

LA CUMBRE; A PRELIMINARY REPORT ON RESEARCH INTO THE EARLY LITHIC  
OCCUPATION OF THE MOCHE VALLEY, PERU

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The La Cumbre site, Moche Valley, north coastal Peru is a major lithic preceramic surface station. From materials collected at this site, and others in the Moche Valley, it is possible to make a basic typological list for the study of north coast lithic preceramic collections. Excavations at La Cumbre produced remains of horse and mastodon, as well as artifacts fully comparable with those found on the surface of the site. Though this stratigraphic association is, strictly speaking, secondary we suggest that the association of man with extinct fauna in the Moche Valley is valid. This statement is based on an overlap of radiocarbon measurements from Quirihuac Shelter with a measurement for the La Cumbre mastodon and a careful consideration of the stratigraphic possibilities at La Cumbre.

#### Introduction

The lithic stage occupation of the Peruvian north coast forms a definite gap in the current understanding of the central Andean preceramic. The present evidence of a lithic stage occupation comes from surface, workshop sites found intermittently between the Virú and Pacasmayo Valleys. These sites are at best only scantily described, and the artifacts have never been systematically studied. The collections from these sites frequently contain long, stemmed projectile points, called "Paiján points"; which artifacts have been treated as a type fossil by archaeologists and used for a broad interrelation of the various collections.

Junius Bird mentioned finding lithic workshops between the Moche and Virú Valleys, and near Paiján, north of the Chicama Valley.<sup>1</sup> In the latter area he collected chipped stone artifacts and found fossil elephant remains on the same surface. A number of long, stemmed projectile points and other stone tools have been discovered in the Cupisnique Quebrada. Larco Hoyle discussed this material briefly.<sup>2</sup> Fossil bones of extinct capybara (Neochoerus) and giant armadillo (Pampatherium) were encountered on the surface of one of the Cupisnique sites by Ubbelohde-Doering.<sup>3</sup> The north coast lithic materials were discussed in a cursory manner by Lanning and Hammel, who listed a few of the classes of artifacts that have been found.<sup>4</sup> Several authors note that sherds are sometimes found on the same surfaces as the lithic remains. This situation, we believe, constitutes a secondary association, i.e., one not indicating contemporaneity. Chipped stone artifacts are relatively rare in ceramic stage settlements in this area, and a primary stratigraphic association of pottery with long, stemmed points and their related tools is nowhere in evidence. Thus, current knowledge of the north coast lithic stage is limited to poorly reported surface sites and undescribed collections.

Occasionally, there is a fortuitous association of the stone artifacts with sherds. The nature of the association between the lithic materials and the fossil animal remains is undetermined.

### La Cumbre

The north coast valley of Moche (Trujillo, or Santa Catalina) has recently been the scene of intensive archaeological work by the Chan Chan-Moche Valley Project. One of the main aims of the project is to reconstruct the culture history of the valley. Elucidating the lithic stage occupation is the responsibility of the senior author, who conducted thirteen months of field studies in the area during 1969-1970.

To date 13 lithic stage sites have been found in the study area. One of these sites is a shelter, Quirihuac Shelter, while the other 12 are surface stations and workshops; a workshop being a site where there is enough knapping debris to suggest that knapping was a major activity at that locale. The largest and richest site is La Cumbre, discovered in July, 1969. La Cumbre covers an area of more than 15,000 square meters. Over 4,500 pieces of worked stone were plotted and collected from this site. Worked pieces, artifacts, are flakes that exhibit post-core-removal retouch, as well as cores and core tools. Unretouched flakes were not collected. A limited program of stratigraphic testing was carried out, and a larger excavation was opened in one area. This excavation yielded remains of fossil mastodon and horse in what appears to be a secondary association with stone artifacts.

La Cumbre is situated just beyond the northern margin of the Moche Valley well away from the area of modern cultivation (fig. 1). The site is approximately 14 kilometers north-northwest of the mouth of the Moche River, and some 10 kilometers back from the coast. The desert setting is in general conformity with those described for other north coast lithic stations. The site is located on the Pampa del Río Seco. The Pampa is a wide alluvial plain that derives its name from a large quebrada or dry wash. This quebrada parallels the lower course of the Moche River and reaches the sea 12 kilometers north of the river mouth at the fishing village of Huanchaco.

### Geomorphology

The Moche River has a drainage basin of roughly 1500 square kilometers. Rains in the Andean highlands feed the streams and in most years there is a permanent flow of water reaching the coast. Along most of its course the river valley is narrow, but it begins to fan out at an elevation of 300 meters, some 20 kilometers from the coast. Thereafter the valley sides diverge to form a wide triangle of flat land. This is composed largely of Quaternary alluvium lying on Tertiary granodiorites. The surrounding hills are of similar granodioritic composition. The lower slopes of these hills, on both their lee and seaward sides, are frequently covered by thick deposits of aeolian sands.

The Río Seco lies to the north of the Moche River, and the two are in part separated by a low range of hills. This now dry stream has a relatively small drainage basin that begins approximately 15 kilometers in from the coast. The flood plain is similar in composition to that of the Moche River, and the two plains coalesce within 7 kilometers of the coast. The alluvial plain of the Río Seco is very heavily dissected, and nowhere is the alluvium more than two meters thick. Generally it is one meter or less in depth, except near hill slopes where there has been some protective aeolian deposition. The site of La Cumbre is situated on a thin remnant of this alluvium. This remnant is immediately adjacent to the north side of a small granodioritic hill that forms an outlier of a much larger and higher eminence to the southeast known as the Cerro Cabras.

At La Cumbre the Río Seco is currently degrading. This degradation is intermittent and is not immediately noticeable except when El Niño, the coastal countercurrent, disrupts the normal climatic pattern. Sporadic rains in the early part of 1970 produced a minor amount of flowing water in some areas of the stream. The Río Seco is reported to have carried a substantial amount of water during the torrential rains of 1925, and considerable degradation probably took place at that time. The geomorphological position of La Cumbre does not make it clear whether a degradational regime was in effect at the time the site was occupied. In this regard, however, it is worth noting that the lithic remains are on an exposed surface and that they do not appear to have been deposited there by any agency other than man. Furthermore, the area is exposed throughout the year to very strong coastal winds that arise late in the morning and continue through the day. The only vegetation at the site consists of a few vines that grow on a few small, amorphous, sand dunes that dot the area.

#### Collection Procedures

The field procedures employed at La Cumbre were designed to record accurately the spatial locations of all 4892 pieces of worked stone that were collected. To this end, a grid of 1640 ten meter squares was laid out covering the entire site area (fig. 2). Out of this total of squares a random sample of 500 was selected for intensive examination. Sampling was necessary because of the great size of the site, and because the amount of time required to record the exact provenience of all the items at the site would have been prohibitive. Each square in the sample was searched individually. The amount of time spent upon a square ranged from ten minutes to several hours, depending upon the artifact and flake densities. The crew working on collection was never larger than four, and it included the senior author at all times; most of the time the crew was composed only of the senior author and one assistant. Once the base lines of the grid were laid out, squares were located with tapes and transit. Artifacts were triangulated from two corners of a square before they were removed and catalogued. The advantages of the field procedures were: 1) allowing for the exact recording of the location of all collected pieces; 2) providing a base for the use of a variety of

sampling procedures, in this case a random selection of a predetermined number of divisions; 3) systematically focusing the search for pieces of worked stone to a small area at any one time; 4) allowing the use of a small, well-trained, collection crew to be practical, thus making for maximum consistency; and, 5) making minimal demands upon equipment. Further, because of the unit nature of the collection, the individual engaged in field research could concurrently undertake laboratory processing of the artifacts. The main drawback of the procedure used at La Cumbre is that it is time consuming; approximately five months were spent in collecting from the area selected.

### Artifacts

The surface of La Cumbre was covered with flaking debris and stone artifacts. The density of these remains was quite variable. In general, there was a relatively high concentration of material in a northwest to southeast axis that parallels the hills behind the site. This concentration may reflect the fact that these hills could have offered the inhabitants of La Cumbre some shelter from the prevailing winds. The density and distribution of knapping debris correlated positively with the density and distribution of artifacts, although we did not measure this association exactly. There are no indications that the artifacts had been disturbed, or moved to any significant degree, since they were originally dropped. Locations or stations where particular cores or blanks had been flaked were readily recognizable, and the different pieces of a broken tool were occasionally found in close association. The great majority of artifacts, of most types, was broken. Altogether the evidence indicates that a great deal of knapping took place at La Cumbre and that surely one of the major functions of the site was as a lithic workshop. The majority of chipped stone pieces showed little or no discoloration or other sign of weathering, nor was there marked differential weathering of tools made of different types of stone.

In addition to La Cumbre we have examined and collected a nearby quarry site (H2231, fig. 2), in the Río Seco area, as well as a number of other early workshops in the Moche Valley. Thus, it seems likely that we have now encountered a good number of the types of lithic artifacts associated with the early lithic preceramic manifestation in the Moche Valley.

We have pointed out that a comprehensive classificatory scheme for north coast lithic materials is not available. Therefore one must be devised. At this preliminary stage of study, the material from La Cumbre cannot be treated as a self-contained, integral industry. Because it is a surface, workshop collection, we cannot be sure if the artifacts were deposited in a relatively short period of time, or if the location was used over a long period by peoples with somewhat differing lithic assemblages. In the course of future analysis these alternative possibilities can be critically evaluated against such things as distributional patterns of association. Thus, for the moment the working lithic

typology must be broad enough to allow for the possible eventual definition of internally distinct industries or chronologically separate assemblages, if such in fact exist within the collections made so far. As a result the classificatory system being used in the initial ordering of the La Cumbre materials is a broad combination of technological attributes overlying a very basic list of lithic forms. The system is general and thus includes all the types of artifacts found at La Cumbre, as well as all other workshop sites so far found in the Moche Valley.

We do not advocate a "type-fossil" approach to the study of artifact collections. However, when dealing with small assemblages, such as many north coast sites produce, certain particularly specialized artifact types (such as points, scrapers and slugs) may prove to be useful and sufficiently reliable indicators for distinguishing the cultural and chronological affiliations of different sites. Therefore, although our artifact types reflect manufacturing and technological forms, we particularly emphasize specialization and standardization of form to facilitate the initial understanding of the culture history of the region. It is in this spirit that we present the following preliminary list of artifact types.<sup>5</sup>

#### 01- Projectile Points

Projectile points have long been treated as the basic type-fossils of the north coast lithic preceramic, yet an adequate description of the type(s) has never been published. Our description is based on specimens found in the Río Seco area. Examination of these specimens and specimens from other areas of the Moche Valley and the northern part of the Chicama Valley makes it clear that locally available stone had some impact upon the final form of these pieces. Because there is only a small sample of points from these other areas, it is best to label this point description as tentative.

##### 01-0 Paiján points

These long, stemmed points show substantial variation at La Cumbre. Length is usually about 8 cm. with a range between 6-11 cm., width varies between ca. 2.0-2.5 cm. and thickness around 0.9 cm. Two major features seem to have been kept in mind by the makers; first, the general form, which is especially recognizable in measurable ratios, i.e., length to stem length and length to width; second, some parts of the points remain essentially constant both in form and size. The stem is the clearest case of such a part, but the tip also shares this quality. The stem is usually ca. 1.5 cm. long, ca. 0.7 cm. wide and ca. 0.5 cm. thick, with a rounded and slightly flattened rhomboidal section. There are two basic variations on stem form; the distal end may either expand (figs. 9 and 12) or narrow (figs. 3 and 10). The dimensions of the tip vary rather more than those of the stem, but in most cases the form is standardized. The point narrows to a straight, parallel sided, rhomboidal sectioned tip (figs. 3, 7 and 13). The basic body shape is rather

like an isosceles triangle which bulges near the center of its long sides. The widest section of the piece is usually within the lowest third of the body. Large flakes were probably used as the original manufacturing blanks.

#### 01-1 Broad stemmed points

These are long, stemmed points similar to the Paiján variety. The significant difference lies in the broad stem, which is quite uncharacteristic of the former class of points (fig. 8).

#### 01-8 Opportunistic points (and variable point classes)

After the classification of a large number of projectiles into the above types there remains a considerable number of stemmed points that must be classed as opportunistic. These pieces do occasionally have some attributes of the better defined points, but it is quite evident that even by using a broad polythetic set of attributes it would be impossible to arrive at a clear and directly useful classification of these specimens. It is profitable to regard this residue as pieces whose forms were influenced by the nature of the material, its irregularities and, most specifically, by the shape of the blank. Meaningful distinctions within this group should probably be based on the functions of the projectiles. Usually this is reflected most clearly in projectile size.

#### 02- Scrapers (fig. 6)

The La Cumbre scrapers are almost all made on flakes by continuous unifacial retouch along all or part of one edge. A flake, as distinguished from a blade, is a blank whose length is not greater than twice its width. End scrapers, that is pieces retouched along an edge parallel to the short axis of the blank, often a blade, are not present in the Moche Valley lithic collections. Bifacial retouch is rare and appears to be opportunistic rather than patterned. A modification of Bordes' system of classification for the Middle Palaeolithic of Western Europe seems generally applicable to the Moche Valley scrapers.<sup>6</sup> We feel that a more concise and viable division might be made on the basis of a more complex set of attributes, but it would be premature to devise such a system on the data presently available.

Río Seco (Moche) Types	Equivalent Bordian Types
02-0 Straight side scraper	9, 22
02-1 Convex side scraper	10, 23
02-2 Concave side scraper	11, 24

02-3	Double side scraper	12-17
02-4	Double convergent side scraper	18-21
02-5	Bifacial side scraper (rare)	28
02-6	Irregular side scraper (rare)	not listed
02-7	Concavo-convex (sinuous) side scraper	not listed

03- Slugs (French limace) (fig. 4)

These unmistakable pieces are rare and were found only at La Cumbre and the Cupisnique Quebrada. Slugs, made on flakes, are totally unifacially retouched and of bipointed, foliate shape. The retouch has destroyed any traces of the original flake's bulb and platform. Occasional bifacial retouch, when present, does not appear to have been aimed at changing the basic flake curvature; thus the pieces cannot be assumed to be unifacial projectile points, because a fair amount of the original curvature remains. The size is extremely variable, ranging from ca. 6 cm. to ca. 13 cm. long. Thickness is never less than 1.5 cm.

04- Notches On Flakes (fig. 19)

Notches are deep removals from the flake edge. The resulting concavity breaks up the continuity of the flake edge as the retouch on the edge of a concave scraper does not. The distinction within notches on flakes is drawn between pieces where the notch is made by one blow and pieces where the notch is the result of a series of removals, or has been regularized by a series of removals. In the case of retouched notches, the edge tends to be much thicker.

04-0 Simple (Clactonian) notch on flake

04-1 Complex or retouched notch on flake

05- Beaks

Beaks are formed by two deep adjacent notches, usually on a projection of the blank. The retouched projection resulting is usually not elaborated further. Beaks are usually made on thick flakes.

06- Denticulates

The basic characteristic of this very diverse category is a series of adjacent or near-adjacent notches on the edge of a flake

resulting in a serrated edge. Possibly this class could be better studied by attributes measuring the size and depth of the notches and so forth, but we have only utilized the clear distinction between those denticulates made on normal flakes and those made on thick flakes or chunks where the serrated edge is a very stout, thick edge.

06-0 Flake denticulate (figs. 14 and 18)

06-1 Nucleiform denticulate

#### 10- Pebble Scrapers

These pieces are generally compatible with the scraper class (02-) and differ only in being larger and made on pebbles. Because they are relatively few, they are not subdivided. It appears that the majority resemble class 02-1, convex side scrapers.

#### 11- Pebble Tools

This very basic class has been well organized in an extensive and generally applicable classification by Ramendo for North Africa.<sup>7</sup> For our purposes we have eschewed this elaborate division for a simpler one based on the relation of retouch to surface.

11-0 Unifacial pebble tool (figs. 15 and 17)

11-1 Bifacial pebble tool

#### 12- Bifacials

This broad class of artifacts is very widespread in South America. Some authors have assigned some bifacials to great antiquity on the basis of a resemblance to Old World bifaces, or simply on a supposed typological progression from simple to complex forms.<sup>8</sup> Because the majority of our sample is composed of fragmentary bifacials of great variability, the distinctions that we have found most useful are based on symmetry and edge regularity. Size is extremely variable, and because we have not yet arrived at finer division within the size parameters we have elected to separate only large, massive bifacials from the group.

12-0 Regular edged symmetrical bifacial (figs. 5 and 16)

12-1 Regular edged asymmetrical bifacial



12-2 Irregular edged symmetrical bifacial

12-3 Irregular edged asymmetrical bifacial

12-4 Massive bifacial

13- Retouched Pieces

A large number of pieces with minimal but distinct retouch were collected. Rather than disregard these specimens, we have distinguished them on the basis of the direction of retouch.

13-0 Unifacial retouched piece

13-1 Bifacial retouched piece

14- Diverse

As in any classification there remain some pieces which, though distinctively manufactured in a particular manner, do not fit into any of the regular classes. These are categorized on the basis of direction of retouch.

14-0 Unifacial diverse piece

14-1 Bifacial diverse piece

15- Cores

There exist pieces at La Cumbre that are clearly recognizable as the sources of manufacturing blanks. The great majority of the La Cumbre cores are of the single platform type.

#### Raw Materials

At La Cumbre the stone most commonly used for manufacturing implements was a fine-grained granodiorite with occasional quartzitic impurities. The rock has gray to pinkish hues. It was quarried in the Río Seco area at an outcrop less than one kilometer from the site. A dark basalt was also commonly used in making larger tools. Some cherts and other stones were also employed less frequently. Like the basalt, these latter materials were available locally in the gravels of the Río

Seco. Much of the material made into projectile points, such as the granodiorite, has irregular properties and is not a good flaking medium. Given the quality and refinement of most of the finished implements, the technological skill of the artisans must have been considerable. The poor quality stone accounts, to some extent, for the fairly large number of opportunistically made projectile points. Nonetheless, many of these specimens share very specific morphological attributes with the better made points. We therefore believe that the artisans went to some trouble in trying to attain certain standardized forms.

### Excavations

The intensive surface collection from La Cumbre formed the basis for a program of testing and excavation. Twenty-eight cuts were opened; these ranged in size from four square meters to twenty square meters. A three-fold stratigraphic sequence was revealed for the site (fig. 20). The first and lowest unit was formed by the basal gravels laid down by the Río Seco. The second unit overlay the gravels and was composed of a gray, compact alluvium. This unit averaged about 0.6 meters in thickness at the southeast quadrant of the site. The third stratigraphic unit represented the surface layer of the site. This layer averaged 3 to 4 centimeters in thickness, and the sediments were derived primarily from weathering of the underlying deposit. The surface deposit was moderately to loosely compacted, and the La Cumbre artifacts rested on top of it.

A number of test cuts were opened in the areas of high concentrations of surface lithic debris. These cuts yielded no artifact remains beneath the surface sediment.

The surface search produced a number of small splinters of very dense bones and fragments of equid teeth. These were most abundant in the southeast quadrant of the site, and a number of cuts were opened here. In the location of the heaviest concentration of dense bone an area covering about fifty square meters was excavated. This excavation exposed osseous remains beneath the surface down to a depth of about 60 centimeters. This material has been identified as belonging to horse and mastodon (proboscidean). The horse, an undetermined species of *Equus*, was represented by a number of molars, most of them incomplete, a third metacarpal and an astragalus; the proboscidean (Gomphotheriidae, Apancinae) by molar fragments, some of the bones of one foot, a patella, incomplete neural spines and a large number of rib fragments. The amount and variety of bones found were relatively few and would not account for a complete individual of either type of animal. The remains may represent no more than one horse and one mastodon. In the case of the latter animal it is our impression that we are most likely dealing with one individual. The horse remains are too few to indicate whether more than one animal is represented. Most of the osseous remains were in a poor state of preservation. Much of this destruction is likely to be the result of shallow burial.

In the area of the main excavation bone was found in four

contexts. The first of these was the modern, exposed surface. Bone splinters rested on top of the surface, and some osseous remains projected through the surface from underlying deposits. There was relatively little lithic material in the vicinity of the exposed bone. In this context nothing can be said about the possible relationship of the artifacts to the fauna.

The second context in which bones were found was within the surface deposit. In profiles at the main cut this deposit ranged from 3 to 6 centimeters in thickness. Osseous remains were incorporated into the sediments or projected into them from the underlying deposit.

A majority of the excavated bones were found in the third context. This context was the gray alluvium, and here the faunal remains were found in situ. In the alluvium we cleared a jumbled pile of approximately thirty large rib fragments of mastodon. All had at least one end broken, and in most cases both ends of the rib were gone. At one side of the rib pile was the proboscidean foot. This foot was found in essentially anatomical position. In intimate association with the concentration of mastodon remains were the centra of two vertebrae, along with what was apparently the distal epiphysis of a humerus. Some equid remains, mainly fragments of teeth, were found in the deposit. These remains were scattered over a wider area than the proboscidean bones. The mastodon bones found in the gray alluvium do not constitute an assemblage sorted by transport; they appear in their primary depositional context. The type of bones present and the breakage patterns might have resulted from human activity, but the evidence for such activity is far from unequivocal. The only excavated projectile point fragment, a base portion, was found near the pile of mastodon ribs. The artifact was four centimeters from the nearest bone. However, it rested on the alluvium-surface deposit contact plane and was only 4 centimeters beneath the modern surface. The adjacent bone projected into the surface deposit from the underlying alluvium. The point fragment cannot properly be said to belong with the third depositional context; it belongs rather to the second context. Because of its shallow position, the artifact does not have a secure association with the osseous remains. If other lithic materials had been found in the alluvium, or in the surface sediments, arguments for an association would be strengthened; but this was not the case. Because of its shallow burial, the point fragment could be argued to be intrusive. However, as we have noted, there were very few lithic remains on the surface in the excavation area, and this fact would diminish the chance of intrusion. As the situation stands, we consider the possibility of a legitimate association between the projectile point base and the proboscidean ribs to be tenuous. However the possibility of a primary association cannot be completely ruled out or denied. The evidence is simply inconclusive.

Within the area of excavation a small erosion channel had cut through the gray alluvium, and subsequently filled; this was the fourth context in which osseous remains were found. The channel or "riachuelo" ranged from 1.5 to 2.0 meters in width, and 30 to 45 centimeters in depth below the base of the surface deposit. The channel was filled with

lightly sorted sands. Within these sediments osseous remains were found at depths ranging from 25 to 45 centimeters. Horse was represented by a number of fragmentary teeth, and mastodon by the proximal end of a tibia, several extremely large rib fragments, fragments of a number of long bones, and pieces of as yet unidentified bones. Flakes and artifacts were also found in the riachuelo fill at depths from 25 to 45 centimeters from the base of the surface deposit. Flaking debris was scarce. The artifacts consisted of two complete bifacials, two scrapers, six pebble tools, and several less distinctive worked pieces. The lithic remains are too few to compare quantitatively with the surface artifacts, but there is no doubt that the riachuelo implements fall well within the range of variation of the La Cumbre artifacts.

Because we are dealing with the fill of an erosional channel, the presence of artifacts and bones of extinct animals in this context must be regarded, strictly speaking, as a secondary association. There are several considerations involved in assessing the significance of the riachuelo finds. The first and simplest explanation of the situation is that the erosional channel was cut and filled after the occupation of the site. If this was the case, the artifacts could have been derived from the site surface, and the bones from the gray alluvium and the surface deposit. A second possibility is that, when the riachuelo was open and carried water, the adjacent alluvium was moist and soft. In such a situation bones could have been incorporated concurrently in both the channel fill and in the adjacent alluvium. The general lack of faunal remains in test cuts outside the area of the main excavation and away from the riachuelo might be seen as supporting this possibility. If bones were being incorporated into the alluvium and the riachuelo at the same time, then the source of the lithic materials is problematic. The artifacts could either have been deposited concurrently with the osseous materials, or less probably they could have been laid down at a later date if the channel was open and active for a long period.

As we interpret the riachuelo stratigraphy it appears most likely that the bones and the artifacts were incorporated into the fill at the same time. It is highly probable that this incorporation resulted from a post-occupation cutting and filling of the riachuelo. Yet we cannot fully exclude the possibility that the riachuelo was open and associated with quagmire conditions that allowed for concurrent deposition of tools and faunal remains at the time of the La Cumbre occupation. However, if this had been the situation a roughly equal number of artifacts might be expected to appear in the riachuelo fill and the adjacent alluvium, and such was not the case.

#### Interpretation And Possible Dating

Three stratigraphic features at La Cumbre must be dated relative to one another to clarify the history of the preceramic occupation(s). The features are: 1) the gray alluvium; 2) the riachuelo; and 3) the surface deposit of the site.

The riachuelo cuts through the gray alluvium. Therefore the channel postdates the alluvium. The artifacts from the riachuelo are the same as those on the surface of the site. Therefore, the sediments filling the erosional channel must have been deposited after the build-up of the surface deposit upon which the La Cumbre artifacts rest. The channel sediments may have been deposited either at the same time the surface artifacts were laid down, or after they were laid down. Thus, the riachuelo fill can be no older than the surface artifacts, and the fill may well be younger than the artifacts. When the riachuelo is viewed in profile (fig. 20) there is no evident distinction between the surface deposit overlying the channel and the surface deposit overlying the gray alluvium. This fact denotes a relatively early date for the filling of the riachuelo.

The gray alluvium and the overlying surface deposit constitute the remnant of an ancient plain. At La Cumbre the distribution of artifacts runs up to the edge of the plain. This edge of the plain is being eroded by one of the main channels of the Río Seco (fig. 2). The density of artifacts along this edge of the plain is sufficiently high to suggest that some of the site has been cut away by the Río Seco. The positioning of the La Cumbre artifacts indicates that they have not been significantly disturbed since the site was occupied. Therefore, the site surface has not experienced significant depositional or erosional modification since the time of occupation. The artifacts do not show traces of sand scouring; therefore, the site has not been affected by aeolian disturbance. In other words, the site surface has remained stable since the time of occupation, although the edge of the site has been cut by the Río Seco. These considerations suggest to us that the La Cumbre artifacts were laid down at least within the earlier part of the present degradational stage of the Río Seco, and quite possibly during the latter part of the previous aggradational stage.

Apatite from a fragment of mastodon long bone recovered from the riachuelo fill has been dated at  $10,535 \pm 280$  radiocarbon years B.P.; 8,585 B.C. (GX-2019), calculated with the Libby half life. This age is not inconsistent with current knowledge of the late presence of extinct megafauna in western South America. The measurement also falls well within the range of radiocarbon assays on charcoal that we have from a small Moche Valley rockshelter.<sup>9</sup> This site, the Quirihuac Shelter, produced a small, though stratigraphically sealed, lithic assemblage that clearly relates to the La Cumbre material.

If the La Cumbre mastodon is correctly dated, and if the Quirihuac Shelter assays are accurate, then the radiocarbon measurements indicate human occupation of the Moche Valley at the same time that extinct megafauna inhabited the region.

#### Conclusion

The La Cumbre site has produced a collection of lithic remains demonstrating a substantial range of artifact types. Many of the artifacts

will probably not turn out to be distinctive; yet others, such as the projectile points, slugs and scrapers, may prove upon further analysis to be culturally diagnostic. The range of artifact types found at La Cumbre is greater than the range known from other north coast lithic workshops. However, this is probably primarily a product of the lack of systematic collection and reporting of materials from other preceramic sites. Without good comparative data it is impossible to assess how typical or atypical La Cumbre may be. We have visited some of the lithic workshops in regions adjacent to the Moche Valley. Although superficial, these inspections do not suggest that the La Cumbre collections are unusual or aberrant.

The possibility of a legitimate stratigraphic association between artifacts and extinct fauna at La Cumbre exists but is tenuous. The strongest suggestion of an association is the projectile point base found adjacent to the pile of proboscidean ribs. However, this is a questionable relationship because of the shallow burial. The faunal and lithic remains found in the riachuelo must be considered a secondary association and nothing more. Thus, the stratigraphic situation is not conclusive.

The possibility that man and extinct megafauna inhabited the Moche Valley is suggested by the radiocarbon measurements from La Cumbre and the Quirihuac Shelter. An argument for contemporaneity of man and mastodon based primarily on overlapping radiocarbon measurements must be treated with caution. However, in evaluating the implications of the measurements we would note that there is no evidence from either the Moche Valley or the north coast that implies man and extinct animals could not have been in the area at the same time. In fact, the radiocarbon assays may be viewed as increasing the likelihood that the La Cumbre inhabitants hunted mastodon and horse.

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## NOTES

<sup>1</sup>Bird, 1948.

<sup>2</sup>Larco Hoyle, 1948, pp. 11-12 and 1963, pp. 19-21.

<sup>3</sup>Ubbelohde-Doering, 1959, pp. 28-32 and 1967, pp. 87.

<sup>4</sup>Lanning and Hammel, 1961.

<sup>5</sup>The notation used for this preliminary list is designed for flexibility. The first two digits designate the major artifact class (e.g., 02-, scrapers). Digits following the dash designate the specific types within that class. In this case the digits run from 0 to 9 but if it were necessary we could utilize double digits to accommodate a larger number of types.

<sup>6</sup>Bordes, 1961.

<sup>7</sup>Ramendo, 1963.

<sup>8</sup>Schobinger, 1969; Moseley, 1971, pp. 932-933.

<sup>9</sup>Four radiocarbon measurements from Quirihuac Shelter ranged from 8,645  $\pm$  370 to 12,795  $\pm$  350 radiocarbon years B.P., calculated using the Libby half life. One measurement of 4,740  $\pm$  210 B.P. has been rejected as too far out of line with the others.

## POSTSCRIPT

Apatite from a fragment of mastodon rib found within the gray alluvium at La Cumbre has been dated at 12,360  $\pm$  700 radiocarbon years B.P.; 10,410 B.C. (GX-2494), calculated with the Libby half life. This age determination overlaps with the one for GX-2019 from the riachuelo deposit at La Cumbre. The overlap with the dates from Quirihuac Shelter remains in effect.

(May, 1972)

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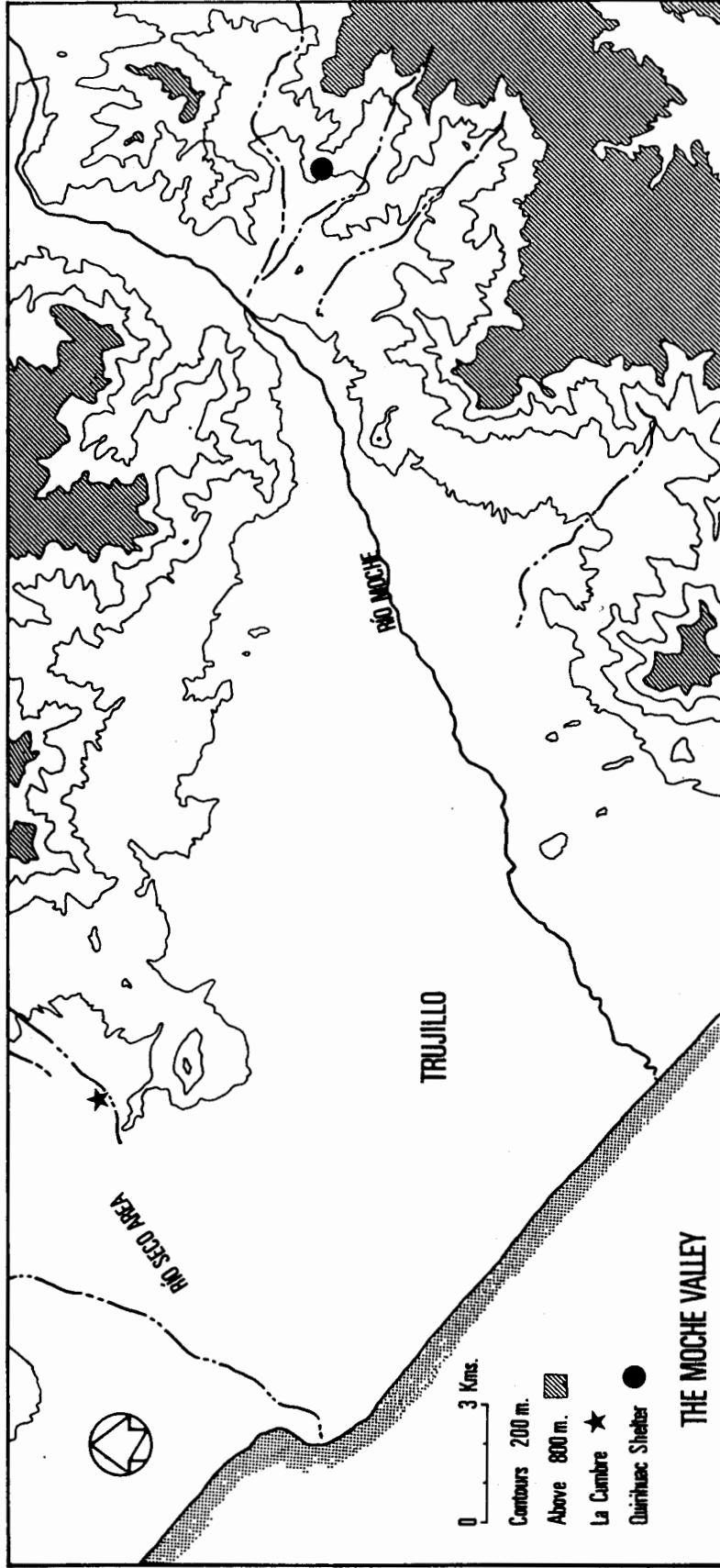
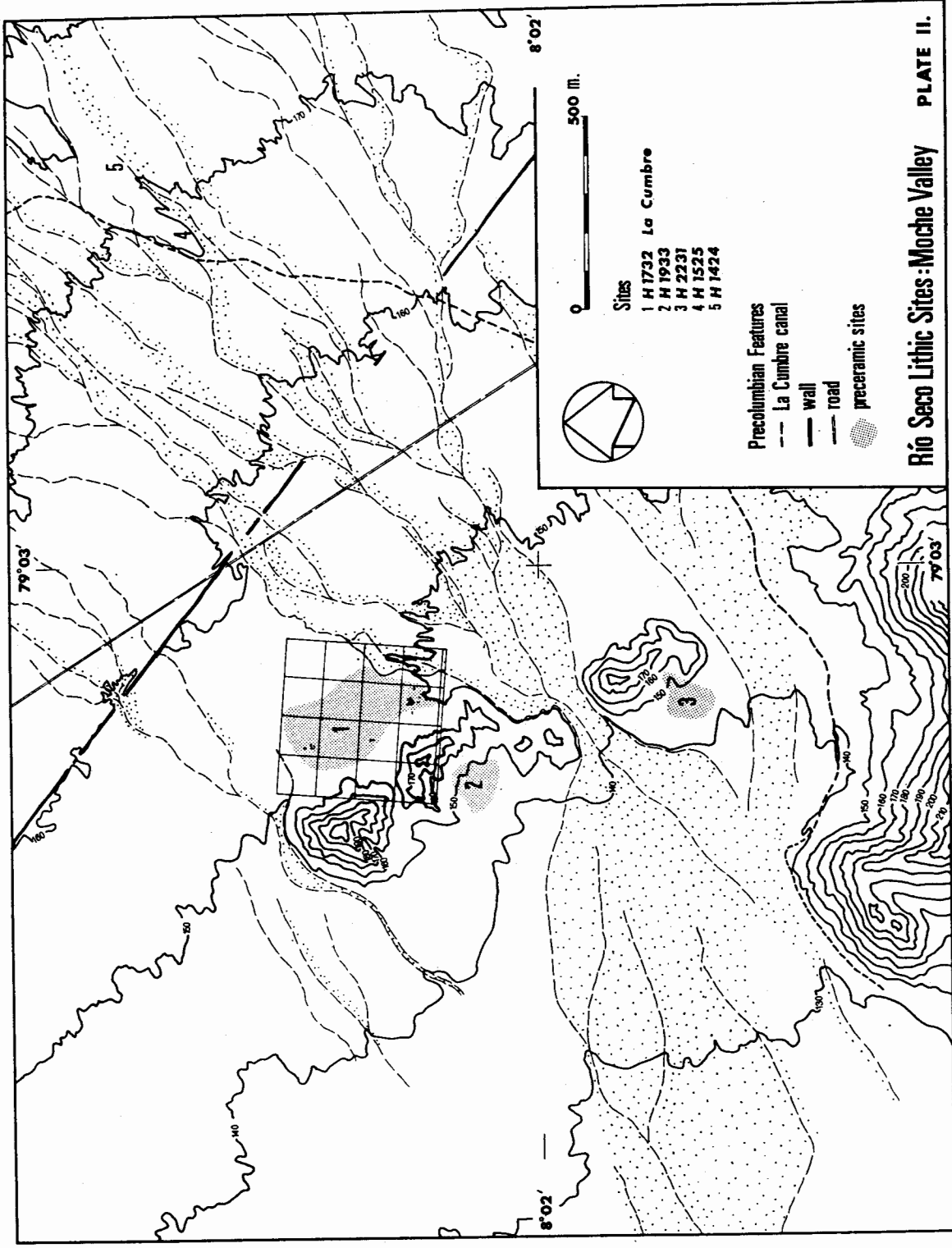
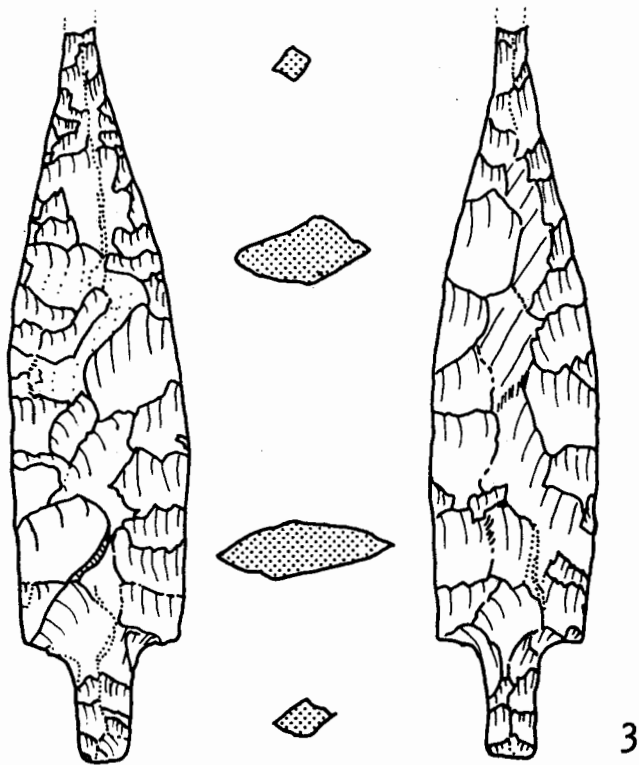


Plate I.





0 3 cm.

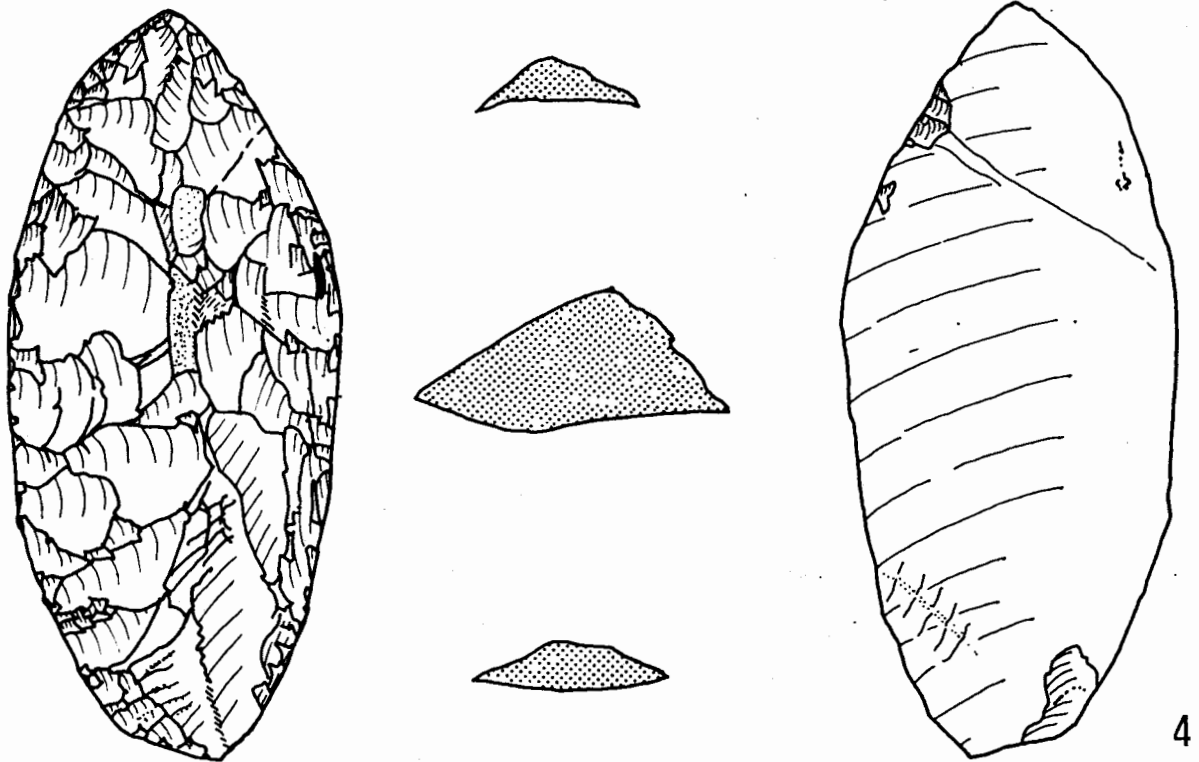
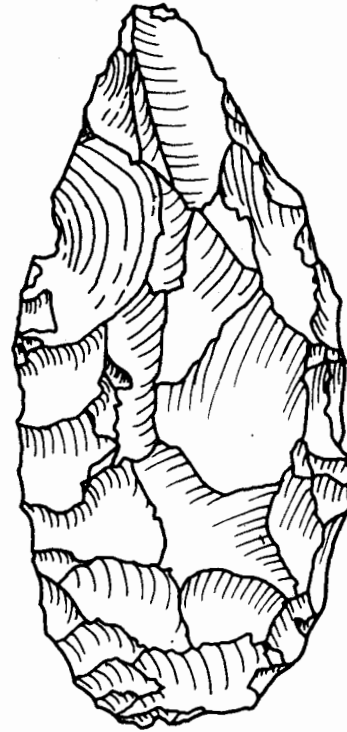
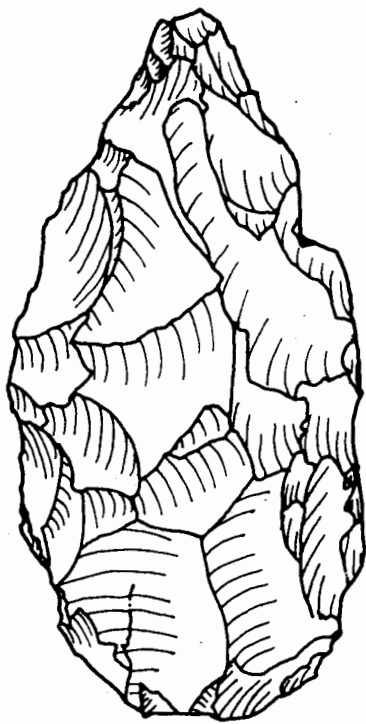
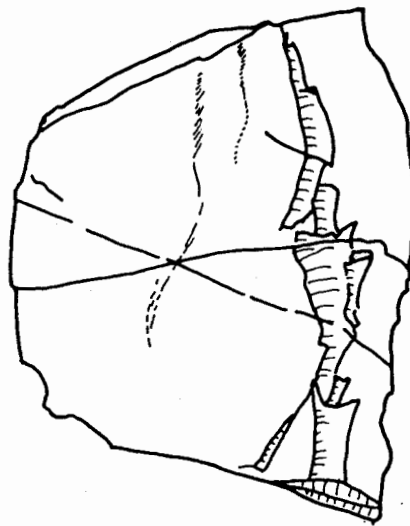
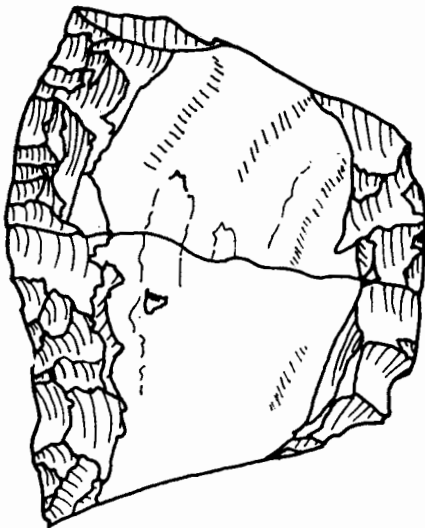
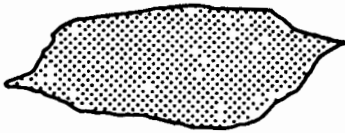


Plate III. Fig. 3, Paijān projectile point (H1933/7); fig. 4, slug (H1732/1459).



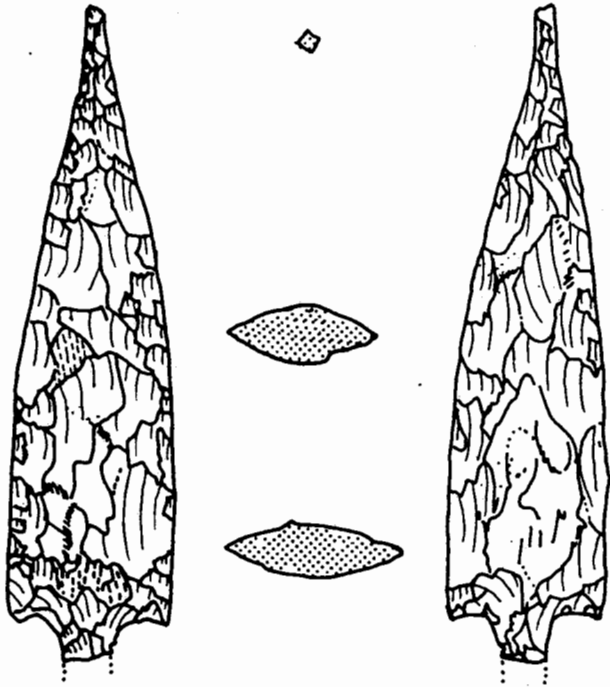
5



0 3 cm.

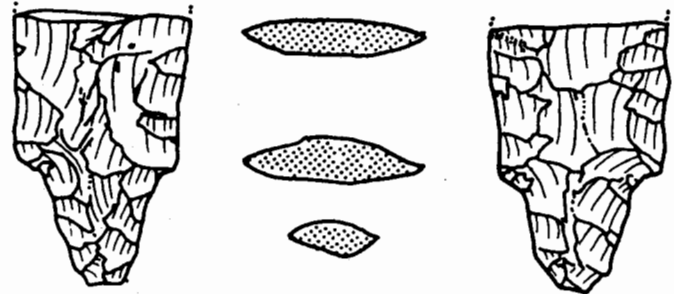
6

Plate IV. Fig. 5, bifacial (H1732/1592); fig. 6, scraper (H1732/208 and 214).

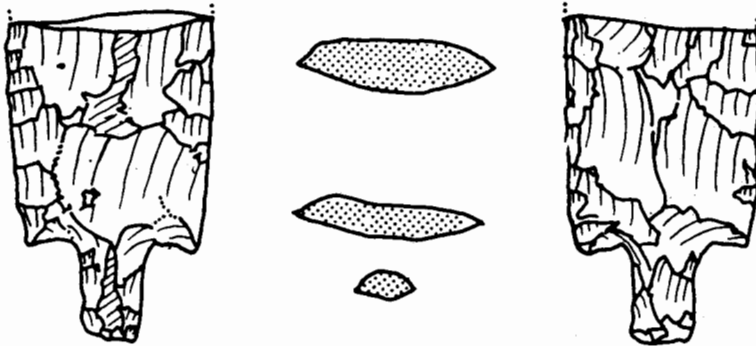


7

0 3 cm.



8



9

Plate V. Fig. 7, projectile point (H1732/4413); fig. 8, projectile point base (H1732/995); fig. 9, projectile point base (H1732/48).

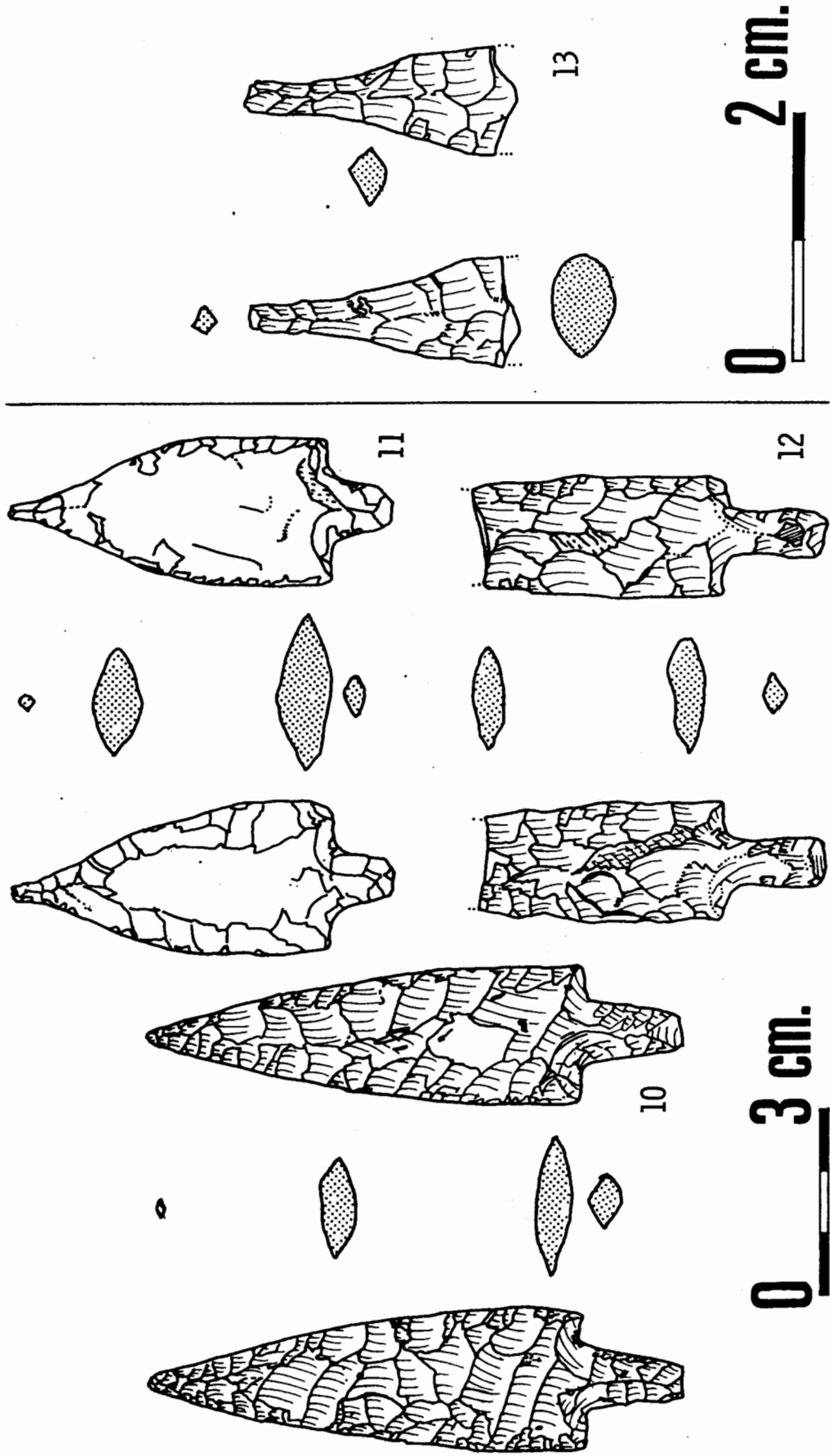


Plate VI. Fig. 10, projectile point (H1732/4289); fig. 11, projectile point (H1732/2342); fig. 12, projectile point base (H1732/2593); fig. 13, projectile point tip (H1732/658).

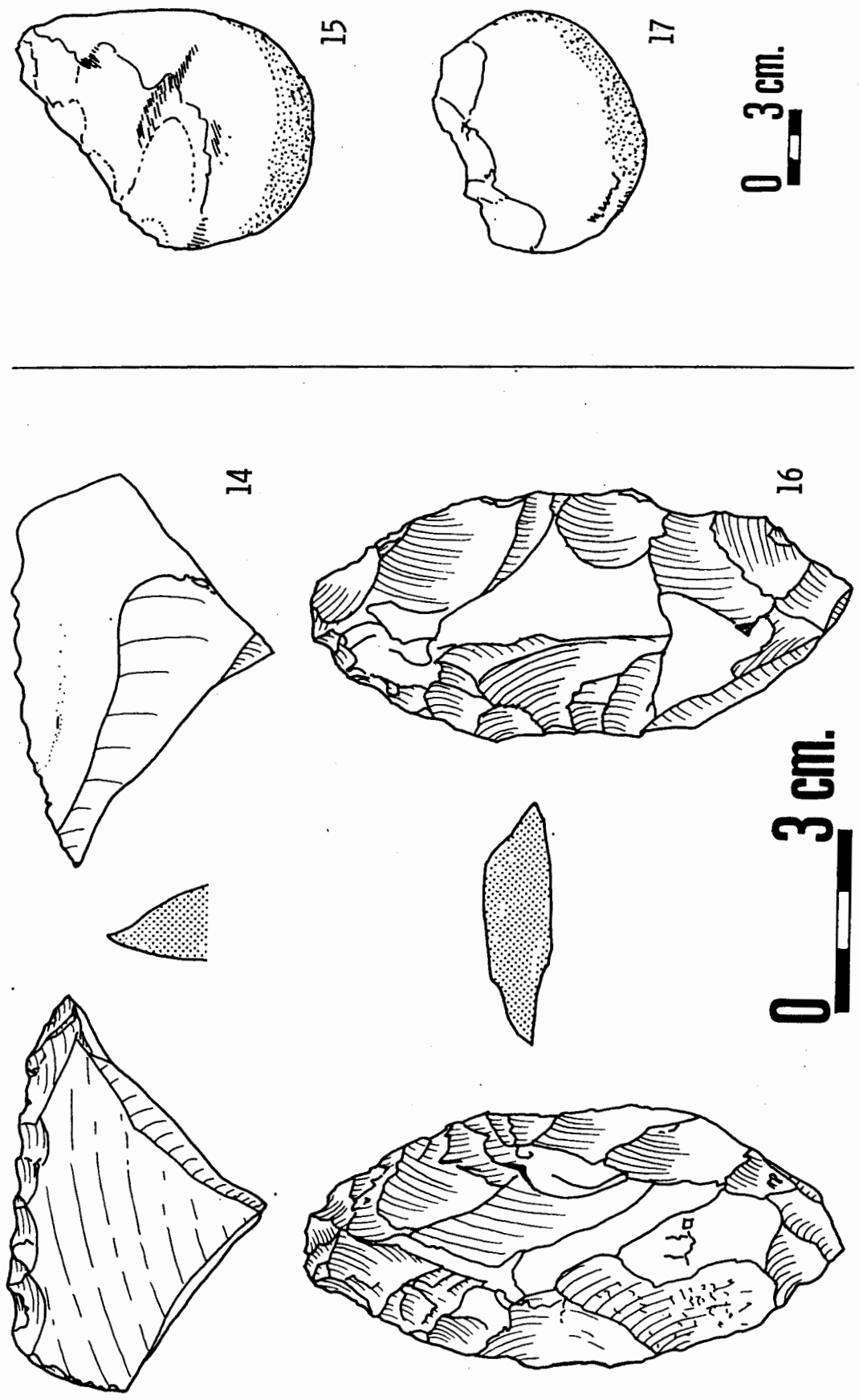
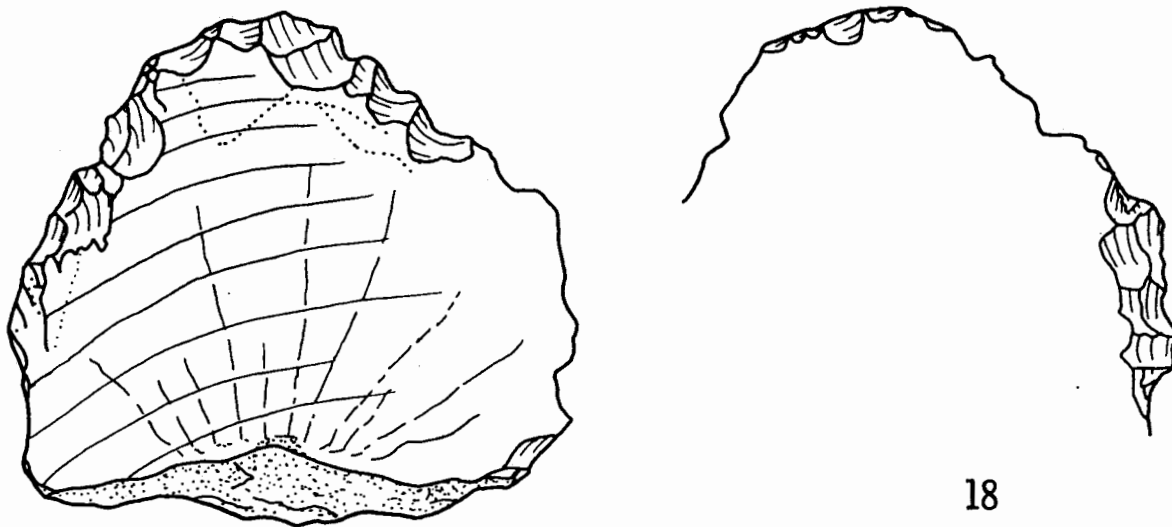
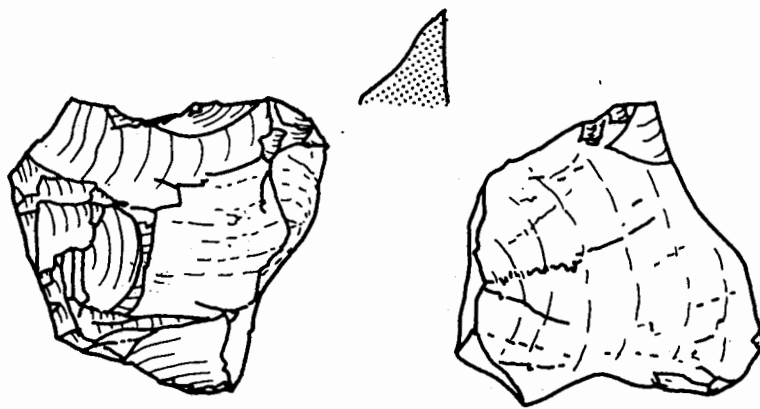


Plate VII. Fig. 14, flake denticulate (H1732/4878); fig. 15, unifacial pebble tool (H1732/1924); fig. 16, bifacial (H1732/1533); fig. 17, unifacial pebble tool (1732/1936).



18



19

0 3 cm.

20

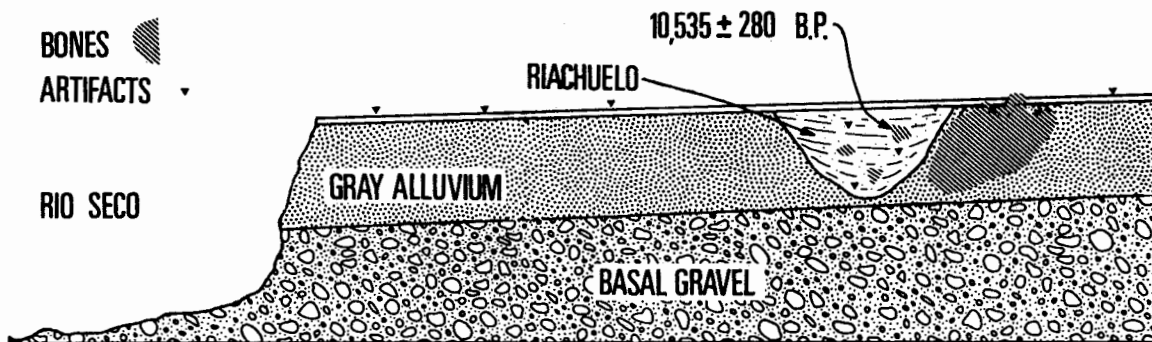


Plate VIII. Fig. 18, flake denticulate (H1933/125); fig. 19, complex notch on flake (K506061/24); fig. 20, schematic section of the stratigraphy at La Cumbre, Peru. The drawing is not to scale.