Andean Past

Volume 2 Article 4

1989

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Introduction

This paper was prepared first for a Festschrift to honor Robert E. Bell, a pioneer of South American Paleo-Indian studies. Financial difficulties at the University of Oklahoma prevented publication of the volume and the papers were returned to their authors in 1986. Nevertheless, it is still appropriate to acknowledge and thank Bell for his contributions to the Chobshi research, while, at the same time, introducing new data, interpretations, and a sense of context to the work of the various investigators of this site.

Bell, in 1970, was the first North American to work at the Cueva Negra de Shobschi (or Chopshi, as the locale is indicated on the Ecuadorean topographic sheet for Sigsig). Before that, various amateur archaeologists from the provincial capital in Cuenca had known of the architectural ruins on the Plain of Chobshi, which were described by Bedoya (1965: 36-48), who inserted Chobshi Cave in the literature. The two days Bell spent at Chobshi, however, in July of 1970, not only confirmed the importance of the site, but also created a lasting impression of the man on the minds of those who accompanied him (Juan Cueva J., Nicanor Merchan, and Gustavo Reinoso). Two years later I was somewhat grudgingly told that, although I was an intense field worker and a fast walker, my speed was nothing compared to that of the great Professor Bell, who flew up and down the rough quebradas as if they were city sidewalks.

My own involvement with Chobshi Cave came about rather accidentally when, in the spring of 1972, Bell found himself unable to return for the excavations that he had hoped to undertake. Realizing that the site would soon be totally destroyed by collectors, and knowing that I was planning a survey of the same part of southern Ecuador, Hernán Crespo T. (Director of the National Institute of Anthropology and History) asked me to conduct salvage excavations. I contacted Bell for advice and was treated with a level of graciousness and concern for our common task that is hardly universal in the profession. Bell assured me, first by telephone and then by letter, "I appreciate your consideration in not wanting to work or examine a site that someone else has located, but want you to know that under the circumstances I welcome your help. . .I am interested in the site, of course, but am not really concerned whether you dig it or if I dig it." Thus, during the summer of 1972, I undertook excavations that resulted in two descriptive reports--one rather inaccessible (Lynch and Pollock 1980), one lacking its tables and artifact measurements (Lynch and Pollock 1981), and both with inadequately reproduced figures. This present paper compensates for these difficulties, summarizes the first reports while adding new information on chronology and obsidian sources, and reconsiders the cultural affiliation and adaptation represented by the site.

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Chobshi Cave and its Environs

The Cueva Negra is cut into conglomerate bed rock at the edge of the old terrace deposits that constitute the Plain of Chobshi, west of the Rio Santa Barbara, about 4 km from the village of Sigsig. Although the parish annex of Chobshi (Sigsig Canton) contains several impressive late prehistoric ruins, the only modern structures are the houses of the farmers who today raise corn, wheat, and barley on the fields adjacent to the cave. By way of foot and pack roads through San Bartolomé and Santa Ana, the site is only 35 km southeast of Cuenca, but Chobshi can also be approached by car, to within a few kilometers, by a road that runs along the Rio Paute, through Gualaceo and Chordeleg, and up the east side of the Rio Santa Barbara (70 km). Grid coordinates on the topographic map of the Instituto Geográfico Militar are 438 658; the latitude is about 3°, 1', 11" south and the longitude is 78°, 48', 13" west (Figure 1). Chobshi Cave is a bit more than 2,400 m (8,000 feet) above sea level.

Chobshi Cave would better be called a rockshelter, as the floor behind the drip line is only 8 or 9 m deep by 15 to 20 m wide (Figures 2 and 3). The opening faces north, providing a good view north and east across the Plain of Chobshi, which is deeply dissected by the Quebrada de Puente Seco (or Quebrada Seca), draining northeast about a kilometer to the Rio Santa Barbara (Figure 4). An arroyo, just to the east of the shelter's mouth, flows only in the rainy season and drops precipitously to the bottom of the Quebrada de Puente Seco, about 25 m below.

Although the rain-sheltered area of the site is not large (about 150 m^2), it is enough to accommodate a self-sufficient group. While not a chambered cave, which would be desirable in a colder climate, it provides the effective weather protection that is characteristic of a base camp as contrasted to an occasionally-used hunters' or herders' shelter. The wide variety of kinds of artifacts, collected by Reinoso and myself, probably represent various activities, male and female, in addition to the hunting specialization. The density of identifiable bone fragments, many of them burned, is high. Furthermore, as the Cueva Negra of Chobshi has an ecologically strategic and convenient location, just as the mountain streams enter the main valley, it can be seen that it has most of the attributes of a seasonal base camp, as defined by Hole and Flannery (1967: 162-163).

Judging from its location at the edge of the plain, the cave was cut by the same stream, under a different regimen, that has since eroded the Quebrada de Puente Seco. The vault has the characteristic semi-hemispherical shape of a stream-eroded erosion alcove. The bluff itself, which forms the ceiling and walls of the cave, is an unevenly indurated and ill-sorted, but probably water-laid, conglomerate. John D. Erickson, then an exploration geologist for Prospection Limited, named this unit the Chobshi conglomerate (Figure 5). Its clasts are sub-angular to sub-rounded, pebble to boulder size, and almost entirely of a grey porphyritic diorite. After an interval of erosion, a more evenly laid but poorly indurated conglomerate, composed of clasts of several rock types, was deposited in the Quebrada. This was overlain in turn by a third conglomeratic unit, poorly consolidated and even less well sorted than the Chobshi conglomerate. Boulders and cobbles derived from these conglomerates, found loose in the quebradas and river gravels, were probably the source of much of the stone used for tools, as Bell noticed on his reconnaissance in 1970. A light grey rhyolite, sandstone, and quartzite are common, but cryptocrystalline silica rocks (cherts) and metamorphosed volcanics, favored for the Chobshi chipped stone industry, can also be identified. Reinoso (1970: 237) reports finding jasper, flint, and chalcedony in the gravels.

The third conglomeratic unit unconformably overlies the second, where the juncture is exposed in the quebrada wall, and contains occasional dioritic boulders, presumably derived from the Chobshi conglomerate. Sand lenses occur throughout its fabric. This final major valley filling, now mantled with a thin colluvial soil resulting from relatively recent denudation of the countryside, probably formed the surface of the terrace in front of Chobshi Cave at the time of its first human occupation. In Figure 6 the upper part of this third unit is labeled "sterile conglomerate" to signal that it did not contain artifacts or other cultural debris. A compact dark soil (A horizon) had begun to form before the episode of hillside denudation and colluvial deposition. Thus, on geomorphological grounds alone, the occupation of Chobshi Cave might reasonably be expected to be entirely postglacial.

In the Köppen system of climatic classification, the upper valley of the Paute and the Santa Barbara are assigned to the Cfbi category (continuously moist mesothermal). Ferdon (1950: 73) gives the mean temperature of nearby Cuenca, at perhaps 100 m greater elevation, at 13.9° C (57°F), with only 2.1 degrees of range in the monthly means. Yearly rainfall is 862 mm (34 inches), but the April mean of 168 mm falls far short of ten times that of the driest month (July, with 29 mm). Where ten times as much rain falls in the wettest month, the Köppen classification requires assignment to the Cwbi (wet and dry mesothermal) category, a condition that now prevails about 20 km to the southwest. It is less than 20 km to the high elevation paramo grasslands (ETi) above 3,400 m, so it can easily be seen that this is a region of high environmental diversity. The Cuenca Basin and Paute/Santa Barbara valley system is protected by high mountains from the west coast wet-dry alternation, but opens eastward toward the Amazon. It is, in fact, only about 40 km east, or twice that by following the river itself, to the tropical rain forest environment (Afw"i) below about 1,400 m of elevation.

Fresh from field work in a drier and more seasonably variable zone of Peru, I found the native flora of the Santa Barbara Valley somewhat exotic and foreign. Beyond the introduced eucalyptus and ubiquitous willow, I was faced, on uncultivated steep slopes, with a bewildering array of small trees and large shrubs that grow, wherever permitted, below the paramo grasslands. Under natural conditions, I believe that the woodland would somewhat resemble the wet forest of the Peruvian ceja de la montaña. Unfortunately, the vegetation of the high Andean slopes of Ecuador, and particularly the forest slopes of the eastern cordillera, have been little studied (Steere 1950: 85). The latter have extremely heavy rainfall and, as they descend in elevation, a forest of nearly unbelievable richness in species is produced. Around Chobshi Cave itself, the present day woody vegetation is stunted and has been cut back repeatedly. Surely these remnants of the former flora, now mixed with light-demanding northern agave and various cactuses, are not characteristic of the preagricultural scene. In wet and shady corners, mosses and ferns persist. Berries (like blackberries), fuchsia-like flowering plants, and altamisa (*Artemisia*) may also be representative of the natural condition.

Historical Setting

Bedoya (1965: 36-48) has summarized the scant historical records that pertain to the Chobshi district in the period of first Western contact. From the Corregidor Antonio Bello Gayoso, in 1582, we get the initial Spanish rendering of the river as Santa Barbola and the nearby towns as Gualaxio and Cicce (modern Gualaceo and Sigsig). This was the territory of the warlike Cañaris, culturally and linguistically distinct from the Incaic Quechuas. Through the *Relaciones Geográficas de Indias* of Marcos Jimenez de la Espada and Pedro Cieza de León's *La Crónica del Perú*, also comes notice of rich mines, probably placer deposits, along the Santa Barbara (Figure 7). The Jesuit Fernando de Montesinos, in a major history dated 1652, related the tradition that a Cañari leader, Dumma, constructed the impressive ruins of Chabalula and Ingapirca, only a few yards below Chobshi Cave, shortly after submitting to the Inca Tupac Yupanqui (Figure 8). Bedoya has reinterpreted this account and suggested that the structures, overlooking the constricted valley below, were used by the Cañaris to control access to the area and, more remarkably, to protect Chobshi Cave (Figure 9). Today, local legends have it that the "Caçique Dumas" lived and hid his gold in the cave. This explained, at least to the satisfaction of local workers, the intensive previous activities of looters and relic hunters. It is also interesting to note in this connection that the present owner of Chobshi Cave bears the surname Dumas.

Gustavo Reinoso H. (1970) was the first of those who dug in Chobshi Cave to attempt a formal archaeological description. His report deals with the stone and bone artifacts that he found and retains in his personal collection. Although he did not describe the stratification of the cultural layers, said to be 35 to 42 cm thick when he worked there, it is to Reinoso's great credit that he saved fragments of wood charcoal for future radiocarbon dating. The charcoal is said to have come from a meter-square pit, possibly the one still visible when I mapped the site in 1972 (Figure 3, grid square H10).

Unpublished professional or semi-professional excavations were also evidenced by a two-meter-square pit, oriented to the cardinal directions and dug 30 or 40 cm deep to the sterile grits and rubble. This pit, lying mostly in square E7 of my grid system, is unclaimed by any of the archaeologists and archaeological aficionados to whom I talked (Figure 10). It may have been dug by French or Japanese amateurs, rumored to have worked in the area, but is more likely the work of unknown local aficionados.

When Cueva, Merchan, and Reinoso brought Bell to Chobshi in 1970, they screened a collection of artifacts and bones from the backdirt left from the earlier excavations. Bell (1974: 62-68) promptly published his observations on the site locale, his interpretation of the stratigraphy, and, with excellent photographs, the 286 artifacts he recovered. The faunal remains were examined first by J. Keever Greer at the Stovall Museum, later to be combined with those I collected, and then identified by Elizabeth Wing of the Florida State Museum (Lynch and Pollock 1980). Bell dated human use of Chobshi Cave by means of the charcoal from Reinoso's excavations 8480 ± 200 radiocarbon years: 6530 B.C. (Tx-1132) and 10,010 ± 430 radiocarbon years: 8060 B.C. (Tx-1133) (Bell 1971; Lynch 1973a: 242).

Results of the 1972 Excavations

By the time I arrived at Chobshi in 1972, the prehistoric cultural stratigraphy had been completely destroyed, although it took a month to make sure of this. Not only had the cave been pillaged over the centuries by gold hunters, and indiscriminately mined by the local relic collectors, but the farmer of the field in front had spread much of the midden on his crops as an ideal fertilizer. Use of the cave as a stable, in recent years, probably contributed greatly to its store of available nitrates and phosphates, while the ancient but unfossilized bones were also rich in potassium. Unfortunately, the primary deposit of prehistoric midden on open talus and fronting terrace would have been lost by erosion, soon after it was laid down, as the heavy rains wash the conglomerate bedrock clean just outside the dripline. Behind the dripline, under the shelter of the cave's roof, there were stratified deposits, but in all instances it was clear that the final deposition of the layers took place in modern times. The loosely textured, or "sifted", preceramic midden contained fresh wood chips (from recent use as a wood shed), bottle caps, and occasional sherds of glass and pottery. This sort of contamination, common in Andean cave sites, signaled that the fill of Chobshi Cave had been turned over and restratified a number of times by later inhabitants, treasure seekers, and previous excavators.

In a futile attempt to find richer deposits, earlier diggers repeatedly penetrated the culturally sterile subsoil of disintegrating conglomerate, rubble, and grits. Their irregular pits sometimes extended as deeply as 3 m below the modern surface, became refilled with restratified midden, and were duly re-excavated in 1972 (Figure 11). We screened all cultural deposits. Finally, we sunk grid square E6 2 m into the semiconsolidated, undisturbed Pleistocene deposits to prove their sterility (Figure 12). The details and methods of excavation, cultural features identified, and system of mapping and provenience control are described elsewhere (Lynch and Pollock 1980).

Despite the extensive disturbance of its deposits, Chobshi Cave has been a valuable site for the reconstruction of early Andean cultural and economic patterns. Wing's analysis of the animal bone, reported in the work cited above, is unique in Ecuadorean preceramic studies. White-tailed (109 MNI) and pudu (60 MNI) deer were by far the most important game animals, and brocket deer may also be represented. White-tailed deer, at least, were taken almost exclusively in their prime of life, when they were between 2 and 4 years old. The age distribution argues against beats or drives, which would have included a substantial number of fawns and aged individuals. While does and fawns might have been released, as in the much later Inca state drives, surely overage animals would have been slaughtered. Rather, it is likely that young bucks were hunted selectively, especially during rutting season when they are most curious, even bold or belligerent, and susceptible to decoying and attraction by antler rattling. The pudu is a very small deer, with a live weight of only about 20 pounds, standing about 30 cm high at the shoulder, whose behavior and life cycle is poorly known. In the Chobshi sample, their dental ages are more varied, leading to the suspicion that pudu deer might have been driven into, or trapped while watering in, the very steep-sided Quebrada de Puente Seco.

Other animals represented at Chobshi Cave appear to be much less important dietarily, to judge by their numbers and sizes, but the variety is striking. Rabbit (39 MNI), tinamou (2 MNI), paca or agouti (27 MNI), and tapir (2 MNI) are common game animals today, although the latter two are more characteristic of the forested habitat that may have prevailed before land clearing for farming. They are also typical of the tropical forest, some 50 km to the east, that could easily have been within the range of Chobshi's preceramic inhabitants. Porcupine (4 MNI), opossum (8 MNI), and spectacled bear (1 MNI) similarly prefer a more closed habitat. These last species were not necessarily game animals but, given their habits, they are easy to hunt.

Conditions were unfavorable for the preservation of pollen and other floral remains. Robert Kautz (Hamilton College) attempted pollen extractions from our samples, but none was recovered, apparently because of the highly basic (pH 8.4-9.0) condition of the matrix. This is unfortunate. Although the midden would have been contaminated with modern pollen, and subject to the usual cultural imbalances and complications, I had hoped that the pre-occupation samples from the sterile layers of square E6 would give us a late Pleistocene vegetation and climate sequence to compare with those from the Central and Southern Andes and the Bogota Basin in Colombia. Neither did we find macroscopic remains of plants in the damp midden. Phytoliths, however, may be present, should someone care to search for them in the soil samples.

Chronology

With no meaningful stratigraphic record available, we can date the occupation of Chobshi Cave in only an approximate way. Bell's dates on the charcoal collected by Reinoso (8480 ± 200: 6530 B.C. and 10010 ± 430: 8060 B.C.) are statistically distinct, but there is no stratigraphic information on the derivation of his samples, beyond their having been found 10 and 20 cm below the surface. For all we know, the Chobshi midden may already have been thoroughly mixed prior to Reinoso's work.

I am indebted to Robert Stuckenrath (University of Pittsburgh) for dating the collagen fraction of two samples of deer bone from my excavations. The results agree reasonably well with those from the charcoal samples. My sample of unburned bone pieces tested at 8615 ± 90 radiocarbon years: 6665 B.C. (SI-1505), whereas another lot, composed exclusively of charred bone, assayed at 7535 ± 295 radiocarbon years: 5585 B.C. (SI-1506). Observing that many of the artifacts and flakes showed fire crackle and pot lid fracture, I wondered if all the burned material might have come from a discrete, temporally distinct, primary deposit--rather than being the result of numerous fires at various times. There is little support for this idea, as the two samples were pooled from a number of fragments. In the absence of stratigraphic controls, all the radiocarbon tests should be regarded as averages drawn from unknown spatial and temporal provenience. The minimal prehistoric occupation of Chobshi Cave can, nevertheless, be calculated as the 2475 year span between 8060 and 5585 B.C., assuming that bone and charcoal can be tested equally reliably in the laboratory and that there was no contamination of the samples by modern bone or charcoal.

The 1972 collections included 17 pieces of worked obsidian. Clem Meighan kindly measured hydration rind thicknesses on nine flakes. Eight of these fell between 5.3 and 6.6 microns, while one rind measured only 3.2 microns. If obsidian was flaked at Chobshi throughout the occupation dated by radiocarbon, and if the nine flakes measured are a representative sample, the hydration rate is much slower, as would be expected, than in the coastal lowlands. This is due to the lower soil temperatures of the Andean zone. Also, a slower rate of hydration is experienced in perpetually cool cave deposits than in shallow open sites exposed to intense high altitude sunshine.

It has not yet been possible to collect enough obsidian, coincidentally dated by other means, to work out consistent hydration rates for highland Ecuador. Nor are major-element compositional analyses available for the various potential sources. Still, the Chobshi measurements are useful and revealing in that they cluster with about the same degree of variance as the carbon dates. This is simply demonstrated by taking the mean of the radiocarbon estimates (8660 years), dividing it by the mean of the hydration measurements (5.7 microns), to extract a linear hydration rate of 1519 years per micron for the environmental conditions and obsidian types at Chobshi Cave. The 1.3 micron spread of the eight clustered measurements thus translates into a minimal occupation of 1975 years. The total 3.4 micron range would yield a maximal span of 5165 years. A figure somewhere in between would compare well with the range of carbon dates on pooled samples (2475 years).

Cultural Relationships

It was hoped that some direct indication of cultural relationships might be gained through trace element analysis of the obsidian from Chobshi Cave. In Peru, Burger and Asaro (1977, 1978) have shown that obsidian from a flow at Quispisisa, near San Genaro in the Department of Huancavelica (Figure 1), was widely distributed in the central and northern highlands from preceramic times onwards. Long distance movement of obsidian provides solid evidence of the interzonal and interregional travel and exchange thought to be a strong factor in central Andean preceramic cultural development (Lynch 1971, 1973b, 1981). Burger and Asaro favor a model of multiple small exchanges between neighboring groups of hunters, but mobile traders, or direct exploitation by migrants from distant communities, would also explain the distribution of preceramic obsidian. The third possibility is particularly attractive to those of us who believe that seasonal migration and transhumance were important in early times. The scarcity of obsidian artifacts on the central and north coasts of Peru suggests that the distribution of this commodity was by highland routes and, in some way, related to the mobile life style necessary in most of that zone.

Burger and Asaro submitted ten obsidian flakes from Chobshi Cave to neutron activation analysis, a method of measuring a large number of elements with much higher precision than X-ray fluorescence; five of these samples were also analyzed by X-ray fluorescence, as was an eleventh sample not submitted to neutron activation analysis (see Burger *et al.* 1989, in this volume). Three different, previously unknown source-types were identified; Burger *et al.* (ibid.) argue that these sources are located in northern Ecuador.

From the beginning, Bell (1974: 68) was struck by the absence of fishtail points and the rarity of obsidian in the Chobshi collections (Figure 13). He found similarities between the simple tapered-stem points he recovered and examples from Peru. The "puntas pedunculadas" found by Temme (1982: Figures 9-10) at Cubilán (Figure 1), about 80 km south of Chobshi, are additional examples of Chobshi tapering-stemmed shouldered points (Type 27, Lynch and Pollock 1980: 31, Figures 13f and j [Figures 18 and 19 in this work]; see also Chobshi Types 32 [stemmed round-shouldered points] and 33 [rhomboidal points, Figure 13 in this work]). At Cubilán the tapering-stemmed shouldered points are associated with four dates on charcoal that average 8265 B.C., a figure that might also apply to a first occupation of Chobshi, afterwards mixed with later artifacts and organics:

Cubilán bed B	9100 ± 120 B.P.: 7600 B.C.	(Ki 1859)
Cubilán bed B	9160 ± 100 B.P.: 7660 B.C.	(Ki 1860)
Cubilán bed A	10300 ± 170 B.P.: 8800 B.C.	(Ki 1642)
Cubilán bed A	10500 ± 1300 B.P.: 9000 B.C.	(Ki 1640)

Rick (1988: 20) also finds that shouldered points may occur earlier in the north of Peru and later in the south. In general, we find that in the central Andes there is a trend for large shouldered points to precede, at least in a statistical sense, the laurel and willow leaf (Ayampitín) forms, with the smaller or less elongate points becoming common toward the end of the Central Andean Preceramic Tradition.

It is important to remember, though, that by the time Bell and I made our collections the site had been much picked over and that a large proportion of attractive and distinctive specimens must already have been removed by collectors. It would be extremely hazardous to attempt a study of the frequency of occurrence of types or classes of tools. Instead, the reader is referred to a complete physical description of my 1972 collections, in which the materials are assigned to 45 morphological types (Lynch and Pollock 1980).[1] I will characterize the industry in a more general manner below, relate it to other South American patterns, and provide new illustrations.

The most distinctive projectile points at Chobshi Cave are stemmed and barbed varieties (Chobshi types 21-32; Figures 14 to 17), some of which resemble those of the Paiján Complex of northern Peru (Figure 1), although the Paiján points are often much larger (Kornfeld 1972; Ossa 1973; Chauchat 1977, 1978; Uceda 1986; Uceda and Deza 1979). The stemmed points published by

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[1] To repeat this physical analysis here would violate the copyright of the Idaho Museum of Natural History and more than double the length of this paper. Readers who did not receive a copy of the 1980 report are encouraged to request a copy from either author: Thomas F. Lynch, Professor of Anthropology, McGraw Hall, Cornell University, Ithaca, N.Y. 14853 USA, or Susan Pollock, Assistant Professor of Anthropology, State University of New York, Binghamton, N.Y. 13901 USA.

Lanning (1963: Figure 4j-l) from the central coast are now also subsumed in the Paiján Complex, as is the Chivateros quarry industry. In addition to the dates from the somewhat uncertain associations at La Cumbre, Quirihuac, Chivateros, and the Ancón sites (Figure 1), there is now a good series of dates on midden and hearth charcoal from the Chicama-Cupisnique Paiján sites proper:

PV22-12-unit 7	5490 ± 140 B.P.: 3540 B.C.	(GIF-3565)
PV22-13	7740 ± 150 B.P.: 5790 B.C.	(GIF-4163)
PV22-27-unit 1	8260 ± 160 B.P.: 6310 B.C.	(GIF-4162)
PV22-14-unit 2	8730 ± 160 B.P.: 6780 B.C.	(GIF-5159)
PV22-13-unit 29	9300 ± 170 B.P.: 7350 B.C.	(GIF-4915)
PV22-14-unit 2	9360 ± 170 B.P.: 7410 B.C.	(GIF-5161)
PV22-13-unit 11	9490 ± 170 B.P.: 7540 B.C.	(GIF-4914)
PV22-14-unit 2	9600 ± 170 B.P.: 7650 B.C.	(GIF-5162)
Ascope 5-unit 4	9670 ± 170 B.P.: 7720 B.C.	(GIF-4912)
PV22-13-unit 1	9810 ± 180 B.P.: 7860 B.C.	(GIF-4161)
PV22-13	10200 ± 180 B.P.: 8250 B.C.	(GIF-3781)
PV22-14-unit 2	10380 ± 170 B.P.: 8430 B.C.	(GIF-5160)

Uceda (personal communication, 1980) has obtained a 9490 ± 170 B.P. (7450 B.C.; GIF-4914) reading from charcoal in hearth BM-30 in his Cupisnique workshop on the Pampa de los Fósiles. Chauchat (1977: 19, 1988: 58) considers the sample from site PV22-12-unit 7, taken from only a few centimeters beneath the surface, to be contaminated with recent carbon. The other 12 dates, ranging from 8430 B.C. to 5790 B.C., are in remarkably close agreement with the four carbon dates from Chobshi Cave (8060 to 5585 B.C.). The average dates are 6710 B.C. (Chobshi) and 6757 B.C. (Paiján). Points with tapering stems are common in the Central Andes, but specimens with pronounced barbs and straight-sided or expanding stems are otherwise distinctly uncommon (Figures 18 and 19). The Chobshi Site provides a chronological and typological link between the Paiján Complex, formerly rather isolated, and northern Ecuador where such stemmed points are also regularly found (Bell 1965; Bonifaz 1978; Mayer-Oakes 1986). Somewhat similar types from northern Chile seem more remotely related (Lynch 1986).

Scraper and burin types also set the Chobshi industry off from the Central Andean Preceramic tradition as it is known in Peru (Lynch 1980: 297-299). Endscrapers, unknown in the Paiján complex, are scarce at Chobshi Cave (Types 6 and 7 [Lynch and Pollock 1980: 28-29]), despite the fact that the Chobshi industry is blade-oriented (Types 7 and 45) and found in a site with abundant animal bone. Hide preparation surely took place at Chobshi, at least from time to time. Perhaps it is significant that snubnosed endscrapers, also known as spurred endscrapers, now are thought to be diagnostic Paleo-Indian artifacts in both North and South America (Lynch 1983: 103; Rogers 1986). Rogers, for example, shows that in Kansas they have a distribution parallel to that of sites in which fluted points occur, and that these scrapers are almost never found on Holocene terraces formed after the Paleo-Indian period, whereas they are frequent on Wisconsin-age terraces. The El Inga and Chobshi burins (Type 40) resemble those found at quarries, such as Oquendo, on the Peruvian coast. Chauchat (1988: 46) doubts that there are intentional burins and other artifacts at Oquendo, but I have, myself, collected indubitable scrapers and an angle burin there. Burins are rare in the Peruvian sierra, as are true blades.

However, in several other respects the Chobshi industry is similar to those making up the Central Andean Preceramic tradition of the Peruvian Andes. A single rhomboidal point (Chobshi type 33; Figure 13) resembles the larger of two specimens from Guitarrero Cave IIb (Lampas type 12) dating about 8000 B.C. (Lynch *et al.* 1985) (Figure 1). Lampas type 12 rhomboidal points occur regularly in north-central Peru; loosely defined "pentagonal" or "Arenal" types are also found further south.

Chobshi type 34 includes at least three examples which, in the central Andes, would be called Ayampitín points, after the Argentine type site (Figure 20). These lanceolate "willow-leaf" points are defined as Quishqui Puncu types 5 and 6 in the Callejón de Huaylas. Although some archaeologists wish to abandon the Ayampitín point type as excessively general, its redefinition in the central Andean zone has been useful:

> They are usually rather thick in cross-section and frequently there are distinct medial ridges resulting from collateral flaking; others are smoothly transverse-flaked on one or both sides, and have a lenticular cross-section. There are a few examples with serrated edges known, and a few cases of edge-grinding (basal end) have been identified. . .(Lynch 1967: 35-37).

Known by many names, the Ayampitín point is nearly ubiquitous in central Andean preceramic sites. In fact, Carluci (1963: 26, Figure 4a-c) briefly noted the presence of such points at Chordeleg, a few miles from Chobshi Cave, a good many years ago. Mayer-Oakes (1986: 13, 34, and 71) applies the Ayampitín name to a rather different "tear-drop or leaf-shaped" type at El Inga, but a more typical specimen came from San José (Figure 1), now dated firmly to Holocene time.

It is interesting that Ayampitín or willow leaf points are never found with fishtail points, fluted or unfluted. I wrote long ago that

> Different game animals may be the key to the separateness of the willow leaf and Paleo-Indian horizons. It is likely that the Paleo-Indians relied primarily on animals which became extinct in early postglacial times (e.g., the horse, sloth, and perhaps mastodon). . .The willow leaf horizon may correspond to a shift to reliance on other, smaller game, and a consequent expansion of cultural range to include the high Andean habitat of camelids and deer (Lynch 1967: 36).

Although she does not differentiate the Paleo-Indian fishtail complex so strongly from the Ayampitín complex (Central Andean Preceramic tradition), Lavallée (1985: 415-420) interprets the occupation and exploitation of the *puna-paramo* and high Andean valleys, from 10,000 to 6,000 years ago, in much the same way as I do. From at least Cubilán in the north to northern Argentina and Chile (*cf.* Tojotojone [Dauelsberg 1983]), the industries and adaptive patterns are seen to be much the same.

The faunal remains and stone artifacts are our only indicators of the adaptive strategy represented at Chobshi Cave. At least from this station, the Chobshi hunters seem to have restricted their attention to modern species that were not later domesticated. The great extinct ground sloths, mastodons, horses, and so forth were apparently already extinct, at least locally. Although the first inhabitants of South America are poorly known, it is generally thought that they were specialized big game hunters rather than broadly diversified hunting and gathering people (Lynch 1983). Be that as it may, the early South Americans soon began to orient their subsistence activities more toward plant foods, certainly in the central Andes where there is evidence of early postglacial agriculture, and toward a wider variety of animal foods. Chobshi Cave evidently represents an early stage in this diversification process and gives us crucial information on the wealth of game available, even outside the generally higher, colder and/or drier habitat of the Andean camelids.

Salazar (1980: 63-75) has most recently and effectively described the resources of the alpine meadows or grassy paramo of Ecuador, postulating a seasonal extractive pattern that would have been most effective. In northern Ecuador, many sites have been located and investigated in the high open country where there are abundant outcrops of obsidian. Bell, of course, was a leader in those early studies, but he was also among the first North Americans to work at the archaeologically difficult intermediate elevations.

The same factors which permit greater population today (more rainfall, higher temperatures, and luxuriant vegetation) must have been operative at the end of the Paleo-Indian epoch. The grinding stones in Reinoso's collection, for instance, hint at the processing of plant foods or fiber products. Stothert (1985: 622) notes flat-surfaced circular stone grinders in the Las Vegas complex on the Santa Elena Peninsula (Figure 1), but otherwise there appear to be very few correspondences in either the environment or the lithic industry, even though the Chobshi-Paiján complex is closely equivalent in age. Flat grinding stones may be nearly ubiquitous in Paleo-Indian/Early Archaic industries of the Andean zone, for they are occasionally reported in Peru and Chile and apparently are fairly common in Argentina. Reinoso's cannon bone awls, also identified as from Chobshi Cave, may have been used for making baskets as well as leather goods. Despite the good preservation of bone in coastal Vegas sites, few bone artifacts have been recovered there (Stothert 1985: 621). The investigation of early sites in the highland zone, no matter how badly they have been disturbed by later inhabitants, is potentially very informative. An intact, sheltered, early preceramic midden would be an extremely valuable discovery.

Conclusions

Chobshi Cave, probably a base camp at lightly wooded temperate elevation, represents an early stage in the diversification process or Archaic transition that followed the Paleo-Indian horizon. Four radiocarbon tests, from 8060 to 5585 B.C., agree well with the point types recovered, although the occupation may have been both longer and subdivided into several episodes. Obsidian hydration takes place at an unknown rate in the Chobshi environment, but the range of rind measurements suggests a similar period of use of two or three thousand years.

Remains of butchered and burned bone include neither extinct Pleistocene species nor camelids native to the high Central Andean puna and cold semidesert pampas. White-tailed deer, the now-rare woodlands pudu, and perhaps brocket deer dominate the faunal assemblage. Rabbit and paca were common prey. Although not usually associated with early subsistence patterns, tinamou (Andean partridge), tapir, porcupine, and opossum were probably hunted, too.

In addition to the well demonstrated "broad spectrum" hunting, plant gathering may be indicated by the grinding stones attributed to Chobshi Cave. There is no evidence for cultivation of plants, although this is known from the same period in the central Andes, from Guitarrero Cave south to the Huachichocana Caves in northwestern Argentina and, perhaps, Tiliviche in Chile.

The Chobshi lithic industry relates typologically to the collections from El Inga and other sites in northern Ecuador, but there are also specific resemblances to the stemmed point Paiján Complex of north coastal Peru and to the Central Andean Preceramic Tradition. In general terms the Chobshi site cultural adaptation and stone tool industry fit comfortably within the willow leaf or Ayampitín Tradition that I have assigned to the beginning of the Archaic Transition (Lynch 1983). At the highest possible level of generality, Chobshi Cave might be said to be an early representative of the American Archaic Stage.

Acknowledgments

In addition to Robert Bell, I wish to thank the following scholars and colleagues for their generous contributions to the Chobshi project: Richard Burger, Hernán Crespo, Juan Cueva, Karen Dukes, John Erickson, Daniel Heyduk, Robert Kautz, Manual Landivar, Benigno Malo y Vega, Gerardo Martinez, Clement Meighan, Susan Pollock, Gustavo Reinoso, John Rowe, Karen Snedaker, Robert Stuckenrath, Santiago Uceda, and Elizabeth Wing. Any misuse of their information or errors of interpretation are, of course, mine. Four anonymous reviewers for **ANDEAN PAST** helped me bring this paper up to date. I am also grateful to Gary Florkowski, Cathy Moore, and Beverly Phillips for their help with drafting, photography, and typing. The Latin American Studies Program of Cornell University provided a travel grant in aid of the project.

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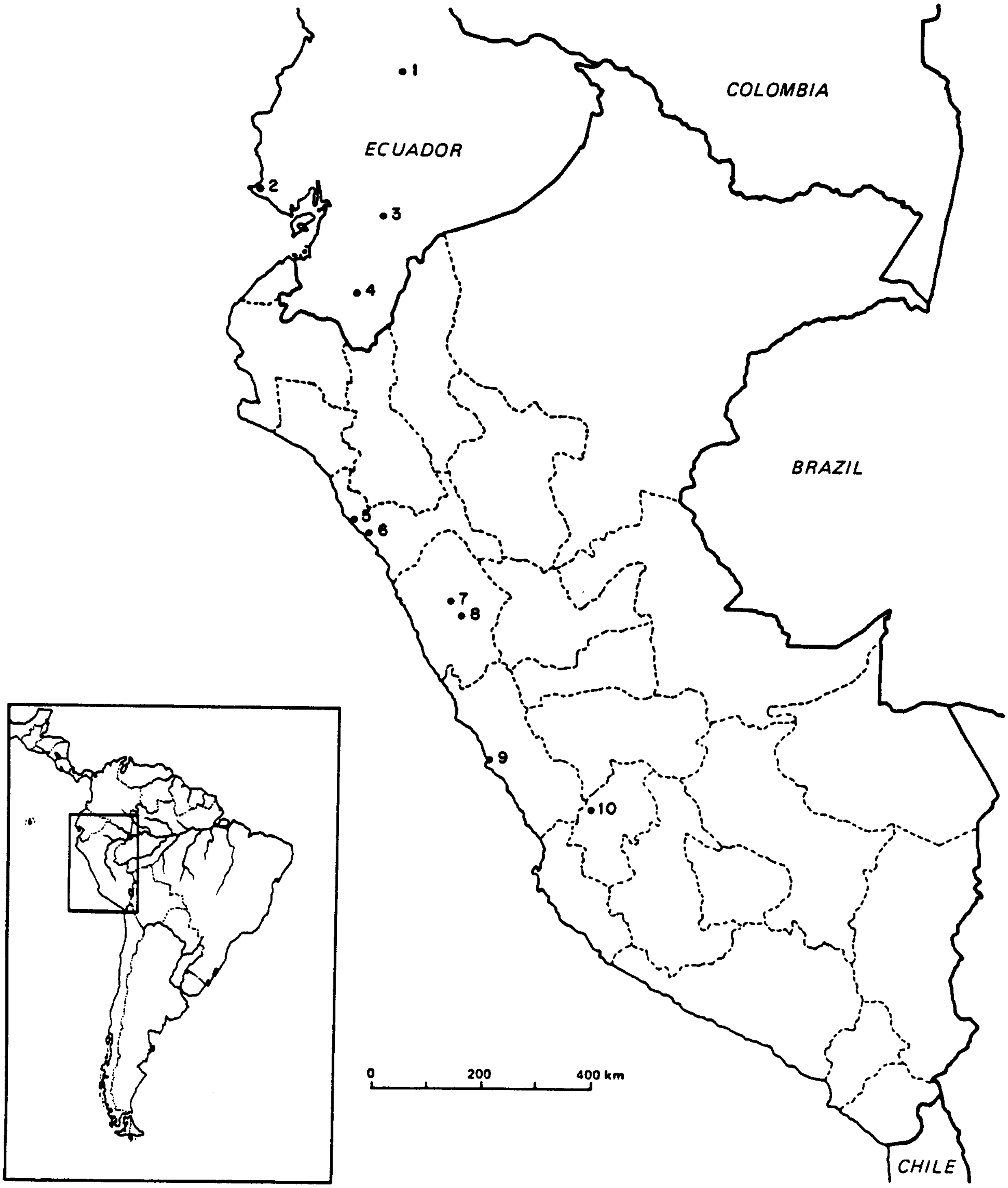

Figure 1. Map of Peru and Ecuador, showing the location of Chobshi Cave and other sites mentioned in the text. 1) El Inga, San José. 2) Las Vegas. 3) Chobshi Cave. 4) Cubilán. 5) Paiján. 6) La Cumbre, Quirihuac. 7) Guitarrero Cave. 8) Quisqui Puncu. 9) Ancón, Chivateros, Oquendo. 10) Quispisisa.

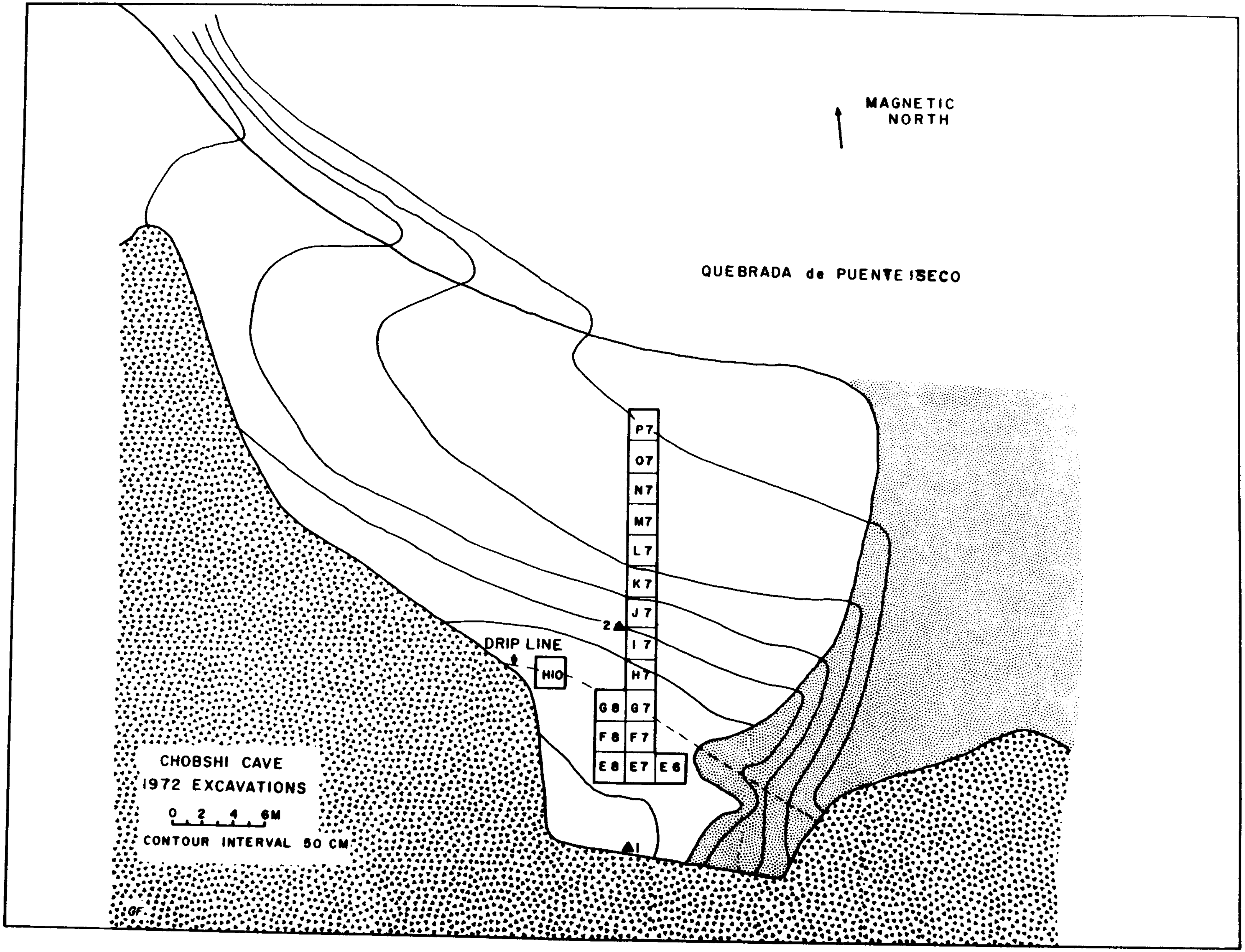

Figure 2. Map of Chobshi Cave site, on eroded terrace of the Quebrada de Puente Seco, showing surface contours and major trench excavated in 1972. Declination of magnetic north was 4 degrees and 30 minutes east of true north in 1969.

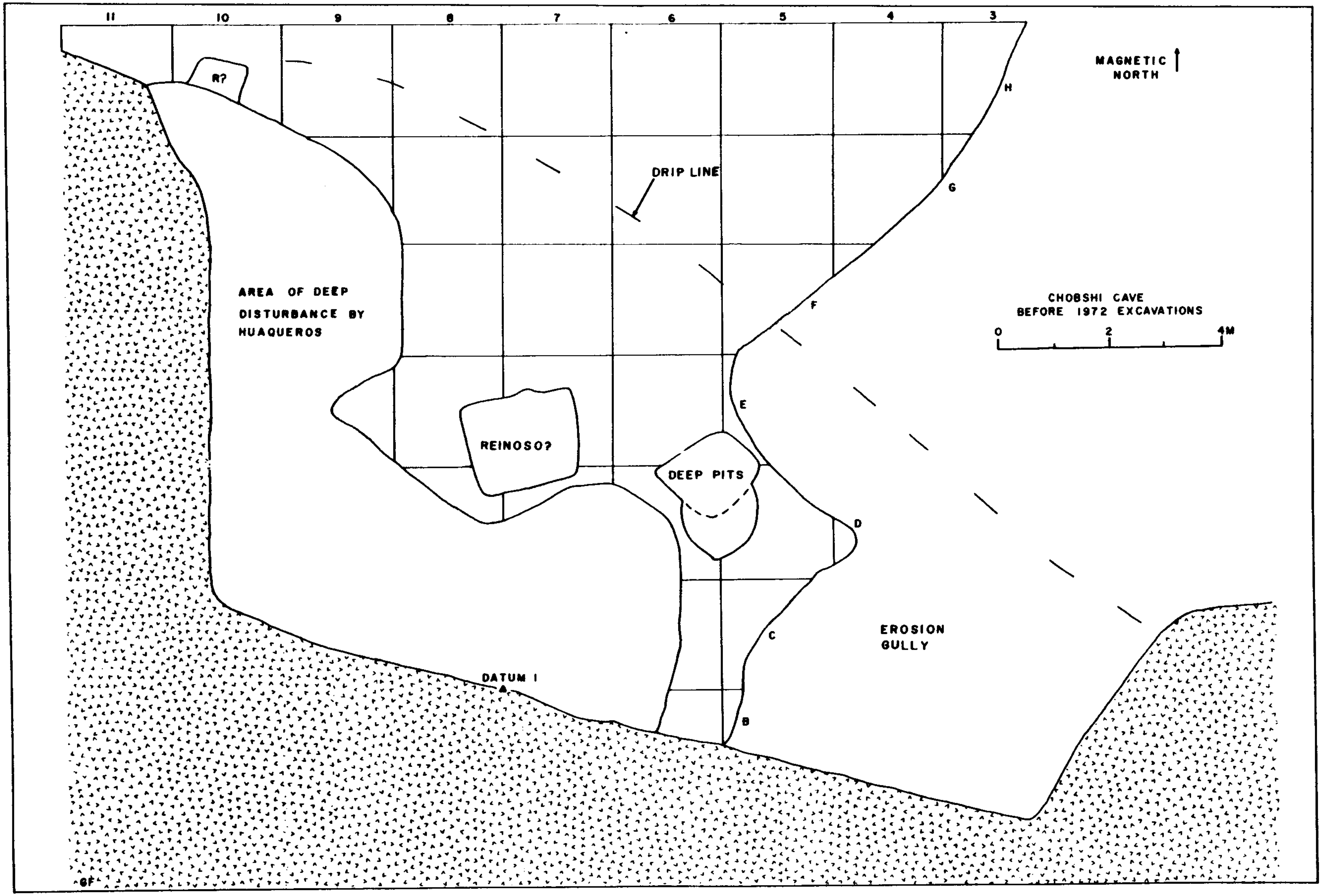

Figure 3. Map of sheltered portion of Chobshi site, with grid system superimposed, indicating eroded area, earlier excavations, and deep pits made by relic hunters.

Figure 4. View up the Quebrada de Puente Seco, showing its deep entrenchment in the Chobshi Plain, stream-cut bluff at the edge of the alluvial plain, and the shadowed alcove of Chobshi Cave (upper left, behind eucalyptus trees).

Figure 5. Semihemispherical vault of Chobshi Cave, cut into the Chobshi conglomerate. Note exotic agave and Trench 7 on slope in front of cave.

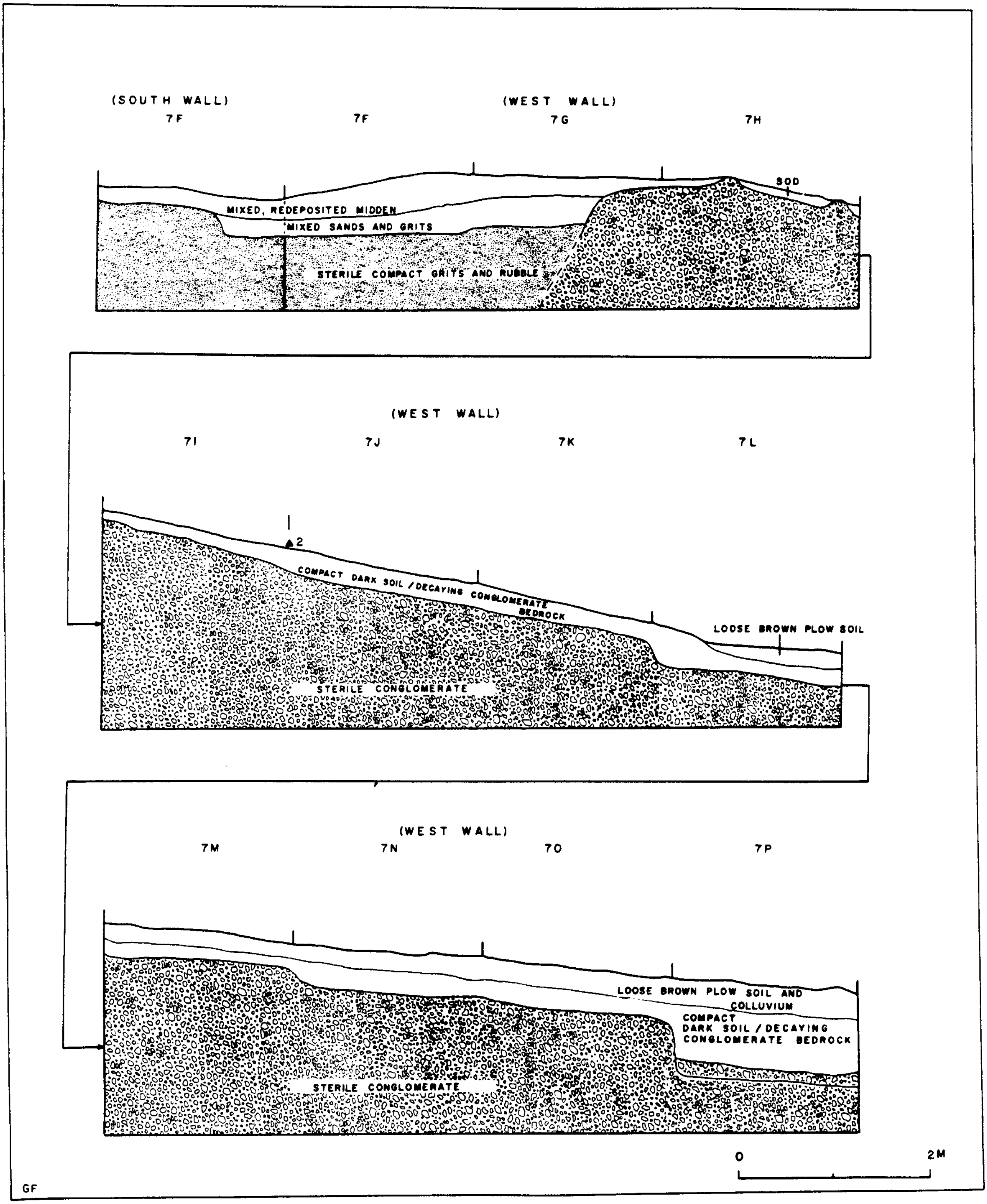

Figure 6. Stratigraphic profile of west face of Trench 7.

Figure 7. Valley of the Rio Santa Barbara, looking downstream toward Chordeleg and Gualaceo. Note placer gravels and ancient bridge abutment at lower right. Deforestation for agriculture has taken place since the Preceramic Period.

Figure 8 (*facing page*). Late prehistoric Chabalula ruins, said to have been built by the Cañari leader Dumma. Bedoya suggests that Chabalula and Ingapirca, on the Chobshi Plain, protected the cave and controlled movement along the Rio Santa Barbara.

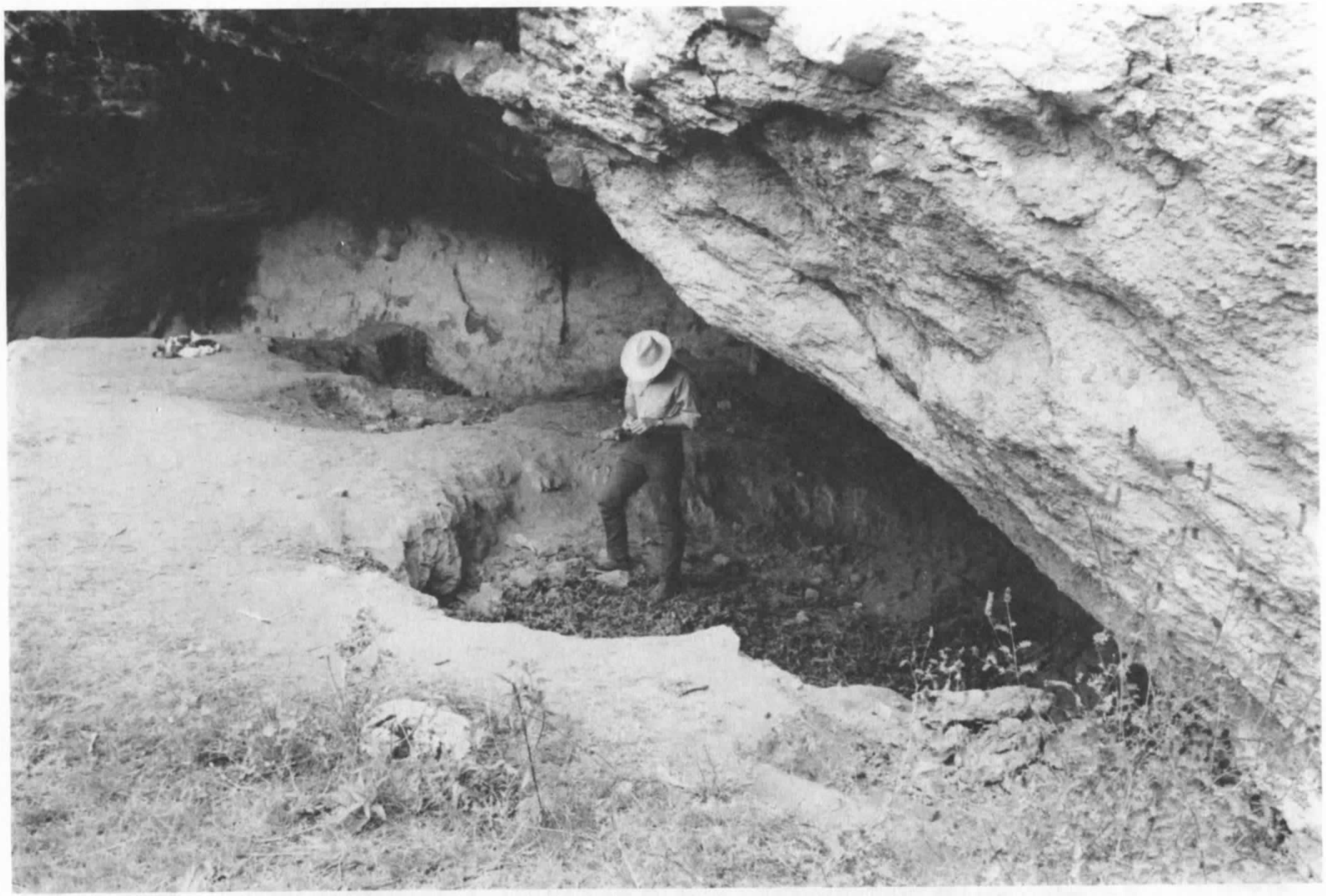

Figure 9 (*facing page*). View north, down the Santa Barbara Valley, from the edge of Chobshi Plain. From this vantage point the occupants of Ingapirca and Chabalula controlled the constricted gorge at the lower right. Scars from mass movement and slumping, which bring auriferous gravels and crystalline silica rocks to the river, can be seen on the east bank.

Figure 10 (*above*). View into Chobshi Cave from the northwest, before 1972 excavations, showing destruction of the deposits by previous diggers. Standing figure is at grid square F9, in a deep pit dug by gold or relic hunters. To his right, mostly in grid square E7, is the shallower two-meter-square pit attributed to amateur archaeologists. The faint outline of darker soil, one meter square, between the camera and human figure, is the pit in grid square H10, from which Reinoso may have collected his charcoal.

Figure 11. View west across irregular pitted surface of culturally sterile deposits, after completion of 1972 excavations. All pits have been re-excavated and all midden screened and removed. The hand screen lies in the pit, in square E7, attributed to amateur archaeologists.

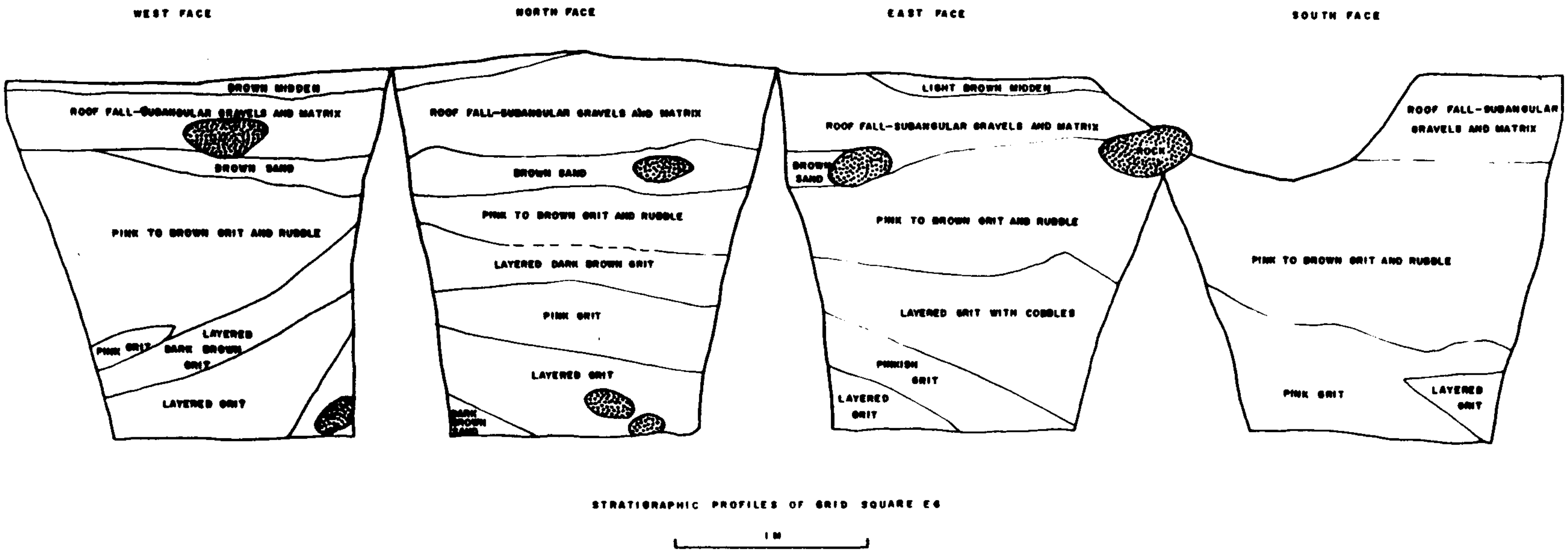

Figure 12. Stratigraphic profile of the four walls of grid square E6, dug deeply into the sterile Pleistocene deposits.

Figure 13. Chobshi projectile points: obsidian leaf-shaped point, left; type 33 rhomboidal point, center; small leaf-shaped point or blank, right.

Figure 14. Chobshi stemmed and barbed projectile points. Note serrated edges (type 21) on two specimens at upper left and long Paiján-like stems in bottom row.

Figure 15. Chobshi stemmed straight-shouldered points (type 25).

Figure 16. Chobshi stemmed points with eliminated (type 29) and weak shoulders (type 26).

Figure 17. Chobshi stemmed and shouldered points (type 26, left and center) and stemmed and barbed point (type 22, right).

Figure 18. Chobshi broad-stemmed shouldered points (type 28, left) and tapering-stemmed shouldered points (type 27, right).

Figure 19. Chobshi tapering-stemmed shouldered points (type 27; top row left and center, bottom row on right).

Figure 20. Chobshi willow leaf or Ayampitín points (type 34).