L. G. FREEMAN, JR.
Department of Anthropology, University of Chicago
K. W. BUTZER
Department of Geography, University of Chicago

The Acheulean Station of Torralba (Spain): A Progress Report

INTRODUCTION

Under the direction of Professor F. Clark Howell of the University of Chicago, a multi-disciplinary program of research and excavation of the Middle Acheulean open-air stations of Torralba del Moral and Ambrona (Soria, Spain) has been under way since 1961. Excavations have now been completed at the site of Torralba, and analysis of the distribution of artifacts on some of the occupation surfaces is largely finished. A preliminary report, based on the 1961 excavations of this site, has been published by Howell et al. (1963). The accumulation of evidence has since continued, and it adds much detail to the outline presented in the preliminary report.

The geological stratigraphy and a paleo-environmental interpretation have been published by Butzer (1964 c, 1965). Sedimentary analyses were carried out by the Instituto Lucas Mallada (Madrid) through the courtesy of Professor F. Hernández-Pacheco in 1962-3, and more detailed sedimentological studies are underway. Pollen analyses of about 145 samples from the site have been carried out by J. Menéndez-Amor and F. Florschütz, who will discuss their results in an interim report. The faunal analysis, performed by E. Aguirre, S. J., of the Instituto Lucas Mallada (Madrid) is also in preparation. To all of our colleagues mentioned above we express our thanks for their permission to use some of their results at this time.

This paper is a report of the present status of analysis of data recovered from Torralba. It is intended to bring together evidence about as many aspects of the geological and cultural situation of Torralba as is possible in limited space. Much of what will be said here must be phrased in general terms; it will only be given detailed treatment in the interim and final reports.

THE GEOMORPHIC SITUATION

Torralba is located at the headwaters of the Jalón River, a major tributary of the Ebro River, near the watersheds of the Duero and Tajo Rivers. The regional morphology is characterized by a series of late-Tertiary erosional surfaces, dissected

by steep-sided, flat-floored valleys. At Torralba the upland plateaus (*parameras*) are developed in a massive series of dolomitic limestone of basal Jurassic age. Drainage lines commonly intersect the underlying Triassic (Keuper) series, which consists of highly variable clays, marly limestones, and evaporites.

The bedrock is of considerable interest in understanding the local setting of the twin sites of Torralba and Ambrona. (1) The underlying Keuper strata are mainly unconsolidated, and the silt or clay facies are readily subject to deformation or solifluction when thoroughly lubricated. This has favored repeated solifluction prior to and during the period of first settlement, while subsequent micro-tectonic activity has seriously disturbed the site stratigraphy. (2) The impermeable Keuper, found at the base of the porous and permeable limestone, gives rise to several springs on the valley margins. At least one former spring of this type was almost certainlq available at prehistoric Torralba. (3) Raw material for stone-working can be obtained from certain strata, either nearby or more commonly at a distance. Although local limestones were occasionally used, preference was obviously given to quartzite (obtained from Lower Triassic conglomerate exposed 2-3 km away on the Ebro-Duero watershed), white chert and chalcedony (obtained from lower-Pliocene limestone somewhat farther north), and brown cherty flint (available in Cretaceous limestone farther west). Most of the raw materials used for tool manufacture were thus not available in the immediate area.

The archeological site is situated in a lateral embayment of the Rio Ambrona-Masegar valley at the foot of a 5-15° slope rising about 100 m above the valley floor. This peculiar topographic location has determined the character of early-Pleistocene sedimentation at the site, part of it fluvial or palustrine, part of it reflecting slope wash and mass movements. Water resources are also determined by the location. Whereas the *parameras* or uplands are dry and without surface water, water is now available 500 m away in the small, perennial Rio Ambrona. At the time of Middle Acheulean occupancy, however, a seasonal watercourse about 30 m away may have been permanent, while a spring or two almost certainly existed at the base of the nearby slopes. Finally, the location is also pertinent, because Torralba is found along one of the few low-level routes between Old Castille to the north and New Castille to the south. There is reason to believe that seasonal migrations of gregarious herbivores were funneled through this valley, thus attracting prehistoric hunters.

THE LOCAL PLEISTOCENE SETTING

The Pleistocene record of the Jalón headwaters is fairly diverse although areally modest. It includes breccias and solifluction mantles on the upland slopes, shallow alluvial spreads in the valley bottoms, and remnants of true alluvial terraces on the valley margins.

The sites of Torralba and Ambrona are located within complex alluvial beds, representing two fragments of a 40-45 m terrace of the Rio Ambrona. In each case, solifluction beds or cryoclastic slope wash form the base, followed by alternating sands, marls, and gravels of stream, swamp, or slope origin. Repeated

erosional disconformities and facies changes can be readily correlated from one site to the other; they are interpreted as the records of repeated climatic oscillations between cold and temperate humid conditions. Most of the upland breccias can be directly correlated with this terrace complex. Alluviation was followed by calcification and by intensive rubefaction (a fossil *terra fusca* soil in the sense of Kubiena, 1953). These two properties are useful in regional correlation of deposits.

The Jalón River has three moderately well developed alluvial terraces below Arcos, beginning about 25 km downstream from Torralba. The " high " terrace, at 22-32 m, is generally well consolidated near the surface, exhibits various soil-frost features, and is preserved in small segments only. Soil erosion has removed almost all traces of paleosols. The " middle " terrace is found at relative elevations of 12-21 m, is nowhere calcreted, and lacks all evidence of soil frost. The truncated base of a weak (B)-horizon may be present. These coarse gravels are preserved fairly continuously, becoming a prominent and universal feature farther downstream. The " low " terrace, at 3.5-6 m, is unconsolidated, consisting of fine-grained materials without evidence of soil frost. The climax soil development is a *rendzina*.

Even though no possibility of direct field correlation exists, a wide range of exposures studied over 2,000 sq km leaves no doubt that the sites of Torralba and Ambrona are contemporary with the " high " terrace of the upper and middle Jalón. Detailed arguments, as well as a discussion of correlations across the Ebro-Tajo watershed, must be deferred to the interim report. In view of the terrace sequence and two series of younger, cold-climate deposits at Torralba, the sites were probably contemporary with the ante-penultimate glacial complex. The period of chemical weathering responsible for the deep, reddish paleosol further suggests correlation with a similar Pleistocene phase of intensive rubefaction evident in many parts of northeastern Spain — a phase contemporary with the Tyrrhenian I in Catalonia (Butzer, 1964 b), thereby confirming the geological opinion that the sites predate the Great Interglacial and correlate with what is conventionally called the Elster-Mindel.

GEOLOGICAL STRATIGRAPHY OF THE TORRALBA SITE

The lower-Pleistocene deposits at the Torralba site — ante-dating the *terra fusca* development — can be outlined in summary form below. Textural descriptions are based on preliminary field examination as well as sieve analyses of the sand fractions, according to the modified Atterberg scale. Carbonate determinations were made according to volumetric release of CO_2. Soil colors are given by the *Munsell Soil Color Charts*. Finally morphometric gravel analyses were made according to the modified Lüttig (1956) method outlined by Butzer (1964 c) (1).

(1) Degree of roundness is estimated in percent of the smoothed convex parts of a pebble's circumference. The coefficient of variation applied to a sample lot provides an index of homogeneity. Further information is provided by the detrital component, *i.e.*, angular gravel of detritus with an index of rounding less than 9%, as well as by indices of flattening, providing information on the mechanical mode of transport by rolling or sliding motions.

Unit I (Basal Unit). Red colluvium. Red to reddish-yellow matrix of calcareous sandy silt or silty sand within a colluvial scree. The coarse materials are crudely stratified, constituting a very heterogenous detritus, moved both by sliding and rolling (2 samples of 100 limestone pebbles each). Over 50% of the components were mechanically fractured during or after transport and are clearly cryoclastic. Whereas the coarse materials are derived from frost-weathering on the upland slopés, the fines incorporate both Keuper silts and older red paleosols from the limestone country. Attaining over 4 m in thickness locally, the red colluvium is archeologically quite sterile and lacks pollen. A very cold climate is implied.

— — disconformity — —

Unit IIa. Gray silts and sands. Up to 60 cm of light-gray to olive-gray homogeneous silty sand. The deposits suggest a well-sorted fine valley infilling of fluvial type, presumably under cool and moist conditions. No pollen or cultural debris.

— — hiatus — —

Unit II b. " A " Gravel. A 5-30 cm band of coarse, heterogenous, subangular detrital gravel (2 samples totalling 150 limestone pebbles) intercalated between thin lenses of subcontinuous light gray marl or marly sand. The gravel was moved both by rolling and sliding and occurs discontinuously on the uplands as well as on the valley margins. It is again cryoclastic, with clear evidence of solifluction on slopes exceeding 5%. Stone rings and garlands are common, suggesting frequent diurnal freeze and thaw alternations (Troll, 1944). Although solifluid transport was prominent, colluvial washing was the primary agency (Butzer, 1964 a). This suggests a cold and moist climate. A major cultural horizon is concentrated on top of or among the pebbles of this unit. From the orientation and dispersal of bones, it is at once evident that some downslope sliding has taken place. However, from the lack of rolling or wear of articular bone surfaces, the lack of size sorting of bones or artifacts, and the nearly articulated position of some bones of single animals, it is evident that such sliding has not destroyed the validity of cultural associations independent of orientation.

— — hiatus — —

Unit II c. Lowever gray colluvium. White to light-gray, well-stratified gritty sands 100 cm thick, intercalated with a few 10 cm horizons of medium-sized, very heterogeneous detritus, moved both by sliding and rolling (1 sample of 100 pebbles). These " B "-gravels are not cryoclastic, and they lack soil-frost structures. They can best be interpreted as water-laid screes derived from frost-weathering of exposed bedrock on the slopes. The base of the gritty sands and perhaps 2 higher sand levels show typical festoons suggesting solifluction, however, and the pollen content averages about 50% non-arboreal. Climate must have been cold and moist, with widespread alpine meadows. In fact, the pollen spectra are identical to those found at 2,000 m elevation in the Sierra de Guadarrama today — about 200 m above the present-day altitudinal tree-limit (Welten, 1954). Cultural horizons without soil-frost disturbances and with a fair amount of articulated bone are found on top of some of the intergrading gravel lenses and within one sandy zone. Scattered water-worn bone is also found at some points within the gritty sands.

— — disconformity — —

Unit II d. Brown marl. Up to 90 cm of light brownish-gray sandy marl, locally gritty. The dip of the beds is 5-10°. They suggest a valley fill of swampy type analogous to deposits now being laid down near active springs. Pine pollen accounts for 80-90% of the spectra, with grasses constituting the balance. This suggests a moist, temperate climate and a landscape dominated by pine woodlands with some low-lying, grassy marshland.

— — disconformity — —

Unit III a. Upper gray colluvium (80 cm). Quite analogous in facies, pollen spectra, and interpretation to unit II c, except that there are no gravel strata or distinct cultural horizons.

— — disconformity — —

Unit IV. Gray marl. As much as 50 cm of homogeneous light-gray to olive-gray marl, formed on alluvial flats of an aggrading floodplain. The basal beds are inclined with the slope of the substratum, whereas higher strata are almost horizontal. (Occasional coarser stream-bed deposits, suggesting a meandering stream branch, interrupt the lower part of the sequence at the Ambrona site. Such coarse materials are moderately cryoclastic, although the marls themselves suggest a fairly temperate climate.) Limonitic oxide flecks, streaks, and bands as well as calcareous nodules all suggest seasonal water-logging in a ground-water soil of *syrogley* type (Kubiena, 1953). Analogous deposits, with identical gastropods, are still forming in poorly drained parts of the Jalón-Duero watershed. These are seasonally inundated sedge and grass flats, where the groundwater table is usually close to the surface. The overall implication is one of greater moisture. The top of the marl sequence represents the culmination of the 40 m terrace of the Rio Ambrona Masegar. The pollen diagram begins with a dominance of non-arboreal pollen at the base, terminating with 90% arboreal values, predominantly *Pinus sylvestris*. The non-arboreal pollen of the upper marl is dominated by sedges (which may, however, result from overrepresentation of focal plant cover), that of the lower marl by grasses. The natural tree vegetation today is live oak, while the pine belt is located at elevations of 1,250-1,800 m. The pollen diagram implies a cooler climate thant that at present, even during the warmest periods of lower-Pleistocene marl sedimentation. Archeological materials are found scattered within the lowest marls.

— — disconformity — —

Unit V. Reddish alluvium. About 165 cm of coarse alluvial deposits complete the lower-Pleistocene sequence. At Ambrona, where they are better preserved, they constitute alternating gritty silts and cryoclastic, detrital gravels. At both sites they belong to shallow alluvial fans deposited by minor tributaries onto the edge of the 40 m floodplain. General aggradation had ceased. Climate was drier and quite cold, but, in contradistinction to Ambrona, there is no evidence of human occupation during deposition of this unit at Torralba.

The alternating cold and temperate paleoclimates inferred for the Torralba site suggest several stadials and interstadials of the late Elster. Downcutting and draining of the Rio Ambrona valley followed during a warmer and drier climate. There was little or no surface denudation prior to the development of the *terra*

fusca soil profile during a later phase of warm and humid climate. The intensity of chemical weathering is indicated by the 160 cm depth of the (B)-horizon of the soil, above the shallow C and Ca horizons.

STONE ARTIFACTS

Nearly 700 stone artifacts were recovered in the excavations of 1962 and 1963, mostly from Unit II c. The largest single category represented is that of " waste " flakes and chipping debris, which make up more than one-third the total. Slightly more than half the total are flake tools, and only about 5% are bifacial tools, among which cleavers predominate. Cores make up slightly more and hammer-stones slightly less than 1% of the total. Sidescrapers, denticulates, " intentionally retouched flakes ", and utilized flakes each make up about 10%. Also represented, in smaller numbers, are endscrapers, notches, borer/becs, burins and proto-burins, backed knives, choppers, and trimmed chunks. Some tools are of types normally considered to be characteristic of quite evolved assemblages. These pieces are so few that their appearance may well be fortuitous. However, recent studies by F. C. Howell (1966) seem to indicate that such " precocius " pieces are not totally absent in collections from sites whose ages most closely approach that of Torralba.

Retouch varies in quality from crude stone-on-stone flaking, such as is often considered characteristic of the so-called " Abbevillian ", to flat, delicate flaking typical of that producible by the cylinder-hammer. There seems to be no consistent variation in technique from level to level. The nature of raw materials used may be correlated with such " technical " differences, however. Bifaces seem to be most numerous in the lowest level at Torralba and in one high level in Unit II ([2]).

OTHER ARTIFACTS

Bone tools at Torralba are abundant. They are not simply broken bones; many show evidence of intentional manufacture to a pattern. The study of these objects is being performed by Dr. Pierre Biberson of the Institut de Paléontologie Humaine, Paris, and will be presented in the interim report. Wooden artifacts were also recovered.

DISTRIBUTION OF CULTURAL MATERIALS

By far the greatest number of artifacts and bones occur in horizons within deposition Unit II c. This unit consists of several levels distinguishable on cultural grounds, most of which are occupation surfaces atop gravels. Two such horizons

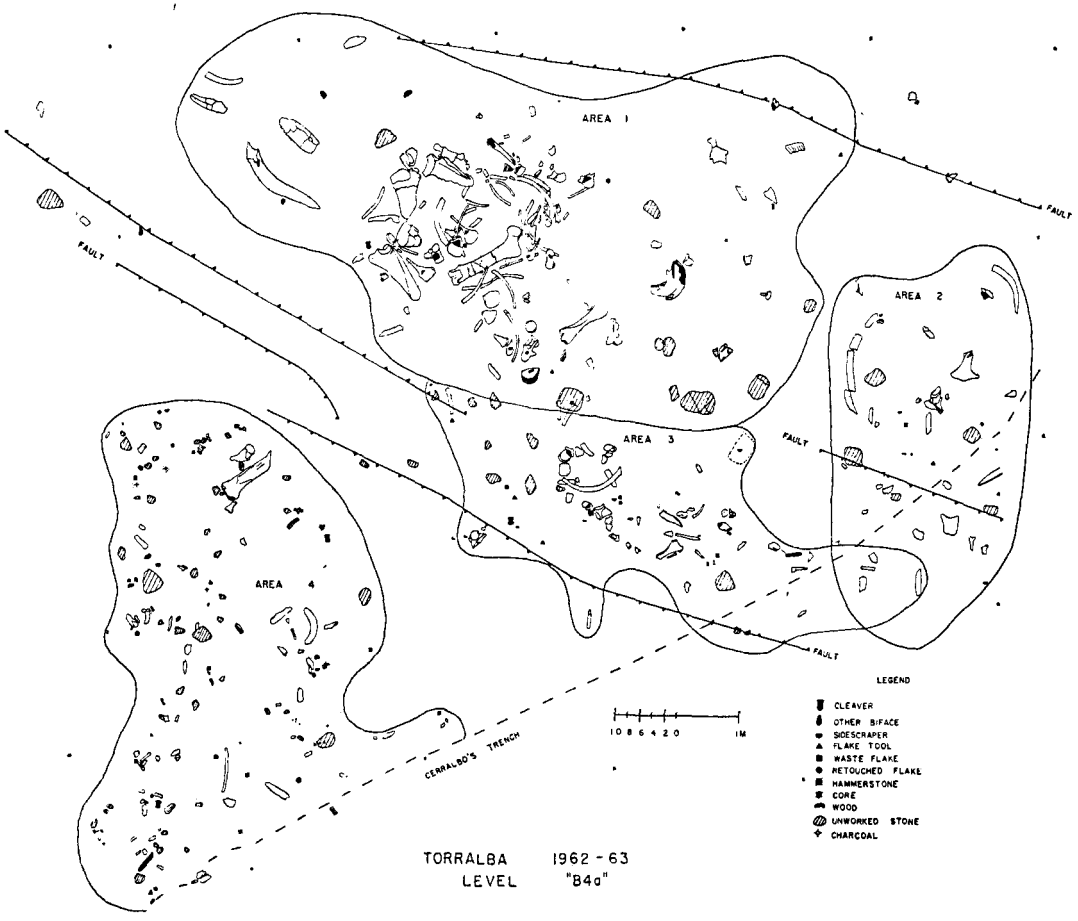
([2]) The stone-artifact typology was done in accordance with principles stated by Bordes (1961) of the University of Bordeaux, France, who kindly checked part of our classification. We are extremely grateful to Prof. Bordes for his counsel. Naturally, any errors that may remain are our own.

(levels B2 and B4 a) have been analyzed sufficiently to permit inferences concerning cultural activities.

Level B4 a is geologically one of the latest phases of gravel deposition identifiable in Unit II c. The accumulation of cultural materials seems at present to have occurred immediately after the gravel was laid down. Level B4 a is exposed over a total of about 300 sq m.

The cultural materials in at least the northern half of level B4 a seem to have been deposited synchronously, because bones of a single large animal occur over the whole of this area. Nonetheless, it seems possible to delineate several sub-areas which differ in artifact content and the parts of animals represented.

The most striking feature in this level is the half skeleton of a straight-tusked elephant, lying in the extreme northern sector of the exposure (Fig. 1, Area 1). The bones of this individual, spread over more than 50 sq m, were found in semi-articulated position, lying skin-side up, head to the west. Only bones of the left side of the animal and some vertebrae seem to be represented. The cranium is missing, except for the tusks. The pelvis is also missing. The mandible, broken across both ascending rami, is present, but it was found on the east side



of the main bone accumulation, which comprises the hind part of the skeletal distribution. A single *Equus* molar is the only bone in Area 1 from an animal other than *Elephas*. In the fact that most of the contents of the cluster are bones from a single individual, Area 1 differs from adjacent areas. Bone density in this accumulation is also higher than in surrounding clusters, averaging about three extremely large bones or fragments per square meter. The treatment of bone in Area 1 differs from that in surrounding concentrations of materials. There is little evidence that bone was broken for marrow extraction in Area 1, which makes the area unique in our experience at Torralba.

Stone artifacts found associated with the bones are the following: a single tiny cleaver made on a flake of chalcedonic flint, found close to the olecranon of an ulna, a thick borer in the same material found between a vertebra and the proximal end of a large tibia; a retouched quartzite flake among a jumble of ribs and vertebrae; a discoidal chert core found near the northeastern periphery of the distribution; a limestone core found in the same region; and a small core from the southwestern edge of Area 1. The " cleaver " measures only about 6 cm long by 4 cm wide at the widest point on the expanding bit. It seems too small to be considered a cleaver in the same sense as larger tools of similar shape. However, a microscopic examination of the tool in accordance with techniques explained by Semenov (1964) reveals use-striations perpendicular to the transverse cutting edge, and considerable battering, which may indicate that its use did not differ greatly from that postulated for larger cleavers.

There are many possible explanations for the paucity of finished stone tools in Area 1. Perhaps the simplest hypothesis is that tools were removed from Area 1 for use in continued processing of materials in other areas nearby. The occurrence of cores in the concentration would seem to indicate that some tools were manufactured during the course of butchering activities undertaken in Area 1.

Regions of bone and artifact distribution of a distinct nature exist to the south, southeast, and southwest of Area 1. There is no evidence that these areas are not contemporaneous with the " half elephant ", and some bones of that individual were actually found in each area.

Area 2 (Fig. 1) is a cluster of approximately 18 sq m in size containing about thirty bone fragments. The elephant bones include pieces of a small scapula, at least two small tusks, and some pelvis fragments, as well as broken limb bones. Bones of other species include a *Bos* cubonavicular, an *Equus* astragalus fragment, and 2 *Equus* molars, a much higher proportion of the total bone concentration than they made up in Area 1. All bones in Area 2 have been broken into bits. A convergent sidescraper and two " waste " flakes, in quartzite and flint, are also part of the distribution.

Area 3 (Fig. 1) resembles Area 2 in contents; in fact, it may be continuous with that accumulation. Rib and vertebral fragments from the large elephant in Area 1 are numerous and bones of a smaller adult and of an infant were also present. Many fragmentary bones of *Bos, Equus,* and *Cervus* were found in Area 3. As in Area 2, all bones from this accumulation are broken, and many bear marks of cutting and flaking. Two pieces of wood were found in this area: one is a mere splinter; the other was probably a stick or a broken branch about 25 cm long. Much of the latter piece had decayed. Fortunately,

it left a hollow mold in the ground and it was possible to recover the original form in plaster. Stone tools in Area 3 include a large quartzite cleaver, a quartzite hammerstone, 2 flint sidescrapers, a notched flint tool, a flint borer-bec, a quartzite denticulate, and 2 flint " waste " flakes. A single fine discoidal core found between Areas 1 and 3 may belong to either.

Area 4 (Fig. 1) is a larger cluster of materials than either Area 2 or 3. However, in bone contents the three resemble each other to a great extent. Elephant rib and vertebra fragments, parts of limb bones, teeth, and bits of skull were found in this area. The distribution includes part of a long bone of the big elephant in Area 1 and a broken ulna from the infant in Area 3. Bones of *Equus* and *Bos* are very numerous, and there are some rare cervid and *Rhinoceros* bones. Stone tools include 2 sidescrapers, one convergent and one bifacially retouched, a notch, a retouched flake, 2 cleavers and 7 " waste " flakes. The Area 4 accumulation also includes many small unworked limestone rocks, in which respect it is unlike the other areas. Four patches of charcoal and at least 5 pieces of wood or casts of wooden objects were also found in Area 4.

It seems possible, on the basis of the contents of the clusters in B4 a, to divide them into two types. Our analysis is expected to test the hypothesis that these cluster types coincide with stages in the processing of venison and its by-products. The first type of accumulation is represented by Area 1, which may be the very spot where the large animal was killed. Here the primary stages in processing meat and other materials may have been carried out. The activities undertaken in Area 1 possibly involved stripping flesh from bones, which seem not to have been broken for marrow extraction. The products of primary processing, and probably also the tools necessary for secondary processing stages, seem to have been removed to Areas 2, 3, and 4 for further manipulation.

Areas 2, 3, and 4, then, are apparently the sites of secondary manipulation of raw materials gathered in Area 1 and in other primary butchering areas. Parts of animals of several species were evidently handled more or less simultaneously in these areas. Secondary processing involved the breaking of bones either to get at their contents or to reduce pieces gathered in Area 1 to more convenient sizes. The manipulations performed in Areas 3 and 4, at least, may have involved the use of fire. Stone sidescrapers were found in all 3 of the secondary processing areas. Large bifacial tools with transverse cutting edges were probably also important at this stage, although they may have been equally important during activities undertaken in Area 1.

The earlier excavations of the Marques de Cerralbo seriously hamper further analysis of materials in this part of level B4 a. The distribution of materials in level B2, an occupation surface within the sands of Unit II c, was not disturbed by Cerralbo to so great an extent, and analysis of materials from that level complements the picture derived from level B4 a. Several clusters of bones and artifacts seem recognizable in level B2. Seven have been almost completely analysed. Their contents reveal astonishingly regular associations of specific artifact types and skeletal parts. The clusters appear to be divisible into three categories. The first (2 clusters) contains broken large marrowbone, skull fragments, borer-becs, retouched flakes, and " waste " flakes. The second (3 clusters) consists of rib and scapula fragments of large mammals, some small (*e.g.*, cervid) marrowbones,

denticulated tools, retouched flakes, and " waste " flakes. The third group (2 clusters) has *Elephas* mandible fragments, molars and dorsal vertebrae, and retouched and "waste " flakes as the sole stone-tool types. All clusters of all three types contain bones of more than one animal species.

The clusters in level B2 may reflect subdivisions of activities undertaken during secondary processing of materials. However, it is equally likely that they are the remains of activities involved in the final processing, distribution, and consumption of materials " produced " in locations like Area 1 in level B4 a.

CONCLUSIONS

The number of areas upon which this preliminary analysis is based is small, and the results may have to be altered in some details after further study. However, the continuing accumulation of evidence from other levels still (August, 1965) supports the above delineation. A number of general conclusions seem rather firmly established at present.

First, clusters of cultural materials in levels B4 a and B2 are not the products of continual, long-term, areally random accumulation; rather thay seem to have been produced in each level by a single short-term " occupation " of the site for very limited periods of time, followed by abandonment of at least the precise area of previous deposition. The evidence for this is that:

(1) materials are found at relatively the same depth in each level, and their microstratigraphic position is the same;

(2) the distribution of raw materials used in stone-artifact manufacture seems homogeneous within each of the 2 levels studied;

(3) accumulations are often demonstrably synchronous, because the remains of a single animal may occur in several areas.

Second, some light is shed by the analysis on the nature of hunting methods employed by the Torralba people. Elephant bone is the most striking and abundant material in the levels studied, and one might be inclined to speculate that the Torralbans were specialists in pachyderm hunting. However, bones of animals of at least 5 species are present in the two levels, and any interpretation of hunting practices at Torralba must take that into account. It is possible that the Torralbans intended to capture all animals above a given size in the region hunted — that they did not, in fact, actively seek elephants as the most desirable game. Even if they did prefer elephants to other animals, the evidence indicates that their tastes and techniques were not so selective that elephants were secured to the exclusion of other species.

Third, the analysis of materials from levels B2 and B4 a affords no basis on which to conclude that the way of life of peoples responsible for the accumulation of those materials differed. Distributions in level B2 seem to reflect activities closely similar to those responsible for the distribution of materials in level B4 a.

There are no grounds for attributing differences in " culture " or " tradition " to the human agents of the cultural remains in the two levels.

We have stressed this point because an alternating occupation of the site by peoples of different tradition might be postulated to account for the fact that true bifaces occur in fair numbers relative to the rest of the tool assemblage in two levels at Torralba, while in levels B2 and B4 a they are rare. In our opinion, there is no evidence for this hypothesis. Since specialized activity areas exist in levels B2 and B4 a, it is only reasonable to assume that such areas also exist in the levels where bifaces are more numerous. This difference in artifact content between levels is equally likely to be due to the fact that the biface-rich levels are areas used for specialized purposes not represented in our excavation of levels B2 and B4 a. All the occupants of Torralba could thus have participated in broadly similar traditional systems.

The fact that activity-specific areas seem to exist at Torralba has very important methodological implications for prehistorians. Excavation that coincides with the areal limits of a single activity locus cannot be expected to yield artifacts or fauna representing the total range of acivities undertaken at a site at any time. Thus a comparison of the toolkit from any one level with that from any other level is certain to be misleading in some way, unless it can be demonstrated that the excavated areas in the two levels are functional equivalents. If the tool assemblages are taken as representative of complete toolkits, the consequence that may follow from attempts to infer *cultural* similarity or difference from this evidence are likely to destroy any real understanding of the functional nature or the degree of similarity of the assemblages.

In summary, from the Acheulean station of Torralba, we have recovered evidence suggestive of considerable organization and patterning of cultural activities. The level of organization evidenced by the materials and their distribution seems greater than that heretofore considered probable for social groups during Elster times. This patterning and specialization of activities is demonstrated by the artifacts, which include types that normally are thought to characterize the Middle or Upper Paleolithic. It is also evident in the existence of apparent activity-specific areas. The fact that such areas exist poses many new problems about the extent and nature of cultural diversity during the Lower Paleolithic period.

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ZUSAMMENFASSUNG

Torralba liegt im Tal des Rio Ambrona-Masegar, — in einem der wenigen Durchgänge zwischen Alt- und Neukastilien — das während des Mittelpleistozäns vermutlich eine jahreszeitliche Wanderstrasse für Wildherden bildete. Die Fundstelle befindet sich innerhalb eines Bruchstückes der Hochterrasse des Rio Jalóns. Auf Gypstone des Keupers liegen Solifluktionsbildungen oder cryoklastische Hangschuttdecken; darauf abwechselnde Schichten von Sanden, Mergeln und Schotter verschiedenen Ursprungs (fluvial, sumpf, kolluvial). Darauf folgte eine tiefgründige terra fusca-Bildung sowie spätere Mikrotektonik, veranlasst durch Quetschungen der unterliegenden Gypstone. Die verschiedenen Alluvial- und Hangschuttsedimente weisen auf eine längere Kaltzeit hin, die in Anbetracht der palynologischen und paläontologischen Zeugnisse mit der Elster-Mindel Kaltzeit korreliert werden muss.

Archäologisches Material tritt in mehreren Schichten auf; z.T. handelt es sich um ungestörte Siedlungsböden. Fast 700 Steinwerkzeuge wurden 1962-63 gefunden. Die Hälfte dieser Artifakte besteht aus Abschlägen, während Faustkeile nur 5% darstellen. Knochen- und Holzwerkzeuge absichtlicher Herstellung sind vorhanden und Feuer war bekannt. Die Streuung der Artifakte und Knochen ist nicht regellos: es können bestimmte, regelmässige horizontale Vergesellschaftungen spezifischer Knochenteile mit gewissen Artifaktentypen nachgewiesen werden, die auf bestimmte Funktionskreise innerhalf verschiedener Niveaus hindeuten. Diese Hinweise auf geregelte Aktivitätsformen sind von Interesse, da ähnliche Sozialerscheinungen in dieser frühen Zeitepoche kaum zu erwarten waren.

RÉSUMÉ

La station de Torralba est située dans la vallée du Rio Ambrona-Masegar — une des rares routes en direction nord-sud entre la Vieille et la Nouvelle Castille. Le gisement est placé près d'une des probables voies de migration saisonnière utilisées par les troupeaux d'herbivores au cours du Pléistocène moyen. Les niveaux inférieurs, appartenant au Triassique (*Keuper*), sont imperméables bien que très souvent non consolidés et donnent lieu, lorsque surmontés par du calcaire perméable sur les bords de la vallée, à une série de sources. Une ou plusieurs de ces sources existaient certainement à l'epoque de l'occupation du gisement. La nature des niveaux *Keuper* a favorisé les perturbations microtectoniques que présente la stratigraphie du gisement. Les faciès à argile et silt de la série stratigraphique de Torralba constituaient de faciles véhicules de solifluction. Des pierres disposées en cercles ou en guirlandes se trouvent dans au moins un niveau à graviers colluviaux. Les niveaux archéologiques sont recouverts à Torralba d'un sol épais intensément rubéfié. Se basant sur la nature des sédiments et sur les résultats d'études palynologiques et paléontologiques, les auteurs considèrent le gisement de Torralba comme précédant le Grand Interglaciaire et appartenant au glaciaire Elster-Mindel.

Les nombreux niveaux archéologiques, parfois légèrement dérangés mais le plus souvent intacts ont livré un outillage abondant. Presque 700 outils en pierre ont été récoltés en 1962-63. Environ cinq pour-cent seulement est représenté par des bifaces tandis que cinquante pour-cent du nombre total récolté est constitué par des instruments sur éclat. Un outillage en os, façonné, est aussi représenté ainsi que des outils en bois. L'usage de feu était connu. La distribution des outils et des ossements n'est pas due au hasard. Dans plusieurs niveaux l'existence de secteurs consacrés à une activité spécifique semble à l'heure actuelle être suggérée — et leur aire délimitée — par l'association répétée et régulière, dans un même horizon, de certaines parts anatomiques animales avec des types d'outillage en pierre déterminés. La disposition et l'organisation des activités suggérées par ces associations semblent plus élaborées de ce qui, jusqu'ici, était considéré probable pour des groupes sociaux datant de l'Elster.