Beaker occupation and development of the downland landscape at Ashcombe Bottom, near Lewes, East Sussex

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Research excavations were conducted of colluvium in the dry valley of Ashcombe Bottom to the west of Lewes. Colluvial deposits in the centre of the valley were only 1.5 m thick but contained a buried soil on which was a series of parallel ard marks, which were confirmed by soil micromorphological analysis and indicated prehistoric tillage. The colluvium contained a number of sherds of Beaker pottery and at least 26 Beaker vessels were represented, indicating a settlement site rather than a funerary monument.

Environmental analysis of the sediment provides a broad history of the landscape from the Neolithic period to Middle Bronze Age and spans the construction and disuse of the causewayed enclosure at Offham, and the activity associated with the Late Neolithic and Bronze Age flint scatters recorded in the Houndean-Ashcombe area.

The results of this research excavation provide settlement and environmental data which enhance our understanding of the Early Bronze Age prehistoric occupation and use of the Sussex Downs.

Research excavation of a shallow colluvial sequence revealed evidence of a rare Beaker domestic settlement and was associated with direct evidence (ard marks) of tillage. Each side of the valley contained a very different colluvial sequence indicating significantly different and variable soils in the past. Soil micromorphological and environmental evidence defined significant changes in the soils through the Neolithic and Bronze Age periods, and indicated that the past environmental potential was very different to that of the downlands today. These data allow this paper to explore Beaker settlement sites in southern England, and in particular their location, and the lack of their presence in the archaeological record to date. It also allows us to make some significant comments on hillwash, not just from its environmental and geoarchaeological potential (Bell 1983; Wilkinson *et al*. 2002; Wilkinson 2003), but also as to its archaeological significance to the presence and location of past activity within chalkland landscapes.

ASHCOMBE BOTTOM (FIGS 1 & 2)

Ashcombe Bottom is a typical dendritic dry valley lying on the dip-slope of the Downs to the west of Lewes about 2 km south of the chalk scarp (Figs 1 & 2). The broad, gently undulating dip-slope plateau of the Downs here contains a number of narrow and deeply incised dry valleys that follow gently wandering courses southwards. The heads of the dry valleys are often steep 'bowls' behind the escarpment (Fig. 1). Ashcombe Bottom is no exception with the head of the valley less than 150 m from the escarpment. It is situated between the dry valleys of Houndean Bottom and Cuckoo Bottom to the east and Buckland Hole to the west. This downland comprises Upper Chalk with few localized patches of Clay-with-flints mainly along the escarpment and prominent ridges such as Balmer Down. The area supports mainly brown rendzinas of the Andover Series with grey rendzinas (Upton Series) on the scarp slopes and localized typical paleo-argillic earths and typical argillic brown earths of the Carstens Series and Charity Series, respectively, over Clay-with-flints. The soils within Ashcombe Bottom are typical brown earths and colluvial brown earths with brown and grey rendzinas on the chalk slopes and hilltops. Occasional local patches of non-calcareous coarse silty (possibly loessic) deposits supporting silty brown earths were noted as small benches on the western valley side. Similar loessic deposits are

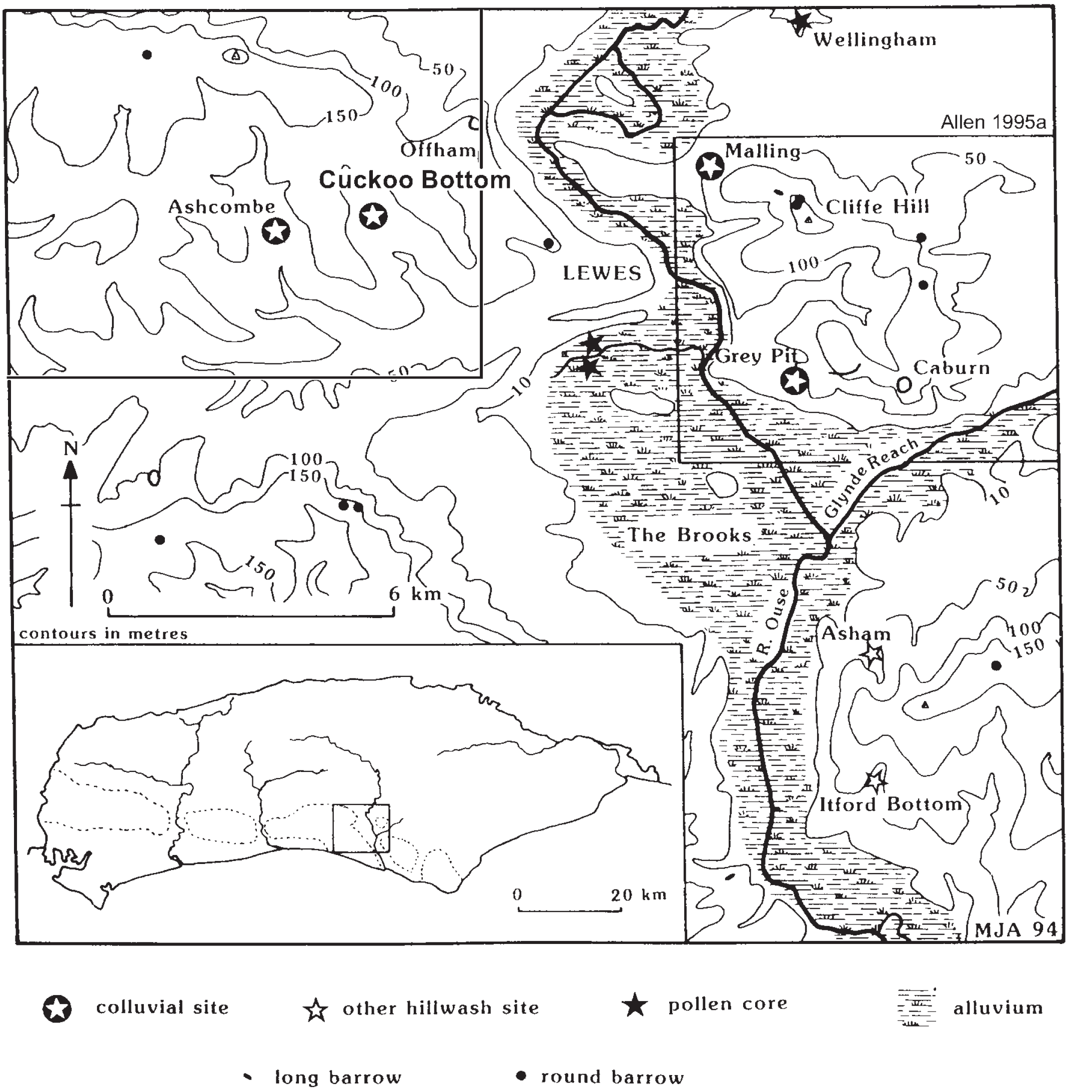

Fig. 1. Study area around Lewes showing the location of the Ashcombe Bottom and its study area and the Malling–Caburn study area (Allen 1995a), and the location of other dry valley studies.

reported in Buckland Hole (Allcroft 1924, 111).

Excavation of colluvium (hillwash) in the dry valley at Ashcombe Bottom (TQ 380 106) in 1984 (Allen 1984a,b) was designed to form the basis of a non-site interpretation of the Offham-Houndean-Ashcombe environs: a landscape that contains the Neolithic causewayed enclosure of Offham (Drewett 1977) and extensive Late Neolithic to Bronze Age flint scatters (Biggar 1973; 1975; 1978). This research examined valley sedimentation with a view to evaluating the landscape evolution as has been done for the Caburn-Malling Downs (Allen 1995a) and elsewhere (Bell 1983; Allen 1988; 1994). The excavation of colluvial deposits in dry valleys and foot-slope locations provides a broad off-site landscape, rather than a purely site-based approach to environmental studies. Although colluvium is essentially a natural product of eroding soils (Dimbleby 1976; 1984), its presence implies accelerated and increased erosion as a result

Fig. 2. General view of Ashcombe Bottom dry valley looking north (Photo: Mike Allen).

of human activity, particularly cultivation (Bell 1983; 1992; Allen 1988; 1992). As a result, dated palaeo-environmental sequences relate to a larger area than that of just a settlement site (or valley bottom) alone.

The block of downland to the west of Lewes and north of the 'Falmer valley' (i.e. A27) is the location of a number of important archaeological investigations and sites (Fig. 3). Excavations recorded details of the Neolithic causewayed enclosure at Offham (Drewett 1977) from which molluscan analysis by Thomas (1977) was particularly significant. Extensive artefact scatters recorded by Joyce Biggar around Houndean, Ashcombe and Balmer (Biggar 1973; 1975; 1978; 1980) included several Neolithic sites between Balmer Huff and Buckland Bank to the west, as well as at Houndean/Cuckoo Bottom to the east. Finds have included a Neolithic flint axe on Balmer Down overlooking Ashcombe Bottom (Evans 1897), and a large Neolithic-Early Bronze Age flint assemblage including several partially polished axes and scrapers of Neolithic-Early Bronze Age character (Drewett, in Biggar 1978, 147) thought to indicate a settlement (Biggar 1978, 145) above the confluence of Ashcombe Bottom and Buckland Hole (TQ 399 099). Of particular interest was a rare flint burnisher of the type Curwen described as 'blunted axe-like implements' (Curwen 1939), which Gardiner states is significant in view of the typically unremarkable nature of the remaining flint scatter (Gardiner 1988, 172).

A number of valley 'entrenchments' are recorded by Toms (Fig. 3); although undated they may be prehistoric (Toms 1926; 1927). They are similar to the Beaker enclosure at Belle Tout (Toms 1912; Bradley 1970; 1982) and Cuckoo Bottom (Allen 2005a/this volume). Several are recorded in the immediate vicinity, one of which is a part of the famous Bronze Age site at Plumpton Plain. Others include simple rectangular enclosures such as that at Horseshoe Plantation (TQ 358 111) on the western slopes of Faulkner's Bottom which produced Beaker and Bronze Age pottery (Toms 1927, 187), and that at Cuckoo Bottom which straddles the valley floor (Toms 1926; Allen and Fennemore 1984) from which both comb-impressed Beaker and collared urn have been recovered (Allen 2005a/this volume; 1989a,b). Ashcombe Bottom, like a number of valleys, contains two valley entrenchments (Fig. 3).

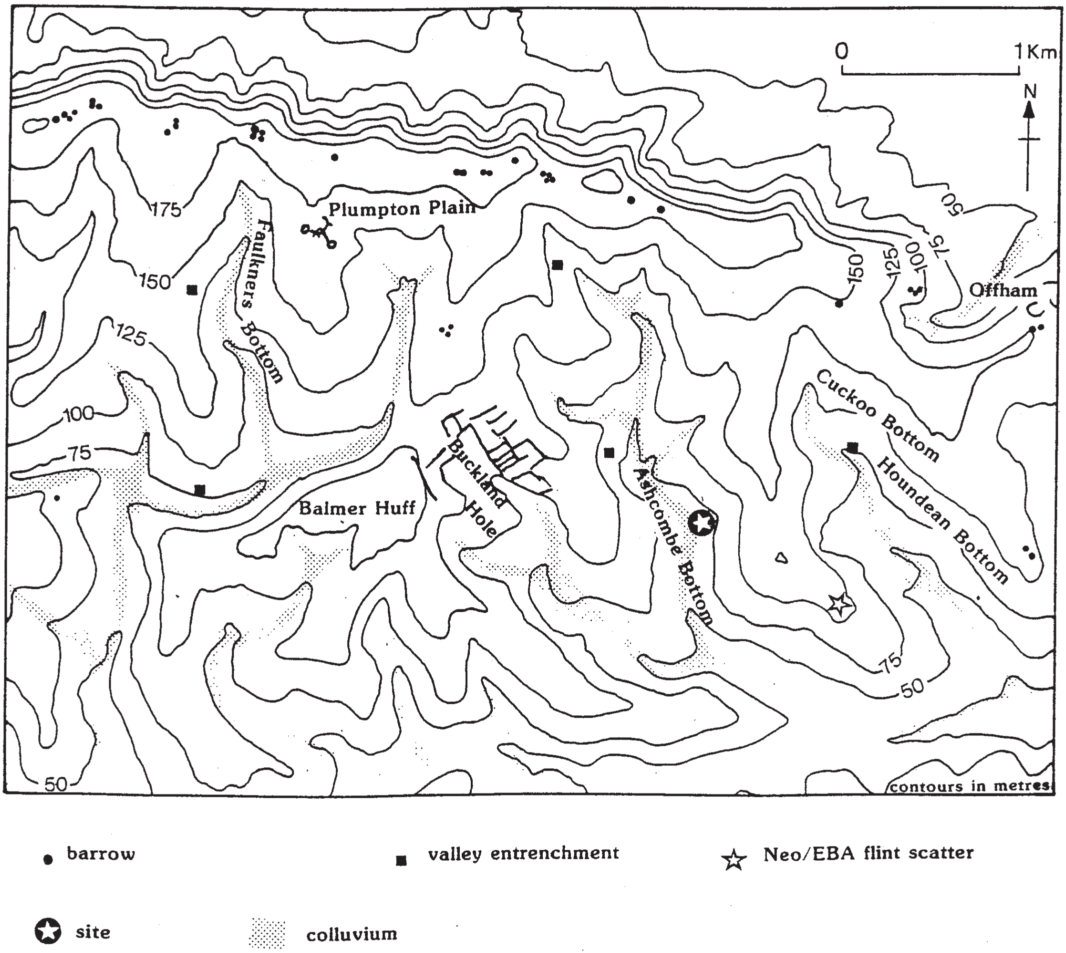

Fig. 3. Geomorphology of Ashcombe Bottom and the surrounding Downs.

A number of Late Bronze Age/Early Iron Age sites were also located by Biggar's work (1973; 1975; 1978; 1980) as well as evidence of extensive rural Roman activity.

EXCAVATIONS (FIG. 4)

Precise location of the trenches was defined by the necessity to leave vehicular access for the farmer, Mr. C.J. Rae. Excavations were situated just to the south of a sharp meander in the valley's course with a relict river cliff on the eastern side (Fig. 2). The valley floor widens beyond this where a small dry valley enters from the east (Figs 1, 3 & 4). The trench was L-shaped so that it sectioned the 'confluence' of Ashcombe Bottom and the minor tributary (Figs 4 & 5). The valley floor has a very shallow gradient (less than 4°) whereas the minor valley to the east is comparatively steep (greater than 18°).

Two trenches were opened; one major L-shaped trench on the east side of the valley floor (trench 1). The east–west section (0–20 m) examined sediment from the axis of the minor valley and the trench that ran perpendicular to it (20–35 m) examined valley-side sediment from the smaller valley (Fig. 4). A small 3-metre trench (trench 2) was located on the western slope.

EXCAVATION METHODS

The hillwash was excavated and recorded using techniques principally developed by Bell (1977, 252–7; 1981; 1983) but with modifications (Allen

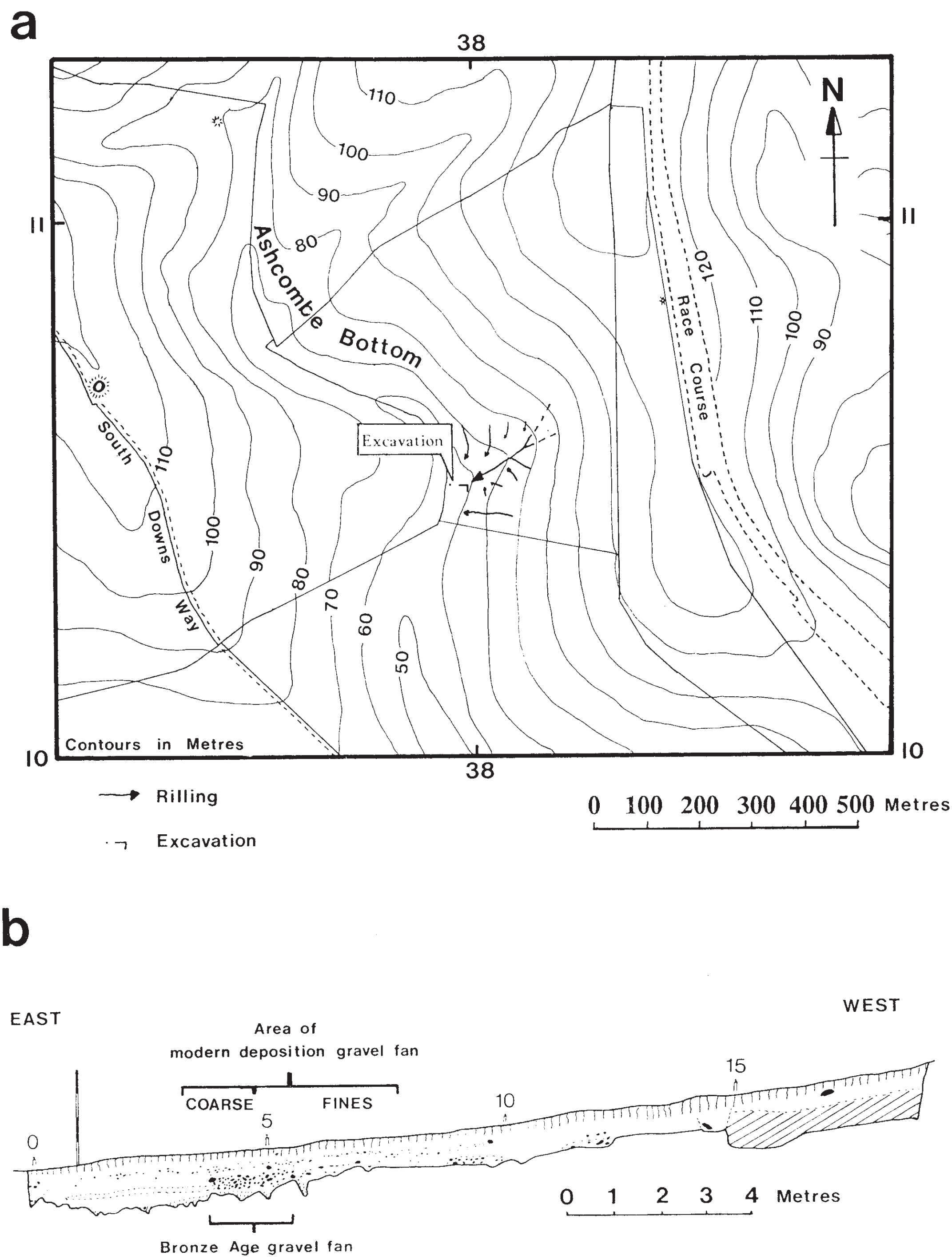

Fig. 4. Ashcombe Bottom; locations of trenches and valley profiles.

Fig. 5. The excavated trench: note the tree-hole sectioned in the centre of the trench (Photo: Mike Allen).

1983; 1984a; 1988). The sediments were sectioned with a 2-metre wide, machine-cut trench and one face was straightened and cleaned by hand prior to recording and hand-excavation. Observation of the exposed sections enabled a comprehensive understanding of the stratigraphy. Sections were recorded after weathering which enabled horizons that were not readily visible when first cut to show up. Detailed drawings were made of the section at 1:10 and every stone larger than *c.* 10 mm was recorded. Sedimentological and pedological descriptions were following terminology outlined by Hodgson (1976). Summary descriptions of the main sequence are given in this report; more detailed pedological field descriptions are in the archive (Allen 1994).

A strip 0.75 m wide along the length of the trenches was hand-excavated (Fig. 6) and the location of every artefact recorded with three co-ordinates to within 10 mm. All the deposits in trench 1 below the modern soil horizons (except a block sampled for flotation, *see* below and Fig. 7) was dry-sieved through 10 mm and 5 mm mesh sieves to recover artefacts missed during manual excavation, as nearly all diggers were inexperienced. Less than 1.8% of the finds were found by dry-sieving indicating a high manual recovery rate.

Flotation

On-site flotation was conducted to recover charred plant remains and charcoals from the colluvium. The sediment from a 1.5-metre block (Fig. 7) was processed in its entirety. It was divided into three 500 mm sections and was sampled in eight 100 mm spits and in excess of 1300 litres of soil was processed. The flot was retained on a 5 mm mesh and residues retained on 2 mm mesh (Allen 1984a, 23–6).

STRATIGRAPHY

The excavations revealed relatively shallow deposits (up to 1.5 m) and mixing by earthworms and other soil fauna was noted through most of the sequence. Detailed soil descriptions of the major layers are given in the archive.

Trench 1: 0–20 m

The section produced only *c.* 1.5 m of sediment in the centre of the valley. Nearly all the colluvial deposits were decalcified or only weakly calcareous

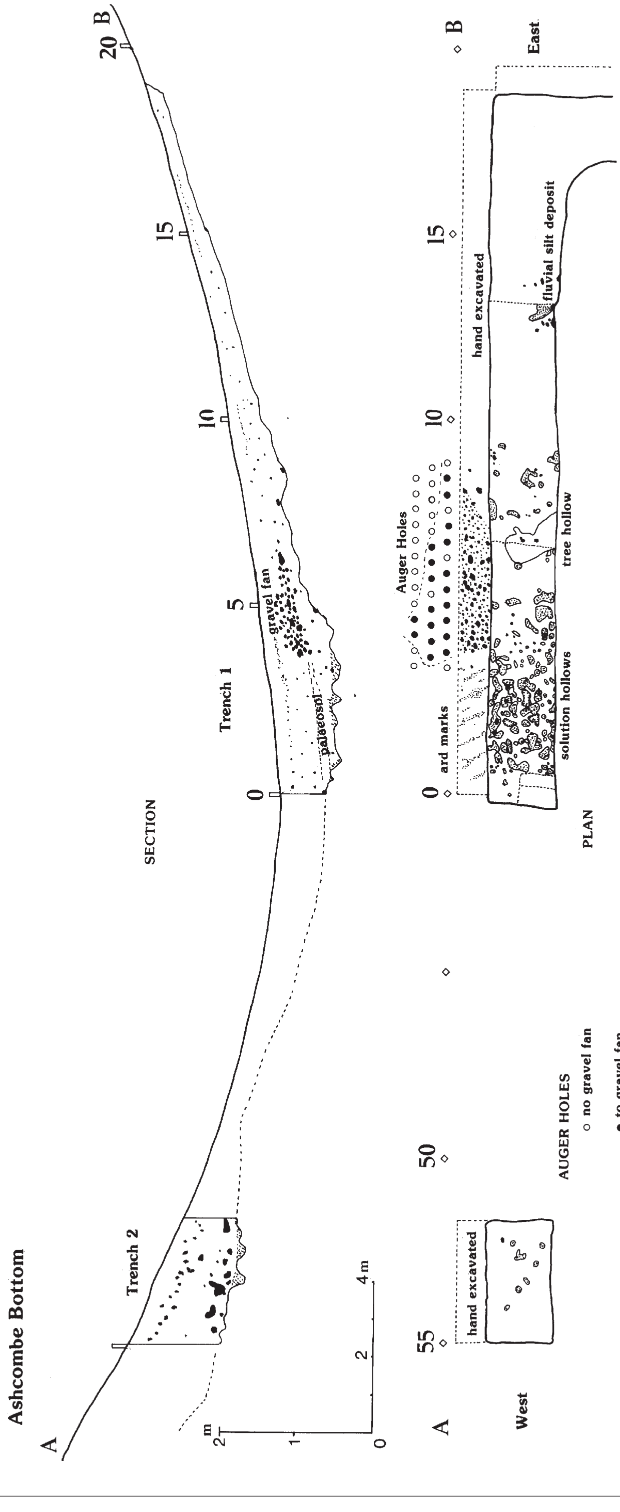

Fig. 6. Summary section and plan of the excavation showing extent of the gravel fan and the location of the tree hollow and fluvial silts.

and thus molluscan evidence was limited or non-existent. A number of deposits were investigated, however, and ranged from prehistoric colluvium to recent (post 1945) military activity which is only dealt with briefly.

Periglacial (layer 20)
The base of the trenches exposed a very pale brown (10YR 8/3) periglacial soliflution, Coombe deposit (Fig. 7) which was variable and contained subangular and sub-rounded large to medium chalk pieces cemented into the calcareous matrix. Within the periglacial material were localized patches of very pale brown (10YR 7/4) fluvial, laminated sandy silts. The surface to the Coombe Deposit was pitted with hollows that contained a relict early Holocene palaeosol (layer 11). They were absent upslope but more frequent and larger in the valley centre (Fig. 6).

Former soil (layer 11)
Within solution hollows and depressions in the Coombe Deposits was a strong — dark brown to reddish brown (7.5YR 4/6 - 7.5YR 3/4 to 5YR 4/4) clay/silty clay, with strong, well-developed structure with few very small chalk pieces and localized patches of flints and devoid of artefacts. Clay coating on inter-ped surfaces (hand lens), indicate an illuvial horizon. It is probably the truncated Bt horizon of a mature typical argillic (Luvic) brown earth.

This also occurred in the valley bottom and on the western valley side (trench 2), where it was distinctly more silty (possibly sandy), probably because of the overlying loessic colluvium (layer 32 and 33). Illuviated clay on inter-ped voids was not noticed in the field with a hand lens.

Tree hollow
Cutting into the periglacial deposits was a tree hollow 1.1 m wide and at least 1.4 m across with an irregular outline (Figs 6 and 8). It did not lie wholly within the trench and augering determined it to be broadly crescentic. Unfortunately, its relationship with the lower colluvium (layer 10) could not be established (*see* Fig. 5)

Its main fills were a basal (layer 3 a yellowish brown (10YR 5/6) highly calcareous silty clay loam with abundant chalk pieces, and the upper layer (layer 1) with a highly irregular interface, probably root hollows. It was a dark brown (7.5Y 4/4) silty clay with rare stone and well-developed medium blocky structure.

A few undiagnostic flint artefacts and rare burnt flints were present in the tree hollow.

The prehistoric colluvial sequence
The main prehistoric sequence occurred on the valley floor and comprised the deepest sedimentary sequence between 0 m and 6 m (Fig. 9).

Lower colluvium (layer 10)
Occurs only in the centre of the valley (0.6 m to 4.1 m) overlying the Coombe Deposit and sealed below the buried soil This colluvium was only 340 mm deep and was a dark yellowish brown (10YR 4/6 to 10YR 4/4 with depth) weakly calcareous silty clay/silty clay loam with few chalk pieces. Ancient earthworm channels were present, presumably from the buried soil (layer 9) above. It is pre-Beaker but contained little artefactual material.

Beaker buried soil (layer 9)
Sealing the early colluvium was a Beaker buried soil *c*. 100 mm thick, and only fully recognized after the section had been allowed to weather for two weeks. It was a dark yellowish brown (10YR 3/6) silty clay loam, with weak blocky structure and almost stone-free. Its surface shows as a clear wavy and undulating boundary suggestive of prehistoric cultivation ard marks (Fig. 10). Detailed excavation of its surface showed up to 14 parallel grooves over 1.5 m (Fig. 10), which can be paralleled with those recorded by Bell at Kiln Combe (Bell 1981, 120, fig. 11) and are similar to those recovered at Brean Down (Bell 1990, figs 19 & 22).

The buried soil was eroded upslope and ended abruptly where it met the gravel fan (layer 5). It produced very few artefacts, but these include abraded sherds of Beaker pottery.

Colluvium (layer 8)
Dark yellowish brown (10YR 4/4) non-calcareous silty clay loam with reddish silty clay loam at base overlying paleo-argillic horizon and few medium to large flints. The relationship between this layer and lower colluvium / buried soil was removed by the deposition of the gravel fan. It contained flint artefacts and Beaker pottery and may be broadly contemporary with the buried soil.

Upper colluvium (layer 7)
Overlying the buried soil in the centre of the valley downslope from the gravel fan was the main prehistoric colluvium which survived up to 0.52

NOTE Figure 7 gets tipped in between pages 8 and 9

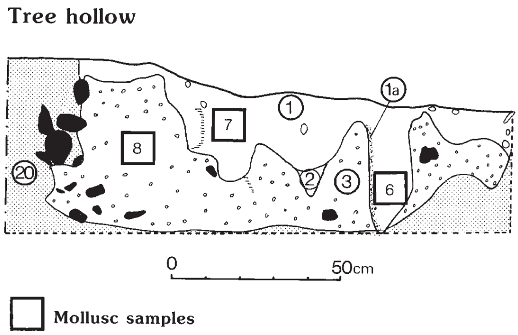

Fig. 8. Section drawing of the tree hollow.

Fig. 9. Prehistoric colluvium in the centre of the valley with gravel fan; the Beaker buried soil can just be distinguished running from the end of the gravel section toward the centre of the valley (Photo: Mike Allen).

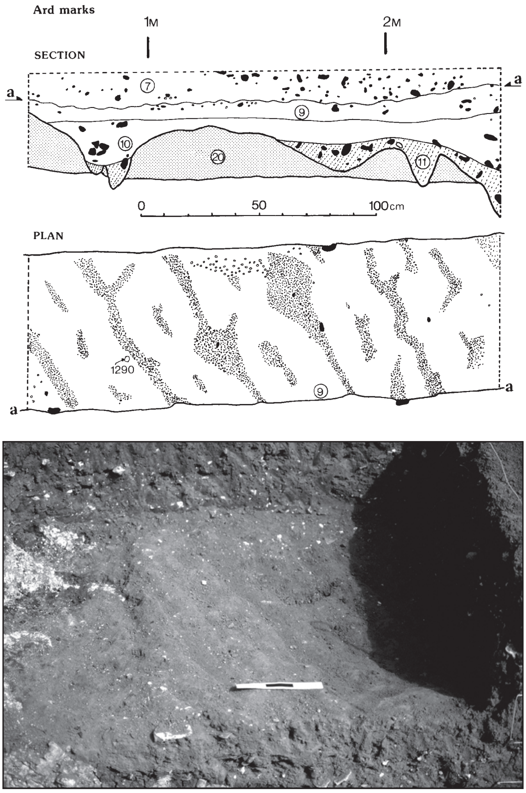

Fig. 10. TOP: Plan and section of the ard marks. BOTTOM: Ard marks as excavated in the top of the Beaker buried soil (Photo: Mike Allen).

m thick and abuts the gravel fan. Its chronological relationship with the gravel fan is uncertain. The colluvium was a dark yellowish brown (10YR 4/4) silty clay loam with common medium and small flints and rare large flints. Localized intermittent lenses of abundant small chalk pieces (layer 7a) probably represent rill erosion (cf. Allen 1992, figs 4.4 & 4.5) in an essentially uncalcareous colluvium. This horizon contained Beaker–Iron Age pottery, with abundant flint flakes.

Gravel fan (layer 5)

A gravel fan at the foot of the slope comprised very large abundant wholly cortical flint nodules, angular flints, and many small and medium flints in a colluvial matrix.

Augering showed this to form a fan (Fig. 6) and is the product of a single-event gully erosion. Stone orientation measurements on 178 clasts showed a preferential dip of *c.* 59° and strike of 87° indicating erosion from the tributary valley. It is typical of material washed from fields and deposited in ‘alluvial fans’ (Boardman 1992) that usually occur in Autumn–January when arable fields are bare and the winter crop has not come up.

The modern sequence

In the centre of the valley these deposits were sealed by modern (probably post 1945) deposits comprising a buried soil (layer 4), chalky lenses (layer 2) and the brown earth soil (layer 1). These are summarized below with the other ‘modern’ deposits.

1945 grassland soil (layer 19)

A discrete weakly calcareous, well worm-worked humic horizon up to 150 mm thick typical of a grassland soil.

Canadian Army trench (Feature 18 and fill 17):

A trench 4.6 m long and at least 0.8 m deep cut into the Coombe Deposits at the east end of the trench was probably cut between 1941–48 by the Canadian Army for training (C. Rae pers. comm.). It was filled coarse chalk rubble and Coombe Deposit with obvious tip lines some with thin soil lenses. Artefacts included Beaker pottery and cartridge cases.

Shrub burning (layer 16)
A very dark brown layer with abundant charcoal pieces and burnt branches (charcoal includes *Pomoidea* and *Crataegus*) lying lenses of reddened burnt soil. This related to shrub clearance either by the Canadian army or by the farmer in 1956-61 (T. and C. Rae pers. comm.).

Modern colluvium (layers 14 & 15)
Overlying the burnt layer and the army trenches soil was a highly calcareous silty clay loam with common small chalk pieces and few flints.

Modern buried soils (layers 4, 3 & 19)
Very dark greyish brown (10YR 3/2) to dark brown (10YR 3/3) stone-free humic silt loam with well-formed fine crumbly prismatic peds typical of grassland soils.

Chalk rills (layer 2)
A number of intermittent lenses up to 40 mm thick of abundant small chalk pieces under the present topsoil. These lenses represent chalk wash deposits from the adjacent field after its first ploughing in *c.* 1961.

Trench 1; 20–35 m
The north–south wing of trench 1 produced only shallow colluvial deposits. These never exceeded 0.7 m and were mainly post-Roman.

Trench 2
A small trench (52–57 m) was situated on the short western slope of the valley. It was located just above a break in slope (Figs 6 & 7) and produced a completely different sequence, quite atypical of the Downs. The deposits exceeded 1 m and were deeper *upslope* but only two colluvial units were recognized. The loessic colluvial horizons overlaid the paleo-argillic soil and periglacial solifluction deposits as described above.

Lower loessic colluvium (layer 33)
Yellowish brown (10YR 5/4 to 10YR 5/6) silty clay loam possibly with a loessic component, common large flint stones completely cortical. The main differentiation between this and layer 32 is the presence of more flint pieces and the greater clay (fine silt) component. Only flint artefacts present.

Upper loessic colluvium (layer 32)
Dark yellowish brown (10YR 4/4 to 10YR 3/4) non-calcareous dense coarse silt loam–loamy sandy silt, possibly aeolian/loessic. Common medium angular flints. Iron Age and Romano-British pottery and a few flint flakes including retouched pieces.

ARTEFACT DISTRIBUTIONS
A total of 1606 finds was recovered of which over 300 were post-medieval; most being associated with the 1945 use of the valley and included a number of bullets, cartridge cases, shrapnel and a 4½-inch white phosphorous bomb! Nevertheless, the distribution of material was discrete and informative. The distributions discussed below are limited to the datable and diagnostic artefacts (e.g. pottery and 1945 militaria) and the flints. The distribution of significant artefacts is shown in figures 11, 12 and 13. A total of 111 sherds of pottery was recovered of which 79% (88) were prehistoric.

Late Neolithic sherds
Nearly all the Late Neolithic pottery came from the deeper colluvial sequence near the centre of the valley (Fig. 11). Seven of these 21 sherds were from lower colluvium (layer 10). A number of more worn and abraded sherds were found in the upper part of the gravel fan (layer 5) and colluvium associated with it (layer 7). Although one sherd was found in buried soil (layer 9) and the valley-side colluvium (layer 8), these are assumed to be derived as are the two sherds in the shallow colluvium at 20–35 m.

Beaker
All the Beaker pottery (56 sherds) was recovered from the main trench (0–20m). The lower colluvium (layer 10), which produced a number of Late Neolithic sherds was devoid of Beaker material. Apart from three sherds in the buried soil (layer 9), and ten in the valley-side colluvium (layer 8) the majority of the Beaker pottery was from the upper part of the gravel fan and its associated fine-grained colluvium (Fig. 11). The sherds in the buried soil and the valley-side colluvium arrived in the valley soon after their deposition; the majority were

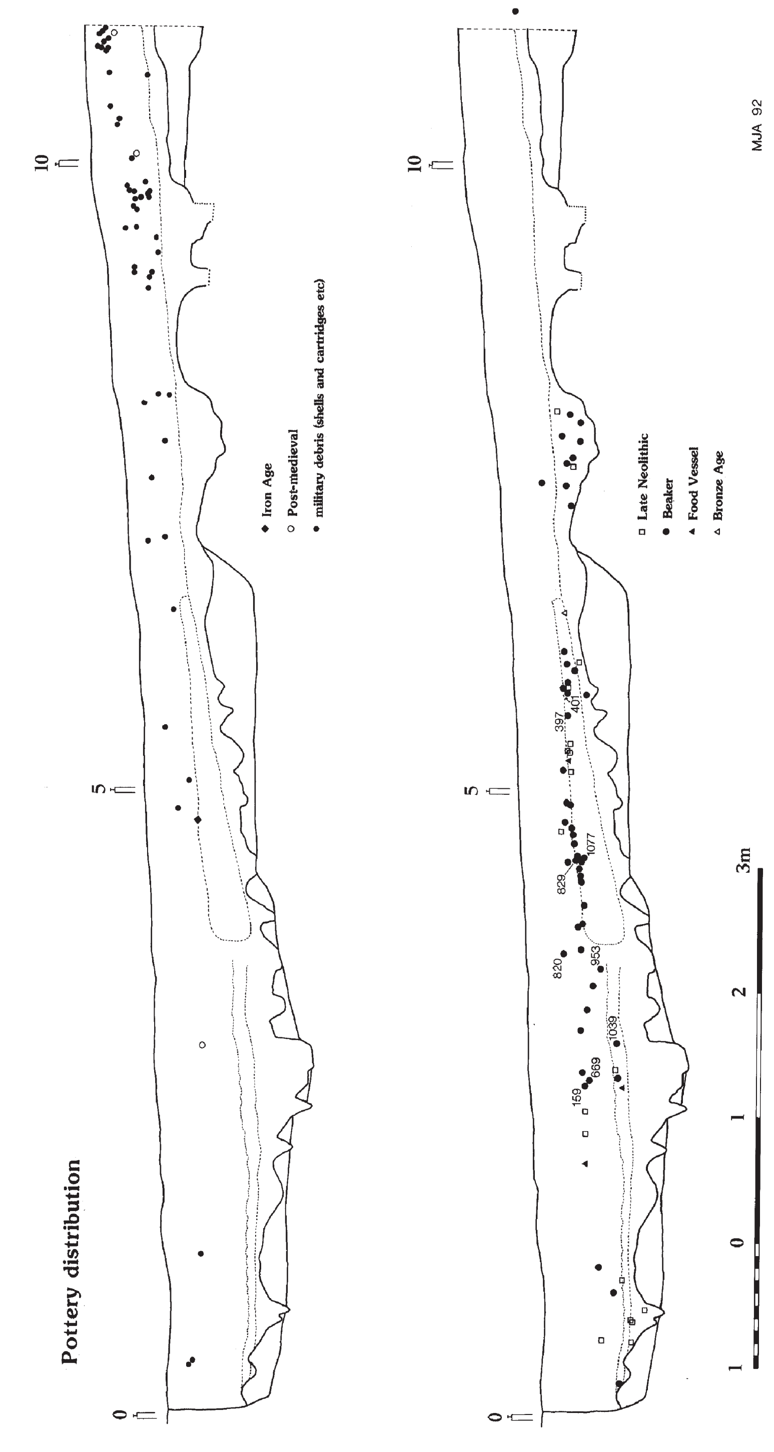

Fig. 11. Distribution of pottery in trench 1 (0–11 m).

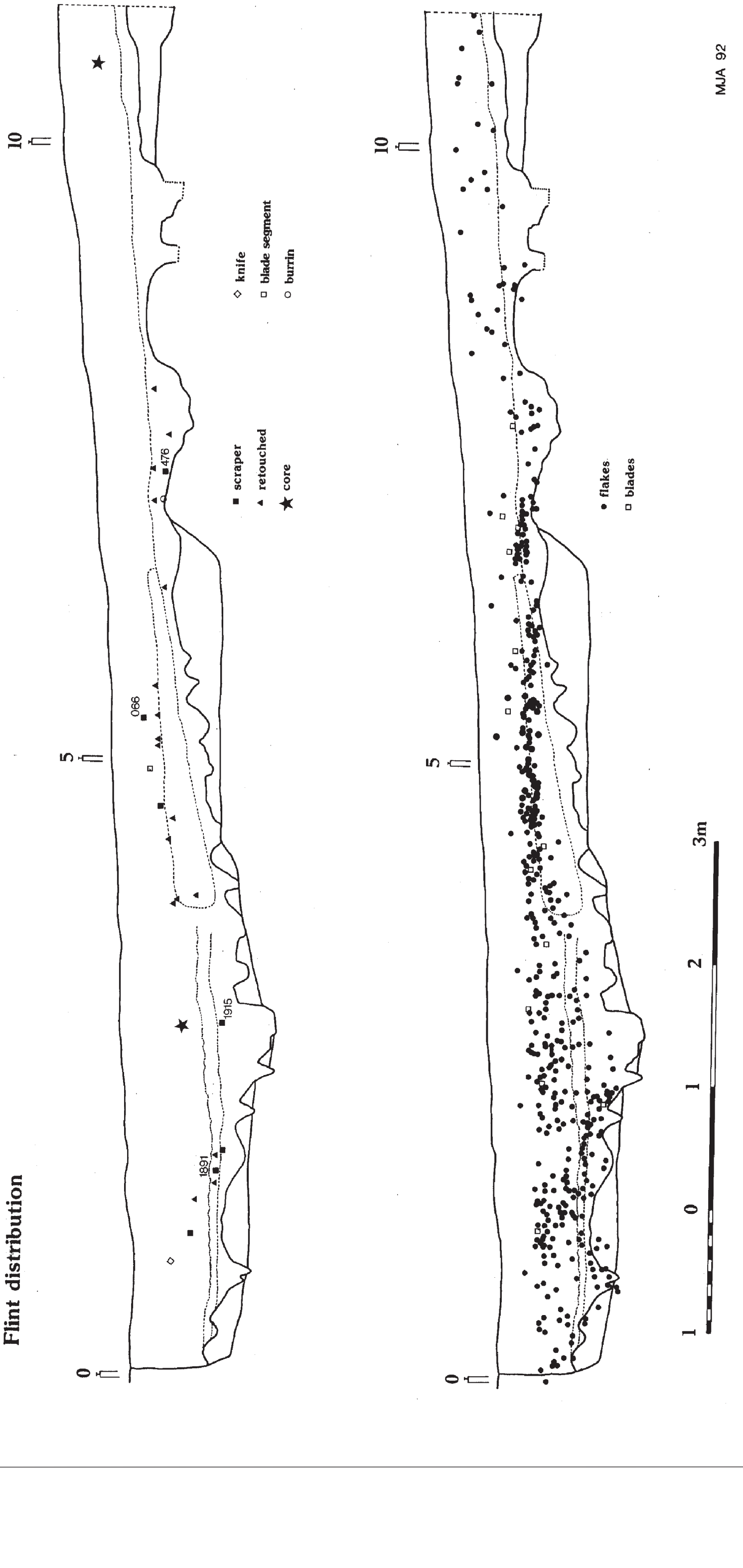

Fig. 12. Distribution of flint artefacts in trench 1 (0–11 m).

probably eroded from the tributary valley. Sherds of probably the same vessel were recovered from both the colluvium on the valley side (layer 8) and the gravel fan and suggest that these two layers are not significantly different in age.

Food Vessel and Bronze Age
Only three sherds of Food Vessel were recognized, but their distribution is not dissimilar to that of the Beaker material. A single undiagnostic Bronze Age sherd was also recovered from the gravel fan.

Iron Age
Few Iron Age sherds were found but they were widespread and all were upper and later colluvial layers especially in trench 2.

Flints
There is no differentiation between the distributions of primary, secondary and tertiary flakes. In trench 1 the flint was generally distributed through the lower colluvium, the buried soil and the valley-side colluvium, with few beneath, and within, the gravel fan. Flints were concentrated in the upper horizon on the gravel fan and occurred in vague lines through the fine-grained colluvium (Fig. 12) and throughout the colluvium in trench 2 (Fig. 13).

Tools and retouched pieces
The distribution of the tools was very informative. None was recovered from the lower colluvium and a relatively high number were distributed through the buried soil and valley-side colluvium; these two contexts accounted for 13 of the 28 pieces.

In trench 2 the flints were spread throughout the colluvium except in the basal portion of the lower colluvium (layer 33); *see* Figure 13. Most of the tools (7 of 10) were recovered from the lower colluvium.

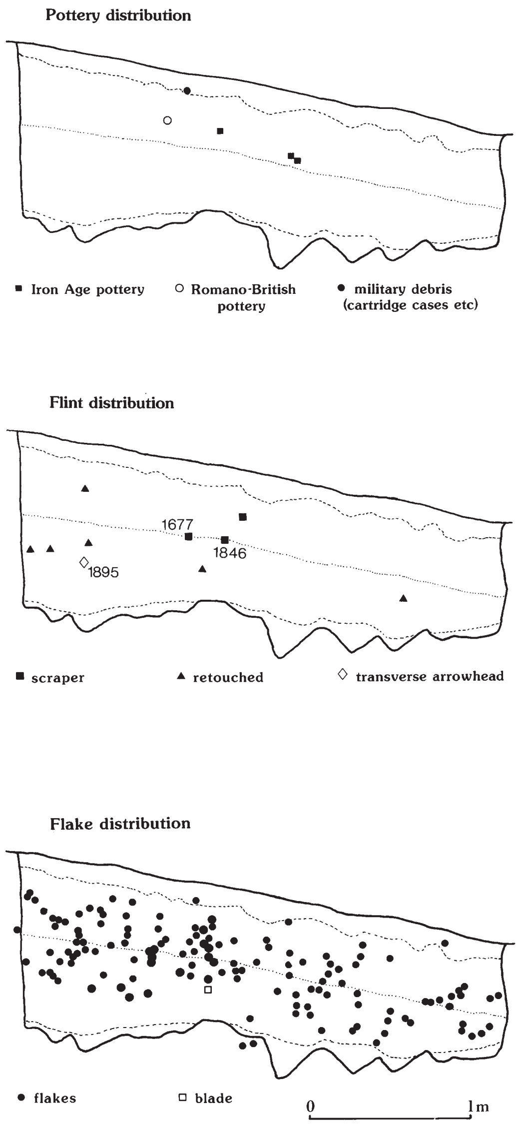

Fig. 13. Distribution of artefacts in trench 2.

1939–1945 artefacts
Fragments of bomb and military miscellanea were mainly distributed immediately downslope and adjacent to the Canadian Army trench; they were almost wholly confined to the modern colluvium and buried soils.

ARTEFACTS

POTTERY

The pottery assemblage comprised 106 three-dimensionally recorded sherds and 5 unstratified (prehistoric) sherds. Most of the pottery was prehistoric, and the majority (53%) was Beaker. Fabrics were based on those used by Bell for his dry valley investigations in Sussex (1981)

Late Neolithic
Very abundant small to medium flints with occasional organic tempering, with a predominantly leather brown to dark brick-red surface colour which was often smoothed, although angular calcined flint protruded through the surface.

Twenty-one sherds, none decorated, but one simple rim (no. 378) was recovered.

Although no forms could be distinguished, this fabric compares well with Drewett's Neolithic Fabric I which is the most common in Sussex, but generally, but not exclusively, considered to be earlier Neolithic (Drewett 1980, 27). Nevertheless, although it is similar to some of the Peterborough Wares in Wessex (Cleal pers. comm.), it is tentatively suggested that these sherds might be later Neolithic in view of the absence of any earlier Neolithic flint artefacts.

Beaker

A total of 56 sherds, divided into five predominantly soapy, grog-tempered fabrics, were identified as Beaker and represent at least 26 separate vessels (Table 1). The Beaker assemblage was relatively small but represents 64% of the prehistoric pottery; over 55% of the Beaker sherds were decorated.

Fabric 1

Grog- and flint-tempered: grog-tempered, frequent medium calcined flint, generally oxidized, reddish brown colour, often slightly redder exterior surface (possibly slip) occasionally grey core. Vessels are fine and thin-walled 3 - 4.5mm thick. 69% was decorated and this group included three sherds of 'domestic' Beaker (*viz.* Gibson 1982; ApSimon pers. comm.).

Fabric 2

Grog-tempered with flint inclusions: grog-tempered, sparse fine flint inclusions, a number of fine to medium voids. Completely oxidized, varying from salmon pink to orange/ buff colour, a number had a red 'sealing wax' coloured surface described by Clarke (1970, 86). Vessels are fine but vary from thin-walled to thicker vessels (3.5 - 6.5mm). 58% was decorated.

Fabric 3

Grog-tempered with sand and rounded voids, rare small calcined flint. Red brown colour, generally well fired and thicker than most up to 6mm.

Fabric 4

Sandy wares with grog tempering: medium sand and grogs. Mainly undecorated small sherds (av. wt 1.5 g), reddish brown to orange.

Table 1. Beaker pottery: numbers of sherds, vessels and fabrics.

Fabric	sherds	wt	minimum identified vessels
1	13	49	5
2	33	97	11
3	3	4	2
4	6	9	1
6	1	2	1
TOTAL	**56**	**161**	**20 +6***

* unstratified sherds recorded from spoil

Fabric 6

Very soapy (grog-tempered), small clasts of iron oxide, reddish brown colour.

Forms, decoration and affinities

The assemblage includes 36 sherds of fine Bell Beaker and four 'domestic' Beaker forms (the latter identified by ApSimon). Of the 56 sherds 16 remain un-attributed, but are most likely to be Bell Beakers. Although mean sherd size was small (2.9 g), nearly the entire assemblage can be defined as representing Clarke's (1970) East Anglian and Southern Developed forms which belong to the Middle and Late Styles as defined by Case (1977; 1993). The main diagnostic feature of the assemblage — rather coarse and carelessly applied comb-impressed decoration, is typical of Beaker pottery and a number of motifs and arrangements were recognized. Some were finer (e.g. 401) and filled running zig-zag decoration on 953 is typically a Southern British Motif (?Clarke's S4) and suggest a very late assemblage and the assemblage as a whole can be seen to represent a fairly late Beaker assemblage (cf. Gibson 1982).

No vessel was well enough represented nor were sherds large enough to give any real indication of vessel form, although the neck profile of 401 is more typical of 'necked' Beakers. Some individual sherds indicate that square-sectioned flat rims on distinctly angled necks (Fig. 14, no. 401), flat, comb-decorated bases (Fig. 14) and usually sharp carinations (Fig. 14, no. 669) all occurred within the group.

The comb-impressed wares included a number of vessels with bands of coarse rectangular parallel comb impressions separated by undecorated zones (Fig. 14, nos 820, 829, -, and 1077) and can be paralleled by a number from Kiln Combe found beneath two metres of colluvium (Bell 1983), as well as Offham (Drewett 1977, fig. 11, nos 21 & 22), and Southerham Grey Pit (Allen 1995; 1994, fig. 22). Other more sophisticated motifs are represented by crosses (no. 597, not illustrated) and complicated lozenge and triangular motifs and borders (Fig. 14, no. 401) depicted with a very fine-toothed comb and more typical of the Southern Developed Beakers. Decoration was not confined to the walls of the vessel, a single line of comb impression on the base of one vessel was also noted. A small number of sherds were incised rather than comb-decorated. These included lozenge and ladder decoration (e.g. Fig. 14, no. 953) and had a 'sealing wax' red surface colour.

The assemblage is most closely paralleled with the later elements at Kiln Combe (Bell 1981) especially sherds 2708, 2905, 2748, 2883 and 2737 (Bell 1983, 128, fig. 7), and like Kiln Combe, very little of the Ashcombe material compares with that from Belle Tout. The latter Beaker assemblage consists largely of rusticated forms, which may be considered to be slightly earlier Beaker forms.

The soft soapy fabrics were fired at low temperatures and the relatively low number of sherds surviving in the colluvium indicates that they must have been derived locally and were not allowed to weather on the soil surface (i.e. via manuring). The assemblage of a minimum of *c.* 26 vessels, is probably derived from a Beaker settlement in the immediate vicinity.

Food Vessel and Bronze Age

One distinct fabric was recognized by Arthur ApSimon as probably Food Vessel. The fabric was soapy (grog-tempered like the Beaker material) with large platy voids, grog and occasional flint inclusions. There were only three sherds of this group, two of which may have belonged to the same vessel,

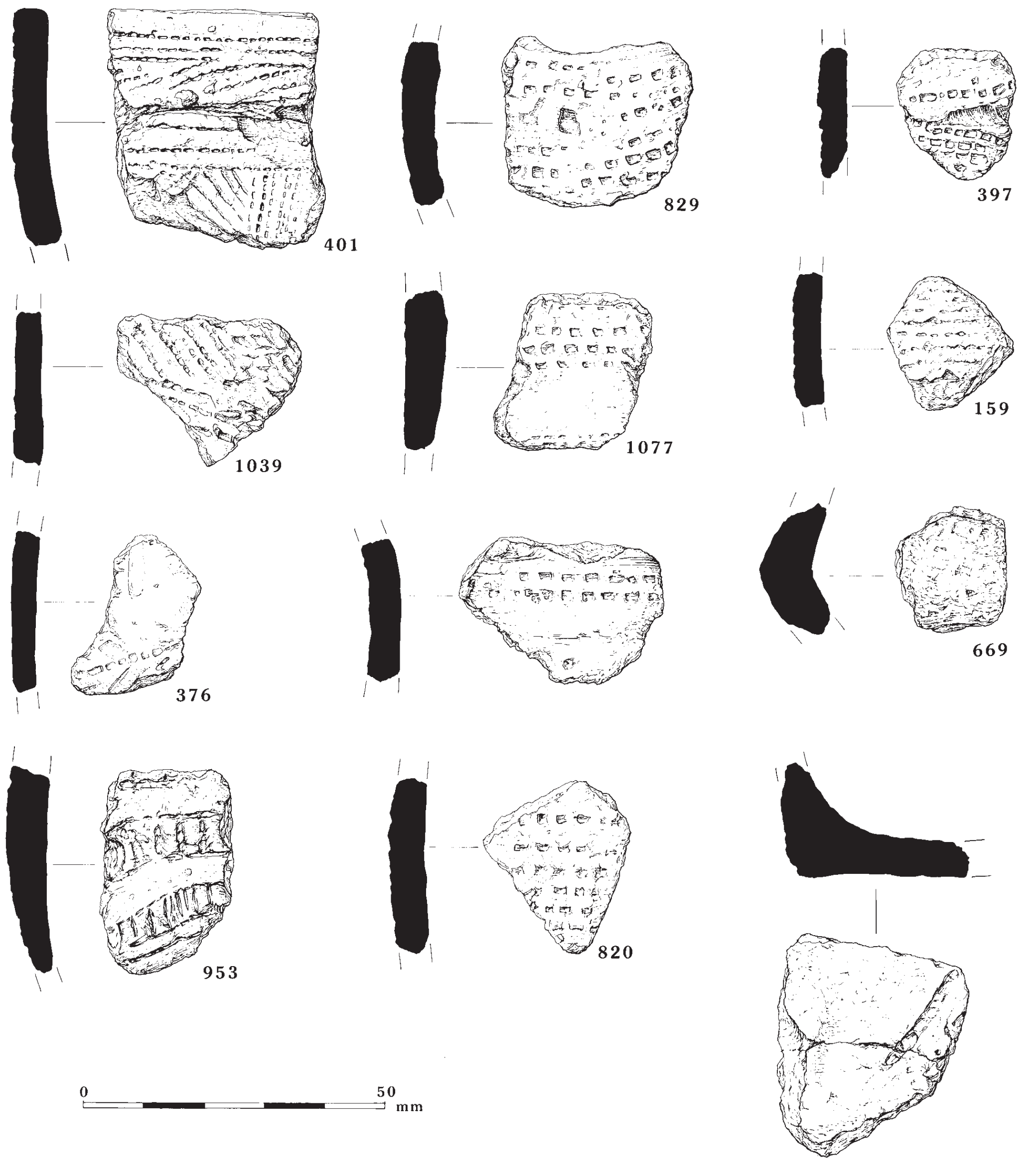

Fig. 14. Beaker and Early Bronze Age pottery.

but none were decorated or diagnostic. A single undecorated, but large sherd (wt 29 g) was heavily tempered with large and medium calcined flints which stood up to 1.4 mm proud of the worn surface (Allen 1984a, fig. 9, no. 375).

Iron Age

The Iron Age assemblage was limited to only six sherds. Two fabrics were represented (black sandy burnished wares and black sand and flint-tempered wares), and both common in the area. A bead rim (no. 452) is typical of Caburn saucepan pottery.

Roman

The small Roman assemblage included the locally common East Sussex ware (Green 1977) and colour-coated sandy wares. Their presence here is indicative of no more than manuring; however, the decorated fragment of box-flue tile may indicate more substantial remains within the area.

Medieval and post-medieval

Medieval pottery includes forms and fabrics typical of the twefth/thirteenth century in Eastbourne (nos 1200, 1349; Lawrence Stevens pers. comm.) and seven sherds of local

Table 2. The flint assemblage. (Figures in parenthesis are unstratified and excluded from the percentages.)

	No.	No.		% of assemblage
Flakes	911		**% flakes**	93.0
Primary		79	8.7	-
Secondary		401	44.0	-
Tertiary		416	45.7	-
from core tools		3	0.3	-
Core-trimming flakes		12	1.3	1.2
Cores	5 (1)		0.5	
Blades/blade-like flakes	20		2.0	
Retouched pieces	23		2.3	
Tools	21 (4)		**% tools**	2.1
Scrapers		11 (4)	52.4	-
Notched pieces		4	19.0	-
Knives		1	4.8	-
Piercers (awl/burin)		2	9.5	-
Transverse arrowhead		1	4.8	-
Blade segment		1	4.8	-
Serrated piece		1	4.8	-
Total	**980**			

thirteenth-/fourteenth-century material from the Ringmer kilns (Hadfield 1981). The latter included applied thumbed straps. A small number of early post medieval green glazed, 'Victorian' willow pattern and 1940s cream ware was recovered. Some of this assemblage can be attributed to the army occupation of the valley.

THE FLINT ASSEMBLAGE

Although it is difficult to ascertain to what extent we are dealing with contemporary assemblages (cf. Bell 1983, 129), detailed metrical analysis was undertaken (Allen 1994). Most of the flints were three-dimensionally recorded (Table 2), augmented by a small number of unstratified tools and other pieces. These latter pieces are not included in the overall statistics.

Acquisition of the flint

All of the flint was chalk-derived, but four distinctly different local sources were determined by examination of patination and cortical condition. The majority (*c.* 88%) was probably derived from non-calcareous soils; brown earths and paleo-argillic brown earths and loessic soils. These probably derive from sandy/loessic soils as seen in trench 2 and are recorded locally (Wooldridge and Linton 1933), but also possibly from thicker, non-calcareous soils such as brown earths which may occur over the chalk or over Clay-with-flints. Despite the large area of typical chalk rendzina soils in the area today only 11.3% of the assemblage was represented by those derived from chalk soils. Five very worn (0.5%) were frost-shattered creamy coloured flakes were recovered were typical of those from the Coombe Deposits. Four slightly stained and browner flints were recovered typical of those from Clay-with-flints outcrops such as that at Blackcap at the head of the valley.

Technology

Flakes: The length and breadth of the 931 waste flakes and blades were measured and then plotted as individual scatter diagrams for primary, secondary and tertiary flakes (Allen 1994, fig 18). A high proportion of the flakes were tertiary and secondary flakes with few cores (Table 2) suggesting that primary flint preparation was being undertaken elsewhere but that final manufacture may have been occurring locally. The length:breadth ratios are more comparable with the later Neolithic assemblages at Durrington Walls and West Kennet Avenue and the Beaker assemblages at West Kennet Avenue and Belle Tout, than with those from earlier Neolithic assemblages at Bishopstone, Alfriston, Windmill Hill and Broome Heath.

Cores

Five large cores were recovered, and had been discarded well before they were exhausted. Only one core was systematically well reduced (Fig. 15). All the cores were systematically flaked from one, two or three platforms and large broad flakes detached.

Retouched and tool assemblage

The 44 retouched pieces were dominated by the 11 scrapers (Table 2). Other tool types included a transverse arrowhead (Fig. 15, no. 1395), a knife (Fig. 15), piercers, notched pieces and hammer stones (Fig. 15). A further four scrapers were recovered from the lower contexts of trench 2. The most diagnostic and significant component was the group of small convex scrapers typical of the Late Neolithic-Early Bronze Age and Beaker assemblages (Gardiner 1984; 1990a).

The nine recorded and five unstratified convex scrapers were on flakes and were neatly retouched at the distal end; some were just lightly retouched primary flakes (Fig. 15, no. 1915). They were of generally small dimensions, mean size 34 × 28 × 7 mm with retouching predominantly at 60°–70° and typically Beaker in character. Scrapers were mainly small horseshoe/discoidal (Fig. 15, nos 066, 424, 476, 635, 1677) or thumbnail pieces (Fig. 15, nos 1211, 1803, 1915) but included one end-scraper (Fig. 15, no. 1846) and parallels can be seen at the non-funerary sites of Kiln Combe (Healy in Bell 1983 mf. 7–9) and Belle Tout (Bradley 1970), and in flint scatters on the Sussex Downs (Gardiner 1988) as well as barrows (e.g. Pyecombe, Butler 1991). Two hollow scrapers were recovered (Fig. 15, no. 1591); these are extremely common in Sussex

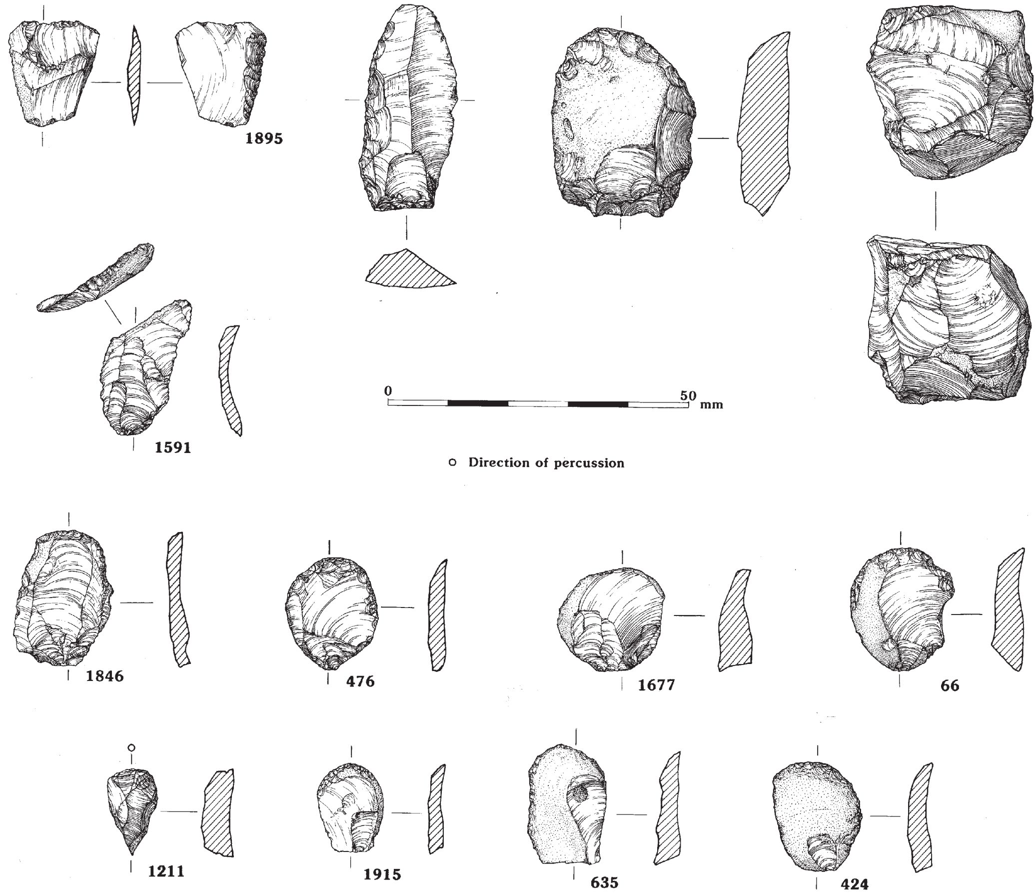

Fig. 15. Flint implements.

in Late Neolithic–Early Bronze Age and Beaker assemblages (Gardiner 1984; 1990a).

Discussion

A large element of the assemblage is characteristically Beaker: small scrapers and notched pieces. Most of the tool types can be attributed to Late Neolithic–Early Bronze Age if not actually paralleled in Beaker assemblages. Transverse arrowheads are current throughout the Late Neolithic and Early Bronze Age and are found from Beaker contexts (Green 1980) such as Belle Tout (Bradley 1970, fig. 15.38).

A large proportion of the assemblage is waste with few primary flakes and a low proportion of mis-hits. The quality of the flint is generally good. The blade frequency is low, the proportions of scrapers to retouched pieces is high and the main flake/core size is generally large. This may suggest a local source of flint and home range activities which exhibit high frequencies of retouch (7%), high proportions of tools (4–5%) and the reliance on specific tool types (scrapers) and may suggest the concentration and maintenance of domestic activity (Gardiner 1984; 1990a).

CHARCOAL AND CHARRED SEEDS by Joy Ede

Charcoal survived as small fragmentary pieces and identification was not possible on almost half of the pieces submitted. Charcoal recovered during hand excavation of the Bronze Age colluvium and buried soils included *Quercus* (6), cf. *Corylus* (2), *Pinus* (2), *Prunus* cf. *avium* (1), *Prunus* (1) and Pomoidea cf. *Crataegus* (2). Charcoal from the flotation of tree hollow layer 3 produced seven pieces of *Pinus*, four fragments of cf. *Pinus* and one of *Quercus*.

Despite flotation of in excess of 1300 litres of soil, only a single seed of *Hordeum* sp. (barley) from the upper colluvium (layer 7) was retrieved.

THE LAND-USE HISTORY; MOLLUSCAN EVIDENCE

No shells, except fragments of *Pomatias elegans*, were recovered from columns of samples taken by both Dr Caroline Ellis and Dr S. Carter. Spot samples from the tree hollow (Fig. 8) analysed by the writer were more calcareous. Although shell numbers were low, important assemblages were recovered (Table 3).

Table 3.Land mollusca from the tree hollow.

Context	3	1a	1	1	1
Sample	**8**	**6**	**7**	**13**	**7+13**
Wt (g)	**1280**	**716**	**1725**	***c.* 100**	**1825**
MOLLUSCA					
Pomatias elegans (Müller)	7	+	2	+	2
Carychium tridentatum (Risso)	48	1	1	2	3
Cochlicopa spp.	-	1	-	-	-
Abida secale (Draparnaud)	3	-	-	-	-
Pupilla muscorum (Linnaeus)	-	-	1	1	2
Vallonia costata (Müller)	4	1	-	-	-
Acanthinula aculeata (Müller)	-	1	-	-	-
Ena montana (Draparnaud)	1	-	-	-	-
Ena obscura (Müller)	2	1	-	-	-
Punctum pygmaeum (Draparnaud)	1	2	-	-	-
Discus rotundatus (Müller)	15	1	3	2	5
Vitrina pellucida (Müller)	1	-	-	-	-
Vitrea crystallina (Müller)	1	1	-	-	-
Vitrea contracta (Westerlund)	10	-	-	1	1
Nesovitrea hammonis (Ström)	2	-	-	-	-
Aegopinella pura (Alder)	2	-	-	-	-
Aegopinella nitidula (Draparnaud)	5	1	2	-	2
Oxychilus cellarius (Müller)	14	-	-	-	-
Limacidae	3	1			
Cecilioides acicula (Müller)	2	7	-	8	8
Cochlodina laminata (Montagu)	2	-	-	1	1
Macrogastra rolphii (Turton)	5	-	-	-	-
Clausilia bidentata (Ström)	3	1	2	1	3
Trichia striolata (C. Pfeiffer)	1	-	-	-	-
Trichia hispida (Linnaeus)	5	3	2	1	3
Helicigona lapicida (Linnaeus)	-	+	-	-	-
Cepaea/Arianta spp.	2	+	-	-	-
Taxa	22	12	7	7	9
Shannon Index (H')	2.39	2.44	1.87	1.89	2.08
TOTAL	**137**	**14**	**14**	**9**	**23**

Samples from layer 1 and 1a contained few shells, and these were predominantly shade-loving species. The main fill (layer 3) produced a taxonomically rich assemblage dominated by shade-loving species; *Carychium tridentatum* with *Discus rotundatus*, *Oxychilus cellarius* and *Vitrea contracta*. The presence of *Abida secale*, *Ena montana* and *Macrogastra rolphii* is significant. This represents a fauna of mature, probably deciduous woodland. The locally rare species *Abida secale* and *Ena montana* are significant; *Abida* is common in open colluvial habitats but has not successfully colonized secondary habitats created by human activity; *Ena,* although relatively rare, is surprisingly common in Neolithic and Bronze Age contexts (Evans 1972, 165) and Kerney (1968) has argued for its demise since the Sub-boreal due to its intolerance to a lack of summer warmth. *Pomatias elegans* certainly indicates that this is unlikely to be prior to *c.* 6000 BC i.e. Boreal (Kerney 1966, 5). This, therefore, provides evidence of a rich mature, probably Sub-boreal, woodland.

SOILS: MAGNETIC SUSCEPTIBILITY AND MICROMORPHOLOGY

Owing to the lack of molluscan remains, and impoverished pollen preservation (Scaife pers. comm.), detailed soil micromorphology was the most important palaeo-environmental study. Information from soil analysis has been provided by Richard Macphail and this report is largely drawn from his published reports *viz*. Macphail 1992; Courty *et al*. 1989; Macphail *et al*. 1990. Magnetic susceptibility was conducted by the writer.

Magnetic susceptibility

Magnetic susceptibility was measured on 100 g air dried soil <2 mm to aid in the characterization of the deposits and interpretation of the soil and sedimentological history (cf. Allen & Macphail 1987; Allen 1986; 1988). Several columns of samples were taken through key points in the stratigraphy and measured using a Bartington MS2 meter coupled to a MS1B sensor coil. The results are summarized in Table 4.

The calcareous parent material, periglacial marl and fluvial silts (layers 20 and 21 respectively), both gave readings below 5 and agree with previous work (Allen 1988). Although the magnetic susceptibility results displayed considerable variation and significant enhancement was detected in burnt areas (Table 4), the variation within the prehistoric sequences was limited. The paleo-argillic soils (layer 11) were high (43–59), probably as a result of their higher clay content (cf. Oades & Townsend 1963) and high illuviated clay (*see* below). The overlying

Table 4. Magnetic susceptibility data. (Magnetic susceptibility is recorded in SI units × 10^{-8} SI/Kg.)

Depth	Layer	Description	Ave
Trench 2 @ 54.3 m			
0–15 cm	31	Topsoil	21.0
30–45 cm	32	Upper colluvium	16.0
60–75 cm	33	Lower colluvium	12.0
80–95 cm	33	Lower colluvium	20.0
95 cm+	11	Palaeo-argillic	24.0
100 cm+	20	Periglacial	5.0
Trench 2 @ 53.1 m			
0–10 cm	31	Topsoil	20.0
30–45 cm	32	Upper colluvium	17.0
55–70 cm	33	Lower colluvium	13.0
90–115 cm	11	Palaeo-argillic	25.0
Trench 1 @ 2 m			
0–10 cm	1	Topsoil	65.5
10–20 cm	2	wash	62.5
20–30 cm	4	Modern buried soil	48.5
30–45 cm	7	Fine-grained colluvium	42.0
60–70 cm	9	Buried soil	32.0
70–80 cm	10	Lower colluvium	28.0
80–90 cm	10	lower colluvium	33.5
95 cm +	11	Palaeo-argillic	43.0
100cm +	11	Palaeo-argillic	59.0
Trench 1			
	21	Fluvial periglacial	4.0
	13	Recent colluvium/topsoil	72.5
	14	Recent colluvium	72.0
	22	Calcareous colluvium	71.5
56–61 cm	16	Charcoal/burnt	313.0

colluvium was relatively low (aver. 31) which may indicate that it was not derived from paleo-argillic soils but from less clay rich and enhanced soils. Slight enhancement is seen in the buried soil, but the later colluvium and modern sequence were considerably enhanced.

In trench 2, all the susceptibility levels are suppressed, including the modern soil profile. Although consistent results were recorded, no significant trend can be detected. The initial loessic colluvium records higher magnetic susceptibility, probably due to increased fragments of the relict argillic soil.

Table 5. Location and description of undisturbed (micromorphology) soil samples.

Sample	RIM Code[1]	Layer	Description	Trench
11	C	12	Fluvial periglacial sand	1
14	A	11	Palaeo-argillic soil @ 2.65 m	1
15	B	11	Palaeo-argillic soil @ 55.00 m	2
55	G	7-9-10	Buried soil (ard marks) and colluvium	1
61	D	33	Lower loessic colluvium	2

[1]Richard Macphail laboratory notation

SOIL MICROMORPHOLOGY by Richard Macphail

A series of undisturbed soil samples (cf. Courty *et al*. 1989, 40–43) was taken from key horizons. Questions addressed of the samples were primarily ones of identification of past soil regimes and detection of processes relating to human activity (Courty *et al*. 1989; Davidson *et al*. 1992). The locations of the samples are given in Table 5.

Parent material

The basic parent material is chalky periglacial deposits, Coombe Deposit (layer 20), but at one location a Late Devensian deposit (layer 21; sample C) of finely bedded, water-lain, fine sand-sized round chalk and silt-sized quartz occurred. Soil micromorphology showed the chalk clasts to have been weathered and that some micritic (i.e. calcite crystals <10 µm; Courty *et al*. 1989, 175) cementation had taken place (Macphail 1992, fig 18.2).

Palaeo-argillic soil: layer 11

Both trench 1 (sample B) on the east side of the valley floor, and trench 2 on the west side of the valley (sample A; Fig. 7), revealed decalcified silty clay which had been preserved in solution hollows in the Coombe Deposit. These are identified as the Bt horizon of a severely truncated typical argillic brown earth disrupted by clearance.

Microfabric studies of the soil in trench 1 clearly indicate an original typical argillic brown earth (Avery 1980) character (Bt horizon). In contrast, trench 2 (sample A) contains less in the way of clay-rich fragmented Bt horizon material and some of the loamy material may be dark because it may be residual Ah horizon material.

This layer in trench 2 is much more porous than that in trench 1 and most pores have textural coatings (Macphail 1992, fig. 18.4). The soils are truncated palaeosols of an early to mid- Holocene decalcified argillic brown earth which had formed in loess (cf. Weir *et al*. 1971), calcareous fluvial deposits and Coombe Deposit, but which had been totally disrupted by tree-throw or clearance activity (cf. Macphail and Goldberg 1990). Decalcification of chalky material seems to have been the main origin of the clay in the subsoil Bt. Certainly the soil on the east side of the valley (trench 1) is more clay-rich,

Table 6. Minimum numbers of Beaker vessels at sites in Sussex.

	Beaker sherds	min. no. vessels	vol. excavated (m3)	sherds per m^3 excavated
Belle Tout	1180	175	150	7.9
Ashcombe Bottom	56	20	13.8	4.1
Kiln Combe*	48	?	45.6	1.1
Cuckoo Bottom	22	7	c.6.0	3.6
Grey Pit	10	4	0.55	18.2

*Kiln Combe – bulked charcoal including hazel, hawthorn, ash, gorse (Cartwright, in Drewett 1982, mf 1), which was loosely associated with the assemblage gave a date of 2300–1700 cal BC (3630±90 BP, HAR-5469; Bell 1983, 129).

even though the colluvium above is remarkably silty and acid and probably represents a residual deposit of locally reworked loess.

The complex deposition of textural features (Macphail 1992, figs 18.3 & 18.4) indicate two periods of soil disturbance (possibly Early and Late Neolithic). In the first instance, these textural features could be ascribed to loose soil washing into the hollows and disrupted by clearance, whereas fine rooting and minor disturbance of the textural features may relate to the re-establishment of woodland.

Beaker buried soil

Layer 9 - Typical (colluvial) brown earth

The buried soil overlay colluvium and contained ard marks scored into its surface. Some 100 mm of this horizon was examined in sample G, and a number of microfeatures relating to the effects of cultivation noted (Macphail *et al*. 1990). The sample contained a variety of included soil fragments (Mücher 1974), many of which appear to be sharp-edged ones eroded from the clay rich Bt horizon of the early to mid-Holocene palaeosol (Macphail 1992, figs 18.3 & 18.5).

Another ubiquitous soil fragment type is more dusty brown in colour with many very fine birefringent clay fragments. It sometimes contains fine charred organic matter, coarse wood charcoal and a vesicular porosity (Macphail 1992, fig. 18.6). The last is indicative of trapped air in a water-saturated soil. These dusty brown soil inclusions may originate from the surface crusts (Boiffin & Bresson 1987), perhaps formed in ard furrows, which were reworked/eroded into the plough soil. Dark rounded soil fragments, which are poorly birefringent and red under oblique incident light, are pieces of burned soil. Their presence, alongside charcoal in the crust fragments, could testify to arable agriculture employing burning.

Thus, the Beaker palaeosol contains relict fragments of the clay-rich truncated argillic brown earth, loessic Bt, and cultivation crust and burned soil, with charred organic matter and charcoal inclusions.

Many coarse peds had been broken up presumably by ard impact, and biological activity had been encouraged (Macphail *et al*. 1990, pl. 11), but not enough to strongly rework the soil. Hence colluvial accumulation appears to have been rapid. Ard ploughing may only rework the upper 60 mm of the soil (Gebhardt 1990), so the presence of cultivation features throughout the 100 mm-thick sample of the buried ploughsoil, indicated phases of accumulation at the same time as cultivation took place.

Loessic colluvium: Layer 33

Further silty and ‘loessic’ colluvium was examined in sample D, from trench 2 on the west side of the valley. This compacted silty colluvium (Macphail 1992, fig. 18.7) is a mixture of decalified subsoil (Bt) and silty (loess cover) soil (Courty *et al*. 1989, fig. 7.5d). This may indicate ‘internal slaking’ (Jongerius 1970, 1983), and the evidence of surface slaking and the soil surface was often sealed by crusts. A fragment of 5mm-long ferruginized straw-like material (Macphail 1992, fig. 18.7) occurred, as well as ferruginized root fragments, and may indicate the ploughing in of chaff(?) and possible manuring.

DISCUSSION

LAND-USE HISTORY AND SETTLEMENT IN ASHCOMBE BOTTOM

The combination of the field records, artefacts and analytical work (molluscan analysis, magnetic susceptibility and soil micromorphology) enable a detailed picture of the land-use history and human occupation to be portrayed (*see* Table 7).

Late Glacial environment

The late Devensian periglacial solifluction material (Coombe Deposit) was fairly typical of southern Britain, but the record of fluvially laminated sandy silts (layer 21) within its matrix provide an insight into the fluvial components of deposition, and the presence of Late Glacial cover sands (loess) in Sussex (cf. Catt 1978) during the last glaciation.

Mesolithic and earlier Neolithic downland (and occurrence of Pine)

The pitted nature of the Coombe Deposit surface indicates *in situ* weathering by solution in part caused by the formation of a decalcified paleo-argillic brown earth (forest soil, Limbrey 1975) which fills them. The presence of illuviated clay and the rubified colour of these soils indicate that this was a mature, well-developed, soil and suggests

Table 7. The main events at Ashcombe Bottom.

Phase	Land-use evidence	Landscape	Human activity
Last Glaciation Devensian	Coombe deposits and fluvial sand	Cold Stage and Tundra	
Mesolithic	Forest soil	Wood	
Earlier Neolithic *c.* 3750 cal BC	truncation	clearance and truncation	Offham causewayed enclosure
	treehole + Colluvial/brown earth	Wood regeneration	
Later Neolithic	Colluvium layer 10	Clearance and open conditions	LNEBA activity in Houndean-Balmer-Cuckoo Bottom
Late Neolithic–Early Bronze Age + Beaker	Buried soil layer 9	ploughed and grass	Beaker settlement/activity in the valley
LNEBA settlement on Houndean			
Valley entrenchments e.g. Cuckoo Bottom			
Middle Bronze Age	gully	Cultivated valley sides, grass in valley bottom	Fields and farming –, soil thinning, Plumpton Plain
Prehistoric onwards	upper colluvium	Cultivated valley sides, grass in valley bottom	Field systems- Buckland Hole

a long period of stability, probably under a mixed woodland.

Preservation of just the lower Bt horizon in these hollows (as in other valleys: Bell 1983) is a testimony to severe truncation of almost the entire (paleo-) argillic brown earth profile. Almost wholesale removal of the valley soil may have been instigated by woodland clearance over much of the valley catchment and soil disruption. When erosion occurred is not known, but in light of the long and dated subsequent events we can postulate that this occurred in the earlier Neolithic. As such we may link this with the hilltop clearance and activity at Offham (Thomas 1977; Gardiner 1988, fig 6.22).

After loss of the original forest soil, a colluvial brown earth developed in the valley bottom, and woodland grew in these more calcareous soils (tree hollow), of which pine and oak were constituents (charcoal). The presence of pine on the chalk is a matter of interest and has great implications (Allen 1988; 1995a, 35–6). Pine was a significant component of the post-glacial woodland, but was largely extinct in southern England by the development of the earlier Neolithic woodland. Its presence on the chalk, however, is rare and surprising (Allen 1988, 83) as it has been argued that pine cannot survive on this chalkland soil as it suffers from chlorosis; a condition arising from its inability to obtain sufficient magnesium in the presence of calcium carbonate (Thorley 1971). Pine charcoal has been recorded from Mesolithic contexts sporadically across chalk of southern England but rarely, if ever, from later periods (*see* below). Nevertheless, it seems to have occurred as a component of the woodland in the Lewes area well into the Bronze Age (Thorley 1971; 1981), and its presence has been taken to question the presence of the thin chalky soils we see over the Downs today (Allen 1994; 1997; 2002; French *et al.* 2003; 2005). The presence of thicker, less calcareous soils has been suggested (Limbrey 1978; Allen 1988; 1995a), and this is borne out by the soil micromorphological evidence here.

Later Neolithic

Primary clearance of the valley floor was probably associated with the Offham causewayed enclosure (earlier Neolithic *c.* 3750 cal BC), and this was followed by woodland regeneration; a typical pattern of Neolithic land-use as recorded from molluscan evidence across Sussex (Thomas 1982; Allen 1988).

A hiatus in the soil/sediment record exists as a

Table 8??. List of dated pine charcoal on the chalk in southern Britain.

Ashcombe, E. Sx	post *c.* 6000 BC	-
Itford Bottom, E. Sx	8200–7650 cal BC	8770±85 BP, BM-1544 (Bell 1983)
Hambledon Hill, Dorset	7580–7350 cal BC	8400±60 BP, OxA-7845 (Mercer & Healy forthcoming; Allen & Gardiner 2002)
	7600–7340 cal BC	8480±55 BP, OxA-7846 (Mercer & Healy forthcoming; Allen & Gardiner 2002)
	7970–7590 cal BC	8725±55 BP, OxA-7816 (Mercer & Healy forthcoming; Allen & Gardiner 2002)
Stonehenge, Wilts	7350–6650 cal BC	8090±140 BP, HAR-456 (Vatcher & Vatcher 1973; Pitts 1982)
	7600–7160 cal BC	8400±100 BP, OxA-4920 (Allen 1995b; Allen & Bayliss 1995)
	7750–7350 cal BC	8520±80 BP, OxA4919 (Allen 1995b; Allen & Bayliss 1995)
	8300–7600 cal BC	8880±120 BP, GU-5109 (Allen 1995b; Allen & Bayliss 1995)
	8800–7700 cal BC	9130±180 BP, HAR-455 (Vatcher & Vatcher 1973; Pitts 1982)
Strawberry Hill, Wilts	9150–8250 cal BC	9350±120 BP, OxA-3040 (Allen 1992; 1994)

result of the loss of the former argillic brown earth soil, but was succeeded in the valley bottom by the re-establishment of woodland I a calcareous colluvium. This regeneration of woodland is evidenced by the tree hollow which from the molluscan evidence indicate a post-Mesolithic date (post *c.* 6000 cal BC). It contains a calcareous brown earth rather than the clay rich reddish (rubified) non-calcareous argillic brown earth which it is succeeds. This woodland re-establishment is also supported by soil textural features such as root perforations through the relict argillic brown earth. The tree hollow also contained burnt flint and a number of undiagnostic flakes.

What was the pre-Beaker activity?

Later Neolithic erosion deposited a 300 mm-thick layer of lower colluvium (layer 10) sealing the tree hollow, and may relate to renewed phase of clearance (and possible cultivation) in the Late Neolithic. The tree hollow feature does not indicate that the tree was felled (cf. Macphail 1987, fig. 2) as the typical asymmetrical fills of tree-throw hollows were not recorded (Macphail 1987; Macphail and Goldberg 1990) despite its typically crescentic plan.

This later phase of soil instability could be the source of the last phase of compound, dusty to silty, textural soil features that characterize the soil porosity of relict argillic brown earth (Macphail 1992, fig. 18.4). Although no direct human activity is discernible associated with this, the presence of pottery and flint flakes may suggest activities such as localized occupation and possibly cultivation. These episodes relate to the Late Neolithic-Early Bronze Age site on Houndean (Biggar 1978). The Late Neolithic pottery and relatively large flint assemblages (*see* Figs 11 & 12) are typically domestic. The flint assemblage on the western slope (Fig. 12) cannot have travelled more than *c.* 30m owing to the local topography, and the pottery and flints in the valley bottom are also derived from the minor tributary dry valley to the east leading towards Biggar's Houndean/Ashcombe site (Figs 3 and 4).

Final Neolithic and Beaker

The buried soil in the centre of the valley is formed in colluvium. Occurrence and preservation of the soil suggests stabilization, possibly in a grassland, and lessening of soil erosion from the valley sides. The buried soil is thought to be Beaker in age although only a few sherds of pottery were found in it.

What does the Beaker assemblage represent?

The assemblage comprising elements of at least 20 pottery vessels (Table 6), and the worked flints are not wholly typical of funerary contexts in Sussex (Musson 1954; Clarke 1970; Gibson 1982), nor have any assemblages of Beaker pottery been found in fieldwalking in this area (Biggar 1973; 1975; 1978; 1980). The high number of vessels represented (Table 6) is indicative of settlement and occupation in the vicinity rather than purely the erosion of manuring debris and is supported by the contemporary flint industry consisting mainly of small scrapers just as at Kiln Combe and Belle Tout (Bradley 1982, 64). Re-examination of these latter collections found no sherds with Beaker fabrics similar to those reported here, though similar sherds have been found in colluvium at Kiln Combe, Grey Pit and Cuckoo Bottom.

The large number of vessels presented exceeds the numbers found in any discrete funerary contexts. Only other non-funerary sites have produced such large numbers of minimum vessels, and of these the assemblages from Kiln Combe (Bell 1983), Cuckoo Bottom (Allen 1989a; in prep.) and Ashcombe Bottom all contain developed comb-decorated styles typical of a fairly late Beaker assemblage. The assemblage at Belle Tout is distinctly different being dominated by East Anglian, corded decorated and supposedly earlier forms (Bradley 1970; 1982; Gibson 1982), while that at Cuckoo Bottom contained a mixture of fine comb-decorated and more restricted coarser comb-decorated sherds more typical of East Anglian style.

Where was the settlement?

Although a few Beaker sherds clearly lay on the top of the buried soil (layer 9), the majority were recovered from colluvium overlying this and from the gravel the top of gravel fan. We take this to indicate that the buried soil surface is Beaker in date, but that most of the sherds have washed down from a settlement site within the minor tributary valley. The nature of the slope morphology suggests that it is unlikely that this quantity of material could have eroded from much more than *c*. 100m upslope. A programme of augering in the tributary dry valley in 1994 revealed only shallow ploughed colluvial soil (maximum 420 mm) of which little more than 100 mm lay beneath the plough soil (Ap). We can suggest that the site is, or was, buried by only shallow deposits of colluvium, but has been eroded by Bronze Age to recent erosion (Allen 1988; 1991a).

What was the valley floor used for?

The settlement is likely to have been located in the small valley and the edge of Ashcombe Bottom overlooking the major route-way in the valley bottom which was, evidently, tilled. Cultivation of the soil is certainly indicated by the series of parallel ard marks scored into its surface (Fig. 10) and the analytical evidence. Soil micromorphology indicates that the soil was mixed by cultivation which may have induced both surface sealing and compaction of the plough soil.

Unlike ploughs which create deep furrows and turn the sod, simple ards score the soil surface to provide a seed bed. On this basis we can assume that these marks are not at the base of a deeply disturbed ploughed soil, but at the surface of a shallowly arded soil (Fig. 10), and thus of Beaker date. Manuring and the incorporation and 'ploughing in' of organic matter is indicated by the chaff, ferruginized root channels, and straw (soil micromorphology sample D). The presence of charcoal and burned soil fragments may represent localized burning and fires associated with settlement.

What other activities were associated with the settlement?

It seems, perhaps, in someway surprising to find a Beaker settlement in this valley, or even on the dip-slope of this block of downland, in view of the paucity of round barrows in the immediate area. Barrows are not false-crested on the skyline, nor as combe-cluster cemeteries (cf. Tomalin 1993), and none are located on the adjacent ridges. The main foci of barrows are on the high ridge of the scarp (Fig. 3). Undated valley entrenchments are, however, common in this area and may be a feature of the Beaker landscape. None of the flint scatters seem to belong to this period, so the location of these sites, being located in the valley bottom has served to bury and seal them from archaeological reconnaissance and discovery.

Bronze Age

Tillage of the valley sides, and the tributary valley continued in the Bronze Age. As a consequence, soil erosion (some of the upper colluvium (Fig. 11) continued into the Bronze Age. In fact the presence of high-energy deposits such as the gravel fan may suggest more extensive areas of open fields (*see* Allen 1988; fig 6.5; 1991a, fig 5.2). It has been postulated that that particular event may relate to winter- or autumn-sown crops (Allen 1988, 82). Erosion is more prevalent in the autumn, after harvest, when the fields are dry and bare and highly susceptible to run-off erosion caused by the first winter storms (Allen 1988, 82; 1992; cf. Stammers and Boardman 1984; Boardman and Robinson 1985; Allen 1992). As these events have been shown largely to be the product of autumn sowing at present, it is possible that this was practised in the Bronze Age.

Continued soil depletion would certainly affect the nature of the soils and consequently crop husbandry and the location of fields. I have previously calculated an average minimum depth of soil loss for the valley of 50mm (Allen 1988), and soil micromorphology demonstrates that this colluvium included both relict clay Bt and loessic Bt fragments (Macphail 1992, fig. 18.5), implying the erosion of deeper established soils.

A summary of the main events is outlined in Table 7.

BEAKER SETTLEMENT IN SUSSEX

Despite the wealth of recognizable and diagnostic Beaker artefacts, and numerous Beaker graves, there are remarkably few Beaker domestic sites recognized within the archaeological record, and fewer still excavated. Well-defined domestic and non-monumental structures of Beaker date are rarer still. Beaker vessels are known from barrow and funerary contexts, and occasional Beaker sherds have been recovered from excavation, very few sites have excavated clear Beaker non-funerary features. Excavation apart, fieldwalking evidence provides a more widespread database with which to locate such sites (Gardiner 1990b).

Although approximately 30 other Beaker sites are known in Sussex, most have funerary associations (Ellison 1978) and few have been recognized as occupation sites. Prior to this research Drewett (1978, 28) had stated that 'very little ... demonstrably Late Neolithic is known from Sussex' let alone from the areas studied as a part of this research (Fig. 1 and Allen 1995a) and his more recent review (2004) did not significantly contradict that view. Nevertheless, Gardiner's research demonstrated that large Late Neolithic-Early Bronze Age flint scatters did exist, and that these must represent settlement (1988). Indeed, a surprising quantity of Beaker pottery and potential Beaker (or Late Neolithic/Early Bronze Age) settlement sites have been recovered sealed beneath hillwash. Apart from Ashcombe Bottom, these include Kiln Combe (Bell 1983), Cuckoo Bottom (Allen 1989a,b; 2005a/this volume), Southerham Grey Pit (Allen 1994; 1995a), Cow Gap (Bell 1981, 102; Bell & Walker 1992, 37), Pyecombe (Allen 2005b) and Malling Hill (Allen 1995a). Belle Tout, the most extensively excavated Beaker settlement in the county is located within a dry valley, but no colluvium occurred within the valley to mask the deposits or the valley enclosure within which settlement is contained.

Perhaps this indicates that Beaker settlement sites are more common, but that most are located in dry valleys and are sealed by hillwash and cannot be discovered by normal archaeological reconnaissance such as fieldwalking, aerial photography etc. (Allen 1991a). Even very rapid fieldwork and augering (cf. Allen 1991b) in the dry valley below the Pyecombe Barrow indicated possible settlement under a thin veneer of hillwash (Allen 2005b). The occurrence and location of Beaker sites is explored further elsewhere (Allen 1994; 2005b).

Archive:

The site archive is deposited at Barbican House, Lewes, Site code AB84, Acc No. 1985.1.

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