period 2 contexts comprises 1,313 sherds weighing 8.525 kg. Selected sherds are illustrated on Figs. 28 and 29. It is characterized by the presence of hand-made and wheel-thrown vessels (as discussed by Trow 1988, 74–5) manufactured during the 1st century A.D. Assemblages of similar date have been found within Gloucestershire at Cirencester (Wacher and McWhirr 1982), Kingsholm (Hurst 1985), Ditches hillfort (Trow 1988) and West Hill, Uley (Woodward and Leach 1993). These have been subjected to detailed examination, allowing comparisons with important unquantified groups from Bagendon (Clifford 1961) and Salmonsbury (Dunning 1976).

The Period 2 assemblage incorporates a large quantity (42% by number, 36% by weight) of hand-made pottery manufactured in the Iron-Age tradition (Fig. 28). In Period 2 the quantity of Palaeozoic limestone-tempered pottery (Fabrics 1, 6 and 7) increases significantly in proportion to the more local limestone- and/or fossil-shell-tempered wares (Fabric 2), to form the majority (60% by number, 51% by weight) of the hand-made pottery. The evidence suggests that the production of local hand-made vessels diminished or ceased before Period 2, at which time Fabric 1 vessels were utilized. This is also apparent in the 1st-century A.D. assemblages from Ditches hillfort and West Hill, Uley, where Palaeozoic limestone-tempered pottery was dominant amongst the hand-made vessels. On this evidence it seems probable that much, or possibly all, of the Fabric 2 pottery from Period 2 contexts is residual from Period 1. If so, it can also be presumed that a proportion of Fabric 1 sherds also derived from the Period 1 occupation.

A few Palaeozoic limestone-tempered sherds from Period 2 were decorated (no decorated examples came from Period 1). One sherd with impressed dots and a linear incision (no. 22) is very similar to a sherd from Ditches hillfort (Trow 1988, fig. 31, no. 18). As in other 1st-century assemblages of the region, the Palaeozoic limestone-tempered vessels from Period 2 show a tendency for the rim to be everted (e.g. nos. 25–8).

The character of the wheel-thrown pottery of Period 2 suggests that it originated during the mid–late 1st century A.D. Typologically earliest are the beakers, carinated and necked bowls, and large storage jars manufactured in fabrics belonging to Group C (argillaceous), Group D (early Severn Valley ware) and Group E (Savernake ware). Dating is, however, problematic, for the commencement of manufacture of these vessel types *c.* A.D. 20 postulated from the work at Bagendon is now questionable. Trow (1988) has interpreted an assemblage of this character from Ditches hillfort as dating to the decades following the Roman conquest, as Swan (1975) and Rigby (1982, 199) have previously suggested should be the case. However, the question of the origin of the material has not been settled beyond doubt and Timby (1990) has re-affirmed the pre-Roman introduction of early Severn Valley wares.

Birdlip adds nothing to the debate concerning the period of the introduction of this early wheel-thrown material, since it was found mixed with pottery which was probably not current in the locality until the end of the 1st, or possibly the early 2nd, century A.D. This material (the majority of the pottery assigned to Groups F–J) represents slightly less than one fifth (18% by number, 16% by weight) of the Period 2 assemblage. A little less than half of it is accounted

for by Dorset black-burnished ware (Fabric 18: 7% by number, 6% by weight). This is potentially the latest material from the Period 2 assemblage. At Gloucester black-burnished ware does not appear to arrive in any quantity before the early 2nd century (Ireland 1983, 100–1), and the same date of bulk arrival at Birdlip might be expected. However, against this interpretation is the fact that the latest samian ware from Birdlip (Dannell above) is of 1st-century origin. To sum up, the pottery represented in Period 2 appears to have been current in the second half of the 1st century A.D., but a case could be made for extending the date range at either end by several decades.

A meagre quantity of fine wares were represented in the Period 2 assemblage (i.e. terra nigra and samian: *c.* 1% combined). This forms a marked contrast to the rich and varied contemporary assemblage recovered from the high-status site at Ditches hillfort, and it tends to indicate that the Period 2 occupation was of low status. Unstratified pottery (Fig. 30) is chiefly of interest for the forms that can be added to the 1st-century A.D. assemblage: the platter (no. 73) is paralleled at Bagendon (Clifford 1961, fig. 48, no. 2), and the flange-rim bowl (no. 75) is comparable to one found at Ditches hillfort (Trow 1988, fig. 38, no. 133).

ROMAN BRICK/TILE by C. Parry

A total of 64 fragments of Roman brick/tile weighing 2.534 kg was recovered. Most pieces were small and abraded and few could be identified with certainty, although one unstratified fragment from Area C is identified as a *tegula*. Thirty two fragments weighing 845 gm were stratified within Period 2 contexts. Twenty one of these came as small fragments from Area C; eleven fragments (432 gm: over half the stratified assemblage by weight) came from a single context (B203) in Area B. Possible sources for the brick/tile fragments are the Roman structures postulated at locations north and east of the excavated areas from concentrations of surface artefacts found during fieldwalking in 1983 and 1984 (Fig. 20.3).

RADIOCARBON DATING: DISCUSSION by C. Parry

Four age determinations were sought. One charcoal sample was submitted to the Radiocarbon Accelerator Unit, University of Oxford; three bone samples were submitted to the Radiocarbon Research Laboratory, Queen's University of Belfast. A summary of the results is presented on Table 5. At two sigma the calibrated date range for the pitfill A13 indicates a date of deposition in the Middle or Late Bronze Age; pottery obtained from this context (Woodward above) suggests that a date of deposition in the Middle Bronze Age is probable. The calibrated dates obtained for the fills of the pits sampled on Area C indicate that, at two sigma, these were deposited at some time during the 4th–2nd centuries B.C. This date range is in accordance with the Middle Iron-Age pottery recovered from these deposits and suggests that the same general date can be applied to the features assigned to Period 1.

CHARRED PLANT MACROFOSSILS by Vanessa Straker

Summary

Samples examined from Area A contained hulled wheat (probably emmer), barley, hawthorn and fragments of charred hazelnut shell. Assemblages of this sort are typical of early prehistoric deposits. Samples obtained from Area C dating to the Middle Iron Age (Period 1) and 1st century A.D. (Period 2) afforded an opportunity to look at arable agriculture during those periods in a locality for which no other data are available. Contexts examined included the fills of ditches and pits of crop-storage type. The crop plants recovered were hulled six-row, and

possibly two-row, barley, emmer, spelt wheat, and a free-threshing wheat which was most probably bread wheat.

Most of the samples from the Middle Iron Age and 1st century A.D. had more than 50% grain and less than 50% chaff and weeds and the concentration of plant remains was low. The Middle Iron-Age pits do not appear to have retained a crop-storage product *in situ*, but contained refuse from crop-processing activities that took place nearby. These may have included threshing and cleaning wheat and barley to a stage where it would have been suitable for storage, which, in the case of the hulled wheat, may have been in the form of spikelets rather than free grain.

Introduction

Bulk soil samples were collected from most features, and in some instances samples from several distinct fills within a single feature were collected. Some 83 samples were processed by flotation. Residues were collected on a 500 micron nylon mesh net and floats on a 250 micron mesh, and both were examined completely. All of the plant macrofossils were charred, with the exception of a single seed preserved by mineralization. The plant macrofossils were identified using a comparative collection and binocular microscope in the Department of Geography, University of Bristol. A full record of the identifications is held in the project archive; a summary is presented on Table 6.

Area A: early prehistoric and other deposits

Penannular feature A29/142: Samples were examined from a number of segments excavated from this feature. Plant remains were very scarce, the commonest being charred pieces of hazel nutshell and stones of hawthorn. Whether the haws were from the Midland hawthorn *Crataegus laevigata* or common hawthorn *C. monogyna* is not certain. A single barley grain and two indeterminate cereals were identified and a stem (culm) node that could be from a grass or cereal. In addition, a single stone in poor condition of wild cherry or sloe was found in one sample. This sort of assemblage with wild fruit and nuts predominating is common in both Neolithic and Early Bronze-Age deposits (Moffett *et al.* 1989).

Hollow A21: This feature contained a small amount of evidence for the use of cultivated cereals in the form of a grain of barley, a poorly-preserved grain of wheat or barley, the base of a spikelet fork of a hulled wheat, and an internode of a brittle-rachised wheat. The most likely species of wheat is emmer (*Triticum dicoccum*) but the diagnostic features required for certain identification were not preserved. Like the barley identified from feature A29/142, the barley was too poorly preserved to tell whether naked or hulled, six- or two-row forms were present. The hollow also contained fragments of hazel nutshell. The finding of charred plant macrofossils in a hollow presumed to be of natural origin may indicate that it was in fact a shallow pit.

Pit A12: Few plant remains were identified from the pit, which is dated to the Middle Bronze Age on the evidence of pottery and a radiocarbon date. Apart from charcoal of hazel, *Prunus* and Pomoidae, the only other plant macrofossils consisted of a single fragment of hazel nutshell and a poorly-preserved and unidentifiable seed.

Areas B and C: the cultivated and wild plants from Periods 1 and 2.

Avena sp. (oats). Fragments of oat awns and occasional grains were present in Periods 1 and 2, but no floret bases were preserved; these would have allowed determination of whether a wild or cultivated species were represented. Wild oats are common weeds of cereals; these and other large-seeded grasses (*Bromus* spp., see below) may well have infested cereal crops.

Hordeum sp. (barley). Barley was represented in Periods 1 and 2 by grains and, less frequently, rachis internodes. In most cases it was poorly preserved and precise identification was not possible. In a minority

of cases hulled grains and twisted and straight grains could be isolated. The positive identification of hulled barley does not mean that naked barley was not present, but it is less commonly found than the hulled form. In ears of six-row barley, three fertile florets generally develop at each rachis node, resulting in a rough proportion of two 'twisted' or asymmetrical grains to one 'straight' or symmetrical grain. The numbers of twisted, straight, and indeterminate grains are given on Table 7. The identification of twisted grains suggests that six-row barley was present in both periods, but the proportion of the two forms, and the large number of indeterminate grains, means that two-row barley may also have been. None of the rachis nodes was well enough preserved to confirm this.

Triticum sp. (wheat). Most of the evidence for the use of wheat is confined to hulled varieties. The use of both emmer (*T. dicoccum*) and spelt (*T. spelta*) is confirmed by the presence of glume bases of the two species (quantified on Table 8). There was also a number of glume bases that could not be assigned to a particular species, owing to poor preservation. It is, therefore, difficult to be certain whether one species was more common than the other in Periods 1 and 2, since numbers were low. All that can be said is that emmer may have become less important in relation to spelt, which would be consistent with most sites from the late prehistoric period onwards. It is also worth noting that the only internodes of a tough rachis (i.e. free-threshing) wheat occur in Period 2. Small amounts of grain morphologically similar to free-threshing bread-wheat (*T. Aestivum*) occur as a minor component of assemblages of Neolithic and later date, but free-threshing wheat does not become dominant in general until the early medieval period. There are exceptions, such as Barton Court Farm, Oxfordshire (Jones 1986), where *T. Aestivum* s.1. was common. Exactly when the change takes place is not clear, owing mostly to the lack of data available from late Roman and early medieval sites.

The remaining flora is limited. Most of the taxa belong to Period 1, but this may reflect the fact that almost twice as many deposits from Period 1 were sampled compared with Period 2. The majority of the species are of plants that thrive in disturbed conditions and cultivated ground, and are most likely to have arrived at the settlement as arable weeds. Examples include fat hen (*Chenopodium album*), cleavers (*Galium* cf. *aparine*), chickweed (*Stellaria media* gp.), ribwort plantain (*Plantago lanceolata*), black bindweed (*Fallopia convolulus*) and species of brome (*Bromus* spp.). As discussed above, oats (*Avena* sp.) may also have arrived as an arable weed. Chickweed, black bindweed and fat hen are all characteristic of Silverside's (1977) class *Stellarietea*, which he considered characteristic of present-day British arable communities from a phytosociological point of view.

There is a small group of plants that may be suggestive of a grassland flora, and this includes grasses (cf. *Poa* sp. and other members of the family Gramineae), clover (*Trifolium* sp.), medick or clover (*Medicago/Trifolium*), and possibly yellow rattle (cf. *Rhinanthus* sp.). At West Hill, Uley (Girling and Straker 1993, 251–2), a late Roman grassland flora also from the western scarp of the Cotswolds was indicated by the presence of mineralized seeds of a number of plants thought to be remnants of hay fed to goats at the temple there: it also included clover and yellow rattle. However, in view of the small number of taxa and specimens from Birdlip, it is not possible to infer whether hay, which involves a particular management regime, or pasture is indicated.

The only taxon characteristic of disturbed ground which is not normally associated with cereals is a woody nightshade (*Solanum dulcamara*). It is, however, also found in the sort of hedge or woodland edge conditions in which hazel (*Corylus avellana*), sloe/wild cherry (*Prunus* sp.) and hawthorn (*Crataegus* sp.), which are present in small amounts, also thrive. Hazel, prunus and hawthorn could have been collected for consumption.

Exotic (i.e. non-native) herbs and spices have been found on a number of Romano-British sites such as Farmoor, Oxfordshire (Robinson 1979), and in London (Willcox 1977). The only possible candidate from Birdlip is a possible seed of opium poppy (*Papaver* cf. *somniferum*) from a Period 2 context. This species was found at the Wilford shaft, Wiltshire, in a Bronze-Age context (Robinson 1989, 83). It is a common garden weed today, but is not native to British flora. As Robinson (1989) points out, it could have arrived as an arable weed or have been deliberately cultivated for its oil, or for its edible or medicinal qualities.

Discussion

The composition of the plant remains in Periods 1 and 2 is summarized by the tripole graphs presented on Fig. 31, which show the distribution of grain, chaff (glume bases, rachis internodes

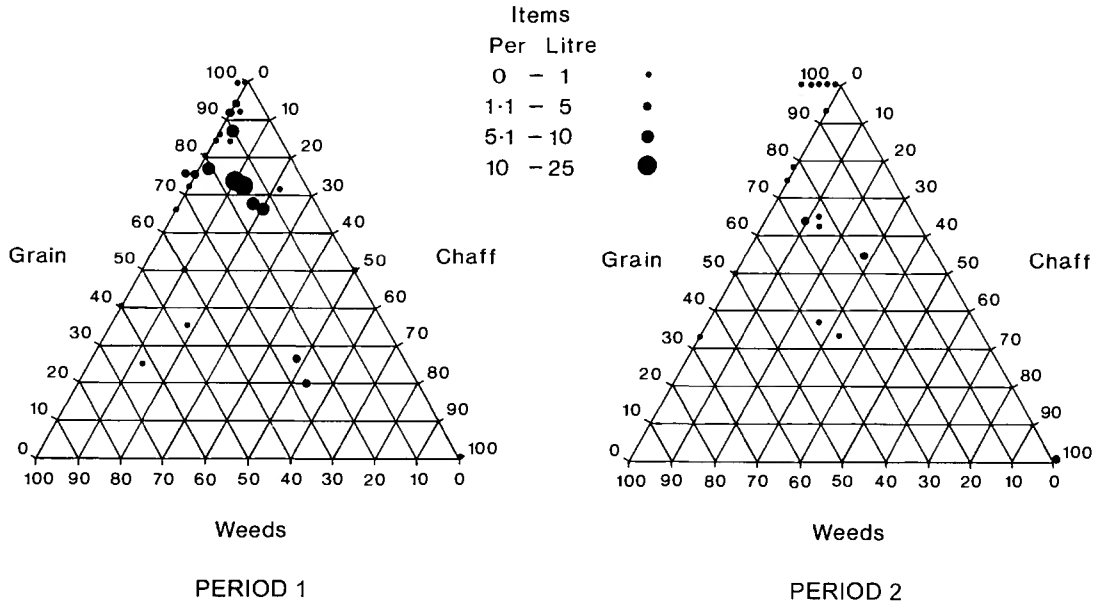

Fig. 31. Charred plant macrofossils: tripole graphs showing the proportion of grain, chaff and weeds in Periods 1 and 2.

and culm nodes) and weeds and also the density of the plant remains in each sample. Period 1 samples were mostly very low in density, having only 0–1 items per litre of soil, and only a few samples had a higher density. Most of the higher density samples were from the lower, or basal, fills of storage pits in Area C, but one was from the enclosure ditch (B204) sampled in Area B. The Period 1 assemblage demonstrated a concentration (79%) of samples with more than 50% grain and less than 50% chaff and weeds. In Period 2 the samples were also of low density, producing 0–1 items per litre of soil. Most samples derived from the upper fills of storage pits in Area C, but there were also five from fills of ditches in Areas B and C. The Period 2 sample composition did not appear to vary greatly: some 81% of the samples had 50% or more grain and 50% or less chaff and weeds. The composition of the plant remains was remarkably similar between the two periods, suggesting that the crop-processing activities carried out, and thus probably the agricultural regimes, did not alter significantly.

The nearest sites for which similar diagrams have been compiled are in the Thames Valley (Jones 1985). In his paper, Jones compared and contrasted the Middle Iron-Age phases at Smiths Field, Ashville, Mount Farm, and Claydon Pike. The distributions at Ashville and Mount Farm, which are interpreted as 'producer' sites, are quite similar to Birdlip, but higher densities of plant remains were found. The Middle Iron-Age phase at Claydon Pike was very different from Birdlip, with generally under 50% grain and over 50% weeds and chaff. The assemblage from Claydon Pike was interpreted as resulting from the final processing stages of crops brought in elsewhere. The later Iron-Age, early Romano-British, and late Romano-British phases from Claydon Pike are more similar to Birdlip, although they had more samples containing smaller amounts of grain and more weeds, and also a greater proportion of samples with a higher density of plant remains (Straker unpublished).

The fact that the Middle Iron-Age fills of the storage pits at Birdlip contained such a small amount of plant material, and that the composition of these samples did not differ significantly

from other context types (including fills above them), suggests that they retained no portion of the product for which the pits were constructed. Instead, the content of these fills appears to reflect crop-processing activities going on in the immediate area, rather than the storage products themselves.

At Danebury, Hampshire, a storage product was found in the form of burnt lumps in the base of the pit. Preservation in this instance probably occurred as a result of firing the pit to clean it. The deposit was rich in grain, and appears to reflect storage at an intermediate stage of crop processing, after removal of most types of weed seed and almost all the fragments of cereal stem, but before separation of most of the chaff (Jones 1984). At Birdlip one deposit (C659) recovered from the base of pit C313 had a density of plant material which was higher than normal for the site. The sample from Danebury suggested that the storage product was charred *in situ*. The Birdlip sample, however, incorporated a 'weed' component, including a hawthorn stone and hazelnut fragments. This must be regarded as mixed refuse accumulating within the pit after a storage product, if one was ever present, had been removed.

The usual way to establish where crops were grown is by looking at the ecological preferences of the weedy species. Unfortunately, at Birdlip, the range of taxa was very limited. No taxa that could not have grown on the limestone soils of the Cotswolds were recorded. It must, therefore, be concluded that crops were probably grown locally.

The closest area for which good data is available for comparison with Birdlip is the Thames Valley. One of the main differences is that in the Thames Valley the weed assemblages contain surprisingly large numbers of seeds of members of the family Cyperaceae (*Carex* spp., sedges, and *Eleocharis*, spike-rush). It has been suggested that, owing to the pressure on arable land, some wet marginal land was taken into cultivation (Jones 1988). At Birdlip, where permanently wet soils are rare, only a single spike-rush seed (cf. *Eleocharis*) was identified.

At Rollright, Oxfordshire, which is also on Cotswold limestone, charred plant macrofossils were identified from pits and ditches associated with an Iron-Age enclosure (Moffett 1988). The range of crops—emmer, spelt, and hulled six-row barley—was the same as found at Birdlip. In addition the weed taxa were similar, although a greater range was present in the Rollright samples, and, possibly connected with this, the density of the plant remains in the archaeological deposits was much higher. As at Birdlip, it was concluded that the crops were probably grown nearby.

The sizes of the Period 1 and 2 assemblages are small. The inference that barley was more common than wheat in Period 1 may be misleading. In this respect, percentage presence (number of samples that the cereals occur in) may be more useful than numbers of grains. In Period 1, barley occurred in 79% of samples; wheat (emmer and spelt) in 29% of samples. In Period 2, barley occurred in 63% of samples, wheat in 28%.

No individual deposits can be assigned to a particular crop-processing product or by-product, with the possible exception of context C659 noted above. Culm nodes present in this context indicated that cereal straw had been harvested with the ears, which had been largely removed by threshing, winnowing and sieving. However, as most of the weed seeds were small, and chaff was not common, the majority of the charred material from C659 may originally have come from the waste of the later stages of crop processing, later burnt and disposed of in pits no longer used for crop storage.

THE ANIMAL BONE by Keith Dobney and Deborah Jaques

Summary

A small assemblage of animal bones was recovered from contexts dating to the Middle Iron Age (Period 1) and the 1st century A.D. (Period 2). Domestic animals included cattle, sheep/goat,

pig, horse and dog. Roe deer represented the only hunted wild fauna. Standard analysis of the assemblage indicated that in both periods cattle was the dominant species, followed by sheep/goat and horse. However, statistics calculated from wet-sieved data suggested that Period 1 contained a more typical Iron-Age assemblage dominated by sheep/goat. Over the period of time represented by the assemblage, no apparent changes in size of the major domestic species was noted.

Introduction

The faunal assemblage recovered during excavation was relatively small, consisting of *c.* 53 kg of assorted animal bone fragments. The bones were in a fairly good state of preservation, although somewhat fragmented. The material derived mostly from ditch and pit deposits dating to the Middle Iron Age and the 1st century A.D. To allow meaningful comparisons to be drawn between Periods 1 and 2, only contexts positively provenanced to either period were analysed. Some contexts contained mixed material from both periods: these were sorted and recorded, but excluded from the final analysis. As a result, the analysis is based on *c.* 24.5 kg of bone with 1,583 fragments identified to species.

A summary and discussion of the species representation is presented below. A more detailed report containing the results of analysis of the frequency and biometry of the skeletal elements, age structure of the assemblage, butchery, metrical and non-metrical traits and pathology, has been deposited with the excavation archive (Dobney and Jaques 1990).

Methodology

Wherever possible bone fragments were assigned to species, or assigned to the categories of large or medium sized-mammal, or were designated as unidentified. Groups of similar fragments were then weighed and measured to establish total weights and the size range of fragments. However, due to the amount of fresh breakage noted, analysis of fragmentation did not prove informative. Bones identified to species were recorded in the manner set out by Dobney and Rielly (1988) using identifiable zones present on each element. Thus, minimum numbers of individual counts (MNI) were based on the most frequent occurrence of one non-repeatable zone. Other quantification methods employed in the assessment of species frequency were total fragment counts (including isolated tooth fragments) and epiphyses-only counts (both methods being more fully explained by Grant 1975). All measurements were in millimetres and followed those set out in von den Driesch (1976); all ageing information was based on Silver (1969) and Grant (1982).

Species represented

All of the major domestic mammals were present in the assemblage, these being cattle, sheep, pig, horse and dog. Goat bones were not present in the identified portion of the assemblage but, of course, may have been represented in the medium sized mammal category. As well as domestic species, a small number of roe deer bones was also recovered. From this it can be inferred that a minor proportion of meat was provided by the hunting of wild game.

The relative frequency of individual species can be estimated in a number of ways (Fig. 32). Using the MNI method it would appear that the most common species present in the assemblage was cattle, followed by sheep/goat, pig, horse, dog and roe deer. There seems little change between the species representation in Periods 1 and 2, but there is a suggestion in Period 2 of an increase in the numbers of cattle, sheep and pig, with lesser numbers of horse. Using epiphyses-only data, cattle were dominant in both periods and, along with pig, was the only species to show an increase in Period 2. If the species representation is considered from the viewpoint

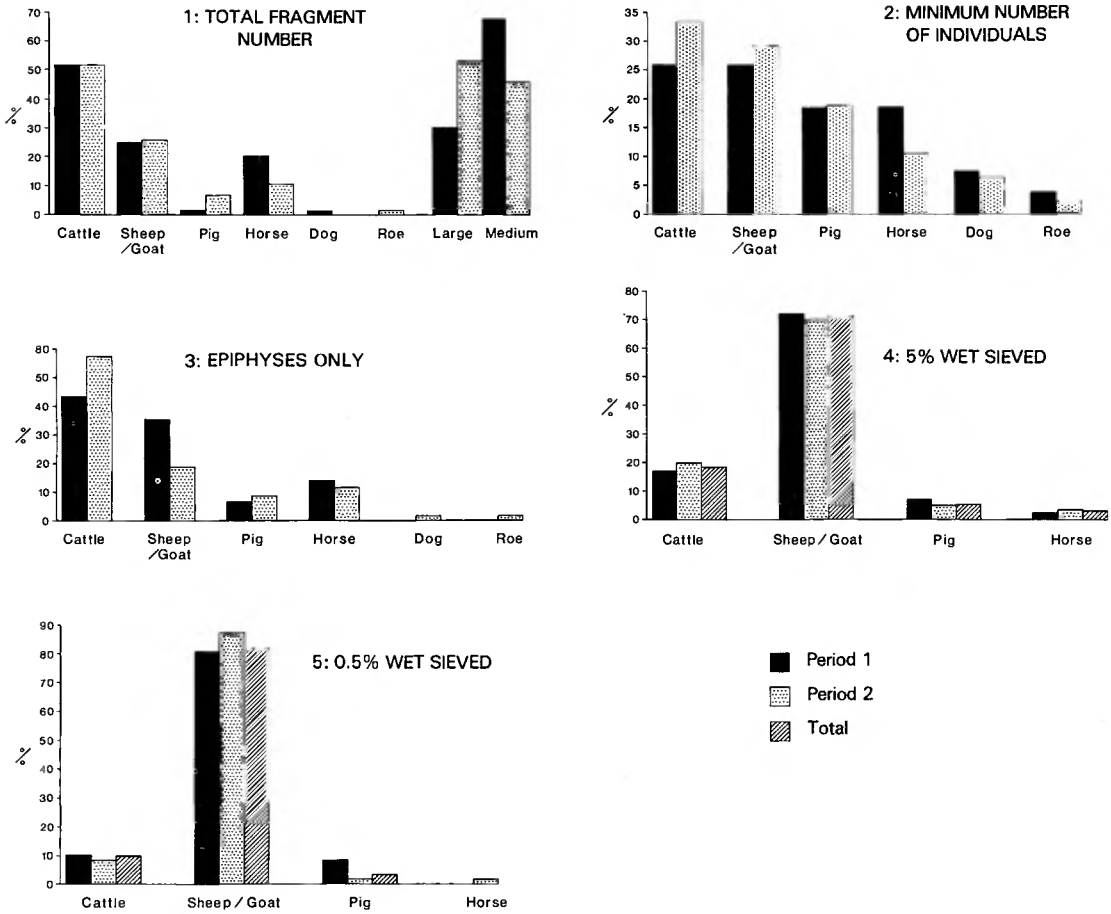

Fig. 32. Animal bone: species representation according to 1: Total fragment number; 2: Minimum number of individuals; 3: Epiphyses only; 4: 5% wet-sieved; 5: 0.5% wet-sieved.

of total fragment counts, there appears to be a shift in the frequency of large and medium sized mammals over time: medium sized mammals appear to predominate in Period 1, larger ones in Period 2.

Data obtained from animal bone recovered from wet-sieving residues conflict with the above conclusions, since in this assemblage the relative importance of sheep and cattle was reversed. A difficulty in assessing the importance of the results from the wet-sieved assemblage is that, in the absence of quantifiable data, the sizes of the original samples from each context has had to be estimated. Fig. 32.4 assumes that a 5% sample of each context was obtained, the numbers of wet-sieved bones being multiplied by a factor of 20. Fig. 32.5 assumes a 0.5% sample, the numbers of wet-sieved bones being multiplied by a factor of 200. It should be noted that most samples, which were obtained from ditches and pits, probably represented less than 0.5% of the contexts from which they were excavated, and this serves to emphasize the dominance of sheep/goat over cattle in both periods.

Discussion

The importance of the vertebrate remains from Birdlip lies in the fact that they are one of very few bone assemblages excavated from a later prehistoric and 1st-century A.D. settlement in the Gloucestershire Cotswolds. The Birdlip assemblage can be compared and contrasted with patterns of animal exploitation suggested at other sites in the locality. For the Middle Iron Age (Period 1) the only other comparable assemblage from the Gloucestershire Cotswolds analysed so far is that from Guiting Power (Wilson 1979). For Period 2, the assemblages from the 1st-century A.D. sites of Ditches hillfort (Rielly and Trow 1988) and Bagendon (Jackson 1961) are broadly contemporary. It must, however, be stressed that, due to the small size of the Birdlip assemblage and its unsystematic recovery, conclusions must to some extent be tentative.

The frequency of the domestic species from Periods 1 and 2 at Birdlip indicate that cattle and sheep comprised the main components of the faunal assemblage. Excluding the wet-sieved data, the evidence implies that cattle and sheep were present in roughly equal proportions during Period 1, while in Period 2 cattle appear to have been slightly more common. When considering body weight ratios of cattle and sheep, it is obvious that cattle would be far more important as a source of meat. This apparent increase in the importance of cattle by the 1st century A.D. at Birdlip fits well with other sites excavated in the region and beyond, where there is a clear shift away from sheep/goat in the 1st century to cattle in the 2nd century, with cattle being more typical of both civilian and military occupation in Roman Britain (King 1984).

At many Iron-Age sites the norm tends to be with the emphasis on sheep/goat husbandry. The emphasis on cattle at Birdlip in Period 1 is, therefore, a little unusual, and elsewhere this has been associated with so called 'high-status' Iron-Age sites. This is clear from Noddle's (1987) survey of sites in the Cotswold region. However, it should be borne in mind that the wet-sieved data relating to the Birdlip assemblage suggests that the apparent emphasis on cattle during Period 1 may be misleading, and, indeed, that it is possible that sheep/goat were dominant during both Periods 1 and 2. Thus, some caution is necessary in considering the significance of the Birdlip vertebrate assemblage, which is capable of being interpreted in several ways.

Other sites excavated in the locality include the supposedly high-status sites of Ditches hillfort and Bagendon. Both had a preponderance of sheep/goat, but the upland site of Ditches hillfort had an animal bone assemblage resembling that recovered from the military levels at Cirencester, with cattle supposedly playing an important role. Rielly and Trow (1988) have argued that differences between Ditches hillfort and Bagendon may, perhaps, result from a poorly excavated Bagendon sample, since there a preponderance of cattle might be expected where suitable grazing and water was more accessible. This is contrary to King's (1978) view that upland sites, with perhaps more widespread tree cover, would be more suitable to both cattle and pig husbandry. Tree cover in the Birdlip locality during Periods 1 and 2 can be inferred from the occurrence of roe deer bones in the sample.

In his survey of British Iron-Age and Roman sites King (1978) supports a hypothesis of environmental constraint on animal husbandry regimes during these periods by reference to a number of upland sites where both cattle and pig seem to predominate. He concluded that, in general, although most cattle-rich sites were indicative of a Romanized diet, the assemblages obtained from upland areas may reflect local economies controlled by environmental, rather than cultural, factors. Where does Birdlip fit into this general picture? Based on the overall interpretation of the settlement it does not readily appear to be a high-status site. However, the only other local settlement that can be used for comparison is the Middle Iron-Age site at Guiting Power. There, the vertebrate assemblage (881 bones) was even smaller than at Birdlip: sheep/goat represented 64% of total species, while cattle constituted only 26% (Wilson 1979).

No mention was made of recovery procedures and, considering the wet-sieved data obtained from the assemblage from Birdlip, it may be thought likely that sheep/goat bones at Guiting Power were even more numerous than the analysis of the material there suggested.

Clearly, further excavations of later prehistoric and Romano-British rural settlements on the Gloucestershire Cotswolds are required before the data from sites such as Guiting Power and Birdlip can be fully understood. It is also clear that precise interpretation of the animal bones will only be obtained where greater emphasis is placed upon quantitative recovery procedures during excavation.

Acknowledgements

Excavations along the Birdlip bypass were undertaken with the kind permission of the then landowner, Mr. T. Berington, Little Malvern Court, Worcestershire. The land lay on Stockwell farm, whose then manager, Mr. R. Brunt, assisted in several ways. The work extended into the early months of the programme of road construction, and I should like to thank Biwater Construction Ltd. for their help during this time.

The Birdlip bypass project was instigated by Jan Wills (County Archaeological Officer) with funding from English Heritage. The Crickley Hill Archaeological Trust's Manpower Services Commission Agency provided staff who assisted with the excavations. I should like to thank Marjorie Imlah, then manager of the Agency, for her help. Jon Hoyle of Gloucestershire County Council's Archaeology Service assisted in the direction of the fieldwork and also the programme of post-excavation analysis undertaken in 1988 and 1989: Figs. 1–20 and 22–30 were drawn by him. Fig. 21 was drawn by Caroline Jamfrey and Figs. 31–2 were drawn by Nigel Harriss. Finds specialists who contributed to this report are acknowledged in the text. In addition I should like to thank Gloucestershire County Council's Sites and Monuments Record for permission to reproduce the aerial photograph (Fig. 2), Mark Johnson for help in identifying the fossil echinoids, Philip Cracknell for discussing the brooches and Malcolm Watkins for his comments on the coins. Toby Catchpole, Patrick Foster, Alan Lupton, Andrew Mudd, Jo Vallender and Robert Williams kindly provided information relating to their recent excavations.

The archive of records and finds deriving from the Birdlip bypass excavations will be deposited with Corinium Museum, Cirencester.

TABLES

Table 1. Flint artefacts (all weights in grammes).

Type	Area A		Area B		Area C		U/S		Totals	
	no :	wt	no :	wt	no :	wt	no :	wt	no :	wt
Unretouched flakes, fragments/chips	149	81.5	3	1.8	24	23.7	2	3.3	178	110.3
Scrapers	2	6.7	—	—	—	—	—	—	2	6.7
Piercer	1	5.5	—	—	—	—	—	—	1	5.5
Barbed-and-tanged arrowhead	—	—	—	—	—	—	1	2.2	1	2.2
Miscellaneous retouched pieces	3	14.5	—	—	—	—	—	—	3	14.5
totals	**155**	**108.2**	**3**	**1.8**	**24**	**23.7**	**3**	**5.5**	**185**	**139.2**

Table 2. The chemical composition of the glass bead expressed as weight % of oxide (ND = not detected).

Colour Analysis no:	1. cobalt blue	2. opaque yellow	Colour Analysis no:	1. cobalt blue	2. opaque yellow
Na_2O	13.6	14.3	MnO	0.3	0.5
MgO	0.5	0.5	Fe_2O_3	0.7	1.1
Al_2O_3	2.5	2.6	CoO	0.1	ND
SiO_2	70.5	59.7	NiO	0.1	ND
P_2O_5	0.2	0.2	CuO	0.2	ND
SO_3	ND	0.2	ZnO	ND	ND
Cl	0.9	0.8			
K_2O	1.1	0.6	As_2O_3	ND	0.1
CaO	7.5	5.4	SnO_2	ND	0.2
TiO_2	0.1	0.1	Sb_2O_3	ND	0.9
Cr_2O_3	ND	ND	BaO	0.1	0.1
			PbO	0.5	11.3

Table 3. Total pottery assemblage: incidence of Fabric Groups A–L.

		sherds	% by no	wt (kg)	% by weight
Group A	Palaeozoic limestone	604	18.144	2.989	14.164
Group B	Limestone and/or shell	835	25.043	6.117	28.990
Group C	Grog-tempered	98	2.937	0.639	3.028
Group D	Severn Valley wares	932	27.952	6.294	39.827
Group E	Savernake wares	71	2.127	1.054	4.994
Group F	Soft oxidized wares	230	6.897	1.053	4.989
Group G	Sandy wares	141	4.224	0.728	3.446
Group H	Imitation black-burnished	42	1.259	0.144	0.682
Group I	Black-burnished I	88	2.639	0.523	2.478
Group J	Amphorae and fine wares	54	1.616	0.420	1.989
Group K	Misc. and untyped	215	6.448	0.972	4.606
Group L	Medieval and post-med	24	0.719	0.168	0.796
totals		**3334**	**(100.005)**	**21.101**	**(99.989)**

Table 4. Incidence of pottery Fabric Groups A–K within selected Period 2 deposits from Area C.

		Ditch 315 & 520–1		Upper pit fills		Ditch 311	
		% no	% wt	% no	% wt	% no	% wt
Group A	Palaeozoic limestone	42.4	38.2	28.3	17.6	11.7	6.9
Group B	Limestone and/or shell	11.1	7.5	26.0	34.3	7.3	4.8
Group C	Grog-tempered	2.5	3.6	5.1	4.5	5.3	5.2
Group D	Severn Valley wares	27.1	30.3	27.2	33.3	33.0	42.7
Group E	Savernake wares	3.3	6.0	0.3	1.3	2.7	6.5
Group F	Soft oxidized wares	2.9	2.1	1.1	0.9	8.2	7.6
Group G	Sandy wares	0.8	0.3	0.5	0.2	6.9	3.5
Group H	Imitation black-burnished	3.3	4.0	2.4	2.8	3.4	2.7
Group I	Black-burnished I	3.7	3.5	3.8	2.3	14.4	14.2
Group J	Amphorae and fine wares	1.2	3.3	0.8	0.8	3.0	2.7
Group K	Misc. and untyped	1.6	1.1	4.3	1.8	3.9	2.9
totals		**99.9**	**99.9**	**99.8**	**99.8**	**99.8**	**99.7**

All percentages have been rounded to the nearest 0.1%. The pottery (1,301 sherds weighing 8,413 gm) was obtained from: upper fills of ditch C315 and feature C520/521 (243 sherds weighing 1,845 gm); upper fills of thirteen storage pits (622 sherds weighing 3,539 gm) and ditch C311 (436 sherds weighing 3,029 gm).

Table 5. Radiocarbon dating: summary of results.

Laboratory	Context	Material	Age BP	Calibrated date range
OXA 2544	A13 (fill of pit A12)	charcoal	2700 ± 100	990–800 1 sigma 1160–540 2 sigma
UB–3301	C452 (fill of pit C429)	bone	2270 ± 30	393–269 1 sigma 398–248 2 sigma
UB–3302	C560 (fill of pit C561)	bone	2222 ± 44	382–202 1 sigma 394–178 2 sigma
UB–3303	C533 (fill of pit C384)	bone	2198 ± 37	369–196 1 sigma 385–169 2 sigma

The 1 and 2 sigma range represents 68% and 95% confidence respectively. The calibrated date range for OXA 2544 was obtained using the programme of C.I.O. Groningen; calibrations for UB–3301–3 were obtained using the programme of the University of Washington.

Table 6. Summary of the charred plant macrofossils.

taxon	common name	early prehistoric	Period 1	Period 2
Avena sp. awn fragments	oats	—	5 (1)	—
Avena sp. grain	oats wild or domesticated	—	4	1
cf. *Avena* sp. grain	cf. oats	—	7	—
Avena/Bromus	oats/brome	—	3+	2
Hordeum sp. grain	barley	2	173	30
Hordeum sp. grain, straight	barley	—	2	3
Hordeum sp. grain, twisted	barley	—	2	—
Hordeum sp. grain, hulled straight	barley	—	10	—
Hordeum sp. grain, hulled twisted	barley	—	4	1
Hordeum sp. rachis internode	barley	—	4	—
cf. *Hordeum* sp. grain	barley	—	2	1
Triticum/Hordeum grain	wheat/barley	1	6+	—
Triticum sp. spikelet fork base	hulled wheat	1	2	2
Triticum sp. grain	wheat	—	63	20
Triticum sp. glume bases	hulled wheat	—	8	3
Triticum sp. brittle rachis internode	hulled wheat	1	1	—
Triticum sp. tough rachis internode (hexaploid)	bread wheat	—	—	3
Triticum cf. aestivum sl.	cf. bread wheat	—	—	1
Triticum cf. *dicoccum* grain	emmer	—	6	1
T. dicoccum glume bases	emmer	—	3	—
T. cf. *spelta* grain	spelt	—	16	—
T. cf. *spelta* glume bases	spelt	—	17	3
T. dicoccum/spelta glume bases	emmer/spelt	—	25	6
T. cf. *dicoccum/spelta* grain	emmer/spelt	—	26	—
Cereal sp. indeterminate grain		2 +	155 +	45
Cereal sp. rachis internode		—	4	2
grass/cereal culm node		1	5	—
Papaver somniferum L	opium poppy	—	—	1
Stellaria media gp.	chickweed	—	1	—
Chenopodium album	fat hen	—	3	—
Chenopodium spp.	goosefoots	—	3	—
Atriplex sp.	orache	—	1	1

Table 6 (*continued*)

taxon	common name	early prehistoric	Period 1	Period 2
Chenopodium rubrum L./*botryodes* Sm.	goosefoot	—	1	—
Medicago/Trifolium sp.	medick/clover	—	6	1
Trifolium sp.	clover	—	1	—
Vicia/Lathyrus sp.	vetch/tare	—	2	—
Crataegus sp. stone	hawthorn	6 +	2	—
cf. *Prunus* sp. stone	cherry/sloe	1	—	—
Rosaceae, spine	—	—	1	—
Corylus avellana L. nut shell fragments	hazel	12 (1)	33 (2)	11 (1)
Fallopia convolulus (L.) A. Love	black bindweed	—	1	—
Polygonum sp.	—	—	1	—
Rumex sp.	sorrel	—	2	—
Euphrasia/Odontites verna (Bell) Dumort.	eyebright/red bartsia	—	1	—
cf. Rhianthus sp.	cf. yellow rattle	—	1	—
Plantago lanceolata L.	ribwort plantain	—	1	—
Galium cf. *aparine* L.	cleavers	—	12	—
Galium sp.	bedstraw	—	5	2 +
Solanum dulcamara L.	bittersweet	—	1	1
cf. *Eleocharis* sp.	spike-rush	—	1	—
cf. *Poa* sp.	poa (grass)	—	23	6
cf. *Bromus* sp.	cf. brome	—	1	—
Bromus sterilis L.	barren brome	—	5	—
Bromus hordcaceus L./*secalinus* L.	lop grass/rye-broom	—	22	8
grass culm node	—	—	1	1
grass glume base	—	—	3	1
unidentified	—	1	17	1
totals		**17**	**670**	**148**
litres soil		**283.3**	**396.4**	**451**
items/litre soil		**0.06 (0.3–0.6)**	**1.7 (0.1–14)**	**0.33 (0.01–2)**

Table 7. *Hordeum* sp. (barley): incidence of straight and twisted grains.

	Period 1	Period 2
straight	30	3
twisted	6	1
indeterminate	187	34
totals	**223**	**38**

Table 8. *Triticum* sp. (wheat): incidence of glume bases.

	Period 1	Period 2
emmer	3	0
spelt	17	3
indeterminate	25	7
totals	**45**	**10**

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