Straus L.G., Otte M. et Haesaerts P. (éds.), *La Station de l'Hermitage à Huccorgne*. Liège, ERAUL 94, 2000.

CHAPTER 7

THE 1991-1993 EXCAVATIONS BY THE UNIVERSITIES OF NEW MEXICO AND LIEGE

Lawrence Guy Straus

METHODOLOGY AND CHRONICLE OF THE 1991-1993 EXCAVATIONS

The Belgian-American team worked at Huccorgne from July 9-August 6, 1991, June 6-July 14, 1992, and June 22-July 9 and July 29-30, 1993. The 1993 campaign was preceded by the shovel removal of sterile loess Stratum 3 in squares J-L/53-55 of the Smetz area by members of the Belgian crew. The Belgian crew worked alone in digging the second Smetz area pit (JJ-KK/45-46) between July 1-9, 1993, but this pit was finished by the American crew. Each digging season was followed by days of artifact classification and drawing in Belgium. Total crew sizes varied from time to time, but were usually on the order of 10-12 people, mainly from the Universities of New Mexico and Liège, but also from Tohoku University (Japan), New College (Florida) and City University of New York, plus occasional, short-time visitor-participants (including ones from Belgium, Netherlands, Morocco, Poland and Spain).

Excavation was done by a combination of shovelling (in archeologically sterile deposits) and trowelling. For provenience control of screen and non-piece-plotted finds, each meter square was actually dug by quarter squares, labeled "a" (NW quadrant), "b" (NE), "c" (SW) and "d" (SE). Sediments (generally fine, powdery loess [wind-blown silt] or clayey silt) were dry-screened through 2.5-3 mm mesh. Nevertheless, due to the fine, loose texture and light color of the sediments, artifacts were generally found *in situ*, especially when trowelling. When digging in cultural layers, all *in situ* finds (lithics >1 cm in length; all teeth; bones >5 cm) were piece-plotted with reference to a metric grid we established for the main ("Dock" property) site (hereafter "HU") and which was later extended to the western ("Smetz" property) area (hereafter "HS"). We aligned the north-south axis of our grid so as to be roughly parallel to the main trends of the railroad and road cuts in their transections of the center of the known site. In this way the east-west axis of our grid was aligned with that of Haesaerts' deep stratigraphic trench dug into the western face of the railroad cut, which is where we began our work in 1991. Our grid was tied into property markers around the edges of the Dock lawn as they existed at the time. (It should be noted however, that some of the markers to which Haesaerts' grid had been tied for his 1976 trenches along the eastern face of the road cut were apparently already missing in 1991, thus making correlation of his trenches with our grid somewhat imprecise.) On the north-south axis the squares are labeled from A (which coincides with the southern end of the larger, northernmost of two shed) to Z and then from AA to NN (which corresponds to the southern end of the Dock property and the convergence of the rims of the road and railroad cuts). On the east-west axis the squares are designated from 0-55, with the "0" (zero) column being in the railroad trench, near its western edge. In order to accommodate a small test pit we dug on the eastern side of the railroad trench, we repeated the series of row letters ZZ-MM, this time descending northward from the "A" row, and we created a series of negative number column designations going eastward from "0"(zero) to -23.

The datum plane for our excavations was set by optical transit to be above present ground surface in all areas of the site and was marked at about 1.8 m above present surrounding

ground surface on sheds both north and south of our main (railroad-side) excavation, as well as secondarily on a metal utility pole (numbered--in 1991--by the Belgian electric company as "11") along the western side of the main (Moha-Huccorgne) paved road cut, 4 m north of the junction of a dirt road that provided entrance to the Smetz property and the western end of the oxbow ridge. The base of this utility pole is at 6.19 m below our datum plane. The site was mapped using the transit by A.E.Martinez, V.Ancion and Straus (Figure 1.3).

All finds were washed and labeled at the Université de Liège dig house in Dinant (kindly made available by the City of Dinant, Namur Province), where the artifacts were also measured and classified. All faunal remains were weighed, inspected for modification, and delivered to Prof. Achilles Gautier (Universiteit Gent) for identification and analysis. Some were then selected for AMS radiocarbon dating by the Lawrence Livermore National Laboratory (after biochemical analysis and collagen extraction by Dr. Thomas Stafford [INSTAAR, University of Colorado]) or by the University of Oxford Research Laboratory for Archaeology (Dr. Rupert Housley).

Stratigraphic sections were inspected and compared with his master sequences from HH by Dr. Haesaerts. The main pits at both HU and HS were sampled for pollen at the close of the 1991 and 1992 seasons respectively by Claudine Noirel-Schutz (Institut de Paléontologie Humaine, Paris). Unfortunately, all the samples turned out to be nearly or completely sterile.

Our work at HU (Dock property) began with the clearance of vegetation around Haesaerts' trench into the western face of the railroad cut; once that stratigraphy was visible and cleaned, we extended the upper part of that stratigraphic section back 0.5-1.0 m toward the west. We found the Gravettian cultural horizon at/near the base of a loess deposit. The cultural horizon became our Stratum 4, at the base of which is a reddish lens (a weathering/oxidation zone) which we called 4.1, but which archeologically is simply the lower part of Stratum 4. Our immediate goal was to try to expose this horizon over as large an area as possible between the railroad cut and the eastern edge of Destexhe's large block excavation in the center (and apparently richest, most intact part) of the site. We were helped in determining approximately where that was by Mr. François Tromme, an amateur archeologist who had participated in Destexhe's excavations. (Later, we were provided with copies of Destexhe's sketch plans by Haesaerts and these confirmed Tromme's indications and our own findings, namely our intersection of Destexhe trench walls in places where indeed they were to be expected.) In the eastern part of Destexhe's dig, Tromme reported that the Gravettian component lay no more than about 80 cm below the 1969 surface, although it became increasingly deeper (up to or somewhat over 2 m) toward the south and west. Our cleaning of the railroad cut section ended up covering a linear distance of 9 m corresponding to squares D-L/ 6. The discovery of large limestone slabs (a possibly man-made arrangement or feature) and bones in Stratum 4 of I-J/6 led us to also open the eastern halves of squares I-J/7 in 1991. More limestone slabs, numerous (albeit badly preserved) bones and flint artifacts (including several refits indicating the intact nature of this feature) were found and recorded. In order to more closely correlate the Gravettian cultural component uncovered by Haesaerts' roadside trenches, by Destexhe's central excavation block and now by our westward extension of Haesaerts' railroad section, in 1991 we also opened a 2x2 m *sondage* near the rim of the road cut about 4 m east of two of Haesaerts' 1976 trenches and (at the closest) 16 m southwest of our main block excavation near the railroad cut as the latter was eventually in 1992. Our roadside *sondage* corresponded to the northern half of Q/25-26, all of R/25-26 and the southern half of S/25-26. The Gravettian horizon was indeed reached at 1.9-2 m below ground surface, as predicted by Tromme and Haesaerts.

In 1992, in order to uncover a substantially larger area of the apparent feature near the railroad cut, we opened a further 3x3 m block corresponding to squares H-J/7-9, which was finally expanded to include K7 and the northern half of K8. To maintain close stratigraphic control, this area was initially dug as a series of three 0.5 m-wide slit trenches with temporary balks between them which were eventually removed to expose a broad area of the Gravettian horizon. A corner of Destexhe's main block was intersected by our square H9 and the end of one of his exploratory slit trenches was cut across by our square J9. We did not encounter the late 19th century trench of F. Tihon, although its northern edge is likely to lie within about a meter of our square L6 and an irregular disturbance in the SW corner of our square K7 might be a badger hole extending northward from Tihon's trench.

In 1992 we also opened a 3x3 m *sondage* (J-L/53-55) c. 2 m west of the rim of the road cut in the Smetz property, 43 m due west of our main Dock area excavation along the railroad cut. (This work took advantage of the fact that the trees in this former woodlot had recently been felled for lumber.) Ground surface here was at almost exactly (1.8-2 m below datum) the same elevation as in the area of our main excavation, but we could expect (given the already proven slope) that the Gravettian horizon would be considerably deeper here than at the eastern side of the site. The bottom limit for possible excavation in this *sondage* was provided by our discovery of weathered limestone bedrock outcropping below yellowish orange loess at c. 6.35 m below datum at the base of the unpaved entry road cut of the Smetz area of the site (hence c. 4.5 m below general ground surface in this area). It also outcrops along the base of the western edge of the main road cut, downslope (south) of this entry to the Smetz property. (The bedrock is also visible under loess and colluvia/alluvia along the southern face of the oxbow meander of the Méhaigne at the north side of the Smetz property.)

Finally, in 1992 we also dug a small step trench into the upper part of the eastern edge of the railroad cut at the edge of a sivicultural field owned by Mr. Y.Collinet. This was done to check if the site might extend this far toward the base of the Méhaigne valleyside in the direction of the Roua valley mouth. The area dug here included NN/-22, half each of MM/-22, NN/-21, NN/-23 and OO/-22, and a quarter each of MM/-21, NN/-23, OO/-21 and OO/-23--maximally 2x2 m. Correlation with Haesaerts' deep step trench dug from the top to the base of the western face of the railroad cut led him to suggest that the Gravettian component was missing along the eastern face in this MM-NN-OO section and that its strata corresponded earlier periods, with evidence of a dark brown loam weathering horizon (soil formation)(our Stratum E) that might date to the Moershoofd (c. 45 kya) or Hengelo (c. 38 kya) temperate/humid oscillation. Above this is a reddish lens (D), a grey-light brown calcified loess layer (C) topped by a mantle of stones. Above the stony layer is a thick stratum of pure light beige loess (B'). Haesaerts believes this layer to be equivalent to his level F on the west side of the railroad cut; this layer was leached and calcified during the Les Cottés (c.35 kya) temperate/humid oscillation. This in turn is overlain by a calcified yellowish-orange beige loess (B) with few stones. In turn, this layer is overlain by the surficial humic layer (topsoil)(A). The exhausted core fragment we found in the brown loam (E) is probably Mousterian. Deposits dating to oxygen isotope stage 2 may have been eroded away from this upslope area and indications of slope dismantling are present in the main site (especially at the eastern end of our main railroad-side excavation block) in the form of stony mantles within Stratum 3 (solifluction? colluvium?). However, we did find two atypical endscrapers in the lower half of loess Stratum B' and this could conceivably correspond to Stratum 4 in the main site, lying as it does atop a stony layer that could be equivalent to Stratum 5. If this hypothesis is correct, this unit would not correlate temporally to Les Cottés and the upper part of the stratigraphic sequence would not be missing in the footslope area east of the railroad cut. In that event, the calcified loess equivalent to Haesaerts' F (and hence possibly dating to Les Cottés, c.35 kya)

would be our east railroad trench Stratum C. It is, however, impossible to test these alternative hypotheses with the available data.

In 1993, the main "Smetz" *sondage* (J-L/53-55) was continued well below the probable Gravettian component, exposing a series of probable Mousterian levels (already hinted at in Tihon's, Haesaerts' and our Q-S/24-25 excavations). Finally, to test the southern extent of the site in the Smetz area and to check Haesaerts' hypothesis of channel flow disturbance of the Gravettian horizon along the western edge of the paved road (in Froment's sections of 1980), we laid out and dug a 2x2 m test pit (JJ-KK/45-46) near the southeastern ("downstream") corner of the Smetz property (not far from the property line of the "Hermitage" manor property). This pit yielded inconclusive, somewhat problematical results, which, nonetheless tend to support the disturbance hypothesis, although there is clearly an upper loess (4) lying atop a stony layer (5).

STRATIGRAPHIES

In this section, the stratigraphic sequences in our five excavations are described from an archeological perspective. All are described from top to bottom.

Step Trench at East Face of Railroad Cut (MM-OO/-21-23) (Figure 1):
Stratum A. Grey-brown, humic surficial layer (topsoil). 30-45 cm.
Stratum B: Orangish-brown, clayey loess with small stones. 5-25 cm.
Stratum B': Pure light beige loess; calcified. 80-90 cm.
Stratum C: Light brown, humic calcified loess with stones (some large). 30-35 cm.
Stratum D: Reddish (oxidation/weathering) lens. 2-4 cm.
Stratum E: Dark brown, humic, calcified loess (stoneless, but one flint core). 15-25 cm. (May correspond to Moershoofd or Hengelo temperate phase according to Haesaerts.)
Stratum F: Bright orange clayey silt (loess). 25 cm.
Stratum F': Yellow loess lens. 2-5 cm.
Stratum G: Light greyish loess. >10 cm.

HU ("Dock") Railroad-side block excavation (*H-K*/6-9, *with extensions*)(Figures 2-6):
Stratum 1: Grey-brown, humic surficial layer (topsoil: "A" horizon). 10-40 cm.
Stratum 2: Dark, yellowish or orange brown mottled silty clay with some water-worn pebbles. 25-65 cm. (Where 2 is subdivided, this upper unit is called 2.1 or 2.0 [crumbly, reddish clayey, silty loam]) Contains some modern artifacts. Stratum 2 ("B" horizon) *sensu lato* has rodent and worm holes and roots.
Stratum 2.2: Reddish-brown (weathering?) lens within 2. Discontinuous.
Stratum 2.3: Light yellowish beige-brown, less mottled silty clay-clayey silt. Localized lens.
Stratum 3: Gravelly, clayey silt with abundant, locally very dense limestone clasts-gravels. 20-25 cm. Sometimes divided into two distinct stony layers. Stone mantles are discontinuous; 3 is absent in some places. Some water-worn pebbles. A few isolated flint artifacts.
Stratum 4: Fine, powdery, yellowish beige loess ("lehm") with few stones (except in a possibly anthropogenic feature). 10-40 cm. The pure loess *per se* is discontinuous and its thickness is variable. Base of 4 can be marked by small channels or rills which are filled in with this loess. Locally dense artifacts and faunal remains, but more scattered in other areas.
Stratum 4.1: Reddish (weathering?) silt lens at base of 4. 2-10 cm. Archeologically coterminous with 4. Stratum 4 can infill rills and small channels in 4.1, suggesting a wet episode that interrupted early upper loess formation (i.e., the 4.1 weathering followed by erosion).
Stratum 4.2: Localized yellowish-beige silt lens with charcoal flecks. 5-10 cm.

Stratum 5: Stony layer, variably clayier or siltier, beige in color. More continuously stony ("pavement"-like) than 3. 15-35 cm. A few flint artifacts.
Stratum 6: Pure beige clayey silt (with few or no stones). 10-55 cm.
Levels observed only in cleaning the west face of Haesaerts' section along the railroad cut (H-J/4-5: Figure 2).
Stratum 7.1: Fine gravel. 6-8cm.
Stratum 7.2: Pure beige silt. 4-10 cm.
Stratum 7.3: Larger stones at top of Stratum 8. 6-10 cm.
Stratum 8: Beige, sandy, gritty silt with isolated stones and gravels. 60-65 cm.
Stratum 9: Beige, powdery pure loess, pinkish at base of exposed section. Columnar structure. A few isolated stones. c. 130 cm.

HU ("Dock") Road-side sondage (*Q-S*/25-26) (Figure 7)
Stratum 1: Grey-brown humic surficial layer (topsoil: "A" horizon). 10-15 cm.
Stratum 2: Yellowish-reddish brown silty, clayey loam ("B" horizon). A few isolated flakes and a reddened (burnt?) slab (=possible Mesolithic, as found nearby by Destexhe). 110-125 cm.
(Stony layer [Stratum 3] is absent here.)
Stratum 4: Yellowish beige loess (55-60 cm. thick) with thin but dense scatter of small flint artifacts and small water-worn pebbles at base.
Stratum 4.1: Thin reddish clayey silt lens (weathering horizon) at base of 4. 3-5 cm. Contains the lowest of the concentrated flints, whose distribution really cross-cuts 4.1 and basal 4. The flint and pebble scatter in 4 base/4.1 slopes downward and is less dense from NE to SW, suggesting a gentle wash in that direction. Indications of rilling.
Stratum 5: Beige-brown clayey silt/loess, locally rich in sandstone rocks and gravels. A few flints. 5-10 cm.
Stratum 6: Yellowish-beige, mottled, gritty, clayey silt with manganese oxide stains and fewer stones. > 50 cm. A blade at top of stratum and a piece of shatter at base; rest is sterile.

HS ("Smetz") Main Pit (J-L/53-55) (Figure 8)
Stratum 1: Grey-brown surficial humus layer (topsoil). 30-35 cm.
Stratum 2: Pure, yellowish-light brown to beige loess (without stones). Archeologically sterile (except for a railroad spike in an intrusive pit in J53, the NE corner, closest to the road cut). 160-190 cm.
(No Stratum 3; i.e., no upper stony layer.)
Stratum 4: Thick (65-110 cm) whitish-light beige compact loess ("lehm"). Scattered flints at base. Possible frost cracks (ice wedges?) at base. 60-110 cm.
Stratum 5: Stony layer with light, yellowish-beige silt matrix. Scattered flints (including some burnt), flecks of charcoal and bone. Possible frost cracks. 5-30 cm.
Stratum 6: Dark, reddish brown clayey silt with fewer stones. Archeologically sterile. Possible frost cracks. 5-30 cm.
Stratum 6.1: Localized lens of greyish, yellowish green sand in square L55.
Stratum 7: Wedge of mottled reddish or brown-beige clayey loess (thin at north; thicker at south). A few flints (including a refit pair). 10-20 cm.
Stratum 8: Pure, yellowish-beige loess, darker with depth. Scattered flints. Possible frost cracks. 45-55 cm.
Stratum 9: Orangish-light brown stony loess. Archeologically sterile. 10-15 cm.
Stratum 10: Pure, dark reddish-brown loess. A few flints. 10-20 cm.
Stratum 11: Light brown stony loess. Archeologically sterile. 20-30 cm.
Stratum 12: Pure, very pale brown loess. Archeologically sterile. >20 cm.

HS ("Smetz") Southeastern road-side sondage (JJ-JJ/45-46)(Figure 9)
Stratum 1: Grey-brown humic layer (topsoil: "A" horizon). 10-15 cm.
Stratum 2: Yellowish-orange brown crumbly loess-loam with roots and worm holes ("B" horizon). Archeologically sterile. 35-40 cm.
Stratum 3: Darker brown loess. ("C" horizon). Archeologically sterile. 10-25 cm.
Stratum 4: Beige-tan to light brown pure loess. Archeologically sterile. 85-90 cm.
Stratum 5: Thin (1-3 cm), discontinuous, convoluted lens of reddish brown loess (possibly equivalent to 4.1 in "Dock" area?), with weathered limestone *éboulis* blocks and a few water-worn cobbles embedded in underlying Stratum 6. A few scattered flints--some possibly artifactual. Cryoturbated and/or soliflucted? 5-20 cm.
Stratum 6: Very fine, powdery, pure, whitish-beige loess. Archeologically sterile. Cannot be far from bedrock, since this was found by Haesaerts and Froment in adjacent trench along west face of road cut and visible at edge of pavement at base of roadcut itself. >30 cm.

There are clear analogies among the stratigraphic sequences of our Dock railroad- and road-side trenches and our main Smetz *sondage*, with the principal exception that the upper stony layer (Stratum 3) exists only in the first area. This is no doubt because the limestone blocks and rocks are *éboulis* from the limestone cliffbase talus slope which is near to only the railroad cut at the eastern side of the site. The Gravettian artifacts--dense in the Dock property excavations and rather rare in the Smetz excavation--are found at the base of the fine, light yellowish-beige loess ("lehm") (Stratum 4), the bottom of which is locally weathered or oxidized (Stratum 4.1). This upper loess had already begun to be deposited when the first Gravettian occupations took place, perhaps during a humid phase which is represented by the weathering of its base (reddish 4.1), itself not very rich in flints (most of which are in the lower few cm of yellowish-beige Stratum 4 per se. The underlying layer (Stratum 5) is universally stony, even in the western (Smetz) area of the site. It and sometimes underlying Stratum 6 (clayey silt everywhere, except in the JJ-KK/45-46 *sondage* in the southern end of the Smetz property, where it is a loess and possibly not correlatable with Stratum 6 in the rest of the excavations) yielded a few scattered artifacts, possibly Mousterian in age (notably Levallois cores and flakes in our main "Smetz" pit and a sidescraper in our "Dock "roadside pit).

Haesaerts (1978; Froment 1980) established a composite stratigraphic sequence for the main HU site, based on his trenches all the way down the steep western face of the railroad cut (from which we extended our main block excavation) and along the eastern face of the road cut. His and our strata (from top to botto) are readily (if not exactly) comparable for the main HU ("Dock") site (Table 1):

TABLE 1.
COMPARISON OF THE STRATIGRAPHIES OF THE
UNM/ULg AND IRSNB EXCAVATIONS AT HUCCORGNE (MAIN / "DOCK" SITE)

Straus and Otte	**Haesaerts**
1	K (Humic topsoil) (Tihon's traces of possible Neolithic material)
2	H upper (=Destexhe's "Mesolithic")
3	H lower (=upper/reworked Gravettian material; possibly equivalent to B in the east section of the railroad cut)
4	G4-1 (basal 4+4.1, main Gravettian artifact layer = Haesaerts's G3 = Destexhe's Gravettian horizon; B' in our step trench on the east face of the railroad cut is possibly roughly equivalent)
5	F (=Haesaerts' uppermost Mousterian = Destexhe's Mousterian; base possibly corresponds to Les Cottés temperate oscillation according to Haesaerts; possibly equivalent to C in east railroad step trench)
6	E4 (?)
7	E3 (?)
8	E2 (?)
9	E1 (?) (Possibly corresponds to Moershoofd, according to Haesaerts; possibly equivalent of Stratum E in our small step trench in the eastern railroad section [MM-OO/21-23].)

The Gravettian artifacts are mostly situated within the bottom 10-20 cm of Stratum 4, as well as in 4.1--but mainly at the base of 4--in our excavation block east of the railroad cut. In our *sondage* near the western side of the road cut (Q-S/25-26) the artifacts are even more tightly localized in vertical space; they are almost all found within a spread of no more than 5-10 cm. The vertical distribution is more dilated in the western ("Smetz") J-L/53-55 pit, but artifacts there are, at any rate, much scarcer than in the main ("Dock") site area. The localization of the Gravettian flints (and bones, plus features) in the basal centimeters of the upper light yellowish beige coincides with earlier descriptions of the situation by Haesaerts, Destexhe and Tihon.

RADIOCARBON CHRONOLOGY

Following Destexhe's excavations, Haesaerts obtained a conventional radiocarbon date on a bulk bone sample (probably from several small pieces) from the Gravettian horizon by the Groningen laboratory: 23,170±160 BP (GrN-9234)(Caspar 1984, citing Haesaerts et al. 1981). Long accepted as a reasonable "Tursac" oscillation age for Huccorgne-Hermitage (albeit perhaps slightly "young"), this date is younger or much younger than the large, but discordant and stratigraphically incoherent series of conventional dates run on humic soils from within and below the Gravettian horizon at Maisières-Canal (35,970+3140/-2250 - 23,160+550/-510 BP, with most of the nine Louvain and Groningen determinations being in two clusters at around 30 kya and 25 kya) (Caspar 1984). The HH date was also rather late for a human occupation of NW Europe in the face of the onset of the Last Glacial Maximum (even if it did occur during the Tursac "amelioration"). For these reasons, it was imperative to obtain new, higher precision radiocarbon dates from this important site in Europe's "Far North".

The relative "abundance" of mammoth bones in our railroad-side block excavation provided the opportunity for trying to run several determinations, but the problem would be to

find adequately preserved collagen uncontaminated by humates, etc. Analyses of the organic content of bone samples were conducted by Dr. Thomas Stafford (INSTAAR, University of Colorado). Bone samples from Stratum 4.1 (squares Q/25-26) did not preserve sufficient collagen to be datable according to his analyses. However two individual (albeit fragmented), piece-plotted mammoth ribs--both from square J7c, Stratum 4 (at depths between 280-285 cm below datum in the "feature" and intimately associated with numerous flint artifacts) proved to be extraordinarily well preserved, with about 30% of the original amount of protein preserved and amino acid content essentially identical to that of modern bone collagen, meaning about 1000/3000 nanomoles of amino acids per milligram of bone. The percentages of nitrogen for these ribs are 1.15% (lab no. NSRL-1044) and 1.55% (NSRL-1045)(T.Stafford, *in litteris*, January 26, 1993). Two determinations were run under Stafford's personal supervision by accelerator mass spectrometry (AMS) at Lawrence Livermore Laboratories on each of these two bones: for NSRL-1044 on KOH-extracted collagen (base extracted gelatin hydrolysaty) and gelatin from bone collagen; for NSRL-1045 on KOH-extracted collagen and on the individual amino acid, aspartic acid, which can only have come from the bone. The latter of these determinations (CAMS-6371) should technically be considered the most valid of all the Huccorgne dates: 28,170±430 BP. It is statistically identical to the older of the two determinations run on the other rib: 28,390±430 BP (CAMS-5891) done on gelatin from bone collagen. Each of these two ribs also gave younger determinations on whole collagen: 26,670±350 (CAMS-5895) and 24,170±250 (CAMS-5893) respectively. The former of these whole collagen dates is statistically identical to a whole collagen AMS date run by Dr. Rupert Housley at the Oxford Accelerator Laboratory on a single bone from Stratum 4 at 277 cm below datum in upslope square J6: 26,300±350 BP (OxA-3886). It is also associated with several flints.

One additional date run by Stafford at Livermore on a bag of small bone fragments from Stratum 4 in square D6 along the west face of the railroad trench did not give such satisfactory results. Its nitrogen percentage was only 0.74% and the determination on aspartic acid yielded a date of 16,900±230 BP (CAMS-10365). Clearly this bulk sample was contaminated by some recent material (bone percolated from above or from the side via burrows?). Finally an attempt to date a small lump of charcoal found in Stratum 4.1 near the edge of the railroad trench in square G6 produced clear evidence of downward percolation (via burrows, roots, or worm holes?). The determination, done by AMS at Livermore, after sample preparation by the late Dr. Harrold Krueger at Geochron Laboratories, is 284±52 BP (GX-17016). Obviously this is charcoal from a 17th century fire that percolated downward the < 1 m from the ground surface at the time--or sideward the < 1 m from the side of the 19th century railroad cut.

In sum, the most likely radiocarbon age for the Gravettian component is probably around 28.3-26.5 kya, with the older estimate normally the best approximation. The younger 23-24 kya dates are likely to be explainable as the result of contamination from humic acids, etc., even if the possibility of several occupations--perhaps over an extended period of time--remains open. An occupation (or, more likely, a series of occupations) during the Maisières oscillation is probable and hence penecontemporaneous with the Gravettian horizon at the site of Maisières-Canal, 85 km to the west of HH in Hainaut. But visits to HH during the later Tursac oscillation are also conceivable, and would have represented the very last times that humans were present on the territory of Belgium until recolonization during the Upper Magdalenian, c. 12,600 BP (uncal.). All the radiocarbon dates from HH are detailed in Table 2.

TABLE 2
HUCCORGNE GRAVETTIAN / STRATUM 4
RADIOCARBON DETERMINATIONS

Lab Numbers	**Material**	**Square**	**Method**	**Date**	**±1 Sigma**
GrN-9234	bbc	Destexhe	conv.	23,170	160
CAMS-5893(NSRL-1044)*	ibc	J7	AMS	24,170	250
CAMS-5891(NSRL-1044)*	ibg	J7	AMS	28,390	430
CAMS-5895(NSRL-1045)^	ibc	J7	AMS	26,670	350
CAMS-6371(NSRL-1045)^	ibaa	J7	AMS	28,170	430
OxA-3886	ibc	J6	AMS	26,300	350
Dates to be rejected as too young, due to contamination:					
CAMS-10365(NSRL-558)	bbaa	D6	AMS	16,900	230
GX-17016	ch	G6	AMS	284	52

bbc=bulk bone collagen; ibc=individual bone collagen; ibg=individual bone gelatin; ibaa= individual bone aspartic acid; bbaa=bulk bone aspartic acid; ch=charcoal.
*=same bone; ^=same bone; conv.=conventional radiocarbon; AMS=accelerator mass spectrometry.

In the larger "Smetz" area excavation, at the top of Stratum 5 in square L54, we uncovered a surface "paved" with limestone clasts, some of which were reddened and broken, presumably by fire. Among these stones were a few artifacts including five burned flints. Two of these plus a piece of burnt limestone, together with associated silt samples, were sealed in aluminum foil and sent to Drs.Hélène Valladas and Norbert Mercier of the CNRS Centre des Faibles Radioactivités in Gif-sur-Yvette (France) for thermoluminescence dating. They provided a dosimeter which was placed by J-M. Léotard in the stratigraphic section at a depth corresponding to the Mousterian "pavement". Unfortunately, as reported by H.Valladas (*in litteris*, 15 September, 1998), the stones proved to have been insufficiently heated to be datable. Such dating would have allowed us to test the hypothesis that there had been a major depositional hiatus between the Mousterian component in Stratum 5 and the apparent traces of Gravettian occupation in Stratum 4.

GRAVETTIAN FEATURES: NATURAL OR ARTIFICIAL?

Both the Tihon and Destexhe excavations uncovered evidence for concentrations of knapping debris (i.e., the abundant flint artifacts in the Gravettian horizon at the top of the ridge in the "Dock" area were not distributed evenly across the surface). Both excavations also yielded indications of hearths, with hints of more or less circular clusters of débitage around these features, which are unfortunately not further documented (see Otte, chapters 4 and 5, this volume). Haesaerts also found areas of densely concentrated flints, sometimes associated with limestone slabs along the east side of the road cut (notably in his P115-116 squares). In contrast, other areas had much lighter scatters of flints.

Neither Haesaerts' nor our excavations produced evidence of heaths, probably because both were rather peripheral to the central area of the site. However, like Tihon and Destexhe

(and unlike Haesaerts), we did uncover relatively substantial quantities of bone (especially mammoth) associated with several large limestone slabs and a concentration of flints at the base of Stratum 4/Stratum 4.1 in squares I-K/6-8 (Figure 10).

Obviously, interpretation of this concentration of stones and bones requires some discussion of the possible role of natural processes before attributing all aspects of the pattern to human activity. Limestone blocks are absent in Stratum 4 in our western (roadside) *sondage* in the "Dock" area; they were not common in equivalent Stratum G in Haesaerts' trenches along the eastern face of the road cut; and they are very rare in the apparently equivalent loess stratum 4 in our J-L/53-55 "Smetz" area excavation. On the other hand, the stony layer (Stratum 3--sometimes with two separate mantles of stones), is present only in our western railroad-side excavation: mostly at the easternmost side closest to the railroad cut and--more relevantly--to the talus at the foot of the gorge-side cliff. (Stratum 3 is absent at the western end of the excavation block.) So it seems most likely that the limestone blocks in the upper zones of the HH stratigraphy came from the cliff. On the other hand, the concentration of slabs and blocks in the "feature" is *not* aligned parallel to the talus slope as one would expect if the clasts had simply rolled, slid or flowed in solifluction down from the cliffbase to their ultimate resting place. Instead, the concentration of blocks and large bones seems to be oriented at roughly 45º to the axis of the cliffbase, although a few individual bones and blades are in fact oriented almost perpendicularly to the axis of the concentration as a whole. This would suggest that some human arrangement may have occurred, at least as concerns the larger blocks. In addition, the rocks are intimately associated with remains of mammoths and other ungulates (horse, deer) and with distinct concentrations of flints, many of which refit (see Martinez, this volume). Among the flint artifacts in this "feature", there are two cores, one of which provided a significant number of refits.

With a degree of imagination, one can "see" in this concentration two curvilinear strings of rocks--both open to the west-northwest and both facing a larger block from which they are separated by c. 50-70 cm. The mammoth long bones, intermingled with the stones as they are (especially in the larger of the two sub-clusters), could be speculatively interpreted as construction elements. Each of the two sub-clusters also has a fairly clear concentration of lithic artifacts (mainly debris). These are centered on K8a and J7b+J6a (the latter including the refitted blade core). Could the two crescent-shaped groups of rocks and bones represent the bases of some small sort of shelters or windbreaks facing individual seats? If so, their orientation would seem to be wrong. And there is no evidence of hearths (or pits). Among all the squares over which the "feature" occurs there is no more than a dozen burnt flints, one calcined tooth and less than a half-dozen possibly burnt bones. There are no fire-cracked rocks. Deliberate structure remnants or not, the two sub-clusters of rocks and bones and the concentration as a whole do stand out relative to the amounts of material we found in adjacent squares; there are few if any limestone blocks or bones and relatively few stones in squares H-J9, I8, H6-8, K-L6 or D-G6 outside the "feature" area. Interestingly, more than half the retouched tools (11) we found in our main, railroad-side excavation were found in or very near this concentration of blocks and stones. In fact, these (few!) tools represent nearly half of all the tools we found in both our excavations in the "Dock" area. In contrast, the amounts of débitage are impressive, emphasizing the central lithic workshop function of the HH site. The concentration we found--whether it is a deliberate, constructed feature or not--concords with the earlier observations by Tihon and Destexhe of distinct knapping areas in the central part of the site. The refits attest to a high degree of integrity in at least the eastern part of the site and they suggest at least two (and probably more) visits to the site within a fairly short period of time. The western end of the "feature" is underlain by an east to west trending channel cut into Stratum 4.1 and filled with beige Stratum 4 loess (Figures 11 and 12). This is probably a natural

feature that existed on the landsurface before the slabs and bones of the concentration were deposited in squares J8-9.

The contrast between our "railroad-side" (eastern) and "road-side" (western) excavations on the "Dock" property is great. Strata 4+4.1 in the latter *sondage* (Q-S/25-26) yielded no limestone blocks, virtually no faunal remains (4--mainly teeth--versus 193 bones and teeth in the eastern excavation block), and a much lower percentage of microdébitage than in the eastern excavation (23.7% trimming flakes + shatter versus 55.6%). Perhaps the very light-weight chips had been winnowed or washed away from the western part of the "Dock" area, where Haesaerts suspected that there had been a gully in Gravettian times. Strata 4+4.1 in the Q-S/25-26 pit also have a few water-worn pebbles. In short, there is no indication of any anthropic feature here, but, to the contrary, suggestions of some (at least slight) reworking by water flow and rilling on a gentle slope oriented toward the southwest, although there do not seem to be preferred orientations among the limited sample of elongated objects (i.e., blades). The *in situ* concentrations of knapping debris (activity areas) found by Tihon, Destexhe and us were located a few meters upslope, toward the east. Our eastern excavation area presents all the signs of *in situ* knapping: very abundant microdébitage, cores and numerous refits. Indeed the large limestone slabs could at least be interpreted as having served as seats used during knapping, whether they were moved by humans or not.

A MOUSTERIAN HEARTH?

As noted above, when we reached the top of stony Stratum 5 in the main "Smetz" area pit, we found a number of burnt (reddened, cracked and/or potlidded) pieces of limestone and flint concentrated in the southwestern half of square L54 (Figure 13). The burnt limestone rocks total 12 and the burnt flints are 5 (plus a few very small reddened chips). (Unfortunately there are no preserved faunal remains here or elsewhere in the J-L/53-55 pit.) There was no hint of a pit or of any particular arrangement of the burnt stones that would set them apart from the apparently naturally stone-"paved" nature of Stratum 5. Nor was there evidence of burnt (reddened) sediments. Charcoal and ash--if ever present--were not preserved, although a lump of charcoal had been found a few centimeters higher. To the north of this small concentration of burnt stones, in adjacent squares K/54-55 (plus a small area of the southwest corner of J54), there was a very large limestone block (c.170x130 cm) at the top of Stratum 5. The southern edge of this block was no more than 30 cm from the northernmost of the burnt limestone rocks and 75 cm from the northernmost burnt flint. It is possible that this large, strangely isolated block served as "site furniture", namely a fireside seat. It is unclear as to whether the block was brought here from elsewhere by humans or not, although it is hard to see what natural phenomenon could explain its presence here. All the other limestone blocks in Stratum 5 are *much* smaller, the largest being no more than 30-40 cm long.

This "hearth" was 2.9 m below present ground surface. It is in a matrix of compact, slightly clayey, orangish-light brown loess. The oxidated (weathered) base of overlying Stratum 4 (light beige powdery loess) has calcium carbonate concretions ("*poupées*"). The tops of the Stratum 5 limestone rocks also have a calcium carbonate precipitate crust. There seems to have been a very wet episode after deposition of Stratum 5, whose rocks served as an "armor plate" to hold the surrounding sediment in place. First there was erosion of whatever had been deposited above the Stratum 5 stony "pavement"; then there was calcium carbonate precipitation; and finally, after Stratum 4 loess had begun to be laid down, there was an episode of weathering. The first (and most significant) of the humid periods presumably responsible for these

phenomena, could pertain to either some phase early within the Würm Interpleniglacial or even to the Last Interglacial (or a later humid phase of oxygen isotope stage 5). Discriminating among these possibilities is impossible at present without radiometric dates (given the failure of the attempt to TL date the burnt flints) or diagnostic fauna. That Stratum 5 is Mousterian seems well established by the presence in square J55 of a centripetal Levallois core and a Levallois flake with a facetted platform which refits with the core. The presumably Gravettian artifacts at the base of Stratum 4 were within only a few centimeters of the top of Stratum 4 and included some narrow, elongated blades that would fit well into the Gravettian assemblages from the main ("Dock") site.

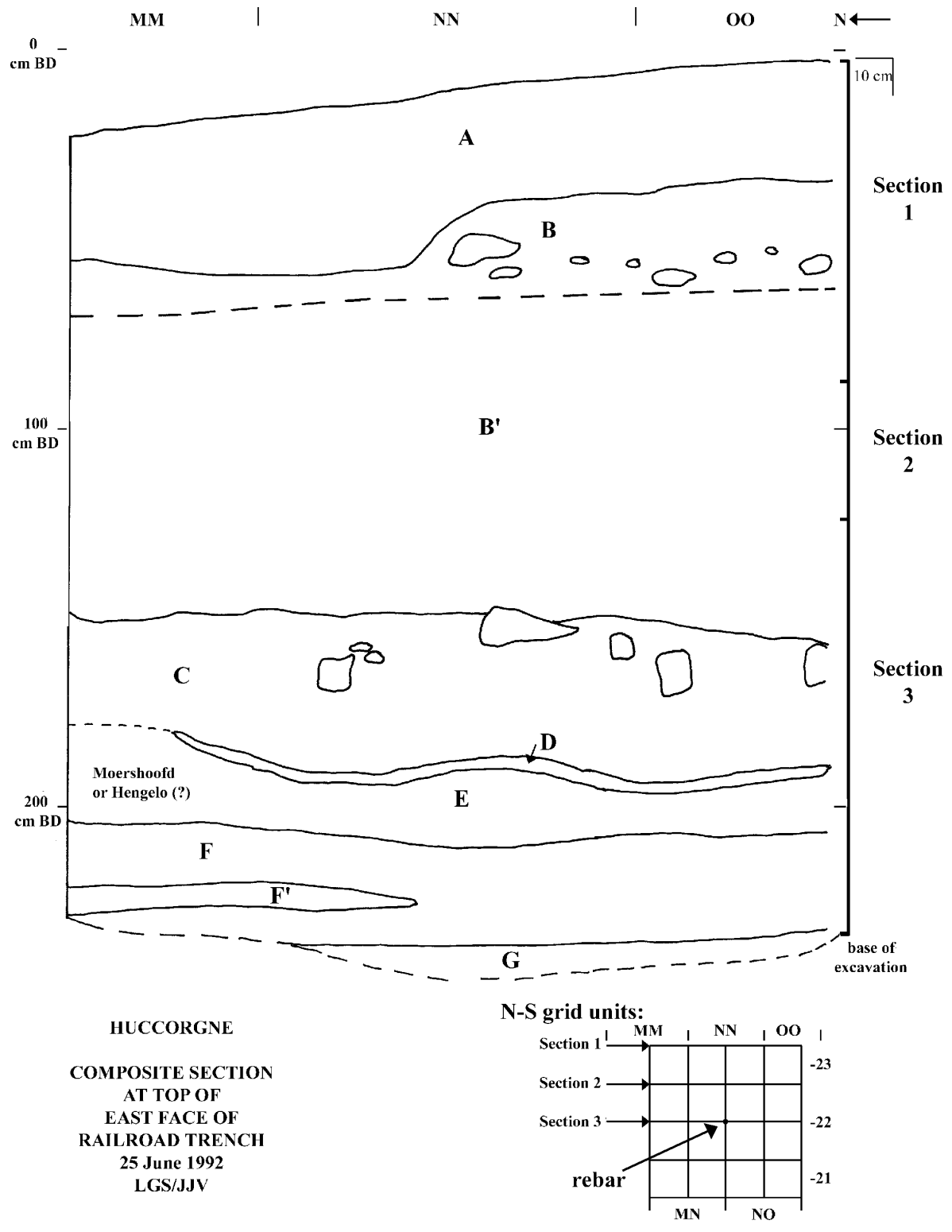

Figure 1. Huccorgne. Composite stepped stratigraphic section of MM-OO/21-23 (east face of railroad trench). Stratigraphy: A: humus, B: orangish brown clayey loess, B': pure light beige loess, C: light brown humic layer, calcified loess, D: red, E: darker brown humic calcified loess, F: bright orange loess (clayey), F': yellow loess lens, G: light greyish loess. Sections: 1: at 100 cm east of rebar, 2: at 50 cm east of rebar, 3: at rebar. Grid at bottom indicate location of the tri-section stratigraphy.

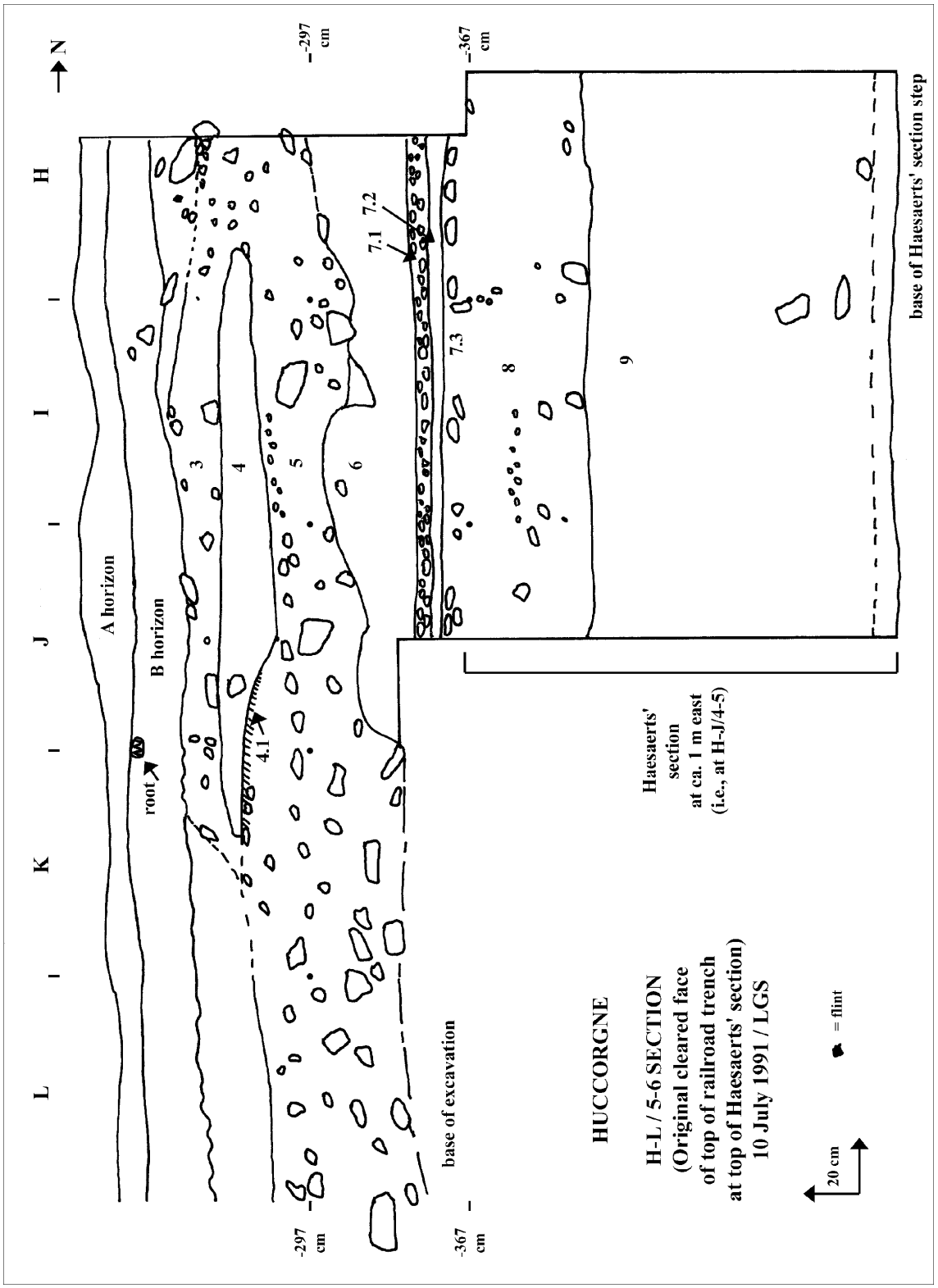

Figure 2. Huccorgne. H-L / 5-6 section (original cleared west face of top of railroad trench at top of Haesarts' section). Stratigraphy: A horizon: humus; B horizon: grey, mottled, clayey silt; 3: yellowish-brown clayey silt (without stones in L-K, stony in K-H); 4: light yellow silt without stones; 4.1: red lens with gravel; 5: stony layer; 6: yellowish-beige clayey silt (loess); 7.1: fine gravel layer; 7.2: pure silt; 7.3: larger stone layer; 8: beige, sandy, gritty silt; 9: pure loess, beige, very fine, powdery, pinkish at base of stratum.

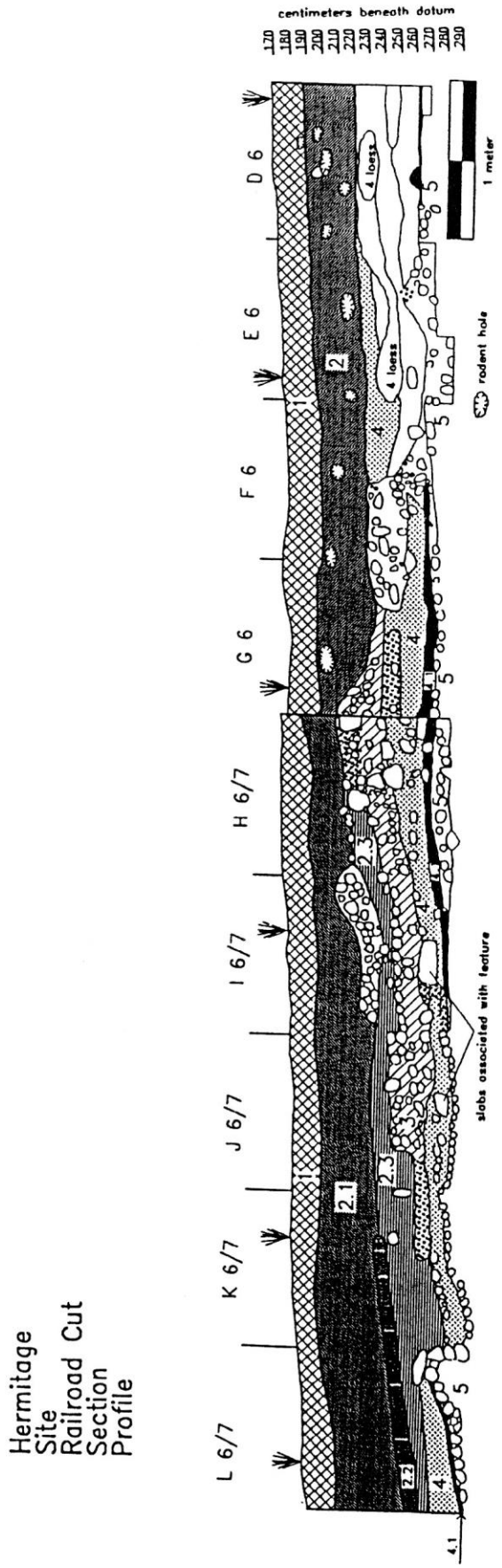

Figure 3. Stratigraphic section D-G/6 mid + H-L/6-7 (railroad-side excavation, "Dock" area).

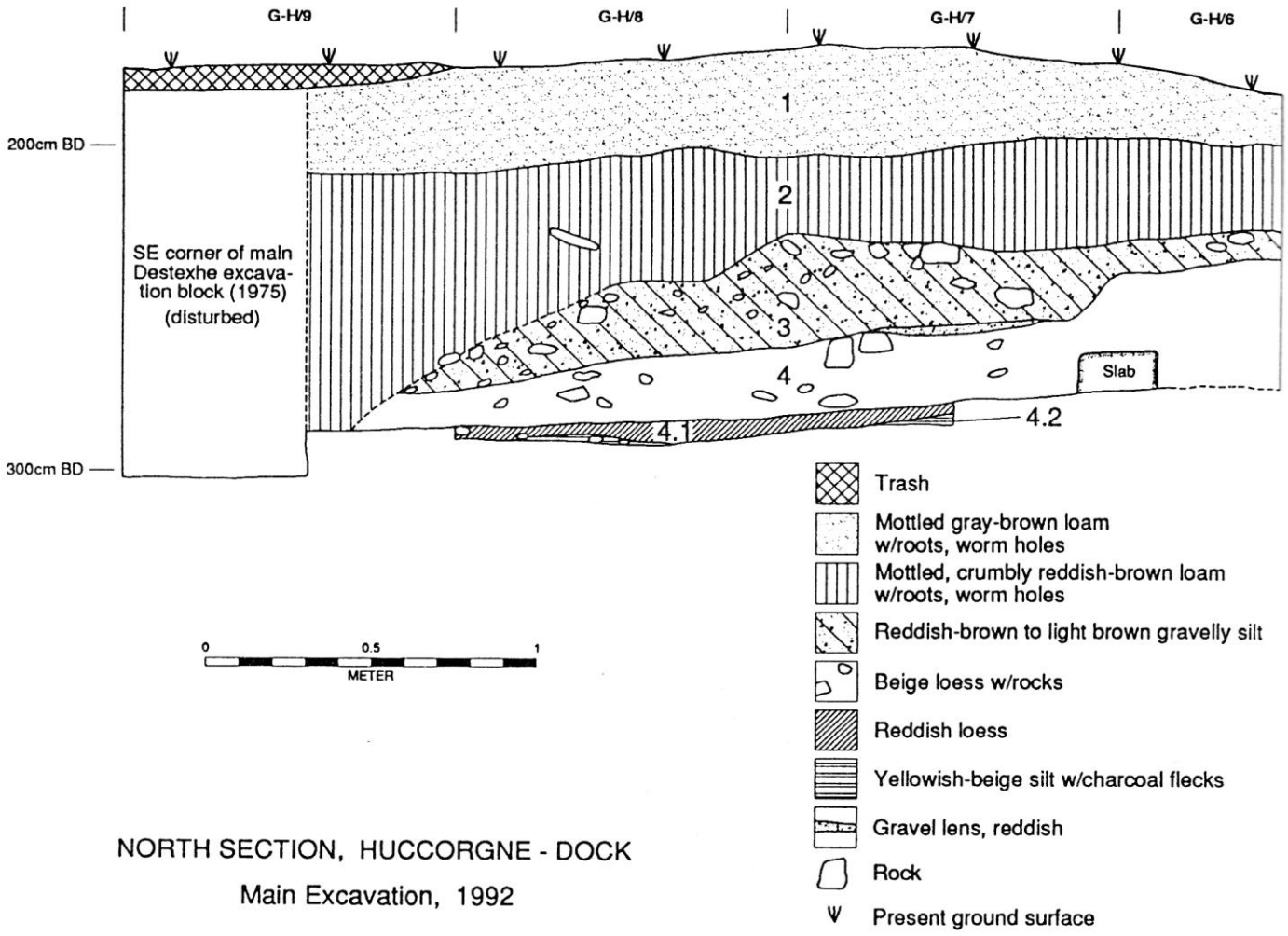

Figure 4. Stratigraphic section G-H/6-9 (railroad-side excavation, "Dock" area).

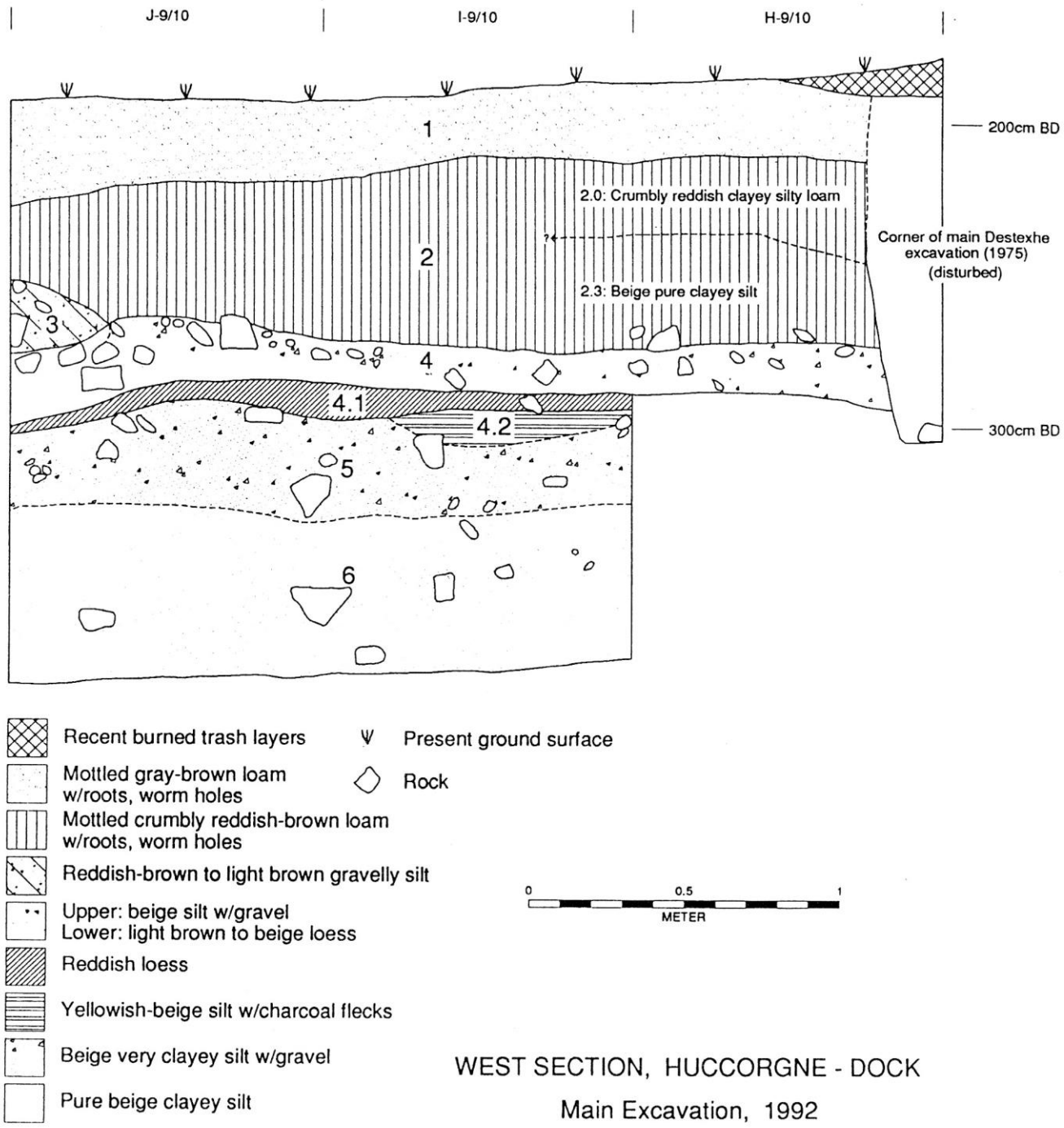

Figure 5. Stratigraphic section H-J/9-10 (railroad-side excavation, "Dock" area).

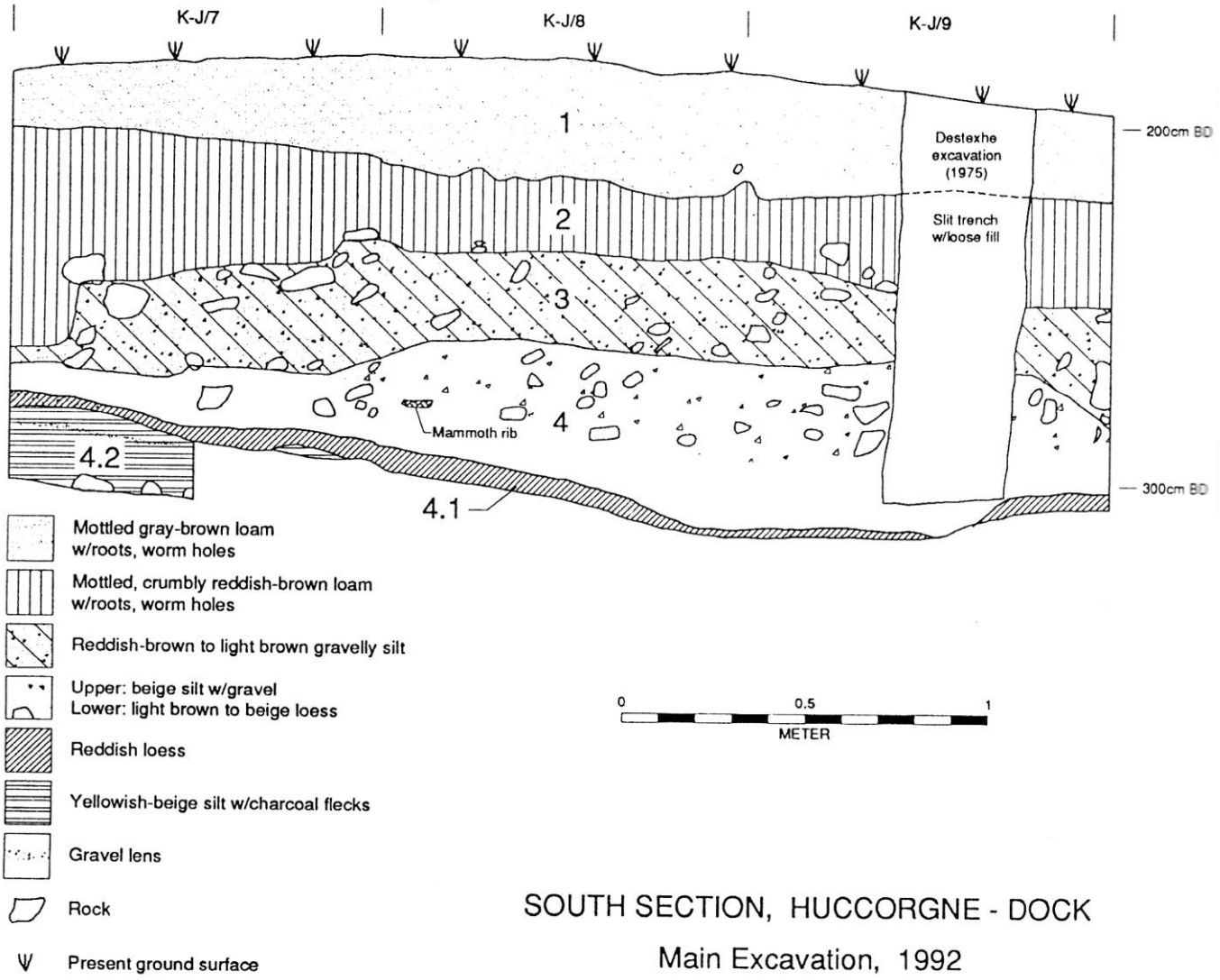

Figure 6. Stratigraphic section J-K/7-9 (railroad-side excavation, "Dock" area).

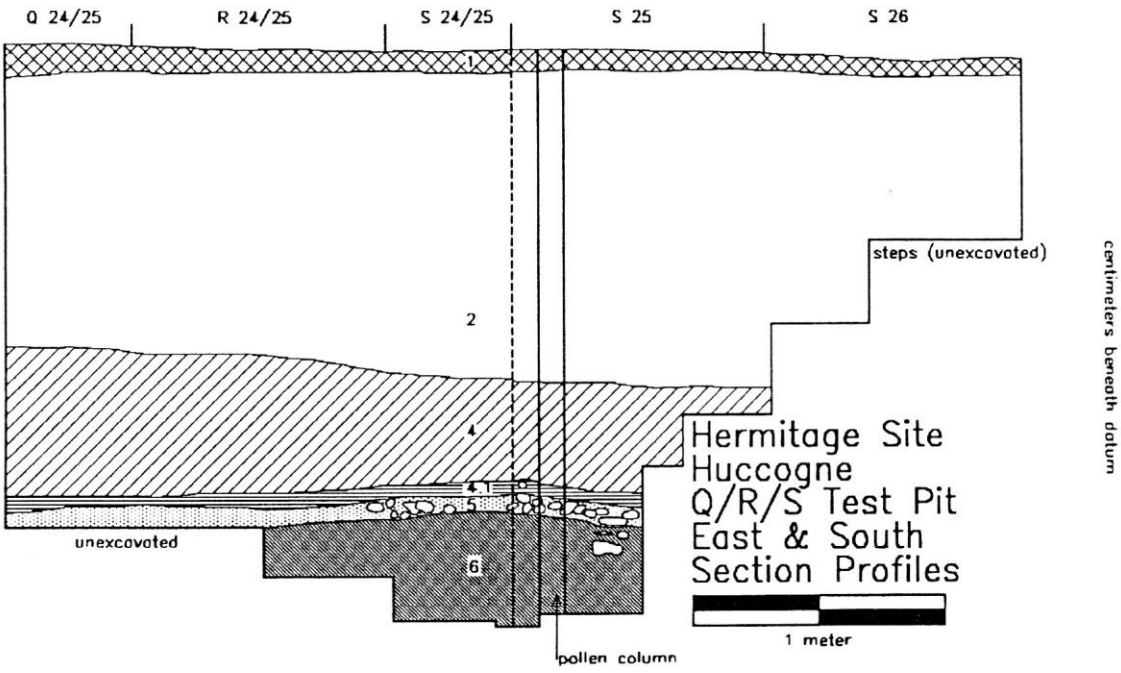

Figure 7. Stratigraphic sections Q-S/24-25 + S/25-26 mid (road-side sondage, "Dock" area).

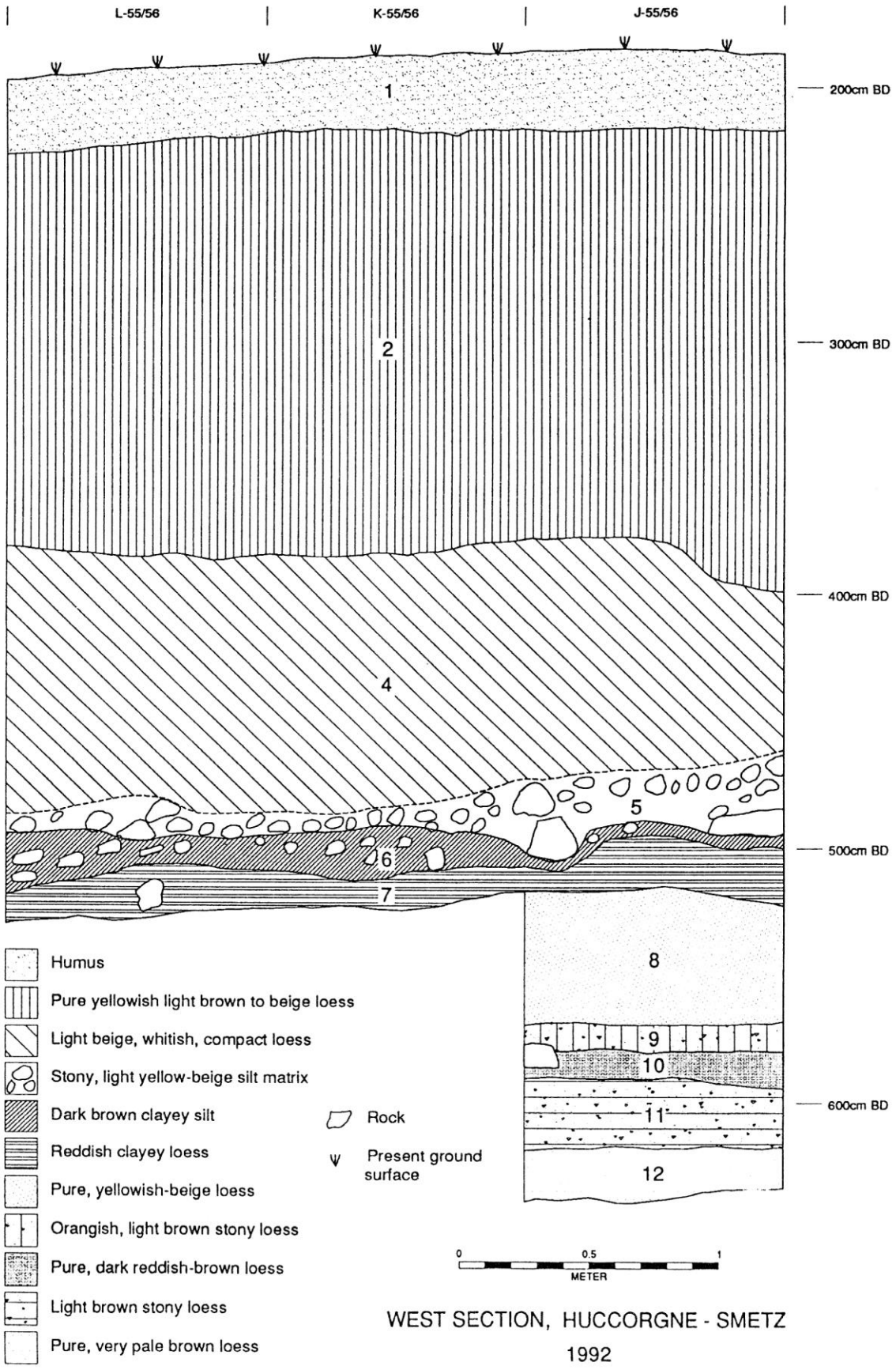

Figure 8. Stratigraphic section J-L/55-56 (main west /"Smetz" area excavation).

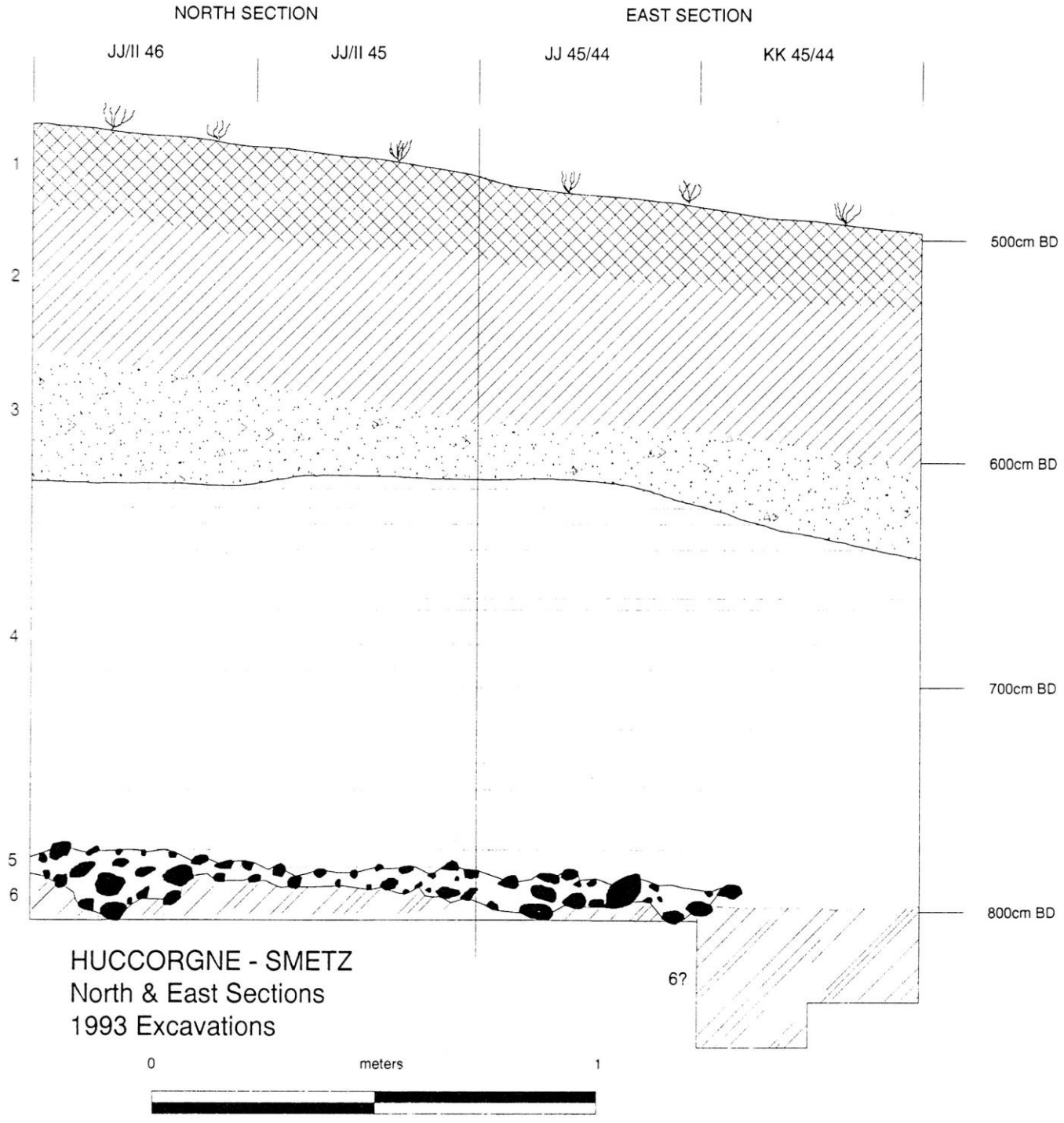

Figure 9. Stratigraphic sections JJ-II/45-46 + JJ-KK/45-44 (west/"Smetz" area sondage).

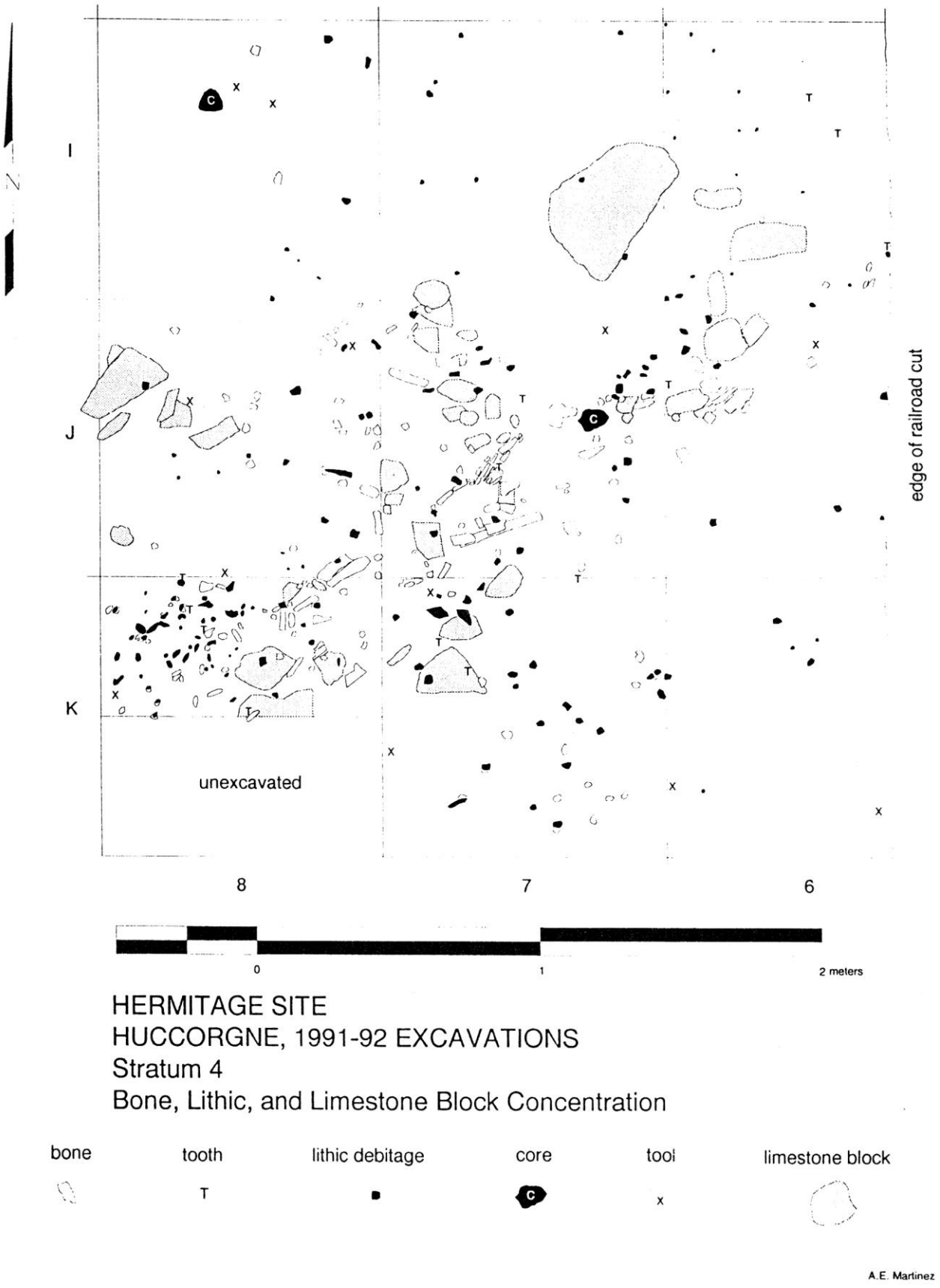

Figure 10. Plan of "feature", Stratum 4, squares I-K/6-8.

Figure 11. Plan and longitudinal profile of channel, Stratum 4.1, squares J8-9 (railroad-size excavation). Channel filled with Stratum 4 material (pure, almost sterile, light brown-beige loess). The base is formed by sloping continuous Stratum 4.1 material.

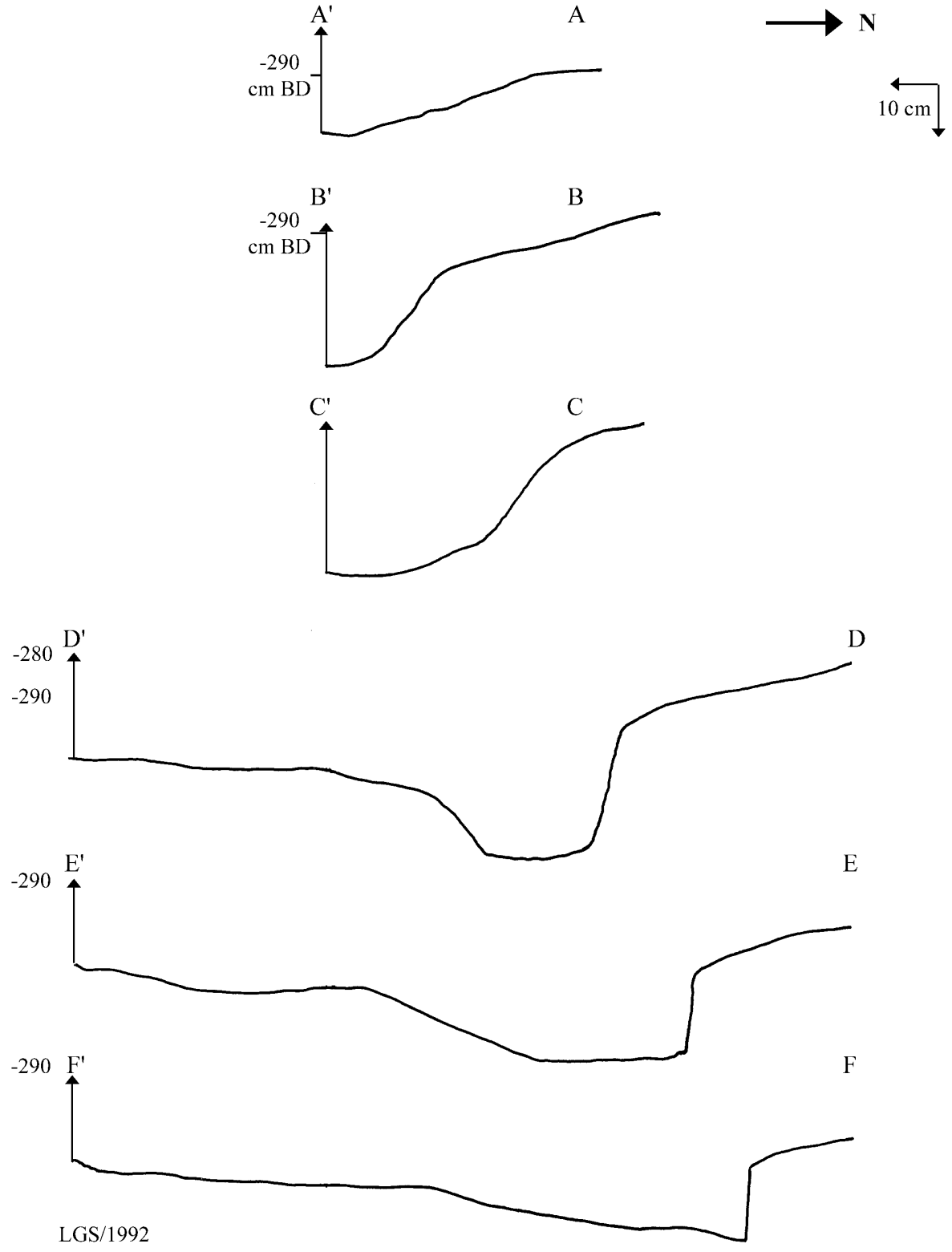

Figure 12. Transversal profiles of channel, Stratum 4.1, squares J8-9 (railroad-side excavation). Cross-sections of "channel" in J9 and J8 on S-N axes. Ground surface at top of Stratum 4.1 (reddish, gravelly).

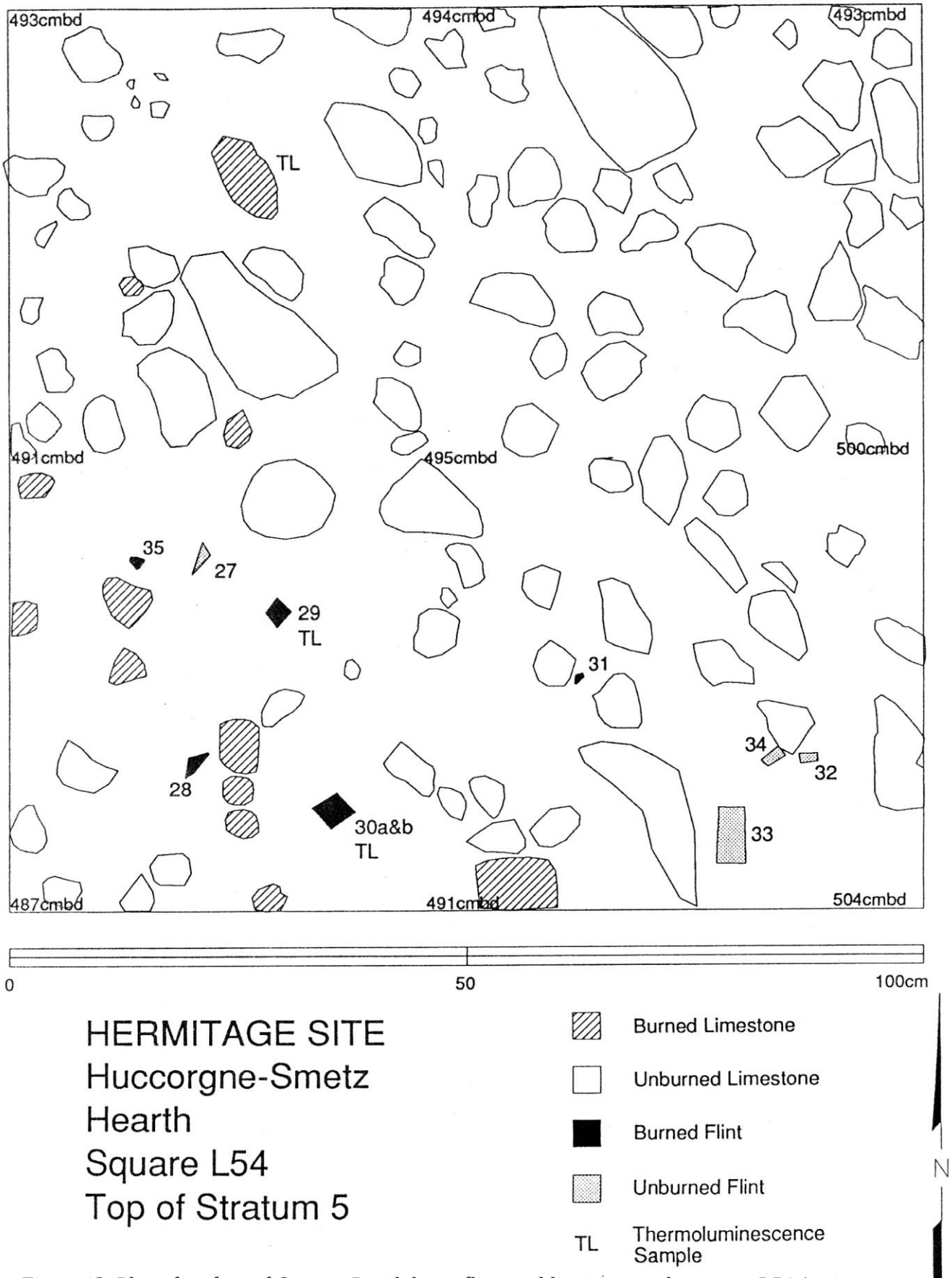

Figure 13. Plan of surface of Stratum 5 with burnt flints and limestone rocks, square L54 (main west area excavation).

Plate 1. 1991 excavation along the westernface of the railroad cut in the main ("Dock")area, at the top of the section dug by Haesaerts in 1976.

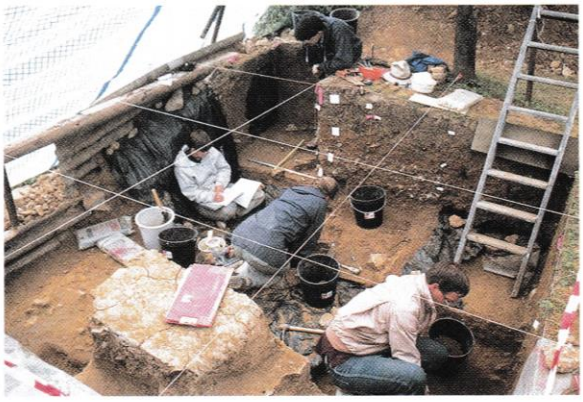

Plate 2. 1992 excavations adjacent to the railroad cut in the main ("Dock") area.

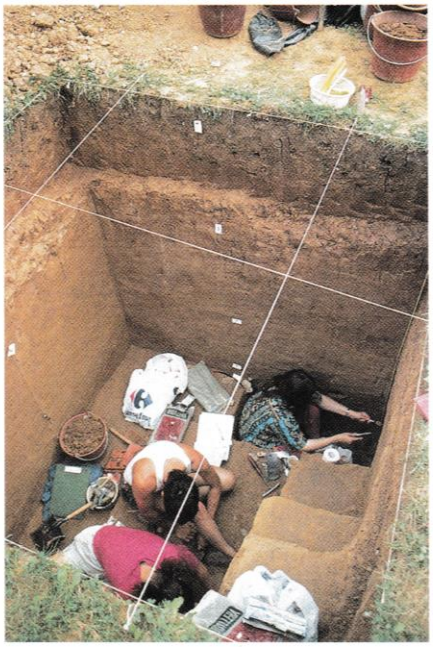

Plate 3. 1991 sondage adjacent to the road cut in the main ("Dock") area.

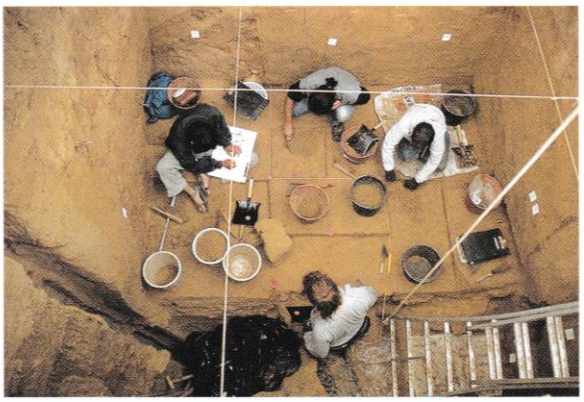

Plate 4. 1993 excavation of the larger trench in the western ("Smetz") area.

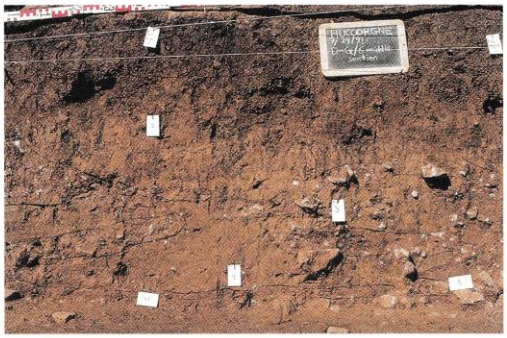

Plate 5. South-north stratigraphic section midway through squares F-G/6 along the top of the railroad cut at the eastern edge of the main ("Dock") area.

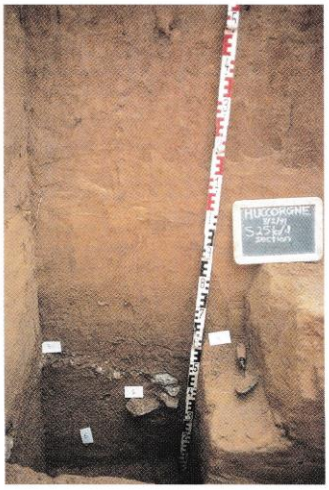

Plate 6. Stratigraphic section mid-way through square S25 in the *sondage* adjacent to the road cut in the main ("Dock") area.

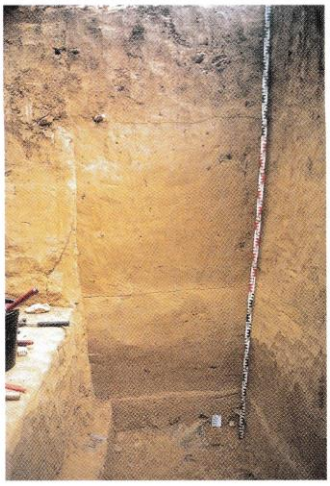

Plate 7. L-M/55 stratigraphic section of the larger excavation trench in the western ("Smetz") area; note stony Stratum 5 with Levallois core at the base of photo.

Plate 8. J6, Stratum 4 "feature" before removal of bones.

Plate 9. I-J6, Stratum 4 "feature" after expansion of excavation and removal of bones.

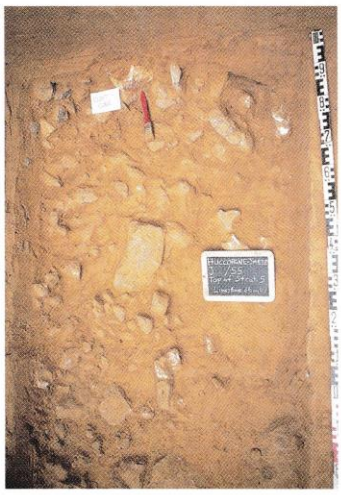

Plate 10. Stony pavement with burnt flints and limestone rocks ans de Levallois core at top of Stratum 5 in J55