

**Janusz K. Kozłowski, Andrzej
Krzanowski**

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JANUSZ K. KOZŁOWSKI
ANDRZEJ KRZANOWSKI

NEW FINDS OF LEAF POINTS FROM THE CENTRAL ANDES OF PERU (CORDILLERA HUAYHUASH)

POSITION OF THE SITES AND ORIGIN OF THE COLLECTION

The region, from which the collection originates, is situated in Central Peru in the basin of the Upper Huaura, a river flowing from the Andes to the Pacific. Administratively it lies within the district of Oyón, Cajatambo province, in the department of Lima, while morphologically it comprises the basin of the Rio Pampahuay-Pucayacu (a tributary of the Huaura), to the E of the town of Oyón.

This is a typical mountainous area, bordering on the main ridge of the Andes (the Pacific-Atlantic watershed) in the part called Cordillera Huayhuash or Chacua. The altitude varies from approx. 3600 m (the town Oyón) to approx. 5350 m above sea level (the summit of C° Cañonpunta). The axis of the region is formed by the valley of the river Pampahuay, whose upper section is called Pucayacu. This is joined by numerous small tributaries, which flow into it almost perpendicularly.

As in all areas with a varied mountain morphology, the climatic levels in the Andes are of very great importance, influencing the conditions of weathering, the character of denudation, as well as the division of soil and vegetation zones.

According to the criteria of Peruvian geography, the region under discussion falls into two morpho-climatic zones¹. These are: the cordillera (*janca*), over 4800 m above sea level, and the puna zone (precordillera), situated between 4000 and 4800 m.

The cordillera zone consists of the highest parts of the Andes, completely or partially covered by glaciers. In the Pampahuay-Pucayacu basin such areas occur at its NE (Cordillera Chacua) and SW borders, also sporadically in the region of the highest summits. Because of the harsh climatic conditions this zone is uninhabited and almost entirely devoid of plant or animal life.

¹ J. Pulgar Vidal, *Geografía del Perú. Las ocho regiones naturales del Perú*, Lima 1972; C. Peñaherrera del Aguila, *Geografía general del Perú. Síntesis*, Lima 1969.

Mainly snow and hail fall here, and the temperatures generally remain below zero, with minor seasonal fluctuations.

The puna zone includes the upper parts of the valleys. In the region discussed here, this corresponds to the zone which A. Cardich has called the precordillera². The landscape was fashioned by the activity of the glacier, which once flowed from the slopes of the Cordillera Chacua along the Pampahuay-Pucayacu valley. This type of post-glacial morphology continues to a height of approx. 4000 m. Lower down the process of mechanical denudation by the rivers, whose valleys are extremely narrow and deep, has been the decisive factor. Today the Pampahuay Pucayacu valley has the characteristic shape of a letter U, as well as some other features resulting from glacial erosion (polishings, roche moutonnée). In the highest parts post-glacial lakes, often filling out former cirques, are numerous. A further phenomenon typical of post-glacial morphology are the hanging valleys of streams, which flow into the Pampahuay-Pucayacu (fig. 1).

The bottom of the valleys and the less eroded slopes are covered with low vegetation, consisting mainly of mosses, dry ichu grass, low cacti, stinging shauli-shauli bushes, and also cushion plants such as yarita or distichia, which cover the extensive peatbogs alongside the courses of the streams. More rarely, in watery spots protected from the wind, the scrub *Polylepis* grows. This zone is the favourite haunt of the llama, and is still inhabited by the vicugna species. Other larger animals here include the venado or Andian deer, the vizcacha (a large rodent) and the condor, which also appears in the higher regions.

The climate in this zone is cold, because of the proximity of the glaciers. Throughout the year low temperatures prevail; for January these are on average +6.7°C and for July +4.7°C³. Although the seasonal differences are minimal, the fluctuations over a 24 hours period are considerable (from -6°C at night to +20°C by day). Rainfall is slight, reaching an annual average of only 800-900 mm. There is a dry season (May-August) and a wet rainy season (September-April), during which the precipitation amounts to as much as 80% of the annual total.

In the valleys of the precordillera the presence of man is clearly visible. On the green pastures, which cover the bottom and slopes of the valleys, large flocks of sheep and llamas are grazed. Grazing, although very extensive here, is nevertheless based on settlement in the lower zones (below 4000 m above sea level). In the Pampahuay-Pucayacu basin permanent farms are encountered only in isolated cases. Most of the buildings, which are scattered over the whole area, are thatched shepherds' huts made from stone and

² A. Cardich, *Los yacimientos de Lauricocha. Nuevas interpretaciones de la prehistoria peruana*, Buenos Aires 1958.

³ *Estudio geológico de los derechos especiales de Minería-Perú en la hoya carbonífera de Oyón*, Lima 1973.

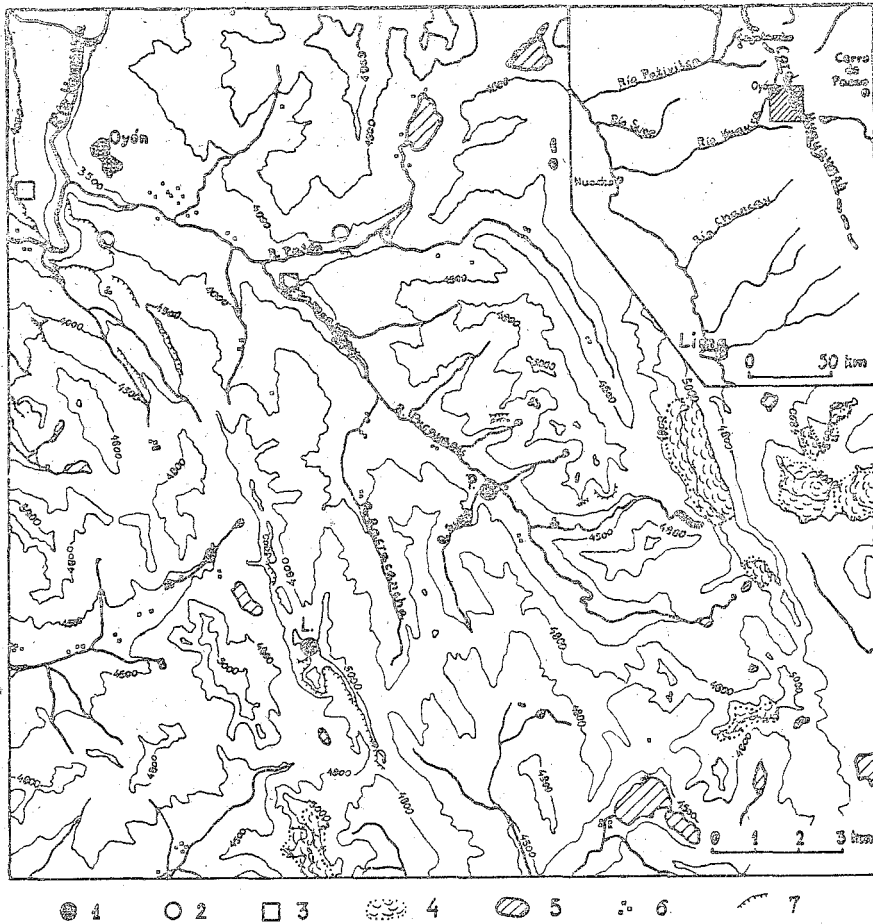


Fig. 1. Archaeological map of the Pampahuay-Pucayacu basin near Oyón

1—preceramic sites (P—Pucayacu, L—Limpio), 2—early sites (IV-I century B. C.), 3—late sites (IX-XIV century A. D.)
4—glaciers, 5—lakes, 6—contemporary habitation sites, 7—cliffs

clay, and are used for many years. At several points along the valley potatoes are cultivated on small plots, but this is an entirely untypical occupation. Generally speaking, contemporary man frequents these places only to graze sheep, or occasionally to hunt the few animals, and in exceptional cases to gather herbs or search for minerals. This latter activity is reflected in the large number of primitive mine galleries and shafts.

The climate of this zone, as has been demonstrated by the research of A. Cardich in the region of Lauricocha⁴, underwent considerable fluctuations

⁴ A. Cardich, *Lauricocha. Fundamentos para una prehistoria de los Andes Centrales*, Buenos Aires 1964.

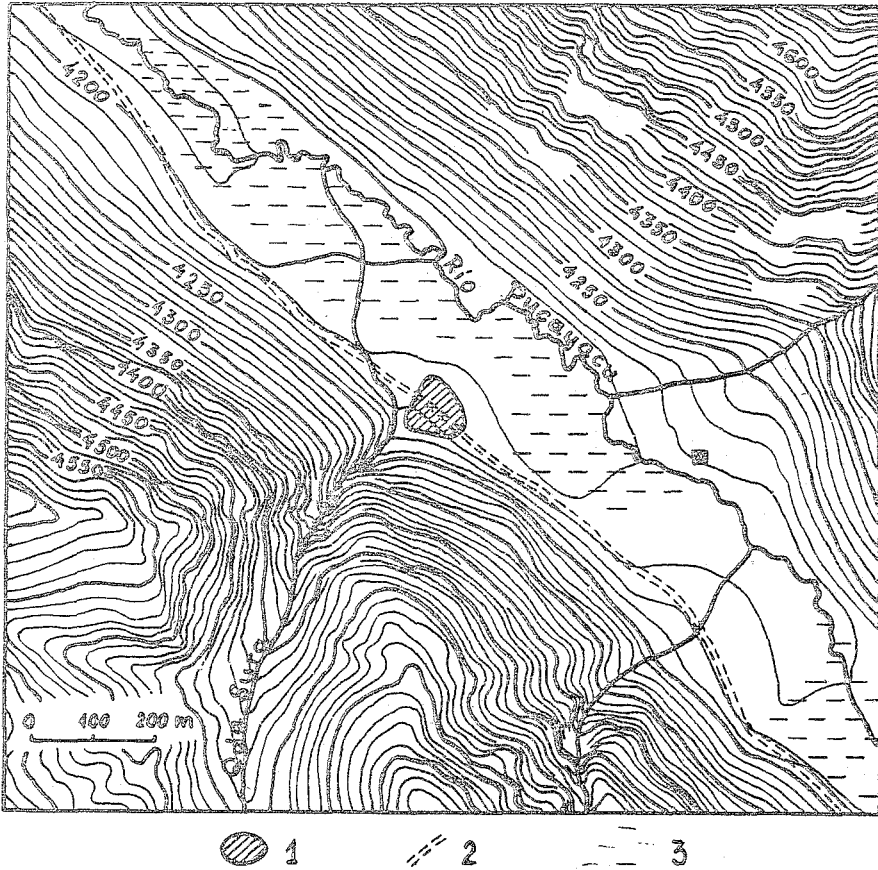


Fig. 2. Topographical contour map of the Pucayacu site
 1—area of horizontal distribution of artifacts, 2—road, 3—swampy areas

during the Holocene period, thus the environmental conditions necessary for the presence of man were also subject to change. The last Pleistocene glaciation of the Central Andes (Antarraga), unlike its predecessors, did not affect very large areas; at that time the glaciers reached a height of c. 3500 m above sea level, whereas earlier moraines are even found at 1800 m⁵.

At the beginning of the Holocene period the climate became considerably warmer and drier. During the first period (the so-called *jalca*), which lasted approximately from 8000 to 5500 B. C., a general recession of the glacier took place. This process was irregular, and there were even phases of trans-

⁵ H. Kinzl, *La glaciación actual y pleistocénica en los Andes Centrales*, "Revista Peruana de Andinismo y Glaciología", vol. 9, 1970.

gression. Sheguel Huaman, occurring between 6000-7000 B. C., is the clearly discernible substage of this period. The next period, the so-called *yunga* (5500-2000 B. C.), brought the most favourable climatic conditions. Now the glaciers probably disappeared altogether, or were preserved only on the highest peaks. The climate was warm and dry. The last period, which dates from c. 2000 B. C. until the present day, is the *quechua*, characterized by its changing climate. Fluctuations caused frequent changes in the glaciation boundaries, a phenomenon observed in Peru even in historical times (i. e. since the 15th century A. D.)⁶.

The collection of artefacts numbers 82 pieces, and was compiled by A. Krzanowski in 1972 during archaeological investigations made in the Upper Huaura basin⁷. Most of the specimens were donated by the inhabitants of the region, while others were purchased⁸. Although they were not taken directly from the surface by archeologists, their authenticity and common origin—from a relatively small area of the Pampahuay-Pucayacu basin—do not raise any doubts.

The majority of the relics were obtained from shepherds inhabiting the Qda Racracancha region (a tributary of the Pampahuay). According to them, the points were found in two places, called Limpio and Pucayacu. Limpio is said to be situated above the sources of the Qda Racracancha in a mountain pass (c. 4950 m above sea level) between the summits of C° Quima Cruz and C° Quellococha. This information was not verified; however, the second place (Pucayacu) was visited, and the existence here of an archaeological site was confirmed.

The Pucayacu site is situated in the Río Pucayacu valley at a height of approx. 4220 m⁹. The valley of the river has a U-shaped cross-section at this point, formed by a glacier. Both slopes, consisting of hard quartzitic sandstone, are precipitous and inaccessible. The base of the valley is nevertheless almost flat, approx. 200 m wide and overgrown with low grass. Nearby the river there are marshy areas covered with green "cushions" of distichia. The site is on the left, wider bank at approx. 150 m from the river. It occupies a weakly defined promontory (an old alluvial fan) by the mouth of the ravine of a small tributary called Qda Sura, directly adjacent to the precipitous slope of the valley. The area over which the artefacts occurred forms an irregular triangle of approx. 0.5 hectare (fig 2, 3). Its borders could not be precisely located, because of the difficulties encountered in uncovering

⁶ O. Dollfus, *Effets des fluctuations et des accidents climatiques sur l'écologie humaine du Pérou*, "Journal de la Société des Américanistes", vol. 54, no. 2, 1965.

⁷ During the investigation a lot of ceramic sites has been found; detailed description see: A. Krzanowski, *Archaeological investigations in the Upper Huaura Basin (Central Peru)*, "Acta Archaeologica Carpathica", vol. 17, 1977 (Part I), vol. 18, 1978 (Part II).

⁸ The part of the collection belongs to Ing. J. Kielkowski from Katowice (Poland); we examined this material thanks to his kind permission.

⁹ Geographical coordinates: 76°41'30" West, 10°44'00" South.

the relics from among the grass and moss. Only on the surface of the road, which intersects the whole site, was it possible to observe a greater concentration of finds, including numerous flakes, crumbled points and fragments of flint and quartzitic sandstone. The site did not yield a single fragment of ceramics. On the surface some oval ridges 0.5-1.0 m high are just visible,

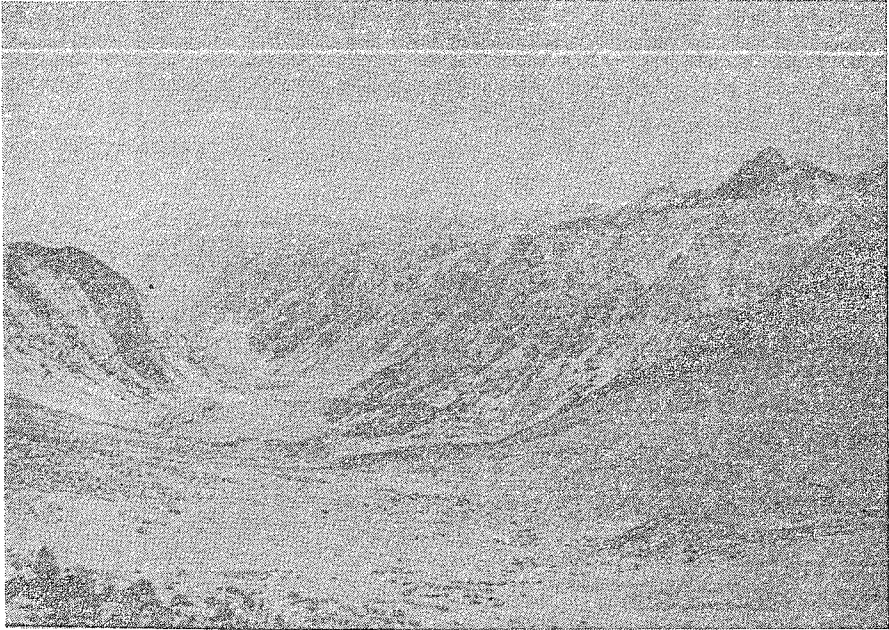


Fig. 3. Pucayacu valley as seen from SE. Photo by A. Krzanowski

probably the remnants of stone or clay walls. The ridges form a series of rectangles (with sides reaching a length of 25 m), which may be the remains of corrals. These structures are probably much later than the flint finds, for they extend right up to the course of the Sura torrent, yet have not been destroyed by it.

The position of the site on the old alluvial fan gives some suggestion as to its age. After the recession of the glacier, erosion shaped the outlets of the hanging valleys. At the foot of the steep slopes of the Pampahuay-Pucayacu valley, violent action caused the formation of alluvial fans. When the remains of the hanging glaciers had melted and the climate became drier in the period of the optimum environmental conditions, the amount of water in the streams probably decreased. The fans deposited in the first phase now checked the flow of water, already only slight, hence the asymmetric position of most of the present water courses in relation to their own alluvial fans. In the light of the above geomorphological data, the Pucayacu site could have been

occupied at the earliest during the period from 5000-6000 B. C. Since the site lies at a great height, it seems likely that it came into being during the period of the most favourable climatic conditions (i.e. 5500-2000 B. C.).

THE TYPOLOGICAL DIVISION OF THE LEAF POINTS

The division of leaf points adopted in this study was based on the following criteria:

1. shape;
2. retouch technique, manifesting itself in two respects:
 - a) shape of the scores on the point surface,
 - b) cross-section of the point, revealing the sequence of alternating flake removals on both sides and both edges;
3. method of forming the base of the points;
4. other features of technique.

Since both sides of nearly all the points were almost completely retouched it was not possible, in the majority of cases, to determine the original forms from which they were made. It would appear, however, that they include specimens produced from flakes or, more rarely, from blades, as well as from ordinary slabs. Because of the uncertainty, we disregarded this otherwise important criterion in the classification of our leaf points.

The choice of shape as the primary attribute was dictated by the necessity of relating our division to classifications already in existence, which were based exclusively on this criterion. Two of the most comprehensive systems for the categorization of Peruvian leaf points were those suggested by C. Chauchat¹⁰ (who compiled what was essentially a preliminary list of types), and by R. Ravines¹¹. Other analyses distinguish between individual types of point, but do not attempt a systematic and comprehensive treatment of the problem (e.g. the works by R. Lanning¹² and R. Mac Neish¹³). Yet another group of studies are restricted to the description of only some of the types, perhaps relating them to forms found in the Argentine or Bolivia. It must be stressed, that basically none of the previous classifications apply the criterion of technique, a fact which renders any attempt at defining the affinities of our leaf points extremely difficult.

¹⁰ C. Chauchat, *Ensayo de tipología del precerámico peruano*, "Revista de Museo Nacional", vol. 48, 1972.

¹¹ R. Ravines, *Secuencia y cambios de los artefactos líticos del Sur del Perú*, "Revista de Museo Nacional", vol. 38, 1972.

¹² P. Lanning, *Peru before the Incas*, New York 1966.

¹³ R. Mac Neish, *First annual report of the Ayacucho archaeological-botanical project*, Andover 1969; R. Mac Neish, A. Nelken-Terner, A. Garcia Cook, *Second annual report of the Ayacucho archaeological-botanical project*, Andover 1970.

The division suggested by C. Chauchat for the category *Bifaces y puntas de proyectil* takes account of the following types:

1. large points (*piezas grandes*), longer than 8 cm, slightly asymmetric;
2. so-called *baguettes* (i.e. oval specimens rather resembling small flat *Blattschaber*);
3. oval specimens (*pieza foliacea sin punta*);
4. bi-points (*pieza foliacea alargada bi-punta*);
5. elongated points with an atypical base (non-retouched);
6. elongated points with an elliptical base;
7. elongated points with a rounded base;
8. short points with a rounded base;
9. elongated triangular points;
10. short triangular points;
11. rhomboidal bi-points (*bi-punteaguda*);
12. elongated rhomboidal points;
13. short tanged points (*base eliptica y lados enserrados*);
14. elongated tanged points;
15. short points with a broad, rounded base.

The classification of C. Chauchat forms part of a system embracing a total of 8 groups of retouched points, one of which consists of leaf points. The classification evolved during work on collections from two sites: Quiqche and Tres Ventanas, and so cannot be treated as representative of the whole of Peru. The method used by R. Ravines is more universal, but unfortunately it distinguishes only 9 types:

- P1. triangular points with a convex base (*de base estocada*);
- P2. points of the Ichuña type (i.e. with lateral protrusions), corresponding to the definition given by Menghin and Schroeder¹⁴;
- P3. elongated points of the Viscachani type (i.e. slender points with a rounded base), corresponding to type 6 according to C. Chauchat;
- P4. short points of the Viscachani type;
- P5. rhomboidal points with a triangular tang;
- P6. asymmetric rhomboidal points;
- P7. triangular points with a rectangular tang;
- P8. rhomboidal points with a wide tang, corresponding exactly to types 12 and 14 according to C. Chauchat;
- P9. points with bent sides and a broad base (*punta con espina larga*).

A comparison of the systems of C. Chauchat and R. Ravines reveals in both cases a lack of precision in defining the various types; moreover, only a few of the categories in the two lists actually coincide. This gives us some idea of the great typological variety of Peruvian leaf points, and points

¹⁴ O. Menghin, G. Schroeder, *Un yacimiento en Ichuña (Perú) w las industrias precerámicas de los Andes centrales y septentrionales*, "Acta Prehistórica", vol. 1, 1957.

to the necessity of applying more discriminating criteria and a greater number of descriptive attributes for their classification (not to mention the need for a revision of dimensional criteria).

THE CLASSIFICATION OF POINTS FROM THE COLLECTION

By observing the guidelines set out above, it is possible to divide our collection of leaf points into two major groups:

1. *bifacial points*—the most numerous group, altogether 71 specimens;
2. *unifacial points*—represented by 2 examples only.

The first group may be further divided into ten types, comprising 60 specimens of definite description and 11 fragments, which cannot be attributed to a particular type. In this group the following types are observed:

1. *Elongated points* characterized by their *thinned base*. This shape resulted from the removal of thin flakes from the base. The scars thus produced are elongated and parallel to the axis; they are reminiscent of the "fluting" technique applied in the treatment of North American points connected with the Llano tradition. The scars on our points, however, are less extensive and often curve out towards the sides, which sometimes gives them the appearance of marks from flat burin blows. The points are flat and superficially retouched, with relatively shallow scars. As a rule there was only one series of flake removal; in rare cases the edge was further levelled by a second series. The bases of these examples are generally slightly rounded; only one point has a broader base.

According to production technique, type 1 points may be segregated into two groups, distinguished by their cross-section:

- 1.1. points with a *rhomboidal cross-section*, made by alternating flake removals (i.e. first on the dorsal and then on the opposite, ventral side etc., fig. 4: 1-3);

- 1.2. points with a *lenticular cross-section*, very flat, made simultaneously on both sides at each edge (fig. 4: 4-10).

Group 1.1. contains 4 examples, and group 1.2.—6 examples. A further specimen is damaged and therefore of uncertain affiliation. It is possible that in many cases there is a technical difference between the two groups, expressed in the universal application of the pressure technique for points from group 1.2.

In terms of size these points fall into three groups:

up to 3 cm	—3 examples,
from 3 cm to 5 cm	—4 examples,
over 5 cm	—2 examples.

The largest points of this category probably did not exceed 7-8 cm; this is shown by a reconstruction of the largest (unfortunately incomplete) specimens.



Fig. 4. Leaf-points from Pucayacu and Limpio
1-3—type 1.1, 4-10—type 1.2, 11-14—type 2.1

2. *Elongated points with a rounded base.* The technique employed here resembles that discussed above. Five examples belong to variant 2.1.—characterized by a rhomboidal cross-section (fig. 4: 11-14), while seven may be classed as type 2.2, with a lenticular cross section. Certain differences in

retouch technique can be observed here, caused by the more frequent application of the "en pelure" retouch in the case of 2.2. (fig. 5: 1-4).

For this type the same divisions according to size may be made, i.e. up to 3 cm (4 specimens), from 3-5 cm (5), and greater than 5 cm (3 examples).

3. *Bi-points* (with a pointed base). There are 8 specimens of this type, characterized by two distinct kinds of cross section:

3.1. —rhomboidal (2 examples—fig. 5: 5, 7);

3.2. —lenticular (6 examples—fig. 5: 6, 8, 9).

Almost all are distinguished by their meticulous retouch, shown by the position of the scars, which have parallel edges running parallel to the axis. In some cases the scars are fairly deep (particularly on specimens of type 3.1). One example has a more denticulated edge, and one is slightly asymmetric. In general the retouch on points of this group was also performed by a single series of flake removal, without secondary retouching. Only one specimen has a more irregular retouch.

As for size, again these points form three groups: up to 3 cm—1 example, from 3 cm to 5 cm—2 examples and over 5 cm—4 cases.

4. *Elongated points with a subrectilinear base*. All four specimens are incomplete, i.e. without tips. They have a blunted base and a semi-steep retouched edge. All are characterized by a lenticular cross-section and a carefully struck, single series of flake removal. Only one example has a secondary retouch, made by removing small overlying flakes; it is, moreover, partly damaged by burin blows on the tip (fig. 5: 10-12).

5. *Triangular points*—represented by 4, almost whole examples. Their characteristic features are a lenticular cross-section and a flat retouch, made by removing several overlying flakes. One specimen was partly damaged by the secondary retouch of one side. On another example a pronounced concave curvature of the lateral profile is visible, probably caused by the use of a flake. All these pieces are small—less than 4 cm long and 2 cm wide (fig. 5: 13-15).

6. *Points with a weakly formed tang*—represented by 5 examples. These have a characteristic "fish" shape, caused by the smooth transition of the point into the tang. Only one example bears the outlines of "ailerons". Four have a lenticular cross-section and a carefully made flat retouch, part of which is similar to the type "en pelure", but somewhat deeper. The fifth piece, on the other hand, has a plani-convex cross-section and an irregular, scalariform retouch. Only one of these points is larger than 4 cm and wider than 2 cm (fig. 5: 16-19).

7. *Triangular point with subquadrangular tang*. This type is represented by a single specimen, very slender, initially formed by a flat retouch made by removing large flakes, then completed by striking off small flat flakes, very regular and narrow, near the edge. The cross-section is lenticular, the length above 7 cm and the width—2 cm (fig. 6: 1).

8. *Points of the Ichuña type*, characterized by lateral protrusions. Repre-

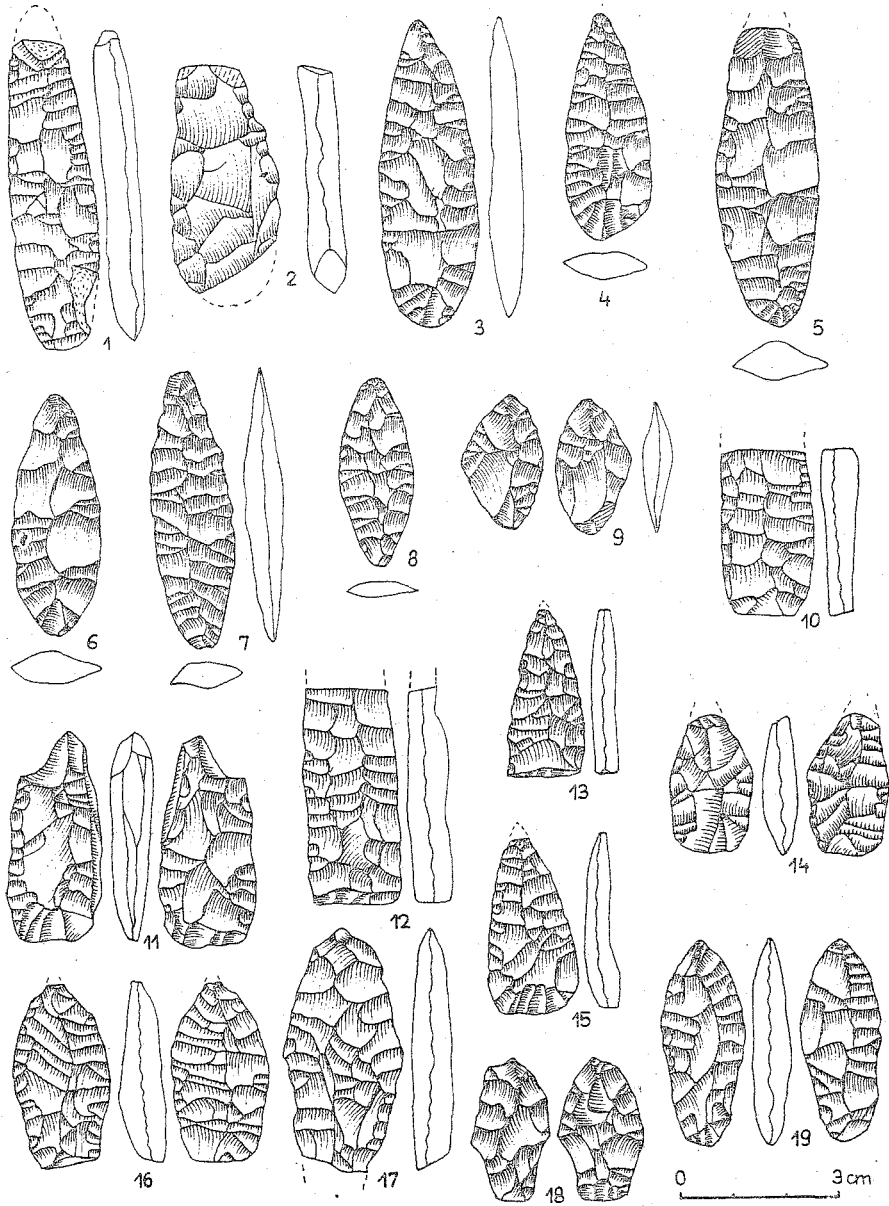


Fig. 5. Leaf-points from Pucayacu and Limpio

1-4—type 2.2, 5, 6—type 3.1, 7-9—type 3.2, 10-12—type 4, 13-15—type 5, 16-19—type 6

sented by two examples with an exceptionally flat retouch and a thin, lenticular cross-section (fig. 6: 2, 3). Length: 3-3.5 cm, width: 2 cm.

9. *Oval points*—represented by 2 specimens with a relatively thick retouch.

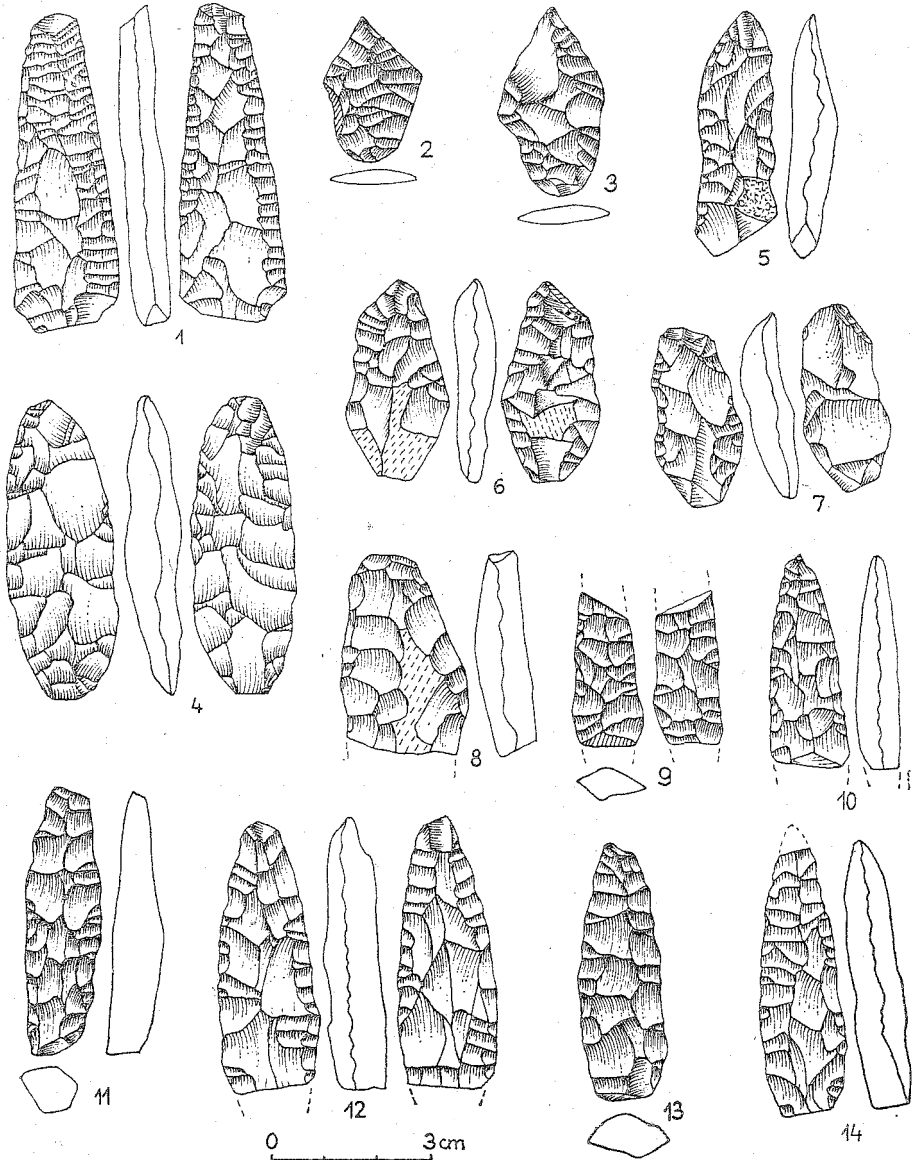


Fig. 6. Leaf-points from Pucayacu and Limpio

1—type 7, 2, 3—type 8, 4—type 9, 5-8—type 10, 9-14—slender points with truncated base

Similar to the bifacial type, they have fairly irregular, slightly zigzagging edges. The retouch is superficial, with deep wide scars, partly levelled at the edge. Length: 4-6 cm, width: 2-2.2 cm (fig. 6: 4).

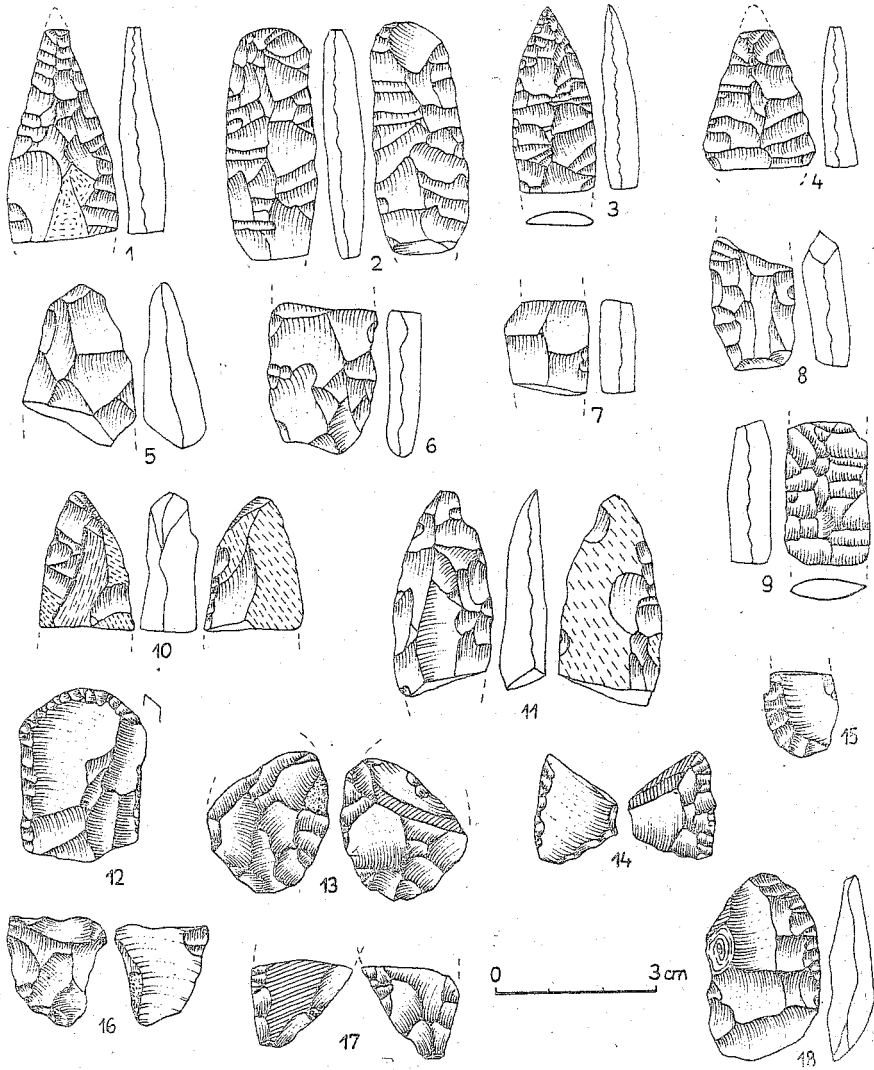


Fig. 7. Artifacts from Pucayacu and Limpio

1-4—slender points with truncated base, 5-9—fragments of bifacial points, 10, 11—unifacial points, 12—end-scraper, 13, 14, 18—partially bifacial side-scrapers, 15—retouched bladelet, 16—denticulated tool, 17—fragment of partially bifacial retouched implement

10. *Irregular (atypical) points*—primarily of the ovaloid type (4 examples). Their shape is above all the result of careless retouching. Two examples have a partially worked base, suggesting that they are unfinished. We should add here that, in both cases the points were made from flat slabs, and not from flakes (fig. 6: 5-8).

11. *Slender points with truncated bases.* Because of the absence of the base it is not possible to attribute them to any of the above mentioned types. Altogether there are 8 such points, of which 6 have a rhomboidal cross-section and 2 are lenticular. Most of these were worked by removing two series of thick irregular flakes. The largest may have been as long as 8 cm (fig. 6: 9-14; 7: 1-4).

12. There are 11 small *fragments of bifacial points.* 8 of these belong to the middle part and 3 to the tip (or base). 4 examples, lenticular in cross-section, were retouched by removing extremely even parallel flakes, while the rest were made by removing a single series of large, thin flakes (fig. 7: 5-9).

Unifacial points are represented by 2 examples, of which only fragments have survived. Both were made from flint slabs. They have a full surface retouch on one side and a partial retouch on the underside, near the edge. It seems likely that these are unfinished specimens (fig. 7: 10, 11).

THE CHRONOLOGICAL RANGE OF THE POINTS IN THE PERUVIAN CONTEXT

Thanks to our knowledge of several stratigraphic sequences in Peru, it is possible to establish the chronology of the points described above by means of the radioactive carbon dating of the strata, in which they occur.

The greatest difficulties are encountered in the case of the first group of points. As already mentioned, the criterion for isolating this group was based on the technique used for shaping (or, more precisely, for *thinning*) the base. Since this attribute was not taken into account by the previous systems of classification, we cannot give exact analogies for these specimens on the basis of published materials. We may, however, expect them to be comparatively early, since the "fluting" technique was characteristic of assemblages dated at the period from the 10th millennium B. C.¹⁵ to the 6th millenium B. C. in Central and North America. In South America we have dates for points of the "fluted" type from the El Inga site in Ecuador, of which the lowest (i.e. earliest) date falls at the end of the 8th millennium (7080 B. C.)¹⁶. On this site the process of the "degeneration" of fluted points has been noted, although they all still possess a concave base and convex sides in the central part of their bodies, rather like the points of the Llano type. And while it is true that on our specimens an elongated score of flake has been removed from the proximal end, thus thinning the base of the point, the bases themselves are nevertheless predominantly subrectilinear, or even slightly convex. This indicates the further transformation of this technique, and so we may surmise that the Peruvian examples examined here are from an even later period. Given the present level of our knowledge of the problem, they may mark

¹⁵ H. M. Wormington, *Ancient Man in North America*, Denver 1957.

¹⁶ W. Mayer-Oakes, *El Inga projectile points*, "American Antiquity", vol. 31, 1966.

the lower (earlier) chronological border (the turn of the 8th and 7th millennia B. C.), but cannot possibly designate the upper limit.

The points of group 2 have closest affinities with the Viscachani type, and with types 6-7 according to the classification of C. Chauchat. The earliest examples of such points appear on the Quiqche site (levels 5-6), where they are dated at 7500-6000 B. C. Those from the Ayacucho region also originate from an early period; here they represent the Puente, Jaywa, Piki and Chihua phases, that is, the period from 7500 to 4000 B. C.¹⁷ A narrower chronological range characterizes points from Lauricocha¹⁸, where they are encountered in phases I and II, as well as from Toquepala, also in phases I and II¹⁹. Thus in both cases they occur in the period from 6000 to 4000 B. C. A similar range is represented by finds of such points in neighbouring countries (e.g. in Bolivia).

Points from group 3 are related to type 4 according to C. Chauchat. In the Ayacucho region they occur over a considerable time span, i.e. during the phases of Puente, Jaywe and Pika, or from 7500 to 4400 B. C.²⁰ Examples from Lauricocha originate almost exclusively from phase II, i.e. between 6500 and 3500 B. C. In Quiqche points of this type are unknown before the 6th millennium B. C. Their upper chronological limit on this site is not known.

The points of group 4 do not have strict counterparts in the classification of C. Chauchat and R. Ravines. A similar specimen occurred within levels R and Q of the Lauricocha cave, i.e. in a layer dated at 7600-6000 B. C. The points with a straight base appearing in Quiqche and in the Ayacucho region are considerably broader than our examples.

For points of group 5, only the lower chronological limit has been fixed, thanks to the presence of analogous specimens in level 3 of the Quiqche cave, dated at circa 6000 B. C.²¹ The absence of such points in the stratigraphic sequences of the Ayacucho region does not allow us to establish their upper limit.

Points from group 6 correspond to type P8 in the classification of R. Ravines. They occur on the Toquepala site in the strata dated at 6700-5900 B. C.²², whereas in the Ayacucho region they are known only from the Puente phase, which falls at the period from 7500-6900 B. C. This is the only type possessing a chronological range which is distinctly earlier than the middle of the 6th millennium B. C.

Group 7 points correspond to type P7 according to R. Ravines. They

¹⁷ Mac Neish, *op. cit.*, p. 46-47.

¹⁸ Cardich, *Lauricocha, Fundamentos para una prehistoria...* p. 17.

¹⁹ J. C. Muelle, *Las cuevas y pinturas de Toquepala*, [in:] *Mesa redonda de ciencias prehistóricas y antropológicas*. Lima 1969, vol. II.

²⁰ Mac Neish, *op. cit.*, pp. 46-47.

²¹ Chauchat, *op. cit.*, p. 125.

²² Muelle, *op. cit.*, p. 26.

are known from the Jaywa phase in the Ayacucho region, i.e. from the 6th millennium²³. But specimens from later times have also been encountered, as they occurred on the Toquepala site in the level dated at 3500-3000 B. C.²⁴

The points of group 8 are similar to the so called Ichuña type, although they do not have its classical features²⁵. The Ichuña type has a fairly broad chronological range. In Toquepala we find points of this kind in layers dated at 6700-5900 B. C., in Lauricocha they appeared in level R dating from approx. 7600 B. C., while on the Cuchima site they originate from the period between 6500-5000 B. C.²⁶ In the Ayacucho region such finds have an even wider range, occurring in the Puente, Jaywa and Piki phases, i.e. from 7500 to 4400 B. C.²⁷

Points from group 9 correspond to type 3 according to C. Chauchat. Undoubtedly they occur very early in the stratigraphic sequence of Quiqche, even as far back as the 8th millennium. Unfortunately, their stratigraphic position on sites in the Ayacucho region is not clear. They appear to represent the earlier phases, mainly Jaywa and Piki.

Due to their uncertain position within the classification system, the remaining points cannot be included in our chronological analysis of the collection.

To conclude our observations concerning the chronological range of the various types of leaf points in the collection, we may state that the majority fall within the period from 2000 to 5000 B. C. Only one type (6) occurs over the time span of 7500-6000 B. C., and one (5) does not appear at all until after 6000 B. C. Consequently the collection may be defined as fairly homogeneous from the chronological point of view, probably dating from the second half of the 6th millennium, i.e. between 5500 and 5000 B.C. We should not, however, rule out the possibility of a slightly earlier origin, perhaps from the first half of the 6th or even from the 7th millennium. At the same time it should be stressed, that the geomorphological situation of the site from which the points were taken rather disproves such an assessment, especially that which suggests periods prior to 6000 B. C. (fig. 8).

On the other hand we may exclude any later dating, especially after 4000-3500 B. C., when new kinds of leaf points begin to emerge in the Peruvian Andes, above all triangular specimens with a concave base (e.g. the so-called Quiani, Colorada and Islay types), as well as the highly characteristic tanged points with "ailerons" (e.g. the so-called Wankarani and Lisera types etc.)²⁸. This does not, of course, mean that certain of the point types discussed in

²³ Mac Neish, *op. cit.*, p. 13.

²⁴ Ravines, *op. cit.*, p. 133.

²⁵ Menghin, Schroeder, *op. cit.*, pp. 41-56.

²⁶ R. Ravines, *Grupos de tradición cazadora en las tierras altas de Huanavelica, Perú*, "Revista de Museo Nacional", vol. 37, 1971.

²⁷ R. Mac Neish, *Early Man in the Andes*, "Scientific American", vol. 22, no. 4, 1971.

²⁸ Ravines, *Secuencia y cambios...*, p. 133.

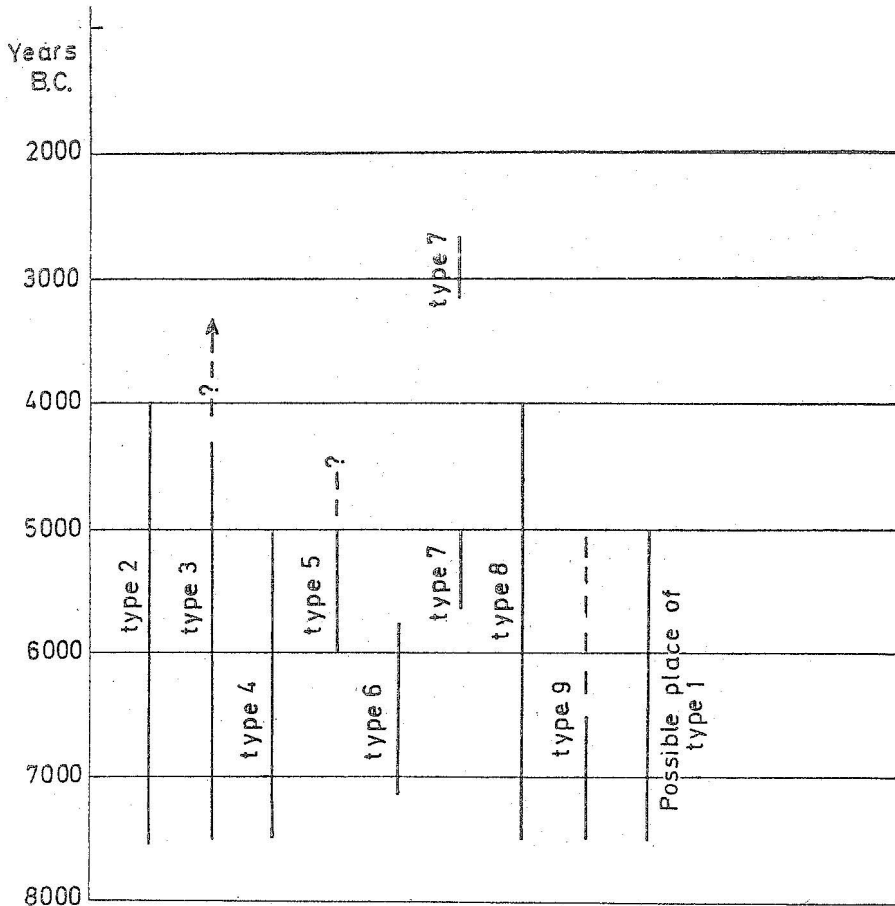


Fig. 8. Diagram showing the chronological distribution of leaf-points

this study (e.g. points of type 3) could not occasionally appear alongside triangular points with a concave base, as, for example, at the Diablomachay overhang in layer 3, probably dating from the 4th millennium B. C.²⁹

THE HOMOGENEITY OF THE COLLECTIONS AND THE FUNCTIONS OF THE SITES

As mentioned in the introduction, the collection originates from 2 sites: Limpio and Pucayacu. Besides 58 finished leaf points, 4 unfinished examples and 11 fragments, the collection contains 9 tools of other descriptions:

1. three partially bifacial side scrapers—one convex, one simple and one discoidal (fig. 7: 13, 14, 18);
2. two denticulated tools, one with an alterne retouch (fig. 7: 16);

²⁹ R. Ravines, *El abrigo de Diablomachay: un yacimiento temprano en Huacuco Viejo*, [in:] *Mesa redonda de ciencias prehistoricas y antropologicas*, Lima 1969.

3. two retouched bladelets (fragments). The retouch is fine, steep and near the edge (fig. 7: 15);
4. an end-scraper on a one sided retouched blade (fig. 7: 12);
5. fragment of a partially bifacial retouched implement, perhaps a side-scraper (fig. 7: 17).

These implements have clear analogies among tools found together with leaf points on other sites in the Peruvian Andes (Ayacucho region, Lauricocha, Toquepala and others), although they are slightly smaller than the specimens from, for example, the Ayacucho area. Typologically, however, they entirely coincide, as in all cases they include bifacial side-scrappers, denticulated tools and end-scrappers.

In view of the quite considerable uniformity of the leaf points and other related objects, it is safe to assume that the collection is connected with sites which were probably settled several times by group of hunters belonging to the same traditions. The high incidence of leaf points in comparison with other products is particularly striking in this case. Such a tendency is characteristic of camps built during summer hunting expeditions. A high percentage of leaf points is observed, for example, in almost all the levels of the Lauricocha cave³⁰. Level R yielded 10 leaf points with as many as 11 other retouched implements, later however, in level O, there were 28 leaf points to only 2 retouched tools (end-scrappers), while level L has 48 points to 2 implements (short end-scrappers). The proportion characteristic of our collection—69 leaf points to 9 other tools—may, of course, have been distorted by the circumstances in which it arose, i.e. partly from finds made by the local population, who above all picked up points with the most impressive appearance. Nevertheless, these figures clearly indicate the predominance of points in relation to other retouched implements, a fact which is confirmed by data obtained from the systematic collecting of material from Pucayacu.

It thus seems certain that our collection is connected with two sites. These were summer hunting camps where, among other activities, supplies of flint points were replenished. Most of the points were brought here in their finished state, although some were produced on the spot (as is shown by the occurrence of some unfinished specimens). Local production is also suggested by the raw material, which is typical of the region. The materials represented by our collection are as follows:

Local rocks:

- | | | |
|-------------------------|-------|-------------|
| 1. Quartzitic sandstone | 29.6% | |
| 2. Cherts | 42.2% | Total 71.8% |

Allochthonic rocks (not occurring in the region of the site):

- | | |
|-------------|-------|
| 1. Flints | 18.3% |
| 2. Porphyry | 1.4% |

³⁰ Cardich, *Lauricocha. Fundamentos para una prehistoria...*, p. 30.

- | | | |
|---------------------------------|------|-------------|
| 3. Undefined volcanic rocks | 1.4% | |
| 4. Other (probably metamorphic) | 7.1% | Total 28.2% |

The tables above show that local rocks, readily available in the immediate vicinity of the site, predominate (almost 3/4 of the total).

THE SIGNIFICANCE OF OUR SITES IN RELATION
TO THE EARLY PRECERAMIC CULTURES OF THE PERUVIAN ANDES

The preceramic sites so far investigated in this region of the Peruvian Andes fall into two types:

1. Temporary cave camps used repeatedly by small groups of hunters during summer expeditions. These include the Lauricocha site, which lies approx. 55 km to the north of Pucayacu, and the slightly nearer site (about 45 km) of Ranracancha³¹, where settlements corresponding to the middle development phase of the Lauricocha sequence are represented.

2. Open, predominantly terraced sites of the "base camp" or rather "workshop" type, where quartzitic sandstones were prepared. The site at Ambo (sometimes known as Perjaypata), situated approx. 80 km to the NE of Pucayacu, and the more remote site of Quishqui Puncu (about 200 km to the NW) both belong to this category³². Both are places whose chronology corresponds to the middle phase of the Lauricocha sequence (i.e. phase II, dated at 6000 to 3500 B. C.), and thus also to the period suggested by us for the sites of Limpio and Pucayacu. On the site at Quishqui Puncu as many as 94 thousand flint implements were discovered, including only 381 leaf points.

Seen against such a background, the sites which interest us may be defined as the first open hunters' camps, typologically similar to cave sites. The presence of such camps on the terrace of the Lauricocha river has already been noted by C. Cardich; he attributed them, however, to phase III (dated at 3500-1500 B. C.).

It should be emphasized that both our sites are the highest so far found in the Andes, exceeding the level of the Lauricocha cave by approx. 120 m. Other sites are considerably lower (e.g. Quishqui Puncu is 3040 m above sea level).

A further aspects of the sites' position is also worth noting. Namely, they lie on the western side of the main ridge of the Andes, whereas all the other preceramic sites quoted above are situated on the opposite, eastern side of the Cordillera.

The discovery of the flint implements in the region of the Cordillera Huayhuash thus points to the necessity of further investigations, which will undoubtedly allow us to fill the gap still existing in our knowledge of preceramic settlement (particularly in the early stages) between the main ridge of the Andes and the coast.

³¹ A. Cardich, *Ranracancha: un sitio prehistórico en el departamento de Pasco, Perú*, "Acta Prehistórica", vol. 2, 1959.

³² T. F. Lynch, *Quishqui Puncu—a preceramic site in Highland Peru*. "Science", vol. 158, 1967, p. 780.