PRO CALIMA

Archäologisch-ethnologisches Projekt im westlichen Kolumbien/Südamerika

Periodische Publikation
der Vereinigung
Pro Calima

Dezember 1981

2/1981

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Periodische Publikation der Vereinigung Pro Calima

Dezember 1981

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2/1981

1. Introduction

The 1980 field season lasted from July until the end of September. Students from four Colombian universities participated in all aspects of the work, and the element of international collaboration was emphasized by the presence of Swiss and German members. Scholars from the Museo del Oro and the University of Antioquia made short visits to the excavations, and Professor Robert Eidt came to Calima for a week in order to collect soil samples for analysis at the University of Wisconsin. The success of the 1980 season is largely due to the hard work and willing co-operation of these friends and colleagues.

The programme of research followed the outline presented in the 1979 report, and the results are summarized below. Some of the material is still in course of analysis, and at this stage of the Project our conclusions should not be regarded as definitive.

In keeping with the Foundation's policy of collaboration with all scholars interested in Calima archaeology, we have invited contributions from two specialists (Immina von Schuler and David Scott) who did not take part in the field work, but whose studies are closely related to our own. We hope

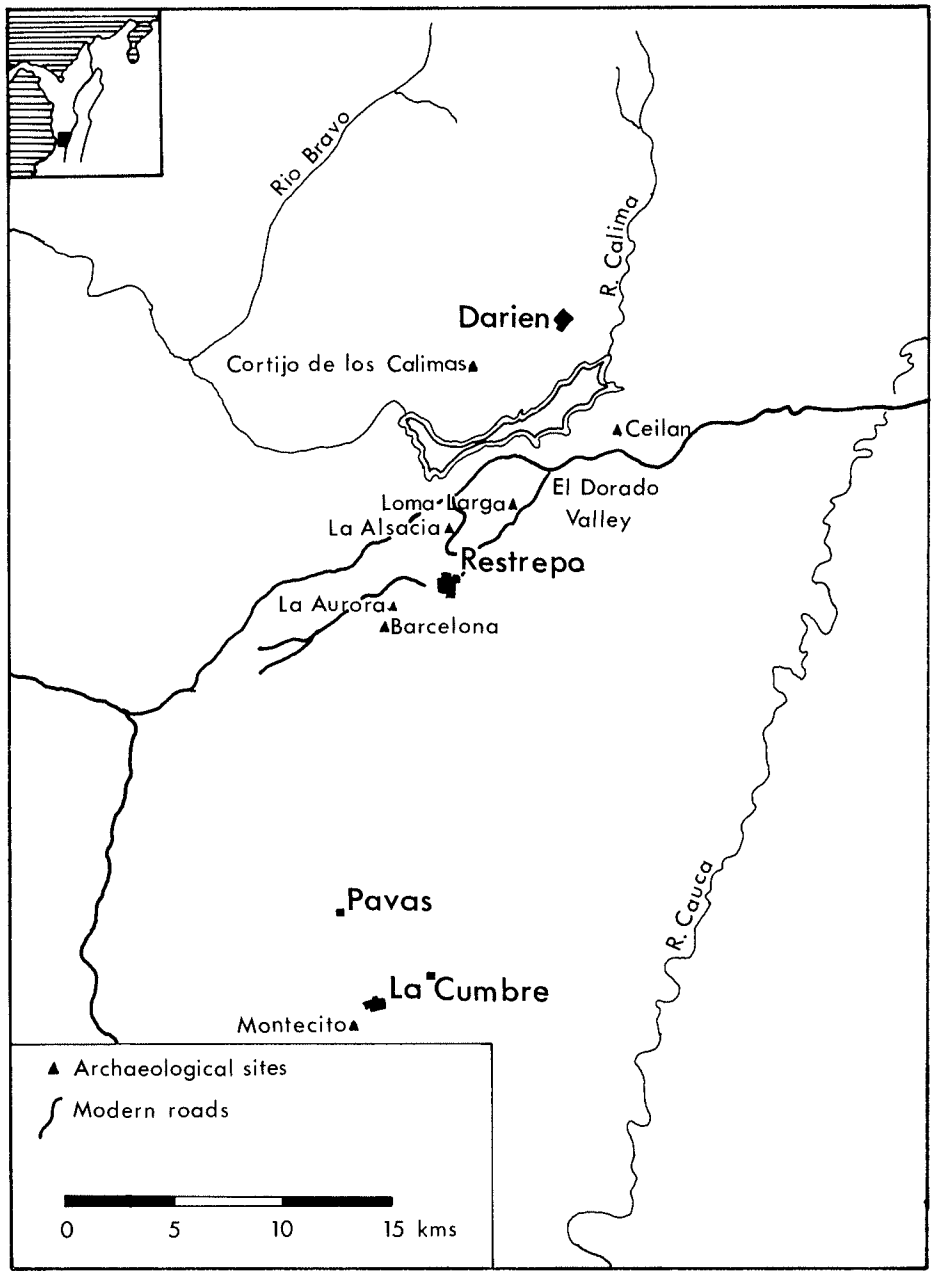


Fig. 1. Map of the Calima region, with the sites excavated in 1980.

to include similar guest contributions in future reports, and would be pleased to hear about any Calima specimens in museums or in private collections.

2. Problems of chronology

One result of the 1980 campaign was a new series of radiocarbon dates. In part, these corroborate the chronology set out in our first report, but there were also some surprises. Fig. 2 lists all the available radiocarbon and thermoluminescence dates from Calima and the adjacent parts of the Western Cordillera. Some of the dated material was illustrated in Report No. 1. A further selection is presented in Figs. 3–10, and also in Section 6, below, which describes the excavations on house sites carried out in 1980.

a) The Sonso period

The dates for this final period of occupation form a consistent group, and place the start of the Sonso stage at about A. D. 1200. The two most recent dates, from a house platform at Cortijo de los Calimas and a tomb at Varsovia, indicate that Indian culture continued for some centuries after the Spanish Conquest.

b) The Yotoco period

The terminal dates for the Yotoco period coincide with those for the beginning of the Sonso occupation of Calima, and suggest that the one followed directly after the other, without any break in the sequence.

As research continues, the Yotoco period grows in importance. Sites of

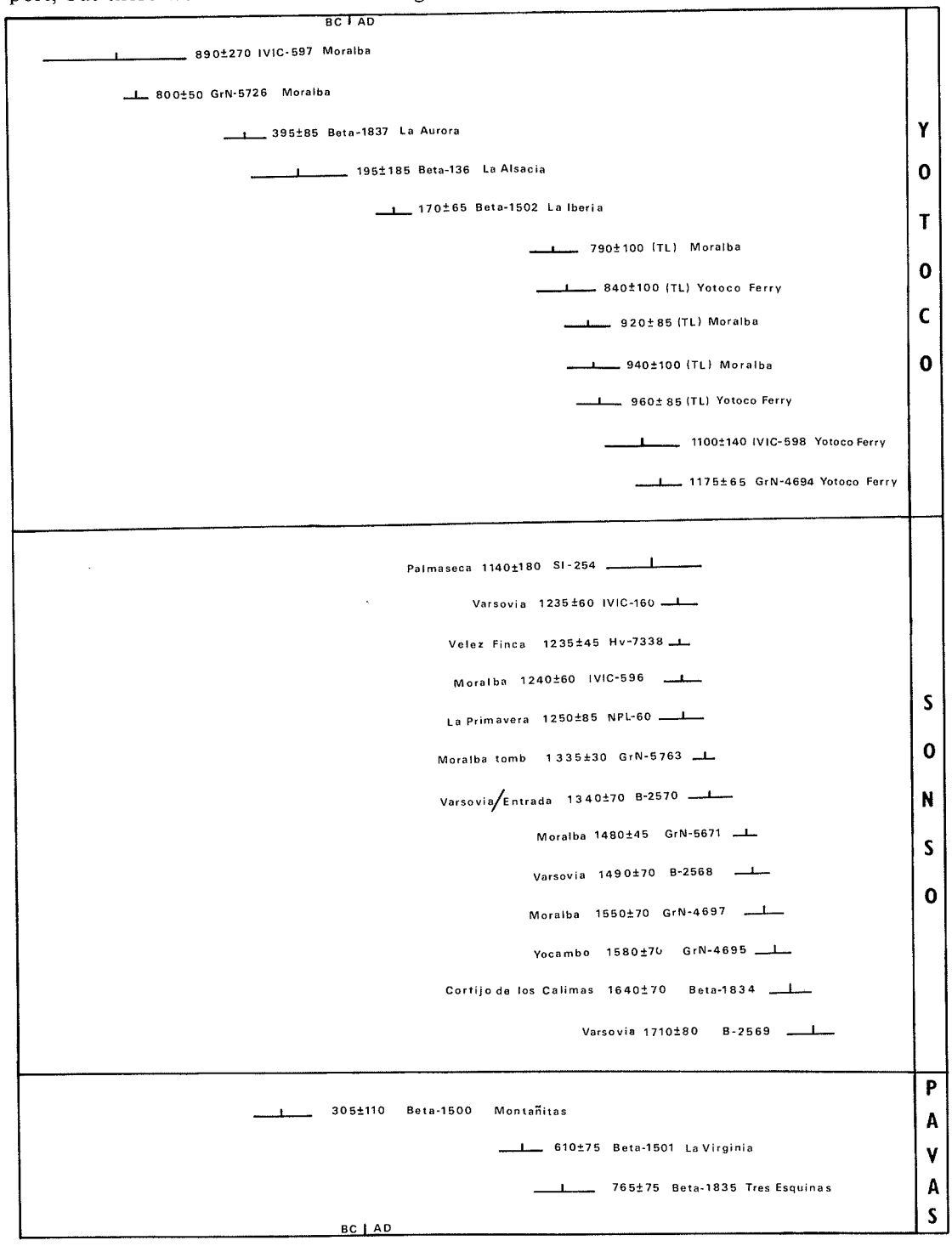


Fig. 2. Radiocarbon and thermoluminescence (TL) dates from Calima and adjacent areas. The radiocarbon dates are uncalibrated and are cited with one standard deviation, using the 5568-year half life. The two oldest radiocarbon dates (IVIC-597 and GrN-5726) are out of line with their corresponding TL dates, and should be rejected as more than fifteen hundred years too old (see Archaeometry *vol. 14, No. 1, pp. 119–26).*

Not included in the chart are two further radiocarbon dates: B-2567 (2940 ± 100 B. C.) from a tomb at La Suiza containing Sonso pottery, and B-2643 (190 ± 85 B. C.) from another tomb at the same site. The first of these dates is unacceptably ancient for Sonso material, and the precise association of the second date is unclear.

All dates with the prefix B or Beta come from excavations by members of the Pro Calima Foundation.

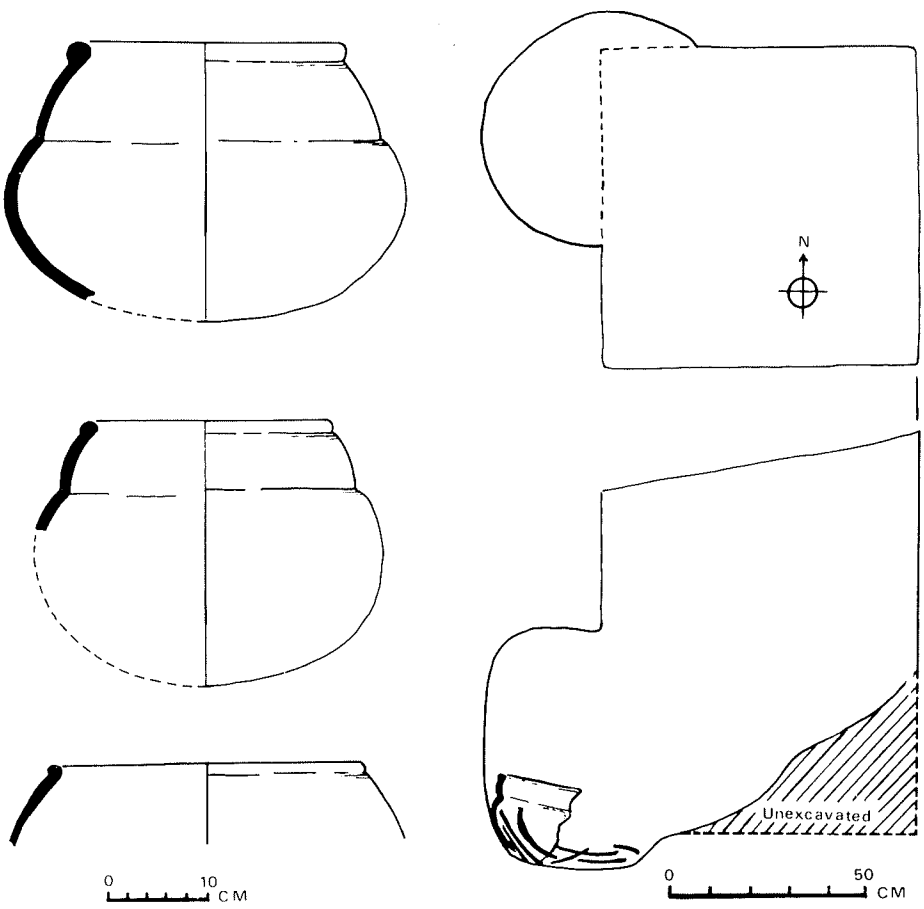
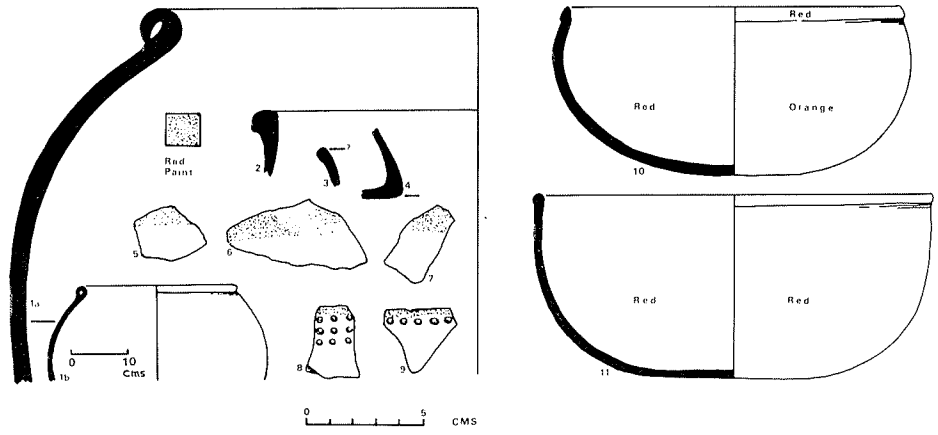


Fig. 3. Tomb 1 of the Yotoco period at Hacienda La Iberia. In the funerary niche were fragments of three typical Yotoco jars or urns. Charcoal from this tomb gave a radiocarbon date of 170 ± 65 B. C. Other tombs from La Iberia have yielded Yotoco bowls and a few gold ornaments (Figs. 4 and 5).

this period are numerous, and include house platforms (and perhaps part of the road system) as well as cemeteries and tombs. In addition, reliable informants report that the finest and most spectacular gold-work comes from graves with Yoto-

Fig. 6. Burial urn of the Yotoco period from the 1964 excavations at the Yotoco Ferry site, in the Cauca Valley. The urn contained the bones of a child, together with a necklace of bone and gold beads (see Fig. 45). Scale in inches.



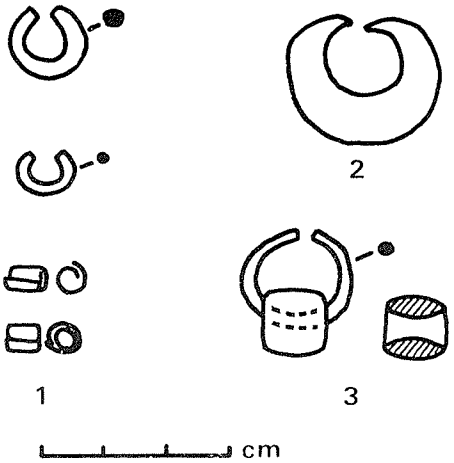


Fig. 4. Yotoco pottery from Hacienda La Iberia. The sherds (left) come from a Yotoco settlement at the site; the complete bowls come from the cemetery. See also Figs. 3 and 5.

Fig. 5. Gold beads and nose-ornaments from the Yotoco cemetery at Hacienda La Iberia (see also Figs. 3 and 4). The three ornaments at the left (no. 1) are reported to come from a single tomb. No. 3 has a green stone bead on the nose-ring.

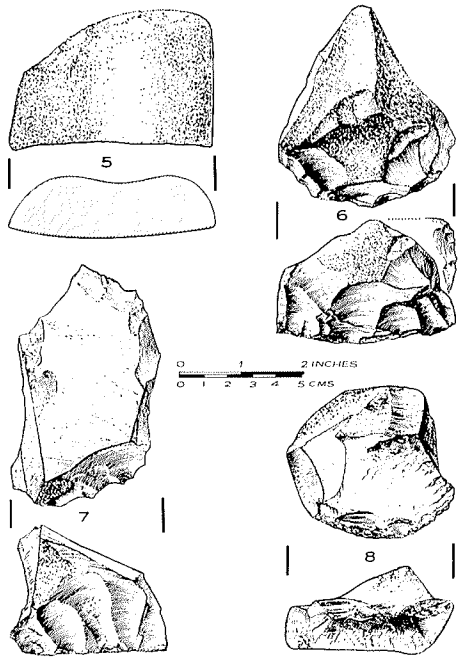


Fig. 7. Stone tools from the excavations at the Yotoco Ferry site. Radiocarbon and thermoluminescence dates for this stratum range from a. d. 840 ± 100 to 1175 ± 65. Item no. 5 is a mano *(maize-grinding stone). The chipped stone tools, Nos. 6–8, are scrapers.*

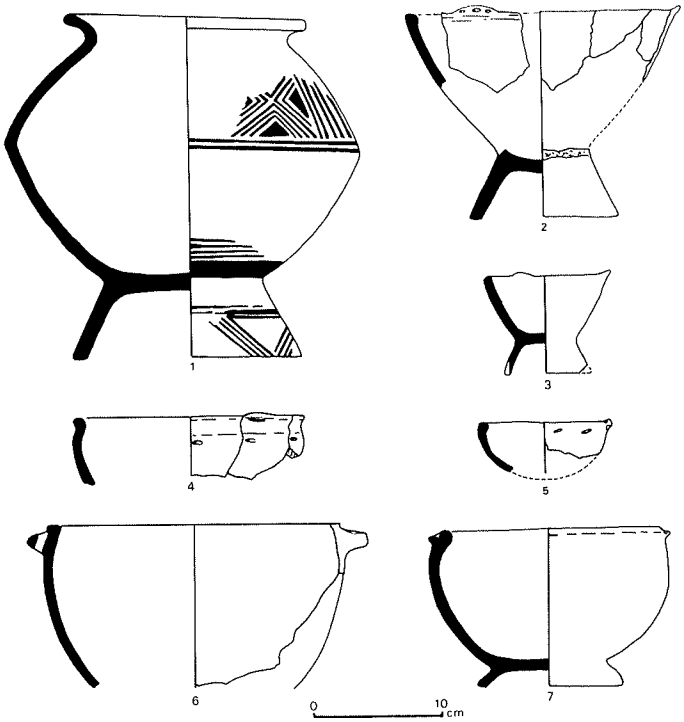


Fig. 8. Pottery from the shaft of a Sonso tomb at La Primavera, in the Calima Valley, excavated in 1962. The vessel at the top left has characteristic Sonso negative painted decoration in black over a red background. This tomb gave a radiocarbon date of A. D. 1250 ± 85. See also Fig. 9.

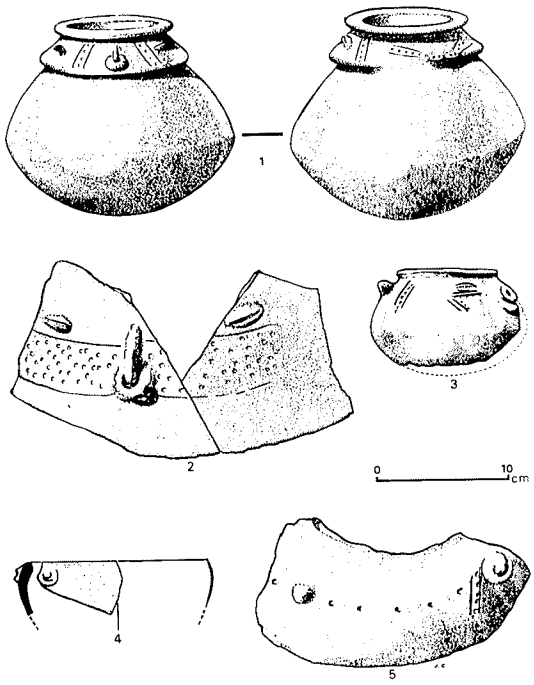
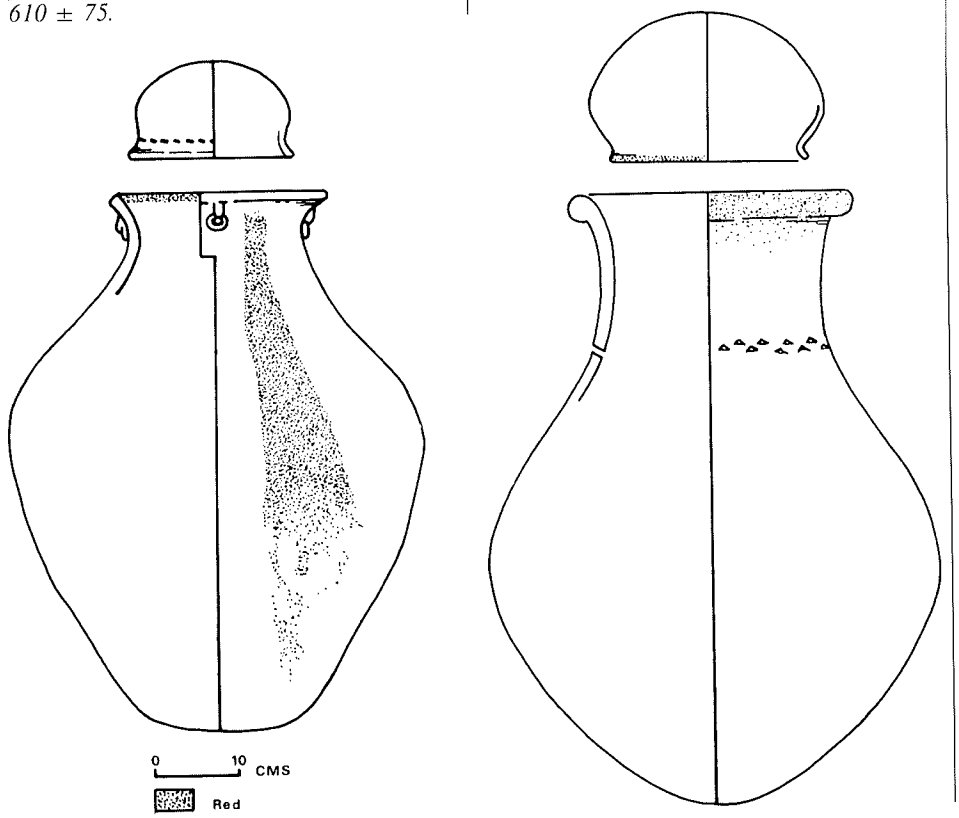


Fig. 9. Pottery from a Sonso tomb at La Primavera (see also Fig. 8). These sherds have the typical decoration of the Sonso period: zones of little dots or pits bordered by incised lines, and also modelled appliqué faces with prominent nose-rings.

Fig. 10. Two Pavas urns, with their lids (private collection). The one on the right is from Montañitas and has a radiocarbon date of 305 B. C. ± 110. The urn on the left comes from Tres Esquinas Tomb B and is dated A. D. 765 ± 75. A chipped stone spear point from a similar tomb at La Virginia (Pro Calima Report No. 1, Fig. 22, upper) is dated A. D. 610 ± 75.



co pottery, and not (as we had originally assumed) with "Early Calima" modelled and incised wares.

This re-evaluation indicates an earlier start and a longer duration for the Yotoco period than was anticipated at the start of the 1980 season. The new radiocarbon dates from La Iberia (Figs. 3–5), La Alsacia and La Aurora, tend to confirm this view, and suggest that the Yotoco occupation of the Calima region may have lasted for a thousand years or more.

c) The "Early Calima" period

Settlements of this period remain elusive, though the large number of tombs hints at a substantial occupation. As this report goes to press, we have just received the first radiocarbon date for this period: 1590 ± 70 B. C. (Beta-2830), derived from small quantities of carbonized material from three Early Calima tombs at La Iberia. The date is a few centuries older than we would have predicted, but confirms that this pottery is indeed the oldest so far known from Calima. More samples are urgently needed.

d) Pavas urn burials

Urn burials are rare in Calima, but are a characteristic feature of the Cordillera to the east, extending as far as the flanks of the Cauca Valley. Three of these urn burials have now been dated (Fig. 10), and the figures indicate an age comparable with the Yotoco period in Calima.

3. House platform and settlement survey

In 1980, the members of the Project began to experiment with techniques of field survey, with the aim (as set out in last year's prospectus) of mapping all the visible archaeological remains within a determined area. The region chosen for the initial trial was a block of territory 2 km. north-west of the town of Restrepo (Fig. 11). This area included our two main excavation sites (Hacienda La Alsacia and Hacienda La Aurora) and a segment of one of the ancient roads leading to the Calima valley, as well as various localities studied in 1978 and 1979.

The existing maps proved inadequate for this kind of research, and our first decision was therefore to base the survey on air photographs obtained from the Instituto Geográfico "Agustín Codazzi" in Bogotá. Our attempts to use these photographs in the field provide a cautionary tale, illustrating the difference between archaeological theory and practical reality.

We began with high hopes. The quality and definition of the photographs were excellent; on enlargements, individual trees could be pickced out quite clearly, as could property boundaries and the general relief and topography of the country. However, within the first hour of walking we realized that most of the purely archaeological features were not showing up at all, and that photographs taken in the middle of the day under a vertical sun (so as to eliminate unnecessary shadows) tend also to eliminate nearly every field system and all but the most deeply-cut house platforms. Unless the archaeological conditions are exactly right, which usually means photography very early or late in the day, and with an oblique light, air photographs by themselves are not an adequate basis for settlement surveys in this part of the cordillera.

What the photographs did provide was a base map onto which detail could be added by hand. The information given in Fig. 11 is the result of nearly two weeks of walking, field by field, carrying a clipboard with a 50 x 50 cm. enlargement of our best photograph (No. IGAC C 1848, at a scale of 7 cm. to the kilometre). All archaeological features were marked on this photograph or on transparent overlays. The use of several overlays (one for house platforms and fields, one for surface pottery, one for modern information and survey units) allowed these different elements to be examined singly, or correlated with each other in any combination.

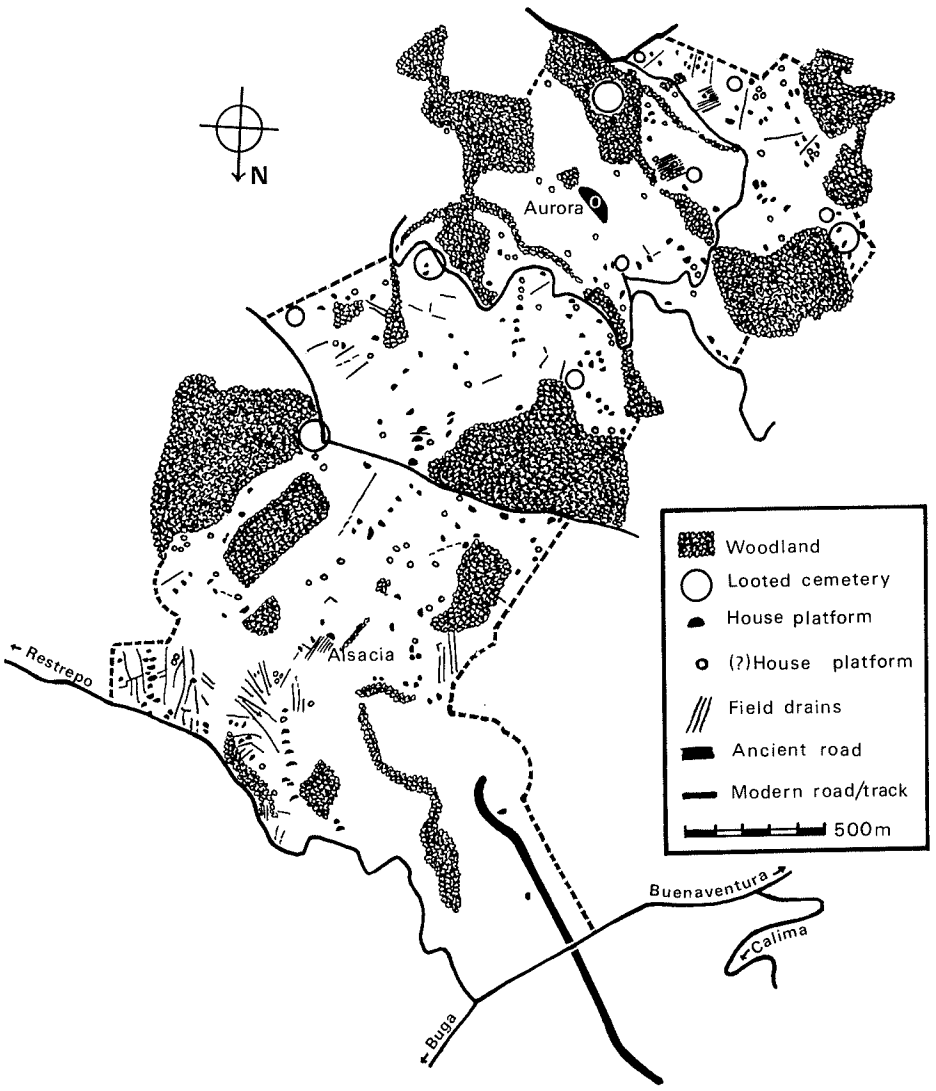


Fig. 11. Prehistoric settlements and fields in the 1980 survey area. Not all the house sites were occupied at the same time. Excavations have shown that platforms were constructed both in the Yotoco and the Sonso periods, and the map therefore represents a palimpsest of at least fifteen hundred years of occupation.

Some of the purely archaeological difficulties came as a surprise. We had not anticipated any problem with the recognition of house platforms. In practice, however, it was sometimes hard, without excavation, to distinguish between small, shallow, eroded and grass-covered platforms and the small, natural landslips which occur on many of the slopes. This explains the considerable number of open circles on the figure.

Mapping the field systems and drainage lines provided a major challenge, even in terrain which we came to know well. A change of viewpoint, or a small alteration in the angle or intensity of the light, could bring out detail where none was visible before. The classic example was a group of drainage lines which appeared, and disappeared again, during a cigarette break, when a cloud shadow passed over a field that we had already visited many times. Fortunately there were several witnesses, and these lines were recognizable (once we knew what to look for) on some of the photographs taken for quite different purposes. The lines shown on Fig. 11 are therefore only a small proportion of those which must exist. Where preservation is good, and the relief more strongly marked,

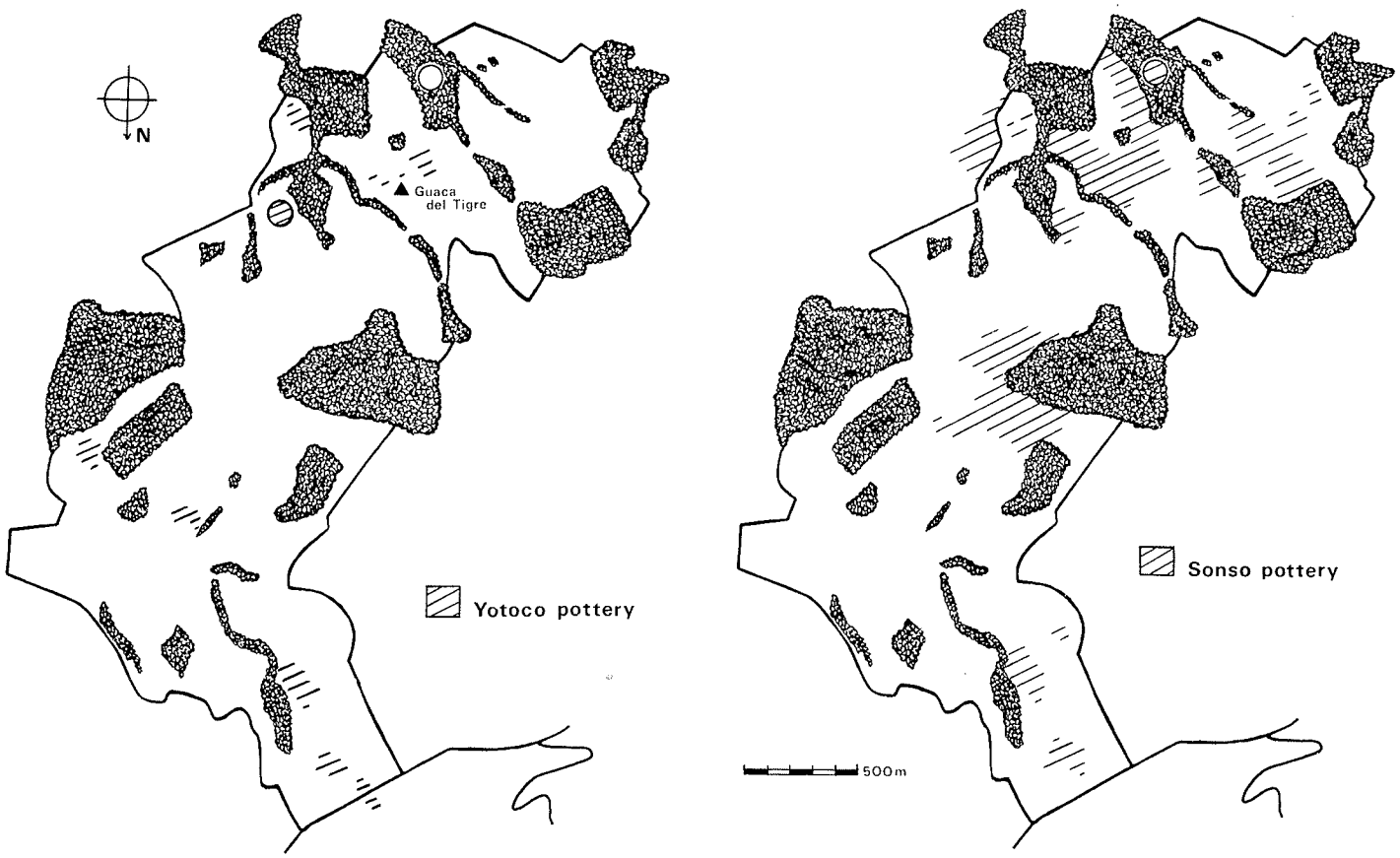


Fig. 12. The 1980 survey area (cf. Fig. 11) showing surface finds of Yotoco sherds (left) and Sonso pottery (right). The «Guaca del Tigre» is a tomb, excavated some years ago, which yielded a rich collection of Calima goldwork, now in the Museo del Oro, Bogotá (v. Fig. 47).

it appears that most of the landscape has been cultivated at some time in antiquity.

While mapping the prehispanic landscape, we also made collections of pot sherds wherever these were exposed – in cultivated fields, cattle tracks, road banks, and in the earth thrown aside by tomb-robbers. Given the density of settlement and of aboriginal cultivation, it is hardly surprising that sherds were found at virtually every point where the grass cover was disturbed, and were not confined to obvious archaeological sites. In a sense, the whole area is one archaeological zone. The blank portions of the map (Fig. 12) do not indicate a lack of habitation (since many of these areas have abundant house sites), but rather the difficulty of collecting sherds in unbroken pasture land. Conversely, dense sherd scatters were sometimes found in areas with no evidence for house platforms. Many of these localities were on flattish or gently sloping land, where houses could have been built without platform foundations. Taking this into consideration, the ancient population density would be even higher than it appears.

House platforms (locally called *tambos)* are generally found in groups of two or three, or else in large clusters which, from a distance, look like a series of steps or giant "toe holds" cut into the mountainside. Isolated single platforms are rare.

Most of these platforms occur on the crests and slopes of the ridges that are a prominent feature of the Calima landscape. Although *tambos* vary in size, they usually measure somewhere in the region of 8×10 metres, large enough for a house to hold a single nuclear family of parents and children. The platform was constructed by digging away the earth on the uphill side, and piling it on the downslope side, so as to produce a level area, a technique which allowed houses to be built on fairly steep slopes.

Besides these relatively small platforms, there are also larger ones, big enough for more than one house, or perhaps designed for some special function (Fig. 13). Some of these larger constructions, such as the one at the Hacienda La Aurora (described below, in Section 6c), would provide enough space for a small village. Pottery models of the Yotoco and "Early Calima" periods (Fig. 14) show rectangular or squareish houses with pitched roofs, presumably made of thatch.

In 1980 four house platforms were partially excavated over a period of three weeks. Two of them proved to belong to the Sonso period, and two to the preceding Yotoco period (see reports on Hacienda Barcelona and Hacienda La Alsacia, below). No obvious differences were noted between the forms of the Yotoco platforms and those of the subsequent Sonso period. However, it is hoped that, with the excavation of further examples in better condition, it may eventually be possible to distinguish visually between the platforms belonging to these two periods.

In Fig. 12 the survey information from the two main periods of occupation is presented, with the Yotoco and Sonso periods mapped separately. Interpretation is not as straightforward as it might seem, and there are various ambiguities. From some zones, especially those which are largely grass-covered, our sherd samples are small, and may not be

Fig. 13. An unusually large, T-shaped platform in the valley of El Dorado. Photo: Edgar Caldas, Cali.

Fig. 14. An «Early Calima» vessel from Restrepo, modelled in the shape of a group of houses linked by paths. The central, and largest, house is raised on a platform, dominating the four smaller huts. Surrounding the houses are objects that may represent trees. Height 21.3 cms. From the collection of the Museo del Oro, Bogotá (no. CC 5620). Photo: Rudolf, Bogotá.

representative. This danger was brought home in 1979, after surveying the recently ploughed fields at the Hacienda Aurora, close to the "Guaca del Tigre" (Fig. 12, left). In a collection of several hundred diagnostic sherds, the abundance of Sonso material all but "masked out" the handful of earlier Yotoco fragments. In a sample of only 20 or 30 sherds, fairly typical for a field under pasture, the earlier occupation would have gone unnoticed. For this reason, the impression given by the maps – that the area was less populated in Yotoco times than in the more recent Sonso period – may well be misleading. This is a problem that only further excavation can resolve.

4. Pre-columbian roads in the Calima area

An impressive feature of the Calima landscape is the network of Indian roads. These roads, which usually measure between 8 and 16 metres in width, are prominent on the steeper slopes, where they form channels some 1.30 metres deep, cutting across the countryside in lines as straight as the topography will allow. For preference they follow the crests of long ridges, conserving time and energy by dipping down into the valleys as little as possible (Fig. 15). Their straightness distinguishes them immediately from the winding routes of the modern roads for motor traffic, or the course of the bridle-paths, zigzagging their way up the hillsides. Both car and horse must avoid steep gradients, but the Indians clearly took them in their stride. The size and carefully chosen routes of the old roads give the impression that they were laid out by engineers, and used by a considerable number of people.

Fig. 15. Aerial view, taken during the 1980 season, of one of the pre-Spanish roads leading to the Calima valley. The road appears as a hollowed-out channel following the line of the ridge crest (compare Fig. 16).

No less than five of these roads converge on the southern end of the now-flooded Calima valley, hinting at the former importance of this area. According to local lore, some of these roads lead deep into the Chocó, while others cross the Cauca valley and continue into the Central Cordillera. Mapping roads is a painstaking and time-consuming process, further complicated by the fact that large-scale maps are available for only limited areas. However, it has been possible to follow and plot in detail a stretch of road running from the Calima valley to the El Dorado valley, a distance of about 15 kilometres. From here the road leads on to the Cauca valley, one and a half hours walk away. There has not yet been an opportunity to follow this part of the route, but it is still used by people living in the El Dorado area who go down to the Cauca valley for a day's fishing.

In some areas at least, the roads must once have run through open farm land, as the Indian field systems bordering them indicate. Here and there, where the ground dips slightly and may have been boggy, the road appears to run on an embankment for a short distance. In other localities it seems to run between banks thrown up on either side. However, at the only locality excavated so far, these supposedly artificial "banks" proved to be the natural surface of the ridge.

In conjunction with these main roads, minor paths can also be distinguished occasionally, and this network will almost certainly become clearer once large areas of settlement are mapped. Some of these paths lead up to house platforms; in other areas they can be seen skirting the edges of ancient fields, or leading from large artificial platforms (apparently the sites of villages) to nearby streams. It is not hard to imagine these paths in constant use, with people going down to bathe at dawn, women and children carrying up water in pots or in gourds, and groups of chatting women hunched over the family washing.

It has not yet been possible to find a datable settlement clearly associated with one of the major roads. Even the small house platforms all seem to be constructed at a discreet distance. In 1980 a trench was cut across a stretch of road where it climbs the ridge out of the Calima valley at the Hacienda La Lorena (Fig. 16). Excavation was carried out by kind permission of the landowner, Señor Fernando Piedra, and with the help of a group of soldiers from the Batallón Palace.

It was hoped that this excavation would throw some light on the age of the road and on problems connected with its construction. Our single trench produced 140 sherds, a surprisingly large quantity of pottery for a non-domestic structure. The rim sherds are illustrated in Fig. 17. Nos. 4 and 8 are classic Yotoco shapes, and the white paint on no. 2 is also characteristic of the Yotoco period. A number of body fragments were of yellowish paste with a black core, a ware which is associated with Yotoco bowls. This would suggest, at least, that the road was in use during the Yotoco period, probably in the first millennium A. D. Quite why so many pots should have been broken and dropped on a busy highway is a question hard to answer.

Almost all the sherds were found on the road itself, rather than by the roadside. Pottery was found throughout a layer of dark, clayey loam which appears to have been the original surface of the road. Small quantities of charcoal, plus a rather high phosphate content, suggest fairly intensive human activity (information from Robert Eidt). The other finds consisted of a small lump of chert, a few fragments of diabase, and three tools of the same material (Fig. 18). A second trench, some 120 m. down the road, where

Fig. 16. Excavation of the Pre-Spanish road at Hacienda La Lorena, on the slopes of the Calima valley.

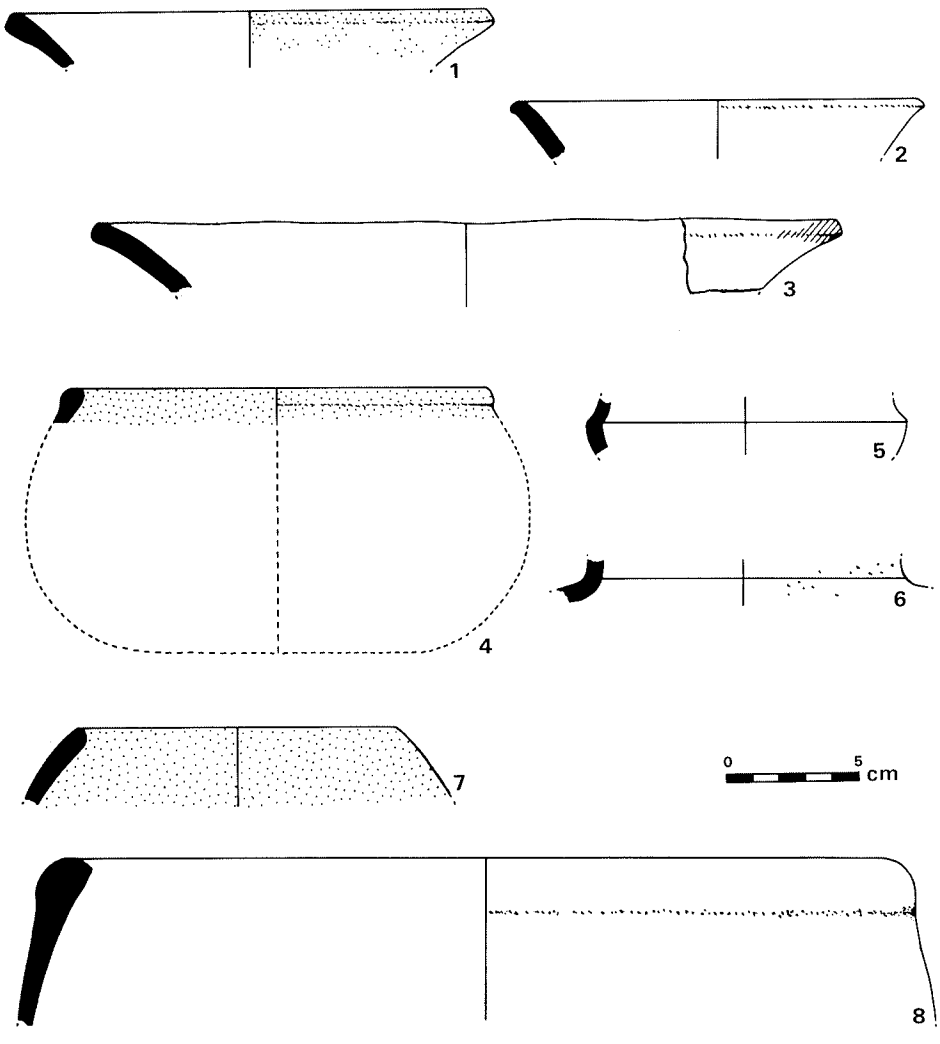


Fig. 17. Yotoco pottery from the excavation of the ancient road at Hacienda La Lorena.

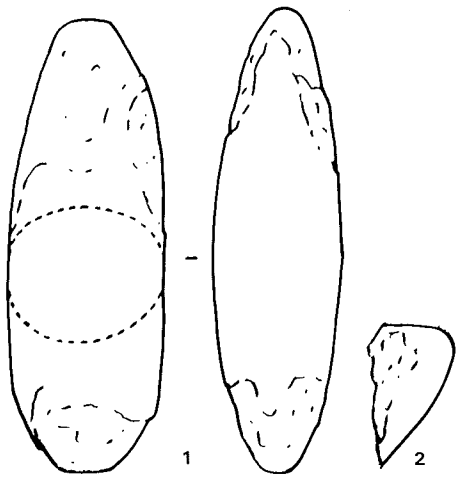


Fig. 18. Stone tools from the excavation of the Indian road at Hacienda La Lorena. Length of No. 1 is 10.3 cms.

it crosses a patch of woodland, also produced a few sherds, apparently of the Yotoco period.

The surfacing of these roads remains something of a puzzle. There is little possibility that they were once paved, since the natural rock in most of the Darién-Restrepo area lies under 10 or 15 metres of clay. On the other hand, one would expect that a well-used road surface on a hillside in an area of heavy tropical rains would soon erode into deep, meandering gulleys and become almost unusable. This may have happened on some of the steepest slopes where "alternative" routes can sometimes be seen running parallel to the original one for a short distance. However, at La Lorena, where the slope was about 20°, there was no clear indication of erosion of this sort.

Another intriguing question concerns the way in which the roads were planned and marked out. We all know the tendency for paths and, in fact, for almost anything that was not laid down by the Romans or as a motorway, to wander. A field boundary here, a fallen tree there, and the route becomes permanently sinuous. Although the Indian roads curve to some extent with the ridges, they always remain basically straight. The edges of the roads must presumably have been marked in some way. If they had run between banks or through forest, this would not have been necessary but, as we have seen, this was certainly not always the case. An intriguing find in the excavation at La Lorena was a digging-instrument of stone, a type associated with Yotoco material at other sites (Fig. 18). It was found buried almost vertically near the inner edge of the road, at the junction of the dark humus layer and the stratum beneath. However, we cannot at present exclude the possibility that the road surface was lowered and flattened artificially and the earth dumped, not to form banks, but at a spot where it would not erode back onto the highway.

It is hoped that eventually pollen studies will tell us more of the history of the vegetation of the area and indicate to what extent the roads were originally laid out in forest or in what was already open farmland. Some roads were clearly used for long distance communications, almost certainly with other political or ethnic groups. It was probably by these routes that gold objects apparently made in the Calima area, and now in the Gold Museum, reached the middle Cauca valley to the north or crossed the Central Cordillera to the upper course of the Saldaña river in the Magdalena drainage, in both cases distances of well over 100 kilometers.

The planning, construction and maintenance of these roads hint at some sort of a central power. We now know that some of the richest burials, with the gold jewellery for which the Calima area is famed, date from the Yotoco period. Should the large platforms, whose construction entailed moving tons of earth, also prove to be contemporary, we will be on the way to understanding a little more of what increasingly appears to have been a powerful and populous society with a great deal of technical expertise, living in the Calima area during the first millennium A. D.

5. Fields and drains

One of the main objectives in 1980 was to examine the linear markings which cover the slopes all over the Calima region, and which are clearly the remains of prehistoric cultivation systems.

As survey proceeded, a pattern began to emerge. Although there are occasional groups of squareish features (Fig. 19), most of the markings consist of linear depressions or shallow channels, running directly downslope on the ends or sides of ridges (Fig. 20). The distance between channels is variable, but generally falls within the 7–20 m. range. These features occur on both gentle and steep slopes, from about 11° at Hacienda Ceilan (Fig. 21) to nearly 40° at Hacienda La Alsacia (Fig. 28).

The total area covered by these features is impressive, and in some regions the entire landscape is a mosaic of "lines" interspersed with house platforms (Fig. 20). If (and it still remains to be proved) all these field systems were in use at the same time, we must imagine an artificial, man-made landscape in which the forest cover had been largely removed to make way for cultivated fields. The alternative possibility is that the fields were not all contemporary, but represent successive clearings in a woodland environment. Soil and pollen studies planned for 1981–3 should eventually answer this question.

Fig. 19. Engraved boulder in the Calima valley. The slopes in the background have the usual linear drains, but also horizontal markings, forming a grid of squares.

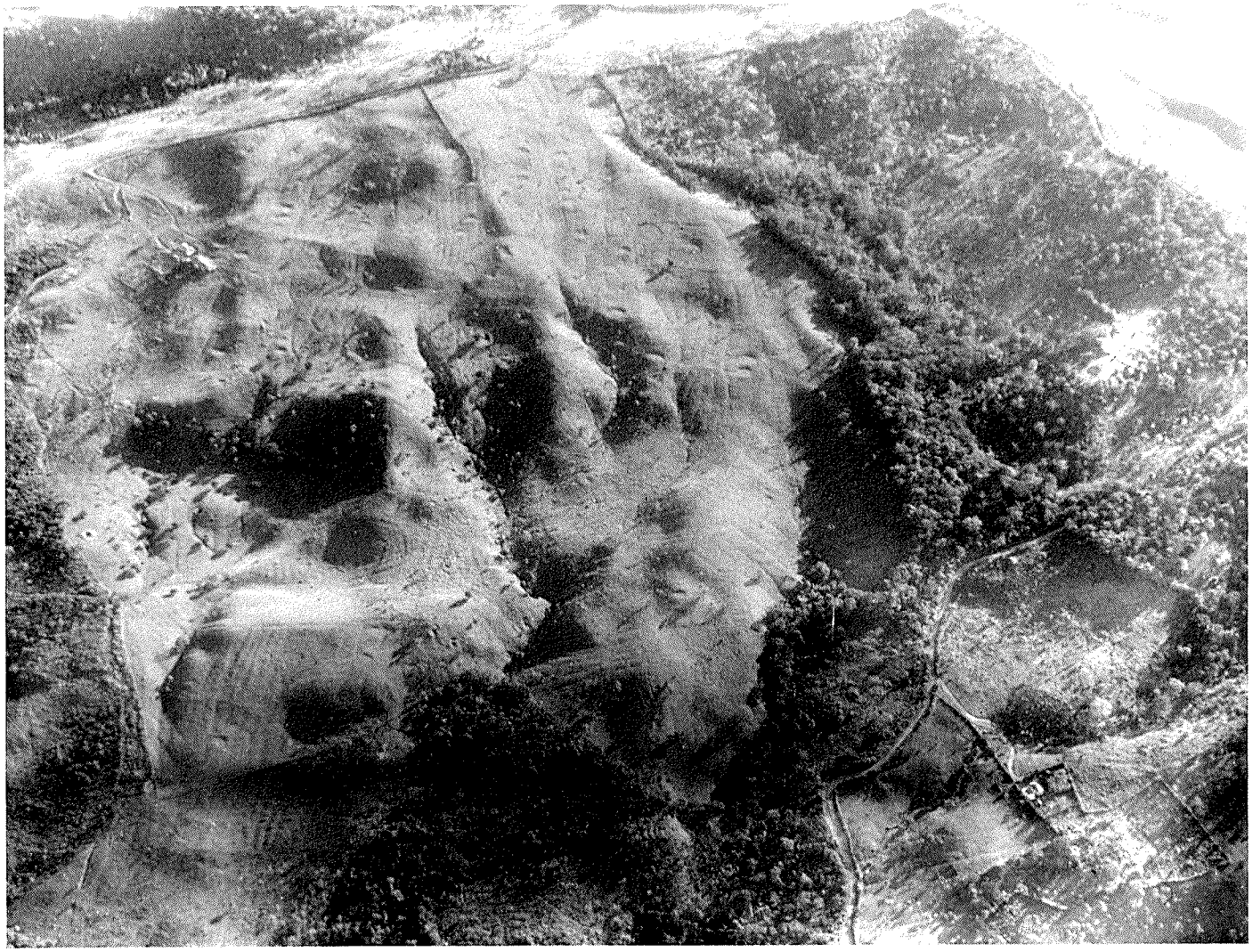


Fig. 20. Oblique air photograph of the hill slopes in the region of El Dorado. The whole of the cleared area is covered with the linear channels that we believe are drains, and these are interspersed with small platform-terraces representing pre-Spanish house sites.
From colour slide by Ingeniería y Aerofotografía Ltda., Cali.

Three groups of "lines" were tested by excavation in 1980: (a) Hacienda La Alsacia, where the markings were associated with house platforms on a steep slope (Fig. 28 and Section 6b below), (b) Hacienda Ceilan, a group of gently sloping fields overlooking the Calima Valley (Figs. 21, 22), and (c) the Loma Larga group, discovered in 1979 and illustrated in our first report (see also Fig. 23).

At Loma Larga and Ceilan, the soil profiles were similar (Fig. 22). Above the natural red clay was

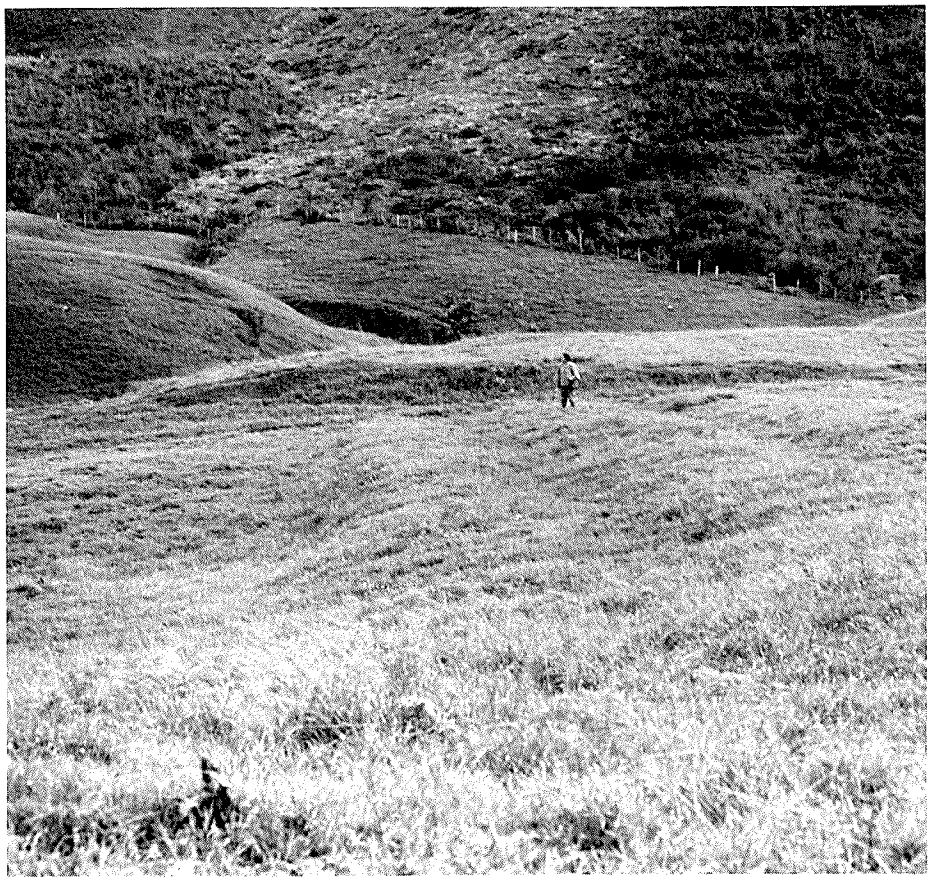


Fig. 21. Ceilan, Calima valley. Group of parallel ridges and linear features on a gentle slope. The figure stands on the edge of the excavation trench (Fig. 22).

Fig. 22. Ceilan, Calima. The excavation trench cuts at right angles across a series of ridges and drainage lines. The natural red clay (the dark stratum in the foreground) is overlain by a grey, silty, clay loam with all the characteristics of a gleyed soil. The vertical scale is 50 cms. See also Fig. 21.

20–50 cms. of grey, silty, clay loam. Observations by Professor Eidt confirmed that this is a typical gleyed soil, mottled almost to the surface, with evidence for a perched water table which oscillates seasonally. Even on steep slopes, the water table during the wet season rises to within 10 cms. of the surface, creating problems of waterlogging.

At this point in the investigation, we began to think in terms of drainage systems rather than of field boundaries or raised cultivation plots. Other lines of argument support this view:

1. Downslope, the channels tend to converge on valleys which would carry off the water, and in some cases the "lines" connect with gullies and streams, combining natural and artificial drainage into a single system (Fig. 23).
2. In some localities (Fig. 28), the "lines" are distinctly sinuous. This may be a measure designed to slow down the speed of water flow, in order to reduce the risk of erosion. There is a possibility, not yet confirmed by excavation, that some drains had miniature check dams at intervals along their length. This, too, would help to reduce erosion.

Soil samples from all these excavations have been analysed at the University of Wisconsin, using the phosphate fractionation method pioneered by Professor Eidt (v. *Science*, vol. 197, pp. 1327–1333). His preliminary results are consistent with an agricultural use for these features, though more samples (including reference samples from modern fields) must be taken before we can achieve conclusive results. These studies, together with analyses of pollen and phytoliths (silica skeletons from plant tissue), are an important element of the programme for 1981.

Another problem is to assign a date to these linear features. In general, they contain no charcoal suitable for radiocarbon dating, and, because of disturbance by cultivation, the sparse sherds in the humus layer are not necessarily contemporary with the construction of the drainage system. The most promising approach is to study the stratigraphic relationship between the drainage lines and house platforms, since the latter usually contain datable pottery. In some localities, the drains cut across abandoned house sites, and must therefore be later than the platforms; at other localities the "lines" divert around house sites which were presumably still inhabited at the time when the drains were in use. Sherds from these house platforms can thus be used to delimit the period during which the drains were functioning. The excavation at La Alsacia was a first attempt to put this principle into practice.

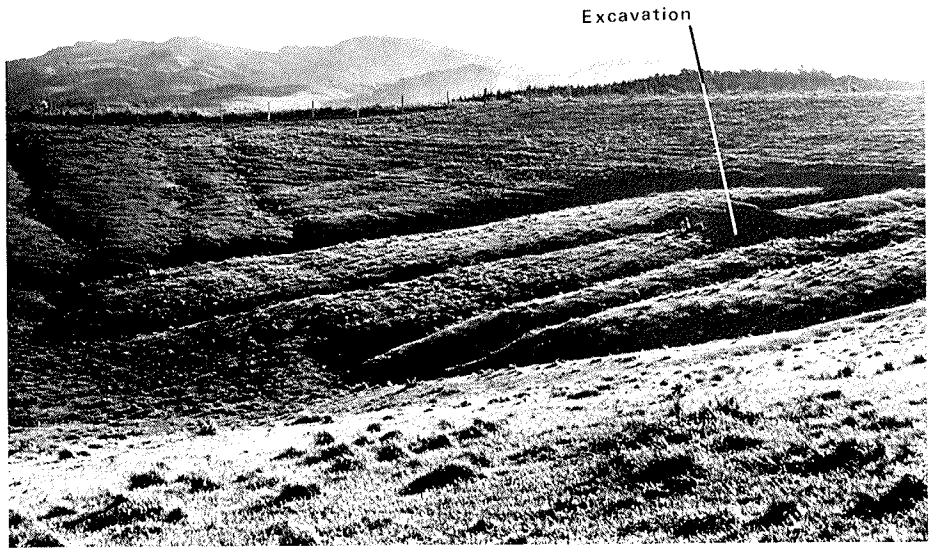


Fig. 23. Linear features at Loma Larga: photograph taken late in the day, with oblique light. The excavation trench cuts across the main group of lines, and a second, shallower, set of markings is visible on the slope in the middle distance. The entire system drains off into a small gulley at the left hand margin of the photograph.

6. Excavations on settlement sites

a) Hacienda Barcelona

Two Sonso period platforms were excavated on the Hacienda Barcelona, vereda Calimita (Municipio of Restrepo), by kind permission of the owner, Don Hugo Ramirez. They form part of a small group of platforms scattered over a north-east facing slope of about 20° which runs down to a stream some 200 metres away (Fig. 24). One of the platforms (No. 1) was placed towards the centre of an early field; to judge from the size and position of this house platform, it seems probable that it was built after the field had been abandoned.

The two platforms were quite well preserved, and trenches dug across their lips revealed their structure clearly (Fig. 25). In platform No. 1 the original occupation level lay just beneath the modern turf. Below this was a layer 60 cm. thick of mixed reddish material that had been dug out from the back of the platform during its construction, and which sealed an old ground surface. This lay immediately above the red diabasic clay. The buried soil was presumably once part of a Sonso or pre-Sonso field, and samples are awaiting analysis for pollen.

Platform No. 2 has two occupation levels (both belonging to the Sonso period) separated by a thin layer of fill (Fig. 26). This fill may result from an attempt at flattening and enlarging the living area while the platform was occupied, or from clearing and remodelling the platform after a period of abandonment.

Cultural material was found in the levels corresponding to the occupation of the house platform, and also in the buried soil beneath. The finds consisted of crudely-worked flakes of black chert and fine grain diabase, fragments of two pottery spindle whorls with shape and decoration characteristic of the Sonso period, and a number of Sonso sherds (Fig. 27). In both platforms the occupation debris seems to have been concentrated near the central

Fig. 24. The Hacienda Barcelona. The slope in the middle distance is covered with house platforms, two of which were excavated in 1980.

part of the lip; a trench (Tr 2) opened towards the side of the lip in platform No. 1 produced only half a dozen sherds.

The buried soil in platform No. 2 produced a total of 60 sherds from the two trenches excavated, including a fragment of a typical Sonso bowl and some stone flakes. Unfor-

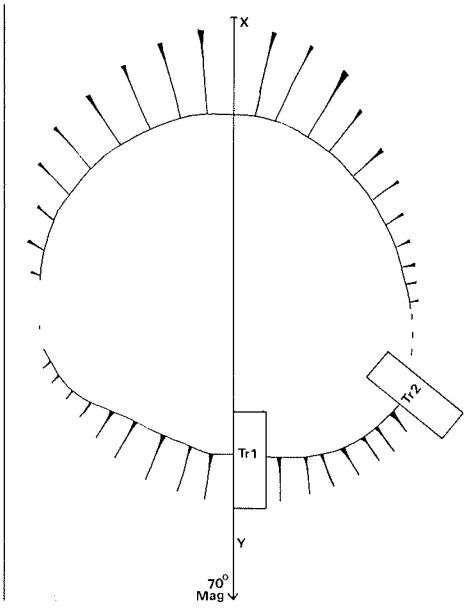


Fig. 25. Hacienda Barcelona: Plan of House Platform No. 1. The excavation trenches on the lip of the platform measure 3 m × 1 m. →

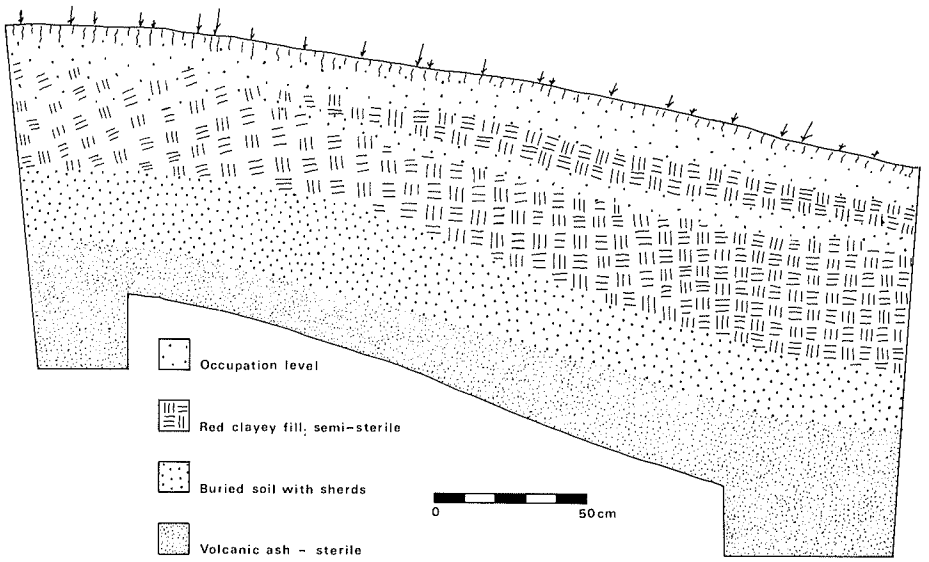


Fig. 26. Hacienda Barcelona, House Platform No. 2, Trench 1. Section, showing the occupation levels and the buried soil. →

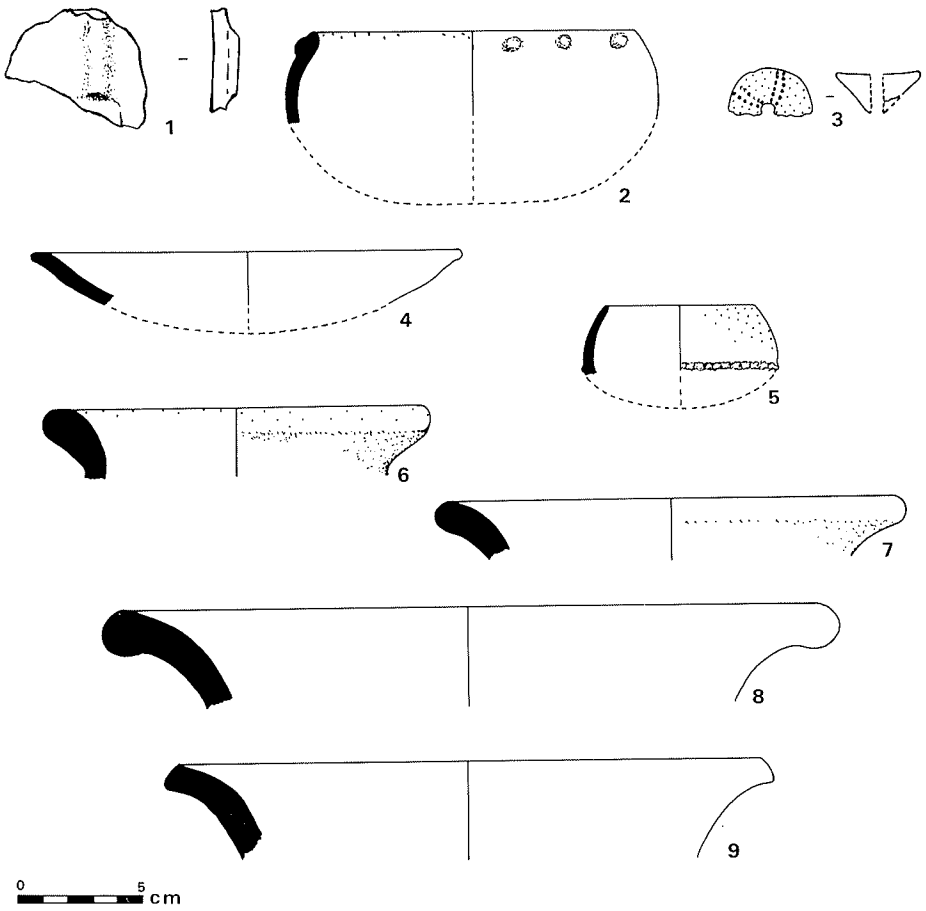


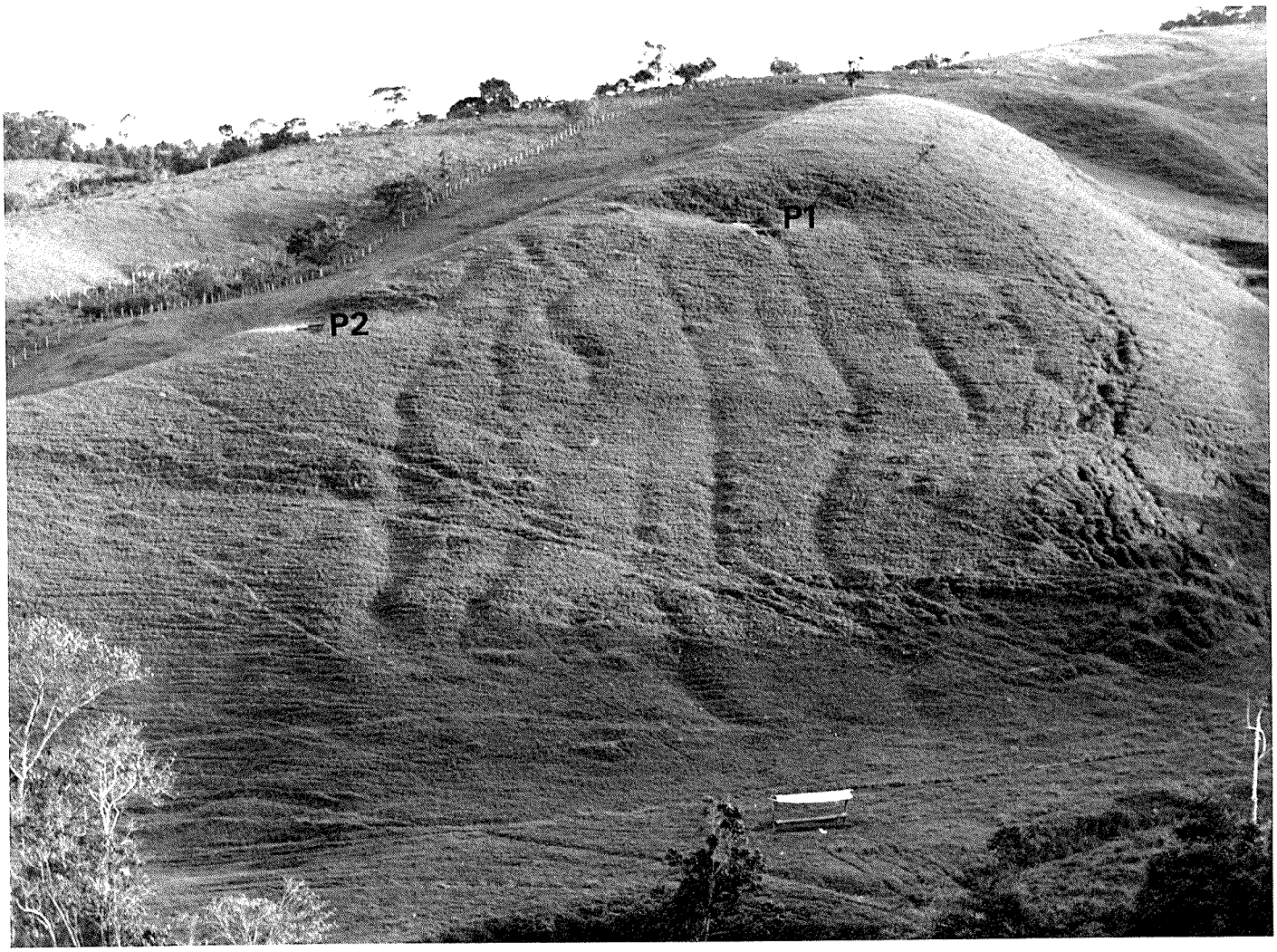
Fig. 27. Sonso pottery and a spindle whorl (No. 3) from the house platform excavations at the Hacienda Barcelona.

tunately, the only pottery found in the buried soil of platform No. 1 consisted of 16 undiagnostic plain body sherds which provide no clue to the age of the former field. Their presence suggests that domestic rubbish was being thrown onto the fields before the house platforms were built.

b) Hacienda La Alsacia

Two further platforms were chosen for excavation because of their clear association with a field system of ridge and ditch type (Fig. 28). The site is located on the Hacienda La Alsacia, near the Restrepo-Madro-

Fig. 28. Hacienda La Alsacia, showing the field lines and the two excavated house platforms. The channels run more or less parallel, but take a sinuous course, rather than the most direct line, down the steep slope. The excavation trenches can be seen on the platforms.



ñal road, and permission to excavate was kindly granted by the owner, Don Martiniano Vélez. Both platforms belonged to the Yotoco period.

The site is well watered, with streams on two sides. The platforms were constructed at the upper edge of the cultivable zone, and after platform No. 1 was abandoned its flat area was incorporated into the field system, the ditches continuing across the floor of the platform as far as its rear wall.

The field system has a well preserved layer of fertile volcanic ash immediately below a humus with a good, open structure. The relatively high clay content of this humus would, in the opinion of Robert Eidt, have helped to retain moisture and to protect the volcanic ash from erosion. From the agricultural point of view, the soils at La Alsacia were by far the best of those in the three groups of field systems sampled during the 1980 season. On the other hand, the north-facing slope was very exposed and also extremely steep, at an angle of 30–40°. The construction of house platforms in this position would have required a considerable amount of earth-shifting (several tons for platform No. 1), and these factors suggest the possibility of population pressure during the Yotoco period.

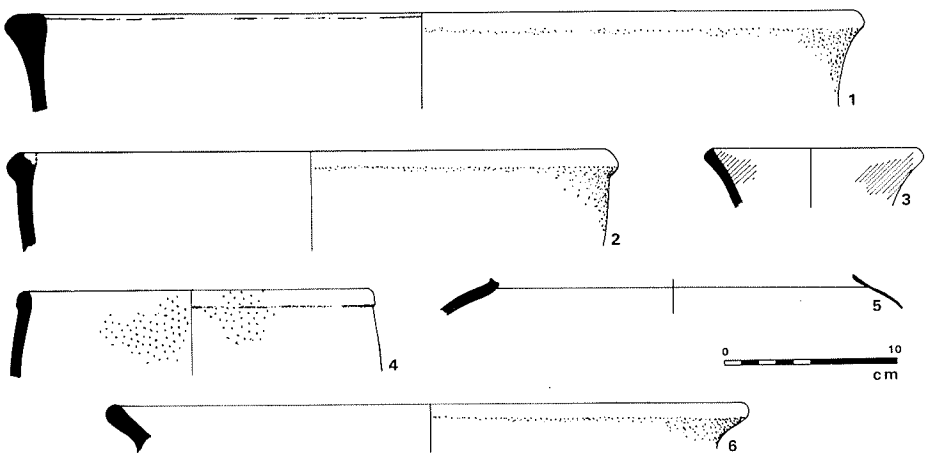
It seems probable that platform No. 1 was abandoned because its front edge slumped away. The retention of the relatively unstable earth forming the front of the platform must have presented a problem, and it may have been necessary to erect a retaining fence of stakes. A possible stake hole was found in just this position, though, without excavation on a larger scale, we cannot be sure that it formed part of a fence of this type.

Fig. 29. Excavations at the Hacienda La Alsacia.

At the time of our excavation, both platforms were badly eroded. Not only had the occupation level at the lip of the structure gone, but so too had the buried soil beneath. Very little cultural material was recovered. In platform No. 1, this was restricted to the very back of the flat area, where the occupation floor was buried under material eroding from the rear wall of the cut. The archaeological finds from both platforms consisted of characteristic Yotoco pot sherds and a few worked flakes of chert and fine grained diabase (Fig. 30). Charcoal from near the base of the buried occupation layer in platform No. 1 gave a radiocarbon date of 195 B. C. ± 185 years (Fig. 2).

Further downslope, the buried soil was preserved under a layer of red clayey material deposited there during the construction of the house platform, and probably also as a result of the later slump. Samples taken from the buried soil are being examined for pollen. In both the trenches where this soil was visible (one at 3 m. outside the rim of the platform, and one at 6 m.) the brown humus was mottled with numerous yellow lenses, leading one to speculate that this may have been the result of cultivation.

Fig. 30. Pottery in the Yotoco style from the excavations at La Alsacia.



c) Hacienda La Aurora

La Aurora represents another kind of habitation site, and one which had not previously been recorded in

Calima. The site lies immediately to the southeast of the Hacienda La Aurora, and consists of a low hilltop with sparse sherds visible in the cattle tracks over a distance of nearly 200 m. Tombs have also been reported from this locality, and looted graves later turned up in the excavations. La Aurora was visited during an early stage of the reconnaissance, but, because of its considerable extent and its gently sloping topography, its artificial nature was not at first recognized. Later, the site was probed with a media caña, and a blackish buried soil was discovered about 1 m. below the surface.

The 1980 excavations were designed to expose and sample this palaeosol. Six trenches were opened along a line from the centre to the edge of the site. It now became clear that the entire southwestern slope of the hill top had been modified and levelled by the dumping of a deep layer of construction fill. Towards the downslope edge of the site the fill was thickest, and had been laid on top of an ancient land surface, protecting this from subsequent erosion and agricultural disturbance. This was the explanation for the black stratum which had shown up in the test probes.

The history of La Aurora is revealed most clearly in Trench 3 (Figs. 31, 32). The lowest stratum consists of material derived from the parent rock, and contains no signs of human activity. This layer is overlain by the black palaeosol, with evidence of ancient occupation in the form of sherds and charcoal. A few fragments of Yotoco pottery were scattered throughout this soil. At its base, lying directly on top of the yellow, were pieces of an atypical vessel, whose shape and decoration do not fall within the normal Yotoco range (Fig. 33). Stratigraphically, this is the oldest vessel in the Trench, and might therefore belong to a pre-Yotoco or proto-Yotoco stage. Only a larger sample can resolve this problem. Charcoal fragments from the lowest part of the buried soil gave a radiocarbon date of 395 B. C. ± 85 years (Fig. 2), which tends to corroborate the early dating for the sherd.

In an attempt to reconstruct the ecological conditions and vegetation cover at La Aurora during this first

Fig. 31. Hacienda La Aurora, Trench 3, Wall A–B. The scale is one metre. From bottom to top, the sequence of deposits is: (1) a natural, yellow, sandy loam (the floor of the trench) with no archaeological material, (2) a dark palaeosol, or buried land surface, with a post hole just to the right of the scale, (3) a lighter, mottled deposit, consisting of constructional fill, (4) topsoil. Another wall of this trench is shown in Fig. 32.

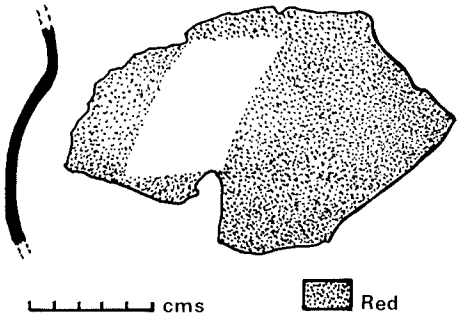
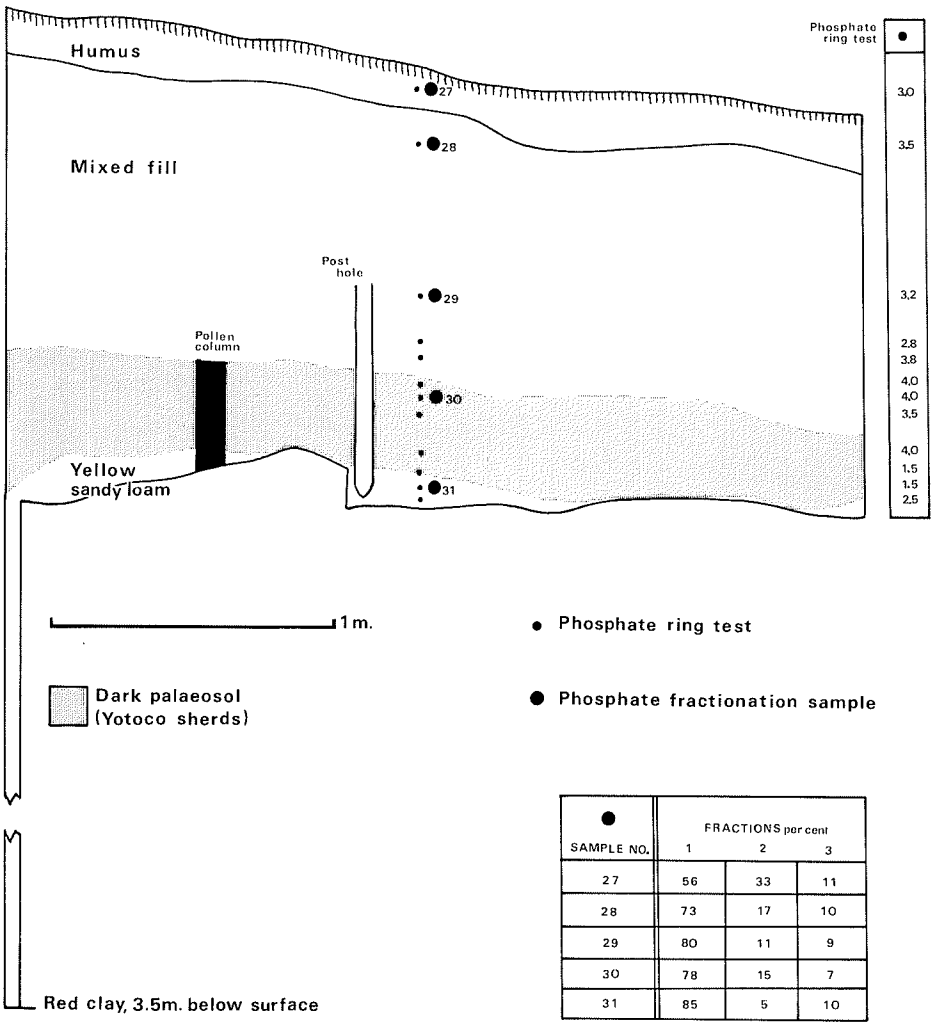


Fig. 33. Fragment of a red-painted vessel from La Aurora, reconstructed from eleven sherds found at the base of the palaeosol in Trench 3 (Figs. 31, 32). This is the earliest pottery from the site, and is not typical of any known style. A radiocarbon date from this deposit suggests an age around the 4th century B. C.

Fig. 32. Hacienda La Aurora, Trench 3, Wall B–D (for a photograph of Wall A–B, see Fig. 31). The phosphate fractionation samples (indicated by a large dot) are analysed in order to distinguish between different types of land use. Samples analysed by the ring test (small dots and right hand column) indicate the total amount of phosphate in the soil, and are measured on a scale from 0 to 5.



SAMPLE NO.	FRACTIONS per cent 1	2	3
27	56	33	11
28	73	17	10
29	80	11	9
30	78	15	7
31	85	5	10

occupation, the black soil is being studied in the laboratory. Professor Robert Eidt has completed the phosphate fractionation analyses, and the Institute of Archaeology (London) is examining samples taken from the pollen column. It was disappointing to discover that pollen grains were not preserved in the palaeosol, but, in compensation, this study showed that phytoliths (microscopic silica skeletons present in certain plant tissues) were well represented. One of the tasks in 1981 will be the collection of modern reference samples of crop plants, whose phytoliths can then be matched against those in the buried soil.

Two post holes indicate that some kind of structure was erected in the area at the time of this first occupation, and that parts of the structure were still standing above ground when the black soil was covered over by the later fill. The mottled nature of this fill shows that it was scraped up from several different localities before being dumped on the slope. The sherds contained in the fill have therefore been mixed up and redeposited during the process of levelling, but the presence of typical Sonso fragments proves that this operation took place during the final archaeological period, after about A. D. 1200. The ultimate stage, representing the centuries after the Conquest, is marked by the formation of a modern soil on top of the Sonso fill.

As in previous years, the Ramirez family, owners of La Aurora, gave their fullest co-operation.

d) Cortijo de los Calimas

Air photographs show that the hills forming the northern slope of the Calima valley are covered with house platforms and the remains of ancient fields right up to the present forest margin. Effective survey is impossible within the forest, but it is likely that, in the past, settlement was continuous, extending over the crest and down into the next valley (the Rio Bravo) where Sonso sites have been recorded.

Previous surveys in Calima had concentrated on the valley bottom and the lower slopes. To complete the picture, information was needed from sites at a higher altitude. Cortijo de los Calimas was chosen for its accessibility. The site lies at the end of a jeep trail branching off the main road at Palermo, and consists of a modern farmhouse surrounded by a cluster of platforms at the edge of the cloud forest (Fig. 34). It is not only the highest locality investigated so far, but also one of the few where we have seen any present day potato cultivation, though not on a comercial scale.

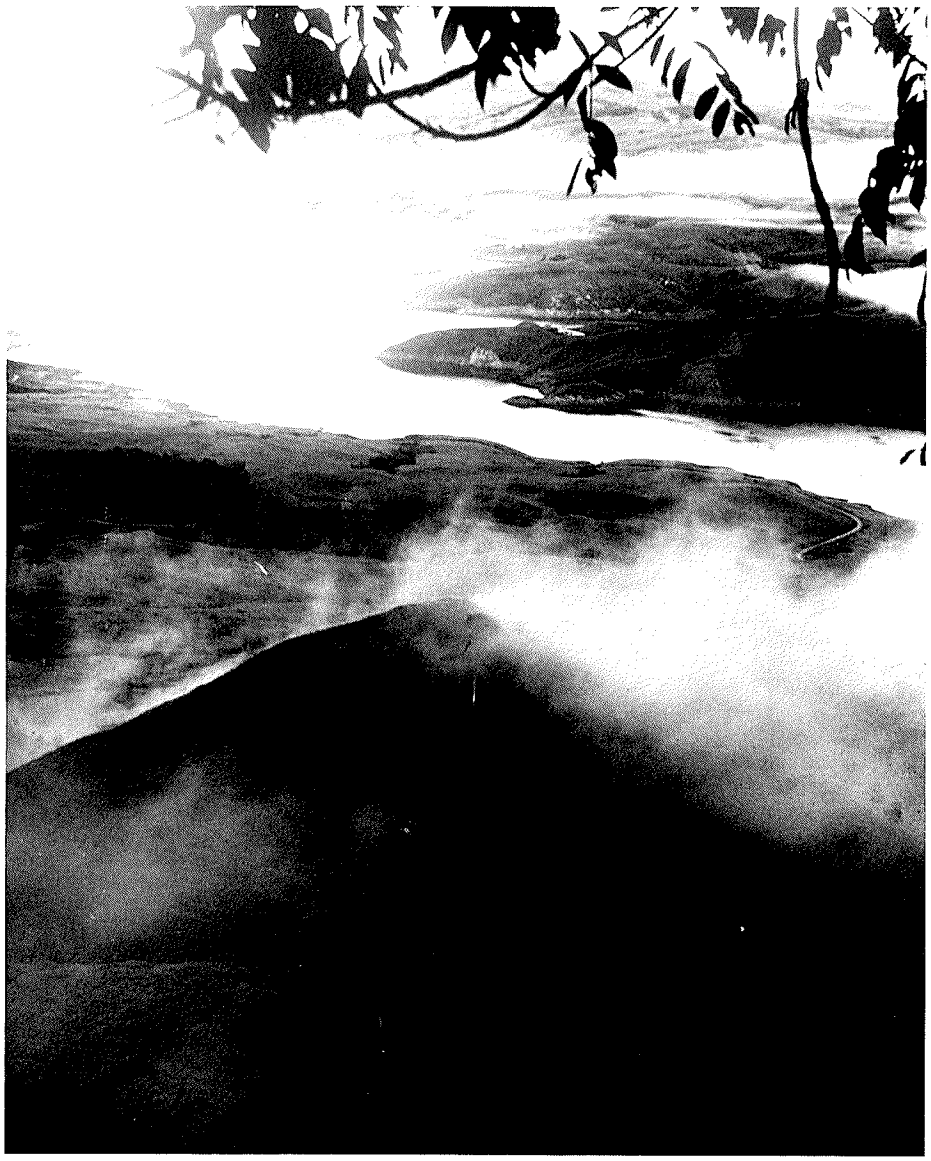


Fig. 34. The Calima reservoir, from Cortijo de los Calimas.

Four of the platforms were examined by Dr. Rupert Spillmann. Test trenches on three of them (Tambos B, C and D) yielded only a few sherds, probably of the Sonso period, but excavation on the lip of Tambo A uncovered a rich, though shallow, occupation layer resting directly on the natural clay, and sealed by the recent topsoil. Some of the pottery is illustrated in Fig. 35. The decoration of appliqué cordons is diagnostic of the Sonso period, as is the handle (no. 6). This form occurs only on three handled jars of the kind which are common in Sonso tombs. From the same deposit came the clay figurine shown in Fig. 36. Identical specimens are known from museum collections (Fig. 37), but this is the first to be discovered in a controlled excavation.

Charcoal from Tambo A gave a radiocarbon date of A. D. 1640 ± 70 years, and suggests that the Sonso culture continued for some time after the first European contact. In confirmation of this, treasurehunters claim to have found occasional Spanish trade items in Sonso tombs throughout the Calima zone.

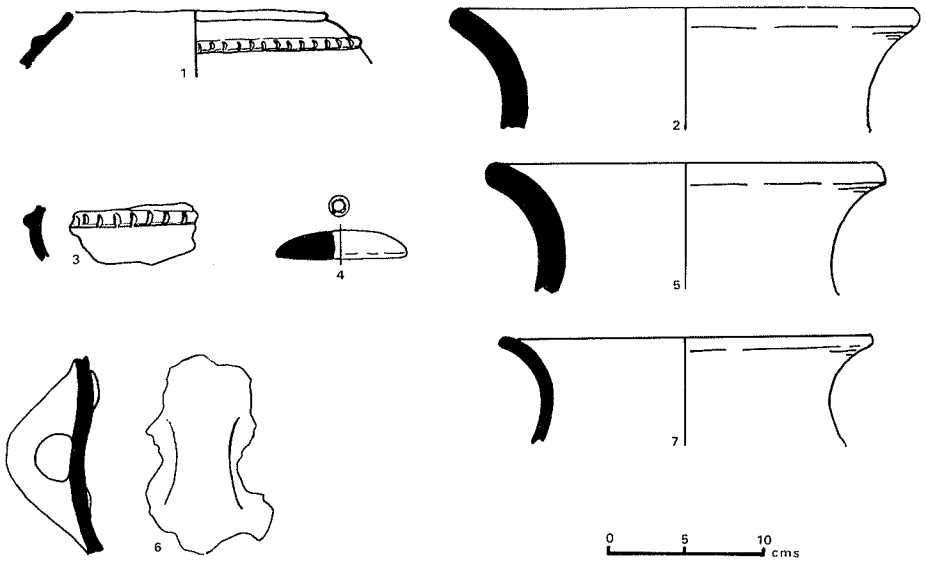
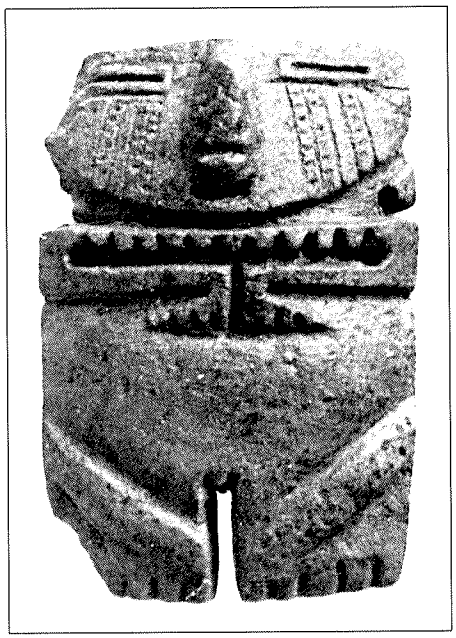
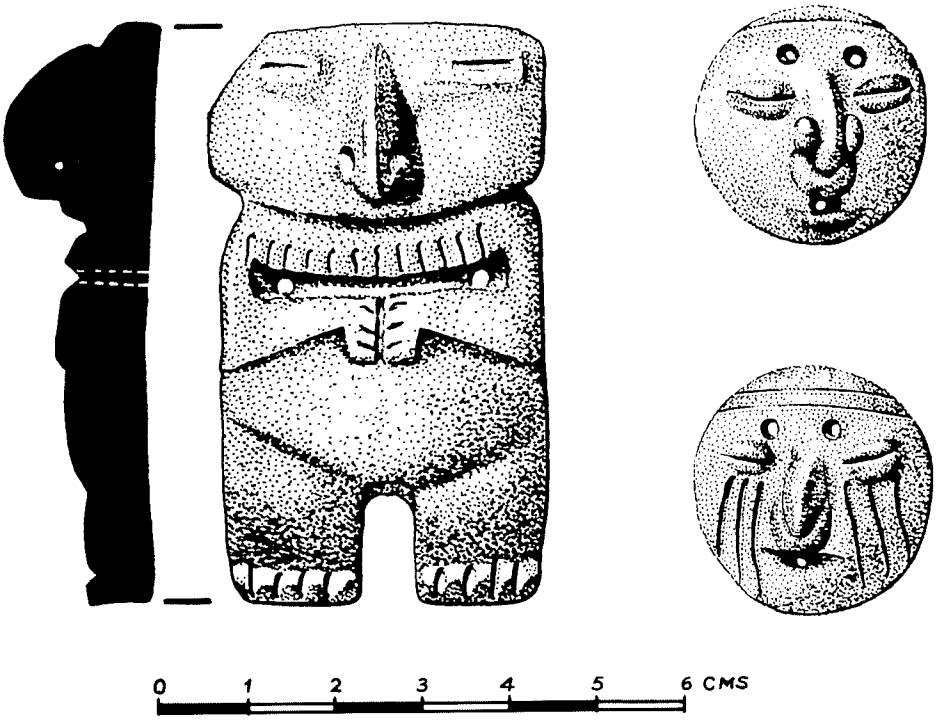


Fig. 35. Pottery and a clay spindle whorl from the excavations at Tambo A, Cortijo de los Calimas.



←*Fig. 36. Clay figurine, 6.4 cms. high, from Tambo A at Cortijo de los Calimas.*

Fig. 37. Clay figurine and two miniature masks collected in 1962 at El Bosque, Calima, and now in the Cambridge University Museum of Archaeology and Anthropology. The three items are said to have come from a single tomb, but were undatable until the discovery of the similar figurine at Cortijo de los Calimas (Fig. 36).



7. The Montecito excavation

This site, on the Hacienda Montecito, at 1630 m. altitude in the Western Cordillera just south of La Cumbre, was found accidentally during coffee-planting, when workmen cut into a rich deposit of sherds. The discovery was brought to our attention by Sr. Rodrigo Solarte, and a preliminary visit showed that the pottery had several unusual stylistic features. In order to augment our samples, and with the encouragement of the landowner (Dr. Hernan Calderon Estrada), a portion of the site was cleaned up and excavated.

Although damaged by cultivation, the feature proved to be a pit cut into the reddish clay which underlies the topsoil throughout the Cordillera (Figs. 38, 39). The fill of the pit was a yellow, clayey loam containing abundant fragments of pottery, several unmodified stones (from pebbles to river boulders), a few broken milling stones, and occasional small flecks of charcoal. By comparison with the usual midden deposits, this fill was remarkably clean and free from organic staining. The sherds were lying at all angles (one jar neck, for instance, was found with its rim downwards), but disturbance was minimal. In spite of some crushing, the sherds from individual vessels were still articulated, and some pots were nearly intact. The untrampled condition of the pottery, and the cleanness of the fill, suggest that the deposit had accumulated rapidly. Perhaps the pit was cut, the rubbish dumped, and the hole refilled in a single operation. All lines of evidence indicate that neither the pit-fill nor its contents had suffered long exposure to the elements.

All the pottery was soft, friable and easily damaged. In addition, sherds of identifiable vessels continued back into the walls of the excavation, and the sheer quantity of material (with individual pots crushed one into another) made the work slow and difficult within the confines of a test trench. Since full-scale excavation would have required a good deal of time, as well as conservation facilities that were not avai-

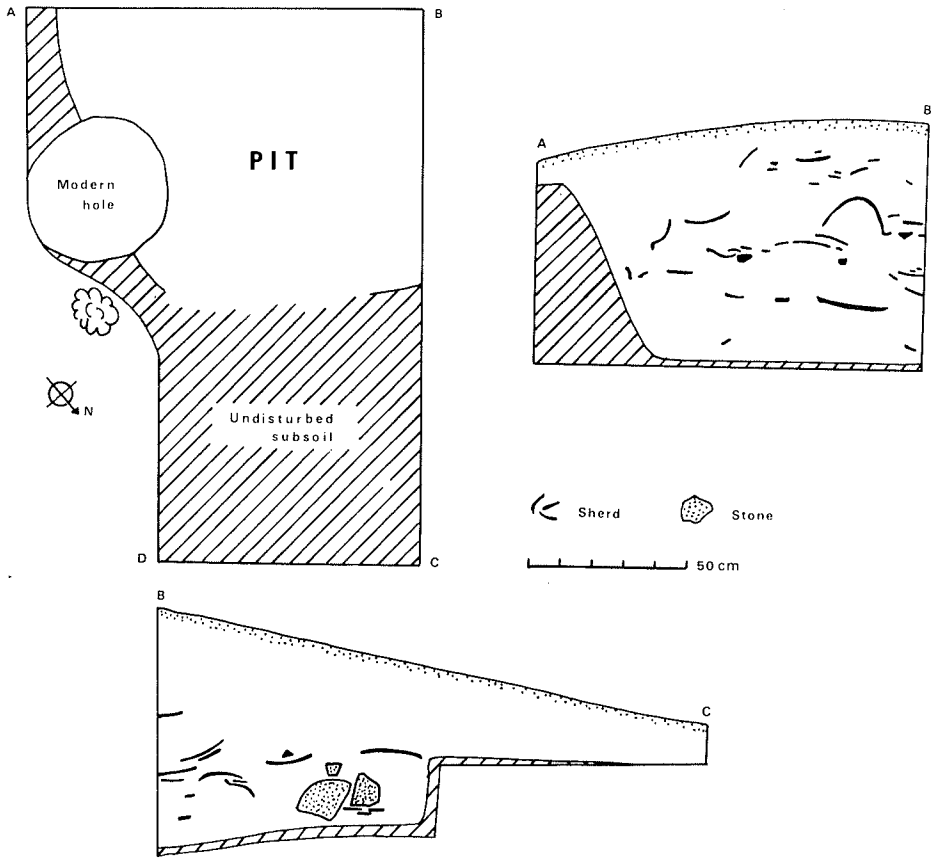


Fig. 38. Plan and sections of the excavation at Montecito.

Fig. 39. The Montecito excavation, showing the large size of the sherds in the pit fill.

lable in 1980, the Montecito site has been reserved for a later year. From the limited area of the excavation, sherds belonging to some 90 different vessels were recovered, many of them represented by several pieces. Measurable rim diameters ranged from 12 to 38 cms., with a marked peak around 20–25 cms. After joining as many sherds as possible, individual pots were separated out on the basis of shape, size, thickness, rim diameter, paste and surface treatment, to give a breakdown of the numbers and types of vessels. This procedure gave the following results:

Jars with out-turned lips	57
Simple, plain bowls	2 or 3
'Montecito bowls'	21
Unclassifiable	2

Jars are predominantly plain, though some have red slip on the outer surfaces, and many rims have a horizontal band of red paint just inside the lip. A handful of sherds, from vessels of unknown shape, have broad lines of red paint over the natural buff-coloured surface.

The most interesting category is that which we have provisionally called 'Montecito bowls'. These constituted almost one quarter of the total sample and are remarkably standardized in size, shape and decoration. The main characteristics are illustrated in Fig. 40. Singly or in combination, the decorative elements consist of parallel incised lines (no. 7), bands or zones of red paint, little appliqué faces, each consisting of a nose with its nose-ring (nos. 5, 6), and horizontal rows of rectangular or triangular impressions, occasionally replaced by finger nail imprints made in the soft clay before firing. It is this group of vessels that sets the Montecito pottery apart from the other styles of the area.

Stone artifacts were uncommon in the excavated area (Fig. 41). All the items are grinding stones. Nos. 1 and 3 are broken *manos* (the upper, hand-held stone used in grinding maize). No. 2 is a broken fragment of *metate* (lower grinding stone) which had, at some stage, been used for preparing red pigment. Red stain covers all that remains of the original smoothed surface, and traces of ochre are still visible under a binocular microscope. This broken and discarded fragment was subsequently re-worked by chipping, to make a crude edge-tool.

The age of the Montecito material is still a problem. The excavation did not produce enough charcoal for a radiocarbon date, and the stylistic comparisons are ambiguous. Although all the techniques of decoration are found on pottery of the Sonso period (A. D. 1200 to the Conquest), the way in which these elements are combined on Montecito vessels is quite different. This was confirmed fairly conclusively by the discovery, no more than 400 m. away from the Montecito excavation, of absolutely typical Sonso sherds in a road cut. The two samples have nothing in common; no Montecito rims came from the road

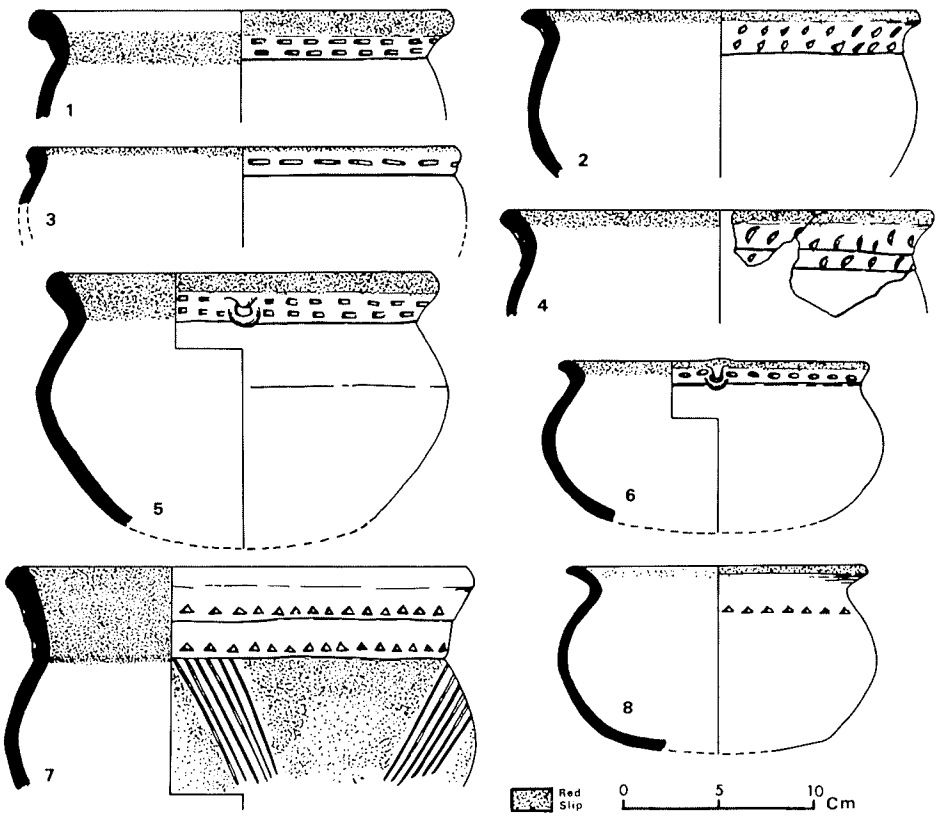


Fig. 40. Pottery from the excavation at Montecito, La Cumbre.

cut, and none of the most diagnostic Sonso traits was present in the Montecito collection.

On present evidence, two interpretations are possible: (a) that Montecito and "typical Sonso" styles, though clearly related to each other, are of different ages, or (b) that the Montecito pottery represents a very specialized selection from the total Sonso repertoire.

Comparative evidence from other sites is inconclusive. A Montecito bowl is reported from the shaft (though not the funerary chamber) of a tomb which contained an "Early Calima" vessel. If this association is valid, it would indicate an early date for the Montecito style. Other comparisons suggest a much later date, contemporary with the Yotoco or Sonso periods. The size, shape, and the more simple decoration of 'Montecito bowls' resemble those of the vessels used as lids for Pavas urn burials (compare Fig. 40 with Fig. 10, left). Radiocarbon dates for these urns range from 305 B. C. to A. D. 610 (Fig. 2). In addition, a Montecito rim turned up in our excavations at Hacienda La Aurora (Trench 6) in a constructional fill containing a mixture of Yotoco and Sonso sherds. Finally, Montecito rims occur fairly abundantly among the sherds from a cemetery near Guabas, in the Cauca valley, currently being excavated by Carlos Humberto Illera and Carlos Armando Rodriguez. The pottery from this cemetery is predominantly of Sonso type, with no admixture of Yotoco or of anything earlier.

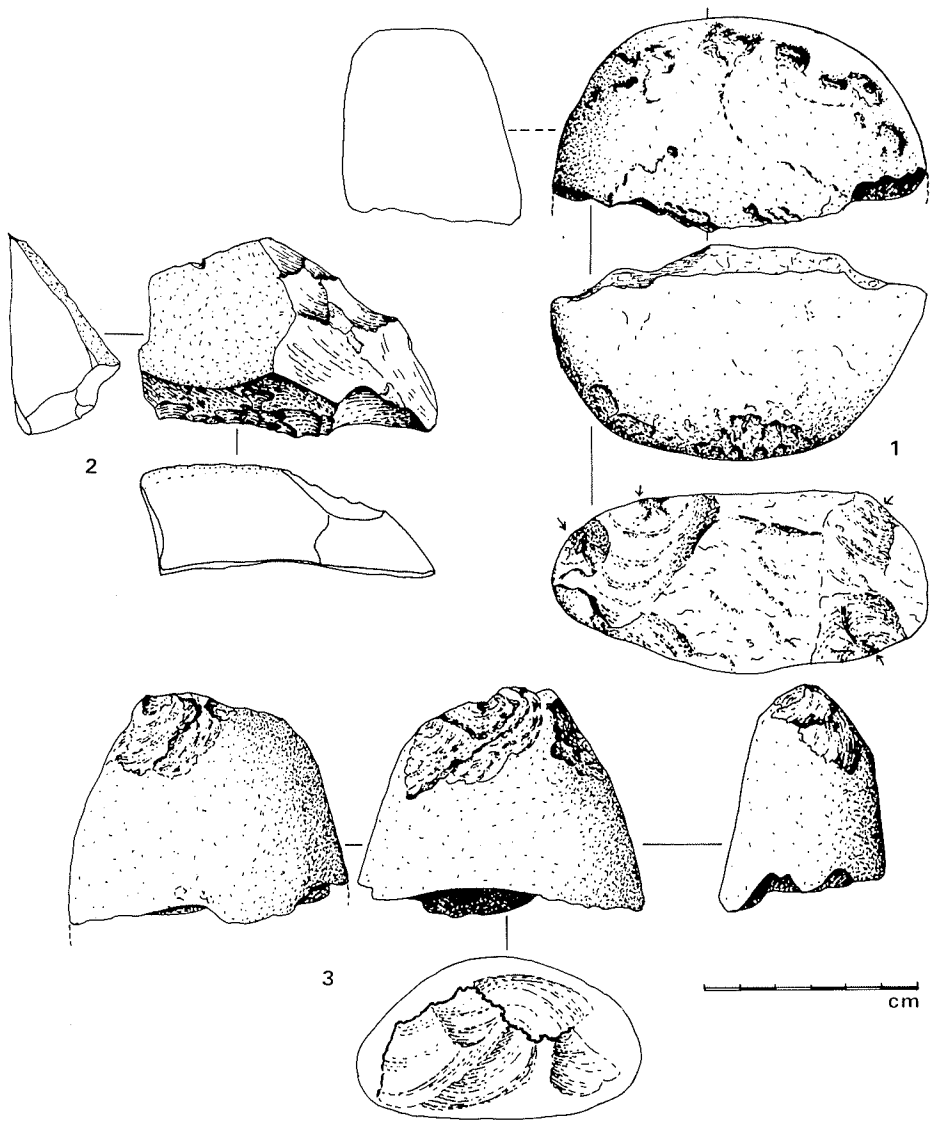


Fig. 41. Stone objects from the excavation at Montecito. Nos. 1 and 3 are broken manos; no. 2 is a chipped tool made from a re-worked metate fragment.

8. Proposals for 1981

The 1981 season will concentrate on the intensive study of a limited area, with the aim of mapping all the visible archaeological features and testing some of them by excavation. The area chosen for study is the Valley of El Dorado (Fig. 1). The opportunity to fly over the valley in 1980 confirmed that all categories of remains are well represented, including a substantial stretch of valley bottom with a palimpsest of drains and ridged fields which seem to belong to several periods (Fig. 42–44). Because of the Calima dam, and its reservoir which has flooded the bottomland, this kind of terrain is no longer available for study in the main valley, though old air photographs show that the same features were once visible there.

We have already obtained good air photographs of El Dorado, and a two-week reconnaissance by Leonor Herrera and Marianne Schrimpff in May 1981 has located more than 600 house platforms, several sections of road, and innumerable drainage lines. One consequence of this kind of survey has been the recognition of two new types of construction: large T-shaped terraces (Fig. 13) and large terraces with "tumuli". One of these will be tested in 1981. All the archaeological features recognized up to May 1981 have now been incorporated in a base map prepared for us by the Federación Nacional de Cafeteros.

Accommodation has already been arranged at the Hacienda La Suiza, through the kindness of Dr. Byron López, and field work will start in July, 1981.

Fig. 43. El Dorado: Air view of one of the many looted cemeteries on the flanks of the valley. Each of the dark, roundish marks, above and to the right of the farm, indicates a pre-Spanish tomb, excavated by treasure-hunters and subsequently refilled. Photo: Pro Calima 1980.

Fig. 42. General view of the valley of El Dorado, taken from the air during the 1980 season. The photograph shows existing streams (dark, meandering lines), recent drainage ditches (dark straight lines), and a system of earlier drains and extinct stream channels, which appear on the photograph as dark gray lines against the lighter background.

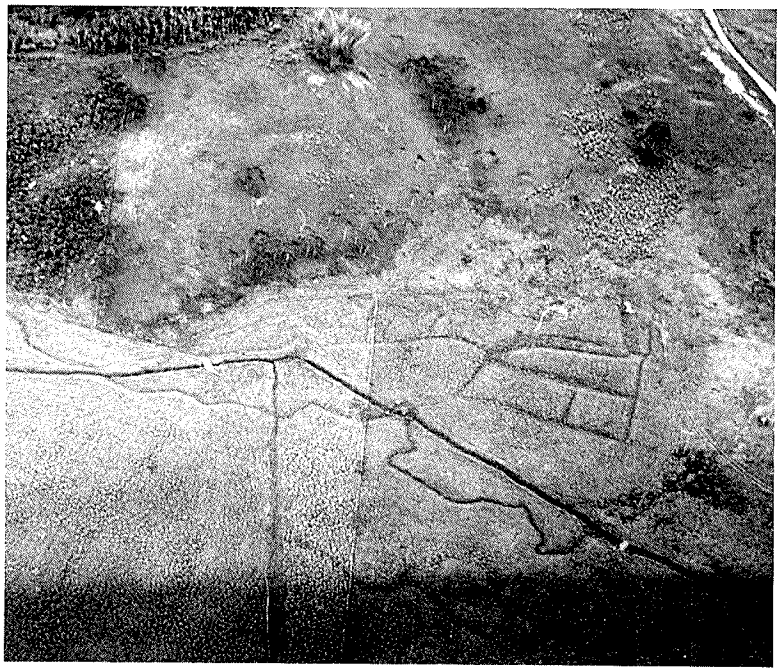


Fig. 44. El Dorado: Part of the pre-Spanish drainage system recognized from the air in 1980. The square group of drains to the right of the photograph is clearly visible on the ground, and this locality has been chosen for test excavation in 1981.

9. Acknowledgements

Our thanks are due to many persons who, in one way or another, gave their time and attention when we were in need of help. In Bogotá Ivan Posada F., Elvira de Salamanca, Alvaro Ayala (Instituto Colombiano de Antropología); Luis Duque Gómez, Clemencia Plazas, Ana María Falchetti de Sáenz and Alec Bright (Museo del Oro). In Cali we have been much aided by Victor Manuel Patiño, Ana Judit Silva and Omar Perea (Instituto Vallecaucano de Investigaciones Científicas); Luis Enrique Baena and Jairo Calderon (Eternit Pacífico); Alex Cobo, Guillermo Hurtado, Omar Diez (Federación para la Educación Superior); Coronel Ospina Cubillos; Edgar Caldas, Froylan Bustamante (Ingeniería y Aerofotografía); Oscar Mazuera Gómez and Jaime Valencia (Corporación Regional del Valle del Cauca); Julio Cesar Cubillos (Universidad del Valle); Hernan Mejía and Hilda Caicedo (formerly of the Museo de Ciencias Naturales). In the town of Restrepo we must mention a few of those who have been both kind and patient: Fabio Soto Montoya (Mayor of Restrepo); Carlos Arturo Ospina (Caja Agraria); Jorge Duque, Bernardo Rendón, Bayardo Betancourt, Gilberto Echeverri, Fabio, Hugo, Emma, Lucila, Helena and Teresa Ramírez, the late Martiniano Vélez, Armando Rívas, Don Francisco, Yolanda, Chila and Janet (Telecom), Doña Rosa and Lucy. In Darién and Lake Calima: the soldiers of Batallón Palace (Base Calima), Henry and Virginia Tejada, Joaquín González, Vicente Jaramillo, Rafaél and Piedad Posada, Don Amerigo, Fernando Piedra. In the Valley of El Dorado: Enriqueta de Dominguez and the Acosta family. In Pavas: Irma de Quintero. Finally, in Pereira, Jaime Mejía Marulanda, and in Manizales Giorgio Manzini.

Warwick Bray
Leonor Herrera
Marianne Schrimpff

Metallurgical studies of Calima ornaments

David A. Scott
(London University Institute of Archaeology)

Six metal items from the Calima region have been analysed in the Department of Conservation and Materials Science at the Institute of Archaeology, London University. All these specimens are illustrated in Fig. 45 and are described individually below.

a) From a Sonso grave at the Hacienda La Suiza, Valley of El Dorado. Private Collection.

A hammered nose-ornament of tumbaga (gold-copper alloy). In order to achieve a square section, some metal has been folded back on itself, and, on further working to shape, some buckling of these folded-over edges has occurred. A small fragment of the folded edge was removed for examination. The polished section shows a gold-rich matrix with no evident inclusions. Etching with cyanide persulphate showed the grain structure to be worked and annealed, with a well-developed twinned crystal structure in which the twin lines appear straight.

Atomic Absorption Spectrophotometry: an analysis of 4.62 mg. gave the following result:

Au	Cu	Ag	Fe	Pt	Pb	Sb	As	Ni	Total
67.9	15.8	11.6	nd	1.87	nd	nd	nd	nd	97.17

b) Fragments of a sheet metal ornament from Marales (Municipio of La Cumbre), said to have been found in a tomb with Pavas urns.

The alloy is a tumbaga with enriched surfaces on both sides. One face is noticeably less well finished than the other. Underneath the enriched surfaces the metal is extensively corroded. Etching in diluted ferric chloride solution suggested that the sheet has been shaped by the hammering and annealing of a cast ingot of tumbaga alloy.

Electron Microprobe Analysis: the polished section was used to obtain the following results:

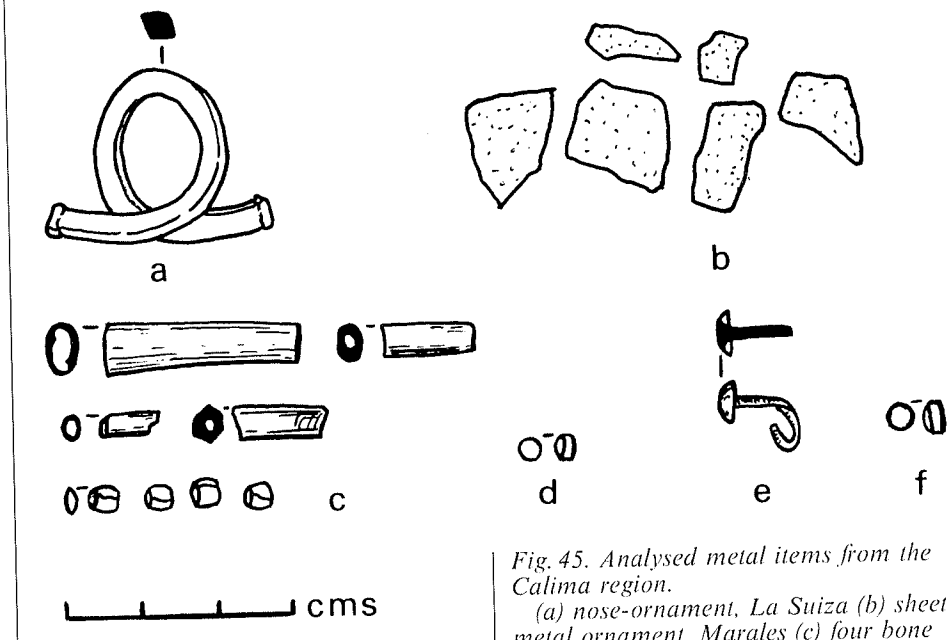


Fig. 45. Analysed metal items from the Calima region.
(a) nose-ornament, La Suiza (b) sheet metal ornament, Marales (c) four bone beads (above) and four small gold beads from Yotoco Ferry (d) gold bead, no provenance (e) nose-stud, La Primavera (f) bead, «Guaca del Tigre», Hacienda Calimita.

Sample No.	Au	Cu	Ag	Pt	Fe	Total
1	63.5	27.9	6.4	nd	nd	97.8
2	62.7	24.4	7.5	nd	nd	94.6
3	68.4	15.4	7.7	nd	nd	91.5
4	67.3	15.9	11.8	nd	nd	95.0
5	69.1	20.3	11.5	nd	nd	100.9
6	63.9	25.1	8.9	nd	nd	97.9
7	55.4	25.3	3.2	nd	nd	83.9
8	71.1	6.3	14.1	nd	nd	91.5
9	71.5	5.5	13.7	nd	nd	90.7

Samples 1 to 7 are from the interior of the item, and indicate a gold-copper alloy consisting of about 64% gold, 28% copper and 8% silver. Analyses 8 and 9 attempt to characterise the surface of the sheet, which shows some enrichment in gold.

c) Small sheet metal bead. Weight 0.372 gr.

One of a set of four from a burial urn of the Yotoco period excavated at the Yotoco Ferry site, in the Cauca valley. The urn contained the bones of a child, with a necklace of bone and gold beads (Fig. 6). Radiocarbon dates from this stratum were A. D. 1100 ± 140 years and 1175 ± 65 (Fig. 2).

The analysed bead is roughly cylindrical in shape, with a join or seam along its length. The specimen is slightly eliptical in section, and has been carefully formed so that it is barrel-shaped rather than tubular. A section examined in the polished state showed that the bead is made from thin gold sheet. The overlapping join has been pressure welded, probably by a combination of careful hammering and heating with a blowpipe. The etched structure shows a single-phased matrix with no visible inclusions. Grain size is large but variable. In areas which have been hammered, the grain size is smaller.

Atomic Absorption Spectrophotometry: analysis of 4.82 mg. of the sample gave the following results:

Au	Cu	Ag	Fe	Pt	Pb	Sb	As	Ni	Total
72.1	1.4	22.9	nd	nd	nd	nd	nd	nd	96.4

Electron Microprobe Analysis: the polished section was used to obtain the following results:

Sample No.	Au	Pt	Ag	Ru	Cu	Rh	Os	Ir	Fe	Total
1	73.8	nd	23.6	nd	1.1	nd	nd	nd	nd	98.5
2	73.6	nd	23.6	nd	0.9	nd	nd	nd	nd	98.1
3	73.6	nd	23.9	nd	1.1	nd	nd	nd	nd	98.6

All the samples were taken across the area of the overlapped join, and show that no compositional change occurs across this area.

d) Small bead, reported to come from a site in the general Calima zone.

The item is made from a thin strip of gold around a core of earthy material. The polished section shows the strip to be made of gold-rich alloy. Atomic Absorption Spectrophotometry gave: Au (79.4), Cu (0.9), Ag (14.7). Etching with cyanide persulphate shows the grain structure to be worked and recrystallised. The join has been made by a simple fusion weld. The composition of the metal (with the virtual absence of copper) is similar to that of pre-Sonso goldwork, and suggests an early date for this bead.

e) Nose stud, excavated in a Sonso grave at the Hacienda La Primavera, Municipio of Darién. Another tomb from this cemetery gave a radiocarbon date of A. D. 1250 ± 84 (Fig. 2).

Visual examination indicates that the stud has been hammered from a strip of tumbaga intermediate in thickness between the flanged head and the shank. The surfaces of the head show very heavy working, as well as some surface enrichment. Microhardness examination showed a slight increase in areas which had been more severely worked.

Electron Microprobe Analysis:

Sample No.	Au	Cu	Ag	Total
1	54.1	38.5	5.9	98.5
2	44.8	50.0	6.0	100.8
3	46.8	47.8	6.3	100.9
4	55.7	36.1	5.7	97.5
5	43.8	48.9	8.1	100.8
6	69.2	8.0	17.3	94.5
7	44.8	50.0	6.0	100.8

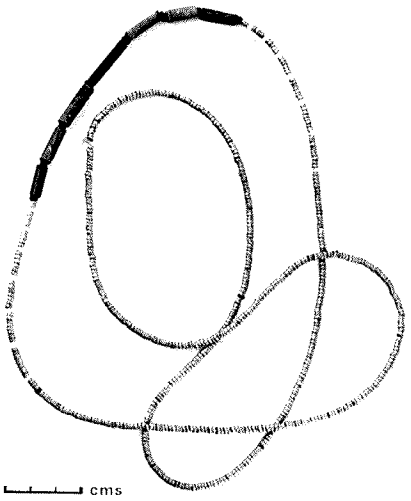
Analyses 2, 3 and 7 show the composition of the body of the stud. Analysis no. 6 is from very close to the surface, showing some degree of surface-enrichment, with a gold content 25% higher than samples 2, 3 and 5.

f) Hacienda Calimita, Municipio of Restrepo.

This bead comes from one of the necklaces from the famous "Guaca del Tigre" (Fig. 46) and was found with a group of gold objects of the finest Calima style (Fig. 47). A full description of this discovery is to be published in the *Boletin* of the Museo del Oro, Bogotá.

The bead measures 3.8 mm. in diameter by 2.3 mm. wide. It appears

Fig. 46. Hacienda Calimita, from the «Guaca del Tigre»; the small gold beads come from one of the necklaces found in this rich tomb, along with the nose-ornament illustrated in Fig. 47. This goldwork probably belongs to the Yotoco period.

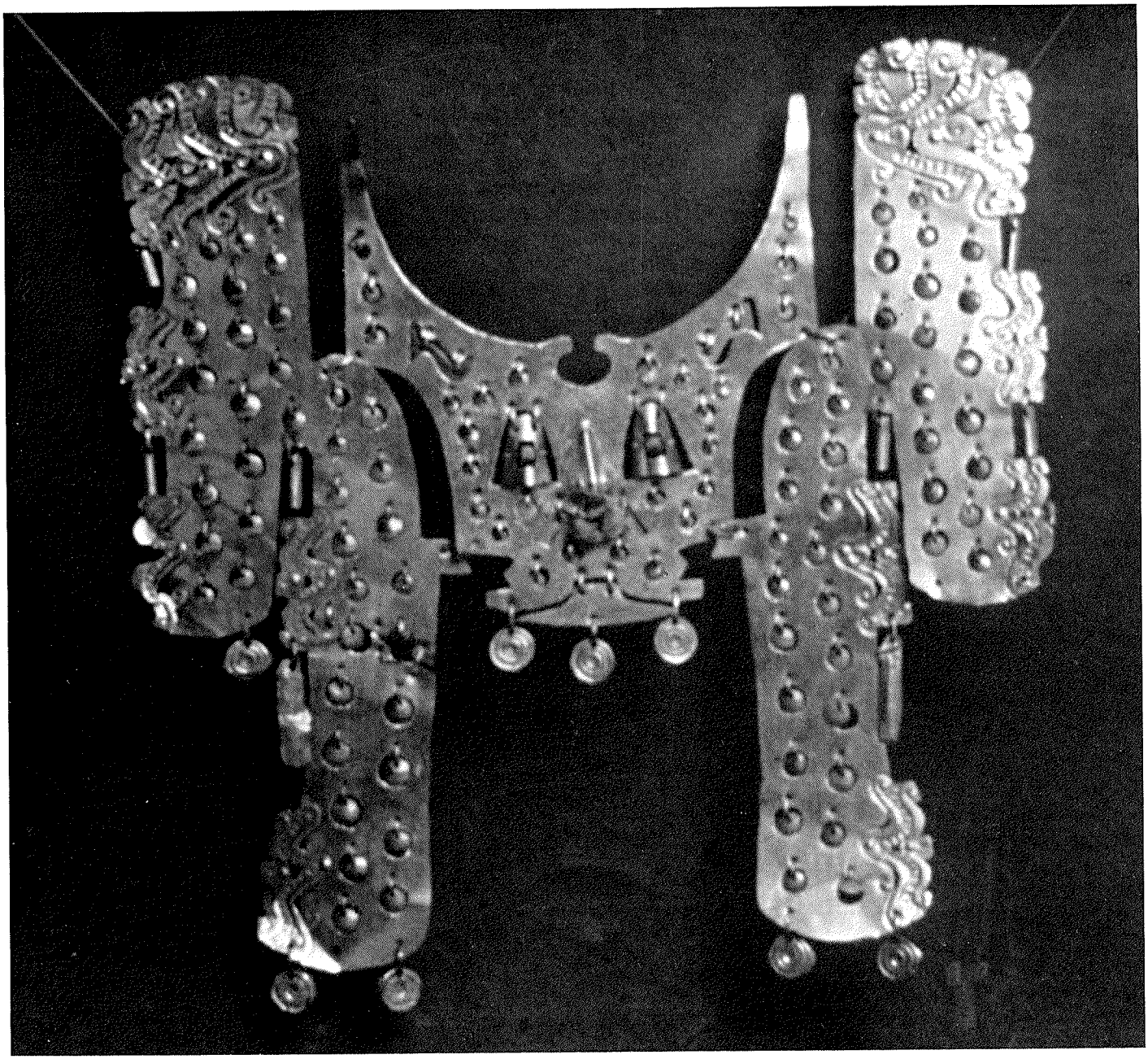


to have been made from a sheet of native gold, beaten out and wrapped round a small mineral core, part of which has now broken away. The bead was examined in transverse section in order to study the join in the gold foil. The foil is quite uniform in thickness, and the join shows a small area of overlap where the metal has been heated and hammered. Etching in cyanide persulphate showed a large grain size. The final stage of working must have been a process anneal, for there is little evidence of extensive deformation.

Electron Microprobe Analysis: the polished section was used to obtain the following results:

Sample No.	Au	Cu	Ag	Pt	Fe	Total
1	85.6	1.5	12.8	nd	0.2	100.1
2	85.9	1.6	13.1	nd	0.3	100.9
3	85.7	1.5	13.1	nd	0.2	100.5

Fig. 47. Hacienda Calimita, from the «Guaca del Tigre»; nose-ornament made from several pieces of sheet gold joined together by wire staples. From the same tomb came several necklaces (Fig. 46), ear-spools, a cast gold figure and a sheet gold breast-ornament similar to the one figured on the cover of the first Pro Calima report (1/80).



A grave-lot of the Sonso period

Immina von Schuler-Schömig
(Museum für Völkerkunde, Berlin)
Based on information from
Karl-Heinz Heinig, Wiesbaden

The information on this grave was collected by Mr. Karl-Heinz Heinig, a German who is deeply interested in all aspects of Colombia, and particularly in its history and archaeology. In May 1975 Mr. Heinig visited a grave (Grave A) which had been opened a few days previously on land belonging to Don Martín Vélez in the Municipio of Darién. He was able to acquire almost the entire contents of this grave and he later presented them to the Museum für Völkerkunde, Berlin, Staatliche Museen Preussischer Kulturbesitz. In addition he was able to measure the grave and to make sketch plans of a second one (Grave B) which was uncovered in a cemetery on the same farm. These sketches were also presented to the Berliner Museum für Völkerkunde (Fig. 48).

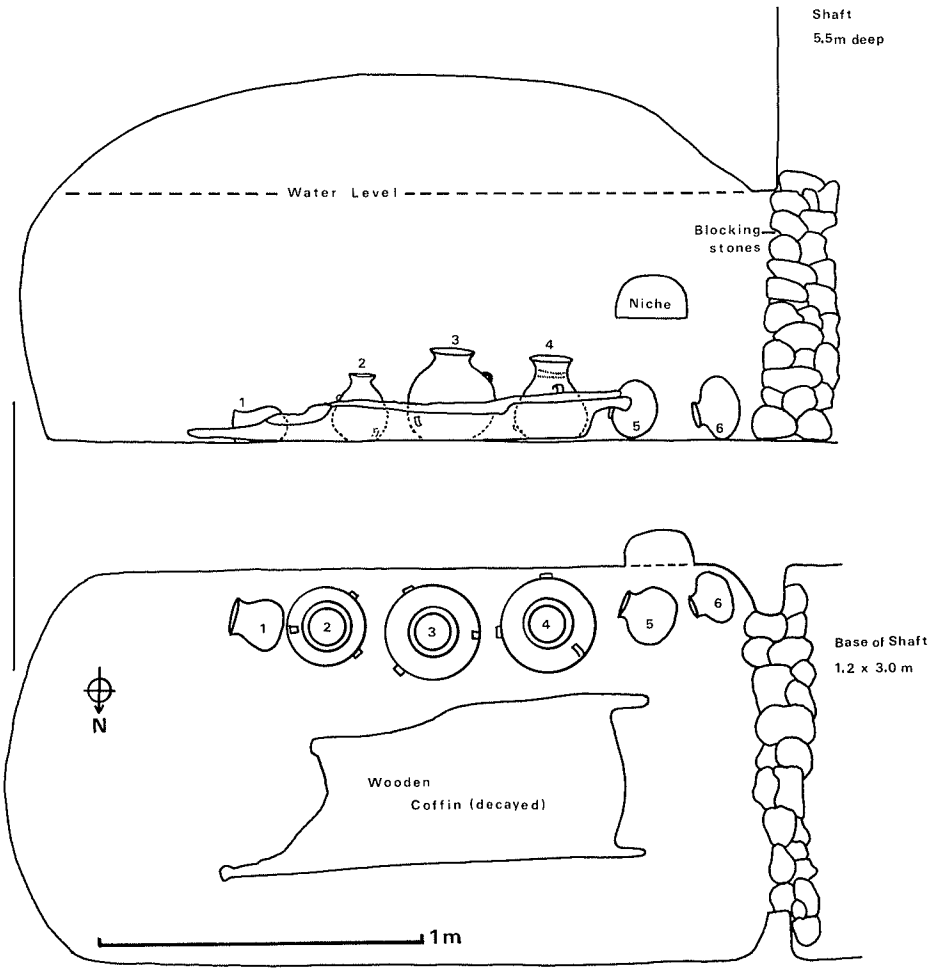
Both graves are of the shaft and chamber variety. These are fairly widespread in Colombia and date from several different periods (see G. Reichel-Dolmatoff, *Colombia*, London 1965, Fig. 46). In detail they are a type which can, apparently, be ascribed to the Sonso period (cf. Fig. 48 with Fig. 17 in *Pro Calima* 1/1980). A wooden coffin was found in the centre of each burial chamber. Since both chambers were full of water, the coffins were in relatively good condition, although the skeletons had disappeared. The best preserved coffin (Fig. 49) came from the grave whose contents are described below. These consist of a roughly-made pottery vessel, a broken pot (since lost) with traces of negative paint, a wooden spear-thrower and the remains of five wooden arrows. The two pots were apparently found at the narrow end of the chamber, with the weapons lying in no particular order on the right hand side of the coffin, as seen from the entrance.

The grave shaft measured 4.20 metres in depth and was 0.70 by 1.85 m. wide, with the entrance to the chamber on the narrow side. This chamber measured 60 cm. wide by 70 cm. high, and lay on the west (uphill) side of the shaft. It was orientated west/east and measured over 2.10 m. long by 1.10 m. wide and about 1.10 m high. The ceiling was slightly vaulted. The entrance to the chamber had been sealed with a wall of rough stones. Neither the walls of the shaft nor of the funerary chamber showed any trace of covering or of supports; it was a simple earth grave.

The coffin is said to be made from the wood of the *comino-real* tree. A length of trunk measuring about 2.15 metres by 35 cm. thick was hollowed out like a canoe, though, unlike a canoe, the ends were blunt rather than pointed, and at each end were two projecting handles carved from the same piece of wood. In spite of the conditions to which the wood has been exposed, axe marks and traces of burning are still visible on the inner walls of the coffin, suggesting that it was hollowed out both by burning and with the help of an axe where necessary. The outside of the coffin appears to have been well smoothed.

A radiocarbon date (Lab. No. Hv-7338) for the coffin was obtained by Professor M. Geyh of the Niedersächsisches Landesamt für Bodenforschung, Hannover. The result was 715 ± 45 years before present, which, as Professor Geyh states in a

Fig. 48. Section (above) and ground plan of a tomb (Grave B) from the farm of Martín Vélez, Darién, based on drawings made by Mr. Karl-Heinz Heinig. The tomb was waterlogged, and its contents included a wooden coffin and several pots. The presence of three-handled jars (nos. 2–4) indicates that this grave belongs to the Sonso period.



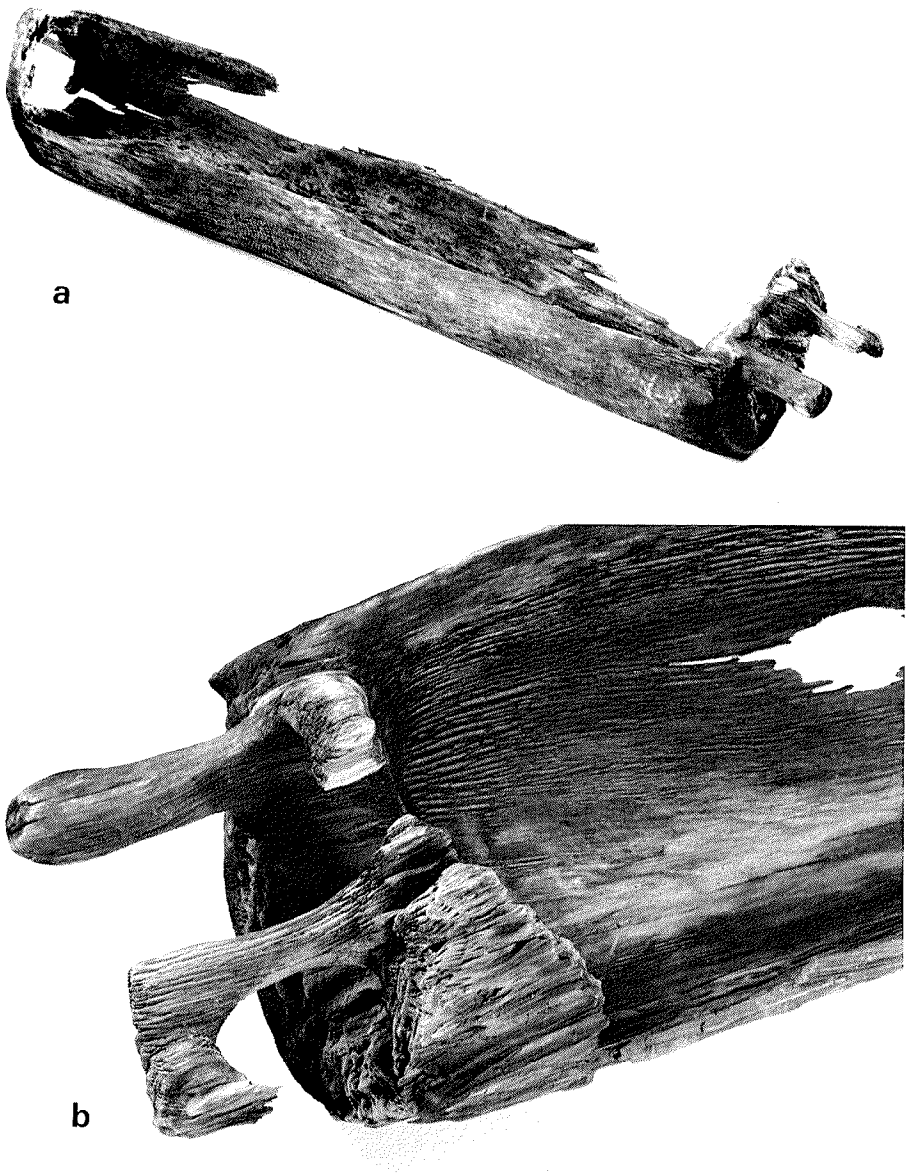


Fig. 49. General view and detail of the wooden coffin from Grave A at the farm of Martín Vélez, Darién. Museum für Völkerkunde, Berlin, No. VA 65265. See also Figs. 50, 51.

letter, after corrections based on tree-ring chronologies indicates a date somewhere in the period A.D. 1200–1290. Professor Geyh considers the results to be reliable. This figure indicates that the coffin was made during the Sonso period, and agrees well with the dates obtained for this period so far (Fig. 2).

Burials in wooden coffins are not uncommon in Colombia. They are already found in the early phase of the San Agustín culture which, according to G. Reichel-Dolmatoff, dates from 555 B. C. to A. D. 424 (*Colombia,* London 1965, p. 94). There is also evidence for similar coffins in the Quimbaya area and in other valleys of the Central Cordillera (Reichel-Dolmatoff, *op. cit,* p. 102). It is interesting to note that, besides the trough-shaped stone coffins at San Agustín, there are also some with two handles at each end, very similar to those of the Sonso period (Reichel-Dolmatoff, *op. cit.,* Fig. 19; also Th. Preuss, *Monumentale vorgeschichtliche Kunst,* Göttingen 1929, Tafel 71,1). According to Reichel-Dolmatoff (*op. cit.,* p. 94) these belong to the middle San Agustín period, which is thought to date from about A.D. 425-1180. This would mean that the sarcophagi of the Sonso phase are not only typologically similar to those of San Agustín, but are also close to them in age.

The other objects in the grave were not used for radiocarbon dating. These items may have been the personal weapons of the occupant of the tomb. Apparently they are made from the hard wood of the *chonta* palm. Since this palm does not grow well in the Calima valley, due to the climate, these wooden items may indicate trade relations (K.-H. Heinig, personal communication). [Ed. note: The wood known as *chonta* can be obtained from a number of different kinds of palms, particularly from certain kinds of *Pyrenoglyphes* (see Pérez Arbeláez, *Plantas Utiles de Colombia,* 1956, p. 579). All these palms need a climate hotter than that of the Calima valley.] Of the three fragmentary arrows or spears, nothing remains but part of the wooden shafts. They now measure 23.4 cm., 33.7 cm. and 42.6 cm. long respectively. There is nothing to indicate what sort of a head they once had, nor how it was attached, and there is now no way of telling whether the shafts were once feathered.

The state of preservation of the spear-thrower (or spear, as the guaqueros called it) is equally poor. Like the arrows or spears, it is covered with a crust of water deposits, and at the same time the wood appears warped and cracked due to the water. The weapon is clearly a spear-thrower and belongs typologically to the Brazilian variety. It resembles most closely the Brazilian Type 2 (see Fritz Krause, *Schleudervorrichtungen für Wurfwaffen,* Internationales Archiv für Ethnographie, Band XV, Leiden 1902, p. 143, Tafel XII, 43; also Bodo Spranz, *Die Speerschleuder im Amerika,* Veröffentlichungen aus dem Übersee-Museum in Bremen, Reihe B, Band 1, Heft 2, Bremen 1956, p. 159, Tafel II). A defining characteristic of these Brazilian spear-thrower types is the broadening of the shaft into a handle with a round hole for the forefinger. Spear-throwers of this type are widespread in eastern South America, and they are also known from Colombia (Spranz, *op. cit.,* p. 159; Alfred Métraux, *Weapons,* Handbook of South American Indians, vol. 5, Washington 1949, p. 247). So far, only two examples of this type are known from Peru (Métraux, *op. cit.,* p. 246) where the usual type is a stick which has a hook instead of a hole for the forefinger (Métraux, *ibid.,* p. 246). In Colombia this latter

type is best known archaeologically from the Muisca Indians of the highlands around Bogotá (Max Uhle, *Über die Wurfhölzer der Indianer Amerikas,* Mitteilungen der Anthropologischen Gesellschaft in Wien, Band XVII, Wien 1887, 111, Tafel IV, 5–7). Thus, during pre-Spanish times, two different types of spear-thrower appear to meet in Colombian territory and are found on archaeological sites: the Brazilian type with a hole for the forefinger, and the "Andean type" (as I will call it) with a hook.

The spear-thrower described here (Fig. 50) is 70.2 cm. long, including the handle which measures approximately 31 cm. The relatively large finger-hole has a diameter of 2 cm. The handle tapers to a point at one end, measuring 3.3 cm. wide at its broadest part, and narrowing to 1.8 cm. at the clearly marked transition between it and the rest of the instrument. This is rod-shaped and also tapers towards its end, though it is no longer possible to tell whether a part of it has broken off. The hook, which should have been at this end of the spear-thrower, is missing. In section, the shaft is somewhat rounded on one side and comparatively flat on the other. The flatter side has been more carefully smoothed, and was probably the upper side, on which the spear or arrow lay.

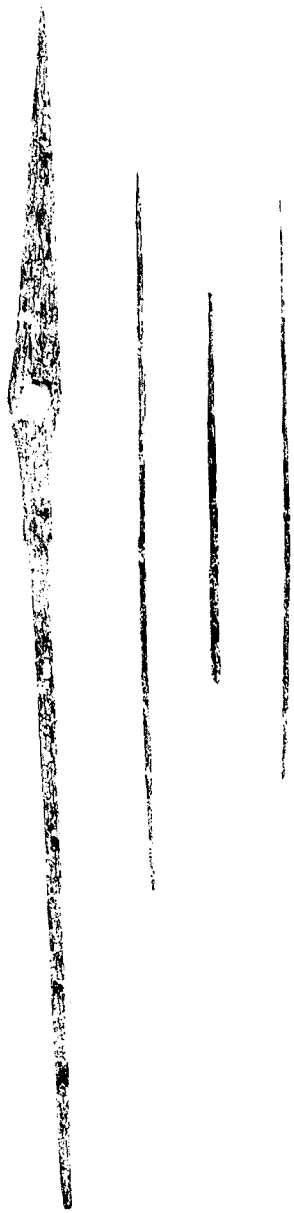


Fig. 50. Wooden spear-thrower and parts of three darts from Grave A at the farm of Martín Vélez, Darién. Museum für Völkerkunde, Berlin, Nos. VA 65519 and VA 65520 a–c. See also Figs. 49, 51.

As stated previously, only one of the two pots originally in the grave has been preserved (Fig. 51). This is a crudely-made vessel with irregular, thick walls which in places measure as much as a centimetre in thickness. The tempering material is coarse, and sometimes the pieces are so large that the surface of the pot appears swollen and cracked. The clay is soft and earthy; however, it is well oxidised and has a brick-red colour. The pot was built up from clay coils, which I believe I can just see on the surface. The jar is oval in form, with a round base and everted rim. It is a purely utilitarian vessel, with no decoration of any sort, but with the remains of a thick layer of soot extending high up the walls. The pot measures 23 cm. in height, with a diameter of 17 cm. at the mouth. Vessels of a similar shape are found in the Sonso style (*Pro Calima,* 1/1980, Fig. 10), so the pottery style also indicates that the grave belongs to the Sonso period. We have tried to determine the age of the pot by the thermoluminescence method, as a check on the radiocarbon date, but the attempt failed for a number of reasons (see Appendix).

A Gaschromatography (GC) examination of material remaining inside this vessel was carried out by Dr. R. Rottländer, Institut für Urgeschichte der Universität Tübingen. I wish to thank him very much for his help. Since analyses of contents from early American pots are rare,

Fig. 51. Sonso pot from Grave A at the farm of Martín Vélez, Darién. Museum für Völkerkunde, Berlin, No. VA 65266. Found with the wooden items illustrated in Figs. 49 and 50.

the results communicated in his letter are quoted here.

We also tested for cholesterol with the aid of Thin Layer Chromatography (TLC). The result was a weak but definitely positive trace. In addition, with Gaschromatography the peak for cholesterol appears as 0.4% absolute, 0.8% relative. The sample therefore contains an animal component, probably animal fat.

The analysis indicates a marked decomposition, shown by a large number of peaks that could not be indentified. I do not know the compound itself; indeed, I have not got any comparable fats from American fauna. The peak of C 16–1, if it is not the result of a transformation process, should indicate a cold climate. The peaks of C 22, C 24 and C 26 are fatty acids, appearing mostly in the grease of the skin. In particular, the fact that they show equal concentrations is an indicator of this. Might the pot have contained a dismembered part of an animal "with skin and hair"?

Appendix

(By Chr. Goedicke, Berlin)

For dating pottery by the thermoluminescence method, the water content of both the sample and its surroundings are of great importance. If, as in this case, we are dealing with an object found in water, additional complications must be expected, since radioactive trace elements may have been dissolved out of the pottery. This leads to a totally misleading date, since, in calculating the age of the sample, the concentration of the radioactive elements must be taken into account.

The measurements obtained for this pot show clearly that elements have been dissolved out; not only the uranium/thorium content but also the kalium content is far below the norm for pottery. Even without additional information, these very low values, together with the brittle appearance of the object, would suggest that the thermoluminescence method would not give reliable results in this case. We should also point out that the computed age depends to an important degree on the radioactivity of the surrounding soil which, in this case, could not be measured.

The following results were obtained:

Archaeological dose	120.5 rad
Alpha count	5.19 cpks
a-value	0.2062
ext. Gamma dose (estimated)	40 mrad/y
max. water intake	22.7 %
Kalium oxide	0.97%

These values give a thermoluminescence age of 530 years before present. Comparison with the radiocarbon date already mentioned shows clearly that, for finds in water, the radiocarbon method is superior to the thermoluminescence method.

(Ed. note: Like the C 14 date, the TL figure is consistent with a Sonso age for the tomb.)

Zusammenfassung

1. Chronologische Fragen

Abbildung Nr. 2 enthält die heute bekannten 14C- und Thermolumineszenzdaten für das Calima- und die angrenzenden Gebiete. Die zwei ältesten Daten (IVIC–597 und GrN–5726) sind als falsch zu erachten (siehe *Cespedesia* 5, 1976, 79–88); die andern sind wahrscheinlich zutreffend. Die Abbildungen 6–9 zeigen einen Teil des datierten Materials, das aus früheren Ausgrabungen im Calima-Tal (1962) und im Cauca-Tal (1964) stammt. Andere Teile des Berichts beschreiben Ausgrabungen, die im Rahmen dieses Projekts in La Iberia (Abb. 3–5), Hacienda La Alsacia (Abb. 28–30), Hacienda La Aurora (Abb. 31–33) und in Cortijo de los Calimas (Abb. 34–36) durchgeführt worden sind.
Im allgemeinen bestätigen die neuen 14C-Daten die für das Calima-Tal bereits bestehende Chronologie. Die Sonso-Periode beginnt um 1200 n. Chr. und endet einige Zeit nach der Eroberung durch die Spanier. Es bestehen keine Zeichen für einen Unterbruch zwischen dem Ende der Yotoco-Periode und dem Beginn der folgenden Sonso-Zeit. Unsere neuen Daten weisen jedoch auf einen erstaunlich frühen Beginn und eine lange Dauer der Yotoco-Periode hin, die gemäss heutigem Wissen 1000 Jahre und länger gedauert haben könnte. Auch die archäologischen Funde heben die wachsende Bedeutung dieser Periode hervor. Yotoco-Fundstellen sind zahlreich. Sie enthalten Siedlungsterrassen, Gräberfelder und möglicherweise einen Teil des Wegnetzes. Ausserdem stammen, laut zuverlässigen Informationen, die spektakulärsten Goldgegenstände aus Gräbern mit Yotoco-Keramik und nicht – wie bisher vermutet – aus Gräbern der frühen Calima-Zeit.
Die Tabelle enthält auch 14C-Daten, die anhand von Bestattungen in grossen Gefässen (Pavas-Urnen), welche in den Kordilleren östlich von Calima gefunden wurden, ermittelt werden konnten. Die datierten Gegenstände sind auf Abbildung 10 zu sehen.
Das erste 14C-Datum für die frühe Calima-Zeit ist soeben an einer Probe verkohlten Materials aus drei Gräbern von La Iberia bestimmt worden: 1590 ± 70 v. Chr. (Beta–2830). Das Datum ist um einige Jahrhunderte älter als ursprünglich angenommen und bestätigt, dass es sich bei diesen plastischen und einschnittverzierten Canasteros und Alcarrazas um den ältesten Stil handelt, dem wir bis jetzt im Calima-Tal begegnet sind.

2. Überblick über die Siedlungsstellen

1980 hat man ein Gebiet in der Nähe von Restrepo gründlich untersucht und alle sichtbaren archäologischen Überreste auf Luftaufnahmen eingezeichnet. Abb. 11 zeigt alle Siedlungsterrassen, Ackerflächen und Gräberfelder. Auf Abb. 12 sieht man Yotoco- und Sonso-Keramik, die auf der Oberfläche gefunden worden ist. Leere Stellen auf dieser Karte bedeuten nicht, dass hier keine Besiedlung stattgefunden hat. Es handelt sich um Weideland, wo Scherben unentdeckt bleiben. Fundstellen der frühen Calima-Zeit konnten nicht nachgewiesen werden. Wahrscheinlich ist die Yotoco-Zeit in unserem Scherbenmaterial untervertreten.
Neben den üblichen kleinen Siedlungsterrassen, auf denen ein einzelnes Haus stand, wurden in dieser Region (z. B. in La Aurora) sowie im Tal von El Dorado (Abb. 13) auch grossflächige planierte Terrassen entdeckt.

3. Wege aus der vorspanischen Zeit

Die Region von Calima wird von einem Netz indianischer Wege durchzogen, das sich sogar bis in die Chocó-Gegend und zum Cauca-Tal und den Zentralkordilleren erstrecken soll. Fünf dieser Wege laufen im Calima-Tal zusammen. Dieses Strassennetz hat man jetzt teilweise aufgezeichnet, wobei das Gebiet um einen 15 km breiten Streifen, von Calima zum El-Dorado-Tal, erweitert wurde. Die Strassen haben eine Breite von 8–16 m und die Form von Kanälen, die tiefer als 1 m sind. Sie durchqueren die Landschaft in möglichst geraden Linien, soweit es die topographischen Verhältnisse erlauben. Mit Vorliebe führen sie den

Hügelkämmen entlang (Abb. 15).
Bei der Hacienda La Lorena, an den Hängen des Calima-Tals, wurde ein Sondierschnitt quer durch eine dieser Strassen gegraben (Abb. 16). Man fand 140 Scherben und einige Steinwerkzeuge (Abb. 17 und 18). Die Keramik konnte dem Yotoco-Stil zugeordnet werden. Sie stammt aus einer dunklen Lehmschicht, die wahrscheinlich die ursprüngliche Oberfläche der Strasse darstellte. Es muss noch weiter geforscht werden, aber gegenwärtig scheint es offensichtlich, dass wenigstens ein Teil dieses Strassensystems während der Yotoco-Zeit benützt wurde.

4. Äcker und Entwässerungsgräben

Es wurden Ackerflächen kartiert und einige davon durch Ausgrabungen überprüft. Bei den meisten Geländemarken handelt es sich um gerade Rinnen oder flache Kanäle, die an den Enden oder Seiten der Hügel direkt ins Tal hinunterführen (Fig. 20–23, 28). Die Distanz zwischen diesen Kanälen bewegt sich normalerweise zwischen 7 und 20 Metern. Diese Merkmale treten sowohl an flachen als auch an steilen Hängen auf, von ca. 11° Neigung bei der Hacienda Ceilan (Abb. 21) bis beinahe 40° bei der Hacienda La Alsacia (Abb. 28). Aus der grossen Ausdehnung dieser Ackerflächen lässt sich schliessen, dass der grösste Teil der Region von Calima in der Vergangenheit bebaut worden ist.
Drei Arten von Linien wurden durch Ausgrabungen erfasst, und die von Prof. Robert Eidt gesammelten Erdproben im State Soil Laboratory der Universität von Wisconsin mit seiner Phosphat-Methode analysiert (siehe Science 197, 1327–1333). Die Bodenprofile von Loma Larga (Abb. 23) und Ceilan (Abb. 22) waren sich ähnlich. Über rötlichem Ton lag eine 20 bis 50 cm dicke Schicht aus grauem Lehm, ein typischer Gley-Boden mit Hinweisen auf einen Grundwasserspiegel, der mit den Jahreszeiten steigt und fällt. Sogar an steilen Hängen kann das Wasser während der feuchtesten Periode bis 10 cm unter die Oberfläche steigen und eine Versumpfung bewirken.
Bei den geraden Geländemarken handelt es sich wohl eher um Entwässerungssysteme, als um Besitzgrenzen oder erhöhte Felder. Es gibt keine Erdwälle zwischen den Kanälen und auch keine Anzeichen dafür, dass versucht worden wäre, die Humusschicht zu erhöhen. Am Fuss der Hänge laufen die Gelände-Linien in Tälern zusammen, die den Wasserüberschuss wegführen. Diese urgeschichtlichen künstlichen Drainagen sind oft mit natürlichen Abflussrinnen oder Bächen verbunden und bilden auf diese Weise ein gemeinsames Entwässerungssystem (Abb. 23). Ein paar der Kanäle sind in vielen Windungen angelegt (Abb. 28). Dies könnte eine Methode darstellen, um die Strömung des Wassers zu verlangsamen und so der Erosion entgegenzuwirken. Es wurde auch angedeutet, dass einige dieser Entwässerungsgräben mit kleinen Dämmen ausgestattet gewesen sein könnten, was jedoch noch nicht bestätigt werden konnte.
Bei der Hacienda La Alsacia durchquerten die Geländelinien eine Siedlungsterrasse der Yotoco-Periode.

5. Ausgrabungen von Siedlungen

a) Hacienda Barcelona (Nr. 24–27)

Zwei Tambos (Siedlungsterrassen) aus der Sonso-Periode sind untersucht worden. Der eine (Nr. 1) befand sich gegen die Mitte eines verlassenen Ackers. Unter Kulturschichten und der aufgehöhten Terrassenkante fand man einen älteren Horizont mit Scherben. Boden- und Pollenproben dieses Horizontes werden gegenwärtig analysiert.

b) Hacienda La Alsacia (Abb. 28–30)

An dieser Stelle wurden zwei Siedlungsterrassen wegen ihrer eindeutigen Beziehung zu einem gut erkennbaren Ackersystem ausgewählt. Beide Terrassen waren stark verwittert, enthielten aber noch spärliche Siedlungsreste der Yotoco-Periode. Auch hier befand sich ein verschüttetes Gehniveau unter der Terrassenaufhöhung. In La Alsacia liegt unter dem Humus der Ackerflächen, die quer durch die obere Siedlungsschicht der Terrasse ziehen, eine gut erhaltene Strate Vulkanasche. Eine Kohlenprobe der Terrasse Nr. 1 ergab ein 14C-Datum von 195 ± 185 v. Chr. (Beta–136).

c) Hacienda La Aurora

Hier handelt es sich um ein grosses Gebiet auf der Kuppe eines Hügels, deren Form sich durch Nivellierungen und Auffüllungen an der Hangseite verändert hat. Es wurden sechs Sondierschnitte ausgehoben, wobei Schnitt Nr. 3 die meisten Informationen lieferte (Abb. 31 und 32). Auch hier war ein Paläosol (ursprüngliche Begehungsfläche) durch Aufschüttungen zugedeckt und geschützt. In der begrabenen Schicht befanden sich ein paar Yotoco-Scherben und an ihrer Basis Teile eines atypischen, rot bemalten Gefässes (Abb. 33). Pfostenlöcher lassen vermuten, dass hier während der Yotoco-Periode ein Bauwerk errichtet worden ist. Pollen war in den Bodenproben nicht mehr vorhanden, dafür eine ganze Anzahl von Phytolithen (mikroskopisch kleine Kieselgerüste in pflanzlichem Gewebe), die gegenwärtig in London analysiert werden. Das 14C-Datum für den unteren Teil dieser Schicht ist 395 ± 85 v. Chr. (Beta–1837). In den darüberliegenden Aufschüttungen fand man Scherben aus der Sonso-Periode. Man nimmt an, dass die Hauptveränderungen an der Hügelkuppe ebenfalls in jener Zeit stattgefunden haben.

d) Cortijo de los Calimas

Es handelt sich hier um die höchstgelegene Fundstelle. Sie befindet sich am oberen Rand der Lichtung im Wald über dem Calima-Stausee. Ausgrabungen auf den Siedlungsterrassen ergaben Scherben der Sonso-Periode und eine Statuette aus Ton, wie sie in vielen ähnlichen undatierten Exemplaren in Sammlungen vorkommen (Abb. 35–37). Das 14C-Datum für diesen Fundort (Beta–1834) ist 1640 ± 70 n. Chr. Es lässt vermuten, dass die einheimische Kultur nach der spanischen Eroberung noch ziemlich lange weiterbestanden hat. Dies wird bestätigt durch Berichte von Guaqueros, die Gegenstände aus Eisen, zusammen mit spanischem Schmuck, in Schacht-Kammergräbern dieser Übergangsperiode gefunden haben.

6. Ausgrabungen in Montecito

Bei dieser Fundstelle in der Nähe von La Cumbre (Westliche Kordillere) handelt es sich um eine Grabung mit einer Fülle von gut erhaltener Keramik (Abb. 38–40) und ein paar Steingeräten. Im Montecito-Stil werden die gleichen Dekorationstechniken verwendet wie in der Sonso-Periode. Die Art der Kombination der Dekorelemente ist jedoch gar nicht typisch für die Sonso-Keramik. Es besteht zwar eine klare Beziehung zwischen diesen beiden Stilen, dennoch konnte die Montecito-Keramik noch nicht befriedigend datiert werden. Es sind zwei Interpretationen möglich:

a) Der Montecito-Stil und der Sonso-Stil gehören zwei verschiedenen Epochen an, oder
b) es handelt sich um eine Spezialisierung innerhalb des Sonso-Repertoires.

Es wurde zwar eine Montecito-Schale im Schacht eines Grabes gefunden, dessen Kammer eine Alcarraza der frühen Calima-Zeit enthielt. Andere Vergleiche deuten jedoch auf ein jüngeres Datum hin. Die Schalen haben eine Ähnlichkeit mit den Deckeln der Pavas-Urnen (Abb. 10). Im Schnitt Nr. 6 unserer Ausgrabungen bei der Hacienda La Aurora befand sich eine Randscherbe im Montecito-Stil unter den Gegenständen eines gemischten Fundkomplexes aus der Yotoco- und der Sonso-Zeit. In einem Friedhof in der Nähe von Guabas, im Cauca-Tal, der gegenwärtig von Carlos Humberto Illera und Carlos Armando Rodríguez ausgegraben wird, fand man ebenfalls Fragmente von Montecito-Gefässen zusammen mit Scherben aus der Sonso-Zeit.

7. Metallurgische Untersuchungen

David Scott berichtet über Zusammensetzung und Herstellung von sechs Objekten aus der Calima-Gegend (Abb. 45). Darunter befindet sich Material von wissenschaftlichen Ausgrabungen in La Primavera, La Suiza und Yotoco Ferry sowie die Perle einer Kette der «Guaca del Tigre» (kunstvolle Goldarbeiten der frühen Calima-Zeit, Abb. 46 und 47, die sich heute im Museo del Oro befinden).

8. Grabfunde vom Municipio in Darién

Frau Dr. Immina von Schuler-Schömig beschreibt den Inhalt von zwei versumpften Gräbern auf der Hacienda Don Martín Vélez, in der Nähe von Darién. Eines der Gräber (Abb. 48) enthielt einen beschädigten hölzernen Sarg und Keramik aus der Sonso-Zeit. Im zweiten Grab (Abb. 49–51) befanden sich ein hölzerner Sarg, eine Speerschleuder, Teile von drei Speeren und zwei Töpfe. Dieses Grab lieferte ein 14C-Datum von 1235 ± 45 n. Chr. (Hv 7338); es stammt also ebenfalls aus der Sonso-Zeit. Die Speerschleuder war eher vom «brasilianischen» Typ mit einem Loch für den Zeigefinger als vom «Anden»-Typ (mit einem hakenförmigen Griff), wie man ihn bei den Muiscas gefunden hat. Das Material des zweiten Grabes befindet sich heute im Museum für Völkerkunde in Berlin.

9. Ausblick auf 1981

Die Feldarbeiten von 1981 werden sich auf das Tal von El Dorado konzentrieren. Anhand von Rekognoszierungen aus der Luft und am Boden konnten bereits etwa 600 Siedlungsstellen, unzählige Ackerflächen und ein System von Entwässerungskanälen (Abb. 42–44) lokalisiert werden.

Résumé

1. Problèmes d'ordre chronologique

La figure 2 contient les datations obtenues par C14 et par la thermoluminescence dont nous disposons aujourd'hui pour la région de Calima et les régions adjacentes. Les deux dates les plus vieilles (IVIC–597 et GrN–5726) doivent être considérées comme étant incorrectes (voir *Cespedesia* 5, 1976, 79–88), mais les autres sont probablement valables. Les figures 6–9 montrent du matériel daté, provenant de fouilles antérieures à notre projet qui ont été effectuées dans les vallées de Calima (1962) et de Cauca (1964). D'autres parties du rapport décrivent les fouilles du projet à la Iberia (fig. 3–5), Hacienda La Alsacia (fig. 28–30), Hacienda La Aurora (fig. 31–33) et Cortijo de los Calimas (fig. 34–36).

En général les nouvelles dates C14, confirment la chronologie déjà établie pour la vallée de Calima. La période de Sonso débute autour de l'année 1200 après J. C. et prend fin après la conquête par les Espagnols. Il n'y a pas de hiatus entre la fin de la période de Yotoco et le début de la période de Sonso. Cependant nos nouvelles dates surprennent par le fait qu'elles indiquent que la période de Yotoco a commencé très tôt et a duré très longtemps. Les preuves évidentes que nous possédons aujourd'hui nous mènent à estimer une durée de 1000 ans ou plus. L'archéologie démontre également l'importance croissante de cette période. Les sites de la période de Yotoco sont très nombreux et comprennent des aires d'habitation, des cimetières et peut-être une partie du réseau routier. En plus, selon des informations sérieuses, les découvertes des objets en or les plus spectaculaires ont été faites dans des tombeaux contenant aussi des céramiques de la période de Yotoco, et non pas – comme on l'avait cru – du matériel plus ancien de Calima.

Le tableau contient aussi les datations C14 tirées des tombeaux sous forme de grands vases (urnes de Pavas), qui ont été trouvés dans les Cordillères à l'est de Calima. Les objets datés sont montrés fig. 10. La

première date C14 pour la période ancienne de Calima vient d'être obtenue: 1590 avant J. C. ± 70 ans (Beta–2830), à partir d'un spécimen composé de matériel carbonisé provenant de trois tombeaux à La Iberia. La date est de quelques siècles plus vieille que l'on le croyait. Elle confirme cependant que ce style modelé, avec des incisions, des canasteros et des alcarrazas est le plus vieux que nous connaissions jusqu'ici dans la vallée de Calima.

2. Reconnaissance des aires d'habitation

En 1980, une partie du territoire près de Restrepo a été complètement explorée et tous les témoins archéologiques ont été relevés sur photographies aériennes. La fig. 11 indique toutes les plates-formes d'habitat, l'agencement des champs cultivés et les cimetières. La céramique des périodes de Yotoco et de Sonso qui a été trouvée à la surface est reproduite fig. 12. Les espaces blancs sur cette carte ne correspondent pas à un manque d'occupation, mais plutôt à la répartition des pâturages où l'on ne trouve pas de tessons. On n'a retrouvé aucun site de la période ancienne de Calima et la période de Yotoco est probablement sous-représentée par la céramique.
A côté des plates-formes modestes, que l'on trouve partout et qui conviennent à des maisons simples, on a découvert dans cette région (par exemple à La Aurora) et dans la vallée de El Dorado des plates-formes plus importantes (fig. 13.)

3. Chemins préhispaniques

On rencontre des chemins indiens dans toute la région de Calima et selon les informations que nous possédons, on en trouve aussi dans la région de Chocó et à travers les montagnes jusqu'à la vallée de Cauca et à la Cordillère Centrale. Cinq de ces voies de communications convergent dans la vallée de Calima. Une partie de ce réseau de chemins est cartographiée ainsi qu'une étendue de 15 km entre Calima et la vallée de El Dorado.
Les chemins creusés de plus d'un mètre ont une largeur de 8 à 16 m. Ils coupent le paysage en lignes aussi droites que la topographie le permet. En général ils suivent les crêtes des collines (fig. 15). Un sondage a été effectué au milieu de l'une de ces routes sur les pentes de la vallée de Calima à l'Hacienda La Lorena (fig. 16). On a trouvé 140 tessons et quelques outils en pierre (fig. 17, 18). Toutes les céramiques identifiables dataient de la période de Yotoco. Elles étaient dans une couche de terre d'argile foncée qui semble correspondre à la surface originale de la route. Bien qu'il soit nécessaire d'effectuer d'autres sondages, il semble établi qu'au moins une partie de ce système a été utilisée pendant la période de Yotoco.

4. Champs et système de drainage

On a effectué une cartographie des terres cultivées et réalisé quelques fouilles de contrôle. La plupart des traces sont de simples sillons linéaires ou des fossés peu profonds, qui descendent directement vers la vallée, soit au bord des collines soit sur leurs pentes (figs. 20–23, 28). La distance entre les canaux est d'environ 7–20 m. On observe ces dispositions quelque soit la pente, de 11° environ à la Hacienda Ceilan (fig. 21) jusqu'à 40° environ à la Hacienda La Alsacia (fig. 28). L'étendue relativement vaste de ce système (fig. 20) indique que la plus grande partie de la région de Calima était cultivée dans le passé.
Les fouilles ont porté sur trois secteurs en lignes, et les échantillons prélevés par le Professeur Robert Eidt ont été analysés au State Soil Laboratory de l'Université du Wisconsin selon sa méthode de fractionnement des phosphates (v. Science 197, 1327–1333).
A Loma Larga (fig. 23) et Ceilan (fig. 22) les coupes du sol sont similaires. Au-dessus de l'argile naturelle rouge, se trouve un limon argileux gris de 20 à 50 cm d'épaisseur, correspondant à un sol à gley typique montrant l'existence d'une variation saisonnière du niveau de la nappe d'eau souterraine. Même sur pentes raides on peut observer jusqu'à 10 cm d'eau pendant la période la plus humide, créant ainsi un état de marécage. Les traces linéaires semblent donc être des réseaux de drainage plutôt que des limites de propriété ou de champs. Il n'y a pas de monticules entre les fossés et aucune trace prouvant qu'on aurait essayé d'augmenter l'épaisseur de la couche végétale du sol. Au bas des pentes les lignes semblent converger vers les vallées qui assurent le drainage de l'eau excédente. Ces canaux préhistoriques sont souvent connectés à des thalweg naturels ou des ruisseaux, associant ainsi drainage naturel et drainage artificiel en un seul système (fig. 23). Le tracé sinueux de certains canaux (fig. 28) correspond peut-être à une méthode pour ralentir le courant de l'eau, et donc de réduire les effets de l'érosion. On a même émis l'hypothèse que certains de ces drains possédaient de petits barrages.
A la Hacienda La Alsacia ces traces linéaires traversent une plate-forme d'habitat de la période de Yotoco.

5. Fouilles sur les sites d'habitat

a) Hacienda Barcelona (fig. 24–27)

Deux tambos (sites d'habitat) de la période de Sonso ont été fouillés. L'un d'eux (no 1) se trouvait au centre d'un champ abandonné. Sous les couches d'occupation et le remblai de construction sur le bord extérieur de la plate-forme on a retrouvé le niveau primitif du sol marqué par quelques tessons peu caractéristiques. Les échantillons de terre de cette surface ancienne sont en cours d'étude ainsi que l'analyse pollinique.

b) Hacienda La Alsacia (fig. 28–30)

Les deux plates-formes de ce site ont été choisies à cause de leur association avec un système de terres cultivées bien marqué. Elles ont beaucoup souffert de l'érosion, mais on y a trouvé quelques vestiges culturels de la période de Sonso. Là aussi il y avait un niveau antérieurement couvert par le remblai de construction de la terrasse. A La Alsacia on a trouvé sous la terre végétale des champs (traversant la terrasse supérieure abandonnée) une couche bien conservée de cendres fertiles d'origine volcanique. Le charbon de la terrasse no 1 a fourni une date C14 de 195 ± 185 avant J. C. (Beta–136).

c) Hacienda La Aurora

Il s'agit d'un vaste site s'étendant sur une colline dont la forme a été modifiée par nivellement et par remblai du côté de la pente. On y a creusé six fosses, parmi lesquelles la fosse 3 a donné le plus d'informations (fig. 31 et 32). Là aussi un paléosol (surface du sol d'origine) a été couvert et protégé par du remblai. On y a trouvé quelques tessons de la période Yotoco et à la base les morceaux d'un vase inhabituel peint en rouge (fig. 33). Des trous de poteaux permettent de penser qu'on avait construit une structure, dans ce site à cette période. On n'a pas trouvé de pollen dans les échantillons de terre, mais un assez grand nombre de phytolithes (squelettes microscopiques de silice se trouvant dans certains tissus de plantes), qu'on est en train d'analyser à Londres. La date C14 pour la partie inférieure de ce sol recouvert est de 395 avant J. C. ± 85 (Beta–1837). Le remblai qui la couvre contient des tessons de la période du Sonso. L'aménagement principal du sommet de la colline a probablement eu lieu pendant cette période.

d) Cortijo des los Calimas

C'est le site le plus élevé examiné jusqu'ici. Il est situé sur le bord supérieur de la forêt clairsemée qui domine le bassin d'accumulation de Calima. Des fouilles dans des plates-formes d'habitation ont fourni des tessons de la période de Sonso et une statuette en argile comparable à des exemples non datés, qui existent déjà en grand nombre dans les collections (fig. 35–37). La date C14 de ce site (Beta–1834) est 1640 ± 70 après J. C. Il est donc probable que la culture indigène a persisté encore assez longtemps après la conquête espagnole. Ces faits se trouvent confirmés par les rapports des guaqueros qui ont trouvé des objets en fer associés à des bijoux espagnols dans des puits ou chambres funéraires datant de cette période de contact.

6. Les fouilles de Montecito

Ce site se trouve près de La Cumbre dans la Cordillère Occidentale. C'est une fosse contenant beaucoup de céramiques en bon état (fig. 38–40) et quelques objets en pierre. Le style de Montecito utilise les mêmes techniques décoratives que celui du Sonso, mais la manière de les combiner n'est pas la même que pour la céramique du Sonso. Il existe une relation évidente entre ces deux styles, bien que les objets de Montecito n'aient pas encore pu être datés de manière satisfaisante. Deux interprétations sont possibles:

a) il s'agit de deux époques différentes
b) Montecito représente une sélection très spécialisée de l'ensemble du répertoire de la période de Sonso.

On avait trouvé un bol de Montecito dans le puit funéraire dont la boveda contenait une alcarraza de la période ancienne de Calima. D'autres comparaisons suggèrent une date plus avancée. Les bols ressemblent aux couvercles trouvés sur les urnes de Pavas (fig. 10). Dans la fosse no 6 de notre fouille à Hacienda La Aurora nous avons trouvé un tesson du style de Montecito parmi des objets du Yotoco et du Sonso. Il existe aussi une combinaison de tessons du style de Montecito avec des tessons du Sonso dans un cimetière près de Guabas, dans la vallée de Cauca, actuellement fouillé par Carlos Humberto Illera et Carlos Armando Rodríguez.

7. Etudes métallurgiques

David Scott a fait un rapport concernant la composition et la fabrication de six objets de la région de Calima (fig. 45). Il y figure des objets provenant de fouilles contrôlées de La Primavera, La Suiza et du site de Yotoco Ferry, de même qu'une perle d'un collier de la «Guaca del Tigre», qui appartient à ces œuvres en or très élaborées de l'orfèvrerie de la période ancienne de Calima et qui se trouve aujourd'hui au Museo del Oro (fig. 46 et 47).

8. Matériel funéraire du Municipio de Darién

Le docteur Immina von Schuler-Schömig décrit le contenu de deux guacas inondées se trouvant à la Hacienda de Don Martín Vélez, près de Darién. Dans l'un des tombeaux (fig. 48) il y avait un cercueil en bois endommagé et de la céramique du Sonso. L'autre tombeau contenait un cercueil en bois, un propulseur, les morceaux de trois pointes de traits et deux pots. Il nous a fourni une date C14 de 1235 ± 45 après J. C. (Hv 7338). Il doit donc être situé dans la période de Sonso. Le propulseur était plutôt du type «brésilien» (muni d'un trou pour l'index) qu'«andin» (avec un crochet) qu'on a trouvé sur des sites des Muiscas. Le matériel de ce second tombeau se trouve aujourd'hui au Museum für Völkerkunde à Berlin.

9. Propositions pour 1981

Les travaux à ciel ouvert de l'année 1981 se concentreront sur la vallée de El Dorado. A l'aide de reconnaissances aériennes suivies de reconnaissances sur place nous avons déjà pu localiser quelques 600 plates-formes d'habitation, un grand nombre de lignes de champs et un réseau de drains et de champs cultivés au fond de la vallée (fig. 42–44).

Resumen

1. Problemas relativos a la Cronología

En la Figura 2 están listadas las fechas de C14 y termoluminiscencia disponibles para Calima y áreas adyacentes. Dos de las fechas más tempranas (IVIC–597 y GrN–5726) deben considerarse como incorrectas (ver *Cespedesia* Vol. 5, 1976, pp. 79–88), pero las demás son probablemente válidas.
Parte del material fechado en excavaciones anteriores en el valle del Calima (1962) y el valle del Cauca (1964) está ilustrado en las Figuras 6–9. Otras secciones del informe describen las excavaciones llevadas a cabo por este Proyecto en las haciendas La Iberia (Figs. 3–5), La Alsacia (Figs. 28–30), La Aurora (Figs. 31–33) y Cortijo de los Calimas (Figs. 34–36).
En general las fechas de C14 obtenidas hace poco confirman la cronología establecida anteriormente para Calima. El período Sonso comienza cerca del 1200 A. D., perdurando hasta algún tiempo después de la Conquista Española. No hay evidencia de un hiato entre el comienzo de la fase Sonso y el final del período Yotoco. Sin embargo, estas nuevas fechas indican una iniciación sorpresivamente temprana y una duración prolongada del período Yotoco, el cual, de acuerdo con la evidencia actual pudo haber durado unos mil años o más. La arqueología también demuestra la creciente importancia de esta época; hay numerosos sitios del período Yotoco, los cuales incluyen plataformas de vivienda, cementerios y probablemente parte de la red de caminos. Además, informantes confiables afirman que el trabajo de órfebrería más espectacular proviene de tumbas con cerámica Yotoco y no, como se suponía anteriormente, con cerámica Calima Temprana.
La Figura 2 también incluye fechas de C14 obtenidas de entierros en vasijas grandes (urnas de Pavas), en la Cordillera al oriente de Calima. Los objetos fechados se ilustran en la Figura 10.
La primera fecha de radiocarbono para el período Calima Temprano acaba de ser obtenida: 1590 a. c. ± 70 años (Beta–2830), a partir de una muestra compuesta de material carbonizado de tres tumbas de La Iberia. La fecha resultó algunos siglos más antigua de lo que se esperaba, pero confirma que el estilo inciso y modelado, con sus canasteros y alcarrazas, es lo más temprano hasta hoy conocido en Calima.

2. Reconocimiento de plataformas de vivienda y asentamientos

En 1980, un sector cercano a Restrepo fué totalmente explorado y los sitios arqueológicos visibles fueron registrados sobre fotografías aéreas y acetato transparente. La Figura 11 muestra las plataformas de habitación, campos de cultivo y cementerios. En la Figura 12 se muestra la distribución de los hallazgos superficiales de cerámica Yotoco y Sonso. Las áreas que se encuentran en blanco en este mapa no indican ausencia de ocupación sino la presencia de potreros en donde no se observaron fragmentos cerámicos en la superficie. No se encontraron sitios del período Calima Temprano y es probable que el período Yotoco no esté adecuadamente representado en la muestra de material cerámico.
Además de las plataformas pequeñas corrientes en donde sólo cabría una vivienda, se descubrieron otras construcciones más grandes, en el área del reconocimiento (p. ej. La Aurora) y también en el valle de El Dorado (Fig. 13).

3. Caminos prehispánicos

Una red de caminos indígenas cubre la región de Calima y, según algunos informantes, se extiende hasta el Chocó y también a través de la cordillera, hasta zonas tan alejadas como el valle del Cauca y la Cordillera Central. Cinco de estos caminos convergen en el valle del Calima.
Los caminos, que miden entre 8 y 16 ms de ancho y forman canales de 1 m de profundidad, cortan el paisaje en líneas tan rectas como la topografía lo permite, siguiendo preferentemente, los filos de las crestas (Fig. 15).
Se hizo una trinchera, cortando transversalmente uno de estos caminos, en la Hacienda La Lorena, localizada en las vertientes del valle del Calima (Fig. 16). De esta trinchera se obtuvieron 140 fragmentos cerámicos y algunas herramientas de piedra (Figs. 17–18). Toda la cerámica diagnóstica pertenece al estilo Yotoco y provino de una capa de suelo oscuro, el cual parece haber sido la superficie original del camino. Se necesitan más excavaciones, pero en el momento, la evidencia sugiere que al menos una parte de la red de caminos se usó durante el período Yotoco.

4. Campos de cultivo y drenajes

Se diagramaron varios sistemas de campos de cultivo, en algunos de los cuales se hicieron excavaciones. La mayor parte de los vestigios consiste en depresiones lineales o zanjas de poca profundidad que bajan en línea recta por los declives (Figs. 20–23, 28). La distancia entre las zanjas fluctúa entre 7 y 20 ms. Este fenómeno ocurre en pendientes fuertes como poco pronunciadas, desde unos 11° en la Hacienda Ceilán (Fig. 21) hasta casi 40° en la Hacienda La Alsacia (Fig. 28). La inmensa extensión cubierta por este sistema de campos de cultivo (Fig. 20) indica que en el pasado una gran parte de la zona Calima estuvo cultivada.
Se estudiaron, por medio de excavaciones, tres conjuntos de zanjas; las muestras de suelos recogidas por el Profesor Robert Eidt fueron analizadas en el Laboratorio Estatal de Suelos de la Universidad de Wisconsin, por el método de fraccionamiento de fosfatos (véase Science vol. 197. pp. 1327–1333).
En Loma Larga (Fig. 23) y Ceilán (Fig. 22) los perfiles de suelos fueron similares entre si. Por encima de la arcilla natural de color rojizo había de 20 a 50 cms de suelo franco arcillo-arenoso de color gris. Esta capa tiene las características típicas de un suelo gleificado, dando evidencia de un nivel freático que fluctúa de acuerdo con la estación. Aún en pendientes pronunciadas, el agua puede subir casi hasta la superficie durante el invierno, creando problemas de anegamiento.
Los vestigios lineales parecen ser sis-

temas de drenaje más que límites de propiedades o eras de cultivo. No se ve amontonamiento de tierra entre las zanjas, ni se advierte un intento de aumentar la profundidad del suelo. Loma abajo las zanjas tienden a convergir en valles los cuales llevan el agua sobrante mientras que canales prehispánicos se conectan frecuentemente con quebradas y arroyos, combinando así drenajes naturales y artificiales en un solo sistema (Fig. 23). El carácter sinuoso de algunas zanjas (Fig. 28) pudo corresponder a una medida para disminuir la corriente de agua, reduciendo así la erosión; se ha sugerido tentativamente que algunos de estos drenajes pudieron haber tenido pequeñas represas de control. En la Hacienda La Alsacia estas zanjas atraviezan una plataforma de vivienda con cerámica Yotoco.

5. Excavaciones en sitios de habitación

a) Hacienda Barcelona (Figs. 24-27)

Se sondearon dos tambos del período Sonso, unos de ellos, el No. 1, colocado hacia el centro de un campo abandonado. Bajo las capas de ocupación y del relleno de construcción, en el borde externo de las plataformas, se encontró un suelo enterrado con algunos fragmentos cerámicos poco diagnósticos. Se tomaron muestras de polen y de suelos en esta antigua superficie que están siendo analizados en el momento.

b) Hacienda La Alsacia (Figs. 28–30)

En este sitio se escogieron dos plataformas debido a su estrecha asociación con conjuntos de zanjas claramente visibles. Ambas plataformas estaban bastante erosionadas, pero el escaso material cultural pertenece al período Yotoco. Aquí también se encontró un suelo enterrado, debajo del relleno de la plataforma. En La Alsacia, el sistema de zanjas, que corta a través de la plataforma superior, tiene un estrato bien conservado en ceniza volcánica fértil debajo del humus. Una muestra de carbón de la plataforma No. 1 dio una fecha de 195 a. c. ± 185 (Beta–136), por C14.

c) Hacienda La Aurora

Se trata de un sitio extenso sobre la cima de una colina, cuya forma fué modificada, nivelándola y botando pendiente bajo una capa bastante profunda de relleno. Se abrieron 6 trincheras, de las cuales la tercera fué la más productiva en cuanto a información (Figs. 31,32). Aquí también se encontró un paleosuelo (capa superficial antigua) cubierto y protegido por el relleno. En este suelo enterrado se encontraron algunos fragmentos cerámicos de la fase Yotoco, y en la base parte de una vasija atípica, pintada de rojo (Fig. 33). Dos huellas de poste sugieren que durante este período se construyó una estructura en este sitio. En las muestras de tierra obtenidas no se encontró polen pero sí fitolitos (esqueletos microscópicos de sílica, presentes en ciertas plantas), más o menos abundantes, que están siendo estudiados en Londres. La fecha de C14 para la parte inferior del suelo enterrado es de 395 a. c. ± 85 (Beta–1837) y el relleno encima de éste contiene fragmentos cerámicos del período Sonso; probablemente durante este período se efectuó el remodelaje de la colina.

d) Cortijo de los Calimas

Es el sitio más alto investigado hasta el momento y se encuentra localizado en el límite superior del área desmontada, en el bosque cubierto de niebla que mira hacia el embalse de Calima. Excavaciones efectuadas en plataformas de vivienda dieron fragmentos cerámicos de la fase Sonso y una figurina de cerámica que puede compararse con las muchas existentes en colecciones y que no han sido fechadas (Figs. 35–37). La fecha de radiocarbono para este sitio (Beta–1834) fue de a. d. 1640 ± 70 y sugiere que la cultura indígena persistió por un tiempo considerable después de la Conquista (teniendo en cuenta sin embargo que si se hace la calibración de esta fecha con sus dos desviaciones estandar se tiene un período de probabilidad que va desde 1457 hasta 1737). Esto lo confirman informes de guaqueros quienes han encontrado objetos de hierro y joyería española en tumbas de pozo y cámara lateral del período de contacto.

6. Excavaciones en Montecito

El sitio está localizado cerca de La Cumbre, en la Cordillera Occidental. Se trata de un pozo en donde se encontró abundante cerámica bien conservada (Figs. 38–40) y algunos objetos de piedra (Fig. 41). La técnica decorativa del estilo Montecito es similar a la del Sonso, aunque la forma de combinar los elementos no es típica de la cerámica Sonso. Los dos estilos se relacionan claramente pero la datación de la cerámica de Montecito no se ha aclarado todavía. Hay dos interpretaciones posibles: a) Montecito y Sonso pertenecen a épocas diferentes, b) Montecito representa una selección muy especializada del conjunto total de material Sonso.

Nos informaron que una vasija de Montecito se encontró en el pozo de una tumba cuya bóveda contenía una alcarraza de estilo Calima Temprano, pero otras comparaciones sugieren una fecha más tardía. Las vasijas se asemejan a aquellas utilizadas como tapas de las urnas funerarios de Pavas (cf. Fig. 10), y un borde tipo Montecito apareció en un depósito mezclado Yotoco/Sonso en la trinchera No. 6 de las excavaciones en la Hacienda La Aurora. Bordes de tipo Montecito se encontraron también, junto con fragmentos cerámicos Sonso, en un cementerio cerca de Guabas en el valle del Cauca, en excavaciones realizadas por Carlos Humberto Illera y Carlos Armando Rodríguez.

7. Estudios Metalúrgicos

David Scott informa sobre la composición y técnicas de manufactura de seis objetos procedentes de la región Calima (Fig. 45). Estos incluyen elementos de excavaciones científicas en La Primavera, La Suiza y el sitio Ferry de Yotoco, así como de una cuenta de collar del «Tesoro del Tigre», un hallazgo muy rico de piezas de orfebrería bastante elaboradas, que actualmente se encuentra en el Museo del Oro (Figs. 46, 47).

8. Material funerario del Municipio de Darién

La Dr. Immina von Schuler-Schömig describe el contenido de dos tumbas inundadas encontradas en la hacienda de Don Martín Vélez, cerca de Darién. Una de ellas (Fig..48) contenía un sarcófago de madera deteriorado, asociado con cerámica Sonso; la otra (Figs. 49–51) contenía un sarcófago de madera, un propulsor y fragmentos de tres flechas o dardos y dos ollas. Esta tumba dio una fecha de a. d. 1235 ± 45 (Hv–7338) y, por lo tanto, está dentro del período Sonso. El propulsor era más bién del tipo «brasilero» (con un agujero para el dedo índice) que del tipo «andino» (con un agarradero para el dedo en forma de gancho) que se encuentra en sitios Muiscas.

9. Programa para 1981

El período de trabajo de campo para 1981 se concentrará en el valle de El Dorado. Reconocimientos aéreos seguidos por reconocimientos sobre el terreno han permitido localizar alrededor de 600 sitios de vivienda, innumerables líneas de campos de cultivo y un sistema de drenaje y eras de cultivo en el fondo del valle (Figs. 42–44).

Donatorenliste

Abbott AG, Zug
Alusuisse, Zürich
Amindus SA. (Dr. M. Graf, Nyon)
K. Aus der Au, Rheinfelden
Autophon AG, Solothurn
Beecham AG (Dr. J. Macheret)
W. Belart, Gallenkirch
The British Academy London University
Galenica, Bern
Buchdruckerei Gassmann AG, Solothurn
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