EXCAVATIONS AT NORTHWOLD ROAD, STOKE NEWINGTON, NORTH-EAST LONDON, 1981

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SUMMARY

In 1981, during the redevelopment of a house site adjacent to Stoke Newington Common, excavations were undertaken to relocate deposits known to contain Lower Palaeolithic implements. The sequence exposed provided evidence of a transition from an initial periglacial climate to warmer conditions. The undulating London Clay bedrock surface has been deeply eroded during gravel and sand deposition by a braided stream. The gravel contained two derived handaxes and waste flakes from handaxe production, which were mostly in a sharp condition. Overlying the gravel was soliflucted clayey silt, initial deposition of which accompanied formation of immature periglacial polygons in the upper part of the gravel. Further accumulations of clayey silt subsequently covered and overfolded these polygons. Examination of the structure and grain size distribution of the clayey silt indicates that the upper part of the deposit is alluvium, probably deposited by the Hackney Brook. A disturbed Mesolithic flint industry, with some blade production, was contained within the alluvium.

The gravel and clayey silt probably date from the Late Devensian period, the alluvium from the succeeding warmer early Flandrian (Postglacial).

INTRODUCTION

Since the late 19th century, a so-called 'buried Palaeolithic land surface' has been known to underlie Stoke Newington in north-east London. This apparently undisturbed surface, first described by Smith (1894: see especially pp. 189–306), has yielded a large assemblage of Palaeolithic implements, many of which were in a fresh condition. The redevelopment of a house site near Stoke Newington Common provided an opportunity for a detailed investigation of the deposits in the area. As a result of this study it was hoped that this archaeologically-important surface could be relocated and related to the regional geology.

Deposits of 'brickearth' and gravel lying between 30–60m O.D. cover much of the area, and were penetrated during construction of houses in the late Victorian period, most of which are still standing. Smith collected and recorded from numerous sections, and a narrow horizon containing artifacts at the base of the 'brickearth', and overlying sands (the Stoke Newington Sands, Gibbard and Harding, in preparation), represented a working floor. He recognised this feature from Abney Park Cemetery in the west to the Lea Valley in the east. Associated with handaxes, side scrapers, and conjoinable flakes was a rich assemblage of faunal and floral remains.

Between 1893 and 1894 Warren (according to Roe, 1981, 175) relocated the 'floor' at Geldestone Road (TQ 343870) and collected handaxes, but his work was not published. Later excavations were restricted by a lack of suitable sites, but some have been made. Sampson and Campbell dug on the north side of Stoke Newington Common in 1971 (Campbell & Cook, in preparation) but did not find the 'floor'. In 1976, foundation trenches on the north side of Cazenove Road (TQ 33958697) were studied by members of the Inner London Archaeological Unit (unpub-

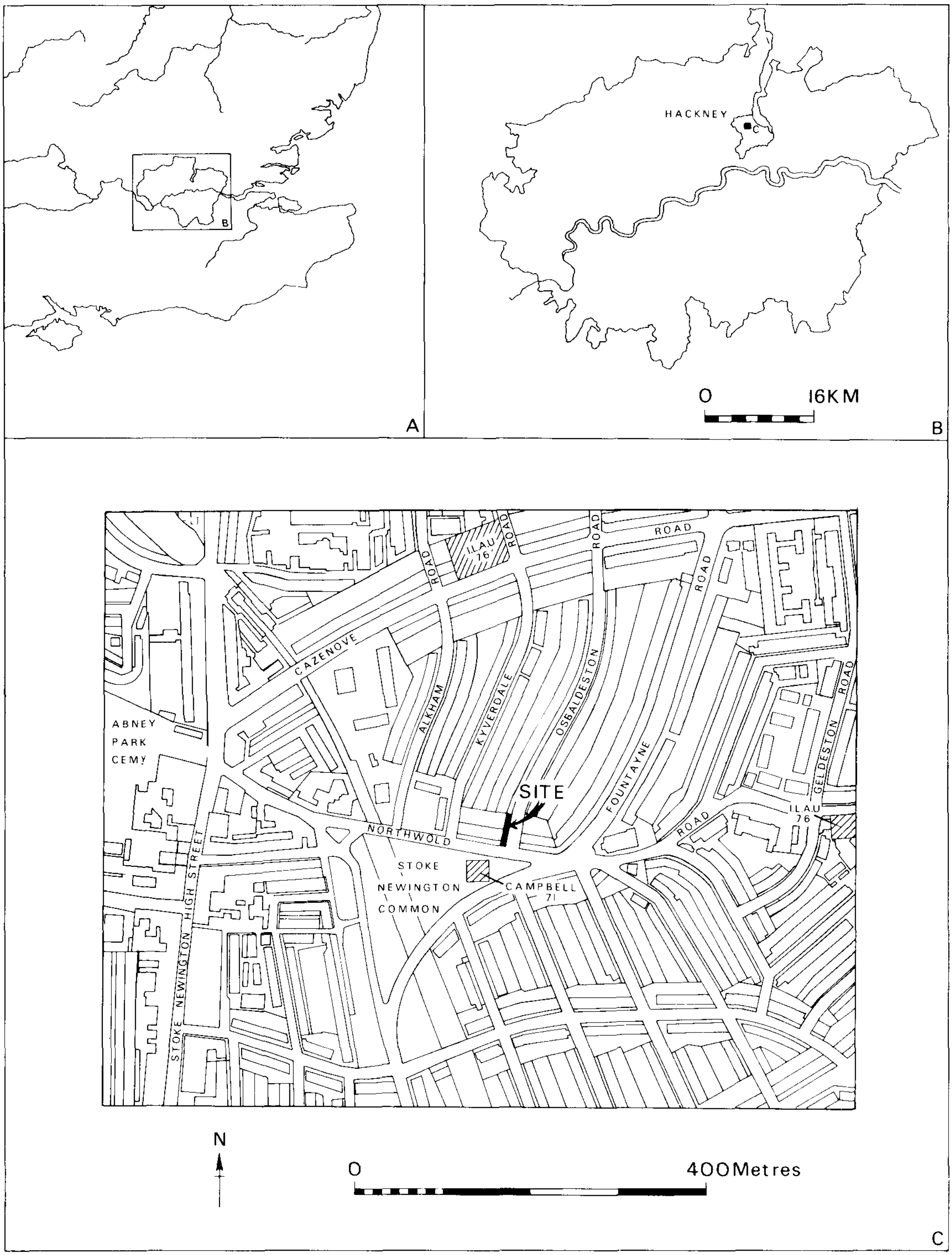


Fig. 1. Northwold Road 1981: site location plan.

lished I.L.A.U. report) to establish the northern extent of the 'floor'. A series of trenches showed London Clay rising to within a metre of the surface and in places cut into by isolated gravel patches. 'Brickearth' was present above the clay but not above the gravel, and at the southern end of the site was underlain by yellow sand (Stoke Newington Sand). A channel 2m deep filled with coarse red and grey gravel ran across the site in a north-south direction. No artifacts were recovered. Additional work by the Inner London Archaeological Unit, later the same year, at 66–76 Northwold Road (TQ 34378663) revealed only ground disturbed by 19th-century brickpit excavations.

The Pleistocene geology of east London is still poorly understood. In spite of numerous reviews of the Thames terrace sequence, there is no clear consensus of opinion regarding the age of individual units. Dating and correlation of the deposits in which the 'floor' occurs is made even more difficult because the area is located close to the confluence of the Rivers Lea and Thames. However, a regional study of the Stoke Newington-Hackney area is now in preparation by the authors and will be published elsewhere. Recent attempts to date the 'floor' using typology of the artifacts, the terrace sequence or palaeontology (Wymer, 1968, 317–319; Kerney, 1971, 81; Roe, 1981, 172–175) have achieved no definite results.

EXCAVATION: SITE AND METHODS

The excavation described was on the site of 55 Northwold Road at the junction with Osbaldeston Road, Stoke Newington (TQ 33988663), where the modern ground surface is at 22m O.D. (Fig. 1). This site is within 200m of both Alkham Road and Kyverdale Road, where Smith made many of his finds. After a test pit established that the deposits were intact, a larger excavation was made in the southern half of the plot (Fig. 2). A trench 11.5m by 4.5m was dug within the area available. Modern demolition rubble covered the excavated area to a depth of approximately 0.5m. At the southern end additional disturbance caused by drainage trenches prevented extension of the workings in this direction. Disturbance of the upper part of the silty clay (see below) was restricted to several shallow modern trenches, and a basement 3.5m by 1.5m adjoining the neighbouring house, penetrated the deposits to a depth of 0.5m. All sections adjacent to buildings or roads were stepped in order to prevent collapse. The trench was excavated manually using picks to the base of the silty clay.

A single metre square was excavated by trowel through the upper flint industry (see below Fig. 10) in order to determine whether small knapping preparation and retouch flakes were present. The underlying gravel was totally removed with trowels, except that a pick was used where the material was sieved. Throughout the excavation a sample of 4m^2, sited to recover a complete profile through the deposits, was sieved using a 10mm mesh (Fig. 2). The material extracted from the hand excavated metre square suggested that the loss of artifacts through this mesh was minimal. All finds were, where possible, three-dimensionally recorded using a 1m grid. The main section was extended to the north by mechanical excavator (Fig. 2) to obtain a more complete section through the deposits.

The finds and site archive are housed at the Museum of London.

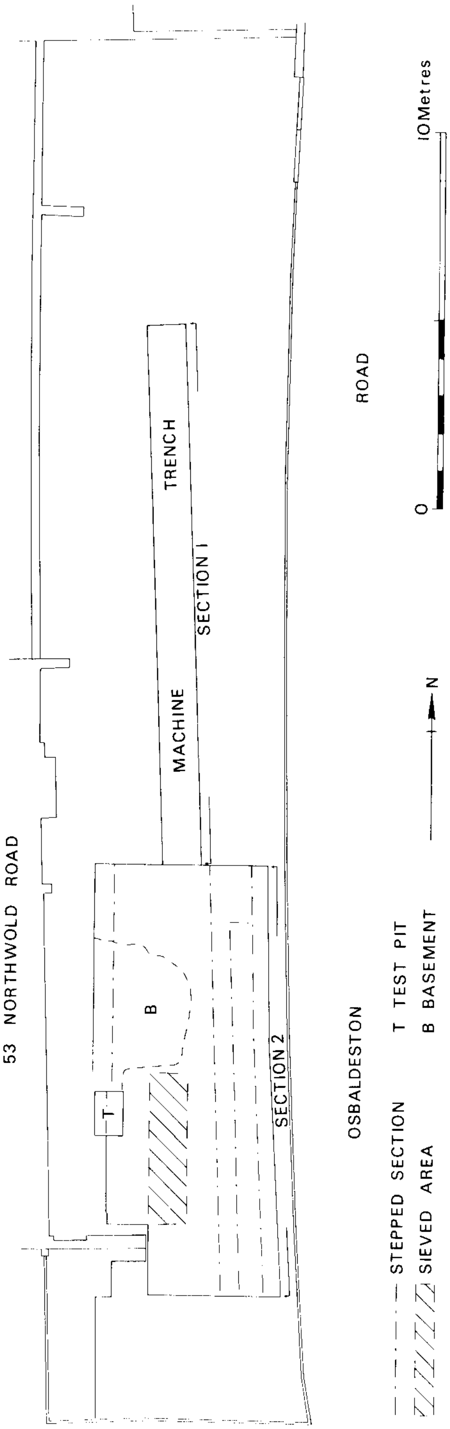
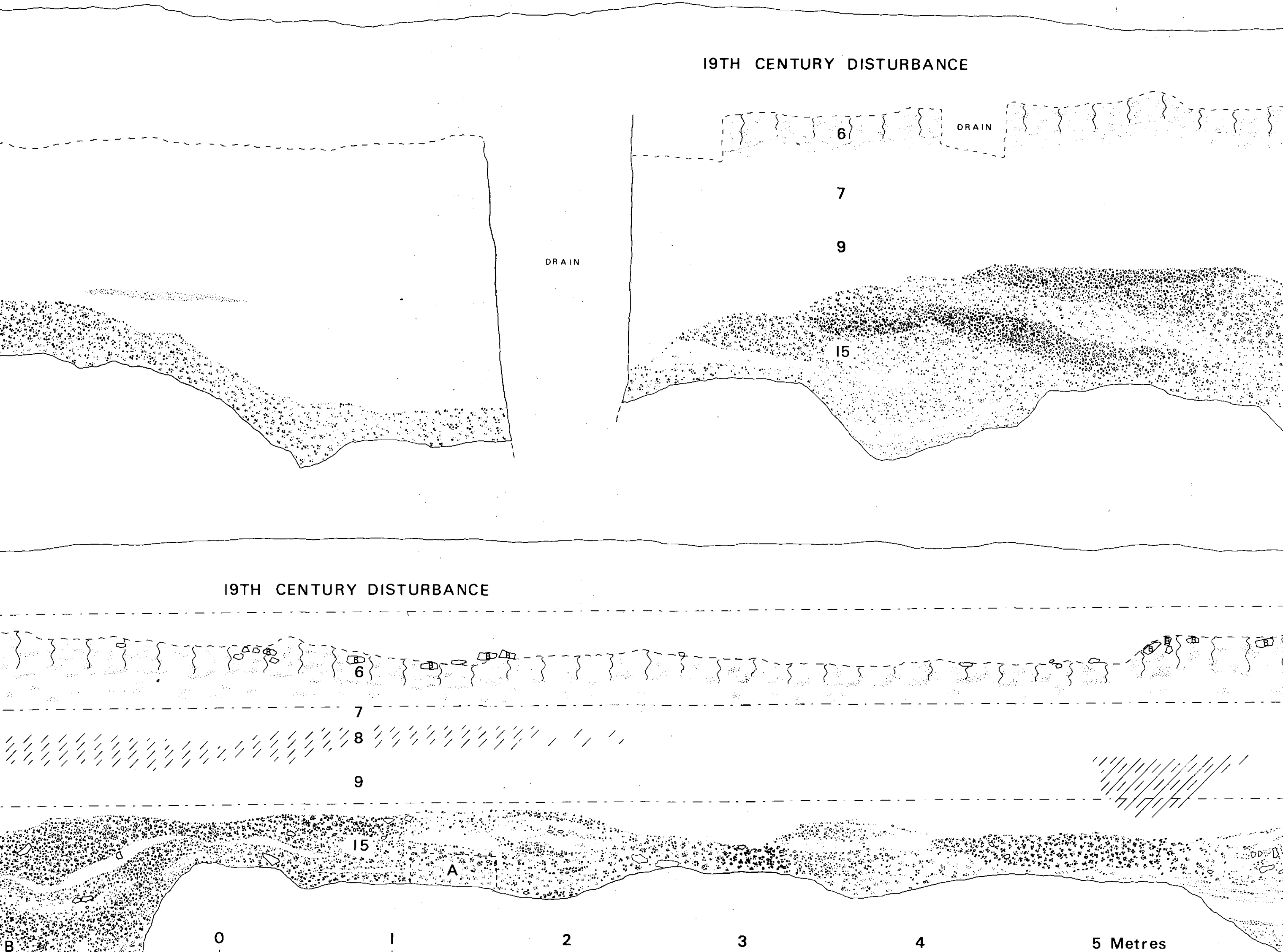


Fig. 2. Northwold Road 1981: plan of excavated trench.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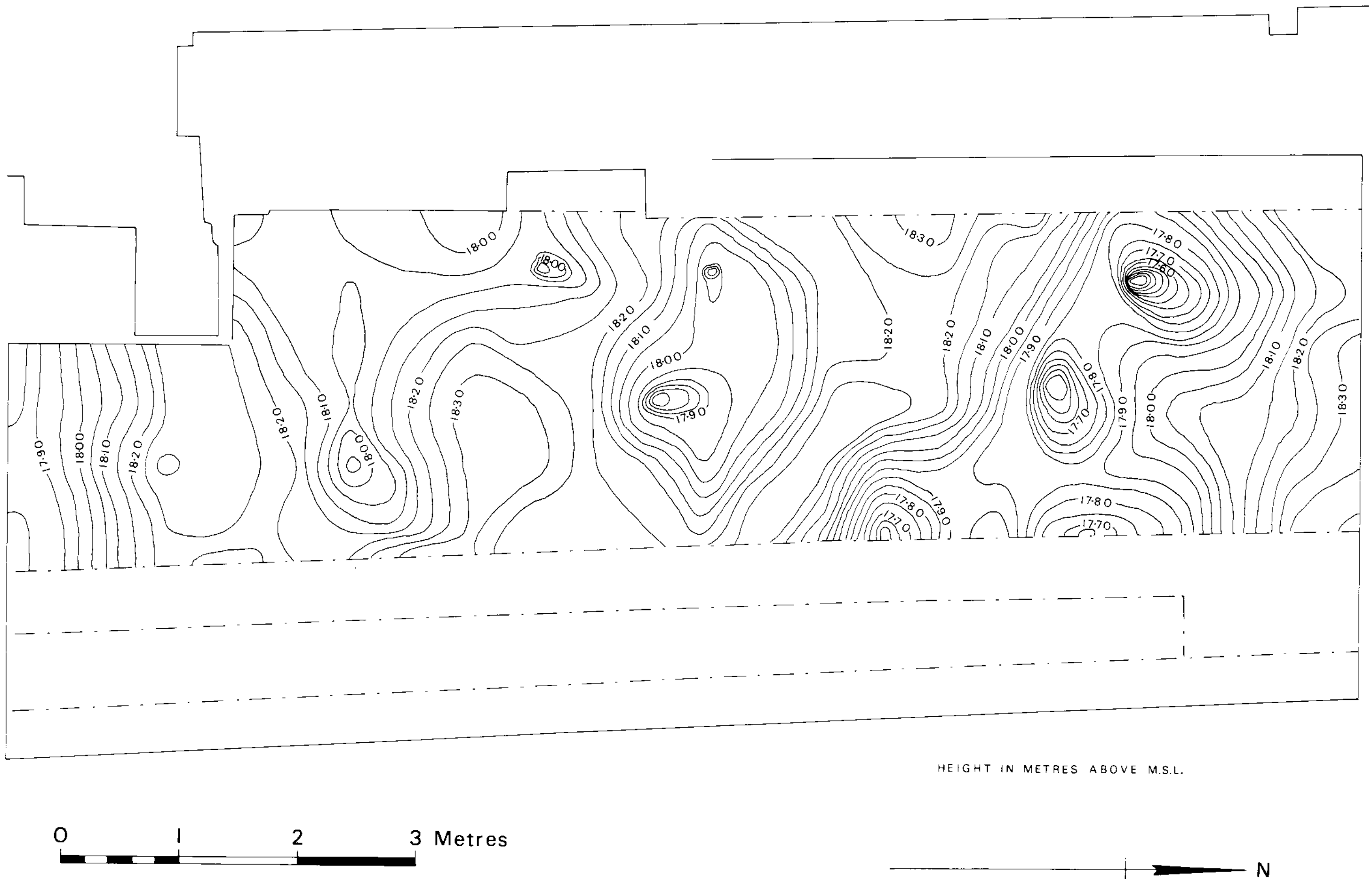

Fig. 4. Northwold Road 1981: contours and surface of London Clay bedrock.

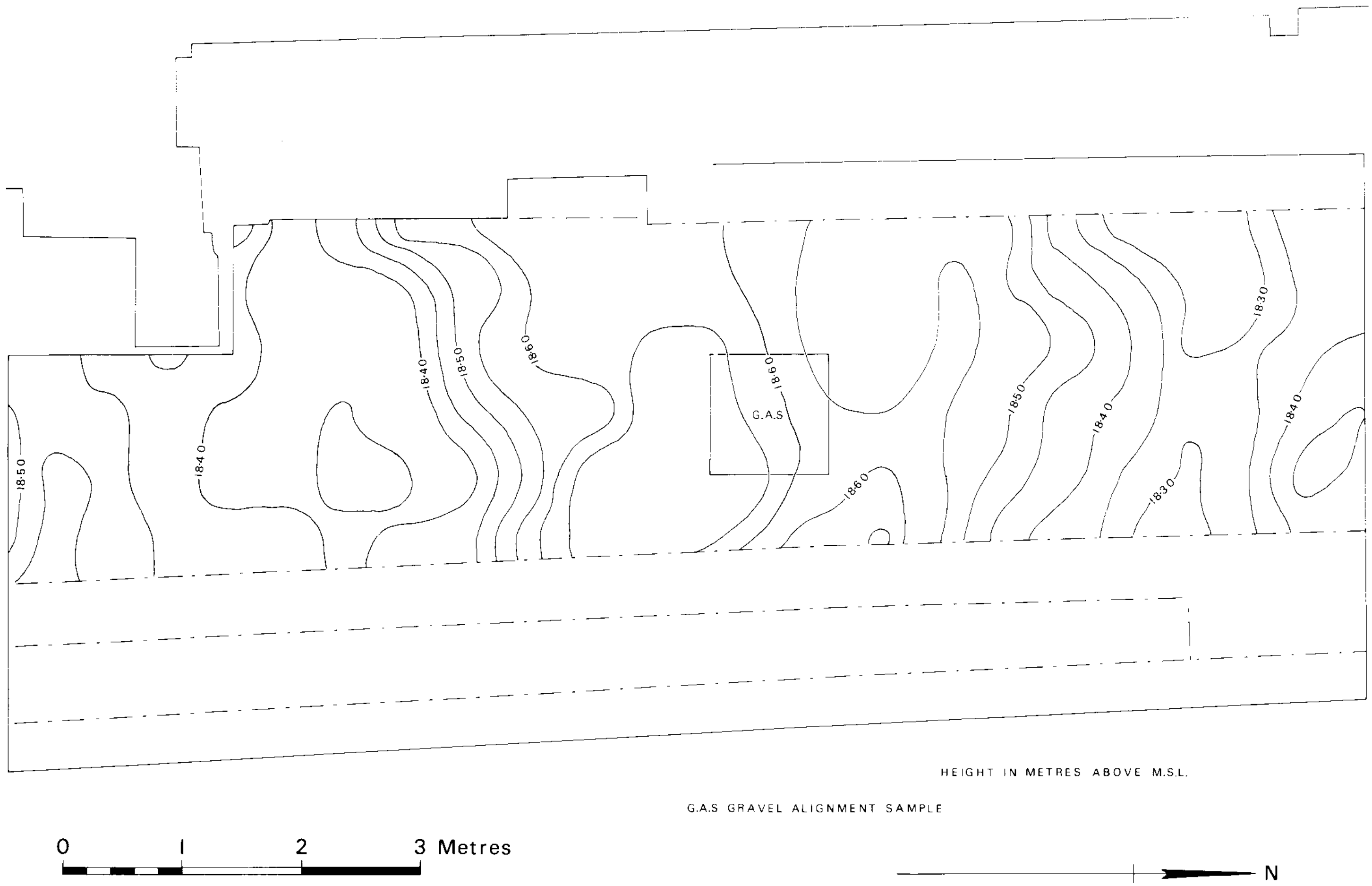

Fig. 5. Northwold Road 1981: contours on the gravel surface showing the location (GAS) of the gravel fabric analysis (Fig. 6).

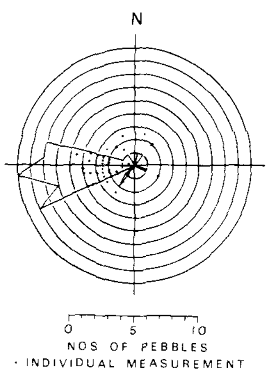

Fig. 6. Northwold Road 1981: gravel surface fabric from point GAS (Fig. 5).

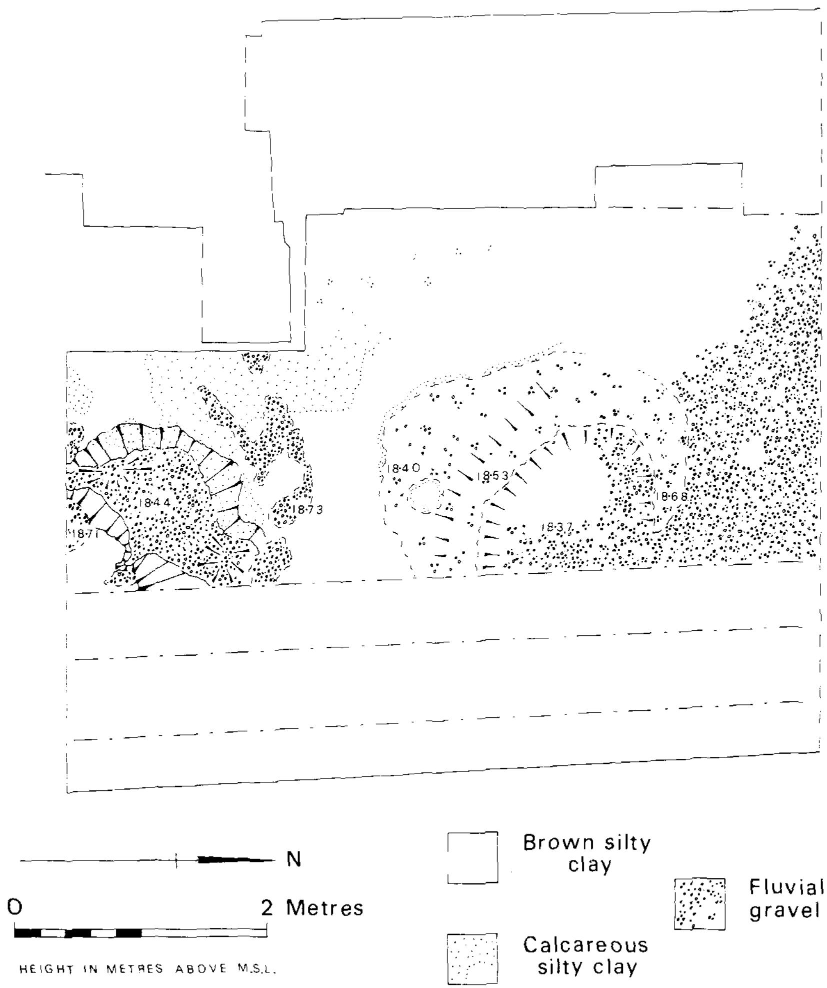

Fig. 7. Northwold Road 1981: plan view of immature periglacial polygons.

GEOLOGY OF THE SITE

(a) The sedimentary sequence

Fig. 3 summarises the sequence of deposits exposed by the excavation. Broadly it comprises yellow brown flint-rich gravels and sands (layer 15) resting on London Clay and overlain by brown to black silt and clay ('brickearth': layers 9–6) containing irregularly distributed clasts. The latter underlay demolition rubble.

The bedrock surface (Fig. 4) was exposed by removal of the gravel and sand above. It was highly irregular and comprised 3–4 elongate channels trending west-east across the excavation. In the basal parts of the channels a number of deeper 'scour-hollows' resembling pot-holes penetrated as much as 0.40m below the general channel floor level. The inter-channel areas had a smooth, rounded form and reached a maximum surface elevation of 18.30m O.D. This resulted in a surface amplitude of over 1m in places. The surface was clearly erosional in origin, probably having been formed during deposition of the overlying gravel because London Clay clasts and fossils were found in the gravel. The erosion had been concentrated in the channel-like features, as the pot-holes were present only in their floors and the channel sides were markedly undercut on the outside of bends, as seen particularly on the eastern side of the northern-most channel. However, the elevated areas had also undergone a little erosion to judge from their form. To the authors knowledge this type of erosional bedrock has not previously been described.

The overlying gravel and sand unit comprised 0.20–1.10m of yellow brown, fine to medium gravel with occasional larger clasts and sand lenses (layer 15). The gravel was supported in a sandy, and near the top of the unit, a clayey matrix. The latter resulted from downward migration of clay derived from the overlying sediments. As can be seen in Fig. 3 the gravel and sand were interdigitated. The gravel bodies were generally massive, but sandy areas were stratified. They were frequently lenticular in form, individual beds reaching a maximum of 0.60m in thickness. The sands also formed lenticular channel-fill or drape-like beds 0.15–0.25m thick. Several of the sand lenses exhibited tabular cross-bedding indicating a palaeocurrent flow towards the east.

The gravel and sand unit varied considerably in thickness. Its upper surface exposed during the excavation (Fig. 5) formed two parallel shallow channels 1.5–2m wide trending west-east. An intervening flat bar-like feature showed imbricate structure on its upper surface. Similar channel patterns were detected on young terrace gravel and sand surfaces in the Thames system by Hare (1947) and Cheetham (1980). Fig. 6, based on long-axis measurements of 50 pebbles from site GAS (Fig. 5), shows that the elongate clasts have a strong preferred orientation, a feature commonly found in the bars of gravel bed rivers (Teisseyre, 1975; Potter & Pettijohn, 1977); it indicates a palaeocurrent flow from slightly south of west.

The overall facies arrangement of the gravel and sand indicates deposition in a complex environment of migrating channels. High flow velocities are necessary to transport and sort gravel which could have eroded the channels and scour hollows in the bedrock surfaces. Much lower velocities would have prevailed during deposition of the sand. These observations indicate that the stream had a braided habit (Williams & Rust, 1969; Rust, 1972; Miall, 1977; Bryant, 1982). The sediments described above can all be recognised in the facies models of Rust (1972) and Miall (1977). Such streams typify cold climate environments in lowland Britain (Castleden, 1980; Bryant, 1982).

The upper surface of the gravel was generally undisturbed, but in some places, particularly towards the southern end of the excavation, some evidence for folding and overturning of the surface was seen. This was especially clear at the extreme southern end where poorly developed polygonal features were preserved. These features were formed of narrow gravel ridges standing up to 0.31m above the surrounding gravel surface (Fig. 7). In plan the polygons were up to 1.25m across. In section the ridges included a number of elongate pebbles with long axes pointing towards the ridge crest. All the ridges were overturned towards the south, the strike of folds trending approximately east-west. The polygons were of the 'small sorted type' of Washburn (1956) and according to this author would originally have had a border of stones surrounding finer material. For this reason they were probably formed after or during deposition of part of the overlying clayey silt, which would have filled the central depression of the polygons. Such polygonal features result normally from annual freezing and thawing of the ground under a periglacial climate (Washburn, 1972). The absence of polygons further to the north in the excavation suggests that the latter area was unaffected presumably because it was more deeply buried by the deposits above.

The overlying deposit (layers 9–6) comprises an unbedded clayey silt 0.80–1.50m thick. The basal 0.30–0.50m of this unit (layer 9) was strong brown (7.5 YR 5/6) clayey silt with some light grey streaks possibly of London Clay. It contained irregularly distributed clasts mostly of flint. This sediment was calcareous throughout the exposure, but it was particularly so at the southern end, where it was paler in colour. It included the upstanding gravel ridges at the southern end of section 2 and a body of gravel incorporated from beneath near the northern end of section 1. As already stated, at least the basal 0.30–0.40m of this sediment had been deposited when the polygons were forming. Later movement of the overlying sediment subsequently overfolded the gravel ridges.

Above the yellow brown clayey silt was an irregular, discontinuous bed of dark grey brown to black clayey silt containing some pebbles (layer 8: Fig. 3). The colour of this bed was caused by deposition of manganese dioxide which also coated the pebbles. The bed was well developed in section 2 and increased in height above the gravel surface towards the northern end of the exposure. The manganese dioxide was probably precipitated from ground water after deposition of the clayey silt.

The remaining upper 0.50–0.80m (layer 7–6) comprised massive yellow brown (10 YR 5/8) clayey silt with occasional flint pebbles and artifacts. This sediment became progressively more dry and crumbly in the upper 0.20–0.30m (layer 6) where it was finely mottled with dark reddish brown (2.5 YR 3/4) and grey along root channels and other structural surfaces. These structures and colours result from soil formation (pedogenesis), though the soil profile was subsequently truncated and buried by demolition rubble.

SEDIMENT ANALYSES

In order to obtain more detail regarding the origin and composition of the sediments they were analysed in various ways.

(b) Pebble lithology

To determine the composition of pebbles in the gravel (layer 15), two samples were taken and analysed by Dr. D. Bridgland (City of London Polytechnic), the first (A) from the bar gravel close to the south end of section 2 and the second (B) from the base of the northern-most channel (Fig. 3 and Table 1). Both counts, obtained using the size range 32–11.2mm, showed over 92% total flint, together with a range of minor constituents. The variability of flint types and other components suggests that sediment mixing was not very efficient. Similar amounts of total flint contrasting amounts of different types have been noted previously by Gibbard (1979). Lithologies exotic to the district include Lower Greensand chert, vein quartz, quartzite, Carboniferous chert, *Rhaxella* chert and igneous rock. All of these are, however, present in gravels of the Rivers Thames and Lea, and their presence can be explained by derivation from one or both of these sources. Since River Lea gravel is known to cap the high ground to the north (Stamford Hill Gravel: Gibbard & Harding, in preparation), this seems to be the most likely source for the material. The gravel also contained clay clasts, (some pyritised), pyritised bone and septarian nodules, all undoubtedly derived from local London Clay.

TABLE 1

Samples	*A*	*B*
Non-Tertiary flint	55.34	30.47
Tertiary flint	36.74	64.86
Total flint	92.08	95.32
Lower Greensand chert	2.66	0.81
Vein quartz	0.56	1.01
Quartzite	3.37	1.61
Carboniferous chert	0.45	0.67
Rhaxella chert	0.22	0.20
unknown sandstone	0.08	—
others	0.08	—
Clay casts	0.38	0.46
Septarian material	1.67	8.72
Total pebbles	1158	991

Table 1. Northwold Road 1981: pebble lithological counts from Section 2 (Fig. 3) in the 32–11.2mm range by D. Bridgland.

(c) Particle size distribution

Two separate sequences of samples were taken through the clayey silt unit (layers 9–6) to determine grain size distribution. The first from site T (Fig. 2) represents a continuous vertical sequence through the whole deposit. It was analysed using standard hydrometer and sieve techniques by P.L.G. A second series of three samples from the northern end of section 2 (Fig. 3) was analysed by Dr. J. Catt (Rothamsted Experimental Station) using the pipette and sieve method. Both sets of samples gave comparable results (Fig. 8) and will therefore be discussed together.

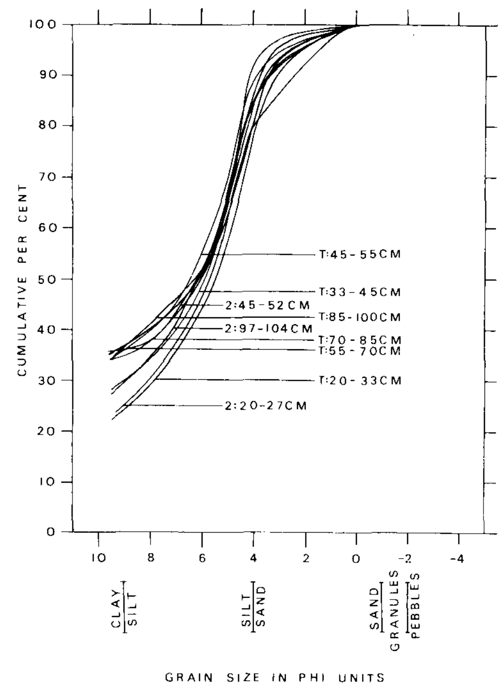

Fig. 8. Northwold Road 1981: clayey silt (layers 9–6), grain size distributions of samples from Section T and Section 2.

All the samples are composed mainly of coarse silt (16–63 μm), a feature suggesting that loess is a major component. However, they also contain more sand and more clay than usually occurs in pure loess. The clay content of weathered loess can be increased mainly by translocation from overlying horizons, but the micromorphology (see below) shows that there is little clay in the form of argillans or bodies of translocated clay (Brewer, 1964). In the higher samples (section T, 0.20–0.45m; section 2, 0.20–0.27m and 0.45–0.52m), the additional clay and most of the sand are probably alluvial components subsidiary to the loess. However, the even greater content of clay in the lower samples (section T, 0.45–1m; section 2, 0.97–1.04m) results partly from inclusion of large clasts and streaks of clay, as seen in thin section (below). The accumulations of manganese occur immediately above this clay-rich sediment, i.e. at the base of the relatively more permeable sediments.

(d) Micromorphology

Two samples were taken at the northern end of section 2 by Dr. Catt to examine the micromorphology of the clayey silt in thin sections prepared from air dried blocks impregnated with Crystic resin. His examination showed that the first sample from the alluvium (0.45–0.52m) was well fissured with diffuse ferrans (Brewer 1964) along the fissures, probably due to periodic waterlogging. Some incorporation of topsoil by burrowing fauna was also evident and the fabric was homogeneous with no translocated clay. The second sample, from the lower clayey silt (0.97–1.04m) was also well fissured, but had fewer diffuse ferrans and contained approximately 1% of translocated clay. The argillans had been disrupted and largely reorientated by stress, probably shrink-swell in wetting and drying cycles. In the second sample, the sediment fabric was very inhomogeneous with patches of strongly stress-orientated clay, probably small London Clay blocks, in a silty and slightly sandy matrix with a skel-in-ma-sepic fabric (Brewer, 1964), i.e. the clay content of the matrix had been almost completely reorientated in various ways by stress. The clay patches formed about 10% of the sample.

Apart from the clay inclusions in the lower part of the deposit, the morphological features noted above are quite typical of soil profiles formed on Flandrian alluvium. This is especially true in southern England where the sediment often includes a large silt component derived from loess. The patches of London Clay were probably incorporated by down slope mass movement from clay exposures nearby. They have fairly sharp boundaries, suggesting that the clay blocks were either dry or frozen and were not dispersed during transport or deposition.

(e) Silt mineralogy

Coarse silt fractions (16–63 μm) were separated from the three particle size analysis samples from section 2 and analysed mineralogically by Dr. J. Catt. The results (Table 2) show that in silt mineralogy the Northwold Road samples differ from Devensian loess from many parts of S.E. England (Sussex, Kent, Essex, London, Huntingdonshire, Berkshire etc.) in the following ways:

(i) They contain more chert and flint, which probably indicates that some of the silt was derived from the underlying gravel and sand.

(ii) They contain more muscovite at 0.97–1.04m, which is probably due to the incorporation of London Clay, noted above.

(iii) Among the heavy minerals, they contain more tourmaline, kyanite and green hornblende, but less zircon and tremolite/actinolite. Although these differences may not be very significant, they could also have resulted from incorporation of local Tertiary material.

(iv) They lack glauconite, collophane and apatite, which is probably due to weathering of the loess component either before or after deposition of the sediment.

However, after allowing for these differences, the silt mineral assemblage in the Northwold Road samples is similar to that of Devensian, rather than any earlier loess (see Avery *et al.*, 1982). This agrees with the micromorphological evidence that the soil profile developed only during the Flandrian and does not show any features (e.g. those of palaeoargillic horizons listed by Avery, 1980) that may have been formed at an earlier stage.

TABLE 2

	0.20–0.27 m	*0.45–0.50 m*	*0.97–1.04 m*	*Mean of 32 Devensian loess samples*
a) *Light Fraction*				
Quartz %	77.7	79.0	78.2	81.9
Chert + flint %	4.9	2.2	2.1	0.9
Alkali felspar %	16.5	17.4	15.7	15.1
Muscovite %	0.9	1.4	4.0	1.4
Glauconite %	—	—	—	0.7
b) *Heavy Fraction*				
Zircon %	8.3	10.0	8.7	12.7
Tourmaline %	7.3	6.5	3.8	3.2
Yellow Rutile %	3.8	4.8	2.8	3.3
Brown Rutile %	1.5	1.3	1.5	1.5
Anatase %	0.7	1.3	0.9	1.8
Brookite %	0.1	0.2	0.4	0.3
Kyanite %	1.7	1.6	1.1	0.4
Sillimanite %	0.1	0.1	—	—
Staurolite %	0.6	0.3	0.4	0.6
Garnet %	5.2	3.9	6.3	4.5
Epidote %	28.3	22.3	21.0	28.8
Zoisite + Clinozoisite %	15.8	15.4	17.5	11.9
Chlorite %	8.6	11.3	15.6	14.1
Green Hornblende %	17.4	19.1	19.2	11.0
Brown Hornblende %	0.4	0.8	0.6	0.7
Tremolite + Actinolite %	—	0.1	0.2	2.8
Collophane + Apatite	—	—	—	0.5

Table 2. Northwold Road 1981: silt mineralogy of samples from Section 2 (Fig. 3) in the 16–63 μm range.

(f) Summary

In summary, the upper deposit (clayey silt) appears to represent remobilised loess which has incorporated material from both bedrock and underlying gravel and sand. The laboratory analyses and sedimentary structures of this deposit all suggest that the lower part (layer 9–8) was formed by solifluction down the valley side to the north. The upper part (layer 7 – 6) of the deposit in which the upper flint industry occurs, represents the alluvium of a small stream, possibly the local Hackney Brook (Greenhill, 1883). A soil developed in the alluvium is of Flandrian (Postglacial) age, suggesting that the alluvium itself dates broadly from the early Flandrian. In view of these conclusions, the lack of evidence for prolonged weathering elsewhere in the sequence, and the preservation of the original gravel surface topography, we suggest that the lower part of the clayey silt unit and the gravel and sand beneath date from the end of the last cold stage i.e. Late Devensian. The gravel and sand were laid down by a bed-load dominated braided stream (probably the precursor of the brook which deposited the alluvium) that was eroding its banks and floor and probably incorporating slope material transported by solifluction. The implements found in the gravel were probably also derived by solifluction from the Stoke Newington Sands, which rest on the London Clay on the hill side immediately north of the site.

THE FINDS

Evidence of two flint industries was recovered, one of the Lower Palaeolithic period from the gravel, the other of probable Mesolithic date from the upper part of the sandy clayey silt. In addition burnt flint and bone was also found. All recorded finds are shown on the plans (Figs. 9 and 10), those from the Mesolithic industry are located precisely (Fig. 10), but a minority of those from the gravel, found in the sieve, are located within the respective metre square. All small flakes and chips similarly recovered were not catalogued as recorded finds and have been omitted from the plan to avoid distorting the overall distribution.

(a) The Lower Palaeolithic Industry.

This industry was examined by C. Bergman, M. Newcomer, K. Ohnuma and P. Robinson as well as one of the authors (P.H.) in an attempt to separate flakes resulting from natural processes from those considered to be genuine Lower Palaeolithic material. Opinions were in agreement for most of the flakes, but specimens were also included as flakes when only a majority of the experts agreed on this. A total of sixty-one pieces were recovered of which thirty were thought to be part of the Palaeolithic industry. The remainder comprise predominantly small flakes and heavily rolled pieces. These often have small narrow butts, cortical or thermally fractured dorsal surfaces and heavily crushed platform edges, typical of flakes removed by natural gravel stream abrasion.

(i) Distribution

The material shows no marked concentration in plan or section (Fig. 9). The grouping suggested in the northern channel is accentuated by the inclusion of fossil bone derived from the London Clay. Despite a slight apparent increase of material towards the upper parts of the gravel, flakes were recorded throughout the deposit. This broadly random distribution suggests that no single artifact is in its primary position and is therefore likely to be derived. This is also suggested by the absence of conjoinable flakes (as found by Smith, 1894, 251 – 258 and Fig. 186 – 189) and small knapping chips and debris, the average length of all measured flakes being 47mm (cf. also Schick, 1980, 129 – 130 for comparable example on residual flake size in water sorted flakes).

(ii) Condition of raw material.

Details of the condition of the artifacts are given using Wymer's (1968, Pl. XI) system; mint, sharp, slightly rolled, rolled and very rolled. Most of the flakes, (twenty-one pieces) can be classified as sharp, with five slightly rolled, one rolled and one heavily rolled. The generally sharp condition of the majority suggests that transport and secondary resorting within the gravel were limited. The presence of the more heavily rolled material, which is also patinated, indicates that some of the pieces have been subjected to considerably more resorting than others. The heavily rolled flake has a light mottled patina, whereas the rolled flake has a dense white to light green patina on its ventral surface. The remainder survives as black through dark brown to grey flint with scattered coarser cherty inclusions and some orange staining. The flint was probably obtained as large nodules of good quality flint with heavily weathered cortex probably from the gravels underlying Stamford Hill. It is possible that the finds were derived from the Stoke Newington Sands which outcrop just north of the site, and with which Smith's 'floor' is associated (Smith, 1894; Fig. 138). The material could therefore have been derived from the same source as those recovered by Smith. If this is so, although the majority does not represent a single knapping unit, there is no reason why it should not be considered as a single technological tradition.

Fig. 9. Northwold Road 1981: distribution of Lower Palaeolithic material in plan (above) and section (below).

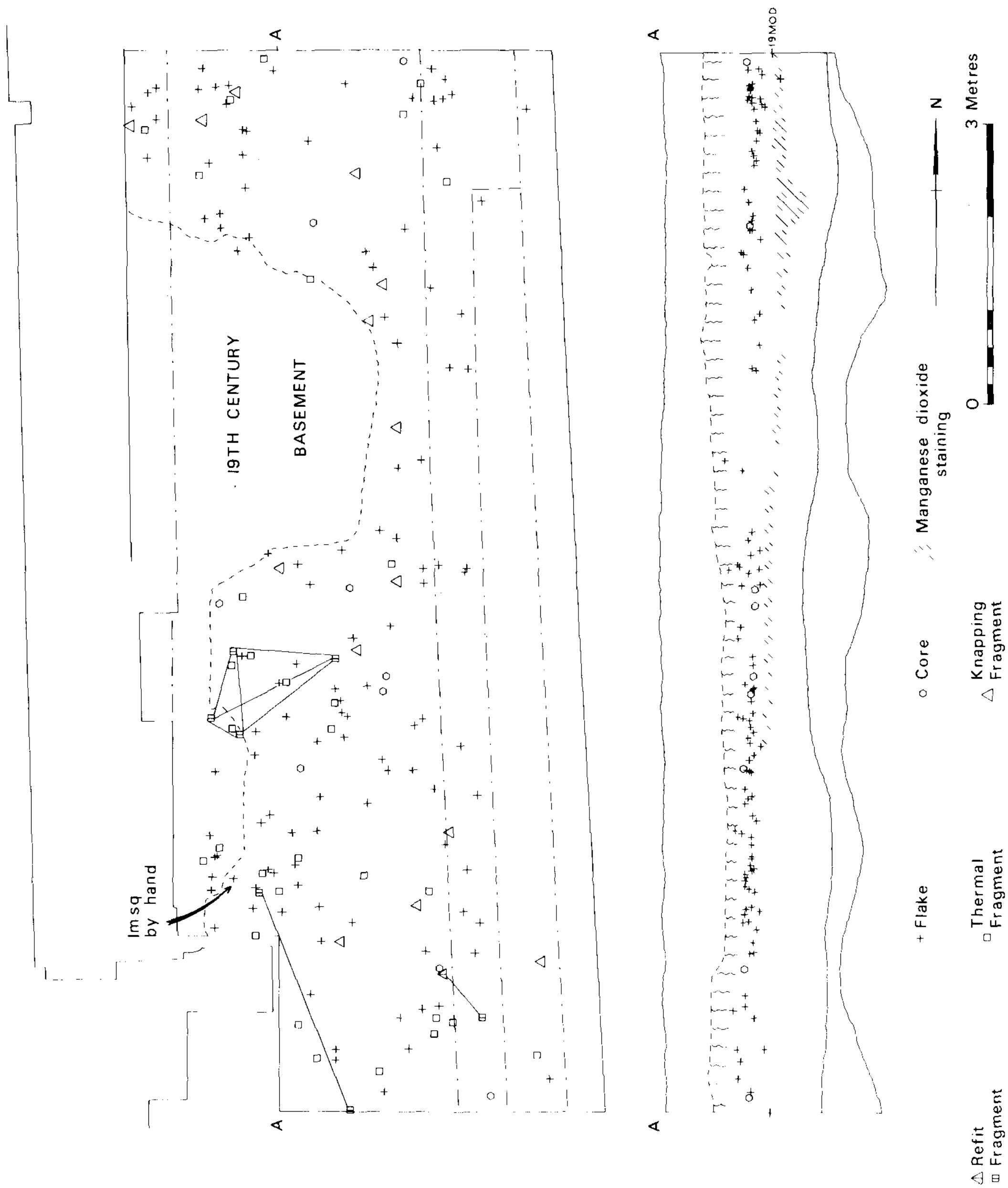

Fig. 10. Northwold Road 1981: distribution of Mesolithic material in plan (above) and section (below).

(iii) The flakes.

The twenty-eight flakes have been examined and may be classified into two groups:

(1) Eighteen flakes, including the two rolled examples, probably from the initial stages of handaxe manufacture but which may result from some form of core preparation.

(2) Ten flakes produced in handaxe manufacture.

Each group is considered separately but is also tentatively discussed using the system adopted by Sampson (1978, 108–110) at Caddington. Here the flakes were classified according to the sequence in which they were produced in handaxe manufacture. Flakes of group one were mainly produced by blows to modify the shape of the nodule. They were struck from a single direction with all but two pieces showing some cortical cover on the dorsal surface. Classification by the Sampson method shows two nodule protrusion flakes, totally cortical, with six nodule shaping flakes, large semi-cortical flakes with broad plain butts, and ten handaxe shaping flakes. These phases of production were apparently conducted exclusively using a hard stone hammer, ten of the thirteen pieces showing characteristics described by Ohnuma & Bergman (in press): well defined point and cone of percussion, conchoidal ripples on the bulb of percussion, and unlipped butt plus pronounced bulb of percussion.

Butts are dominated by broad plain forms, ten of the thirteen complete being both plain and exceeding 5mm in width. Broader butts tend to reduce the need for careful platform preparation and both forms of preparation, abrasion to remove edge overhang on the dorsal surface or faceting of the platform to modify the flaking angle, are consequently absent.

The flakes of group two almost certainly result from the thinning and finishing of handaxes, and have been described by Newcomer (1971) and Sampson (1978, 109). They are characteristically broad, thin, dipping flakes with minimal cortex, multi-directional flake scars, feathered edges and narrow butts (Fig. 11.3 and 11.4). Ten pieces have been classified, of which six may be considered as handaxe thinning flakes and the remainder handaxe finishing flakes. Four flakes have broken proximal ends and of the remainder the narrow butts make identification of hammer mode and preparation difficult. The use of a hard stone hammer remains prevalent, only one flake showing characteristics consistent with the use of a soft hammer (Ohnuma & Bergman, in press): lipped butt and diffuse bulb, vague point/cone of percussion and diffuse bulb. There is, in addition, a *burin de Siret* (Bordes, 1979, 40 and Fig. 4, No. 2), a feature found more commonly in industries using hard hammers. Platform preparation remains rare, only one flake showing signs of an abraded platform edge.

(iv) Tools.

A large lanceolate handaxe (Bordes, 1979, 69 and Fig. 50.5) (Fig. 11.1) in a sharp condition was found in the upper surface of the gravel. The edges are well finished and slightly convex in plan. The butt is thick with a crude, battered, sinuous edge, although the tip has been extensively thinned. It measures 190mm long, 103mm wide and is 55mm thick. It is made from a large nodule of dark grey-brown flint of good quality. Two patches of dark, creamy grey, weathered cortex remain towards the butt. Large parts of both sides of the implement are stained a deep orange brown. This staining exists on areas of the handaxe which protruded through the gravel surface and may therefore have formed since the deposition of the implement in the stream. A large thermal fracture on one side may similarly be a more recent feature.

The tip of a second handaxe (Fig. 11.2) was found within the gravel in a rolled condition and stained dark brown. Very little can be said of the original size or form of this piece.

No retouched flake tools were found, nor was there any evidence of Levallois technology.

(b) The Mesolithic Industry.

This industry (Fig. 10) is represented by nine cores, 116 flakes, fifteen pieces of knapping debris and thirty-eight thermally fractured fragments. A blade core (Fig. 11.5), three core rejuvenation tablets (Fig. 11.6 and 11.7) and a few blade fragments (Fig. 11.8) suggest that blades/bladelets formed an important part of the total blank production.

(i) Distribution.

The industry was found as an evenly distributed spread dipping slightly towards the north between 19.10–19.30m O.D. It also occurred at a similar depth in the trenches excavated by Campbell (J. Cook, pers. comm.). Vertical displacement has occurred together with probable horizontal movement which has resulted in the removal of some small flakes and all chips. The presence of refitting pieces however suggests that the dispersal may not have been extensive. Many flakes appear to have originated from a limited number of cores.

(ii) Condition and raw material.

The material was recovered in mint condition. The heavily weathered cortex suggests that it has its origins in the local gravels where it occurs as small nodules. Six broad groups have been recognised.

(1) 1 flake, 1 knapping fragment of Bullhead flint. Brown-black flint with a thin orange band below green cortex.

(2) 6 cores, 59 flakes, 6 knapping fragments, 12 thermal fragments. Dark red-brown mottled orange-brown flint with flecked cherty inclusions. Cortex ranges from hard, thin, weathered, chalky to worn, pitted, patinated. Generally of good quality but contains thermal fractures.

(3) 1 core, 19 flakes, 6 knapping fragments, 15 thermal fragments including refitting pieces. Flint as group (2) above. Dark grey, worn, pitted, patinated cortex with some hard, thin, weathered chalky cortex.

(4) 13 flakes of good quality black flint with thin, worn, pitted dark grey cortex and some residual hard, thin, weathered, chalky patches. Includes 2 blade core rejuvenation tablets.

(5) 1 flake, 2 thermal fragments of light brown flint with small cherty inclusions. Cortex worn, patinated, hard, pitted.

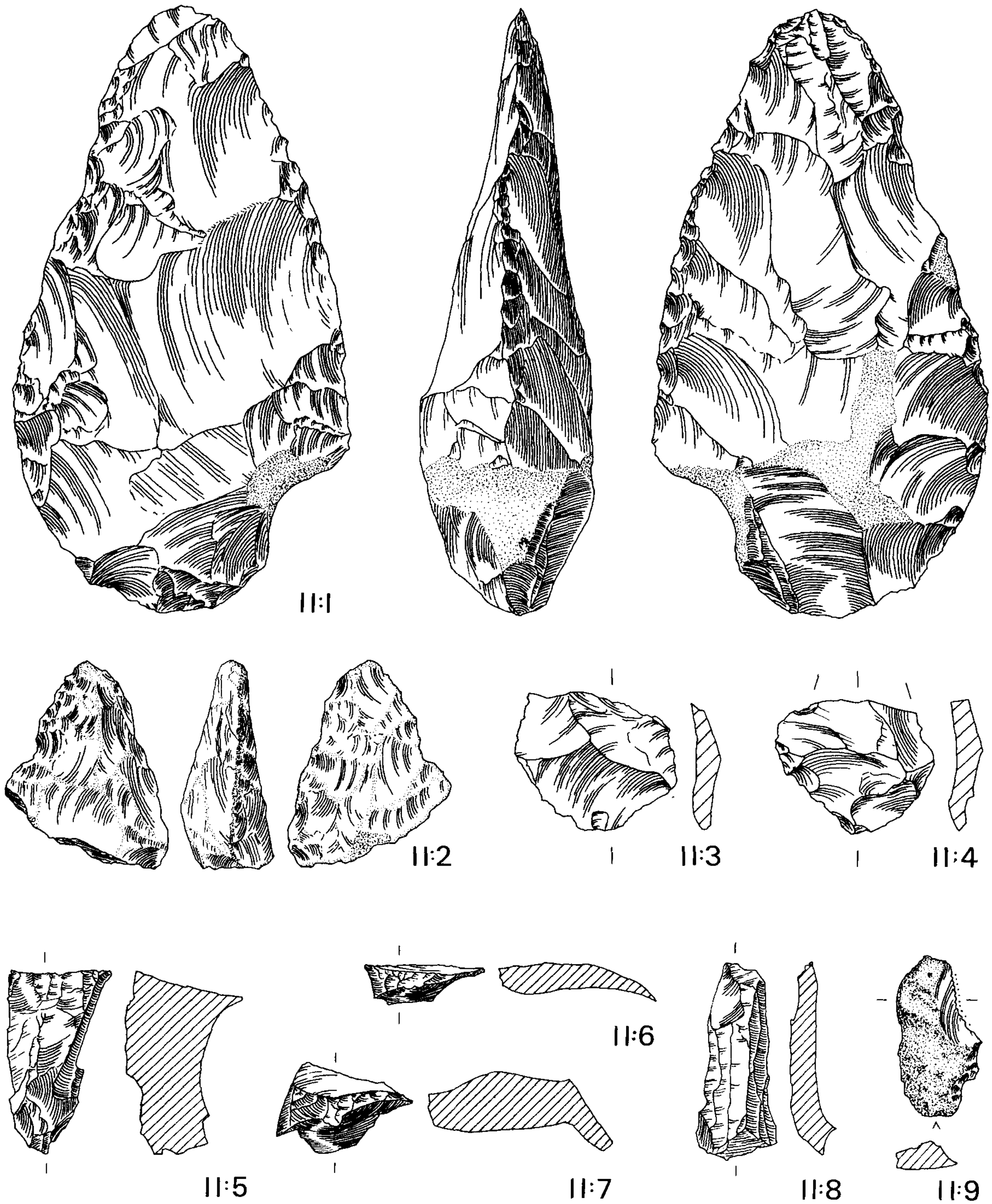

Fig. 11. Northwold Road 1981: Lower Palaeolithic 1–4 S.F. nos. 441, 412, 376, 379. (½) and Mesolithic flint 5–9: 175, 137, 159, 210, 179. (2/3).

(6) 2 cores, 8 flakes, 2 knapping fragments, 9 thermal fragments of miscellaneous worn, patinated, dark brown gravel flint.

Also present were 6 burnt flakes, 1 blue patinated flake and 8 chips too small for classification.

(iii) The cores.

Although not numerically sufficient to warrant detailed analysis these are informative about the technology involved. The nine cores range in weight from 170gm to 26gm averaging 73gm. At least seven show signs of having been made on nodules rather than fragments. Striking platforms were prepared by truncation of the top of the nodule and flakes removed down the axis of the core. Six cores have flaked platforms, two have thermal surfaces and one a cortical platform.

Rejection of seven cores resulted from the loss of a suitable flaking angle associated with some platform edge recession. Core tablets indicate that rejuvenation could occur at this stage. Additional cores were discarded due to hinge fractures or thermal fractures resulting in core breakage. Evidence for the production of controlled blades is restricted to a single exhausted blade core (Fig. 11.5). The remaining cores are mainly failed pieces limited to the removal of a few broad cortical and semi-cortical flakes.

The technique of cresting (lame à crête) was employed in core rejuvenation on the blade core and as a preparatory procedure on a single flake.

(iv) The flakes.

Despite the small quantity of complete flakes, they have been measured for length and breadth and the breadth: length ratio has been calculated for forty-five pieces. Where possible flake classification (Gingell & Harding, 1979, 73–76), cortical cover and butt type and width have also been recorded.

Flake length is clearly determined by overall size of the raw material, and it is therefore understandable that only two flakes should exceed 50mm. The largest proportion, eighteen flakes, measure 20–29mm; similarly twenty-five flakes measure 20–29mm in breadth. Elongated flakes of 3:5 or 4:5 breadth:length ratio contribute twenty-nine flakes. This general shape is reflected in the flake classification where flakes with a dominant ridge account for half those examined.

The flakes recovered may best be described as products of core preparation, at least half of those examined showing not less than 50% cortical cover as well as others possessing thermal surfaces.

Despite the absence of hammers from the industry, hard stone hammers were used exclusively, ventral surfaces conforming to features outlined above, together with eleven *burins de Siret*. A sample of seventy-seven flakes show a trend towards unmodified, plain narrow butts (35% up to 3mm), although 28% of the total have broader cortical or thermal butts, probably associated with core preparation stages. The trend towards narrow butts on prepared cores is reflected by platform edge abrasion to reduce overhang and allow percussion near the core edge. This feature is found on the prepared blade core, the blade fragments and platform remnants on core rejuvenation tablets.

(v) Tools.

No retouched tools were recovered from the industry with the exception of a flake which had its distal end removed to provide a Clactonian notch and a micro-denticulate (Fig. 11.9). This was made on a flake of Bullhead flint. Ten small serrations have been made along the concave right edge from the ventral surface.

(vi) Conjoinable fragments.

Eight thermal fragments and a core fragment, all from flint from group (3) above, were refitted into three separate groups (Fig. 10).

(1) Five thermally fractured fragments, two found together, forming a nodule 863gm in weight. The nodule could not be completely restored; the missing fragments were probably removed in the construction of the adjacent basement passageway. The nodule may have broken naturally as no negative facets were present. A thermally fractured nodule can however shatter on impact without leaving signs of percussion. The general absence of natural flint from the clayey silt makes it likely that these fragments are associated with the industry.

(2) Two small thermally fractured fragments found 2.5m apart, weighing 45gm. One fragment has negative flake scars which may be deliberate and which were removed following the intial fracture.

(3) Two fragments, one a core fragment, found 0.6m apart, weighing 73gm. The core fragment shows use as a bi-polar core producing long cortical flakes. It is not possible to determine whether fracture followed or preceded the use as a core.

Despite the presence of negative flake facets on two of the pieces, none of the conjoining surfaces can definitely be shown to have resulted from percussion.

(vii) Burnt flint.

A total of 166 pieces of burnt flint were located throughout the upper clayey silt. There was a slight increase in the distribution towards the southern end but this may have accumulated during resorting. An apparent concentration within the metre square excavated by trowel was probably accentuated by the excavation technique. The majority of pieces were small, 61% weighing less then 5gm, and were of fractured gravel flint. It is likely that this material is related to the associated flint industry and was produced in domestic fires, but intense natural fires or controlled forest clearance (Evans, 1975, 80 ff.) cannot be excluded.

Five pieces of burnt flint of similar type were recorded from the gravel. No charcoal survived.

(c) Bone.

Twenty pieces of bone and a tooth fragment were recovered from the gravel, located mainly in the northern channel of the stream (Fig. 9). All were heavily pyritised and none could be positively identified. The material almost certainly represents bone derived from the London Clay during the erosion of the stream bed. A piece of bone from the lower part of the clayey silts similarly shows signs of pyritisation and was probably redeposited during solifluction.

CONCLUSIONS

Since the 19th century it has been thought that implements could be found around Stoke Newington on an occupation surface or working 'floor'. Following the systematic excavation at Northwold Road it is now possible to suggest that many of the Palaeoliths in the area appear to be derived, despite the fact that Smith did find some evidence of *in situ* knapping. The gravel and sand at the base of the sequence probably accumulated in a variable energy, bed load dominated braided stream, in a cold, probably periglacial, environment. The eastward flowing stream, possibly the Hackney Brook, was transporting locally derived gravel which could have been partly introduced into the river by solifluction. This process would have supplied gravel by denudation of that underlying Stamford Hill. Artifacts known to occur in the Stoke Newington Sands, which outcrop on the sloping ground north of the site, would have been incorporated during the downslope movement of material. On the basis of a regional study (Gibbard & Harding, forthcoming) the Stoke Newington Sands and also their contained artifacts are thought to be of Wolstonian age. The occurrence of artifacts in the gravel indicates that reworking and active slope degradation was in progress at the time of deposition of the gravels and sands. The pyritised bone present in the gravels is of a type found in the London Clay and was therefore probably derived by fluvial erosion of local bedrock from the base and side of the channel or was incorporated by solifluction from the valley sides.

Wymer (1968, 318) and Roe (1968, 61 and Fig. 11) showed that the implements from Stoke Newington are dominated by generally small pointed handaxes, together with some finely finished side scrapers. Levallois technology is apparently absent. The results of the current excavation cannot confirm or deny this. Larger handaxes were however recovered by Smith similar in form to that found in the gravel. J. Cook, who examined this handaxe, is currently reassessing the implements from the area.

The artifacts contained within the gravels undoubtedly represent individual finds. Although they do not form a complete group, they do appear, technologically, to be the product of an industry producing handaxes. Early stages of production are represented by large cortical and semi-cortical flakes with broad plain butts. Secondary stages can be demonstrated by broad flakes with narrow butts, no cortex and multidirectional flake facets. Hard stone hammers appear to have been commonly used in both phases of production, although there is evidence for the use of a soft hammer in the later stages when thinning became important. Platform preparation too was apparently more important during thinning when it was preferable to produce an accurate blow near the tool edge.

The lower part of the clayey silt deposit is archaeologically sterile and overlies the gravel and sand surface. The undisturbed nature of this surface suggests that a relatively short period of time elapsed before deposition of the overlying clayey silts. Minor realignment and smearing of some gravel surface features together with overfolding of immature polygons at the south end of the site resulted from southward solifluction flowage of the clayey silt. Fine sediment deposition appears to have continued at the site for an indeterminate period. The upper part of this unit is richer in sand and proportionally poorer in clay; the sediments have also been modified by later weathering. The deposit resembles alluvium of a type aggraded during low energy, overbank flooding by the stream, the Hackney Brook. Mesolithic flint waste in this sediment was probably manufactured on the stream bank nearby. Refitting pieces suggest that dispersal was slight. The movement of clasts and pebbles into the stream sediments may have been achieved by rolling on a smooth, fine sediment surface by sheet flow during flood events. The sparse archaeological material implies that occupation was probably only temporary. Local gravel flint was used as raw material.

The general lack of diagnostic material amongst the Mesolithic finds makes interpretation and dating difficult. The large proportion of cortical flakes with broad butts suggests that core preparation may have been the predominant activity. Blank production of flakes and blades, removed by hard hammers, can be demonstrated by the find of an exhausted core and blade fragments. The narrow plain butts on these pieces are associated with platform preparation in the form of edge abrasion to the core edge allowing a deliberate blow near the core edge. Core rejection could be forestalled by the removal of a rejuvenation tablet. The general absence of finished implements may mean that any domestic activities were conducted elsewhere. The inclusion of deliberate blade production in the technology, together with the recovery of a micro-denticulate within the assemblage, suggests that this was probably the product of a Mesolithic industry. Diagnostic material of this period is rare from the area although an assemblage of probable Mesolithic date is known from the Hackney Brook (Lacaille, 1961, 123–125 and Fig. 4; 1970, 24) near its confluence with the River Lea. Tranchet axes also exist from Hackney (Wymer, 1977, 188).

No absolute dating evidence was found at the site; however, relative dates may be proposed on the basis of the site geology. The gravel and sand, together with the lower part of the clayey silt contain features indicative of a cold periglacial climate and therefore date from a cold stage. There is no reason to suppose, however, that the alluvial silts accumulated under a cold climate. The alluvial sediment is weathered and has undergone pedogenesis during the Flandrian. The presence of a soil in this sediment indicates that deposition ceased at some time in the Postglacial. It seems likely therefore that the alluvial silts, which contain the Mesolithic industry, were laid down early in the Flandrian. The suggested dates for this deposit and the archaeological contents may therefore be seen broadly to complement one another.

Since no hiatus has been found within the clayey silt there is no evidence that a long time period intervened between the deposition of the alluvial silts and the soliflucted sediments beneath. There is also apparently no great interval between the accumulation of the basal clayey silt and the underlying gravel and sand. The cold climate affinities of these deposits suggest that they are of immediately pre-Flandrian age, i.e. Late Devensian.

APPENDIX

THE POTTERY

Lyn Blackmore

In all a total of eighty sherds was recovered from the site, representing a minimum of seven vessels. Of these seventy-six sherds, of which sixty-nine are from the same vessel, are of 13th/14th-century date. Four very small sherds are possibly of pre-historic or Saxon date. The general condition of the entire assemblage is poor. Many sherds are small and abraded, some have the appearance of being waterworn, and a large number bear a reddish-brown concretion over all surfaces, including the fractures. No sherds merit illustration; even in the case of No.7 only a small portion of the vessel is represented, and it has not been possible to reconstruct a complete profile. The following fabric types are represented:

1. ?Prehistoric or possibly early medieval. Three small sherds, possibly from the neck of a handmade vessel. Soft micaceous ware tempered with very finely crushed flint, reduced throughout. Layer 7, Small Find No.96.
2. ?Saxon or possibly medieval. One small sherd (8 x 8mm) very fine micaceous ware, almost totally reduced, but having a dark reddish-brown outer surface. Possibly overfired or burnt London medieval ware. Layer 7.
3. ?13th century. One small sherd (15 x 15mm) very coarsely sand-tempered oxidised ware with external white slip. Probably from North London or South Herts. Layer 6/7.
4. 13th/14th century, London ware, Three joining sherds from a thumbed jug base, and one body sherd. Very fine micaceous fabric with occasional red haematite inclusions, largely reduced, with external white slip and very thin, patchy green glaze. Layer 6, Small Find No.6, Layer 6/7, Small Find No.93.
5. 13th/14th century, London ware. One small sherd fine, slightly sandy ware, oxidised throughout, with external white slip and vestiges of external green glaze. Layer 6, Small Find No. 5.
6. 13th/14th century, South Herts grey ware. One sherd very coarsely sand and grit tempered pale grey ware, with average wall thickness of 6–7mm. Layer 6/7, Small Find No. 265.
7. 13th/14th century, South Herts grey ware. Sixty-nine sherds, several joining, from a large jug with groups of multiple (?triple) thumbing around the slightly sagging base angle, and at least two parallel bands of horizontal rilling (*c.*10mm wide) around the girth and shoulder. Coarse sandy fabric with occasional fine inclusions of black and white flint, and some round grains of rose quartz and milky quartz. Pale grey core, orange margins, and pale grey to pinkish-brown surfaces, very eroded. Layer 6, Small Find Nos. 7, 8, 9, 10, 11 and 13 (sixty-four sherds found in a close group).

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