

# ◆ Prehistoric and medieval environment of Old Town, Eastbourne

STUDIES OF HILLWASH IN THE BOURNE VALLEY, STAR BREWERY SITE

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*The prehistoric (Iron Age), Roman and medieval environment of the Bourne valley was examined via the study of dry-valley sediments, comprising a prehistoric lynchet overlooking the 'floodplain', and sediments on the Bourne 'floodplain' in Old Town. This research discovered an Iron Age site at the face of the lynchet, and investigated the area of the valley floor and the former Bourne Stream. Analytical investigations of magnetic susceptibility and archaeomagnetic dating were applied as novel techniques to examine their applicability to colluvial sediments and utilise any results they yielded. This research has provided a rare glimpse into the environment and land use of early Eastbourne and complements that from the downs and the results of the Eastbourne Urban Medieval Excavation Project (directed by Lawrence Stevens), under whose auspices this excavation was undertaken. This report, though long in gestation and fruition, is dedicated to Lawrence Stevens whose concept this excavation was, and who has, for so long, tirelessly championed the archaeology of Eastbourne.*

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📖 indicates further text or tables on the ADS website;

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The opportunity to examine prehistoric colluvium and deposits relating to the former Bourne Stream to the east of St Mary's parish church, Old Town Eastbourne, was made possible by demolition of the Star Brewery and the houses in Spring Terrace in c. 1970 and 1973 respectively (Figs 1c & 3). Evaluation and excavation were conducted in 1980 prior to the redevelopment of the site. This was designed to complement the work of the Eastbourne Urban Medieval Excavation Project (EUMEP) directed by Lawrence Stevens. Excavation between 1977 and 1984 of approximately 4000 m<sup>2</sup> on a ribbon of land on the south side of Church Street opposite St Mary's Parish Church, had revealed medieval buildings, pits and features (Stevens 1978; 1980a). The Star Brewery site (TV 6002 9949) seemed not to contain evidence of medieval occupation (Stevens & Allen 1981; 2007), however, exposures of colluvium on the valley side, and the course of the former Bourne stream, now culverted, provided the opportunity to examine rare surviving prehistoric deposits. The name 'Bourne' is usually

a name referring to a winterbourne or a seasonally flowing stream, whereas here, certainly in the medieval period, the Bourne was a permanent stream supporting several mills.

A trial trench 5 m long was excavated by Lawrence Stevens in May 1980 through colluvium exposed by the insertion of a sewer in 1974. Excavation of a 0.5 m width of the shallow deposits (c. 1.25 m) within a 5-metre exposure produced 940 artefacts, including 130 sherds of pottery ranging from the Bronze Age to medieval date (Stevens 1980b). The density of artefacts (300 per m<sup>3</sup>) was 4.5 times the densities recorded in excavations of colluvium at Kiln Combe, Itford Bottom, Bishopstone, and twice the density of that at Ashcombe Bottom (Allen 1988, table 6.1; 1991, table 5.1). Having demonstrated that excavation would produce evidence of prehistoric activity and accompanying environmental evidence, a full-scale excavation of the Bourne valley profile was conducted for nine weeks from June to August 1980.

## LOCATION, TOPOGRAPHY AND GEOLOGY

Figure 2 📖 ■

The Star Brewery site straddles the course of the Bourne Stream which flows eastwards from Motcombe pond to the sea, and it formerly fed

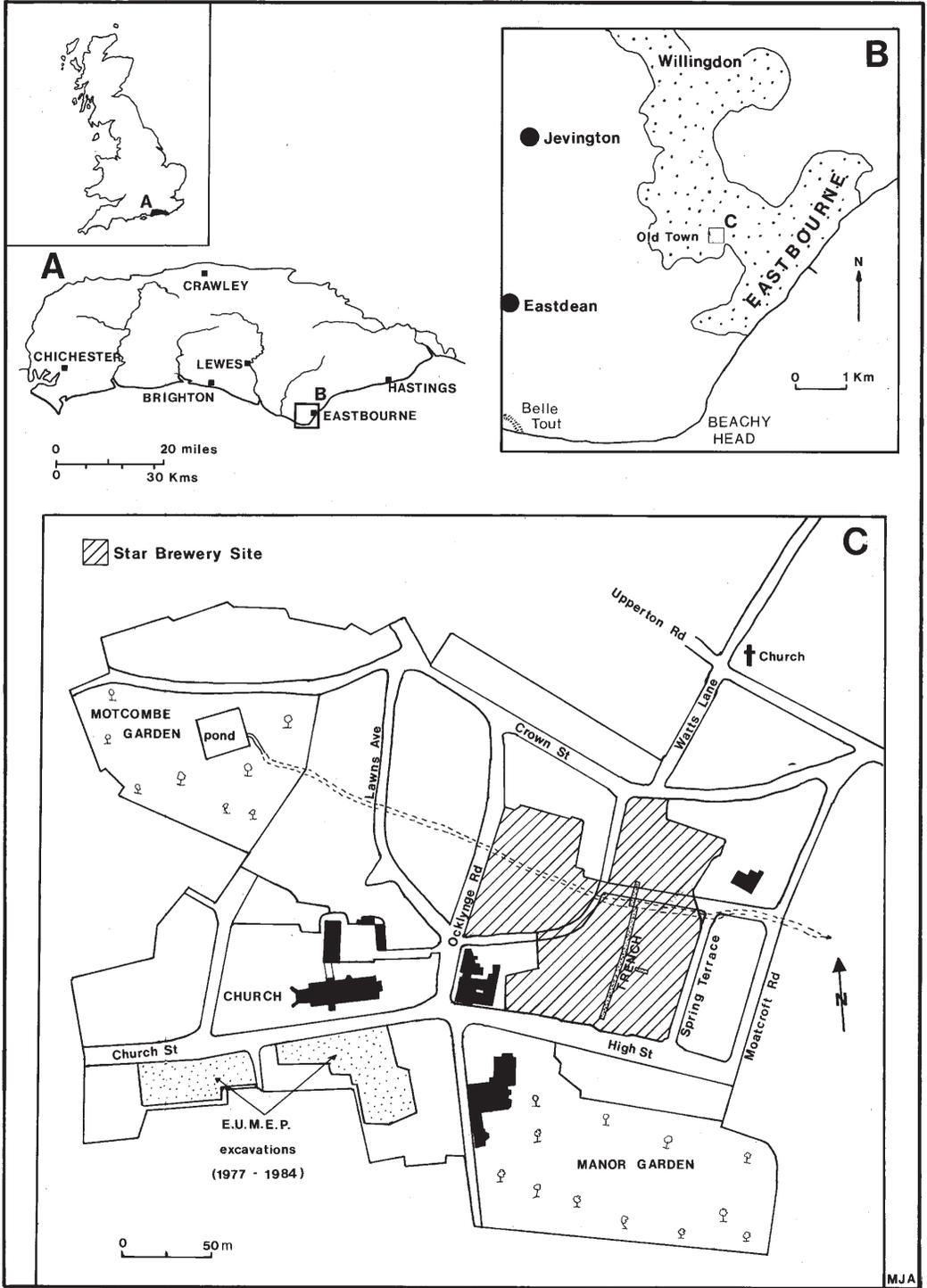


Fig. 1. Location plan showing the Star Brewery Site (hatched), the location of the trench in the Bourne Valley and the short evaluation perpendicular to it.

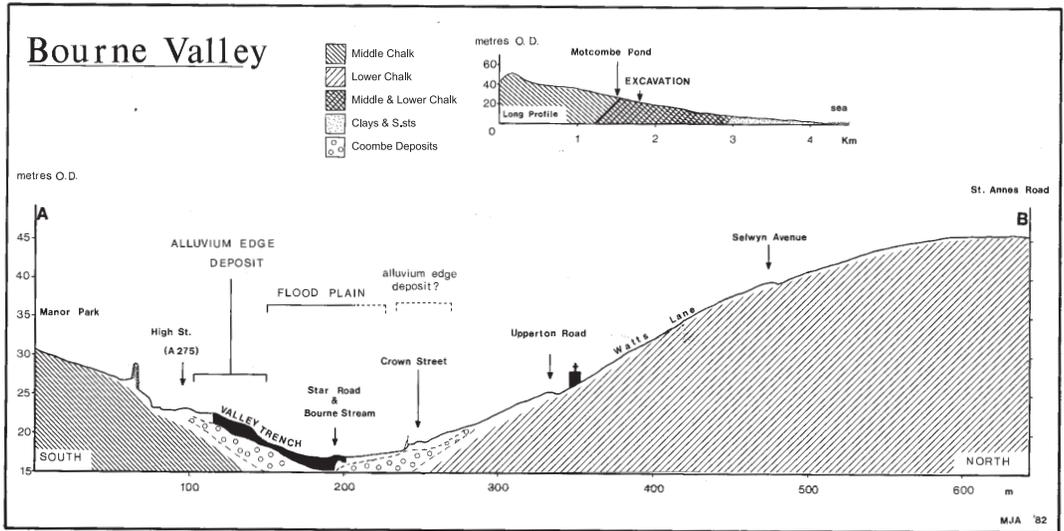


Fig. 2. Cross-section of the Bourne Valley.

Saxon and medieval mill ponds and powered watermills along its course (Spears 1975; Stevens and Allen 1981; 2007). The Bourne valley drains obliquely from the Middle Chalk scarp slope running south and west of the Lower Chalk, Ocklynge to Upperton, Ridge. The valley runs along the mapped junction of the Middle and Lower Chalk (Figs 2 and 4 ■). The area within the Star Brewery site was recorded on the Tithes map of c. 1838 as orchard plot and slaughter house (Stevens 1980b, fig. 6), and is recorded as open ground, although buildings surrounded it on most sides.

The valley does not have a flat floor, but is gently concave (Fig. 2). The valley floor, for nomenclatural classification, has been called the 'floodplain', although it lacks a distinct sedimentary unit which is clearly the product of over-bank flooding, and other evidence of a true floodplain is also lacking, as will be seen below.

#### AIMS AND METHODS

Research excavation was attractive as it provided the opportunity of examining prehistoric deposits rarely encountered in Old Town and not present on the Church Street site (Stevens 1980a). It could provide evidence of the prehistoric and early historic environment of Eastbourne, and examine the medieval Bourne stream. The aims of excavation were principally to examine the

prehistoric environment of early Eastbourne and the Bourne Stream. The excavation was designed to achieve these palaeoenvironmental aims, and not to record archaeological features per se, nor to evaluate the occupation history of the site.

Methods of excavation followed those developed by Martin Bell for his study of dry-valley deposits (Bell 1981a; 1983, *see also* Allen 2005a). The western face was straightened and cleaned, and a strip 0.5 m wide was excavated by hand. Topsoil, demolition, building material, and garden soil were rapidly removed with artefacts retained by context. Below this the location of every artefact was recorded with three co-ordinates (Allen 1983).<sup>1</sup> Distributions of dateable artefacts were used to provide a chronology for sedimentation (Figs 16, 20 & 23, and archive). Detailed drawings of the section were made at 1:10 using a drawing frame to record the shape and location of every stone greater than 10 mm. The sediment profile was described in detail at four strategic locations by Martin Bell following terminology outlined by Hodgson (1976) and three were sampled for land snails. Bulk samples of some features and deposits were taken and wet-sieved (c. 2 mm mesh aperture) to retrieve marine shells and smaller artefacts. Extensive sampling was undertaken for magnetic susceptibility and archaeomagnetic dating two years after excavation. Magnetic susceptibility studies were conducted to assess the method as a useful palaeoenvironmental



Fig. 3. View of the Star Brewery site showing the excavation trench on the lower southern valley side.

tool (Allen 1983; 1986; 1988; Allen and Macphail 1987), and archaeomagnetic dating attempted to assess the value of these methods and utilise any results from them.

#### LABORATORY ANALYSES

Subsamples were taken from the 24 land-snail samples for various sediment analyses. Laboratory analysis of the colluvium and alluvium was mainly performed as a part of an undergraduate dissertation (Allen 1983), and followed standard methods applied to hillwash (Bell 1981b), which itself largely followed methods outlined by Avery and Bascomb (1974). These included particle size analysis, alkali-soluble organic matter, soil reaction (pH), calcium carbonate content, and magnetic susceptibility. Details of the methods and results are given in section 2 of the ADS Supplement.

Particle size distributions were determined for the coarse fraction (>2 mm) from samples prepared for land-snail analysis by sieving (6 mm, 2 mm, 1 mm and 0.5 mm), and the finer fraction (<2 mm, 1 $\Phi$ ) by hydrometer, and the sand size by sieving (1 mm, 0.5 mm, 250  $\mu$ m, 125  $\mu$ m and 63  $\mu$ m). Alkali-soluble organic matter was recorded using the method outlined by Cornwall (1958, 176), with the optical density of each sample recorded at a wavelength of 405 nm, and the readings calibrated against a standard curve (Cornwall 1958) and converted to mg humus/g soil. Soil reaction (pH) was measured electrometrically with a paste

of distilled water and soil (<2 mm) at a ratio of 1:2.5 (Smith & Atkinson 1975, 148). Calcium carbonate content (calcimetry) was measured by acid reaction (Briggs 1977, 36) and magnetic susceptibility measured on 100 g samples of soil <2 mm using a Bartington MS1 meter coupled to a MS1B sensor coil. Land-snail analysis followed standard methods (Evans 1972).

#### EXCAVATION RESULTS

A trench 81.3 m long and about 2 m wide was excavated by machine on the gently sloping southern side of the asymmetrical Bourne valley (Fig. 3). The trench extended from a point 8 m north of the High Street and traversed the valley bottom and the original course of the Bourne stream just south of the former Star Road (Fig. 9) to the foundations of the Star Brewery bottling store. Some 9722 three-dimensionally recorded artefacts ranging from the Bronze Age to post-medieval date were recovered. The trench can be divided into three major zones; alluvial edge colluvium forming a prehistoric lynchet marking the edge of the Bourne 'floodplain' (0–35 m, *see* Fig. 10), the 'floodplain' deposits comprising colluvial deposits and man-made soils (35–66 m, *see* Figure 19 upper), and the valley-floor deposits and a possible channel of the Bourne stream itself, heavily dissected by post-medieval cellars (66–83 m, *see* Figure 19 lower). In summary, the colluvial deposits are

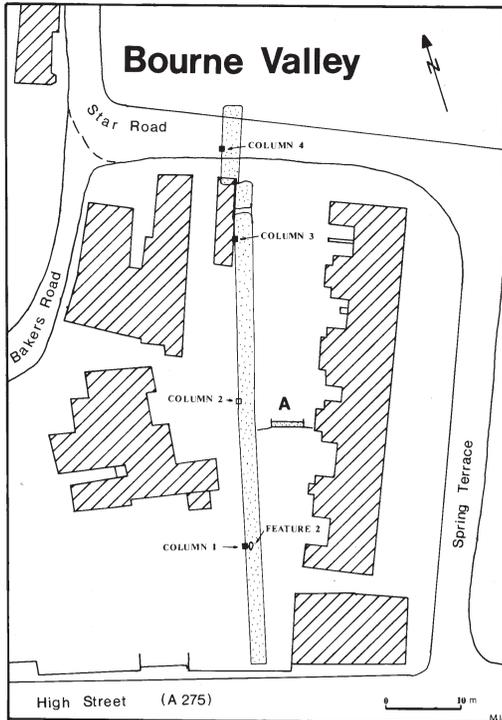


Fig. 9. Plan of the main trench and the evaluation trench (A), situated in former gardens of houses along Spring Terrace. (The location of the mollusc sample columns are shown by ■, and column described but not sampled by □).



Fig. 11. Prehistoric lynchet; sediments being described by Martin Bell assisted by Cecilia Stevens. (Photograph: M. J. Allen.)

later prehistoric and the 'floodplain' deposits essentially medieval and later. A large number of layers were described on site; the majority of these were medieval and post-medieval and have been significantly simplified for the purposes of the publication. Details are available in the archive.

#### IRON AGE LYNCHET AND PREHISTORIC ENVIRONMENT (0–40 m)

The higher slope, above the 'floodplain' contained up to 1.4 m of hillwash and was cut into by post-medieval activity including the former gardens of the houses of Spring Terrace (Fig. 9) and service pipes. At 25–35 m the colluvium was thicker, but had been slighted by later activity and modern demolition debris. This hillwash represents a lynchet on the edge of the Bourne 'floodplain', at the boundary between potentially seasonally wet and dry soils (Fig. 10), creating an alluvial edge

terrace (cf. Bell 1981a). It contained Bronze Age to post-medieval artefacts. The foot of the lynchet was cut by a modern (c. 1972) sewer trench. The face of the lynchet lay below the alluvial terrace edge where it interleaved with the darker medieval deposits on the 'floodplain' (see Fig. 19, below).

#### STRATIGRAPHY; SOIL AND SEDIMENTS ■■

The description of the sequence is based both on field records and also on subsequent sediment analysis; details are presented in the ADS supplement and Allen (1983).

#### Pleistocene deposits

The basal deposit throughout the valley profile was a late Devensian cold-stage periglacial marl, which here (layer 8) was a pale yellow (5Y 7/3), almost soft cheese-like in consistency, calcareous marl with no chalk pieces (i.e. chalky sludge), with a weathered stony surface (layer 7). Particle size analysis showed these to contain a very high

Table 1. Percentage proportion of the constituent particle sizes.

layer	depth	sample	% fine fraction <2 mm			% coarse fraction			
			clay	silt	sand	<0.5 mm	0.5–2 mm	2–6 mm	>6 mm
<b>Lynchet Colluvium; column 1 @ 19.04 m</b>									
12	76–86	11	31.5	54.7	13.8	87.5	3.0	3.2	6.5
5	86–100	10	35.0	54.5	10.5	80.6	3.0	6.1	10.3
5	100–110	9	35.0	55.5	9.5	80.6	2.5	6.8	10.1
5	110–120	8	36.0	54.2	9.8	85.9	2.4	4.5	9.0
5	120–130	7	37.0	54.8	8.25	81.6	1.6	6.0	10.9
5	130–140	6	52.0	41.0	7.0	70.0	1.8	4.8	7.9
5	140–149	5	50.0	45.0	5.0	83.9	2.0	4.9	9.3
13	149–154	4	56.0	35.0	9.0	67.3	5.3	6.4	20.1
14	154–159	3	46.0	51.0	3.0	89.7	1.7	2.9	5.6
7	159–172	2	47.0	44.5	8.5	80.7	5.9	6.9	6.6
8	172–182	1	46.0	50.0	4.0	85.7	8.2	4.6	1.5
F2		24	33.0	54.0	13.0	81.5	3.08	4.27	11.1
<b>Colluvial edge alluvium; column 3 @ 63.55 m</b>									
51	105–115	20	27.0	35.0	38.0	82.8	3.7	4.9	8.7
51	115–130	19	36.0	50.5	13.5	83.1	3.3	3.8	6.7
51	130–145	18	39.0	50.0	11.0	88.6	1.9	4.0	5.7
51	145–155	17	35.0	47.0	18.0	82.1	4.5	6.6	6.9
51	155–162	16	36.0	45.0	19.0	69.2	6.0	10.0	14.9
52	162–170	15	31.0	45.5	23.4	55.2	3.6	12.5	28.7
52	170–180	14	31.0	47.0	22.0	56.4	5.1	13.6	24.9
52	180–189	13	35.0	47.0	18.0	71.7	5.1	11.5	11.7
7	189–194	12	39.0	52.0	9.0	83.1	3.0	4.2	9.8
<b>Floodplain alluvium in the valley centre; column 4 @ 74.38 m</b>									
83	115–126	23	32.0	46.0	22.0	76.8	9.9	3.5	9.9
81	126–149	22	21.0	30.0	49.0	44.3	12.7	17.2	25.8
83	149–156	21	33.0	44.0	23.0	85.4	2.7	4.0	7.9

clay (46%) and silt (50%) content (see Table 1 and 2 ) , which compare favourably with other Pleistocene periglacial deposits analysed by Bell at Kiln Combe (1981b, 158). It recorded very low magnetic susceptibility readings of 5.06 SI units  $\times 10^{-8}/\text{kg}$ .

### Colluvium

The base of the Holocene colluvium was a brown (7.5YR 4/4), almost stone-free silty clay with weak to moderate prismatic/subangular structure (layer 14) that appeared to be a zone of solution and clay deposition at the surface of the chalk. Faint clay mottles were thought to represent clay deposition on pore and ped surfaces (Bell pers. comm.) and silty, if not clay-rich, coatings were seen on ped surfaces with a hand lens. Although provisionally reminiscent of the clay accumulation layer (Bt horizon) of an argillic brown earth, it did not

contain typical reddish hues. Nor did particle size analysis show that there was any clay enhancement, and this layer contained a clay content similar to that of the overlying colluvium (Table 1), but the silt fraction was significantly greater. This relates to surface slaking and silt translocation which can be attributed to early agriculture (cf. Jongerius 1970). The soil thin-section showed secondary chalky infills which relate to cultivation of the overlying chalky colluvium (Macphail *et al.* 1987, 654 and fig. 12). The chalk pieces that appear at the upper boundary (layer 13) of the stone-free silty layer are clearly shown in the >6 mm fraction in the coarse particle size data (Table 1; see Allen 1983, fig. 19 and section 2, ADS supplement ) . This stone-free horizon (layer 14) was also artefact-free, suggesting some antiquity, and confirming that it developed as a result of post-depositional processes such as slaking.

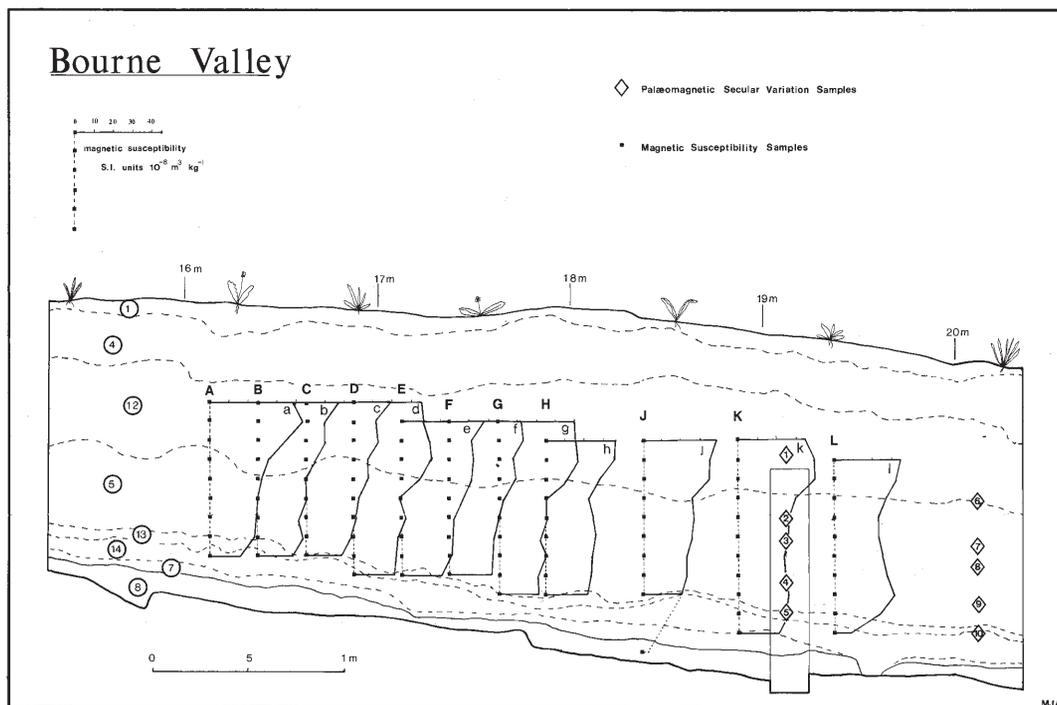


Fig. 14. Magnetic susceptibility results plotted against the Iron Age lynchet, and the location of the 10 archaeomagnetic samples.

The main colluvial layer (layer 5) was a chalky calcareous dark yellowish-brown (10YR 4/4) silty clay loam with common small rounded chalk pieces and rare medium flints (because of their absence in the Lower Chalk) (Figs 10 & 11). It has consistently high pH values (8.1–8.5), and alkali-soluble organic levels were low throughout but rising up profile (0.0116–0.187 mg humus/g soil). This very low alkali-soluble organic context is consistent with a lynchet in which the continual aeration of the deposit by tillage and the high level of microbiological activity would have resulted in the rapid breakdown of organic matter (cf. Clarke 1980; Bell 1981b). *Helix aspersa* was present at 1.16 m depth indicating that the deposits above this are probably Romano-British or later. Fairly abundant vertical earthworm burrows are present; they contain black soil from the medieval and post-medieval garden soils overlying the sequence. Unlike other colluvial deposits there are no stone horizons anywhere in the stratigraphy. The very high clay content (c. 35–55%) may indicate very ancient and now wholly eroded local sources of brickearth deposits and periglacial marl upslope

and from the head of the valley to the east. Magnetic susceptibility profiles (Fig. 14) show a decrease with depth, with the upper colluvium averaging 37.4 (range 32.8–47.9, no. = 35), and the main colluvium averaging 26.2 (range 21.4–37.3, no. = 59), see Table 12. None are low enough to suggest anything but tilled topsoil material, concomitant with tillage erosion, and concurs with extensive readings of modern soils on the chalk (Allen 1988).

The face of the lynchet to the north was similar to the main colluvium, but underlay deposits on the 'floodplain'. In the field it was reported to have a subangular blocky structure and cracking and drying in the field was thought to indicate a higher clay content (Bell pers. comm.). The cracking, however, probably represented soil structure resulting from stasis and soil development of an *in situ* weathered A/B horizon of a rendzina or shallow calcareous brown earth, later buried by colluvium and then by the medieval and post-medieval deposits on the 'floodplain'.

The upper colluvial layer (layer 12) only occurred where the lynchet deposits were at their

thickest. It is a dark greyish brown (2.5Y 4/2) highly calcareous silty clay loam with few small chalk pieces and rare small beach pebbles and flint nodules. Organic content was higher than in the main colluvium. Again there were abundant old earthworm burrows (5 mm diameter), many of them stained with organic soil relating to the overlying medieval garden soil.

#### **Medieval and post-medieval garden soils and other features**

Details of the upper, post-medieval and modern, layers (layers 1 and 4) are given in archive and in Allen (1983); these overlaid the colluvium with a sharp boundary indicating they had been cut into the colluvium. They were very dark grey (10YR 3/1) sandy silts with large quantities of brick, tile, coal, coke and beach shingle in an organic matrix with weak blocky structure, representing garden soil, construction and demolition activity.

One feature (F2), wholly within the trench and lacking any clear stratigraphic relationship with the overlying deposits, occurred at about 17.5–20 m (see Figs 9 & 10). It measured 1.55 × 0.69 m and was only 350 mm deep, with periglacial marl overhanging the western edge. It was filled with a brown (10YR 5/4) silty clay loam colluvium with subangular blocky structure, common very small rounded chalk pieces, few medium chalk pieces and no flints. It was similar to the upper main colluvium (layer 12), and the presence of several examples of *Helix aspersa* together with two sherds of Iron Age pottery and one of Romano-British or medieval origin suggests that this may have been Roman or later. Bulk samples produced 21 fragments of *H. aspersa*, and laboratory examination of the land-snail assemblage (see below) does not confirm the suggestion that this was a prehistoric subsoil (i.e. tree) hollow. Instead it seems likely that this may be an animal burrow dug into the face of the lynchet.

#### **Soil micromorphology** by Richard Macphail

A sample was taken in 1982 of the main colluvium (5) to aid in characterizing the deposit. The colluvium is a heterogeneous soil/sediment composed of frequent chalk clasts (as rounded 2–5 mm and angular coarse >20 mm size fragments), and several distinct soil materials, which are present as coarse sand-sized and gravel-sized clasts and aggregates. These occur as few non-calcareous clay-poor silt ('brickearth' Eb soil horizon), few

weakly argillic silt loam ('brickearth' Bt horizon), dominant moderately calcareous silty clay loam ('brickearth' B/C) and chalky silt (chalk B/C horizon). In all likelihood, these components (in an area of Coombe 2 soil association, i.e. colluvial brown earths) are eroded soils from the plateau drift-covered Chalk, forming a Coombe series soil (typical calcareous brown earth) in the Bourne valley itself, but probably including elements of non-calcareous silty Charity series soil (typical argillic brown earth), calcareous silty Panholes series soils (typical calcareous brown earth) and chalky Upton series soils (grey rendzina) (Jarvis *et al.* 1984). More clayey, but similarly non-calcareous Iron Age buried colluvium is present at nearby Seaford Head, again of plateau drift origin.

The colluvium also includes rare biogenic calcite (earthworm granules and fewer slug granules), rare traces of land snail shell, and much very fine charcoal and amorphous organic matter (now ferruginised). Importantly, the colluvium has a moderately low porosity (<20%), the voids being dominant fine to medium closed polyconcaave vughs, associated with very abundant calcitic intercalations and void coatings (e.g. 100 µm thick) and infills between soil clasts, effectively 'cementing' the soil. The silt content and coatings relate to surface slaking created by early agriculture (cf. Jongerius 1970), as evidenced by these secondary chalky infills and relate to cultivation of the overlying chalky colluvium (Macphail *et al.* 1987, 654 & fig. 12). Lastly, the soil/sediment has been affected by broad to very broad burrowing (2–5 mm).

The soil micromorphology thus seems to record: erosion of non-calcareous silty clay upper-subsoil soil and calcareous lower-subsoil silty clay and 'silty' chalk, that was deposited as a slurry, where some soil material became slaked forming a collapsed soil structure of closed vughs. Chalky colluviation continued, inwashing into some existing voids and in due time becoming burrow-mixed by soil mesofauna. The presence of fine charcoal and organic matter residues implies that cultivated arable soils were being eroded to form this colluvium. At White Horse Stone, Kent, presumed Iron Age colluvium of a similar character and origin, also became increasingly calcareous as increasingly chalk-rich slurries were deposited, again implying deepening erosion of the plateau and valley side soils.

### ARTEFACT DISTRIBUTION

The distribution of the main datable artefacts is shown in Figures 16 and 20, and the colluvium of the alluvial edge terrace lynchet contained Bronze Age to post-medieval artefacts. The distributions (Fig. 16) show some horizonation indicating the approximate dates of the stratigraphy. A few sherds of Bronze Age pottery are present, all from very low down in the sequence, but they nevertheless indicate a Bronze Age presence in Old Town. The Iron Age is significantly represented with 295 sherds in this section. The high quantity of these sherds, largely Middle Iron Age, is hard to explain in view of the lack of known sites in the immediate proximity and of any immediate evidence for a site here. None of the sherds is particularly large, but the majority are not heavily worn. The Iron Age pottery is largely confined to the main colluvium (layer 5). There is a distinct lack of Romano-British pottery: only two sherds of Romano-British pottery were recovered, both in the upper colluvium (layer 12). A scatter of Late Saxon/early medieval sherds is seen in the upper part of the main colluvium (layer 5) and the lower part of the darker upper colluvium (layer 12). In contrast, a proliferation of medieval and post-medieval artefacts lie in the darker layers above the colluvium, though a relatively high proportion (c. 161 sherds, 79%) of medieval pottery occurred in the top of the upper or main colluvium. This would tend to suggest that the main colluvial accumulation started in the Iron Age and that activity continued through the medieval period.

Although clear concentrations of both flint material and prehistoric pottery follow a trend matching the surface of the periglacial marl, there is a suggestion that the zonation of artefacts in the upper hillwash particularly around 22–30 m was more horizontal, and that the upper profile was slighted. This is clearly shown in the distribution of medieval sherds, and confirms loss of the crown of the lynchet at this point. At the face of the lynchet a clear concentration of Iron Age sherds is greater than elsewhere and forms a buried horizon (Fig. 20b) accompanied by predominantly flint flakes. The sherds tend to include larger pieces, and the forms and fabrics include types paralleled by those from the Green St. site (Dove pers. comm.; Budgen 1922a; Hodson 1962), and by vertical-sided saucerpan pots with eyebrow decoration (Hamilton pers. comm.). Unlike the general distributions of sherds in the lynchet (Fig. 16b), these form a

discrete buried layer and may represent the fringes of occupation on the edge of the ‘floodplain’. Further, there is tentative evidence that these lay largely within a buried soil.

### ARCHAEOMAGNETIC DATING (sampled 1982) ■

Two columns of samples were taken from the excavated face of the prehistoric lynchet (Table 4 ■). The first set lay within the snail-sample column at 19.15 m and the second column was 1 m north (Fig. 14). Sampling was undertaken using non-metallic implements. The section was cut into leaving an upstanding column of soil over which a plastic tube was placed. The top was levelled and infilled with plaster of Paris in which magnetic north was inscribed. The sample was cut free at its base, inverted and filled with plaster of Paris encapsulating a portion of sediment (Allen 1983, pl. 6a–d).

Dating by deposition remnant magnetism attempted to date the sediment deposition via its intrinsic components, rather than the distribution of extrinsic components (the artefacts), which had been discarded, incorporated into the sediments and then eroded with them. Measurement was undertaken at the former Ancient Monuments Laboratory using a Digico Micro M16E and a balanced fluxgate spinning magnetometer calibrated using a standard calibration sample. Detailed methods are given in section 3 of the ADS supplement. The stability factor ( $S.F._i = R_i/R_1 + r$ ) was calculated and the fall of intensity with increasing field ( $M/M_0$  vs  $H$ ) plotted (Thompson *et al.* 1974). Those with a convex curve indicate that the sediments hold a stable remanence (Tarling 1967). Three samples (6, 7 & 9) were unstable, and this was confirmed when their plotted inclination and declinations did not lie on the Ancient Monuments archaeomagnetic curve (Fig. 17a ■). The remaining seven samples showed fair stability and were plotted against the archaeomagnetic curve (Fig. 17b ■). The sample from layer 14 (sample 10) although stable, could not be matched with the archaeomagnetic curve; much of the fine material in this deposit was translocated silt (*see* Macphail *et al.* 1987). Although none of the remaining stable samples gave a good individual result, when plotted against the archaeomagnetic curve they showed a general chronological trend (Fig. 17b ■). In summary, samples from layer 13 and the base of the colluvium layer 5 (samples 5 and 4) show a swing from c. 250–300 BC (mid/Late Iron Age)

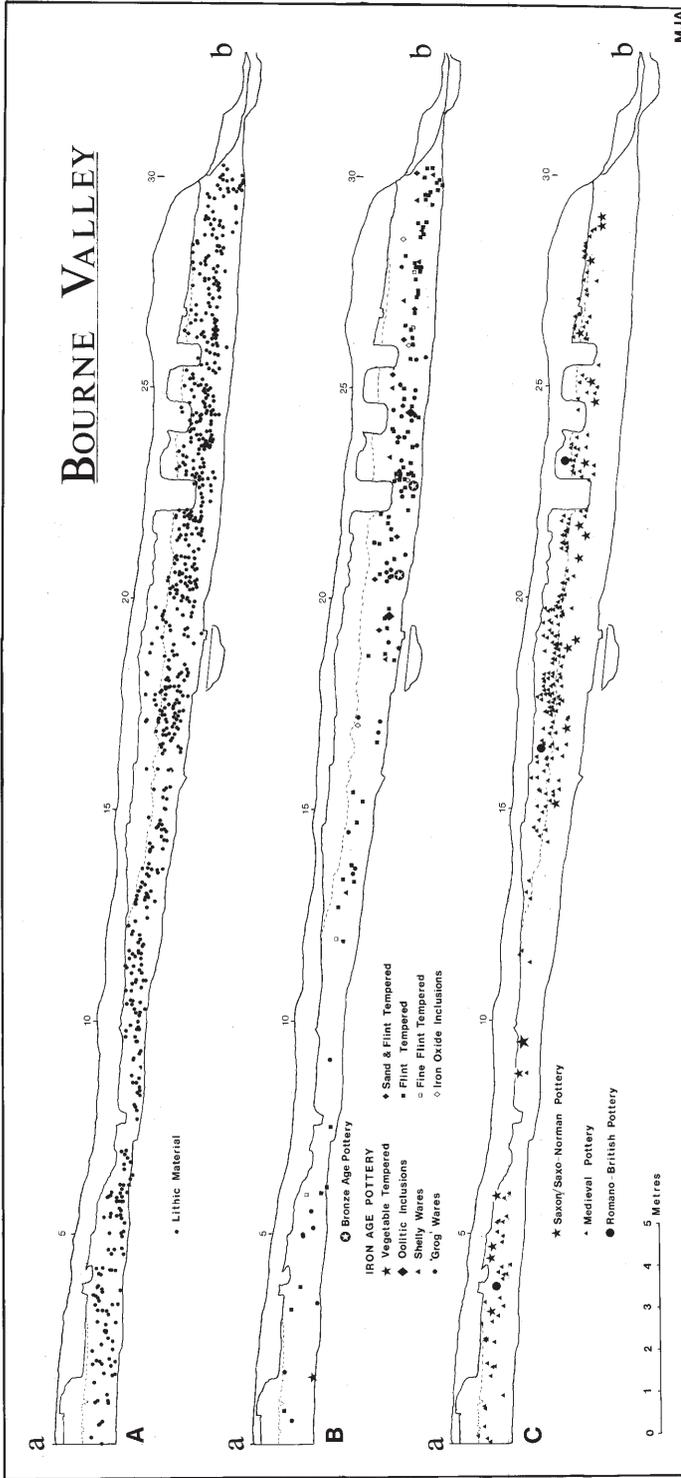


Fig. 16. Distribution of artefacts in the colluvium and lynchet at 0-35 m.

to the first century BC (c. 50 BC) Samples from the middle of the main colluvium, layer 5, (samples 8 and 3) seem to follow the archaeomagnetic curve westwards through 0 BC and samples from the top of the main colluvium layer 5 (sample 2) may be compared with the peak seen at about AD 250. The latest sample from the upper colluvium, layer 12, (sample 1) compares well to about AD 300. These dates, therefore, suggest a commencement of colluviation in the mid/late Iron Age (c. 250–300 BC) and continuation until at least c. AD 300 (Clark pers. comm.). Although provisional, these results provide a very good comparison with the chronology derived from the artefact assemblages. If, therefore, depositional remnant magnetism is fossilised within the samples it indicates both a potential dating mechanism but also suggests that the magnetic domains were 'fluid' at the time of deposition, as is also suggested by the soil micromorphology. This may enable us to make suggestions about the deposition mechanism and environment of the sediments, i.e. that the magnetic domains were lubricated with water suggesting that the soil was flushed downslope and deposited in water; this is consistent with the observed effects of fill erosion of chalk slopes (Bell 1992; Allen 1992; Boardman 1992).

## ENVIRONMENTAL AND ECONOMIC EVIDENCE

### Land snails

A column of 11 contiguous samples was taken through the lynchet at 19.04 m (Figs 10 & 11). Analysis follows Evans (1972), nomenclature is after Kerney (1999) and broad ecological groupings follow Evans (1984), where in the mollusc histogram (Fig. 18) Zonitids include *Ageopinella nitidula*, *A. pura* and *Vitrea contracta* and the catholic species include *Cochlicopa* spp., and *Cepaea* spp. The results are presented in Table 6.

Overall, the assemblages reflect open-country environments typical of other colluvial sequences in Sussex (e.g. Kiln Combe, Itford and Chalton: Bell 1983; Southerham: Allen 1995) and lynchet deposits (e.g. Malling, East Sussex: Allen 1995; Bishopstone, East Sussex: Thomas 1977; and Fyfield Down Wiltshire: Fowler & Evans 1967), but subtle and significant changes occur which reflect local land use, and these are worth exploring in more detail. Significant intrusion and reworking is present in the sequence as an apex and fragments of the Roman introduction, *Helix aspersa*, were present in the periglacial meltwater deposits, as

were fragments of mussel shell (Table 6). Despite this, clear zonation within the assemblages can be recognised, and three mollusc biozones have been distinguished (Fig. 18).

### Pleistocene deposits

Two samples from the periglacial deposits were moderately rich in shells, each containing about 60 shells (Table 6). Despite relatively large, obviously more recent, intrusive elements (*Helix aspersa* apex and fragments, and fragments of mussel), the restricted assemblages are typical of Kerney's cold stage mollusc biozone 'z' (Kerney 1963; 1977). They are dominated by *Trichia hispida* with *Punctum pygmaeum*, *Abida secale*, *Vallonia costata* and *Pupilla muscorum* predominant (mollusc biozone 1), and can be paralleled with Late Devensian assemblages from the North Downs and those at Cow Gap on the Eastbourne Downs (Kerney 1963). The xerophile *Abida secale* is characteristic of Late Devensian fauna in southern England and is seen at Cow Gap in similar Pleistocene chalky marl deposits (Kerney 1963), and here is restricted to these deposits. The presence of the late glacial fossil *Trochoidea geyeri* is significant. It is extinct in post-glacial Britain (Kerney 1999) and today has a basically Central European distribution (Kerney & Cameron 1979, 183). There are a number of Pleistocene records (Sparks 1953; Evans 1972) including Late Glacial assemblages on the North Downs (Kerney 1963), the Isle of Wight (Preece 1977; Preece *et al.* 1995), and Hambledon Hill, Wiltshire (Bell *et al.* forthcoming) as well as further afield. This confirms an open cold tundra late glacial landscape of pre-10,000 BC.

### Colluvium

The post-glacial colluvium showed little evidence of internal stratigraphy, excepting the basal stone-free and stony lens, nor was there any molluscan evidence of major ecological change, but some subtle and significant changes are noted. There is no buried soil, or evidence of early post-glacial soil development and vegetation regeneration, or of the Neolithic woodland seen elsewhere (e.g. Allen 1995), but this is typical of many colluvial deposits in Sussex (Bell 1983) and Wessex (Allen 1992). The assemblages from the main colluvium can be divided into two; the lower (mollusc biozone 2a) is dominated by four species: *Trichia hispida*, *Vallonia costata*, *V. excentrica* and *Pupilla muscorum*; however, the latter declines rapidly while in the



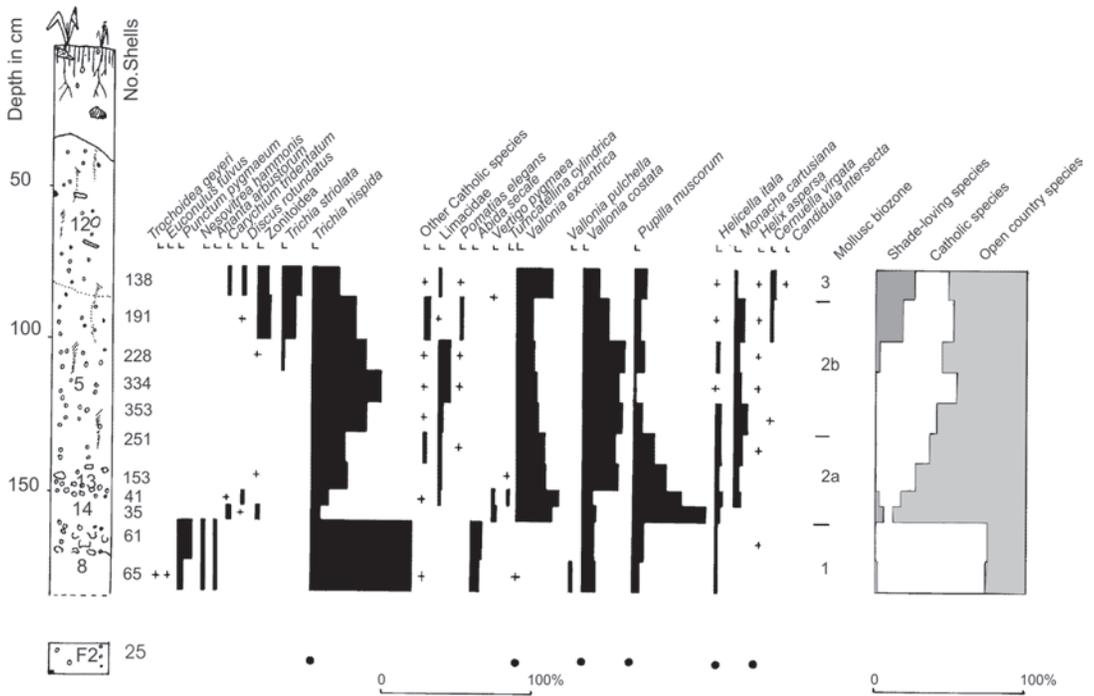


Fig. 18. Snail histogram through the Iron Age-medieval colluvium and lynchet.

upper (mollusc biozone 2b), shade-loving species become more significant. The assemblages of zone 2a, encompassing the stone-free, stony and lower part of the main colluvium (layers 14, 13 & 5), are largely open-country, though the proportion of open-country species steadily declines from 88% to 64%, while the catholic species (primarily *T. hispida*) increase. This is the case with other colluvial sequences and the proportion of the key open-country species compares well with other published sequences (Table 7). At the base of the sequence the xerophile, *Truncatellina cylindrica*, typical of dry, exposed hillsides, was present. The common xerophile *Helicella itala* is considered a fossil typical of prehistoric arable (Evans 1972, 182) and it occurs in low numbers through this sequence. Although Shrubsole (1933, 366) indicates that it has a preference for south-facing slopes, it is generally uncommon in a number of other Sussex sites, in contrast to the lynchets at Overton and Fyfield Down in Wiltshire (Table 7). *T. hispida* is common in ploughwash, and the consistent but low presence of *Monacha cartusiana*, a relatively rare xerophile, is significant as it is restricted to the extreme south and east of England

(Evans 1972, 179; Kerney 1999, 188), where it is largely restricted to short-turfed grassland. It is, however, recorded in Iron Age ploughwash and colluvial deposits at Devil's Dyke and Asham (Ellis 1985), where it is considered to have colonised areas after clearance for cultivation (Kerney 1970). Surprisingly, the Roman introduction *H. aspersa* is present as fragments throughout the main colluvium, and this contradicts the artefact distributions which suggest that the majority of this deposit is prehistoric. In view of the obviously intrusive fragments of *H. aspersa* in the periglacial deposits, we consider that many of the fragments here are also intrusive. Mollusc biozone 2a (upper part of the main colluvium) represents typical open, calcareous, prehistoric arable habitats.

The upper part of the main colluvium (layer 5) and base of the upper colluvium (layer 12) comprises biozone 2b and shows relative increases in the significance of *T. hispida*, relative reductions in *V. excentrica*, *P. muscorum*, and a continued decrease in the open-country species from 54 to 48% with a concomitant increase in the shade-loving species to 19%. The proportional reduction in *P. muscorum* and *Vallonia* spp. may

Table 7. Comparisons of the percentages of the main open country species from the Iron Age lynchet at Bourne Valley with other prehistoric lynchet and colluvial deposits.

	Nos/ samples	<i>Vallonia costata</i>	<i>Vallonia excentrica</i>	<i>Trichia hispidata</i>	<i>Helicella itala</i>	<i>Pupilla muscorum</i>	<i>Vertigo pygmaea</i>
BOURNE VALLEY colluvium layer 52 (Table 10)	263/3	28	14	30	2	9	0
BOURNE VALLEY colluvium layer 5 (Table 6)	1510/6	24	15	34	2	8	0.3
BOURNE VALLEY colluvium layer 51 (Table 10)	325/5	11	11	29	0.9	1.5	0
BOURNE VALLEY colluvium layer 12 (Table 6)	138/1	7	24	18	+	7	0
BISHOPSTONE average samples 7–26 (Thomas 1977, table 10)	1484/6	13	12	19	5	25	0.1
KILN COMBE prehistoric hillwash — averages in layer 11–12 (Bell 1981, table 9)	147/4	27	21	38	4	6	0
FYFIELD DOWN average of samples 3–5 (Evans 1972, table 9)	459/3	23	26	19	12	2	2
OVERTON DOWN average of samples 27.5–65 cm (Evans 1972, table 10)	937/5	7	25	26	29	5	1
MALLING HILL average samples 6–11 (Allen 1995, table 5)	1517/6	1.6	15	21	3	54	2

tend to indicate a more complete vegetation cover locally. At the top of zone 2b there is a rise in the proportion of shade-loving species and a number of Zonitids appear (principally *Aegopinella nitidula*) along with *Discus rotundatus*, *Carychium tridentatum* and the synanthropic species *Trichia striolata* which tends to favour waste ground, longer grass and nettles. This increase in shade-loving species suggests moderately moist and sheltered ground (*D. rotundatus*), longer grassland and some shade (*C. tridentatum*, *T. striolata*) from which we can suggest that the assemblages represent two local habitats, the first being the arable habitats of the adjacent field with the shells derived from colluvium eroded from the field onto the lynchet, and the second being the field-edge habitat, perhaps of longer grass and possibly with the establishment of some shrubby vegetation.

The top of the sampled sequence coincides with the base of the upper colluvium (layer 12), and this sees a rise in *V. excentrica* and decline in *V. costata*. *Trichia striolata* continues to gain importance, and may suggest waste ground and shrubby hedge at the fields' edge, and at the boundary between the 'floodplain' ploughed fields and back of the dry, settled 'floodplain'. The entire sampled sequence is wholly indicative of dry, calcareous, tilled land; there is no indication of adjacent wet 'floodplain' habitats, a fact to be explored below. The presence of fragments of marine shell can be seen throughout the entire sampled profile (Table 6), which is taken to indicate manuring with

seaweed or shells spread with midden material from, probably, the Iron Age.

#### Feature F2

A single spot sample from this feature which was considered to be a possible tree hollow produced only 25 shells, though importantly this was dominated by open-country species, and few shade-loving species were present. Significantly, two apices of *H. aspersa* were present, and a further 21 fragments >2 mm were recovered from a bulk sample sieved on site. In addition *T. striolata*, which only occurs in the upper, Roman or medieval deposits was also present. The conclusion is that this is not a tree hollow: the assemblage represents open-country conditions with local shade and seems to be stratigraphically reversed, possibly as a result of animal burrowing into the face of the hedged or shrubby lynchet.

**Charred plant remains** (identifications by Joy Ede, Sue College and Chris J. Stevens) 📖■

Eleven charred seeds were recovered from the main Iron Age colluvium, layer 5, during the processing of small (1 kg) land-snail samples. The number of charred grains is higher than in many samples ten times larger taken from strictly archaeological features. The grain was largely wheat (*Triticum* sp.), with one free-threshing wheat grain (*Triticum aestivum* sl.) from the upper part of the main colluvium. Two barley grains (*Hordeum* sp.) and one oat grain (*Avena* sp.) were also recorded (Table 8 📖). The lack of free-threshing wheat, typical of

Table 9. Absolute numbers and proportion of marine shell from the prehistoric lynchet (0–30 m).

		layers		13 & 14		5		12	
		no.	%	no.	%	no.	%		
<b>Species recorded from hand excavation</b>									
<i>Mytilus edulis</i>	mussel	2	100	42	48	140	35		
<i>Patella vulgata</i>	limpet	+	+	21	24	105	26		
<i>Littronia</i> spp.	winkle	-	-	14	16	63	16		
<i>Ostrea edulis</i>	oyster	+	+	7	8	63	16		
<i>Buccinum undatum</i>	whelk	-	-	3	3	21	5		
<i>Cardium edule</i>	cockle	-	-	-	-	7	2		
<b>Species recorded in snail samples</b>									
<i>Hydrobia</i> cf. <i>ulvea</i>	hydrobia	-	-	+	+	+	+		
cf. <i>Nassarius reticulatis</i>	netted dog whelk	-	-	+	+	+	+		
<i>Gibbula</i> sp.	topshell	-	-	-	-	+	+		
Total		2		87		399			

Saxon and medieval periods, in the body of the lynchet suggests that the wheat here is probably prehistoric. It indicates the processing of wheat and barley in the vicinity and may be suggestive of settlement.

#### Marine shell

Marine shells were recorded particularly in the upper colluvium (layer 12) commensurate with the occurrence of medieval pottery. At this point there was a significant increase in the quantities and species of marine molluscs which included *Mytilus edulis*, *Patella vulgata*, *Ostrea edulis*, *Littronia* sp., *Buccinum undatum* and *Cardium edule* — all easily collected throughout the year on foot in the intertidal zone. However, marine shells were present in the upper portions (i.e. Iron Age to Romano-British) of the main colluvium (layer 5), and mussel fragments in particular were noted throughout the main colluvium and reworked into the cold-stage periglacial deposits (Tables 6 & 9). Within the snail samples several fragments of other non-edible and small marine shells such as *Hydrobia* (found in estuarine and saltmarsh areas), *Nassarius reticulatis* and *Gibbula* were present. Few marine shells or fragments were present in the lower colluvial layers. These are often entangled in the holdfasts of seaweeds (particularly *Laminaria*, D. Adams, pers. comm.) and their presence here suggests that manuring with seaweed (cf. Thomas 1977; Bell 1981c) was employed from the Iron Age, but especially in the Romano-British and medieval periods.

#### SUMMARY OF THE ARTEFACT ASSEMBLAGES

##### Pottery (fabric identifications by Sue Hamilton)

Two sherds of Bronze Age pottery contain grog and flint tempering and are probably Early or Middle Bronze Age. They predate the lynchet, and their size and condition suggest they may be residual.

A total of 295 sherds of Iron Age pottery were recovered from the main colluvium (0–30 m) and an additional 42 sherds from the face of the lynchet at 35–40 m. The sherds were fabric-typed by Dr S. Hamilton (see key in Fig. 16). The majority of the sherds are flint-tempered (62%) and grog-tempered (30.7%) with fewer shelly wares (5.5%), and quartz sand-and-flint tempered wares (2.2%). Fabrics of (?pisolitic) iron oxide inclusions, fine flint tempering, vegetable tempering and oolitic inclusions each represented less than 2% of the assemblage. These have been correlated with the fabric series published by Hamilton (1977; 1999) where possible, and range from Late Bronze Age to Late Iron Age, with a peak of Middle Iron Age saucepan fabrics (flint-tempered) and late Iron Age (or possible early Romano-British) grog-tempered wares including East Sussex Ware. Detailed examination of the forms was not undertaken (cf. Bell 1983), but the fabrics identified by Sue Hamilton, provide some general chronological and form indicators as listed below:

grog wares	30.7%	these may include East Sussex Ware (Hamilton fabric 5)
vegetable-tempered	0.6%	difficult to date within the Iron Age (includes Hamilton fabrics 2a and 3a)

flint-tempered	62%	the majority is medium flint tempering typical of the Middle Iron Age; this group included some saucepan (Caburn II) forms
quartz sand- and flint-tempered	2.8%	Middle Iron Age
fine flint-tempered	2.2%	Middle Iron Age
oolitic inclusions	1.6%	present in Middle Iron Age saucepan fabric at the Caburn
iron oxide	1.6%	common pre-Middle Iron Age (but could be Late Bronze Age to Middle Iron Age), includes Hamilton fabrics 3b and 3c
shelly wares	5.5%	none specifically recorded with fossil shell which are mostly Late Bronze Age/Early Iron Age (Hamilton fabric 2a and 2b)

These fabrics are generally typical of Middle Iron Age assemblages such as those from Bishopstone (Hamilton 1977), and the Caburn (Hamilton 1999), with the sandier fabrics possibly like those at Heathy Brow (Hamilton in Drewett 1982, 81–8). These probably represent saucepan-pot forms of the Middle Iron Age (cf. Hamilton 1977; 1999), with grog-tempered wares predominantly of the later Iron Age tradition. Others, typically those with sandier fabrics, included forms typical of the Early to Middle Iron Age from the Green St kiln site (J. Dove pers. comm.; Budgen 1922a; Hodson 1962) only c. 1.5 km northwest of the site. Four other sherds with oolitic inclusions were present and suggest trade links with the Oxfordshire-Wiltshire Oolitic limestones.

The grog-tempered wares included East Sussex Ware of the Later Iron Age and Early Romano-British tradition (Green 1977), but these were largely present among the Iron Age assemblage. Three sandy Romano-British sherds were present; all were worn. The medieval sherds were recorded predominantly as dating evidence, but were noted to contain late-twelfth- to early-thirteenth-century coarse-tempered fabrics, and late-thirteenth- to fourteenth-century sand-tempered fabrics (Dove 1985). The late Saxon/early medieval sherds are discussed by Jervis later.

### Flints

The majority of the flints were predominantly crude, hard-hammer secondary and tertiary flakes. A very low proportion were tools and these were crude large scrapers, core fragments and some possible blades. With a clear absence of Bronze Age pottery and the distributions of flints mirroring

those of the Iron Age pottery we must conclude that this is largely an Iron Age flint assemblage (cf. Young & Humphrey 1999).

## THE MEDIEVAL BOURNE VALLEY 'FLOODPLAIN' ENVIRONMENT (40–70 m)

Below the terrace lynchet at the 'floodplain' edge the sediments were relatively uniform: weakly banded, largely post-medieval, deposits of brownish grey silty clay to silty marl cut by numerous post-medieval and Victorian features including modern cellars and several concrete foundation pillars. These latter deposits, in contrast with the prehistoric colluvium, were darker and contained mainly medieval and post-medieval sherds, reminiscent of garden soils or urban deposits (dark earth). They included a shallow deposit about 0.6–0.75 m thick (layer 27) which was a dark greyish brown (10YR 4/2) calcareous chalky silt loam with subangular blocky structure, with moderately high humus content. These upper deposits showed some general banding of the small chalk pieces and similar deposits overlaid a post-medieval greensand floor and at 51–57.5 m were cut by a post-medieval cellar north of 52 m (Fig. 19 upper).

Two areas of medieval deposits were, however, preserved. The first comprised a triangle of light greyish brown silty clay with many chalk pieces and rare medium flints (layer 5c) against the face of the lynchet at the back of the 'floodplain' to 44 m (Fig. 19 upper). It was generally similar to the colluvium in many ways except colour, and it is probable that this deposit derived from prehistoric colluvium that has been subjected to wetting on the valley floor, and to anthropogenic mixing (higher organic content and admixture of prehistoric and medieval artefacts) — possibly as a garden soil.

Towards the centre of the valley between 63 m and 65 m the sequence was slightly better preserved and sealed profiles (layers 51 and 52) which attained thicknesses of about 1 m, may be equivalent to layer 5c at the face of the lynchet. These deposits, near the Bourne stream, were distinctly more clayey or silty. The lower 'floodplain' deposit (layer 52) was a slightly brown (10YR 5/3) silty marl with many medium flint nodules and many chalk pieces (mainly small but

variable in size) and was less humic and had less pronounced anthropogenic mixing than overlying layers. It showed little sign of any pedological organisation and was probably material that had accumulated on the valley floor, not looking much like colluvium, but possibly mixed by cultivation. The upper, 'floodplain' deposit (layer 51; Fig. 19, lower) was lighter, a light brownish grey (10YR 6/2) silty marl with common small rounded chalk pieces and some medium chalk pieces, with a subangular blocky structure. It had a fairly high calcium carbonate content (Table 3, Fig. 13), but very little had been secondarily deposited; a few flecks of charcoal, calcined flint and fragments of winkle, oyster limpet, mussel and cockle were present. It contained slightly higher sand-sized content than layer 52, and raised alkali-soluble humus content. The sedimentological character (particle size, pH, and alkali-soluble organic matter content) of these layers was similar to that of the lynchet colluvium; the darker colours did not obviously represent significantly higher levels of organic matter, but alkali-soluble humus levels were slightly higher than in the lynchet colluvium. These layers (51 and 52) nearer the valley centre seemed to be distinctly less silt- and clay-rich (finger texturing) than those abutting the lynchet (27). This may suggest an over-bank flooding (water lain) element to some of the deposits. Certainly, the sand content was also higher in layers 51 and 52 nearer the Bourne stream. It seems likely, in view of the artefactual content (*see below*), that these represent reworked colluvial deposits that had had some limited over-bank alluvial input, and had been subject to local medieval and later disturbance and mixing by tillage, horticulture or garden soils.

A number of post-medieval and, Victorian features including cellars were encountered as well as a myriad of modern service pipes and trenches. None of the post-medieval features are discussed here, and summaries of this evidence can be found in the archive. The fact that much of this area was open and subject to general disturbance has already been discussed and in what follows slim evidence of the medieval activity within the Star Brewery Site is presented. The quantities of medieval sherds (around 130 three-dimensionally recorded) in themselves indicate some activity. Although no medieval features or structures were recovered such as on Church Street, the small, hand-excavated portion (0.5 m wide)

was certainly not conducive to finding any. The medieval deposits on the 'floodplain', and the quantity of artefacts recovered, nevertheless, seem to indicate more than just casual use. No pits or medieval buildings were found, and this concurs with the open spaces depicted on the Tithe map of c. 1838 (Fig. 26). Nevertheless, the quantity of finds suggests that this open 'waste' ground was used, perhaps as a common, or as garden plots. The medieval pottery included late-twelfth- to early-thirteenth-century coarse-tempered fabrics, and late-thirteenth- to fourteenth-century sand-tempered fabrics, some with splashes of glaze (Dove 1985). cursory examination of the animal bone assemblage indicated that it was generally typical of that recovered from Church Street (P. Stevens 1978; pers. comm.). Animal bones from layers 51 and 52 included 30 identifiable fragments including cattle (8), sheep/goat (14), pig (6), and dog (1) (Stevens 2006).

#### ARTEFACT DISTRIBUTION

The intact 'floodplain' deposits at the toe of the lynchet (layer 5c, c. 40–50 m) contained a mass of medieval pottery, plus one sherd of Saxon pottery at its base (Fig. 20) and a few early medieval sherds on its upper surface (archive); the upper profiles and the entire sequence between c. 50 m and 63 m had been removed by later interventions. A few sherds of Iron Age pottery were present and a large number of flints, presumably eroded from the colluvium containing the Iron Age settlement below the lynchet. Further down the 'floodplain', a small patch of 'floodplain' deposits survived at around 65 m (Fig. 23) and these too contained medieval sherds, but with a relatively high number of Iron Age sherds and struck flint was intermixed with them. The residual Iron Age sherds and high numbers of struck flints in both these deposits might represent disturbed prehistoric colluvial deposits that had subsequently been heavily disturbed by medieval 'garden' or 'urban' soils. The abundance of medieval artefacts is not surprising in view of the excavation's location in the centre of Old Town and the proximity of the medieval church.

#### SNAILS

A second column of nine samples was taken through deposits on the 'floodplain'. The resulting assemblages (Table 10, Fig. 21), like the deposits themselves, are reminiscent of those from the

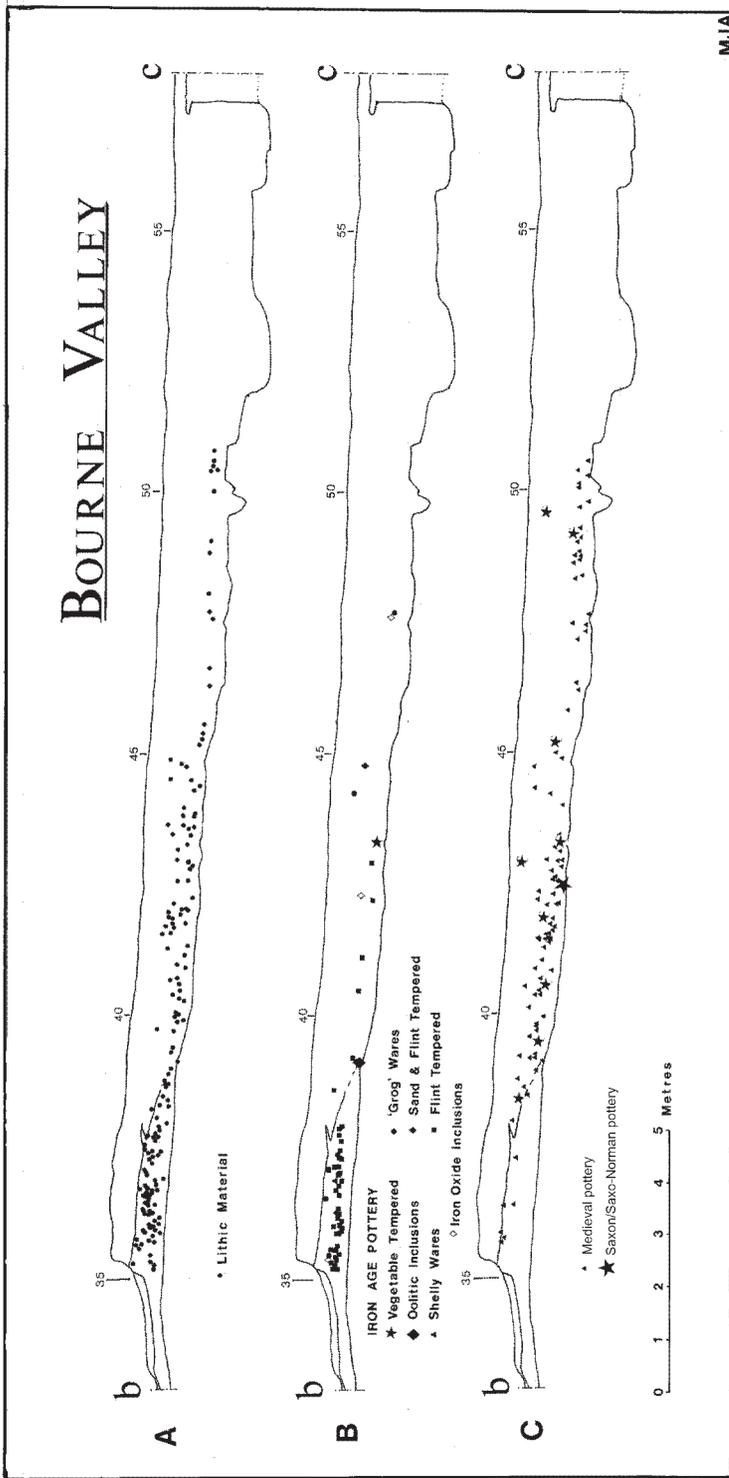


Fig. 20. Distribution of artefacts in the 'floodplain' deposits at 35-66 m.

Table 10. Mollusc from the floodplain deposits (35–66 m and the 'stream').

Location	floodplain deposits, column 3 @ 63.55 m									column 4 @ 74.38		
	7	52	52	52	51	51	51	51	51	83	81	83
Layer	12	13	14	15	16	17	18	19	20	21	22	23
Sample	189-194	180-189	170-180	162-170	155-162	145-155	130-145	115-130	105-115	149-156	126-149	115-126
Depth (cm)	657	500	1000	1000	900	1000	1000	1000	1000	1000	1000	475
Wt (g)	657	500	1000	1000	900	1000	1000	1000	1000	1000	1000	475
<b>MOLLUSCA</b>												
<i>Pomatias elegans</i> (Müller)	-	-	+	+	-	1	1	1	3	-	-	-
<i>Carychium tridentatum</i> (Risso)	-	-	2	3	3	2	-	-	-	-	-	-
<i>Oxyolma pfefferi</i> (Rossmässler)	-	1	3	-	-	2	1	1	-	-	-	-
<i>Cochlicopa lubrica</i> (Müller)	-	1	2	2	2	1	-	-	-	-	-	-
<i>Cochlicopa</i> spp.	-	2	4	5	2	3	-	+	-	-	+	-
<i>Pupilla muscorum</i> (Linnaeus)	3	12	5	6	3	1	1		-	-	-	-
<i>Vallonia costata</i> (Müller)	2	20	25	28	12	9	5	5	6	2	2	1
<i>Vallonia excentrica/pulchella</i>	-	-	-	-	-	-	-	-	-	-	1	-
<i>Vallonia excentrica</i> Sterki	2	14	13	9	11	5	8	6	5	3	-	2
<i>Punctum pygmaeum</i> Draparnaud	-	-	-	2	4	1	1	-	-	-	-	-
<i>Discus rotundatus</i> (Müller)	-	-	2	+	-	2	5	1	2	-	-	-
<i>Aegopinella nitidula</i> (Draparnaud)	-	-	2	-	-	2	3	2	3	3	-	1
<i>Oxychilus cellarius</i> (Müller)	-	-	-	-	1	2	1	2	1	-	-	-
Limacidae	-	-	1	2	2	4	4	4	7	6	4	2
<i>Eucomulus fulvus</i> (Müller)	-	-	-	-	-	-	-	-	-	-	-	1
<i>Cecilioides acicula</i> (Müller)	8	27	42	69	87	52	18	12	12	11	4	2
<i>Clausilia bidentata</i> (Ström)	-	-	+	-	2	3	+	4	3	-	-	1
<i>Candidula intersecta</i> (Poirer)	-	-	-	-	-	2	+	2	1	-	-	-
<i>Candidula gigaxii</i> (L. Pfeiffer)	-	-	-	-	-	-	2	3	3	-	-	2
<i>Cerneuilla virgata</i> (da Costa)	-	-	2	-	-	-	-	-	-	-	-	-
<i>Helicella itala</i> (Linnaeus)	-	2	2	2	2	+	1	+	-	2	-	-
<i>Trichia striolata</i> (C. Pfeiffer)	-	-	3	3	4	7	11	6	12	-	-	-
<i>Trichia hispida</i> (Linnaeus)	2	26	26	27	29	28	17	11	10	12	2	15
<i>Cepaea hortensis</i> (Müller)	-	-	-	-	-	-	-	-	-	-	1	-
<i>Cepaea</i> spp.	1	1	2	-	2	+	-	-	-	-	-	1
<i>Helix aspersa</i> (Müller)	-	-	+	1	-	1	+	1	+	-	-	+
Taxa	5	8	14	11	13	17	14	14	12	6	5	9
TOTALS	10	79	94	90	79	80	61	49	56	28	10	26
<b>MARINE MOLLUSCA</b>												
<i>Mytilus edulis</i>	+	+	+	+	+	+	+	-	+	+	4	+
<i>Patella vulgata</i>	+	+	+	+	1	+	-	-	+	+	7	+
<i>Oystrea edulis</i>	-	-	+	-	-	-	-	-	-	-	+	-
<i>Littorina</i> spp.	-	-	-	-	-	-	-	-	-	-	4	-
<i>Cardium</i>	-	-	-	-	-	-	-	-	-	-	+	-

prehistoric colluvium. They can be divided into two mollusc biozones that broadly correspond to the stratigraphy. The zones, although numbered 4 and 5, are not necessarily directly chronologically successive to those of the prehistoric lynchet described above. A single sample from the periglacial deposits (layer 7) contained only a few shells, but the assemblage is comparable to that analysed beneath the prehistoric lynchet discussed above. Assemblages from the lower deposits

(layer 52 and part of 51; mollusc biozone 4) are dominated by *T. hispida* and *V. costata*. Although dominated by open-country species with *T. hispida* there is a range of shade-loving taxa including *C. tridentatum*, *D. rotundatus*, *Clausilia bidentata* and Zonitids indicating some local more mesic and shady conditions — probably long grassland developed on colluvial deposits. *Helix aspersa* is present in this biozone, and moderate numbers were recorded from bulk samples of these deposits

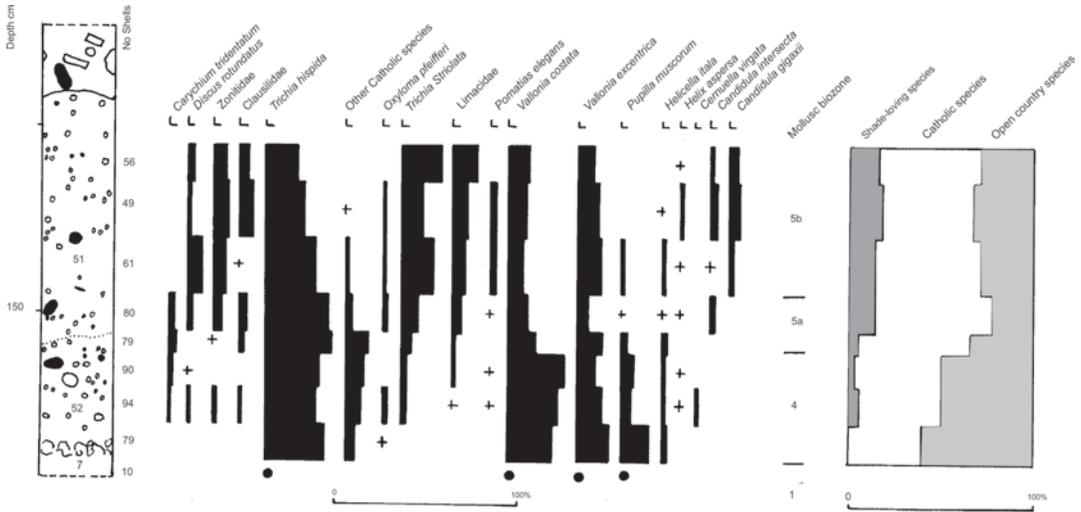


Fig. 21. Snail histogram through the medieval 'floodplain' deposits at 63.55 m.

indicating a Roman or later date. Mollusc biozone 5 (layer 51) shows a decrease in *V. costata* and increase in *V. excentrica*, and similar decrease in *T. hispida*, but increase in *T. striolata*. Additionally, there is a moderate increase in the suite of shade-loving species. These subtle changes are significant. In particular in the Roman and medieval periods *T. striolata* becomes particularly synanthropic enjoying almost exclusively man-made habitats such as gardens, waste ground and hedgerows (Evans 1972, 176–7, 201), and is often in general rubbish, nettles and tall grasses (Kerney 1999, 195). This habitat is consistent with the rest of the assemblage, indicating open land with patches of long unkempt vegetation. The introduced Helicellids, *Cernuella virgata*, *Candidula intersepta* and *C. gigaxii*, all occur in this deposit and confirm a medieval or later date.

Although these assemblages have similarities with those from the prehistoric lynchet (Fig. 18), of particular note is the exclusivity of *Monacha cartusiana* which is present throughout the lynchet deposits but does not occur in this sequence or in any other samples. Whether this is an ecological or temporal division, or a combination of both is not certain. *T. striolata* on the other hand only occurs at the top of the prehistoric lynchet, predominantly in post-Roman deposits, and is present throughout the 'floodplain' sequence discussed here; this is both an ecological and a temporal separation. More surprising is the complete lack of any aquatic species

that one might have expected to find as a result of over-bank flooding, or of any species typical of damp ground pertaining to a seasonally wet 'floodplain'. None were present in any of the bulk samples of the 'floodplain' deposits, nor in samples of medieval and post-medieval features. The assemblages are wholly ones of dry terrestrial habitats. Although *M. cartusiana* is not recorded in the prehistoric and medieval deposits on the 'floodplain', *M. cantiana* and *Oxychilus allarius* are present in post-medieval features on the 'floodplain'.

#### MARINE SHELL (identifications by David Adams)

Apart from individual shells recovered during excavation<sup>2</sup>, two buckets (about 25 litres) of sediment from layer 51 (medieval 'floodplain' deposit) were wet-sieved. This produced an array of marine shell fragments (Table 11) predominantly of mussel and limpet but also including winkle, oyster and cockle. Despite the fact that fragments were common, few numbers could be calculated. Nevertheless, all the species recorded are typical edible shellfish commonly found on medieval sites in Eastbourne (P. Stevens 1987). The fragmentary nature of the shells is consistent with their being present in a reworked 'garden' soil. Marine shells from the post-medieval deposits included all of the above, but also scallops (*Pecten maximus*), variegated scallop (*Chlamys* spp.), piddocks (*Barnea* spp.), and tusk shell (*Dentalium* sp.). Dumps of post-medieval limpet were so numerous that one dump comprised

Table 11. Marine molluscs from the floodplain deposits and 'stream'.

location	Medieval 'alluvium'						Medieval 'stream'			
	60–70 m		80–90 m				70–80 m			
	51	52	88	88	88	88	81	81	81	83
depth (cm)	130–150	190+	100+	110–120	bottom		120–125	125–145	130–145	bottom
volume	2						2	8		
<b>MARINE</b>										
<i>Littorina littorea</i> (periwinkle)	+	-	1	-	+	-	51	90	1	-
<i>Ostrea edulis</i> (oyster)	+	+	+	+	-	+	7	3	+	+
<i>Patella vulgata</i> (limpet)	1	+	+	+	1	+	101	137	+	+
<i>Mytilus edulis</i> (mussel)	+	+	-	+	+	+	7	9	+	+
<i>Buccinum undatum</i> (whelk)	-	-	-	+	-	-	8	1	-	-
<i>Nucella lapillus</i> (dog whelk)	-	-	-	-	-	-	3	+	+	-
<i>Cerastoderma edule</i> (cockle)	+	-	-	+	-	-	+	+	-	+
<i>Chlamys</i> sp. (scallop)	-	-	-	-	-	-	-	+	-	-
<i>Pholas dactylus</i> (piddock)	-	-	-	-	-	-	-	+	-	-

939 shells and full measurements (height, length, width) were recorded on 495 (see archive).

#### CHARRED PLANT REMAINS AND CHARCOAL

(identifications by Joy Ede and Chris J. Stevens) ■■

Once again, the small land-snail samples produced a surprising number of charred cereal grains from the deposit, as opposed to those produced by the archaeological features (Table 8 ■■). Ten cereal grains were recovered from the three 1 kg samples of the upper sampled deposit on the 'floodplain' (layer 51). All were wheat (*Triticum* sp.) with one wheat/barley (*Triticum/Hordeum* sp.) and one barley (*Hordeum* sp.). It is notable that most grains of wheat appear to be free-threshing wheat (*Triticum aestivum* sl.) and in one case *Triticum aestivum* subsp. *compactum* which are typical of Saxon and medieval periods. The medieval grains again suggest that domestic detritus and waste were being deposited in this area. A number of small charcoal fragments (<2 mm) were recovered. Most were unidentifiable but one fragment of *Ilex/Prunus* sp. was identified.

#### POST-MEDIEVAL ACTIVITY

The 'floodplain' continued to be used and some of the earliest post-medieval activity is the construction of a rough Greensand floor or courtyard at 46.2–48.5 m, with some shallow features and a re-cut post-hole beneath it (Fig. 19). Only a portion 0.5 m wide was exposed and it is difficult to make any further interpretative comment. No artefacts were clearly associated with it to date it, but from its position within the

sediments (see Figs 19 upper & 23) the activity occurred in deposits forming after the medieval 'floodplain' deposits.

The burial of a small greyhound-sized dog was also recovered in these deposits (Allen 1983, pl. 8), though as no cut for this burial was located, it is possible that this could be much later. The last major phase of activity included the landscaping and construction of the Star Brewery itself in c. 1777 (Stevens 1980b), the cutting of several cellars and Victorian pits and the building of terraced houses in Spring Terrace and their gardens in about 1880–1890 (L. Stevens pers. comm.).

#### SUMMARY

It is clear that prehistoric soil or colluvium existed in the 'floodplain', but significant colluviation here ceased after the establishment of the Iron Age lynchet, and the thoroughfare of the High Street. Its presence suggests that prehistoric fields may have stretched to the edge of the Bourne stream, but the deposits have been severely mixed and turned over, and extensively reworked as by medieval ploughing, or in garden soils. These deposits, however, were rarely subjected to flooding and incorporation of waterborne material, but survived as an open, dry common land. This incorporated slightly higher humic content but also large numbers of pottery fragments and other artefacts derived from occupation known to have centred around the church. They are in essence man-made or urban medieval soils on the Bourne valley 'floodplain'. The implications of this for medieval Eastbourne are discussed below.

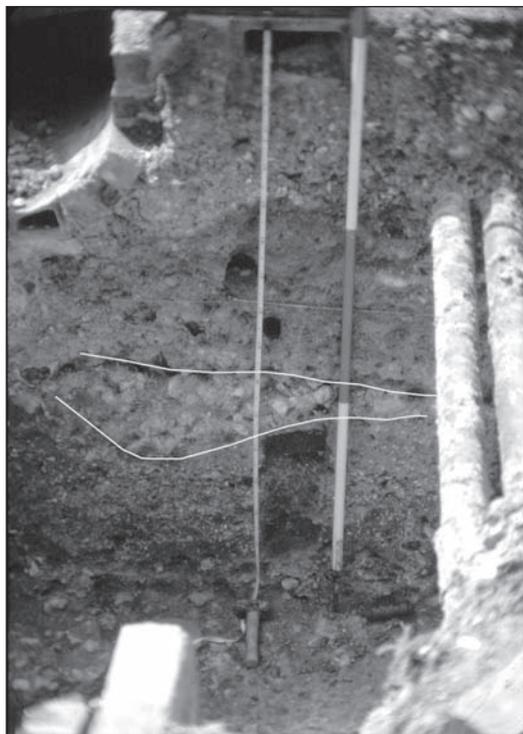


Fig. 22. Valley floor deposits showing the eighteenth-century culvert (top left) and the ditch or stream deposits, layer 81 (outlined).

### THE VALLEY CENTRE (70–85 m) 📖 ■

To the south of Star Road the valley profile clearly shows a broad, 14 m wide lower valley area or palaeochannel with shallow but clear edges at c. 62 m and 76 m sculpted out of the periglacial marl (Fig. 19 lower). On the northern edge of this channel the weathered upper portion of the periglacial marl was embedded with a large number of stained medium flint nodules, possibly the base of a Pleistocene river, and was itself heavily stained with iron mottling, in places as dark as dark reddish brown (2.5YR 3/4). Below this the periglacial marl was flint-free with considerable iron staining produced by percolating ground water. Mottles were yellowish-red (5YR 4/8) and also dark grey (5YR 4/1), the latter possibly manganese. Obviously this indicates a considerable volume of percolating water from the bed of the Bourne stream. This palaeochannel may mark the location of the prehistoric Bourne stream which

flowed as a smaller channel, its meandering and change of course over time creating the full width of the feature. There are no prehistoric (Iron Age sediments) and the nature of the prehistoric Bourne stream is discussed later.

The former courses of the later Bourne stream have been heavily dissected by culverts and service pipes associated with the former Star Road (Figs 9 & 19 lower), nevertheless, a small channel or ditch within the ‘alluvial’ deposit survived disturbance by post-medieval intrusions at c. 73–75 m. Beneath the nineteenth-century brick culvert, cement and dumped gravelly soil, were intact deposits. The ‘alluvial’ silty loam containing many small chalk pieces (layer 83) was greyish brown (10YR 5/2 with a subangular blocky structure. It displayed evidence of gleying with staining (possibly iron) on ped faces giving mottles of light yellowish brown (2.5Y 6/4). This is reminiscent of colluvium, and it was sealed by a ‘midden’ of shells. The shelly deposit (layer 81) was in a broad V-shaped feature 1.30 m across, slighted on its southern edge and 290 mm deep (Figs 19 & 22). The channel was cut into and sealed by the ‘alluvium’, and the shelly fill was a light brownish grey (2.5Y 6/2) silty to sandy loam with a large proportion of sand (49% when analysed by sieving and hydrometer), with medium flint nodules, chalk lumps, pebbles, fire-cracked flints and many small chalk pieces and marine shells including mussel, limpet and winkles as well as animal bone and pottery. It had significantly higher humic content; a 150% increase over the ‘alluvium’. A yellowish-red (5Y 5/8) iron staining and mottling was present throughout the shelly fill. This looks like medieval rubbish dumped in the ditch or channel on the valley floor dug to contain or direct the flow of the Bourne.

### ARTEFACT DISTRIBUTIONS

The lower portion of the ‘alluvium’ under the Bourne stream midden deposit, like the ‘floodplain’ deposit (layer 51), contained Iron Age sherds and flints, but also two relatively large and moderately fresh Late Saxon/early medieval sherds (identified by J. Dove), as well as a few medieval sherds (Fig. 23). The midden deposit in the ditch (layer 81) again contained a number of Iron Age sherds and flints, but also a discrete concentration of Late Saxon/early medieval and medieval sherds. It can be suggested that these artefact-rich layers are re-worked prehistoric colluvium and deposits eroded and deposited from the Late Saxon/early medieval



period and considerably disturbed by subsequent medieval activity.

#### NON-MARINE MOLLUSCA

A series of three samples were taken from the 'channel' deposits (layer 81) and from the deposits which it cut and which sealed it (layer 83) at 74.38 m (Table 10). As indicated by cursory examination of the processed samples (Allen 1983, 65), few non-marine shells were present. Nevertheless, snails were present in all three samples. What is significant about these assemblages, however, is that they are near the centre of the valley, and from a channel or ditch deposit, yet no aquatic or slum species are present. The assemblages are wholly terrestrial and the only indication of any slightly wetter conditions is one possible shell of *Vallonia pulchella*; a species that is found in wetter places than *V. excentrica* and *V. costata*, and can be found in marshes. The terrestrial assemblage is depauperate, mixed and not dissimilar from those from the deposits on the 'floodplain' (see above). They indicate generally open conditions dominated by *T. hispida* with a number of other catholic species (Table 10) which suggests grassy vegetated habitats. Interestingly, unlike the deposits on the 'floodplain' at 63.55 m, there is no *Trichia striolata* in these poor assemblages. This may be a product of low shell numbers, but could indicate temporal differences between this and the deposits sampled on the 'floodplain' to the north.

We may conclude from this that either no aquatic or amphibious mollusc fauna survived in this feature, and indeed, on the 'floodplain' at the sampled location, or that the feature did not contain water and support wet habitats. This would certainly explain the presence of a dry 'floodplain' and the lack of aquatic and amphibious species in the deposit on the 'floodplain' here and sampled at 63.55 m (discussed above). It does, however, question the status and condition of the medieval Bourne at this location. It seems likely that this existed as a well-defined and contained, small channel which rarely flooded. Chalk streams tend to have clean, often silt-free, flat gravel bottoms, but not 'V'-shaped as recorded in the excavation.

#### MARINE MOLLUSCA (identifications by D. Adams)

Marine shells included *Mytilus edulis*, *Ostrea edulis*, *Patella vulgata*, *Littorina littorea*, *Pholas dactylus*, *Cerastoderma edule*, *Nucella lapillus* and *Buccinum undatum*. These were recovered from three samples

of about 150 litres of sieved sediment (Table 11). This is a greater range of species than from elsewhere, and the quantities and species present are not a result of manuring: they were clearly discarded and dumped into the channel. The shells include a range of species; mussel, oyster, winkle, limpet, cockle and whelk that are common shellfish food; they are all intertidal species and are easily collected throughout the year on foot. Several species present (piddock, dog whelk and netted dog whelk) that are inedible are more unusual. Limpets and many of these common shellfish have been recovered from a medieval farm site on Bullock Down (Drewett 1982, 181–2), and although limpet pie is a traditional Sussex dish, limpets are reputed, with other shellfish, to have been fed to pigs. The range of shellfish suggest more than one source; they include species of rocky shores (limpets, winkles and mussels), those of the barnacle zone (dog winkle), lower shore (piddocks) and estuarine or shallow sea (oyster). This assemblage is not purely the dumped waste from human consumption, and in view of the numbers it seems all to have been deliberately collected. A number of species are recorded in medieval contexts in Eastbourne (P. Stevens 1987), and these are predominantly species collected from the foreshore (mussels, limpets, winkles etc) with few which might be collected from deeper, albeit, inshore water (oyster). Although edible shore-collectable species were targeted (cf. Meehan 1983), a few inedible or smaller species such as the piddocks (*Pholas dactylus*) may suggest that these had been caught up in collection, and that the dumped assemblage had not been filtered or separated into edible and non-edible shellfish but may merely have been cleaned and prepared (Ford 1989). It is not certain if this is the waste of human consumption or collection for animal feed.

#### LATE SAXON/EARLY MEDIEVAL POTTERY

by Ben Jervis

A small assemblage of 44 sherds (490 g) was examined. The sherds were widely distributed through the valley section, but nearly 40% of the assemblage, most of the larger sherds and all but one of the measurable rims (Table 13), were concentrated in 'ditch' 81 and associated layers. By analogy with other sites in the area a broad date-range of the ninth to late eleventh century can be suggested.

Nine fabrics were identified by microscopic analysis of hand specimens. Full fabric descriptions are given in the ADS supplement. All of the fabrics are coarsewares and are generally tempered in varying proportions with flint, limestone/chalk, shell, quartz or iron stone/hematite. These inclusions indicate a local source for all of the pottery. The fabrics are illustrative of several local geological sources, suggestive of manufacture and supply of pottery from the surrounding areas. They show influences from the west with fabric F (7 sherds) showing similarity with the main coarseware fabrics from Bishopstone (Jervis forthcoming). Other fabrics, with their shell temper and iron-rich and iron-stained inclusions, are suggestive of eastern and Wealden sources, demonstrating similarities for example with fabrics from Phoenix Brewery, Hastings (Vahey 1991, 6) and Battle Abbey (Streeten 1985, 105).

The majority of the assemblage consists of undiagnostic body sherds, however, seven rim sherds are present in various fabrics. There are three rim sherds in fabric A, representing at least two vessels, all from 'ditch' fill 81. These are the everted form typical of late Saxon jars from this area, which are present across Sussex, for example, at Botolphs (Gardiner 1990, 252) and Bishopstone (Jervis forthcoming). They are notably different from the inverted forms known from the early Saxon period, for example from Rookery Hill (Bell 1977, 228). Slightly squarer, handmade everted rim forms are present in fabrics D and F, and these are common across Sussex. Two further rims appear wheel-finished, probably on a tournette (turntable or slow wheel), judging from the coarse and abrasive nature of the fabrics. These rims are in fabrics A2 (also from 'ditch' fill 81) and F2. The A2 example is seemingly a natural successor to the handmade everted rim form. The F2 example (from the lynchet) is different. The rim is rolled over to form a rounded flange on the exterior. This rim is not a common type in Sussex in this period, but is not unknown. The sherds are generally roughly finished with inclusions often visible on the exterior surface. Some exhibit wiping, but there is no particular correspondence between this practice and particular fabrics. Firing is generally patchy with colours ranging from black through various shades of grey, brown and orange.

Although small the assemblage can provide some further insight into pottery in Sussex in this period. It seems that Hodges's (1980, 99)

suggestion of localized manufacture and markets can still be deemed accurate. The absence of a large proportion of material from east of the River Cuckmere supports the opinion that these localised areas were bounded by natural features such as the South Downs and rivers (Jervis 2005). As with the material from Bishopstone and Botolphs, the use of the tournette is visible through the rim forms, demonstrating the adoption of this technology, but a continuity in the essential design elements. The iron-rich fabrics support a growing picture of pottery production in the Wealden area, with similar material evident from Hastings and, to some extent, Pevensey (Lyne unpub.) and the presence of some material probably from sources in the Weald present on sites as widespread as Bishopstone and Sandtun (Cross *et al.* 2001, 212).

#### **ANIMAL BONE** by Patricia Stevens

Animal bones recovered by three-dimensional recording were general highly fragmentary, however, better assemblages of bone were recovered from bulk samples of key deposits which were water-sieved on a 2 mm mesh. The bone fragments identified were in the main very small fragments from animals, but also included fish. A relatively large assemblage of 157 identifiable bone fragments were recovered from the ?medieval 'stream' or ditch (layer 81) and included cattle (39), pig (11), sheep/goat (101), dog (5), rabbit (1) and fish (11), one vertebra of which was probably cod. Otherwise, bones were scarce in sampled layers 83 and 88 (Stevens 2006). Very few of the bone fragments may be attributed to food waste. In general there were no signs of butchery and no evidence of gnawing to suggest that they had been left lying around for scavengers. Most of the identified fragments seem to have come from general butchery waste — the remnants of lower leg bones together with numerous teeth, long boneshaft fragments and ribs, but the greatest number of fragments — some 600 were unidentifiable.

Although initially little could be said about the assemblages, a small sample of the sheep bones were compared with reference material at the Extra-Mural Department of London University where the sheep here were found to be relatively slightly larger than the Soay sheep. The excavation trench, running as it did through the site of the 'new' slaughterhouse built in 1781 (Stevens 1980b) might suggest that these fragments came from the slaughterhouse itself. This is, however, unlikely as

the waste materials would almost certainly have been rapidly removed from site, and most of the bone reported here predates that slaughterhouse. It might, however, suggest a medieval or early post-medieval predecessor.

#### SUMMARY

Once again, prehistoric evidence, albeit extensively mixed and disturbed, is present.

The bed of the prehistoric stream is represented by the worn flint cobbles overlying the periglacial deposits, with the northern river's edge lying under Star Road (Fig. 19 lower). As with most chalk streams these do not accumulate sediments, but remain clear chalk- and gravel-bottomed. Flooding, when it does occur, dampened local soils but carried very little sediment, and by analogy with modern chalk streams in Wiltshire (e.g. the Chitterne Brook and Wylve at Codford), the 'floodplains' are dry and contain no marsh-loving or aquatic molluscs.

This study is of wider interest in terms of the history of streams emerging from the chalk. This is a topic little investigated, but one which is of significance in terms of the archaeology and history of chalk landscapes. There have been suggestions that bourne streams have been responsible for the removal of valley-floor colluvial sediments (e.g. Chalton, Hampshire, Bell 1983). Elsewhere there is evidence for significantly greater or lesser discharge from chalk streams in prehistory (Evans *et al.* 1993; Bell *et al.* forthcoming), and this study confirms this change. Indeed, the stream has the name 'Bourne' which normally implies a seasonal or episodic stream, but the fact that it fed Saxon and medieval mill ponds only about 0.5 km downstream from Motcombe Garden, suggests a far steadier and stronger flow than near the headwaters of typical bournes. The stream may have been more productive before Victorian pumping of the chalk aquifer, but in contrast, there is no certain evidence that it even flowed in prehistory. The evidence here strongly suggests that colluvial rather than alluvial processes predominated, and that on the 'floodplain' and the valley centre freshwater molluscs are totally lacking.

The midden filled feature may be a former canalized and contained course of the late Saxon and medieval stream, although it seems rather small. Certainly by the Saxon and early medieval period it fed watermills on its course. The remains and rubbish dumped in it (discussed below) suggest that this ditch or channel was not used

for carrying permanent water by the end of the medieval period. By the Saxon and medieval period it is likely that the stream from Motcombe Park to this, the Star Brewery site, was formalised, if not largely canalized, although on the Tithe map (c. 1838) an open and quite wide stretch of standing water is shown along the northern side of Star Road (Fig. 26). Presumably it was culverted between Motcombe and this point, and east of Spring Terrace at this time. Some 50 or more years ago there was a channel with flowing water within the garden wall of the most northerly house in Spring Terrace. In fact that still existed where the pool of water ('puddledock') is shown on the Tithe map (Stevens pers. comm.; Fig. 26).

## DISCUSSION

### COMMENT ON THE ANALYTICAL APPROACH AND ARCHAEOMAGNETIC DATING

Most colluvial deposits excavated in dry valleys and lynchets have been dated by the distribution of datable artefacts (cf. Bell 1983; Allen 2005b). Occasionally, detailed statistical analysis has been applied to these distributions (L. Allen 1982; M. Allen 1982), but all of these artefacts are extrinsic elements that have become incorporated into the sediments before their erosion and arrival at the place of excavation and study. The application of dating by palaeomagnetic secular variation of deposition remnant magnetism attempts to date the intrinsic elements and thus the date of sediment deposition. This was undertaken at the Bourne valley in the hope to test the hypothesis that the dates of the sediment deposition would coincide with that of the artefacts within the deposits. The results of archaeomagnetic dating show that no individual sample gives a clear unambiguous result. However, when unstable samples are removed, those that remain do seem to follow a trend which can be broadly matched with the general archaeomagnetic curve from c. 250–300 BC and continuing until at least c. AD 300. If this is correct then it has two significant implications. Firstly that archaeomagnetic, or depositional remnant magnetism, may possibly be used to date the deposition of other colluvial sequences, and secondly, that for the domains to have become oriented, it requires them to have been lubricated when transported and deposited, indicating that this erosion and the resultant sediment was due to run-off in storm events (see Allen 1992; 2005a; Bell 1992; Boardman 1992).

### SEDIMENT CATCHMENT ANALYSIS ■

In order to understand something of the significance of the artefact distributions (Figs 16, 20 & 23), it is necessary to understand the origin of both the sediments and the artefacts contained within them, and the known archaeological sites within the potential sediment catchment areas (see Figs 5–8 ■). Two major sources of deposit have been sampled; the colluvial deposits which form an alluvial edge lynchet (cf. Bell 1981a, 79 & fig 5.1), and ‘floodplain’ deposits. These each have very different depositional histories and catchments. The colluvium is largely derived from land immediately upslope, and has a simple local catchment area. Although alluvium has a potentially much larger catchment area, the deposits on the ‘floodplain’ are largely colluvial and have subsequently developed *in situ*. There is little evidence of alluvial sedimentation let alone the fluvial transport of artefacts. Thus, by examining the potential colluvial catchment zone in relation to the known archaeological sites in that area ( ADS section 1; Allen 1983; Stevens 1980c), we can come to some better conclusions of the origin and significance of the data and artefacts collected. What is clear is that there are no known Iron Age sites within the immediate area, nor within the colluvial catchment zone, and few even within the alluvial catchment zone. The presence of large quantities of Iron Age pottery from the excavation therefore suggests the presence of Iron Age activity in the immediate vicinity, and raises the significance of the zone of pottery on the buried soil nestling at the foot of the alluvial-edge lynchet.

### IRON AGE FIELD SYSTEMS, THE ‘FLOODPLAIN’ AND BOURNE STREAM

The inception of the lynchet seems to have been in the Iron Age, possibly Early Iron Age, but has less clearly defined zones in the artefact distributions than, for instance, that at Bishopstone (Bell 1977, figs 108–9; L. Allen 1982). The field it bounded continued in use through the Iron Age (the majority of pottery belongs to this period) and into the Roman and early medieval periods as indicated by; the pottery distributions (Fig. 16c), the tentative archaeomagnetic dating evidence, and the land-snail data. Later in its life it seems likely that the lynchet (field boundary) became hedged. The main colluvium (layer 5) is an unsorted calcareous hillwash typical of a sediment resulting from the erosion of highly calcareous

and relatively thin soils subjected to a prolonged period of arable agriculture. They indicate the erosion of thin chalky soils (typical and calcareous brown earths), and micromorphological evidence suggests that these were forming over chalk with some brickearths locally. Stony flint horizons were absent, as indeed are any large flints, and together with their highly calcareous character suggest that any Tertiary deposits or Clay-with-flint must have been largely absent. The accumulation was largely mud and chalky slurry washing from the field. Steady accumulation is indicated by the uniformity of the sequence. A greater concentration of medieval pottery at the back of the lynchet (Fig. 16c) indicates material accumulating at the edge of the field, but not over the lynchet. We could speculate that the boundary might even have been hedged at this point in time. Cultivation seems to have continued in the medieval period, without significant colluvial build-up resulting in deeper *in situ* mixing of the top of the lynchet. Colluviation and further lynchet formation would have been restricted or arrested by the construction of the thoroughfare (the High Street) in the early medieval period, but a strip of cultivable land only 40 m wide existed between the High Street and the excavation.

The thin and highly calcareous character of the soil may have required manuring, and evidence of that in the form of seaweed may be suggested by the presence of fragments of mussel, limpet, wrinkle and oyster in the deposits. Although they are all edible and this might be considered to be food waste, the presence in the snail-samples of brackish water shells of *Hydrobia* cf. *ulvea*, and marine shells of *Nassarius reticulatis* and *Gibbula* sp. (Tables 6 & 9) which are small, inedible and would not be collected in their own right, suggests manuring with seaweed (Thomas 1977; Bell 1981c). The fact that these fields lie at least 1.5 km (but 2 km along the course of the stream) from the sea suggests that seaweed may have been transported by animal up existing tracks (or even a forerunner of The High Street), or up the Bourne stream itself.

Evidently prehistoric field systems extended well beyond the higher downland, as previously indicated by the lynchet excavated in Gildredge Park by Lawrence Stevens (1987b). The lynchet on the Star Brewery site indicates that farming extended down to the edge of the Bourne ‘floodplain’, and by implication we can infer that

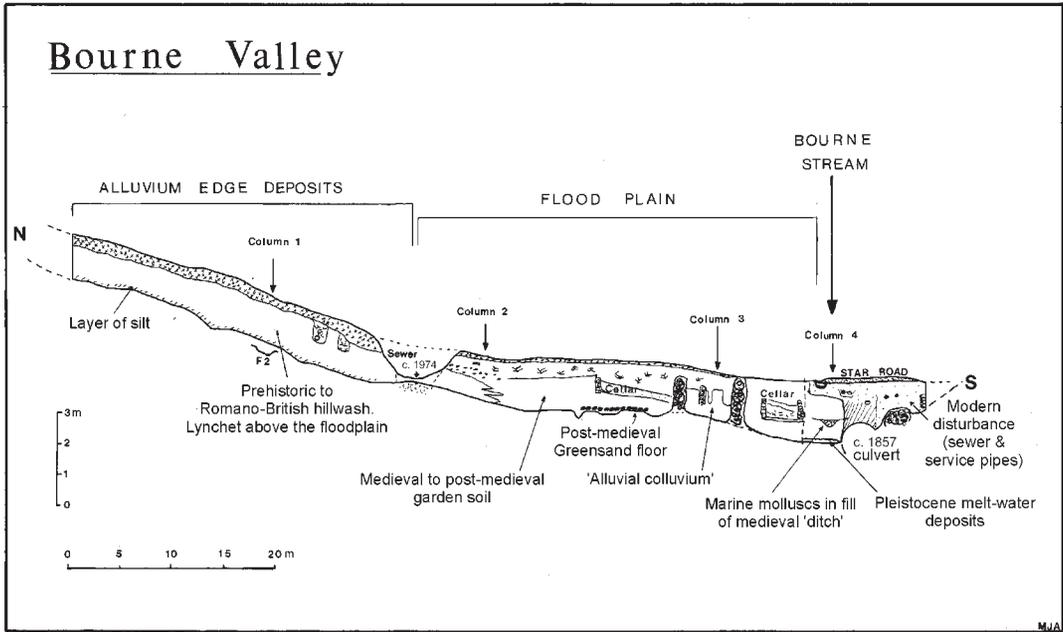


Fig. 24. Annotated sketch of the profile with exaggerated vertical scale.

much of its southern slope, at least, may have been tilled (Fig. 24). Evidence of this is lost elsewhere by urbanisation from the medieval period onwards. Tillage on the lower slopes of the Down within the Bourne valley complement the more extensive field systems on, for instance, Bullock Down, Willingdon Bottom etc. This is an important conclusion supported by recent work at the long man of Wilmington, and allows us to consider the use of the chalklands as whole-scale, not just the upper 'plains'.

The upper part of the valley side is clearly divided from the valley floor by the lynchet. Whether the 'floodplain' was cultivated downslope of the lynchet and the settlement is unclear, but some relict colluvium at this point seems to suggest that this was the case. It postdates the start of lynchet formation and the Iron Age settlement, and its colour may suggest that it was subject to high groundwater conditions. Interestingly, when the site flooded twice during exceptional storm events in 1980, it was precisely to the toe of the lynchet that the floodwater rose on both occasions.

For Eastbourne, rare and tentative evidence of the cultivation of wheat is indicated by charred cereal grains, and we can postulate that animals

penned in fields were watered in the Bourne close by. The fields here, therefore, had more to offer than those on the high Downs; better soils and access to water, so the presence of settlement is not surprising, but the lack of evidence of more settlement in this general topographic area perhaps is. The tentative evidence of a hedged field boundary is of interest as this is unusual, and may indicate a clear division between the 'floodplain' and the ploughed field. No deposits of the prehistoric Bourne stream survive, and it is likely that they never formed. Below the field systems, and the Iron Age settlement, the Bourne stream flowed as a clean chalk stream over the periglacial marl with a gravel bottom. Like many chalk streams, it had well-defined banks and rarely flooded, producing dry riverside edges.

#### IRON AGE SETTLEMENT AND SETTLEMENT PATTERNS

The style of excavation was not aimed at, nor conducive to, recording settlement evidence in the form of features. Nevertheless, the discrete lens and concentration of Iron Age pottery in a former soil below the lynchet is strongly indicative of an occupied and buried surface associated with

settlement. The proportions of pottery fabrics in this section generally mirror those distributed throughout the lynchet, but were generally larger than those in the main body of the lynchet. We can suggest the presence of a Middle to later Iron Age settlement nestling at the foot of the lynchet, and the back of the 'floodplain'. Certainly, the very high numbers of artefacts in the lynchet and the colluvium as a whole, in relation to other excavated sites, also confirms the proximity of a settlement.

The presence of domestic and settlement activity in the vicinity is indicated by the relatively large number of charred cereal grains from within the main colluvium of the lynchet. The presence, albeit of only 11 cereal grains, is from very small ( $\leq 1$  kg) samples, and is suggestive of cereal processing and domestic fires. Settlement sited on the back of the 'floodplain' is perhaps not the most usual location for Iron Age sites, but does provide an ideal opportunity for exploitation of the Bourne stream, for transport and communication up and down the Bourne valley, and for tilling the drier calcareous land on the slopes. Indeed, Iron Age activity in the vicinity has been also demonstrated by occasional sherds of worn Iron Age pottery from medieval features revealed in excavations on Church Street (Dove, in Stevens 1978, 17). Identifications of the animal bone during excavation by Patricia Stevens, indicated that the majority in the colluvial deposits was fragmentary and only identifiable as large (cow) or small (sheep/goat/pig) mammal.

Few Iron Age settlements are known within lowland Eastbourne and none in the immediate vicinity of the Bourne valley. The only other known sites are St Anne's Road on Ocklynge Ridge (Stevens 1987b) and Pocock's Field, which contained over 1000 sherds ( $>13$  kg) of Iron Age pottery (Reffell undated; L. Stevens pers. comm.). Settlement here would have had fields on the drier land immediately adjacent, with the valley itself providing a communication route and access both to the sea and the higher downland, and being situated between the wetland edge sites of Shinewater and those on the high down. Other sites such as the unlocated Early Iron Age kiln in Green Street (Budgen 1922a,b), pottery and quern stones on the east side of the Old Town Recreation Ground (Budgen & Gray 1933) and the Late Iron Age pits at St Anne's Road (Stevens 1987b) represent the first 'development' of Bourne. All of these

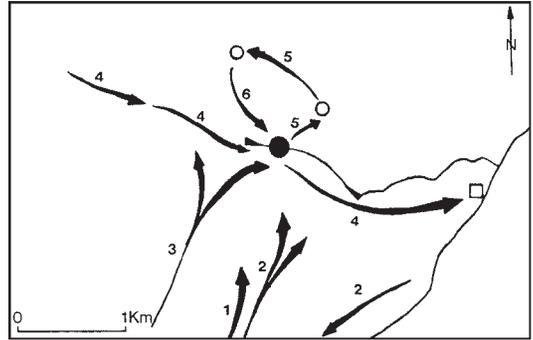


Fig. 25. Schematic diagram of possible population movements into and out of the Bourne Valley area: 1) c. 4000–2000 BC; 2) c. 600–500 BC; 3) c. 300–0 BC; 4) c. AD 1–450; 5) c. AD 450–850; 6) c. AD 1100–1850. (Model adapted from Drewett 1982, fig. 111 and Allen 1983, fig. 23.)

indicate the expansion of Iron Age settlement, farming and daily life on to the lower chalkland slopes encompassing the area of Old Town. We can expand Drewett's model of population movement for the Bullock Down Eastbourne area (Drewett 1982, fig. 111), by the addition of Iron Age settlement and farming off the high chalk Downs in the Bourne Valley (Fig. 25). This is coeval with renewed settlement activity on Bullock Down.

#### SAXON AND MEDIEVAL 'FLOODPLAIN' AND BOURNE (Michael J. Allen and Lawrence Stevens)

The presence of Late Saxon and early medieval pottery here is highly significant. No other archaeological evidence for Late Saxon and early medieval activity is present in Eastbourne, excepting that on the Ocklynge Ridge at the St. Anne's Road site (ECAT excavation). This is an absence made all the more surprising in view of evidence for Saxon occupation (Stevens, L. 1987c), Saxon reference to Bourne in the Anglo-Saxon charter (Barker 1949), and more specifically, the Rev. Walter Budgen considered the site of the mill mentioned as belonging to 'Borne' in the Domesday book to be a watermill located in the area ie, the Goffs (Budgen 1918; Stevens and Allen 2007, 3)). The assemblage of pottery here, therefore, attests to pre-Domesday settlement in the vicinity of the Bourne.

Analysis of both sediments and snails indicate that the 'floodplain' was dry, open, waste ground which was rarely, if ever flooded (Fig. 26). However, before the nature and use of the 'floodplain' can be discussed, it is necessary to consider the Saxon

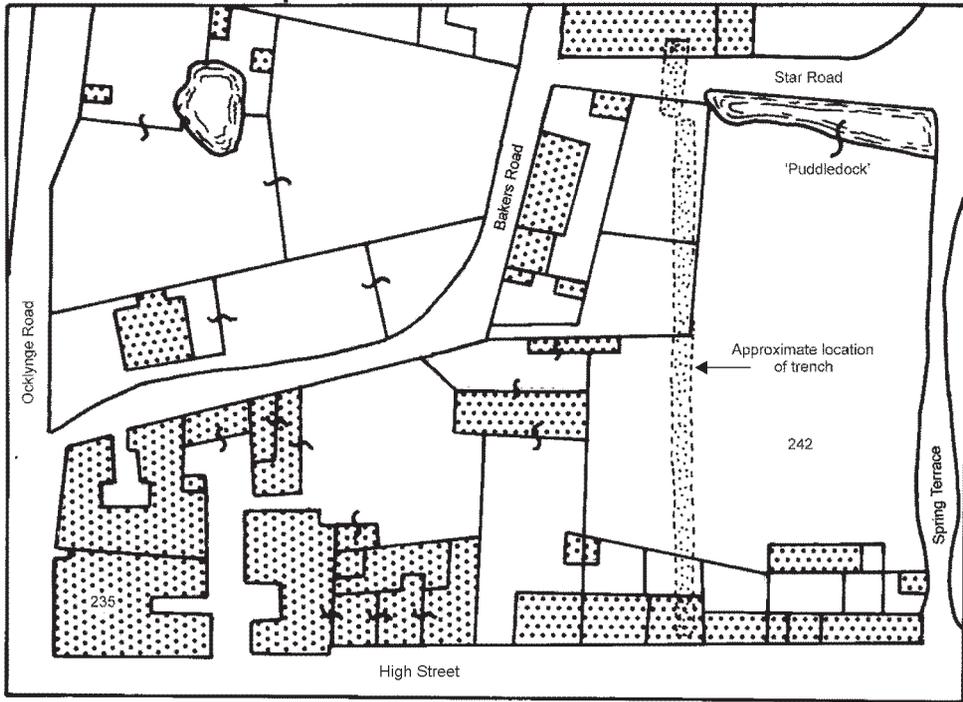


Fig. 26. Stylized numbered plan of the Bourne Valley site based on the Tithe Map (c. 1838) showing the pond of open water south of Star Road. Selected plots; 242 – orchard plot and slaughterhouse; 235 – Lamb Inn. (After Stevens 1980b, fig. 6.)

and medieval Bourne. The Bourne flows out of Motcombe pond, which once probably covered most of Motcombe Gardens (Spears 1975), and into the Star Brewery Site, and across Moatcroft Road (Fig. 1c) where there seems to have been an attempt to construct a moat (L. Stevens pers. comm.), presumably for Gildredge Manor House (33 The Goffs) opposite. Beyond this the Bourne flows into the mill pond for a watermill located north of The Goffs. Much of the course of the stream was managed and certainly culverted by at least the late nineteenth century. On William Figg's 1816 map of Bourne, the stream looks like an open channel with a wide 'pond' on the edge of the Star Brewery site, but by the time the Tithe Map was drawn up (c. 1838) the Bourne had been culverted along much of Star Road where it opened out into a muddy pool known as 'puddledock' (Spears 1975; Fig. 26). This wide 'pond' is mapped just short of the excavated trench yet no evidence of it, nor of any sediments associated with it, were recorded in the excavation.

We can surmise that the draught and flow of the Bourne was moderate in order to supply and

power the two Saxon and early medieval mills, and was presumably far bigger than the small channel excavated beneath the culvert at c. 75 m (Fig. 19, lower). In addition, the lack of aquatic, slum and amphibious snails anywhere in the sequences from the 'floodplain', or the 'channel', is surprising. Relatively fast flowing water may not have deposited shells in the bottom of the channel, but they would have been caught in the sediments and matrix within the midden, and moreover, the Bourne wherever it was located, unless well canalised and managed, would have flooded, if not annually, certainly on a decadal scale leaving both deposits (over bank flood alluvium) and snails. Although there may be evidence of an alluvial sediment input, this seems to be very minor and there is no evidence of the watery environment, or flooding, of the Bourne. The 'channel' is probably a ditch in which medieval debris was discarded, with the Bourne channel either further to the south, or obliterated by the later culverts and service pipes (Fig. 19, lower and 21).

So what of the use of this land in the Saxon and medieval periods? All the medieval farms are

located on the north side of the Bourne, that is on the south-facing slopes, and development was concentrated on the southern side such as around St Mary's Church, Church Street and Gildredge Manor. The 'floodplain' existed as an open area of waste or common ground bounded to the north by the ribbon of medieval development and to the west by the church and its accompanying buildings. The sediments contain little evidence of flood deposits, but are slightly organic, and well mixed, possibly having been reworked as garden or urban soils. Inclusions in manure and other debris might account for the relatively high number of medieval pottery sherds. This area might, therefore, have existed as common ground wherein to tether and water animals, to harvest garden produce, collect natural fruits such as blackberries or possibly hazelnuts. It is even possible that some of the area may have been set to orchard as it was recorded as such on the Tithe map of about 1838.

#### Acknowledgements

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invitation to undertake this excavation, and for guidance, support and advice and his help in many capacities, and to Pat Stevens for her continued support during the excavation and for expert comments on the scrappy bones. Thanks are due to the 93 people who helped in the field, especially Messrs. R. Scott<sup>1</sup>, A. Sayers<sup>2</sup>, A. Godfrey, M. Counihan, B. Holman, G. Holloway<sup>3</sup>, E. Mynett<sup>3</sup>, G. Turner and L. Allen, and to Mrs J. Neate<sup>3</sup>, B. Allen, J. Coillard and John and Phoebe Williams. The excavation would not have been possible without the invaluable services of Peggy Norman and Cecilia Stevens, finds supervisors. Thanks are also gratefully extended to Martin Bell for his advice and for taking samples. Sue Hamilton identified the prehistoric pottery and provided expert comments on the assemblages, John Dove and Lawrence Stevens commented on the local Iron Age and medieval pottery, Ben Jervis on the early medieval pottery and Dr David Adams identified the marine molluscs.

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#### Archive

The paper archive comprising field drawings, field notes, and laboratory analytical data have been compiled and deposited with Eastbourne Museum, who retain the finds. A copy of the sedimentological analysis (Allen 1983) is also available in the Sussex Archaeological Society library at Barbican House.

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#### NOTES

<sup>1</sup> All of the find co-ordinates, and codes defining the artefacts categories were transferred to a PDPI 11 computer at the Institute of Archaeology, London, in 1982 in preparation for analysis of distributions by least squares analysis (L. Allen 1982; M. Allen 1982). As all finds had been recorded from the ground surface, analysis was not possible without calculating depth from a single arbitrary baseline. Transferring all this data was considered too complex and time consuming, and the

hand plotted artefact distributions provide the basic chronological framework.

<sup>2</sup> The record of the Polycheate worm (spiral tube worm) *Spirobis spirobis* (Allen 1983, 43 & 65) identified on site by a then recent biology graduate was not confirmed by subsequent laboratory analysis. No Planorbids (e.g. *Anisus leucomstoma*) with which it might have been confused on site were present, and it is likely that this was a field mis-identification of the terrestrial snail *Vallonia* spp. which are very common throughout all the sampled deposits, and were even recorded from on site sieving.

## REFERENCES

- Allen, L.** 1982. A study of the chronological development of the Bishopstone lynchet by least-squares analysis of the distribution of datable artefacts, *Sussex Archaeological Collections* (hereafter SAC) **120**, 207–8.
- Allen, M. J.** 1982. The Concept of Least-squares Analysis in Archaeology. Unpubl. ms (copy in Barbican House library, Lewes).
- — 1983. Sediment Analysis and Archaeological Data as Evidence of the Palaeoenvironments of Early Eastbourne: the Bourne Valley Excavation. Unpubl. BSc dissertation, Institute of Archaeology, London University (copy in Barbican House library, Lewes).
- — 1986. Magnetic susceptibility as a potential palaeoenvironmental determinant, *Circaea* **4**, 18–20.
- — 1988. Archaeological and environmental aspects of colluviation in South-east England, in W. Groenmann-van Waateringe and M. Robinson (eds), *Man-Made Soils*. Oxford: British Archaeological Report **S410**, 69–92.
- — 1991. Analysing the landscape: a geographical approach to archaeological problems, in A. J. Schofield (ed.), *Interpreting Artefact Scatters: Contributions to Ploughzone Archaeology*. Oxford: Oxbow Monograph **4**, 39–57.
- — 1992. Products of erosion and the prehistoric land-use of the Wessex chalk, in M. G. Bell and J. Boardman (eds), *Past and Present Soil Erosion: Archaeological and Geographical Perspectives*. Oxford: Oxbow Books, 37–52.
- — 1995. The prehistoric land-use and human ecology of the Malling-Caburn Downs; two late Neolithic/Early Bronze Age sites beneath colluvium, SAC **133**, 19–43.
- — 2005a. Beaker occupation and development of the Downland landscape at Ashcombe Bottom, near Lewes, East Sussex. SAC **143**, 7–33.
- — 2005b. Beaker settlement and environment on the chalk downs of southern England, *Proceedings of the Prehistoric Society* (hereafter PPS) **71**, 219–45.
- Allen, M. J. & Macphail, R. I.** 1987. Micromorphology and magnetic susceptibility studies: their combined role in interpreting archaeological soils and sediments, in N. Federoff, L. M. Bresson & M. A. Courty (eds), *Soil Micromorphology*. Plaisir: AFES, 669–76.
- Avery, B. W. & Bascomb, C. L.** 1974. *Soil Survey Laboratory Methods*. Harpenden: Soil Survey Technical Monograph 6.
- Barker, E. E.** 1949. Sussex Anglo-Saxon Charters, SAC **88**, 92.
- Bell, M.** 1977. Excavations at Bishopstone, SAC **115**.
- — 1981a. Valley sediments and environmental change, in M. Jones & G. Dimbleby (eds), *The Environment of Man: the Iron Age to Anglo-Saxon Period*. Oxford: British Archaeological Reports, British Series **87**, 75–91.
- — 1981b. Valley Sediments as Evidence of Prehistoric Land-use: a Study based on Dry Valleys in South-east England. Unpubl. PhD thesis, London University, Institute of Archaeology.
- — 1981c. Seaweed as a prehistoric resource, in D. Brothwell & G. Dimbleby (eds), *Environmental Aspects of Coasts and Islands*. Oxford: British Archaeological Reports, International Series **94**, 117–26.
- — 1983. Valley sediments as evidence of prehistoric land-use on the South Downs, PPS **49**, 119–50.
- — 1992. The prehistory of soil erosion, in M. G. Bell & J. Boardman (eds), *Past and Present Soil Erosion: archaeological and geographical perspectives*. Oxford: Oxbow Books, 21–35.
- Bell, M., Allen, M. J., Smith, R. W. & Johnson, S.** forthcoming. Mollusc and sedimentary evidence for the environment of Hambledon Hill and its surroundings, in R. Mercer & F. Healy, *Hambledon Hill, Dorset, England. Excavation and Survey of a Neolithic Monument Complex and its Surrounding Landscape*, English Heritage Archaeol. Rep.
- Bell, M. G. & Boardman, J.** (eds) 1992. *Past and Present Soil Erosion: Archaeological and Geographical Perspectives*. Oxford: Oxbow Books.
- Boardman, J.** 1992. Current erosion on the South Downs: implications for the past, in M. G. Bell & J. Boardman (eds), *Past and Present Soil Erosion: Archaeological and Geographical Perspectives*. Oxford: Oxbow Books, 9–19.
- Briggs, D.** 1977. *Sediments*. London: Butterworth.
- Budgen, W.** 1918. The Bourne, *Eastbourne Chronicle*, 16 February 1918 and 23 February 1918.
- — 1922a. Hallstatt pottery from Eastbourne, *Antiquaries Journal* **11**, 354.
- — 1922b. Eastbourne — find of Hallstatt pottery, SAC **63**, 241.
- Budgen, W. & Gray, Lt Col. J. V.** 1933. Eastbourne, SAC **74**, 246.
- Clarke, A. F.** 1980. The Study of an Iron Age Lynchet, Bullock Down, Sussex. Unpubl. BSc dissertation, Institute of Archaeology, University of London.
- Cornwall, I. W.** 1958. *Soils for the Archaeologist*. London: Phoenix.
- Cross, R., Gardiner, M., Macpherson-Grant, N. & Riddler, I.**, 2001. Continental trade and non urban ports in Mid-Anglo-Saxon England: Excavations at Sandtun, West Hythe, Kent, *Archaeological Journal* (hereafter Arch. J.) **158**, 161–290.
- Digico Computers**, 1975. *Balanced Fluxgate Rock Magnetometer Handbook*. Stevenage: Digico Ltd.
- Dove, J. C.** 1985. Report on Three Pottery Groups from the Bourne Valley Excavations 1980. Unpubl. archive report, Eastbourne Natural History & Archaeological Society.
- Drewett, P.** 1982. *The Archaeology of Bullock Down, Eastbourne, East Sussex: the Development of a Landscape*. Lewes: Sussex Archaeological Society Monograph **1**.
- Ellis, C.** 1985. Flandrian molluscan biostratigraphy and its application to dry valley deposits in East Sussex, in N. R. J. Fieller, D. D. Gilbertson & N. G. A. Ralph (eds), *Palaeoenvironmental Investigations: Research Design, Methods and Data Analysis*. Oxford: British Archaeological Reports, Int Ser, **266**, 157–65.
- Evans, J. G.** 1972. *Land Snails in Archaeology*. London: Seminar Press.
- — 1984. Stonehenge — the environment in the Late Neolithic and Early Bronze Age and a Beaker burial, *Wiltshire Archaeological and Natural History Magazine* **78**, 7–30.
- Evans J. G., Limbrey S., Maté I. & Mount R.**, 1993. An environmental history of the Upper Kennet valley, Wiltshire, for the last 10,000 years, PPS **59**, 139–95.
- Ford, P. J.** 1989. Molluscan assemblages from archaeological deposits, *Geoarchaeology* **4**, 157–73.
- Fowler, P. J. & Evans, J. G.** 1967. Plough-marks, lynchets and early fields, *Antiquity* **61**, 289–301.
- Gardiner, M.** 1990. Excavations at Botolphs, Sussex, *Arch. J.* **147**, 216–75.

- Green, C. M.** 1977. The Roman pottery, in M. Bell, Excavations at Bishopstone, SAC **115**, 152–78.
- Hamilton, S.** 1977. The Iron Age pottery, in M. G. Bell, Excavations at Bishopstone, SAC **155**, 83–117.
- 1999. Using the finds; the Caburn archive, in P. Drewett & S. Hamilton, Marking time and marking space; excavations and landscape studies at the Caburn hillfort, East Sussex, 1996–98, SAC **137**, 17–19.
- Hodges, R.** 1980. Potters, pottery and marketing, AD 700–1000, SAC **118**, 95–104.
- Hodgson, J. M.** 1976. *Soil Survey Field Handbook*. Harpenden: Soil Survey Technical Monograph No. 5.
- Hodson, F. R.** 1962. Some pottery from Eastbourne, the 'Marnians' and pre-Roman Iron Age in Southern England, *PPS* **28**, 140–55.
- Jarvis, M. G., Allen, R. H., Fordham, S. J., Hazelden, J., Moffat, A. J. & Sturdy, R. G.** 1984. *Soils and their Use in South East England*. Soil Survey of England and Wales, Bulletin No. 15.
- Jervis, B.** 2005. Identity in Late Saxon Sussex: Interpreting the Pottery from Bishopstone, Unpubl. BA Dissertation, University of Exeter.
- forthcoming, The Saxon pottery in G. Thomas, *Excavations at Bishopstone, 2002–2005*. York: CBA Research Report.
- Jongerijs, A.** 1970. Some morphological aspects of regrouping phenomena in Dutch soils, *Geoderma* **4**, 311–31.
- Kerney, M. P.** 1963. Late-glacial deposits on the chalk of south-east England, *Philosophical Transactions of the Royal Society London, B* **246**, 203–54.
- 1970. The British distribution of *Monacha cantiana* (Montagu) and *Monacha cartusiana* (Müller), *Journal of Conchology* **27**, 145–8.
- 1977. A proposed zonation scheme for Late-glacial and Post-glacial deposits using land Mollusca, *Journal of Archaeological Science* **4**, 387–90.
- 1999. *Atlas of the Land and Freshwater Molluscs of Britain and Ireland*. Colchester: Harley Books.
- Kerney, M. P. & Cameron, R. A. D.** 1979. *A Field Guide to the Land Snails of Britain and North-west Europe*. London: Collins.
- Lyne, M.** Excavations at Pevensey Castle 1936–64, Unpublished Report, Barbican House Library, Lewes.
- Macphail, R. I., Romans, J. C. C. & Robertson, L.** 1987. The application of micromorphology to the understanding of Holocene soil development in the British Isles with special reference to early cultivation, in N. Federoff, L. M. Bresson & M. A. Courty (eds), *Soil Micromorphology*. Plaisir: AFES, 647–56.
- Meehan, B.** 1983. A matter of choice? Some thoughts on shell gathering strategies in northern Australia, in C. Grigson & J. Clutton-Brock (eds), *Animals and Archaeology*, vol. 2: *Shell Middens, Fishes and Birds*. Oxford: British Archaeological Reports, Int. Series **183**, 3–17.
- Preece, R. C.** 1977. Fossil *Helicopsis striata* (Müller) and *Trochoidea geyeri* (Soós) from the Isle of Wight, *Proceedings of the Isle of Wight Natural History and Archaeological Society* **6**, 608–9.
- Preece, R. C., Kemp, R. A. & Hutchinson, J. N.** 1995. A Late-glacial colluvial sequence at Watcombe Bottom, Ventnor, Isle of Wight, England, *Journal of Quaternary Science* **10**, 107–21.
- Reffell, R.** undat. *An Excavation at Pocock's Field, Eastbourne, East Sussex 2002- an interim report*. Eastbourne: Eastbourne Natural History & Archaeological Society.
- Seager Thomas, M.** 2003. The Pottery Assemblage, in C. Greatorex, *An Archaeological Evaluation of Land Adjacent to the Church of St Mary, Udimore*. Unpubl. East Sussex, C.G. Archaeology Report, 22–3.
- Shrubsole, G.** 1933. Non-marine mollusca of the Eastbourne district, *Journal of Conchology* **19**, 361–8.
- Smith, R. T. & Atkinson, K.** 1975. *Techniques in Pedology: a Handbook for Environmental Resource Studies*. London: Elek.
- Sparks, B. W.** 1953. The former occurrence of both *Helicella striata* (Müller) and *H. geyeri* (Soós) in England, *Journal of Conchology* **23**, 372–8.
- Spears, H.** 1975. *The Stream that Gave Eastbourne its Name*. Eastbourne: Eastbourne Natural History & Archaeological Society.
- Stevens, L.** 1978. *Jesus House and Vicarage Site Interim Report*. Eastbourne: Eastbourne Natural History & Archaeological Society, Eastbourne Urban Medieval Excavation Project.
- 1980a. Eastbourne Urban Medieval Excavation Project, *Sussex Archaeological Society Newsletter* **31**.
- 1980b. *The Archaeological Potential of the Star Brewery Site, Eastbourne*. Eastbourne: Eastbourne Natural History & Archaeological Society, Eastbourne Urban Medieval Excavation Project.
- 1980c. *The Vigil and Morrow: a Survey of Local Antiquity Research*. Eastbourne: Eastbourne Antiquities Research Group.
- 1987a. Excavation of a lynchet, Gildredge Park, Eastbourne, SAC **125**, 69–74.
- 1987b. A Late Iron Age site at St. Anne's Road, Eastbourne, SAC **125**, 75–80.
- 1987c. The urban environment of medieval Bourne, in M. J. Allen, R. H. Seager Smith, E. M. Somerville, L. Stevens, P. Stevens & P. Norman (eds), *Aspects of the Archaeology in the Lewes Area*. Lewes, Lewes Archaeological Group, 58–69.
- Stevens, L. & Allen, M. J.** 1981. Bourne Valley Excavation, Star Brewery Site, Eastbourne: an Interim Report. Eastbourne: Eastbourne Natural History & Archaeological Society, Eastbourne Urban Medieval Excavation Project. Unpubl. ms.
- 2007. *An Interim Account of the Bourne Valley Excavations, Star Brewery Site, Eastbourne*. Eastbourne: Eastbourne Natural History & Archaeological Society.
- Stevens, P.** 1978. Bone, in L. Stevens, *Jesus House and Vicarage Site Interim Report*. Eastbourne: Eastbourne Natural History & Archaeological Society, Eastbourne Urban Medieval Excavation Project.
- 1987. The archaeology of medieval in Bourne, in M. J. Allen, R. H. Seager Smith, E. M. Somerville, L. Stevens, P. Stevens & P. Norman (eds), *Aspects of the Archaeology in the Lewes Area*. Lewes, Lewes Archaeological Group, 70–77.
- 2006. Bourne Valley Animal Bone, Site E356. Unpubl. archive report, Bourne Valley excavation.
- Streeten, A.** 1985. Pottery, in J. Hare, *Battle Abbey: the Eastern Range and the Excavations on 1978–80*. London: English Heritage, 103–26.
- Tarling, D. H.** 1967. The stability index of remanence in palaeomagnetism, *Geophysical Journal* **12**, 443–8.
- Thomas, K. D.** 1977. A preliminary report on the mollusca from the lynchet section, in M. G. Bell,

Excavations at Bishopstone, *SAC* **115**, 258–64.

**Thompson, R., Aitken, M. J., Gibbard, P. L. & Wymer, J. J.** 1974. Palaeomagnetic studies of Hoxnian lacustrine sediments, *Archaeometry* **16**, 234–43.

**Vahey, Z.** 1991. Phoenix Brewery Excavation Report,

Unpubl. Hastings Area Archaeological Research Group. **Young, R. & Humphrey, J.** 1999. Flint use in England after the Bronze Age; time for a re-evaluation?, *PPS* **65**, 231–42.

### ADS supplement

Information on the laboratory soil and sediment analysis and its accompanying data can be found on the ADS website at <http://ads.ahds.ac.uk/catalogue/library/sac>. Follow the link to *Sussex Archaeological Collections* and select Volume 145.

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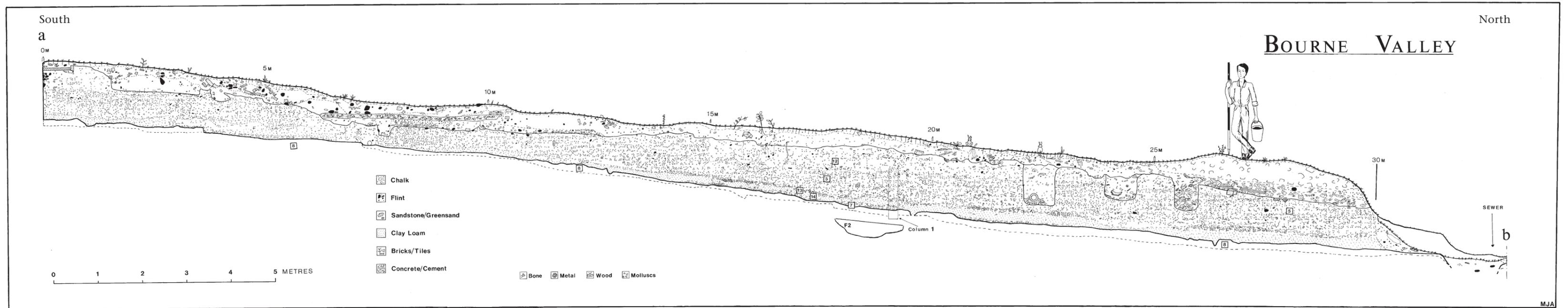


Fig. 10. Long section profile of the colluvial deposits and lynchet at 0-35 m.

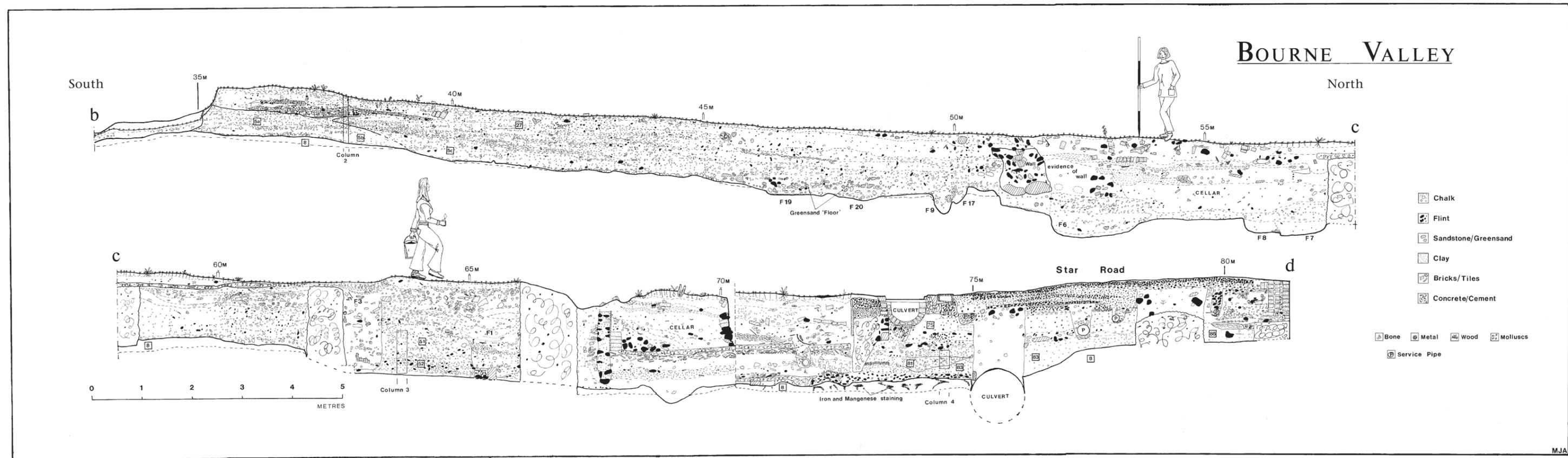


Fig. 19. Long section profile of the 'floodplain' deposits at 36-66 m (upper), and 'floodplain' and Bourne stream deposits at 66-83 m (lower).