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COLOSSAL HEADS OF THE OLMEC CULTURE

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James F. O'Connell and Carlos Benemann

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UNIVERSITY OF CALIFORNIA ARCHAEOLOGICAL RESEARCH FACILITY
Department of Anthropology
Berkeley



Mexican 40 centavo postage stamp showing La Venta 1

Field work costs of the expedition of February, 1967, and partial publication costs of this report were kindly provided by Dean Sanford S. Elberg, Graduate Division, University of California, Berkeley. Each of the project participants individually expresses appreciation for his encouragement.

The Committee on Research and Exploration of the National Geographic Society generously provided funds for printing the plates. In addition, the field work of February, 1967, and of earlier years has been partially sponsored by the Society and grateful acknowledgment is made here for this support.



Colossal Head San Lorenzo 1. Courtesy Museo Jalapa, Ver., México.

PREFACE

The background of the present study is as follows. After 1955, when Philip Drucker and Robert F. Heizer excavated the site of La Venta on a Smithsonian Institution—National Geographic Society—University of California sponsored expedition, a number of problems remained to be worked on. Drucker (1961) made a study of the area where it was believed the peasant population that had built and maintained the La Venta site had lived, and Heizer, with the expert assistance of Howel Williams, made a series of two or three week trips—usually in January, between semesters—to the Olmec area in search of the geological sources of the stones used for monumental sculpture at the sites of Tres Zapotes, La Venta, and San Lorenzo (Williams and Heizer 1965).

Prominent among the examples of monumental Olmec sculpture studied by Williams and Heizer were the colossal heads. While photographs of most of these had been published, no really detailed study had been made, and toward this possible end we recorded them and took numbers of photographs. When, about four years ago, these data were reassessed, it was obvious that they had been collected in too casual a way, and that a good deal of necessary information on one sculptured head or another was lacking. In the summer of 1963, Miss Tillie Smith, then a first-year graduate student at Berkeley, was commissioned to go to Mexico and complete the recording task. Her investigation was financed by the Archaeological Research Facility, and the data recorded by her are part of the permanent field records of that organization. Many of the photographs which appear in this report were taken at that time. Notwithstanding Miss Smith's energy and care, the information needed for a full report was still incomplete, and when the opportunity presented itself in the Winter Quarter, 1967, for us to take four graduate students on a short research trip to Mesoamerica, we settled upon the project of completion of the recording of the Olmec colossal heads and the preparation of this report as one of our main activities.

Our group, joined in Mexico by Philip Drucker and Howel Williams, became a party of eight, and during the course of the group's travel all twelve known colossal heads were observed and studied.

The students had spent two weeks before the trip in an intensive briefing seminar, learning as much as possible about the heads in order to determine what information was still lacking. The result of this preparation was the compilation of a checklist of missing or uncertain data that proved to be a great help in making efficient use of available time.

After returning from the Mesoamerican tour (which lasted for one month) the descriptive sections of the papers presented here were drafted, illustrations prepared, and the report assembled. This phase of the work took another month. From start to finish, therefore, this study represents the product (although not the sole one) of a ten-week Quarter devoted to research. This program, as outlined above, was experimental, and, in our opinion, turned out successfully.

The study that follows has been wholly a cooperative project of the four students. We have helped where we could with information, loaned books and reprints, critically read first drafts, entered into discussions, encouraged the students to persevere when they began to say that they wished they had never heard of the Olmecs, and arranged for publication, but this does not alter in any way the fact that this report is wholly theirs.

Many persons and organizations have provided assistance in one connection or another with the project, and we wish to express our deep appreciation to the following:

Dean S. S. Elberg, of the Graduate Division, was especially helpful in providing a grant from Opportunity Funds to support the trip to Mexico, as well as some incidental expenses connected with preparing the report. Without his willingness to approve our project proposal, we would not have had the opportunity to participate in a research Quarter. This report, therefore, could not have been written without his support, and we hope that he will find the study worthy of his approval.

The National Geographic Society, through its Committee on Research and Exploration, allowed us to use a portion of the funds granted earlier for archaeological investigations in Guatemala for the Mexican investigation. Our original plan to excavate the site of Templo de Montezuma at Papalhuapa (Depto. Jutiapa) was inadvisable due to continued insurgent activity in the area. We are especially indebted to Dr. Alexander Wetmore, Dr. Melvin M. Payne, Mr. Edwin W. Snider, and Mr. Richard Stewart of the Society. Dr. Matthew Stirling's encouragement has been very helpful to us, and we trust that, as the discoverer of eight of the twelve colossal heads, he approves our present effort.

For funds to cover other costs of this research we are grateful for aid provided by the University of California Associates in Tropical Biogeography, through its Director, Professor Herbert G. Baker.

Dr. Michael Coe, Director of the Yale University expedition, was kind enough to offer us the hospitality of his camp at San Lorenzo Tenochtitlán on the Río Chiquito and to furnish us with useful information when we visited

that locality to observe his excavations and examine the recently discovered colossal head called by us San Lorenzo No. 6.

Dr. Philip Drucker accompanied us on our wanderings and was of great assistance in making local arrangements. We are especially grateful to him for smoothing over a particularly uncomfortable confrontation at a native village (unnamed) in Veracruz.

Dr. Howel Williams continued, as a member of our group, his studies of the petrography of Olmec monuments, and all of the information on that subject in this report has been provided by him.

Dr. Ignacio Bernal, Director of the Museo Nacional de Antropología in Mexico City, graciously permitted us to study the colossal head (San Lorenzo No. 2) now on exhibit there.

Ing. Roberto Gutierrez Gil, Superintendente General de Exploración, Zona Sur (Coatzacoalcos) of Petroleos Mexicanos, saved the day (a notably rainy one) for us by providing a four-wheel drive vehicle and driver to enable us to visit Punta Roca Partida, where, on Terron Cagado, we saw columnar basalts that turned out, unfortunately, not to be the source of the basalt columns that occur at the La Venta site.

Dr. Richard Randolph, then of Rice University, provided us with excellent photographs of the San Lorenzo 2 head taken when that specimen was on exhibit in Houston.

Drs. Willard F. Libby and C. Rainer Berger, Institute of Geophysics, University of California at Los Angeles, determined the age of two carbon samples from the La Venta and Tres Zapotes sites, and we express to them our appreciation for this service. One by-product of the 1967 project has been the reassessment of the dating of the La Venta site, the results of which have already been published (Heizer, Graham and Berger 1967).

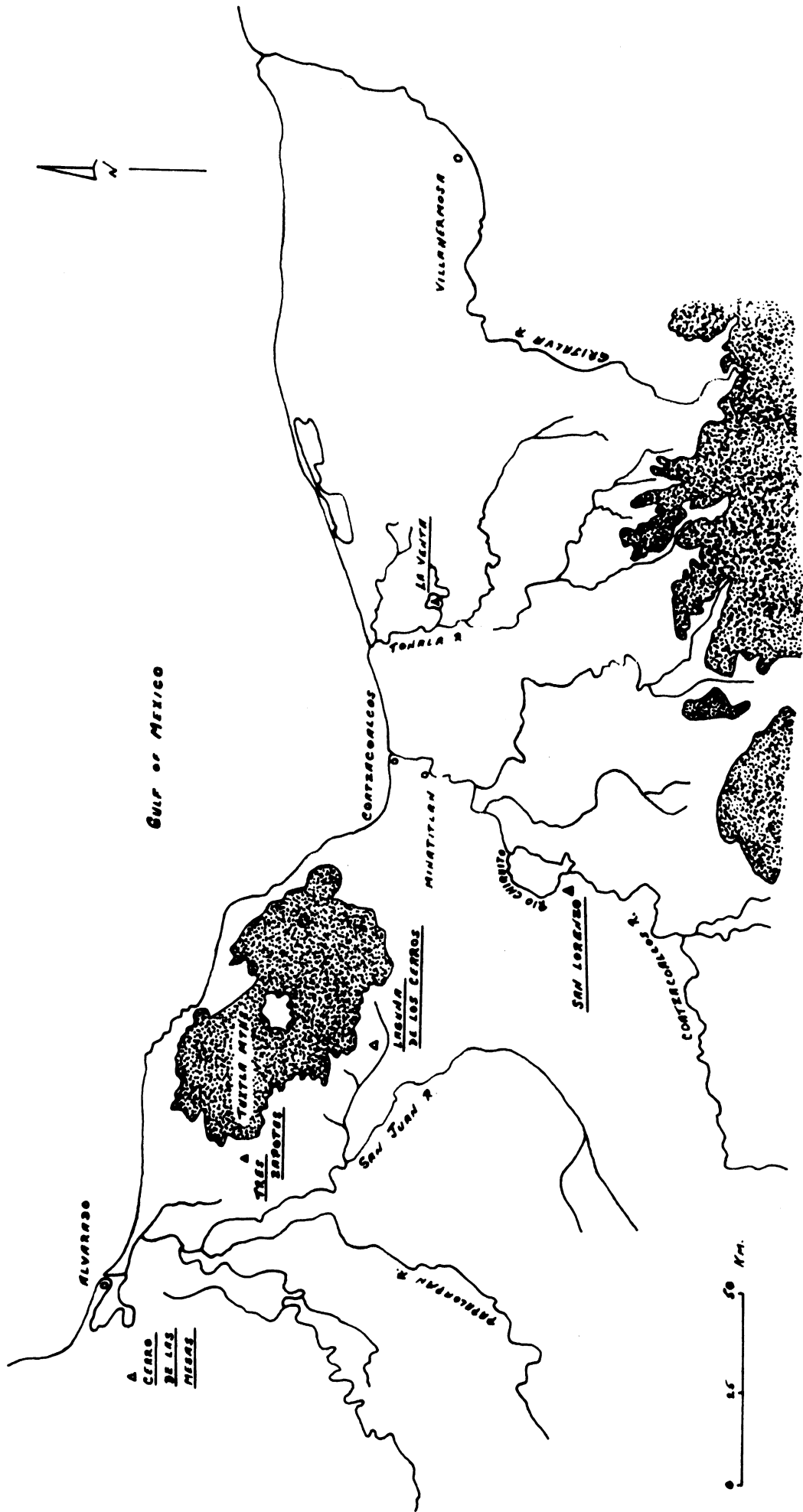
Mrs. Hazel Wald and Miss Donna Chong have prepared the black and white illustrations. To all of these we extend our thanks.

Robert F. Heizer
John A. Graham

CONTENTS

GEOGRAPHY OF SITE AREAS	1
HISTORY OF RESEARCH ON THE COLOSSAL HEADS	7
Discovery and Description	7
Opinions on Racial Affiliations	8
Sources of Stone	9
Removal to Present Locations	9
The Colossal Heads in Relation to the Olmecs	10
Bibliographies	13
DESCRIPTION OF INDIVIDUAL COLOSSAL HEADS	
Introduction	14
La Venta Colossal Heads	19
Tres Zapotes Colossal Head No. 1	28
Nestepe Colossal Head No. 1	30
San Lorenzo Colossal Heads	33
STYLISTIC COMPARISON OF THE COLOSSAL HEADS	44
Ear Ornaments	50
Decorative Elements on Headdresses	51
Chin Straps	52
Nasions	52
Stone Source	53
Weight	53
Iris Form	54
Mouth Form	55
Narrow Ridges Outlining Lips	56
Purposeful Defacement	56
Conclusions	57
SCULPTURING TECHNIQUES	63
WEATHERING AND MUTILATION	68
Duration of Exposure to the Elements	68
Differences in Rock Composition	69
Intentional Mutilation	70
Sharpening Grooves	71
Rectangular Niches	78
Gouges	80
Ground Pits with Dimples	80
Summary	83

APPENDIX I: ELEMENT OCCURRENCE ON COLOSSAL HEADS	86
APPENDIX II: OTHER LARGE STONE HEADS IN SOUTHERN MESOAMERICA	89
ADDENDUM	95
EXPLANATION OF ILLUSTRATIONS	97
ILLUSTRATIONS	100
BIBLIOGRAPHY	164
Map 1. Olmec Area	xii
Map 2. Tres Zapotes Mound Groups	3
Map 3. Plan of Central Group at La Venta	4



Map 1. Olmec area (after Coe 1965)

○ Modern towns

△ Archaeological sites

▨ Elevations over 200 m

GEOGRAPHY OF SITE AREAS

The general area with which we are concerned here is the Olmec "heartland" which lies on the southern Gulf Coast of Mexico, extending roughly from Laguna de Alvarado on the west to the lower reaches of the Grijalva River on the east (map 1). Discussions of the geography, geology, natural areas, etc., of this region have been presented by Tamayo (1949), West (1964a, 1964b) and Vivo (1964).

Within the above mentioned limits and for a distance of 60 to 100 kilometers inland, the area may be described as a flat, low-lying coastal plain made up of alluvial deposits overlying older sedimentary formations. The north central portion of the plain is dominated by the Tuxtla Mountains, a volcanic formation which rises gently from the surrounding lowlands and drops off sharply to the Gulf shore along its northern edge. The most prominent peaks, San Martín Pajapan and San Martín Tuxtla, rise to elevations of more than 1600 meters, and are part of a chain of recent cones forming the northern rim of the highlands. To the south is a series of smaller, more heavily eroded peaks of Plio-Pleistocene age, including Cerro El Vigía and Cerro Cintepec (Williams and Heizer 1965, map 2), which were important sources of stone for the Olmecs. Several rivers transect the area, among them being the Papaloapan, Coatzacoalcos, Tonalá, and Grijalva.

The climate of the region may be described as tropical, Af to Am in terms of the Koeppen system (Vivo 1964:212-213). Rainfall is heavy, averaging in excess of 2000 mm annually for the area as a whole. Although precipitation occurs in measurable amounts throughout the year, it is heaviest during the period from September to November. Daytime temperatures during this time average 25-30° C. In the dry season, from January to May, the temperatures are higher, though they rarely exceed 35° C. Dense tropical vegetation, broken occasionally by savannah grassland, covers most of the higher ground, with scrub forest, mangrove swamp, or open marsh the dominant ground cover in seasonally or perpetually inundated lowland areas.

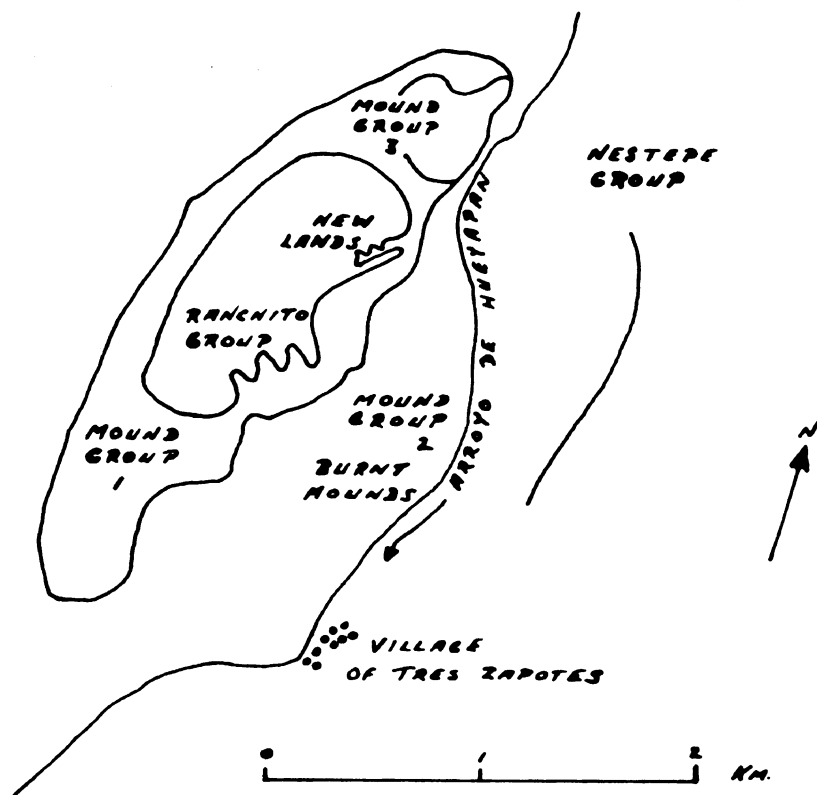
From the time of the Spanish Conquest to the beginning of the twentieth century the Olmec area was relatively unknown and rarely visited by outsiders. The difficult terrain, the oppressive climate, and the often hostile attitude of local inhabitants were major factors in this situation. Contacts with civilization were limited to areas on or near the trans-Isthmian rail line and to activities related to the growing of coffee, the major export crop.

Even as late as 1925, when Blom and La Farge visited the area, it could still be described as extremely isolated. These authors make particular reference to the lack of travelers, and describe the region as being torn by all manner of civil and military strife—a haven for bandits, rebels, and political revolutionaries (Blom and La Farge 1926:16). Foster, who spent some time in the Tuxtlas fifteen years later, remarks that there had been a measure of population growth and a return to somewhat more peaceful conditions as the outside world began to have greater influence in the area. Paved roads connected a few of the more important centers although the horse still provided the major means of cross-country transportation. Spanish was more widely spoken than it had been previously, and money was coming into more general use (Foster 1942:4-15).

More recently the region has undergone a marked change. A network of paved and graded roads has been built, local industry has developed, and the population has expanded rapidly, opening previously uncultivated areas for farming. Minatitlán and Coatzacoalcos, which Blom and La Farge described as small and run down, have grown enormously. Towering black clouds billow up from the refineries in these cities where a growing petroleum industry dominates the economy. Even the agriculturally-oriented Tuxtla highlands have changed. The village of San Andrés, where Blom and La Farge could find only one hotel—which shared quarters with a cigar factory—now has three modern hotels, two banks, and a busy bus depot. However, lest the reader think that civilization has completely engulfed the indigenous culture, we note that bare breasted Indian women still wash clothes along the banks of the Coatzacoalcos, almost within sight of Minatitlán's smoke stacks, just as they did in the days when Cortez first saw the region.

Within the area described, we are concerned with those Olmec ceremonial centers which have produced colossal heads: Tres Zapotes, San Lorenzo, and La Venta. The westernmost of these is Tres Zapotes, lying near the foot of the Tuxtla Mountains, on the eastern edge of the San Juan River flood plain. The area of the site is characterized by Stirling (1943:8) as a low, upland region consisting of a series of small, abrupt ridges and plateaus. Clear, swift-running streams flow through the deep gullies and narrow valleys that separate the ridges. The highly fertile volcanic soils of the region presently support a sizable farming population, and the large number of mound groups indicates that a similar situation probably obtained in the past. Dr. Drucker recently made inquiries and learned that the population of Tres Zapotes, which numbered 300-400 in 1940, had swelled to 1600 in 1966.

Extensive archaeological investigations were carried out at Tres Zapotes just prior to World War II, under the direction of Dr. Matthew W. Stirling. Results of these studies have been reported by Stirling (1943), Drucker (1943), and Weiant (1943). The site consists of a large number of



Map 2

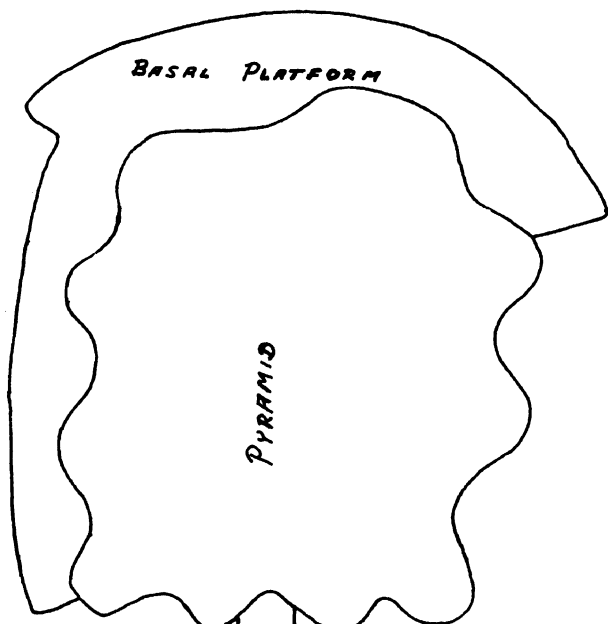
Tres Zapotes, showing location of mound groups (after Stirling 1943, fig. 2).

mounds located on and about a low ridge which runs SW-NE for a distance of over 3 km along the west side of the Arroyo do Hueyapan, just opposite the modern village of Tres Zapotes (map 2). Many of these mounds are clustered together in irregular assemblages that Stirling (1943:10) referred to as "groups." There are six or more of these groups, none of which is arranged, so far as is known, according to a precise geometrical plan, nor has there been any apparent attempt at orientation.

The earth mounds are of moderate size, the highest measuring about 12 m. Of the long low mounds, the largest and most impressive is 130 m long, 17.5 m wide, and 7.18 m high (*ibid.*, 11). The nearby Nestepe group, a separate locality to which we will refer later, lies just across the arroyo from the Tres Zapotes site, at a point roughly opposite Mound Group 3.

South and east of Tres Zapotes and the Tuxtla region the land falls away gradually to the low, hot and humid plain that forms the northern terminus of the Isthmus of Tehuantepec. This area has been described by Coe (1965a:681) as an "extensive flatland of clayey alluvium, mangrove forests and swamps." Six of the colossal heads now known were discovered at the site

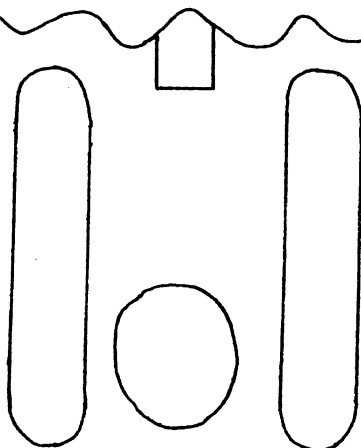
LV1



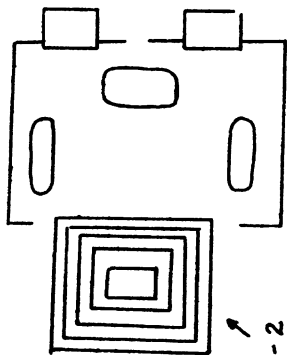
LV3

LV2

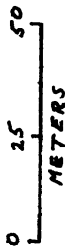
LV4



Complex A



Complex C



Map 3. Plan of the main features of the Central Group at La Venta.

This plan differs from that shown in Drucker, Heizer and Squier (1959, frontispiece, figs. 4, 5) in the shapes of the A-2 mound and the pyramid and its basal platform. New information based upon field work at La Venta in July, 1967, by R. F. Heizer and P. Drucker, with support of the National Geographic Society.

of San Lorenzo, which lies well within this lowland region. This is one of a group of three sites located near the village of Tenochtitlán on the Río Chiquito branch of the Coatzacoalcos River, about 80 km inland from the coast (Stirling 1955).

The population of the area around Tenochtitlán and San Lorenzo has increased sharply in the past twenty-five years, although occupation is primarily restricted to the natural levees bordering the river channels and to the slopes of nearby ridges. Tropical rain forest is the dominant ground cover, except where it has been burned off in the process of milpa clearing.

Preliminary archaeological investigations were carried out at San Lorenzo by Stirling and Drucker in 1946, and were reported in part by Stirling (1955). More recently M. D. Coe has begun an extensive program of re-excavation at the site and to date two preliminary reports have been published on this work (Coe 1966, 1967).

As described by Stirling (1955:9), the site of San Lorenzo lies on the remains of a "flat topped mesa of gravelly soil, cut through here and there by steep ravines," about 4 km west of the river. It consists of a large complex of long mounds and smaller platform mounds, enclosing several plazas. Most of these features, as Stirling indicates, are rather unimpressive; for example, the principal mound is only 8 m in height. In addition to the colossal heads, numerous other examples of Olmec monumental sculpture have been recovered from the vicinity of San Lorenzo, including several altars, seated figures, and a basalt sphere.

La Venta, the third Olmec site with which we are concerned, is located about 85 km northeast of San Lorenzo on a low island which rises above the back-waters of the Tonalá River, 19 km inland from the coast. Although the site lies in a vast mangrove swamp, it has recently been the focus of much attention due to the discovery of petroleum in the vicinity and the subsequent establishment of a base camp for drilling operations, which has since been enlarged into a petrochemical plant. As a result, the site has been largely destroyed.

Archaeological investigations at La Venta were carried out by Stirling, Drucker, and Wedel during the years 1941-43, and reports on this work were published by Stirling (1943) and Drucker (1952). In 1955, a Smithsonian Institution-University of California expedition undertook an extensive excavation program, the results of which were reported by Drucker, Heizer and Squier (1959).

Although there are several clusters of mounds on La Venta island, the

most important is that which Drucker (1952:8) calls the Central Group (map 3). It is dominated by Complex C, a large pyramid rising 33 m above the surrounding land. Just to the north of the pyramid lies Complex A, a symmetrical group of low mounds and platforms laid out along the same centerline as that of the pyramid. The Central Group is oriented 8 degrees west of north.

Map 3 was taken from the original made at La Venta in 1955, and shows accurately (as the maps of the La Venta site in Kubler 1962, fig. 16; and Covarrubias 1946, fig. opp. p. 93, do not) the original positions of the four colossal heads found at La Venta. In addition, the A-2 mound at the north end of Complex A has been shown here as a stepped platform mound, based upon new information resulting from the investigations at La Venta in July, 1967, by R. F. Heizer and P. Drucker. Further, the base plan of the pyramid and the form of the basal platform of the pyramid (referred to in Drucker, Heizer and Squier 1959 as Complex C) shown here are the true ones and are markedly different from those depicted in Drucker, Heizer and Squier (1959, frontispiece, figs. 4, 5). The errors of our surveyor in 1955 are responsible for the earlier published shape and ground plan of the pyramid, and an account (to be published) correcting these has been written (see Addendum for citation to Heizer and Drucker manuscript).

HISTORY OF RESEARCH ON THE COLOSSAL HEADS¹

Since José Melgar first visited what was then the Hacienda de Hueyapan in 1862 to view the colossal head which we refer to here as TZ 1, and returned to Jalapa to write "Notable Escultura Antigua" in 1869, a sizable number of reports have been published on the subject of the colossal heads. This literature is discussed here in its relation to the following subjects: discovery and description of the heads; racial affiliation of the heads; sources of stone for the heads; removal of the heads to their present locations; the heads in relation to the Olmecs; and bibliographies concerned with the heads.

Discovery and Description

As stated above, the first colossal head to be discovered and described was TZ 1. In his original report, Melgar (1869) recounts the discovery of the head by a peasant clearing a milpa, and presents a long argument claiming that the Ethiopian features of the head prove there were prehistoric Negroes on the Gulf coast of Mexico. TZ 1 was briefly described by the German archaeologists Eduard Seler and C. Seler-Sachs (1922) and the American amateur Weyerstall (1932) before it was first fully described by Stirling (1943).

The first note on a La Venta head is that of Blom and La Farge (1926:85) for LV 1 which they discovered while spending a day at the site during the Middle American Research Institute's first expedition to Mesoamerica in 1925.

However, it was not until the several joint Smithsonian Institution-National Geographic Society expeditions to Tres Zapotes and La Venta that the heads at these sites were adequately exposed, studied, and described. This work culminated in Stirling's Stone Monuments of Southern Mexico (1943). In this report, Stirling was able to give measurements, site locations, and stylistic features for TZ 1, and LV 1, LV 2, LV 3, and LV 4. He noted (*ibid.* 16, 17, 56-60) the flat backs that characterize the heads, relates TZ 1 to LV 1 and LV 4, and states that TZ 1 depicts not a Negro but a "broad-nosed, short-faced" physiognomy that is an early type "found over a considerable area in Middle America."

¹ Each of the twelve colossal heads is referred to hereafter by the initials of the site and number of the head. For details on nomenclature see table on p. 16.

It was on the 1945-46 Smithsonian Institution—National Geographic Society expedition to Mexico that the first five heads at the site of San Lorenzo were excavated and studied. Although the expedition's work has never been fully published, the monuments have been described by Stirling. He gives preliminary measurements for each of the heads, describes them, and compares the ten stone heads known at that time. He feels that "stylistically the heads are so similar, and the parallels in detail are such as to force the conclusion that no great time interval could have elapsed during which they were made" (Stirling 1955:9-13, 21).

It was not until 1965 that descriptions and photographs of the eleventh and twelfth heads (NS 1 and SL 6) were published. Although NS 1 had been exhibited on one edge of the principal plaza of Santiago Tuxtla (Veracruz) since 1951 and had often been seen and photographed, it had never been described. Therefore Heizer, Smith, and Williams provided a useful service when, rather than announcing a new discovery in their note on NS 1, they described the head, identified its stone source, noted its close resemblance to TZ 1, and remarked that all eleven of the heads then known were "obviously part of the same sculptural complex" (Heizer, Smith and Williams 1965:103). Although they labeled this head Tres Zapotes No. 2, they noted that this designation would probably have to be changed since it came from a site two miles north of the spot where TZ 1 was discovered.

The first reference to SL 6 is by Aveleyra Arroyo de Anda (1965). He briefly describes the head and its provenience, and notes its specific similarity to the other San Lorenzo heads and its general similarity to all the other Olmec heads. Michael Coe, the actual discoverer of the head, added little to Aveleyra's remarks concerning SL 6 when he published his preliminary report on his excavations at San Lorenzo (Coe 1966).

Opinions on Racial Affiliations of Colossal Heads

The question of whether or not the Olmec heads represent Negroes and thus can be taken as evidence of the existence of a prehistoric black race in North America has interested commentators ever since Melgar first saw TZ 1 in 1862. Melgar devotes well over half of his original publication to "proof" of prehistoric North American Ethiopians. Furthermore, in the revised edition of his article (1871; given in English translation in Stirling 1943:17), the only changes apparent are slight expansions and improvements of his Ethiopian data.

The practice of relating North America to the Old World through an analysis of TZ 1's racial type was continued by Alfred Chavero, who postulates (1883:62) that in Tertiary times all the continents were united and

contained Negro inhabitants who disappeared from many localities when the continents were later separated. Chavero feels that the Tres Zapotes colossal head, "whose type is clearly Ethiopian," serves as evidence for the presence of an early Negro population in Mexico (*ibid.*, 63). In addition to Chavero's work, the question of the Negroid aspect of the heads is considered by D. W. Jeffries in his article entitled "Pre-Columbian Negroes in America." Jeffries accepts (1953:213) the Negroid appearance of the colossal head found in 1862 in the "Canton of Tuxtla" as "valuable circumstantial evidence" for his theory that Arab sailors were indulging in a Negro slave trade with the Indians of Mesoamerica prior to Columbus' voyages to the New World. Finally, in 1962, a special correspondent for the newspaper Muhammed Speaks (1:7:23-28, May 1962) claims that LV 1 was "most definitely carved with a black man sitting as a 'model' more than 1300 years ago." This fact helps the correspondent to prove that black men were first on the earth and were busy creating the civilization that greeted the white man who, last to descend from the apes, was spending all his time living in caves.

Sources of Stone

Williams and Heizer (1965) have made field investigations of the sources of the stone from which the colossal heads were carved. Within the context of a general discussion of the geology of the Olmec area, they note that the source location for the stone of the TZ 1 and NS 1 heads was Cerro El Vigía, while the probable source for the La Venta and San Lorenzo heads then known was the Cerro Cintepec. They further believe (*ibid.*, 5) that the Olmecs utilized "detached and rounded boulders" for their sculptures, rather than quarrying the lavas in situ.

Removal to Present Locations

The removal of the heads to their present locations in modern times has scarcely been noted in the literature. The transportation of the four La Venta heads to Villahermosa is briefly mentioned by Drucker, Heizer and Squier (1959:297), while Heizer, Smith and Williams (1965:102) mention that Medellin Zenil told them something of the circumstances of the removal of NS 1 to Santiago Tuxtla in 1951. While something is known about the recent travels of SL 1, SL 2, and SL 5, the circumstances pertaining to the removal of SL 3 and SL 4 to the Museo de Antropología de la Universidad de Veracruz in Jalapa are unknown. Of the twelve colossal heads, only TZ 1 and SL 6 still remain at the sites where they were discovered.

SL 5 is by far the most widely traveled of the Olmec heads. As part

of a traveling exhibit of Mexican art, it toured museums in fifteen European cities, including London, Paris, Rome, Stockholm, Copenhagen, West Berlin, Vienna, Warsaw, Leningrad, and Moscow, and resided briefly at the Los Angeles County Museum (Gamboa 1963:viii) before returning to its present location at the Museo Nacional de Antropología in Mexico City. SL 1 left Mexico to be placed on exhibit in the Seagram Plaza in New York City, and was later returned to the Museo de Antropología de la Universidad de Veracruz (Artforum 1966).

It is only in connection with colossal head SL 2 that we can learn something of the problems involved in the transportation of the heads. This sculpture—which formed part of the exhibit "The Olmec Tradition" at the Museum of Fine Arts in Houston, Texas, before being returned to the Museo Nacional de Antropología in Mexico City—aroused considerable attention when it was removed from its in situ position at San Lorenzo and transported to the United States. J. J. Sweeney, Director of the Museum, has written (1963) a fairly detailed account of the methods utilized and the problems encountered in the removal and shipping of this colossal head. Included in his article is a description of the discovery of the exact location of the head by helicopter survey, an account of how removal of the head was arranged with the villagers of San Lorenzo Tenochtitlán in exchange for the promise of a prefabricated schoolhouse, and a series of excellent photographs dealing with the actual techniques employed in transporting the head. A less detailed and far more sensational report of the removal of SL 2 was published by F.L. in Archeologia (1965:2:41-47).

The Colossal Heads in Relation to the Olmecs

Of perhaps the greatest interest to the student are those works which consider the problem of the colossal heads in relation to Olmec tradition and its chronology. These studies take their impetus in large part from the late Mexican artist and art historian, Miguel Covarrubias. Fascinated by the Olmecs from the beginning of Stirling's work (see Covarrubias 1942), he wrote continuously about them and sought their artifacts for his private collection up to the time of his death in 1957. While most of Covarrubias' work is concerned with the larger problems of placing the Olmecs in time and space, and their position in Mesoamerican high culture, he did make some comments pertaining solely to the heads. Covarrubias felt (1957:65) that the heads depicted "fat youthful personages with Negroid features, wearing helmets rather like those for football," and that they were the product of the florescence of the Olmec culture, a culture which probably existed during the Middle Preclassic period (ibid., 80-81). Covarrubias (1946:97) felt that the fact that the heads were "meant to be simply heads without bodies" and that the La Venta heads "face directly north-south" might imply

that "they could have been astronomical sights [i.e. sighting points] or simply memorial monuments."

Following Covarrubias, a whole series of works concerning the Olmecs were written, many of which discussed the colossal heads. Kubler (1961:67) made the first attempt to seriate the heads. He suggested that they were like "ideal portraits," that they showed a clear development through two and possibly three generations of sculptors, and that this development could be subdivided into three stages. First came "round heads of grim aspect" (LV 1 and TZ 1); next, heads of intermediate shape characterized by parted lips (LV 2, LV 3, LV 4, and SL 2); and finally, and latest, "long heads of majestic expression" (SL 1, SL 3, SL 4, and SL 5). It was Kubler's opinion (*ibid.*, 333, fn. 12) that the heads must have been carved between 200-300 A.D., since, he claimed, the earlier radiocarbon dates for La Venta do "not accord with the sculptural evidence" for "parallels with Maya sculpture require a terminal data c. AD 300 for La Venta carvings." However, Squier (n.d., 253), in "A Reappraisal of Olmec Chronology," implies a seriation which opposes Kubler's. While noting "the tenuousness of this suggestion," Squier feels that "San Lorenzo may provide a bridge between the monumental art of La Venta and some of the monuments at Tres Zapotes [including TZ 1]." Furthermore, since Squier believes that the Tres Zapotes head is the youngest and was probably erected during the first phase of the Tres Zapotes sequence (*ibid.*, 183), a period which terminated around A.D. 100 (*ibid.*, fig. 7, 258a), he further implies that Kubler's chronology is short by at least two hundred years.

Two works appeared in 1963 which make reference to the giant heads. Alfonso Medellín Zenil, writing a section on "The Olmec Culture" for the unpaginated catalogue (section titled "Man") of the Houston Museum of Fine Arts exhibit of Olmec culture related art, states that the heads "have vigorous and precise negroid physical features"; and that they were probably carved during the "gran Horizonte clasico," which he dates as lasting from the first century B.C. until the ninth century A.D. (*ibid.*, section titled "The Culture"). T. Smith (1963), in "The Main Themes of the Olmec Art Tradition," writes a section on the stone heads that is for the most part a summary of how the heads relate to the Olmec style in general. She feels that "although they are different from other Olmec art, they employ the major features of the art style (*ibid.*, 129), and that "there seems to be a clear affinity of one head to another at each particular site" (*ibid.*, 128).

The problem of whom the heads depict was considered in two works which appeared in 1964. In El Pueblo del Jaguar, Román Piña Chan and Luis Covarrubias state (1964, legend of plate facing p. 36) that the heads could represent either distinguished warriors or champions of the Mesoamerican ball game. They also note (*ibid.*, 48) that the heads might be evidence for

the custom of decapitation which "seems to be a characteristic of the Olmecs." Peter Armillas, on the other hand, enlarges (1964:303-304) upon Stirling's (1955) suggestion that the heads were individual portraits of chieftains when he states that "the colossal heads may be chieftains' memorials." Kubler (1962:69) writes that "the colossal heads manifest a pharaonic desire for eternity, for physical survival beyond all the accidents of time."

The available information on the archaeology of the southern Gulf Coast region of Mexico was synthesized by the publication of three articles on the Olmecs in Handbook of Middle American Indians (1965, vol. 3). These articles—two by M. D. Coe (1965a; 1965b) and one by M. W. Stirling (1965)—make frequent reference to the colossal heads. Coe feels that while the heads are "somewhat divergent in style from the usual Olmec canon, being rather Negroid in physiognomy" (1965b:741), they are definitely part of the culture, and, in fact, are part of its classic form which flourished during the Middle Preclassic of from 800 to 300 B.C. (1965a:681-689). Coe further notes that if he is correct in assigning the Tres Zapotes sequence a Late Preclassic date, then the Tres Zapotes heads were carved elsewhere and only later brought to this location (1965a:694). In regard to the distinctive "helmets" of the heads, Coe suggests (1965b:763-764) that perhaps they were defensive and functioned as protection against clubs of various shapes since spears and spear throwers are not depicted in Olmec art and arrowpoints are not found in Olmec middens.

Stirling (1965:733) feels as he did in 1955: that each head "has an individual quality and was probably the portrait of a prominent leader." He characterizes the heads (*ibid.*, 721) as being almost completely realistic, but notes that the Olmec artists used conventionalizations for certain effects. Such conventionalizations include the "area at the base of the nose [nasion], which the artist altered to achieve the expression desired" (*ibid.*), and perhaps the helmet which could be an "artistic convention for the purpose of eliminating protruding parts" (*ibid.* 733-734). Finally, Stirling notes (*ibid.* 734) that all the heads have flat backs, which might indicate that they were meant to be set up against a wall.

Westheim (1965:131) believes that the U-shaped design on the headdress of LV 1 and LV 4 indicates a "relationship with the moon," and that "the headdress refers, therefore, to fertility, which is the work of the moon. So we may interpret the colossal heads of La Venta as representations of the vegetation god."

Two recently written analyses of the Olmec style make further contributions to the discussion of who is depicted in the heads and how long it took to carve them. Wicke (n.d. 71, 158) believes that the heads were

monuments raised in honor of dead chieftains and that they were carved over a period of at least two hundred and forty years. He further notes (*ibid.* 130-133), from his ordering of the width, depth, facial animation, and iris indication of the heads, based upon Guttman's (1944) scaling, that the Tres Zapotes heads were made earliest, followed by the La Venta heads, and that the latest are the San Lorenzo heads.

On the other hand, the Mexican archaeologist Ignacio Bernal, in a recently completely work on the Olmecs now in press, states that the heads are not portraits but rather may be depictions of "chieftains or warriors in a general sense" (Bernal n.d.). He also feels that the heads must have been sculptured over a fairly short time span, perhaps two or three generations, for at least some of them are the work of the same sculptor or family of sculptors. In a footnote, Bernal mentions a letter he received from M. Coe in which the latter disputes Kubler's seriation, and proposes instead that the La Venta heads are earliest, due to their "close resemblances to the jade and pottery figurine style," then come the San Lorenzo heads, and finally the Tres Zapotes heads, which are "extremely portrait-like and lack pseudo-drilling at the corners of the mouth" (Coe, cited in Bernal n.d., fn. 40). It should be noted, however, that Coe now believes (1967, figs. 1, 2) that a series of early radiocarbon dates from San Lorenzo "reverses the usual scheme and puts San Lorenzo at the beginning, not the end, of Olmec development," followed by La Venta, and finally Tres Zapotes, where there was "the final flicker of a civilization which could now barely be called Olmec" (*ibid.* 1400).

Bibliographies

To conclude this summary of the history of research on the Olmec heads, reference is made to two bibliographies concerning the Olmecs. "Bibliography for Olmec Sculpture" (Jones 1963) is very extensive up to its date of publication. It does, however, lack certain entries of interest to the archaeologist, such as reviews of site reports. Heizer and Smith's (1965) "Olmec Sculpture and Stone Working, a Bibliography," while less extensive, is more archaeologically oriented. Together these two sources probably contain the most important references to Olmec archaeology since Melgar's first paper of 1869.

DESCRIPTION OF INDIVIDUAL COLOSSAL HEADS

Introduction

The existence of the colossal stone heads of the southern Gulf Coast of Mexico has been known since 1869, and they have received more or less constant attention since that time. Much of the interest in the heads, of which there are now twelve known examples, has arisen from their inherent artistic quality. Art historians tend to view the heads as somewhat apart from the Olmec society that produced them. While we would not disagree that the colossal heads are superb masterpieces of an ancient art, it is our opinion that they can only be understood as one element—albeit a prominent one—of Olmec culture as a whole. In this paper, we are mainly concerned with a detailed description of the dozen colossal heads and the differences between them. What part these particular sculptures played in the ceremonial life of the people who built and occupied the sacred centers of Tres Zapotes, Nestepe, San Lorenzo, and La Venta we do not know, and it is probable that we will never find the answer. What relationships to other forms of Olmec sculpture the heads can be shown to have is not discussed here. We present in this paper that which we believe to be of primary importance in the study of Olmec sculpture—detailed information on the statues themselves. Such detail cannot be obtained from the published literature, and the purpose of this report is to provide this information.

Before Olmec sculpture can be studied properly, and meaningful conclusions derived on the nature of the style as it is variably expressed at the Olmec culture sites, equally detailed records of all the monuments ("altars," "stelae," and other forms) must be secured. To do this, ironically enough, we must rely not on the usual data of the archaeologist, but rather upon the more limited resources of the art historian; namely, the heads themselves. As Heizer and Smith (1965:71) have pointed out, while Olmec society certainly constituted a cultural entity, most of the previous scholarship on the topic has been in terms of its distinctive art style. This is particularly true of the colossal stone heads, since they all lack any but the vaguest archaeological associations. Thus, it is from a careful scrutiny of the heads themselves, and from a comparative and inferential approach to their details, that we may hope to draw relevant cultural conclusions.

In order that our study may be placed in chronological perspective, we have included a short history of the Olmec colossal heads since their discovery, and a brief discussion of the larger-than-life heads in pre-Columbian Mesoamerica which are non-Olmec in origin (Appendix II). Atten-

tion has been paid to the geography of the Olmec area from which the colossal heads have come.

In the detailed descriptions which follow, it will be noted that we have established our own designation system by which the heads are numbered according to the order of their discovery at each site. There are now six heads known from San Lorenzo, four from La Venta, one from Tres Zapotes, and one from Nestepe. We have abbreviated the designations of the heads by utilizing the initials of the site from which they came, and their respective numbers, in the following manner: San Lorenzo, SL 1 through SL 6; La Venta, LV 1 through LV 4; Tres Zapotes, TZ 1; and Nestepe, NS 1. Designations by which the heads have previously been known and their present locations are shown on page 16.

We have attempted to emphasize the descriptive attributes of the individual heads. In the rather detailed descriptions of each head, it has been necessary to utilize certain terminological distinctions which are explained below, with the aid of the three schematized drawings in Figure 1.

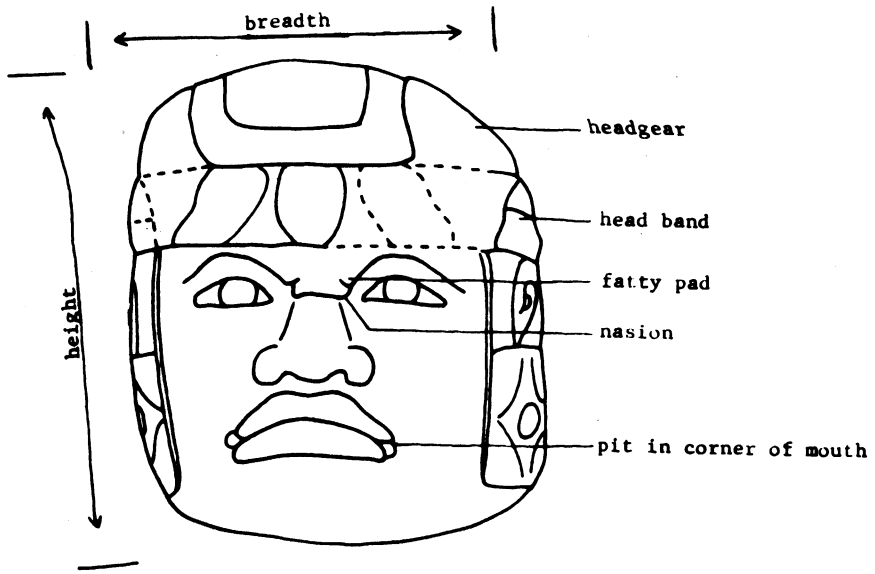
On the tops of the heads is what we have designated the headgear. This term is used to refer to that portion of the head-covering which rests upon the dome of the cranium. In most cases the headgear is distinct and separate from the head band, which is wrapped around the lower cranial area, passes across the area of the forehead, and covers the area of the eyebrows. The term chinstrap is used to designate that portion of the head apparel which extends downward from the lower margin of the headband just in front of the ear and beneath the chin. If the chinstrap is rather short, extending downward only so far as to be roughly between the ear hole and the cheek, we have referred to it as abbreviated, or as a cheekstrap. A full chinstrap extends to the bottom of the jaw and passes beneath the chin. The chinstrap, in each case where it can be clearly seen, appears to be a part of the headgear, since it runs underneath the headband and is therefore presumably attached to the lower edge of the headgear. The combination of headgear, headband, and chin- or cheekstrap is what has been referred to by other authors as the "helmet."

Ear ornaments are the decorative elements attached to the ears of the heads. They appear to cover, pierce, or dangle beneath the lobe of the ear in each case where they are represented.

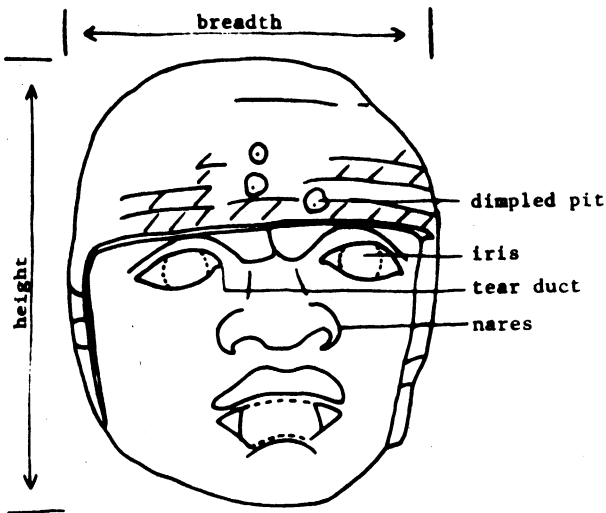
In describing facial features, we have used the anatomical terms that we feel most accurately indicate the actual physiognomic area as it has been translated into stone sculpture. Nasion refers to that area where the more fleshy skin of the forehead meets the taut epidermis of the nasal

Designations and Locations of Twelve Colossal Heads

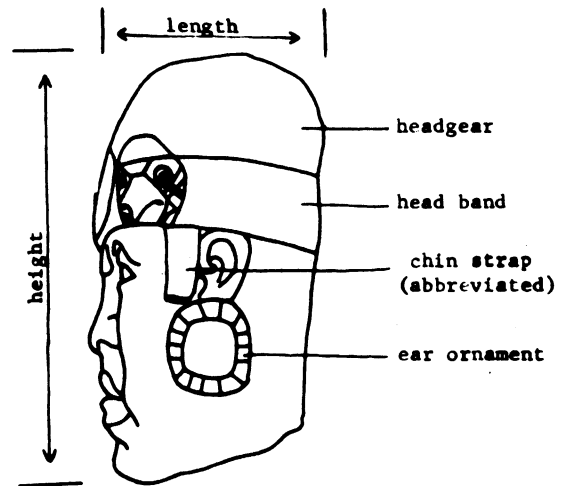
Colossal Head	Our Designation	Previous Designation	Present Location
La Venta No. 1	LV 1	Monument 1 (Blom and La Farge 1926:85) Monument 1 (Stirling 1943:57)	Parque La Venta, Villahermosa, Tabasco
La Venta No. 2	LV 2	Monument 2 (Stirling 1943:57)	Museo Villahermosa, Villahermosa
La Venta No. 3	LV 3	Monument 3 (Stirling 1943:57)	Parque La Venta, Villahermosa
La Venta No. 4	LV 4	Monument 4 (Stirling 1943:58)	Parque La Venta, Villahermosa
Tres Zapotes No. 1	TZ 1	La Cabeza Colosal de Hueyapan (Melgar 1869) Monument A (Stirling 1943:17)	Tres Zapotes, Veracruz
Nestepe No. 1	NS 1	Tres Zapotes No. 2 (Heizer, Smith and Williams 1965:102) Monument Q (Stirling 1965:733)	Santiago Tuxtla, Veracruz
San Lorenzo No. 1	SL 1	Monument 1 (Stirling 1955:9-10)	Museo Jalapa, Jalapa, Ver.
San Lorenzo No. 2	SL 2	Monument 2 (Stirling 1955:10-11)	Mus. Nac. de Antrop., Mexico City
San Lorenzo No. 3	SL 3	Monument 3 (Stirling 1955:11)	Museo Jalapa, Jalapa, Ver.
San Lorenzo No. 4	SL 4	Monument 4 (Stirling 1955:11-12)	Museo Jalapa, Jalapa, Ver.
San Lorenzo No. 5	SL 5	Monument 5 (Stirling 1955:12-13)	Museo Jalapa, Jalapa, Ver.
San Lorenzo No. 6	SL 6	Monument 17 (Coe 1966:3)	San Lorenzo Tenochtitlán, Ver.



b



a



c

Figure 1

Descriptive attributes of the individual heads

bridge, thereby creating a pinched, wrinkled, or folded effect. The terms subrhomboidal and triangular refer to the approximate shape of this folded area, as does the term double, which actually describes a double or divided rectangle. Fatty pads are those fleshy bulges which appear immediately to either side of the nasion and extend upward to disappear or diminish underneath the head band. In speculating as to the physiological interpretation of the nasion and fatty pads, we suggest the possibility that these are not normal physical characteristics but represent protruding folds of flesh caused by the downward pressure of the tightly fitting head band. Jowls are the puffy areas which hang beneath the cheeks at the lower front sides of the face, serving in most cases to emphasize the squareness of the head from a frontal view.

The nares are found at the broadest part of the nose, and are the fleshy areas immediately above and covering the nostrils, which take the usual form—drilled and/or pecked holes separated by a septum.

Tear duct refers to a slight though carefully executed extension of the area enclosed by the eyelids at the corner of the eye.

Dimpled pits, or, pits with dimples, are a form of defacing mark, each of which consists of a cup shaped depression with a small concavity or dimple in the bottom and exact center. Further description and discussion will be found in the section on defacement.

It is important to note that when we refer to the right ear or left eye, for example, we are referring to the right ear or left eye of the head, and not to the feature as viewed from the right or left. Reference to head length conforms to the standard anthropometric measurement of distance between the frontal area just above the nasion and the rear of the occipital region. Width, in our usage, refers to the widest part of the head above the temporal region, measured laterally.

Tables summarizing dimensions, weights, and stylistic elements of the colossal heads appear in Appendix I.

La Venta Colossal Head No. 1

LV 1 (figs. 2, 3a, 3b; pls. 1, 2a, 2b, 6a) was first reported by Blom and La Farge (1926), but was not fully described until the publication of Stirling article, "Great Stone Faces of the Mexican Jungle" (1940:310, 328), and his "Stone Monuments of Southern Mexico" (1943:56-57). Carved of basalt secured from Cerro Cintepec in the Tuxtla Mountains (H. Williams and R. Heizer, personal communication), this head was found at the southern edge of the main pyramid at La Venta, facing south. It is fairly large in relation to other Olmec heads, as it weighs 24 tons and is 2.41 m high and 6.4 m in circumference. Thus, only colossal head SL 1 exceeds it in weight, only SL 1 and SL 2 exceed it in height, and only LV 4 exceeds it in circumference. LV 1 is now located in the Parque La Venta in Villahermosa, Tabasco.

In common with the other Olmec heads, the lower edge of the headgear extends to a position immediately over the eyes. However, in contrast to several of the others, the nasion does not have incised extensions running up to the helmet, but rather has incised extensions over each eye. The nasion is subrhomboid and is characterized by the fact that it is only slightly incised—a lack of detail most probably due to partial erosion. The eyes of LV 1 are flat and slightly inset within the eyelids, and the right eye is placed higher up on the face than the left. The iris is depicted by a raised disc in the middle of the right eye, and a raised disc slightly off-center toward the nose in the left eye. The eyelids do not overlap but join on the inside and outside of the eye, and a small, rounded "tear duct" is formed at the outside juncture of the lids.

The nose is quite wide and noticeably flattened, and the nostrils are visible in a full face view. In common with the other La Venta heads, the base of the nose and the edge of the upper lip are placed quite close together. This upper lip is bow shaped, while the lower lip is in the shape of the letter "U". The mouth is closed, and has small rounded pits in the lip corners. The chin is depicted by a cursive "W", the ends of which join with the outer ends of the mouth. The chin is further emphasized by the fact that the middle inverted V of the W is elevated and rises to the middle of the lower lip's bottom edge. In profile, the ears are placed unnaturally forward in the face. They are small in relation to those of other heads, and appear to be more angular than curvilinear. The ear lobes are completely covered by ear ornaments.

LV 1 has quite prominent jowls. They extend upwards on either side of the mouth to meet with the cheeks and form a single unit vertically bounding the nose and mouth. This unit along with the flat, broad nose contributes to LV 1's appearance of an extremely flat, square face. Furthermore, in profile LV 1 is decidedly prognathous. The face forms practically a single wide plane which inclines inwards at an angle of approximately 25 degrees from

the base of the face to the lower edge of the headband.

In relation to many of the other heads, LV 1 bears relatively little decoration. The head band is plain in the front, and is comprised of six sets of double squares on the left side of the head. The right side of the head band is now plain, but this is most probably a result of erosion of the incised lines. The headgear is reminiscent of that of SL 1, and is simply a raised U-shaped design placed directly above the front center of the head band. This U-shaped motif extends backwards over three-quarters of the top of the head, expanding laterally slightly one-third of the way back. Hanging from this U-shaped element over and to the bottom of the front of the head band are three attachments depicted in relief. The center attachment is oval, while the outer ones are comma-shaped. These are also to be seen on the headgear of the central figure in Stela 2 from La Venta (Drucker 1952, fig. 49).

The ear ornaments are large rectangles with rounded corners. The long edges of the ornaments run vertically, and the ornament extends from where it covers the earlobe almost to the base of the head. It is probable that within each rectangle there was a relief diamond whose tips touched the midpoints of the four lines of the rectangle. In the center of the diamond was an incised circle. The left ear area, however is now so eroded that only the two lower incised lines of the diamond remain. In front of each ear and extending downward to the rectangle is the characteristic cheek strap. Although it apparently passed beneath the ear ornament, the strap does not reappear below the ornament.

The only ancient defacement apparent on LV 1 is a series of grooves on the dome of the head. One series occurs within the U-motif, and larger ones are present toward the back of the dome. These grooves are long and narrow, being approximately 5 cm in width and depth, and over 20 cm in length.

LV 1 has apparently suffered some post-Conquest defacement. Both its right side and face have recently been sectioned into square areas by very thin incised lines. Perhaps some modern artist indulged in this lamentable practice in order to facilitate his rendering of the head. A considerable amount of natural surface scaling has occurred on the stone. The back, which apparently was once quite flattened, is now very eroded, as are the rear section of the right side and the areas of the face mentioned above.

The pattern of scaling on the back follows the natural laminae of the lava flow which produced the original stone, and it would therefore seem that the back of LV 1 was part of the original surface of the stone. This clearly indicates that LV 1 was carved from a large, naturally rounded boulder.

LV 1 is both asymmetrical and minimally modified from the original cylindrical boulder. The right side of the face is much wider than the left, the eyes are not aligned, the ears are too far forward, and in full-face all the features appear to be slightly askew. In profile, the head appears far too wide in relation to its height to be anatomically correct. Furthermore, as implied in the discussion of the facial features, LV 1 as a whole is carved in much lower relief than those from other sites. Nevertheless, LV 1 is an excellent example of the sculptor's art, and one is impressed by the naturalism discernible in its over-all appearance.

La Venta Colossal Head No. 2

LV 2 (figs. 4, 5a, 5b; pls. 3, 4a, 4b, 5a, 5b) was discovered during a joint Smithsonian Institution—National Geographic Society expedition to the Gulf coast of Mexico in 1939-40. In 1940, Stirling published (1940:331, 333) two photographs of it in his article, "Great Stone Faces of the Mexican Jungle," and later (1943:57), in his "Stone Monuments of Southern Mexico," described it as follows: "This [head] is the middle one of three big heads set in a row and facing north, two hundred yards north of the big mound [i.e. the pyramid]." Carved from the same Cerro Cintepec basalt used in most of the La Venta heads, LV 2 is the lightest and shortest of the La Venta heads, with a weight of 11.8 tons and a height of 1.63 m. It has a circumference of 4.24 m, and thus is slightly wider than LV 3. LV 2 is presently located in the Parque La Venta in Villahermosa, Tabasco.

The headgear of LV 2 extends down nearly to the eyes; the nasion is incised and subrhomboidal in form. Joining the nasion on both sides, a deeply incised line curving up to the head band indicates the forehead area. The eyes of LV 2 are quite sunken, for the eyeball is not shown as it is on the other heads, that is, filling the eye socket, but rather the center of each optic cavity is slightly indented and flattened to form an iris. The upper eyelid overlaps the lower one on the inside of the eye, while the eyelids meet on the outside edge to form a small, rounded tear duct. Although the nose is heavily eroded, it does appear to be wide, with nostrils visible in full-face perspective. At present the nose appears to be slightly snubbed, but because of heavy erosion it is impossible to accurately reconstruct this feature in its original form.

Since the upper lip has completely eroded away, it is impossible to either reconstruct its form or to estimate the distance between the nose and the upper edge of the lip. The lower lip is U-shaped, with a concave upper surface. Since the lips are parted, and what remains of the upper lip's surface is convex, the mouth has been termed "smiling" (Stirling 1943:57;

1965:733). The presence of large, upward-slanting oval pits in both mouth corners further contributes to the apparent smiling visage of this head, but the smiling effect of the mouth would, in our opinion, be markedly lessened were the upper lip present to frame it. The four upper incisors are present in the mouth, and since the two central incisors protrude beyond the inner ones, the denture appears to be somewhat buck-toothed.

In profile the chin appears somewhat recessed, although once more this may be partially due to erosion. The recessed nature of the chin as now seen is further emphasized by an eroded area in the lower edge of the stone below the center of the chin. The upper portion of the right ear of LV 2 is well made, and appears more naturalistic than those of several of the other heads. The ear ornament covers the ear lobe. The ear lobe is also covered on the left side, but here the erosion is so severe that only the barest outlines of the upper parts of the ear remain.

Of all the heads, LV 2 has the most oval face. Furthermore, the face is slightly wider across the jowls than across the forehead. Thus these features, plus the apparently smiling mouth, suggest a great similarity between this head and the traditional Halloween pumpkin. This similarity would no doubt be much lessened were it not for the extreme facial erosion. So many of the facial features have disappeared that the face seems soft and devoid of detailed facial planes. That this is so can be demonstrated by the prominent cheekbones. These, the least eroded feature, contribute only to a certain pouchiness in the face. However, were the other facial features as prominent as the cheeks, the head would have a more impressive appearance.

Of all the colossal heads, LV 2 is the only one with an asymmetric head band design. The central element of this design resembles a flattened, upside down medieval shield (or family crest). This is the element termed by Stirling (1943:57) a "bowknot." While there is no doubt that this element was incised to the left of the head's centerline, it is not possible, due to erosion, to now ascertain the shape of the element that joins it and continues around the left side of the head. While we have rendered this element as a sort of flying wing, it must be confessed that this is at best a provisional reconstruction. The element that continues around the head to the right from the central element is roughly oval in shape. Placed at an oblique angle to the head band, it joins the band in the front coterminously with the central element.

LV 2 parallels TZ 1 in that the dome is absolutely plain and undecorated. The ear ornament is likewise plain, being simply a flat disc with a hanging tassel. The disc covers the ear lobe, while the tassel hangs down to the lower edge of the head. This ornament is reminiscent of the small

discs with tassels that form the ear ornaments of SL 4 and SL 5. The cheek strap hangs down in front of the ear to a level slightly below the top of the ear ornament.

LV 2 is perhaps the most altered of all the heads. Pits without dimples are present on the top of the head, on the head band, and in various locations on the face. A few dimpled pits are found on the top of the head. The entire back of the head has been made concave by the many narrow grooves, wide, deep gouges, and grooves within gouges that are present there. These defacements appear to follow a random pattern. There are a few more deep gouges at the base of the back.

The combination of erosion and defacement has made LV 2 the most difficult of the heads to visualize in its pristine state. It would appear, however, that this head was similar in its general proportions to the tall, narrow San Lorenzo heads, such as SL 1 and SL 4. While LV 2 no doubt has a more cheerful visage than do the San Lorenzo heads, which have been described by Kubler (1962:67) as "majestic," nevertheless, in its original state, it must have approached some of the majesty of the San Lorenzo heads. It is our opinion that to label LV 2 as the head of a youth or of a smiling person is to misread the effects of erosion and defacement on a head that must have appeared considerably different in its original condition two and a half millennia ago.

La Venta Colossal Head No. 3

As in the case of LV 2, LV 3 (figs. 6, 7a, 7b; pls. 7, 8a, 8b) was discovered by the 1939-1940 joint Smithsonian Institution-National Geographic Society expedition to the southern Veracruz-northern Tabasco region of Mexico, and was first described and illustrated by M. W. Stirling (1943: 57-58, pl. 42b). LV 3 was originally located to the north of the great pyramid, facing north. It was the easternmost of the three colossal heads lined up here in an east-west row. Like most of the La Venta heads, LV 3 is made of basalt from the Cerro Cintepec. It is slightly above average in size, weighing 12.3 tons, standing 1.98 m high, and is 4.05 m in circumference. It is presently located at the Parque Museo de La Venta in Villahermosa.

As with the other heads, LV 3's headgear comes down to a position just above the eyes. The nasion is a double one, whose outside edges curve out and up under the headgear. It is impossible to ascertain what features were sculptured on the left side of the face since this side is severely eroded. The right eye does not bulge, but appears to be flush with the face, and the left eye is so eroded that little can be seen. Facial erosion in

the area of both eyes is so great that no additional observations can be made beyond noting that the eyelids of the right eye apparently met at the inner corner and formed a point at the outside corner. Erosion on the nose is also great. However, it does appear that it was narrower across the bridge than those of the other La Venta heads, and that in profile, it was slightly snubbed.

Since the upper lip has almost disappeared, it is impossible to ascertain its original shape, or the distance between the upper edge of the lip and the nose. It would seem probable that the mouth of LV 3 was open, and that the lower lip was U-shaped. There is a definite pit in the right corner of the mouth, but this feature does not appear on the left side. The chin in full-face view appears similar to the W-shaped chin of LV 1; however, in profile LV-3's chin is straight while LV 1's chin protrudes. The ears of LV 3 are quite unobtrusive. The left ear is entirely covered by the ear ornament, while of the right ear only the ear pit and a portion of the central part of the external structure are not covered by the headgear or the ear ornament.

In sum, the face of LV 3 has been eroded in such a manner as to nearly obliterate all of the features. Nevertheless, sufficient detail exists to enable us to have some idea of the relationships of the various features and to give us a fairly clear picture of how this face must have looked originally. LV 3 apparently presented a rectangular visage, and lacked prominent facial contours such as high cheekbones and pronounced jowls. In profile, also, this face probably had no one outstanding feature, such as a jutting jaw, prognathism, or enlarged brow-pads. In general facial alignment, then, LV 3 must have appeared quite similar to such even-featured heads as SL 2.

Due either to the effects of erosion or to a particular convention of decoration, it is not possible to note any differentiation between the head band area and the dome of LV 3. The headgear is basically a raised, undecorated area which covers about seven-eighths of the top of the head. It ends toward the rear of each side of the head and extends downward on each side to about the level of the middle ear. There is no indication of the headgear on the back of the head or at the extreme rear of the sides. Thus the headgear represents either a plain helmet or scarf, covering most of the head. The ear ornament of LV 3 is basically a rounded square with a hole in its center, and bears a striking similarity to the jade ear spools found in the Olmec region (Drucker 1952, pls. 52, 56 right; 1955, pls. 42-48; Drucker, Heizer and Squier 1959, pls. 37, 39, 40). It would appear that the ear ornaments are placed approximately over the ear lobes.

The chin straps of LV 3 extend from the lower edge of the headgear

down to the base of the head and give the appearance of continuing under the chin. The left chin strap differs from the right in that it is wider, and covers the whole ear before passing beneath the ear spool. It is considerably narrower below the ear ornament. The right chin strap is of the same narrow width throughout, permitting the central and rear portions of the ear to be shown.

There is considerable defacement of LV 3. Long, narrow grooves are present all over the top of this head and under the right eye. Pits without dimples are found on the headgear, on the nose, under the right eye, near the left orbital area, and around the mouth. Pits with dimples are found on the head band, and one of the three pits inside the central hole of the left ear spool is dimpled. This dimpled pit is particularly interesting for there exists the distinct possibility that pits with dimples were part of the original construction of LV 3. The central area of this ear spool is apparently unfinished, and the fact that a dimpled pit occurs exactly where the hole in the ear spool should occur implies that it was used, at least in this instance, as part of the technique of Olmec stone carving.

As mentioned above, notwithstanding defacement and erosion, this head bears certain resemblances to the general San Lorenzo head type. LV 3 is relatively tall and thin, with a quite flattened back, and there is a slight tendency toward constriction from the bottom of the head to the top. All this indicates that were LV 3 in its original form, it would probably appear much like a San Lorenzo head both in its proportions and in the form and relationships of its features.

La Venta Colossal Head No. 4

LV 4 (figs. 8, 9a, 9b; pls. 6b, 9, 10a, 10b) was also discovered during the 1939-40 joint Smithsonian Institution-National Geographic Society expedition and was first described by Stirling (1940:315, 329, 332; 1943:58). LV 4 was found facing north, and was the westernmost of the three heads standing in a row north of the great pyramid. It weighs 19.8 tons, is 2.26 m in height, and 6.53 m in circumference. LV 4 is now located at the Parque La Venta in Villahermosa.

LV 4 is made of a basalt which is recognizably different from that used to fashion LV 1, LV 2, and LV 3. It is a "basaltic andesite" and is a porphyritic, pilotaxitic, augite andesite. The stone is characterized by abundant phenocrysts of plagioclase from ca. 0.2 to 2.0 mm long, all having murky cores crowded with specks of glass and with thin, clear rims. The

cores are of medium to calcic labradorite; the rims are of calcic andesine. The small plagioclase laths in the groundmass also consist of calcic andesine. Next in abundance, forming about 15 per cent of the bulk, are phenocrysts and microphenocrysts of pale yellowish-green diopsidic augite, few exceeding 1.0 mm in length. Prisms of hypersthene, some of them discrete crystals, but most of them enclosed in jackets of augite, make up approximately 1.0 per cent. The same quantity obtains for roundish granules of olivine which have been largely altered to iddingsite. This rock is much finer-grained than the basalts of El Vigía and Cerro Cintepec, and differs from these last in lacking the conspicuous phenocrysts of augite and olivine. San Lorenzo Monument 20 is made of essentially the same rock as LV 4. The exact source of the stone from which LV 4 and San Lorenzo Monument 20 are made is not known, but it is most probable that it comes from the Tuxtla Mountains. Almost certainly its source is not La Unión.

Although much of the right side of the head band of LV 4 has scaled off, it would appear that, in common with the other heads, this feature came down nearly to the eyes. The nasion is a deeply incised version of the subrhomboid type noted for LV 1 and LV 2. On either side of the nasion the ends of the incised lines are intersected by deeply incised curved lines which go up and under the head band. The deep incisions of the nasion and these curved lines give LV 4 the appearance of having a deeply furrowed brow, or perhaps a frown.

The eyes of LV 4 are sculptured flush with the face, and the right eye is lower than the left. The iris is depicted by a circular raised relief area which is intersected by the lids and disappears under them. The upper lid overlaps the lower at both the inner and outer edges, and the eyes are pointed rather than rounded at their outer corners. The nose is extremely eroded, especially on the right side, but it would seem that it was originally quite broad and flat, and had nostrils visible in full-face perspective. Since the upper lip is eroded away and the nose also is quite eroded, it is impossible to gauge the original distance between the nose and the top edge of the upper lip. The lips are parted and the four upper incisors are present. What remains of the upper lip indicates that it was originally bow-shaped; the lower lip also is bow-shaped and is outlined with a raised ridge. The mouth has circular pits in both corners. The details of the chin of LV 4 are completely eroded away. The ears also have almost totally disappeared. However, since there is space for them and a few traces of incised lines remain, it cannot be doubted but that they were originally present.

In profile LV 4 is quite prognathous. It resembles LV 1 in that the face forms practically a single oblique plane, slanting inward from its base to the head band. However, the parted lips and overhung upper lip of

LV 4 tend to break this plane slightly more than it is broken in LV 1. In full-face view, the features of LV 4's face are slightly askew, and the area of the right eye and cheek is lower than that of the left side. This gives LV 4's face a superficial resemblance to LV 1. However, differences in the eyes and mouth, and the prominent cheekbones serve to distinguish this head from LV 1.

The head band of LV 4 is nearly totally eroded away, but it is possible to partially reconstruct it. In front, it is comprised of a series of five incised horizontal parallel lines. The three upper lines and the two lower ones are placed close together, and these two groups are slightly separated. On the left side of the head, the head band is first comprised of a rounded square. Proceeding from this element is a curvilinear meander which runs backward almost to the back of the head. It would seem that the rounded square and the meander depict designs appliquéd on the head band. On the right side of the head the head band design is nearly eroded away. The lines that remain, however, hint that the motifs on the right side were similar to those of the left.

The headdress design is comprised of a three claw motif in the front and a series of six plain incised rectangles with rounded corners which proceed in parallel fashion back from it over the head. The three claws touch the top edge of the head band. This claw motif is similar to the claw headdress of SL 5. However the design on SL 5 has two series of three claw motifs and the claws overhang the head band. Furthermore, the designs of the back parts of the headdresses of these two heads are in no way similar, since the latticework of SL 5 implies an openwork cap while the parallel rectangles of LV 4 hint at a solid helmet.

The ear ornament of LV 4 is a large square with rounded corners. On the left side it is so eroded that it is impossible to discern what design, if any, was present within it. The central design of the right ear ornament is a relief cross whose ends meet the center of each side of the square. The outer edges of the ear ornament are notable for the fact that they consist of a double, rather than a single, line. The right ear ornament as a whole is reminiscent of a motif on the famous Humboldt celt (Coe 1965b:748, fig. 18). LV 4 is notable for the fact that it may not have had chin or cheek straps. No trace of a strap can be detected on the left side of the head, and the right side is too eroded to settle the question.

LV 4 is defaced only on the headdress area. Here there are many grooves all over the top, and a few pits without dimples toward the left front and right middle of the top. On the other hand, it has been severely damaged by erosion, particularly scaling. As noted above, the chin, ear areas, and portions of the face have been obliterated by natural causes.

In over-all view, LV 4 appears to be a minimally dressed boulder with a flattened back. The relief of its carving is low in comparison to many of the other heads, and in profile the head appears to be too wide in relation to its height to be completely naturalistic. In these and other features noted above, LV 4 bears a distinct similarity to LV 1. However, in the use of the claw motif and in the modeling of the lips, LV 4 parallels SL 5. Thus, while LV 1 and LV 4 are distinctive of a La Venta type, there is a relationship of these heads to those of San Lorenzo in certain artistic motifs.

Tres Zapotes Colossal Head No. 1

TZ 1 (pls. 11, 12a, 12b, 35) has been known in the literature for almost a century, having been first described by Melgar (1869) who called it "La Cabeza Colosal de Hueyapan." It is presently located in an open field about one kilometer northwest of the village of Tres Zapotes. The head lies on its left side, the result of a recent attempt to move it with a bulldozer to another location. Stirling (1943:17; 1965:734) refers to it as Tres Zapotes Monument A and states that excavation showed it to have originally been placed in front of the south mound of Group 1, facing north and resting upon a foundation consisting of a layer of unworked stone.

TZ 1 is relatively small in comparison with the other colossal heads, weighing about 7.8 tons. It stands 1.47 m in height and measures 5.49 m in circumference. The stone from which the head is fashioned is a coarse grained olivine and augite-rich basalt, much darker in appearance than that used for the La Venta and San Lorenzo heads. Large spheroidal boulders of this material may be found not more than 8 km distant from Tres Zapotes, on the slopes of Cerro El Vigía (Williams and Heizer 1965; Heizer, Smith and Williams 1965:102). Several of the monuments from Tres Zapotes are also made of this particular basalt, among these Monuments F, C, and 9. The Nestepe No. 1 colossal head (Williams and Heizer 1965:4) and the El Meson Stela (Covarrubias 1957, fig. 68) are also made of the El Vigía rock.

In terms of physical features, TZ 1 differs from the colossal heads at both La Venta and San Lorenzo. The nasion is triangular in shape and quite flat. The fat pads on either side of the nasion are sharply defined, flat, and angular. The eyes are set in well-defined sockets and are smaller, relatively, than those of the other heads. No iris is indicated. The upper eyelid overlaps the lower at both the inside and outside corners of the right eye, the latter corner being sharply pointed. We are uncertain about this feature on the left eye since it could not be seen at the time of our visit.

The nose is short and broad but not markedly flattened, and the tip is broken off. The upper lip also is somewhat damaged. It seems likely, however, that TZ 1 resembled NS 1 in lip form and that the upper lip was bow-shaped. The lower lip is straight. There is a slight ridge along the outer edge of the lower lip. The mouth is closed, and the chin is short and broad, with a deep indentation between the lower lip and the point of the chin.

In contrast to the well modeled character of the facial features, the ear of TZ 1 is quite stylized. It is outlined in low relief with only its most salient external features defined. The ear hole is represented by a short horizontal groove. The ear lobe is elongated and pierced by an ear ornament.

In general, the facial features of TZ 1 are well modeled. The cheekbones are clearly defined, as are the lines about the nose and mouth. In profile the face is orthognathous, in contrast to the prognathous character of several of the other heads, especially NS 1, which is geographically the nearest.

Turning to decorative elements, we first note the headgear. A plain cap, lacking in ornamentation, covers the dome of the skull. Two small notches are present on the lower front edge of the cap, on a line with the corners of the eyes. (A third notch, just to the right of the notch over the right eye, appears to be the result of recent damage as it is not present in earlier photos of the head.) A shallow U-shaped groove, varying from 13-15 cm in width and 2 cm deep, separates the head band from the cap. This groove narrows slightly at the front of the head. The head band is plain, uniform in width, and completely encircles the head, with the exception of the flattened area at the back.

The chin strap extends from the lower edge of the head band, passes in front of the ear and between the ear ornament and the cheek, and ends at the bottom edge of the head. The ear ornaments are cylindrical plugs or spools which pass through the ear lobes. They are roughly rectangular in shape, with slightly expanded forward ends. The leading edges are concave. On the right ear ornament there is an incised vertical line just ahead of the chin strap. Whether this feature is also present on the left ear plug we cannot say.

The back of TZ 1's head is flattened and bears a series of eight shallow, vertical, incised grooves. These extend from the top of the rear of the head to its base. They may be a stylized representation of hair, and if so, are similar to the braided strands of hair on the back of NS 1.

There has been little defacement of TZ 1. As noted above, the tip of the nose and part of the upper lip have been broken off. Stirling (1943:17) states that the left eye was mutilated, but is not specific as to the character of such damage. There are two V-shaped grooves on the head—a short one on the lower edge of the head band above the right chin strap, and a longer groove (79 cm long, 2 cm wide) running vertically up the back of the head from the right bottom edge. Finally, there are several nicks and scratches on the top of the headdress. These appear to be quite recent, and may have resulted from attempts to move the head.

Nestepe Colossal Head No. 1

The colossal head which is designated NS 1 (fig. 10, 11, 12a, 12b; pls. 13, 14, 15a, 15b) was first described and illustrated by Heizer, Smith and Williams (1965), who referred to it as Tres Zapotes No. 2. More recently Stirling (1965:733) has called it Monument Q, Tres Zapotes. Heizer and his associates (*ibid.*, 102) note that the head was not found in the immediate area of the Tres Zapotes site and that designations implying this to be the fact were probably in error. Although some confusion still exists as to its exact original location, we were informed in February, 1967, by residents of the village of Tres Zapotes, that the head was uncovered during bulldozing operations in a grove of royal palms on the west edge of a large flat-topped mound known locally as the Cerro Nestepe. This mound lies just east of the Arroyo de Hueyapan, about 3 km to the north of the village of Tres Zapotes. The Nestepe mound group apparently does not appear in the Stirling-Drucker sketch of the Tres Zapotes site (Stirling 1943, fig. 2). The distance separating the Nestepe from the Tres Zapote site would seem to indicate that the former is probably a separate site and should be so designated. For this reason we have now renamed the former Tres Zapotes No. 2 head as Nestepe No. 1 (NS 1).

It was reported to us by a Tres Zapotes villager that when discovered, NS 1 lay at the east edge of a large flat area, perhaps a court, almost completely buried. The head faced north. There is no information concerning the presence or absence of a base or platform such as that on which TZ 1 rested. Heizer, Smith and Williams (1965:102) state that the head was moved to its present location—the plaza of the village of Santiago Tuxtla—by the Presidente of the municipality in 1951, although the plaque at the base of head says (probably correctly) 1950. NS 1 is 1.4 m high, 4.9 m in circumference, and weighs about 8.5 tons. The stone from which the head is sculptured is similar to that of TZ 1 and probably came from Cerro El Vigía.

The physical features of NS 1 are similar to those of TZ 1. The nasion

is flat and triangular. The fatty pads above the eyes are also flat, although they arch more than do those of TZ 1. The relatively small eyes are set in well defined sockets and appear to bulge slightly; the iris is not represented. The upper eyelid overlaps the lower at the outer corners of the eyes, and the lids meet evenly at the inner corners. As in TZ 1, the outer corners are pointed.

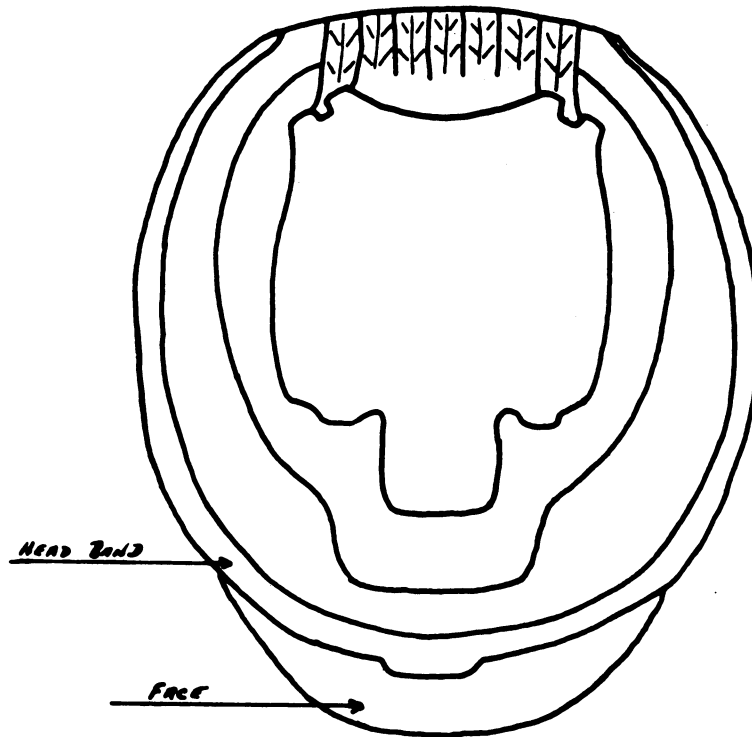
The nose of NS 1 is straighter in profile, and more pointed, than those of the other heads. The nostrils are drilled on a horizontal plane rather than being inclined. The upper lip is bow-shaped, and the lower lip is straight and markedly protruding. There is a raised ridge along the outside edge of the lower lip. The mouth is closed. There are two small circular pits at the corners of the mouth. The chin is not shown, perhaps because of lack of space on the boulder below the mouth.

The ears of NS 1 are not as stylized as those of TZ 1. The modeling of the exterior ear features is more realistic, and the rear edges are smoothly concave in contrast to the rectilinear quality of the ears of TZ 1. The ear holes are represented by small drilled pits. The lobes are pierced by the ear ornaments.

In regard to over-all facial features, NS 1 differs quite sharply from the other colossal heads. The protruding lower lip and the strongly prognathous character of the face are the major distinguishing features. The cheek bones are well-defined, and the lines about the nose and mouth are somewhat less accentuated than on TZ 1.

The headgear resembles that of TZ 1 in form, although differing in detail. The top of the headgear is made up of two distinct elements (see sketch on following page). The topmost element may be described as roughly rectangular, with a tongue flanked by two small projections extending from the front edge. At the rear corners of the rectangle are two notched projections. The second major element is ovate in shape, with the narrow end toward the front of the headgear. A pinched or waisted effect gives the narrow end of the element a tongue-like appearance.

Seven braided strands, probably representing hair, extend from beneath the rear edge of the headdress element, over the lower element, and down the back of the head to a point midway between the base of the head band and the bottom edge of the head. Each braid terminates in a button-and-tassel element. The head band is plain and narrows slightly toward the front of the head. There is a small rectangular projection on the lower edge of the band, directly over the nasion. As on TZ 1, the chin strap extends from the lower edge of the head band to the base of the head, passing under the ear ornament, next to the cheek. The ear ornaments are similar



Top of NS 1 (schematic). Head faces toward bottom of page.

to those on TZ 1, although the upper edge of the forward portion of the NS 1 ornament is slightly convex whereas the upper edge of the TZ 1 ear spool is straight.

There has been no apparent intentional defacement of NS 1. A large slab has been knocked off the lower left rear edge of the head, but it is impossible to determine whether this took place before or after the head was fashioned.

In summary, NS 1 is much like TZ 1 in several specific features. These shared traits include nasion, eye form, style of ear ornament, head band, and stone source. It differs in its marked degree of prognathism, nose form, and specific features of the headgear. On the basis of these similarities, and in spite of the differences, we feel justified in placing the NS 1 and TZ 1 heads in a single stylistic group, separate from the La Venta and San Lorenzo heads. Both are made of stone secured from the same locality about five miles distant.

San Lorenzo Colossal Head No. 1

SL 1 (figs. 13, 14, 15a, 15b; pls. 16, 17, 18a, 18b), one of the most impressive and the heaviest of all the heads, was known at the time of its discovery by Stirling (1947:159) as "El Rey." It was found lying face up on the side of a steep ravine some 300 yards to the southeast of the principal mound group (ibid. 1955:9-11).

The head weighs 25.3 tons, is 2.85 m high, has a circumference of 5.9 m, and a frontal breadth of 2.11 m. The stone from which the piece was carved was from the Cerro Cintepec basalt source (Williams and Heizer 1965: 16-17).

In terms of physical features, SL 1 seems to bear a subjective similarity to the other heads from San Lorenzo. The nasion is of the subrhomboidal type, and exhibits pronounced fatty pads on either side. The eyes are relatively large, and, being set at more of an angle, thus appear to be more slanted than those of the other heads. Both eyes exhibit an iris in raised relief. Both inner eye corners have tear ducts, while the outer eye corners come together at a point and do not overlap. The nose is flattish and well executed, and is interesting because of the drilled pits which are present on the upper side of the nares (see below). The mouth is open, with no teeth showing, and the upper and lower lips are executed as bow-shaped, with narrow raised ridges on upper and lower borders (pl. 34). A round pit is drilled into either mouth corner at a slightly offset angle, aiming, as it were, into the fleshy portions of the lower face to the sides of the mouth. Both ears are present, and are probably the most realistically executed ears of the twelve colossal heads. A prominent chin is shown between heavy jowls which sag at either side.

The head of SL 1 is decorated with a sectioned head band which is tipped back slightly. A curvilinear subrectangle appears in relief on the front, directly over the nasion. This element is apparently in geometric and decorative relation to the U-shaped element, with a quadripartite bottom division which appears directly above it on the headgear. At the back of the head band, on the flat part of the rear of the head, is a knot like the one on SL 2.

The head band is separated from the remainder of the headgear above it by a shallow groove. The decoration of the headgear is weighted toward the front, with the lines of the U-shaped element running parallel over the top of the head and terminating in a subtrapezoid toward the rear. An abbreviated chin strap appears on each side of the head, extending from the head band and ending below an ear plug shown in profile.

Purposeful defacement of SL 1 consists of a number of pits with dimples which have been ground into the face to depths up to 3 cm. A pair of these pits appear to have been symmetrically placed, one on the side of either nostril. A less visible, and perhaps modified, pit with a dimple is present in the center cavity of each ear. The placement of these pits in the ears is consistent enough with the anatomy depicted to suggest that, at least in this case, such pits were used as part of the original sculptural fashioning of the stone.

In general appearance, SL 1 is rather broad in frontal view, and slightly more long and domed in profile appearance than the other San Lorenzo heads. This effect is due to the extensive flattened area on the back of the piece, which, although it has been damaged and recently repaired, still shows signs of originally having been horizontally scored or striated in the flattening process. The heavy jowls, somewhat protruding at the sides of the mouth, tend to subordinate the chin, giving SL 1 the appearance of having an underslung jaw. Such physical variations as this, within the sample of twelve heads, lend themselves to the interpretation of the heads as individualized portraits.

San Lorenzo Colossal Head No. 2

When discovered, SL 2 (figs. 16, 17a, 17b, 18a, 18b; pls. 19, 20, 21a, 21b) was lying on its back, totally buried, on a trail leading south from Tenochtitlán (Stirling 1955:10). The stone from which it is made, like that of the other San Lorenzo pieces, comes from Cerro Cintepec.

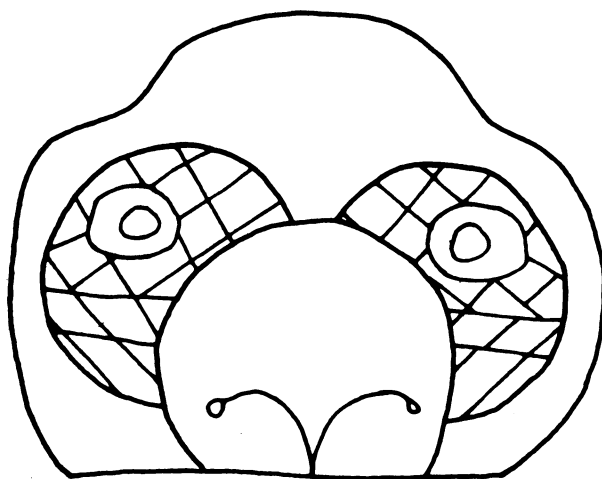
SL 2 weighs 20 tons, is 2.69 m in height, and has a circumference of 5.44 m. The frontal breadth of the piece is roughly 1.83 m, while the thickness is approximately 1.5 m.

Physically, with its heavy, sagging jowls and distinct, somewhat pointed chin, the piece bears a rough resemblance to SL 1. The nasion is of the subrhomboidal type and seems to have large fatty pads on either side. However, these have been somewhat obscured by weathering of the specimen. Both eyes have the iris depicted by flattening of the appropriate surface area, the right eye displaying this feature much more distinctly than the left. The corners of both eyes are pointed; in the inner corners, the upper eyelid overlaps the lower, while at the outer corners no overlap is apparent.

The nose is broad and flat, and the openings of each nostril appear as ground out bean-shaped depressions on either side of the rather wide septum. The mouth is open and shows four faintly distinguishable teeth.

Both upper and lower lips are eroded and damaged, but it would appear that the upper lip was probably sculptured in the shape of a shallow, inverted-U or a bow, while the lower lip was probably straight and without a great deal of modeling. There is no evidence at the corners of the mouth of the distinctive circular drilled pits which characterize a number of the heads, but there are bean-shaped depressions which were obviously made by grinding.

The head band is placed on the head at a slightly oblique angle, and is decorated with three zoomorphic elements in appliqué. These are probably stylized parrot heads (see figure) and are positioned directly in the front center and on the two front temporal sections of the head band. Parrot, or possibly owl, heads have been found on sculptures in other areas of Mesoamerica, especially Teotihuacán (Bernal 1963:48). Moreover, bird motifs, mainly of raptorial species, are not uncommon to Olmec art (Drucker 1952:194-195; Coe 1965c:14). In fact, there is no reason to assume that the three-clawed elements in the SL 5 and LV 4 headdresses are not bird claws rather than jaguar claws, as is usually assumed.



Reconstruction of parrot head on center of SL 2 head band.

A knot, very similar to the one on SL 1 appears on the flat back of SL 2. It is placed slightly to the left of center.

The head band appears to be directly attached to the remainder of the headgear, which appears as a lattice of cross-hatched bands, evenly distributed over the entire head above the head band. The chin straps are abbreviated and end slightly above the ornaments which decorate each ear. These ear

plugs appear as squares with holes, the left square divided by a number of indistinct straight lines and the right square apparently undecorated.

Several types of purposeful defacements may be seen on SL 2. On the front of the face there are a number of the curious drilled pits with dimples. These appear on the face itself, as well as on the front of the head band. Some of these pits appear to have been arranged in a crude sort of bilateral symmetry, with one member of each pair appearing in the same position on either side of the face.

An L-shaped gouge some 4.8 cm in depth, and apparently purposefully inflicted, appears on the head band above the right ear of SL 2. Most peculiar of all the defacements are the seven large rectangular cavities or squarish pits which have been excavated in the flat back of the head. These appear to have been carved out as units, and range from 2.5 to 14.4 cm in depth. There has been some speculation concerning their possible function, but in themselves they seem to afford no clues. Similar defacements appear on San Lorenzo Monument 14 and La Venta Altar 4.

In frontal view, SL 2 is rather broad-faced and resembles SL 1. From the side, SL 2 does not appear as long as SL 1, but it exhibits an impression of squareness or depth. The back of the piece is remarkably flat, and horizontal striations are plainly visible. It would appear that the flattening was done after the excavation of the seven large rectangular cavities referred to above. If anything, this discounts the possibility of their ritual or religious use during the carving of the heads, since the flattening of the back was the final stage in the completion of all the heads.

San Lorenzo Colossal Head No. 3

SL 3 (figs. 19, 20, 21a, 21b; pls. 22, 23, 24a, 24b, 33a) was discovered lying face down on the side of a ravine not far from the other San Lorenzo heads (Stirling 1955:11). Stirling (1965:735) points out that this, as well as the other five San Lorenzo colossal heads, had anciently been removed from its original position and been dumped down into the ravine. It is smaller than the first two San Lorenzo heads reported here, weighing 9.4 short tons. It is 1.78 m in height and 4.02 m in circumference. It has a frontal breadth of 1.63 m, and is 0.95 m thick. The basalt for this head also came from Cerro Cintepec.

Like the other colossal heads, SL 3 has no eyebrows. The nasion, unlike SL 1 and SL 2, is of the double variety, and the fatty pads present

on the latter two heads are absent on SL 3.

Iris are visible in both eyes; they are flattened by pecking and surrounded by an incised line. The outer eye corners show tear ducts and the eyelids meet at a point, while in the inner corners of both eyes the upper eyelid overlaps the lower. The mouth is open, with slightly parted lips, but no teeth are shown. The upper lip is bow-shaped; the shape of the lower lip is uncertain due to its having been damaged. No circular drilled pits are now apparent in the corners of the mouth nor in the area of the nostril holes. SL 3 displays a prominent chin and cheeks, but somewhat subdued jowls.

The head band is composed of four horizontal, parallel bands of equal diameter (pl. 33a). The bands are plain and set on the head at a slightly tilted angle, the front higher than the back. They are sectioned, or divided, by a number of short, straight, diagonal incisions which give the whole head-piece the appearance of being twined. No decorative elements which show appliqué are present. The back of the head is rather worn, but enough remains to determine that no indication of a knot, such as occurs on SL 1 and SL 2, is present. The upper portion of the headgear appears to be a continuation of the head band, with a cap of twined cord or rope apparent toward the top of the head. A geometric design, consisting of three or four diagonally continuous small triangles, appears on the headdress. Four parallel vertical bands hang from either side of the headdress, overlapping the head band, covering the ear area, and possibly serving as a complete chin strap. Due to weathering, it is impossible to be certain of this last point. In general, the headgear elements are evenly distributed and symmetrical in relation to the entire figure.

Defacement of SL 3 consists of a number of circular drilled pits with a dimple in the center of each. These are placed above the lower limit of the head band and on the front and top of the head. No symmetry is apparent in the placing of these pits.

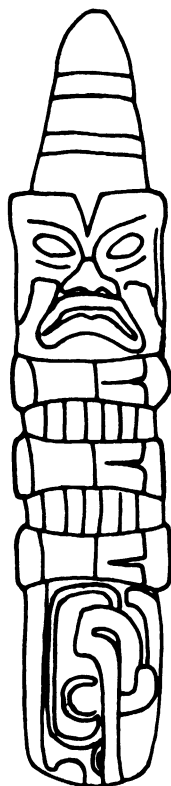
In general appearance, SL 3 is unusual in that, from a frontal view, it appears to be almost pointed at the bottom and heart-shaped in general as a result of the pointed chin and lack of imposing jowls. In profile view, the head appears to be small and flat. This is due to the reduced facial relief and the extreme flatness of the back. As with the other San Lorenzo heads, horizontal smoothing grooves are visible in the back of the sculpture.

San Lorenzo Colossal Head No. 4

SL 4 (figs. 22, 23, 24a, 24b; pls. 25, 26, 27a, 27b) was discovered by Stirling during his field work in 1946. It was lying buried on its right side in the jungle some "600 yards northwest of the main mound" (Stirling 1955:11, pl. 9). Weighing six short tons, this piece is the lightest of all the known colossal heads. Its stand 1.78 m high, has a circumference of 3.8 m, a frontal breadth of 1.17 m, and a depth of 0.95 m. The source of the stone used for this head was Cerro Cintepec.

The nasion of SL 4 is subrhomboidal, with an incised subtriangle prominently visible in the center. An iris is present in both eyes, made by flattening of the iris area and circumscribing with a shallow incised line. Each eye has relatively rounded inner and outer corners. The upper and lower eyelids are flat and wide, making the face appear to have pouches under the eyes. The nose is massive and well executed, the nostrils having been made by drilling round pits into the stone and then modifying them by pecking. The mouth is open and there are no teeth showing. The lips are quite well preserved, the upper being curled into a bow-shape, and the lower being thick and relatively straight. Round pits modified by grinding appear in both corners of the mouth. The chin is small yet noticeable, and is surrounded by the rather puffy, or fleshy, portions of the jowls. One ear, the right one, is present on the sculpture. It has suffered a good deal of weathering, but is nonetheless interesting as it contains a circular drilled pit in its center, obviously intended as part of the general sculptural treatment of the stone.

The head band in the left front and right side areas of SL 4 appears as four parallel horizontal bands, sectioned with diagonal incisions and giving an over-all twined appearance. On the right front section the head band is overlapped by another portion of the headgear consisting of eight vertical parallel bands, divided into three groups, each of which hangs from a circular element near the top of the head in a manner suggesting that the bands represent hair. The chin strap on the right side of the face consists of two vertical bands with diagonal incising, similar to the elements which make up the head band and probably representing a downward extension of it. On the left side of the head, where the ear is covered, three clip-like elements occur, suggesting, perhaps, some sort of decoration worn in the hair. These are almost identical to the elements on the front of a carved stone "celt" now in the Villahermosa Museum (illustrated on page 39). Westheim (1965, pl. 47) erroneously ascribes this specimen to the La Venta site and incorrectly labels it a "ceremonial knife." From the right ear of SL 4 hangs an ornament consisting of an undecorated disc, below which is a tassel very similar to those on either ear of SL 5.



Elaborately carved "celt" from Ejido Ojoshal, Municipio Cardenas, Tabasco (near Sanchez Magallanes). Length ca. 9 inches; material, a very dense, hard black stone. Now in Museo Regional, Villahermosa.

Deliberate defacement of SL 4 consists of some twenty-five drilled pits with dimples placed unevenly on the flattened portion of the back part of the head. It is of interest that there is no defacement on any other portion of the piece.

In general appearance, SL 4 is broad-faced and exhibits a rather high domed head. The face is very finely sculptured, with a delicate and natural approach to detail. The headgear is executed in a much more angular style than in the other San Lorenzo heads, with detail decreasing on the sides as one moves toward the rear. It would therefore appear that the head was made to be viewed full-face, or nearly so, as the profiles present a somewhat incomplete appearance.

San Lorenzo Colossal Head No. 5

SL 5 (figs. 25, 26, 27, 28; pls. 28, 29, 30, 31) was discovered in a ravine south of the main mound, lying on its face (Stirling 1955:12). The head weighs 11.6 short tons and is 1.86 m high. (When on exhibit at the Los Angeles County Museum of Art in the Fall of 1964, it was erroneously reported as weighing only 6 tons.) It has a circumference of 4.6 m, a frontal breadth of 1.47 m, and a thickness of 1.15 m. The basalt from which the head is carved is from the Cerro Cintepec source.

The nasion is of the subrhomboidal variety and displays massive fatty pads on either side. These pads are much more angular than those of the other heads with such pads, especially SL 1, whose pads give the appearance of having been molded much more softly. Both of the eyes of SL 5 display irises depicted by having been incised and flattened in the same manner as those of SL 2, SL 3, and SL 4. The outer corners of the eyes are rather pointed and show no overlap of either upper or lower lid. The inner corners show tear ducts. The upper eyelids appear more fleshy and swollen than those of the other heads. The nose is large and flat, and the nostrils are circular pits without dimples. The mouth is open but no teeth are displayed. The upper lip is bow-shaped and slightly damaged in the center. The lower lip is also bow-shaped. Drilled circular pits are present in the mouth corners. These pits are without dimples and are positioned at oblique angles to the lips, pointing, as it were, slightly outward. The chin is pointed and round, and has a drilled pit with a dimple directly in its center. This positioning suggests that it is a decorative feature. Both ears are present, although neither one is done with a delicacy and modeling equal to that of the facial features. The jowls are massive, giving the face a very square and harsh appearance.

The head band, although somewhat eroded, appears as a series of curvilinear sections. On the front, there is an inverted V-cleft directly over the nasion. The band is seated on the head at an oblique angle, tipped slightly above the horizontal toward the front of the head. Overlapping the front of the head band from the upper part of the headgear are two three-clawed elements which are thought by some to be jaguar claws (Stirling 1955: 12), but which, in our opinion, may be bird claws. These claw elements constitute the front portion of the headdress. The remainder consists of a pattern of cross-hatching or latticework, perhaps intended to represent pieces attached by sewing to the body of the upper headgear. Geometric design elements are present in the form of circular incisions on the sides and back of the headdress. In general, the decoration is weighted toward the front. The head band of SL 5 appears to be wider than that of any of the other heads, and is probably an integral part of the more decorative portion of the headgear above it. The chin straps are abbreviated and undecorated.

Covering the lobe of each ear is a disc with a tassel trailing beneath it. This same type of lobe plug is present on one ear of SL 4.

The only marks of purposeful defacement on SL 5 are two drilled circular pits with dimples on the face. One, as noted above, is placed in the center of the chin; the other is located just below the outside corner of the right eye. The back of the head is wholly free of defacement.

Considering its general appearance, it would seem that SL 5 was intended to be viewed from all angles. This is indicated by the fact that the head band continues all the way around the head, and also by the presence of decoration over the entire area covered by the helmet or headgear, including the back and sides. The head is angular and stern in appearance. The large jowls, squared off near the bottom, contribute to the massive effect of the full-face view. In profile, the back of the head appears flat, and, indeed, has been deliberately flattened by horizontal striations. The chin appears to protrude beyond the jowls and is slightly forward of the prominent cheek bones, giving the appearance that the head tends toward prognathism.

San Lorenzo Colossal Head No. 6

The designation SL 6 has been assigned to the most recently discovered of the colossal heads at San Lorenzo (fig. 29; pls. 32, 36). This head was first described by Aveleyra (1965:12-14), and was found buried face down on the slope of a ravine to the west of the ceremonial zone. M. Coe (1966:3) designates the head as Monument 17.

SL 6 still lies half-buried in the ravine where it was first found. All the other San Lorenzo heads have been removed from the site. It weighs between eight and ten short tons (Aveleyra 1965:14). It is 1.67 m high, 1.26 m wide, and 1.41 m long. It is believed that the basalt for this sculpture, like that of the other San Lorenzo heads, came from Cerro Cintepéc (H. Williams, personal communication).

SL 6 displays a double nasion, roughly resembling a divided rectangle. Both eyes exhibit irises which are indicated by incised grooves. It is interesting to note that in this head the iris does not consist of a full circle; instead the eyelids truncate top and bottom of the iris, giving the impression that the eye is partially closed. The pupil does not seem to be as flattened as on the other heads from this site. The upper eyelid overlaps the lower one at both the inner and outer corners. Both corners are slightly pointed.



Truncated iris in eye of San Lorenzo No. 6

The nose is wide and very flat in profile. A drilled circular pit with a dimple appears directly in the center of the bridge. The nostrils consist of ground circular pits without dimples. The mouth is open, with no teeth showing. It is difficult to determine the precise shape of the lips as Aveleyra's photographs (1965, photos 18, 19) do not stress this detail, and when the present authors saw the head in February, 1967, it was still half buried. Circular drilled pits are present in the corners of the mouth. They are drilled straight back into the mouth. The ear on the right side is relatively well executed. The cheeks are unusual in that they are extremely flattened and thus exhibit a peculiar stylization not present in the cheeks of any of the other colossal heads.

The head band is placed horizontally on the head and is characterized by an unusual flatness in front. The frontal portion is divided into two sections by a vertically incised line directly over the nasion. The portion of the head band beginning above the right ear and extending to the rear of the head is sectioned into four parallel corded or twined bands. These are quite similar to the quadripartite bands on the headdress of SL 4. The remainder of the head band is not elaborately adorned, and there is no knot present at the back. The rest of the headgear of SL 6 appears to be a series of cross-hatched lattices with some large circular elements containing small depressed interior circles present. The chin strap is undecorated and extends the full length of the face. An ear ornament of roughly cylindrical shape is attached to the lobe of the right ear. It is very similar to the ear spools on TZ 1.

There is very little purposeful defacement present on the exposed portion of SL 6. The only apparent defacements are three drilled pits with dimples on the face. As noted above, one of these is in the center of the bridge of the nose, and the other two are placed next to each other just under the right eye. It is of interest that a single similar pit appears in roughly the same position on SL 5.

The most interesting aspect of the general appearance of SL 6 is the use of flattening to achieve sculptural effect. The front of the head band, the nose, the cheeks, and to some degree, the lips, appear as very flat.

This is striking in full front view as well as in profile. Of all the heads, SL 6 appears to be closest to the stylized anthropomorphic jaguars common in portable Olmec art. The everted lips, the flat face, and the narrowness of the integumentary upper lip (in this case 3.5 cm, the narrowest of all the colossal heads) all contribute to this effect.

STYLISTIC COMPARISON OF THE TWELVE COLOSSAL HEADS

Interest has been aroused in recent years in the possibility of seriating the Olmec colossal heads, with the intention of arriving at some sort of chronological scale upon which they could be relatively placed. This interest may have been generated by the fact that until recently only one of the sites at which the heads occur (La Venta) has been adequately dated (Berger, Graham and Heizer 1967). Since these dates are earlier than a number of scholars had expected, the relative dating of two other important Olmec sites has become a matter of prime interest, and seriation of the colossal heads provides one means of guessing at such a relative dating. The heads have the added advantage—especially for art historians—of inherently implying certain developmental traits, so that not only could sites be relatively dated but the whole ontogeny of Olmec art could be hinted at through their typology (Kubler 1962:65-69).

Another factor which may have prompted attempts at seriation was the obvious similarity which the heads at any given site bear to each other. So striking are these resemblances that even a comparatively untrained eye is quickly able to identify the site of origin of a head on subjective impression alone. This subjective impression has a basis in empirical fact. For example, one need not be an anthropologist or art historian to immediately recognize that the La Venta heads are much more weathered and eroded than the others, or that the Tres Zapotes heads appear to have been sculptured from a different, more darkly colored stone than the heads from La Venta and San Lorenzo. Unfortunately, such observation, albeit grounded in fact, imparts little of the chronological, cultural, and technical information that we would like to have for the Olmec heads.

George Kubler (1962:65-69) was the first scholar to attempt a serious seriation of the heads. Before him, Miguel Covarrubias (1957:79-83) had fitted them as a group into a general developmental scheme of Olmec art. Kubler's seriation is based upon a rough grouping of the heads by shape. He classes TZ 1 and LV 1 as round and early. LV 2, LV 3, LV 4, and SL 2, as a group, occupy a middle position in the sequence. Although LV 3 and SL 2 are long-headed and LV 2 and LV 4 are round-headed, the group is given cohesion by the fact that all four exhibit "parted lips" (Kubler 1962:67). Kubler's third group, dating latest in the series, includes one round head (SL 3) and three long heads (SL 1, SL 4, and SL 5).

Kubler's categories are based upon a subjective impression of each head. As the following grouping of the individual colossal heads makes apparent, subjective evaluations of "round-headed" as opposed to "long-

headed" are often influenced by such factors as the position or angle from which the observer views the sculpture. In fact, any seriation based upon such an impressionistic approach is likely to measure nothing more than the positions from which the observations were made. In an attempt to quantify Kubler's approach to the seriation problem, we have calculated the length of each individual head, divided by the height. The results are shown in Table 1 and in Graph 1, and express head shape in mathematical ratios.

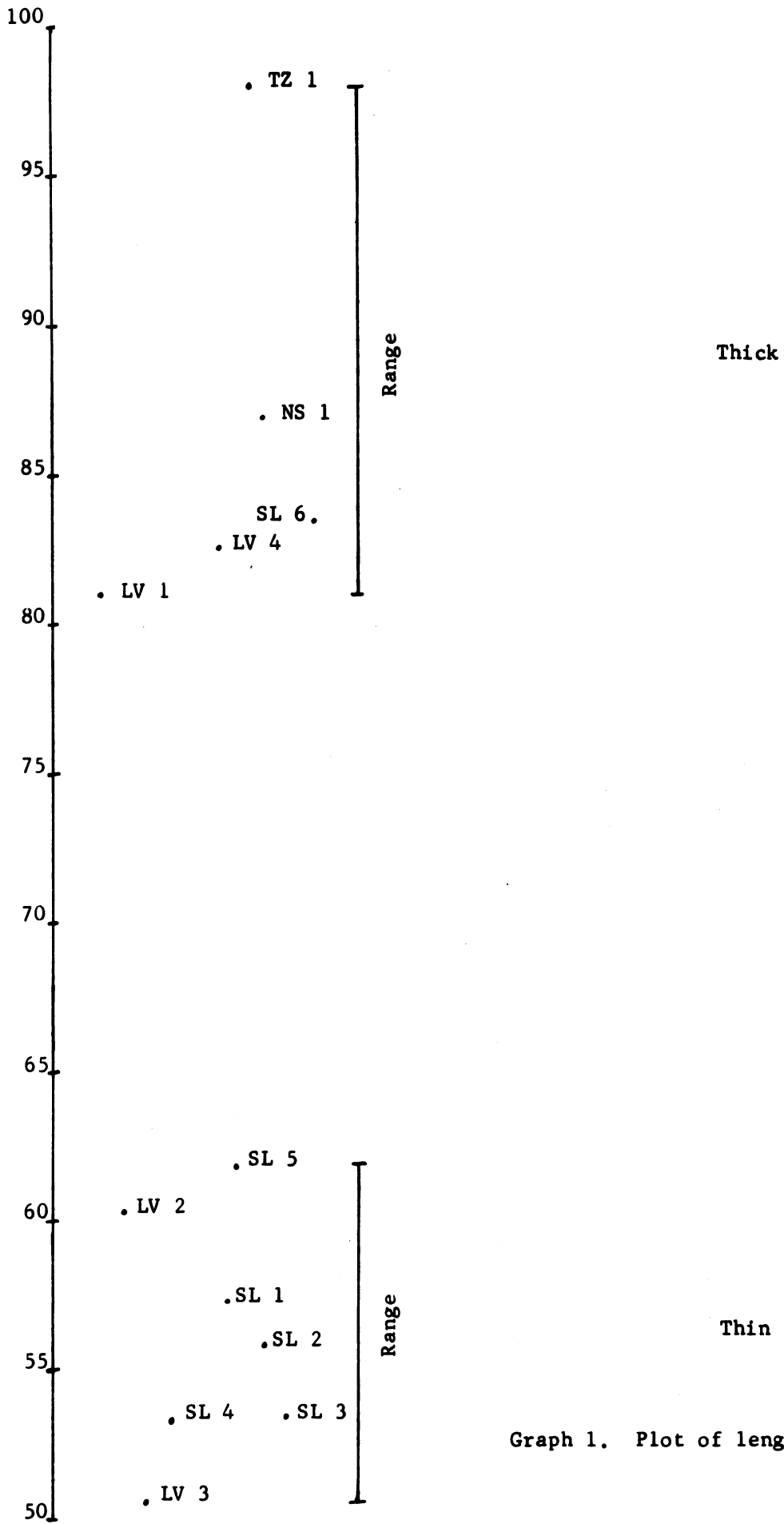
Table 1
Profile Ratios of Head Shapes
(in cm)

	La Venta				NS	TZ	San Lorenzo					
	1	2	3	4	1	1	1	2	3	4	5	6
Length	195	98	100	186	126	145	163	150	95	95	115	141
Height	241	163	198	226	145	147	285	269	178	178	186	167
Ratio	.809	.601	.505	.823	.869	.980	.572	.558	.534	.534	.618	.844

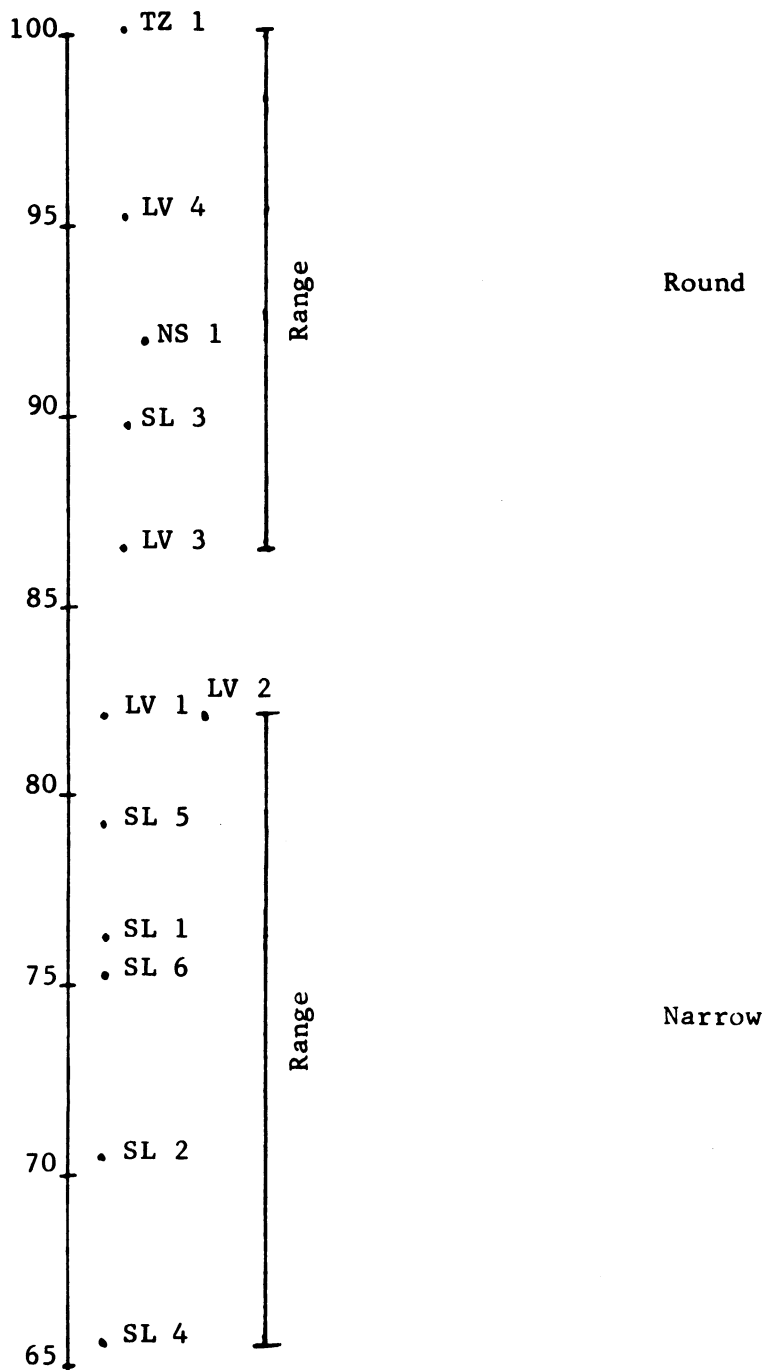
The figures in Table 1 and Graph 1 indicate that, from a profile view, there are two groupings of heads. LV 1, LV 4, NS 1, TZ 1, and SL 6 are all relatively "thick," or round, heads. Their ratios range between .809 and .980. LV 2, LV 3, SL 1, SL 2, SL 3, SL 4, and SL 5 are all relatively "thin," or long, heads, with ratios ranging between .505 and .618. Considering that Kubler was unaware of the existence of NS 1 and SL 6, it is of interest that in only one case, that of LV 2, is there a disagreement between Kubler's estimate and our figures. He feels that LV 2 is round-headed, while we consider that it clearly falls into the "thin," or long-headed, category. Our groupings are compared with Kubler's in Table 2.

Table 2
Comparison of Kubler's Head Types with Those of Present Authors

	Round	Long
Kubler	LV 1, LV 2, LV 4, TZ 1, SL 3	LV 3, SL 1, SL 2, SL 4, SL 5
This paper	LV 1, LV 4, TZ 1, NS 1, SL 6	LV 2, LV 3, SL 1, SL 2, SL 3, SL 4, SL 5



Graph 1. Plot of length/height ratio



Graph 2. Plot of breadth/height ratio

Unfortunately, the correspondence between our grouping and Kubler's holds only so long as we are considering a profile view of the heads. If we take a frontal view of the sculptures, and divide the frontal breadth, measured between temporals, by the height, we are presented with ratios that give us an entirely different grouping. As Table 3 and Graph 2 indicate, LV 3, LV 4, NS 1, TZ 1, and SL 3 fall into the extreme group of round heads, while the remaining heads can be categorized as more or less long. The groupings are summarized in Table 4.

Table 3
Frontal View Ratios of Head Shapes
(in cm)

	La Venta				NS	TZ	San Lorenzo					
	1	2	3	4	1	1	1	2	3	4	5	6
Frontal width	208	135	160	198	134	150	217	190	160	117	147	126
Height	241	163	198	208	145	147	285	269	178	178	186	167
Ratio	.821	.822	.869	.952	.924	1.02	.761	.706	.899	.657	.790	.754

Table 4
Groupings by Head Shape, Frontal View

Round		Long
LV 3, LV 4, NS 1, TZ 1, SL 3		LV 1, LV 2, SL 1, SL 2, SL 4, SL 5, SL 6

Thus we can justify quantitatively our earlier statement that subjective impressions are often a result of the observer's viewing angle. This is particularly evident in the wild fluctuation presented in the two ratios of SL 3. As Tables 1 and 3 indicate, SL 3 varies between .534 in profile to .899 in frontal view, the difference being entirely accounted for by the change in the position of observation. It is probable that Kubler's designation of "long heads" was derived from a consideration of the heads in profile. The same description might obtain from a bird's-eye or top view of the heads, but certainly not from a full-face assessment.

Even if we were not faced with this type of difficulty in a subjective approach to grouping the heads, such categories—head shape in particular—are ambivalent as to the types of cultural inferences they allow the investigator to make.

Let us assume for a moment that the groupings of heads by shape did not vary according to the position from which they were viewed. That is, let us consider the twelve heads as neatly segregated into two groups—one round and the other relatively thin in appearance. What, then, would this mean in terms of cultural differences? Is it to be assumed that we are dealing with two distinct ethnic types? Or is the grouping due to a difference in the ideal standard of beauty, or in the stylistic preference of different groups of artists? Could the apparent differences in head shape be nothing more than a function of the size and shape of the original boulders available to a given group of sculptors? Do these differences, and the reasons for them, actually register temporal trends? Or are they a reflection of varied technological or artistic ability on a synchronic level? Obviously, a satisfactory answer to any of these questions would require use of evidence other than that provided in a subjective segregation of the heads by shape; a number of the decorative and stylistic elements appearing on the heads should also be considered. In addition, certain assumptions might be made dealing with the types of inferences one would hope to gain in a consideration of the various decorative elements represented in the heads.

In the discussion which follows we have assumed that there are two basic types of inferences which can be made regarding Olmec culture on the basis of the various elements, and groupings thereof, which are represented in the heads themselves. The first level of inference is derived immediately from empirical description, and is concerned with objective identification of features which relate directly to the physical appearance of the entity or individual portrayed in the sculpture. This would include such elements as type of headgear, shape of nasion, ear ornament, etc. In other words, this level of inference is one which assumes that the sculpture constitutes a relatively accurate portrayal of a real cultural element, and that the element as depicted in the sculpture is used in the same way as it was in the real life model from which it was copied. For example, we would assume that at least one person in Olmec society actually wore ear lobe plugs such as those which we see carved on SL 1.

The second type of inference is one which allows us to make statements which reflect not so much upon the particular head or heads under consideration as upon the artist or artists responsible for the production of the heads. For example, as we explain below, there are three different ways in which the iris within the eyeball is depicted in the twelve indi-

vidual heads. Since we can assume that all eyeballs of living bearers of Olmec culture were, for all practical purposes, anatomically identical, it follows that these three modes of representation are a result of at least three different sculptural techniques for portraying irises available to Olmec sculptors during the period in which the colossal heads were carved.

We first group the heads according to elements which afford us a direct inference about the object portrayed:

Ear ornaments. As Table 5 shows in summary form, the heads may be divided into five rough groups on the basis of ear ornaments. LV 1 is unique in having a diamond-shaped ear ornament, the exact details of which are difficult to discern because of weathering. It is in all likelihood a severely stylized Kan cross, an element which occurs on LV 4 and elsewhere in Olmec art (Coe 1965b:761, fig. 43g). The ears of SL 3 are covered by extensions from the headgear, and the same is true of the left ear of SL 4. The three remaining groups, however, are of greater significance and interest. Tapered cylindrical lobe plugs are found in TZ 1, NS 1, SL 1, and SL 6. It is worth noting that all of these sculptures, with the single exception of SL 1, fall into the category of "thick" heads in profile, as shown in Graph 1. This fact implies that there was more horizontal space available on the lower part of the head for use in depicting ear ornaments, which tend to be horizontally rather than vertically oriented. It is tempting to postulate in this regard that the type of ear ornament portrayed on at least some of the heads was dictated not so much by ritual or rank of the personage portrayed as it was a correlate of the space available on the various boulders utilized. Circular ear plugs are found on LV 3, LV 4, and S 2, while SL 4, SL 5, and LV 2 display the ear button and tassel element.

Table 5
Ear Ornaments

Oblong Cylinders	Circular Spools	Disc and Tassel	Diamond-shaped Spool	Ears Covered by Headgear Extensions
TZ 1, NS 1, SL 1, SL 6	LV 3, LV 4, SL 2	SL 4, SL 5, LV 2	LV 1	SL 3, SL 4 (left)

There are two additional points worth noting about the ear ornaments as we have grouped them. First, observe that the groups may contain members from Tres Zapotes, Nestepe, and San Lorenzo, or from San Lorenzo and La Venta. However, in this particular set of groupings, we find no sharing of

ear ornament features between Tres Zapotes, Nestepe, and La Venta.

Second, note that the ear ornaments which are represented are not in any way unusual for Mesoamerican ear ornaments. This fact may provide us with some insights when we consider the problem of exactly what kind of personage is represented by each head.

Decorative elements on headdresses. Next we shall consider decorative elements on the headdress or helmet. As shown in Table 6, there are five decorative elements by which we are able to group most of the heads. Some of the heads appear in more than one group, while others do not appear at all. LV 2 and LV 3 are not listed as they are too badly defaced to permit identification of design elements in the headgear. TZ 1 and NS 1 are almost identical in having plain cap-like helmets, and these are not noted here. We have grouped LV 1 and SL 1 together on the basis of the possession by both of a U-shaped element on the front of the headdress. This element is a relatively well known Olmec motif and has been commented upon elsewhere (Drucker 1952:204; Coe 1965b:759, fig. 43d). LV 4 and SL 5 have been grouped together because they both exhibit a claw element, LV 4 displaying one large three-clawed motif on the frontal section of the headband, and SL 5 showing two smaller three-clawed designs, one over each temporal area of the headdress above the head band. These have been referred to by Stirling (1955:12) as jaguar claw motifs. It is of interest that the U-shaped elements in the previous group (i.e. LV 1 and SL 1) are considered by Drucker (1952:204) and Smith (1963:138) to be stylized jaguar mouth forms. Knowing the high importance of the jaguar in Olmec cosmology (Drucker 1952; Coe 1965c:14), we do not find it surprising that jaguar-related elements occur in some of the headdresses of the Olmec colossal heads.

Table 6

Headgear Decorative Elements

U-shaped Element on Head	Claw Element on Head	Knots on Back	Cross- hatching	Four-part Braid
LV 1, SL 1	LV 4, SL 5	SL 1, SL 2	SL 2, SL 5, SL 6	SL 3, SL 4, SL 6

SL 1 and SL 2 are grouped together since they share a distinctive knot element at the rear of their head bands. The knot gives the impression

that the head band is a strip of cloth tied in the back. A similar knot appears on a breechclout on Monument 23, La Venta (Drucker, Heizer and Squier 1959, pl. 52). Crosshatching is present on the headdresses of SL 2, SL 5, and SL 6, and on this account they are grouped together in Table 6. A four-part braided element, possibly hair or some type of twisted rope or cord, appears in one form or another on SL 3, SL 4, and SL 6. If this element does represent rope or cord, we would say that SL 6 exhibits a left-hand twist, SL 3 a right-hand twist, and SL 4 depicts both types of twist. These are the smallest of the heads from San Lorenzo and, as following sections reveal, they tend to draw together repeatedly through related characteristics.

Chin straps. Chin straps on the headgear may be divided into two types: full, and abbreviated. TZ 1, NS 1, SL 4, and SL 6 show full chin straps; while LV 1, LV 2, LV 3, SL 1, SL 2, and SL 5 have abbreviated ones. Chin straps appear to be altogether absent on SL 3, while LV 4 is too eroded to make designation possible. Notice that here again neither TZ 1 nor NS 1 is grouped with any of the heads from La Venta; and also, that SL 4 and SL 6 are grouped together. These results are summarized in Table 7.

Table 7
Chin Straps

Full	Abbreviated	Absent	Indeterminate
TZ 1, NS 1, SL 4, SL 6	LV 1, LV 2, LV 3, SL 1, SL 2, SL 5	SL 3	LV 4

Nasions. In addition to the decorative elements discussed above, we have chosen to assume that the nasion feature is one which provides a more or less accurate rendition of what the artist actually saw as he carved the large heads. We realize that a good deal of stylization may be present in this element; if so, then we need merely to add it to the categories discussed below to obtain a different sort of inference than the one we presently choose to draw. Our conclusions will not be altered if the nasions should be regarded as artistic conventions rather than faithful representations of live Olmec models.

The nasions fall into three categories, as shown in Table 8. LV 1, LV 2, LV 4, SL 1, SL 2, SL 4, and SL 5 have roughly subrhomboidal nasions.

LV 3, SL 3, and SL 6 each have a double nasion. Triangular nasions are found on TZ 1 and NS 1. These groupings show a continuing empirical tendency for the Tres Zapotes and Nestepe heads to associate as a unit. Moreover, the La Venta heads again appear to group with the San Lorenzo, but not with the Tres Zapotes or Nestepe, sculptures.

Table 8

Nasions

Subrhomboidal	Double	Triangular
LV 1, LV 2, LV 4, SL 1, SL 2, SL 4, SL 5	LV 3, SL 3, SL 6	TZ 1, NS 1

When we examine the heads for possible groupings on the basis of categories which provide us with our second type of inference—about the artist, his view of society, and his handling of his materials—we note that some of the trends found in the first series of element groupings are also present here. Our consideration of the sources from which the stone for the heads was obtained is an excellent example.

Stone source. As may be noted in Table 9, there were three sources for the stone used in the Olmec colossal heads. One of these was the "peak formerly called Cerro Santiago but now known as Cerro El Vigía" (Williams and Heizer 1965:4). This extinct Pliocene volcano lies about eight kilometers east-southeast of the site of Tres Zapotes and was the source of the stone used in both the Nestepe and Tres Zapotes heads (*ibid.*). To the south, along the southern edge of the Tuxtla Mountains and near the locality of Soteápan, lies the second source of the stone, another extinct Pliocene volcano known as Cerro Cintepec (*ibid.* 5, 11, map 2). We now know that the stone for three of the La Venta heads (LV 1 - LV 3) and all the San Lorenzo heads came from this source. (In addition, the so-called Monument de Ahosh at San Lorenzo is made of Cerro Cintepec stone—H. Williams, personal communication.) Once again, we call attention to the fact that TZ 1 and NS 1 form a group by themselves, and that the La Venta and San Lorenzo heads cluster together on yet another feature.

Weight. When grouped together by weight—measured by short tons—the association of the La Venta and San Lorenzo heads repeats itself; as Table 10 demonstrates, none of the four La Venta heads is grouped with TZ 1 or NS 1. The latter two heads are grouped with SL 3, SL 4, and SL 6 since all five weigh less than ten tons. We have already noted that SL 3, SL 4, and SL 6

Table 9
Stone Source

Cerro El Vigía	Cerro Cintepec	Unknown Source in Tuxtla Mtns.
TZ 1, NS 1	LV 1, LV 2, LV 3, SL 1, SL 2, SL 3, SL 4, SL 5, SL 6	LV 4

share a number of interesting features (see tables 6 and 7), and, moreover, that SL 6 shares a number of features with NS 1 and TZ 1 (see tables 2, 5, and 7). LV 2, LV 3, LV 4, and SL 5 are categorized together, all weighing between ten and twenty tons. The final group consists of LV 1, SL 1, and SL 2, all weighing over twenty tons. Implications of these weight groupings are discussed in our general conclusions below.

Table 10
Weight in Short Tons*

Under 10 Tons	Between 10-20 Tons	Over 20 Tons
TZ 1, NS 1, SL 3, SL 4, SL 6	LV 2, LV 3, LV 4, SL 5	LV 1, SL 1, SL 2

* Exact weight may be found in Table 18.

Iris form. The category of iris form is of particular value because it allows us to group the heads on the basis of sculptural technique. Such a category is of importance in considering whether various heads were made by the same sculptor or group of sculptors. The assumption behind this category is that, since the different categories of iris form do not represent a great variation in technical ability of execution (i.e., it is no more artistically difficult to depict an iris in raised relief than by flattening and incision), then they must represent a conscious choice by the artists as to how they wished the irises to be executed. Even if there were a time difference reflected in the various categories, we would still argue that the artists, with the exception of those who sculptured the first heads, would have exercised choice since the earlier heads in any given site would presumably still be visible for inspection and would reveal the various possibilities for mode of execution.

As summarized in Table 11, there are four categories of iris form evidenced among the colossal heads (LV 3 is too eroded to be classified). SL 2 displays irises which are merely flattened, probably by a process of grinding. LV 1, LV 4, and SL 1 are grouped together as the irises are all executed in raised relief. The largest group, in which the process of flattening and incision was used, consists of LV 2, SL 3, SL 4, SL 5, and SL 6. In the group in which irises are totally absent, we find TZ 1 and NS 1 once again grouped together.

Table 11

Iris Form

Flattened	Raised Relief	Flattened and Incised	Absent	Indeterminate
SL 2	LV 1, LV 4, SL 1	LV 2, SL 3, SL 4, SL 5, SL 6	TZ 1, NS 1	LV 3

Mouth form. A second category in which is reflected a conscious choice by the artist is that of the execution of the mouths. Choice in this case is afforded by the fact that any living Olmec model probably had teeth, and certainly would have been able to pose with mouth open or closed. However, artistic ability may enter this category to some extent, at least more so than in the category of iris forms.

As Table 12 demonstrates, we can distinguish three groups of mouths. In the group with open mouths and teeth are LV 2, LV 3, LV 4, and SL 2. With mouths open and no teeth showing there are SL 1, SL 3, SL 4, SL 5, and SL 6. Finally, we have those heads on which the mouths are completely closed, LV 1, TZ 1, and NS 1. We have come to expect that TZ 1 and NS 1 will group together; however, in this case, they have been grouped with a head from La Venta. If one assumes that some differential of technical ability is involved in the execution of closed versus open mouths, then it can be said that the artists who worked on TZ 1 and NS 1 were of the same caliber as some of the artists at La Venta; namely, those who worked on LV 1. Although the differences in competence between these groupings may be slight, it is nonetheless interesting to note that at least two modes are available at San Lorenzo and La Venta, while at Tres Zapotes and Nastepe the same level of competence in representing mouths is displayed. Thus, this maintains the trend of TZ 1 and NS 1 to form an empirically valid grouping, since at La Venta as well as San Lorenzo two techniques of carving the mouths are present while the Nastepe and Tres Zapotes heads show only

one mode of execution. It also presents the possibility that sculptors with differential abilities were operating at two of the sites—La Venta and San Lorenzo—where different mouth forms are presented.

Table 12
Mouth Forms

Mouth Open, with Teeth	Mouth Open, No Teeth	Mouth Closed
LV 2, LV 3, LV 4, SL 2	SL 1, SL 3, SL 4, SL 5, SL 6	LV 1, TZ 1, NS 1

Narrow ridges outlining mucous lips. As was noted in the descriptions of the individual heads, a raised ridge appears on some of the lip borders. We have grouped the heads on the presence or absence of this trait, and the results are summarized in Table 13. TZ 1, NS 1, and SL 1 share the presence of these ridges, while they are absent on LV 1, SL 2, SL 3, SL 4, SL 5, and SL 6. We were unable to determine the presence of ridges on LV 2, LV 3, and LV 4, although LV 4 may have had such a ridge on the lower lip alone. As may be seen, these groupings are in line with previous ones and present no new material for discussion. The element may be unimportant, although we feel it to be worth noting that TZ 1, NS 1, and SL 1 have similar ear plugs as well as having lip ridges in common.

Table 13
Narrow Ridges Outlining Mucous Lips

Present	Absent	Undetermined
TZ 1, NS 1, SL 1	LV 1, SL 2, SL 3, SL 4, SL 5, SL 6	LV 2, LV 3, LV 4 (lower?)

Purposeful defacement. The last element by which we attempt a grouping of the heads is that of defacement. Since a separate discussion appears in this report on the defacement of the heads, and since most of the defacement probably took place after the heads were completed, we need not go into great detail. Suffice it to note, as we indicate in Table 14, that the characteristic pits with dimples appear in one form or another on all of the heads from San Lorenzo. LV 3 exhibits pits and dimples similar to those of

the San Lorenzo heads, as does LV 2. While an occasional or random groove or gouge may appear on some of the San Lorenzo heads, it is the four La Venta pieces which are characterized by an abundant and distinct variety of these defacements. Square, block-like holes are found only on SL 2. TZ 1 and NS 1, interestingly enough, form a group showing almost no defacements. TZ 1 shows slight damage, while NS 1 is in no way defaced.

Table 14

Predominance of Defacement Types

Pits with Dimples	Gouges and Grooves	Square Pits	None or Slight
SL 1, SL 2, SL 3, SL 4, SL 5, SL 6, LV 2 (few), LV 3 (few)	LV 1, LV 2, LV 3, LV 4	SL 2	TZ 1, NS 1

Conclusions

As the above discussion has attempted to point out in quantitative terms, it is apparent that the twelve colossal heads may be grouped into several clusters on the basis of a number of combinations of elements. In general, we might say that the TZ 1 and NS 1 heads combine to form a distinct group. The six San Lorenzo heads, while generally constituting a distinct unit, may be said to break down into two subgroups. SL 3, SL 4, and SL 6 may be grouped together on the basis of a number of shared elements, and, with some regularity, these three heads share traits with the heads of Nestepe and Tres Zapotes. SL 1, SL 2, and SL 5, while all maintaining a certain statistical distinction as San Lorenzo heads, seem to group more often, although somewhat randomly, with La Venta, and less frequently with Tres Zapotes and Nestepe, as opposed to a more constant and less random clustering of the smaller San Lorenzo pieces.

The four La Venta heads, while easily distinguishable as a separate group, seem also to be divisible into two subgroups. LV 1 and LV 4 are, in our opinion, rather different in many ways than LV 2 and LV 3. This may be due in part to the heavy erosion of LV 2 and LV 3, but as the tables above indicate, it is also due to a number of empirically valid differences.

Thus a sort of chain may be visualized, with La Venta a distinct group but sharing a significant number of ties with San Lorenzo. San Lorenzo is distinct as a group in certain respects, but in addition to the

ties with La Venta also shares a number of similarities with Nestepe and Tres Zapotes. These two latter heads form a third distinct unit, and share only the most general features with the heads from La Venta, such as similarities in mouth form.

In terms of these groupings, it is possible for us to separate the heads into six subgroups on the basis of the above mentioned similarities between certain of the heads. These subgroups are:

Group A	Subgroup I - LV 2, LV 3
	Subgroup II - LV 1, LV 4
Group B	Subgroup III - SL 1, SL 2, SL 5
	Subgroup IV - SL 3, SL 4, SL 6
Group C	Subgroup V - TZ 1
	Subgroup VI - NS 1

The groupings may be interpreted to mean that within the Group A heads from La Venta we find two subgroups. The first of these (subgroup I), LV 2 and LV 3, stands relatively alone and apart. The second subgroup (II), LV 1 and LV 4, shares certain similarities with the first subgroup (III) in Group B, namely, SL 1, SL 2, and SL 5. The second of the San Lorenzo subgroups (IV), while primarily allied with the first (III), nonetheless is more similar to Group C's subgroups V and VI than are any of the other subgroups. The heads from subgroup I are less like those of subgroups V and VI than are any of the other groups. In other words, our groupings are intended to imply that the closer together any two subgroups are, the more similarities the heads within each subgroup share with those of the other subgroup. The farther apart the groups, the fewer the similarities. Thus, subgroup I of Group A is least like subgroup VI of Group C. We must stress that we intend these groupings to reflect only similarities of elements and their execution, and to have absolutely no temporal implications.

We are, of course, aware that with a scheme such as this the problem of temporal or chronological relationships between the heads must receive consideration. We have discussed Kubler's grouping and, by implication, his chronology. Squier (n.d. 183, 255, 258a), writing before NS 1 and SL 6 were reported, guessed at a three period chronology which would place the site of La Venta oldest, San Lorenzo intermediate, and Tres Zapotes youngest in the sequence. If we assume that the heads are also in such a sequence, then Squier's guess would correspond with that of M. Coe who has proposed a similar chronology in which "the sequence would begin with the La Venta heads, which show close resemblances to the jade and pottery figurine style; then the San Lorenzo heads; and finally the Tres Zapotes ones, which are extremely portrait-like and lack the pseudo-drilling at the corners of the

mouth" (Coe, quoted in Bernal n.d., fn. 40).

While our evidence would force us to disagree with Coe on some of his specific assumptions, we must at the same time admit that our groupings of the heads would not preclude the possibility of a general sequence such as he proposes. Wicke, on the other hand, has seriated the heads in a different manner, one with which we find no agreement whatsoever. He feels (Wicke n.d., 146) that the Tres Zapotes heads (our TZ 1 and NS 1) are earliest, the La Venta heads next in the sequence, and the San Lorenzo pieces latest. He bases this sequence on the opinion that the heads show "the evolution of facial expression from a lack of animation to a smiling countenance to an expression of serenity. In proportion to height, the heads become steadily more narrow and more shallow. The eyes show a development from no iris to a well defined one." As we have demonstrated above, head shape is an inconclusive category for seriating the heads. We feel it unwise, furthermore, to even consider such a subjective category as "facial expression." Our Table 11 considers iris form in greater detail than does Wicke, and for his statement that the full iris depicted in the San Lorenzo heads "is a subtle refinement at the end of a tradition within which artists strive to depict the eye with realism" (*ibid.*, 133), we find no evidence whatsoever. Wicke also dates the Olmec sites, feeling that the "series should indicate that the center of political power in the Olmec region shifted respectively from Tres Zapotes to La Venta to San Lorenzo (*ibid.*, 142). Moreover, he states that "Olmec culture probably persisted at San Lorenzo long after La Venta was abandoned." We now know, from Coe's recent radiocarbon dates (1967:1399-1401), that San Lorenzo is at least as old as La Venta. Thus, on a number of grounds, we are forced to disagree strongly with Wicke's conclusions.

Our groupings are based upon a number of differences which we have shown to occur in a relatively patterned manner within the heads. In addition to these differences, which we have of course stressed, we should note that our groupings also take implicit account of a number of similarities which prevail among the heads. Moreover, the heads share a number of general features which we have not referred to in the tables. For example, all the heads have headgear of a similar type, often referred to as "helmets" (Stirling 1965:733). Moreover, all the heads are characterized by flattened backs (*ibid.*). All have a prominent nasion, as well as a distinctly fashioned chin. Cheek bones and facial modeling, while depicted differently on each head, are nonetheless present on all. None of the heads exhibit eyebrows, probably because they are covered by the head bands.

Despite the differences between heads from the three sites, we feel that all show sufficient similarities, considering the present state of

the Olmec archaeological record, so that it is not unreasonable to argue that all twelve heads are roughly contemporaneous. We cannot agree on a time period, but suggest a span of a century or two at most may be involved (cf. Kubler 1962:67). This implies that San Lorenzo, Tres Zapotes, and La Venta were occupied at the same time and that the heads were sculptured and emplaced at each site during the same period. While our evidence does not deny the possibility of such a sequence as Coe has proposed (some scholars may feel that it enhances such a sequence), we feel that there is insufficient evidence to warrant a definite commitment to any chronological ordering of the Olmec colossal heads. Since the archaeological sites where the heads were found have not been demonstrated to be mutually exclusive temporally, and since the heads are not firmly tied into the known archaeological sequence at any of the sites, it seems to us that chronological guesses would have to be based upon artistic traits alone rather than archaeological fact. As we have stated earlier, we do not consider that the segregation of heads by artistic traits lends itself to a temporal arrangement.

For ease in comparison, we have included Table 15 which relates in summary form the chronological distinctions of Kubler, Wicke, and Coe, all of whom have directly discussed temporal relationships of the heads. In terms of our groupings by element similarities, we find most agreement with Coe, who would class our subgroups I and II as early, our subgroups III and IV as intermediate, and our subgroups V and VI as latest in his sequence. As may be seen, this seriation tends to agree with our conclusions on stylistic similarities within the heads. Wicke, with whom we have little agreement, would almost reverse the order of the heads, classing our subgroups V and VI as earliest, our subgroups I and II as intermediate, and our subgroups III and IV as latest. Relying upon a subjective approach, Kubler has done most violence to the groupings as we see them, and his categories bear little resemblance to ours. He feels, in our terms, that subgroup V and part of subgroup II are early, parts of subgroups II and III and all of subgroup I are intermediate, and parts of subgroups III and IV are latest.

Artistic traits and decorative elements do not, in our opinion, serve exclusively to define chronological distinctions but lend themselves to other types of interpretation. Not only have the groupings of elements which we have employed provided us with empirical reasons for grouping the heads by site, but they have also shown which heads within a site maintain close similarities to each other and to particular heads from other sites. To account for some of these similarities, we suggest that groups or schools of sculptors were at work, and that within these schools there were artists of varying abilities.

A few tentative suggestions as to what these artists were portraying

Table 15

Summary of Other Opinions on Relationships of Olmec Heads

	Oldest	Intermediate	Most Recent
Kubler 1962	TZ 1, LV 1	LV 2, LV 3, LV 4, SL 2	SL 1, SL 3, SL 4, SL 5
Wicke (n.d.)	TZ 1, NS 1	LV 1, LV 2, LV 3, LV 4	SL 1, SL 2, SL 3, SL 4, SL 5
Coe (n.d.)	LV 1, LV 2, LV 3, LV 4	SL 1, SL 2, SL 3, SL 4, SL 5	TZ 1, NS 1

as they carved the colossal heads are offered here. We feel that the sculptors were depicting human figures, not stylized deities. Although some stylization is apparent, there is more than enough individuality of expression, musculature, etc., to assume that the heads were modeled after living persons. Whether or not these are actual portraits, we do not know. A number of writers have suggested that they are (Stirling 1955:20-23; 1965:721; Kubler 1962:67; Smith 1963:128). Others (Armillas 1964:304; Bernal n.d., 62) have felt that they are not portraits but are idealized representations of living persons, possibly chieftains. We feel that the question is probably unanswerable, and our data could be used to substantiate either claim. The important point, in our opinion, is that people, not gods were represented in the heads.

The ornamental elements upon the heads may have been chosen for their purely decorative value, perhaps even by the fancy of the artists. We have shown that the shape of the ear plugs, for example, was possibly related to the amount of space available beneath the ear on which the ornament was to be imposed. None of the other decorative elements seem to be overburdened with sacred connotations, and since no serious opposition to the idea exists in the literature on the topic, we venture to guess that the ornamentation and execution of the heads was primarily secular. Any stylization which exists probably reflects more on conceptions of ideal physical type than on ritual connected with the sculpture. The fact that all of the purposeful defacement on the heads seems to have taken place after their completion also argues against ritual or religious connection with their execution.

Since our conclusions grant that the heads could all be relatively contemporaneous, we must assume that the technology of stone transport did

not vary greatly during the time the heads were being carved. We conclude, then, that the element of weight variation within the heads has absolutely no bearing on the technological ability of the Olmec transport experts. That is, we feel that the weight of the heads, as well as the shape of the boulders on which they were carved, was dictated by artistic preference rather than varied technological ability in the movement of heavy pieces.

We are, in fact, surprised by the wide choice which the artists who carved the colossal heads exercised in the selection and execution of a great number of elements which, in the more rigidly stylized types of Olmec art apart from the heads, would have been subject to almost no choice in their rendition.

SCULPTURING TECHNIQUES

It is appropriate at this point to include a brief description of the method used by Olmec artisans in sculpturing the colossal heads. There are but few published references to this aspect of the problem, most writers being more concerned either with describing the heads or with analyses in terms of art style, function, dating, or seriation. There are some exceptions, among them Kubler (1962:69), who refers to the possibility that postures and expressions first depicted in clay figurines may have been translated to jade and stone after techniques for working the latter had been developed. However, he is not specific as to the nature of these techniques nor to relationships between their application to jade and stone. Although we have concerned ourselves solely with the colossal heads, Kubler raises a point that is worthy of consideration. It does indeed seem that some of the marks of manufacturing techniques applied to the miniature figurines were carried over to the colossal heads. Specifically, Covarrubias (1957:56, fig. 20) suggests a method of making stone figurines which includes the use of drilled pits at the corners of the mouth. Other authors (Coe 1965b:757; Drucker 1952:189; Smith 1963:129) have noted the presence of similar pits at the corners of the mouths of the colossal heads. This may be evidence that an attempt was made to indicate pits similar to those of the figurines.

The parallel is, however, more stylistic than technological, for in the jade figurines the drilled holes marking the corners of the mouth seem to have served as "saw pits" marking the termini of the sawed cuts made to block out the mouth, and in the colossal heads such pits would not have been required since the mouths were sculptured by the slow and laborious pecking process. However, it is not at all certain that the drilled pits in the mouth corners of the jade figurines are present because they are ineradicable remnants of the manufacturing technique. Figurines made of soft serpentine may also have such pits, and pieces of such soft material were probably not made by the sawing technique. Furthermore, a common feature in Olmec pottery figurines is the punched pits made with a stick when the clay at the corners of the mouth was soft. Taken all in all, we are of the opinion that the drilled pits which occur in the mouth corners of the jade figurines and colossal heads (as well as some other large Olmec sculptures) are primarily a perseveration of the method of depicting human mouth corners which originated with pottery figurines. There are, of course, certain additional similarities between the figurines and the heads, but these are more a function of the fact that they belong to the same artistic complex than of any specific affinity in sculptural technique.

A somewhat more imaginative, if less accurate, approach to the

problem is presented by Ayala (1966). One of his figures shows a group of three burly Olmec sculptors, all with shaved heads, hard at work on the nearly completed LV 1 head. Each man holds an unhafted green stone celt in his left hand, while in his right he grasps a wooden mallet or a fist-sized hammerstone (*ibid.*, 25). The suggestion, at least in part, is that the jade and serpentine celts found at many Olmec sites were used as chisels in the sculpture of basalt monuments, an idea which seems unlikely in view of the fact that no known celts bear evidence of such use in the form of edge abrasion or battering.

Given the scant and rather cursory nature of comment on the sculptural process, it may be worth-while to place our thoughts on the subject on record. Much of what follows falls within the realm of conjecture, because a complete understanding of all steps involved in the creation of these works cannot be gained in view of the lack of written records or other forms of graphic representation. Furthermore, there are no known colossal heads which are incomplete or partially finished. If one of these should be discovered, we would surely learn a very great deal about the manufacturing process. However, some inferences can be drawn with a fair degree of certainty.

The first step in the process must have involved the acquisition of a suitable block of basalt and its transportation to the site at which it was to be sculptured and emplaced. Williams and Heizer (1965:4) believe that the blocks were not actually quarried, but rather that detached, rounded boulders of suitable size and shape were selected. Such boulders may be found today on the slopes of both the Cerro El Vigía and Cerro Cintepec localities. Once a selection was made, the boulders were moved by land and water to the given sites. It is not known whether boulders were roughly blocked out prior to transport or if they were brought unmodified to the site. The presence of a large uncarved boulder of basalt at La Venta (*ibid.*, 19), as well as a probable area of basalt debitage at the same site (Heizer, personal communication), may indicate that most of the sculpturing was done at the site after transport. Despite a fair amount of scouting in the Tuxtlas, no signs of stone quarrying in stone exposures have been observed or reported.

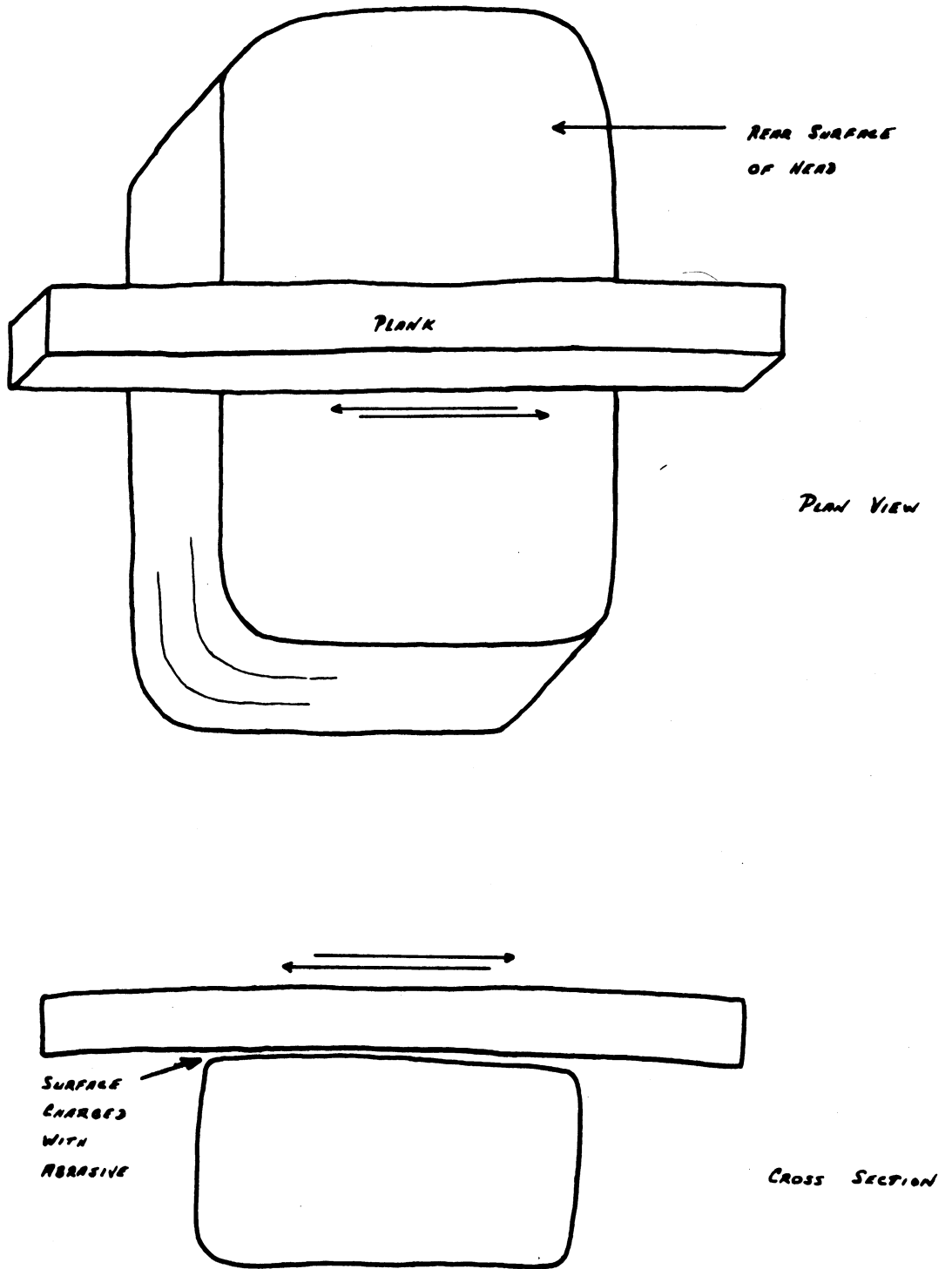
With regard to the sculpturing process, we have little information on the actual steps taken. However, we suggest the following sequence of events. The first step must have involved the planning of the design for the head. This planning may have been carried out after the basalt block was brought to the site, but it seems more likely that it took place prior to the selection of a boulder. Alternatively, a rather general design lay-out may have been devised, subject to modification once a suitable stone was chosen. In any event, once the design was decided upon, the

features of the face and decorative elements were roughed out, presumably by means of pecking with heavy picks or hammerstones. It seems probable that the heavily pecked surfaces on the sides of SL 4 and SL 5 are the result of such initial blocking-out activity.

The next step probably involved fine hammer-dressing, followed by smoothing of the pecked surfaces by means of grinding. It would have been at this point that the flat areas on the backs of SL 1, SL 2, SL 3, SL 5, LV 3, and LV 4 were ground down. These surfaces are now smooth planes, with minimum areas of about one square meter characterized by long, parallel striations which track from one edge of the smoothed surface to the other. It would seem impossible that such large surfaces were ground so evenly through the use of small tools such as hand-held abrasive stones. We suggest an alternative method (page 66) which involves drawing a long flat plank, charged with sand or some other abrasive (quartz?), back and forth across the back of the head. Such a technique would account not only for the uniform surfaces but also for the long unidirectional striations. The stroke of the heavy abrasive-loaded log or plank must have been a long one, as can be inferred from the length of the striae. A method of smoothing and polishing stone described by A. Kennedy (1821:50-51) for India is quoted here as an example of a technique which is somewhat similar to the one we propose.

A block of granite of considerable size, is rudely fashioned into the shape of the end of a large pestle. The lower face of this is hollowed out into a cavity, and this is filled with a mass composed of pounded corundum-stone, mixed with melted bees-wax. This block is moved by means of two sticks, or pieces of bamboo, placed one on each side of its neck, and bound together by cords, twisted and tightened by sticks. The weight of the whole is as much as two workmen can easily manage. They seat themselves upon, or close to, the stone they are to polish, and, by moving the block backwards and forwards between them, the polish is given by the friction of the mass of wax and corundum.

The flattening on the backs of the Olmec heads was carried out for unknown reasons. One opinion holds that the heads were meant to be set flush against some structure and to viewed only from the front (Stirling 1955:20). However, there is no indication of structures of any kind (walls, houses, posts, etc., etc.) at the rear of any of the heads found in situ. While impermanent structures may have been present, there is no archaeological evidence to indicate that this was the case. We prefer to view the



(Suggested method of flattening backs of heads (schematic).
 Arrows indicate direction of motion of plank across back
 of head.

flat back of many of the heads as primarily a stylistic rather than a functional feature. The colossal heads, then, become merely one kind ("stelae" and "table-top altars" are other) of a multiformity of free-standing stone monuments which were placed in full view in the Olmec ceremonial centers.

Following the grinding and smoothing of the heads, remaining features were incised in relief. Examples of this step in the process include the knots on the backs of SL 1 and SL 2, the braids on the back of NS 1, and the vertical grooves on the back of TZ 1. Once the heads were completed, they were moved from the workshop and set in place, perhaps on small mounds or platforms such as that on which TZ 1 rested. There is some evidence that the heads may have been painted. Stirling (1943:58; 1955:20) observes that a portion of LV 4 was covered with a white slip and painted a dark purplish red.

The above outlines what we believe to have been the main procedure followed in sculpturing the colossal heads. In addition, a number of the heads have been the focus of further attention, some of which has been discussed under the category of defacement. The question of the rectangular niches found on the back of SL 2 is considered below. We believe the niches were carved at some time after the completion of the head and prior to the toppling of the monument into the ravine. Numerous other pits and scorings on the heads were executed both during and after construction. Pits at the corners of the mouth are in the former category, as are the remnants of circular pits found in the center of the left ear ornament of LV 3, the pits which form both ear holes of SL 1 and NS 1, and the right ear hole of SL 4 and the left ear hole of LV 1.

As noted in the discussion of intentional defacement below, many of the other circular pits, often with dimples in the center, fall clearly into the category of post-sculptural defacement, as do the numerous gouges and axe-sharpening grooves present on many of the heads. However, pits with dimples are not always randomly scattered, and some appear to have been placed symmetrically on the heads, often in pairs. The pits above the nares on SL 1 and the apparent pairing of certain pits on the face of SL 2 are notable examples of this feature. These may be indicative of a form of ceremonial defacement, although we are uncertain as to whether this occurred before or after the heads were completed.

WEATHERING AND MUTILATION

In addition to several types of intentional defacement, all Olmec colossal heads exhibit some degree of natural erosion. For the purposes of this report, defacement or mutilation is held to mean any purposeful violence inflicted upon the surfaces of the heads. It is not always possible to ascertain whether the disfiguration of a part of a head is due to vandalism or is the result of natural forces acting upon the rock. To make an exact division between natural and purposeful or accidental defacement will, of course remain, in some instances, subjective. Thus, for example, the deterioration of LV 4 through natural scaling may have been hastened by the purposeful prying off of rock fragments along the lines of cleavage by vandals, and through the action of chain or cable friction during its transport in 1956 or 1957 from the original site to the Parque La Venta in Villahermosa.

As a result of prolonged exposure to the elements, all of the Olmec heads have suffered some degree of erosion. The variation exhibited in this respect is a function of several factors.

Duration of Exposure to the Elements

Although all of the heads are believed to have been fashioned within a relatively short time span, it is possible that the generally better condition of the San Lorenzo heads is due to the fact that they were thrown into ravines where they were quickly buried by slope wash, while the La Venta heads remained in situ after the abandonment of the site and were slowly covered by an accumulation of earth, which raised the general level of the area on which they stood. In fact, the La Venta heads may never have been completely buried; we know that they were periodically disinterred by succeeding inhabitants of the area. This fact has been documented by Blom and La Farge (1926:85) who reported being guided by natives to the La Venta site where they photographed the dome of LV 1 where it protruded from the surface. Unfortunately, Stirling (1943) does not tell us whether LV 2, LV 3, or LV 4 were partially exposed, or at least known to the natives, when he excavated them. If they were, this might account for the considerably greater degree of erosion apparent on these heads, particularly the almost complete deterioration of the face of LV 3. As noted below, the San Lorenzo heads show the greatest natural deterioration and purposeful defacement on that area which lay exposed or nearest to the surface, but at the same time these alterations are not limited to the exposed surfaces.

Differences in Rock Composition

The considerations mentioned above do not explain why NS 1 and TZ 1, which were also found in situ and buried by an apparently similar long process of earth accumulation as the La Venta heads, are by far the best preserved specimens. The difference is probably due to variations in rock composition. LV 1, LV 2, LV 3, and all the San Lorenzo heads are carved from large boulders of coarsely porphyritic olivine-augite basalts obtained on the slopes of Cerro Cintepec. These boulders are in all probability of inferior quality and less resistant to erosion than are the smooth-faced, spheroidally-weathered olivine-augite basalt boulders from the upper slopes of Cerro El Vigía where the people of Tres Zapotes and Nastepe obtained their lithic material (Williams and Heizer 1965:4).

Surface exfoliation is a feature especially apparent on LV 1, where rock layers from 3 to 5 cm thick have scaled off from the back on both sides and below the left cheek, and on LV 4 which shows this characteristic on the entire right side and lower part of the right cheek. Another characteristic which is particularly pronounced on the heads fashioned of Cerro Cintepec boulders is the tendency to form small vesicular pits, which may be due to the washing out of softer materials included in the matrix. Stirling (1943: 57) agrees with this interpretation and points out that the pits could not be bubbles such as often occur in lava. These concavities may accumulate water which acts as a solution agent and erodes even deeper into the basalt. Although these vesicular pits occur on all the heads, only a few sizable ones occur on TZ 1 and NS 1. The La Venta heads, particularly LV 2 and LV 3, show a large number on the tops of the heads with numerous roughly circular holes ranging from 4 to 5 cm in depth. These naturally occurring vesicular pits are not to be confused with the artificially ground pits with dimples discussed below. The former are distinguished not only by the lack of dimples but also by their irregular circular shape.

Faults and cracks are found on basalt heads from both Cerro El Vigía and Cintepec. TZ 1 has some superficial cracks on the top of the head, which according to Stirling (1943:17) may have been "caused by repeated exposure to fires made in burning grass or clearing land for milpas."

Similar cracks run over the entire face, top, and sides of NS 1, which also lacks a large piece at the rear left base, probably broken off after the head had been completed. All the San Lorenzo heads except SL 1 have minor cracks and faults. The latter exhibits an extensive fault on the back which has been recently patched with concrete. A section which had scaled off from the head band above the right eye was cemented back in

place by Stirling and Drucker, who found the pieces lying on the ground at the base of the head at the time of excavation (Stirling 1943:10). The apparent "fault" on SL 2 is discussed below in the section on rectangular niches.

Since climatic conditions (which are not conducive to preservation in this area) are generally the same at all three sites, their weathering effect upon the heads should presumably be the same. However, a comparison of photographs published by Stirling (1939, 1940, 1943) with recent ones shows a marked further deterioration of the La Venta monuments, while the TZ 1 and NS 1 heads have remained unchanged. This difference may be ascribable to the superior quality of the Cerro El Vigía basalts of which the latter heads are manufactured.

Intra-site differences, such as the place of exposure or location of the head, could not have caused a great disparity in the relative degree of weathering exhibited by the sculptures since all were imbedded in similarly humid earth. However, the fact that SL 3 was found lying face down in a spring, and consequently was continually waterlogged, may have contributed to the damage exhibited on the lower lip and the formation of a diagonal crack across the face, running from the right eye to the left cheek, which coincides with the corner along which the tip of the nose has broken off.

Intentional Mutilation

With the exception of NS 1, all of the Olmec colossal heads present one or more of the following intentionally inflicted types of defacement: sharpening grooves; rectangular niches; gouges; and pits with dimples. Each of these categories is discussed below. Suffice it to say here that aside from the colossal heads, the extent of intentional mutilation upon all types of stone monuments of the three Olmec sites discussed here has been noted by previous authors. Drucker, Heizer and Squier (1955:229) counted twenty-four clear-cut cases of intentional mutilation on forty monuments at La Venta. Stirling (1943:11) notes some degree of mutilation on all of the monuments from Tres Zapotes. (NS 1 had not been unearthed at the time of his publication.) The fact that until their recent discovery most monuments were completely buried may mean that defacement was carried out shortly after the abandonment of the sites, but it is not possible to ascertain whether such destruction took place during one or several succeeding periodic reoccupations. Interestingly enough, the purposefully overthrown monuments of San Lorenzo are less mutilated than the in situ ones at other Olmec sites. Stirling (1955:9) concludes from this that "the displacing of the stones was apparently done by the later aboriginal occupants of the site, as represented by the upper occupation level. Since the two levels are separated by a considerable time interval, it does not seem likely that a conquest took place." Possibly overthrowing of the

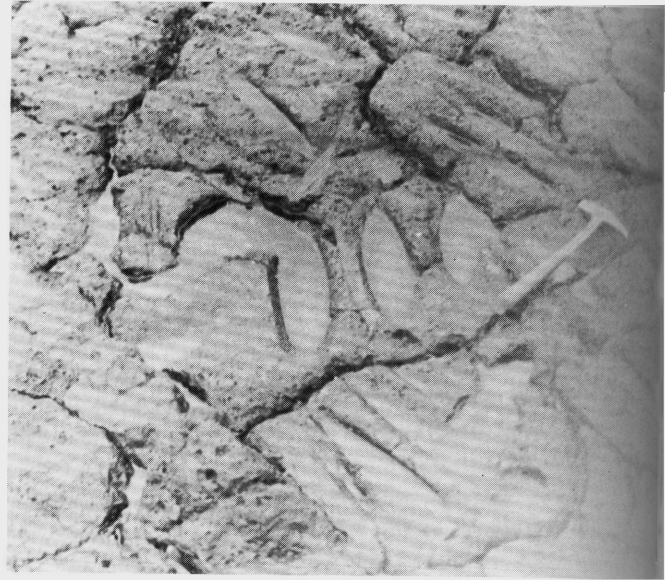
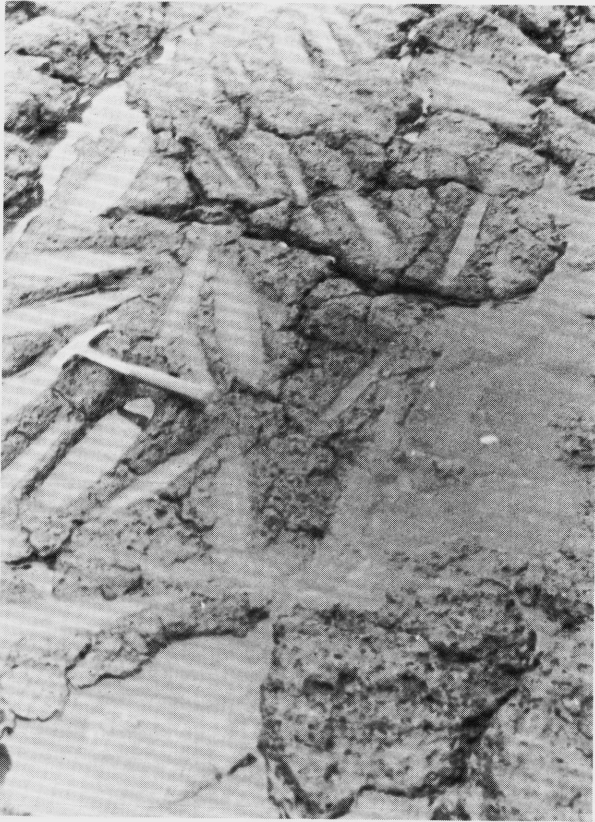
monuments at San Lorenzo should be considered as an alternative to defacement.

On the other hand, Drucker, Heizer and Squier (1955:230) hold that the great amount of energy expended by the mutilators of the La Venta monuments, carried out with heavy tools while working upon "very hard stone," "suggests strongly that its perpetrators were intent on destroying the works of art of their predecessors." In this respect, it should be recognized that what we interpret as intentional mutilation or casual tool-sharpening marks may in fact be signs of some conscious and deliberate ritual or ceremonial act (ibid., 197).

Sharpening grooves. Longitudinal grooves ranging between 2 cm and 50 cm in length occur on all La Venta heads, as well as on TZ 1, SL 1, and SL 2. They appear to have been ground into the stone with tools such as axes or celts, and have been interpreted as axe-sharpening channels. Numerous similar grooves have been found on other Olmec stone monuments, such as Stela 4 at La Venta (Stirling 1943:52, pl. 33d). Drucker, Heizer and Squier (1959:196-197) illustrate a fragment of a limestone slab (probably imported from Chinameca, the source of most La Venta limestone according to Williams and Heizer 1965:12) which shows thirteen very similar celt-polishing grooves on one flat surface. They speculate that the slab may date either from Phase IV or post-Phase IV of La Venta, basing this assumption on the presence of limestone slabs being "undoubtedly late in the site's history."

We discovered a large number of these sharpening grooves on rocky outcrops along the sea near the village of Punta Roca Partida during the winter, 1967, expedition (see page 72). These grinding benches closely resemble others described for various parts of the world, such as those at Fernando Po, Nigeria (R. Kennedy 1962:129), axe polishing grooves in France (Dechelette 1908:525), and a cliff with polishing grooves at Pueblo Bonito, New Mexico (Judd 1959, pl. 23). The grinding technique as actually performed by modern primitives is best described by Harrer (1964, pl. 18) for New Guinea tribesmen, who employ a technique which must not differ greatly from that utilized by the above mentioned axe polishers, including the Olmecs.

It is not certain whether these grooves constituted a purposeful defacement of the heads or were, at least in some instances (e.g. LV 1), part of their decorative makeup. They may simply have been tool sharpening grooves utilized by post-Olmec peoples who saw in the heads no more than a convenient sharpening stone in an area otherwise devoid of available lithic surfaces. In the rock-poor La Venta region, all heads are heavily scarred with these grooves, but at Tres Zapotes and Nestepe, where natural basalt outcrops occur nearby (Stirling 1943:16), only TZ 1 exhibits a few, very small grooves. At San Lorenzo, only SL 2 shows this type of defacement, and



Boat-shaped axe sharpening grooves in basalt outcrop near Punta Roca Partida, Ver.

it is possible that the San Lorenzo heads were not used as a sharpening surface, since the site is located on an extensive gravel plateau and abrasive surfaces for axe polishing must have been readily available. Another possible purpose for these grooves may have been as part of some ritual axe-connected ceremonies, carried out from time to time, and which in some specific way may have involved the heads.

It seems unlikely that the grooves were produced by the sculptors of the heads while sharpening stone tools used in carving the monuments. If that were the case, the grooves certainly would have been cut on some surface of the rock which was not meant to be visible, such as the back or base of the head. Stela 4 of La Venta shows sharpening grooves at the base, and Stirling (1943:58) suggests the possibility that they were used by the carvers of the stela "as the surface of the base would not show when the stela stood up." The fact remains that in the instances where these grooves occur on the colossal heads, they usually cut across the sculptured surfaces, partially destroying the decorative elements. If we are correct in interpreting these V-shaped grooves as channels in which the bits of stone axes were honed, some support for one last statement can

be deduced. Sharp-edged stone axes were probably used for wood-cutting and not stone carving. There is not the slightest indication that chisels or axes were used as sculptors' tools, but rather that hammer-dressing and stone-pecking were the main stone shaping techniques.

In evaluating the probability of any of these hypotheses, it is useful to study these grooves in the light of their relative position on the head and the position of the head when discovered.

LV 1, first described by Blom and La Farge (1926:85), was found in situ in a "normal" upright position, the top of the head protruding from the soft ground. The grooves, interestingly enough, occur only on top of the head, above the encircling head band. Consequently, it may be assumed that they were cut at such a time as the head was protruding at ground level. That period, of course, must have been later than the occupation of the La Venta site by its builders, and at any event would not have been contemporaneous with the sculptors of the head. An alternate possibility, that the sculptors of the head may have intended them as "part of the decorative scheme," is suggested by Stirling (1943:56). His observation may rest upon the fact that the grooves are evenly and radially distributed over the top of the head, pointing to the front and sides. However, this seemingly purposeful symmetrical distribution may be due simply to the fact that overlapping or crossing grooves would make bit-polishing of a tool impossible, since it would have to skip over existing ridges. Only on the right side of LV 1, just above the head band, does such an intersection of two grooves occur. This intersection is at right angles, forming a small cross. We do not think that it was made by stone tools since the grooves do not present the characteristic deeper center, or concavity and shallow ends, which characterize the other 44 grooves on the head. Possibly it represents a Christian cross cut in by modern local natives as part of a spirit-exorcising act. That local natives did cause some of the defacements on the La Venta monuments is discussed by Blom and La Farge (1926:89), who mention "incisions made in recent days with steel tools" on another La Venta sculpture.

LV 2, also found in situ, was standing upright on a stone foundation, facing north and in line with LV 3 and LV 4. We counted 15 grooves on the top and 56 grooves on the back of the head. Besides these clearly defined sharpening grooves, smaller, rather shallow grooves of a different type—some of which may be simply part of the erosion suffered by the head, and others grooves in which grinding was started but then abandoned—occur on the same areas. The longest grooves found on any colossal head are on the back of LV 2; these run to 0.5 m in length. The back is completely scarred by these grooves, some of which run inside the four large gouges described below.

The grooves on the top of LV 2 are in roughly the same symmetrical distribution as those of LV 1; that is, six on the left and six on the right side. The frontal area contains only one groove; presumably it was not utilized for grinding purposes due to the unsuitability of the surface at this point, since it is heavily eroded and covered with the vesicular pits described above. Three grooves occur on the center rear of the top of the head.

While it may be assumed that the axe sharpening grooves on LV 1 are located on the top of the head because this was the only surface exposed at the time the groove-makers were active, this is not true for LV 2, on which grooves occur from the bottom to the top of the rear surface of the head. Consequently, the entire rear of the head must have been exposed when the grinding of the grooves situated on the lower part of the back was begun. This fact presents several interesting problems.

1. Why were only the top and rear parts of LV 2 utilized as grinding surfaces and not the front and sides, which also have conveniently flattened areas? Could there have been some taboo observed by the later occupants of the site which prevented them from mutilating the face? (We assume that since the rear was not yet buried, neither were the face or sides.) Is it possible that the head was cleared by later occupants of the area, seeking some type of grinding surface? If so, why were the other sides of the head not utilized?

2. Assuming that LV 2 was upright at the time of the cutting of these axe sharpening grooves, the ones situated on the lower part of the head could only have been ground by a person lying flat on the ground or stooping down. In either case, the pressure applied to the tool being sharpened would have been very slight, and the process of grinding proportionally ineffective. This ineffectiveness would have been reduced if an abrasive substance had been placed in the grooves while grinding. We have considered the possibility that some such substance—such as quartz sand or stone dust—might have been used when sharpening stone tools in these grooves, but obviously it would have been impossible to place an abrasive substance in a groove cut into a perpendicular surface such as the rear of LV 2.

3. As a consequence of the above, it can be suggested that LV 2 was standing on an elevated surface at the time when the grooves at the bottom of the back were cut. There is no archaeological information for the La Venta heads to support this proposition, except for the fact that LV 2, LV 3, and LV 4 were found "resting on a stone foundation" (Stirling 1940:331). At the Tres Zapotes site, TZ 1 was found on a stone platform, and this same procedure may have been followed at La Venta.

4. If LV 2 was standing on an elevated surface when the lower grooves were cut, the upper grooves must have been ground at a later time, when the surrounding earth had reached a higher level and sinkage of the head had begun. It would have been difficult for someone sitting on the top of the head to grind these grooves downward, and it seems improbable that a sort of ladder would have been used to reach the required height.

The shape of these grooves provides us with some clues as to the position assumed by their fabricators. Whereas most of the sharpening grooves found on grinding benches (such as Punta Roca Partida) and on top of the domes of LV 1 and LV 2 run in straight lines, most of the long grooves cut into the back of LV 2 have an arced shape. In the case of LV 1 and LV 2, this difference may have been caused by the fact that the grinder, able to assume a sitting position, would push and pull the tool in a straight line toward and away from his body, in which case the resultant groove would be relatively short and straight. However, the long, inward curved sharpening grooves on the back of LV 2 indicate to us that the grinder, while grasping the tool (probably with both hands, in order to increase pressure and for greater control), moved it from side to side, his arms constituting the radius for the resultant semicircular sharpening groove.

LV 3, the most eroded and mutilated of all the Olmec colossal heads, is covered with sharpening grooves, with at least a few on every side. We counted 43 clearly defined axe sharpening grooves on the top of the head alone. Stirling (1943:59) speaks of "many striated grooves" on the back of LV 3. On inspection of the head, now in the Parque La Venta, Villahermosa, we could identify only two of these, located on the upper part of the back surface, as "typical" axe sharpening grooves. The remainder of these "scored striations" do not present the typical concave depression, and are rather closely grouped, parallel, shallow, and narrow grooves. Furthermore, three sharpening grooves ground into the surface of the face of LV 3 seem to disprove the hypothesis presented for LV 2: that superstitious fear prevented the makers of the grooves from utilizing the facial surface.

LV 4, which has suffered extensive damage through scaling on its right side, presents fewer sharpening grooves than any of the other La Venta heads. These are concentrated on the center of the headdress. We counted 23 grooves on the center of the top, but this number is not absolutely certain since the scaling on the left top side has destroyed an area which may have contained additional shallow grooves at some time prior to the detachment of the rock surface. The thickness of the layer which has scaled off ranges from 2 to 4 cm to judge by the height of the ridge left along the line of detachment. Since the depth of these sharpening grooves rarely exceeds 2.5 cm, it is improbable that there would be remanent depressions on the head where the grooves penetrated deeper than the scaled-off layer.

In any event, this means that the grooves were made prior to the onset of natural scaling.

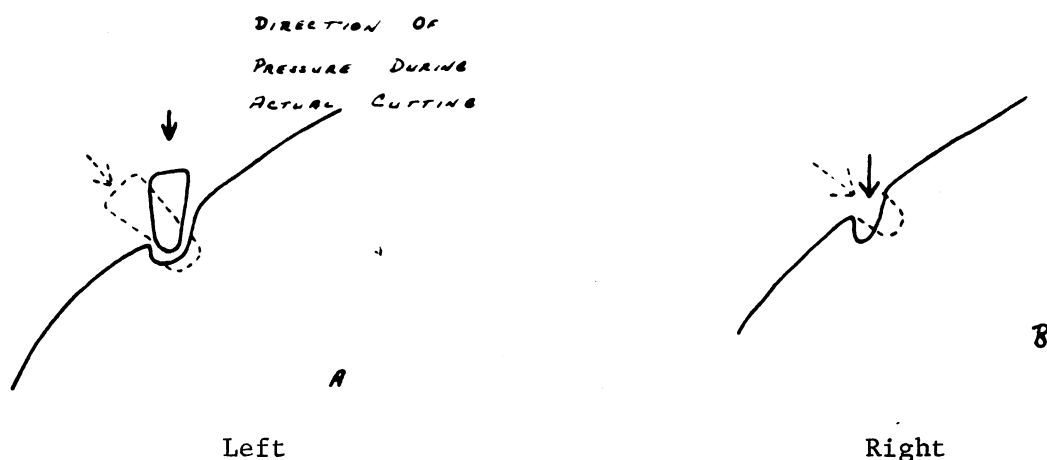
The radial distribution of the grooves on LV 4 bears an immediately apparent resemblance to that of LV 1, sharing the same pattern only on the top of the headdress. Since the top of the head exhibits these grooves—possibly because it was the only exposed surface upon which the groove-makers could work—and since grooves appear in a radial distribution around the entire top center of the head, except in the scaled-off area, we assume that groove-making, for whatever purpose, was restricted to a relatively short span of time. If it had occurred throughout the existence of the head, such grooves would be found on the freshly exposed surface which ensued after scaling. Their absence in the area tends to confirm the former hypothesis that, at least on this head, groove-making was restricted to the period between the time of completion of the head and the beginning of the scaling.

TZ 1, like the La Venta heads, was found in situ, placed upright upon a foundation of unworked stones which to Stirling (1943:17) "indicated that the head had been buried by a process of accumulation of earth." This head shows little defacement and exhibits only three grooves, all on the rear of the sculpture. The back of TZ 1 is crossed by nine shallow, perpendicular, incised lines which may have been cut as part of the decorative element of the head. According to Stirling (op. cit., 16), they indicate hair. Toward the top, the first three lines are crossed transversely by two long, shallow, sharpening grooves which run parallel to each other. Another long, smooth, and concave sharpening groove appears between the third and fourth incised lines, running between them from the base line to about one-fourth of the height of the head. The position of this last groove presents the same problem as that discussed for LV 2: it would have been difficult for the maker of the groove to assume a comfortable position, and the wrist of his working hand would have continually struck the ground while moving the tool downwards. A possible explanation is that this groove was cut before the head was placed upright, and while it was in the position it is today; that is, lying on its side. In other words, it could be contemporaneous with the sculpturing of the head.

SL 2 is one of the two colossal heads not found in situ which presents sharpening grooves. According to Stirling (1955:10), it was found lying face up. We have noted only two grooves on this head. One, on the right side above the ear, is 4.5 cm deep at the lowest point. This makes it the deepest of all sharpening grooves thus far discussed. We are reluctant to classify this groove in the general group for several reasons: (1) it is considerably deeper than all others; (2) rather than being broadly semicircular, it forms almost a right angle at the deepest point; and (3)

only one end of the groove becomes shallow and runs out onto the rock surface level; the other end remains deep, as if the operator had stopped the movement suddenly and reversed the direction of the tool at the same point each time. Possibly this groove was intended as part of the decoration. This suggestion is supported by the fact that the groove was probably cut before the head was toppled into the ravine where it was found by Stirling (*op. cit.*). This hypothesis is based upon the observation that it would have been difficult, though not impossible, to cut the groove while the head was lying on its back. It may be that this angular incision was meant to be continued into one of the rectangular niches which appear on the back of the head. A third possibility is that the groove represents nothing more than the smoothing out of a fault in the rock.

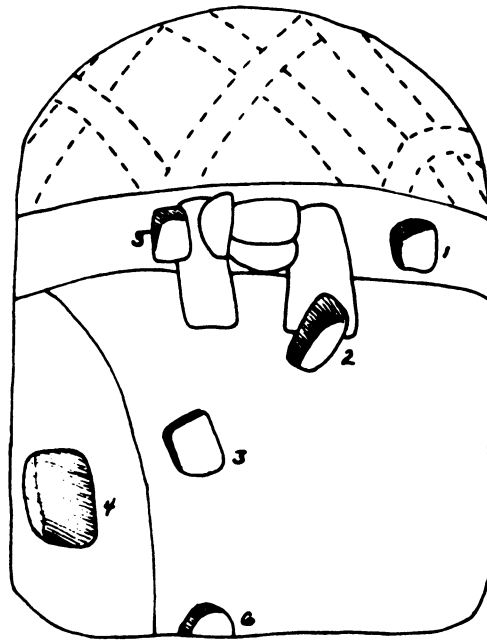
A vertical groove, 30 cm in length, gouged into the right cheek of SL 2 is of great interest. It is 1.5 cm deep, if measured from the ridge formed on the right side down to the deepest part of the convexity it forms at the bottom. Measured from the left side ridge, it is more shallow. This is due to the curvature of the rock at this point of the cheek. We hold that this particular groove was cut after the head was toppled into the position in which it was found, since the groove occurs on the side of the head which was uppermost as it lay on its back, and the angle of incidence shows that it was probably cut by someone positioned (sitting?) on the top of the face, grinding downward (see figure, left). If the groove had been cut while the head was standing upright, its angle of incidence should have been as diagrammed in the right figure. We conclude that this groove was cut after the head assumed its position in the ravine, following its dumping there.



SL 1 exhibits sharpening grooves which present a special problem. Stirling (1955:9-11) states, "When discovered it was lying on its back, head down on the slope of a small but steep arroyo about 300 yards southeast of

the principal mound." All four of the relatively shallow grooves on this head appear in the same general area, two immediately behind the left ear and two smaller ones behind and slightly above the left ear. As this area coincides with the curvature of the left side just before it runs into the flat back surface, the presence of axe sharpening grooves at this particular point indicates to us that they were fashioned before the head assumed the position in which it was discovered. The possibility exists that, after being removed from its original location and thrown down the slope of the steep arroyo, it repeatedly shifted its position as the water of the arroyo undercut the surface upon which it lay. The grooves could then have been cut after the head had been toppled and before it had assumed its final position.

Rectangular niches. The six large rectangular cubical holes which appear on the back surface of SL 2 are unique among the colossal heads. The only other instances in Olmec sculpture where holes of this type appear are on Altar 4 of La Venta and Monument 14 of San Lorenzo (pl. 33b).



Rectangular niches on SL 2.

Niche 1 has a maximum depth of 5.2 cm as measured from the left side. The bottom of the niche slopes upward to the right from its low point on the left side until it is level with the surface of the head band. This characteristic distinguishes this niche from the others on this head, and from those on La Venta Altar 4 and San Lorenzo Monument 14.

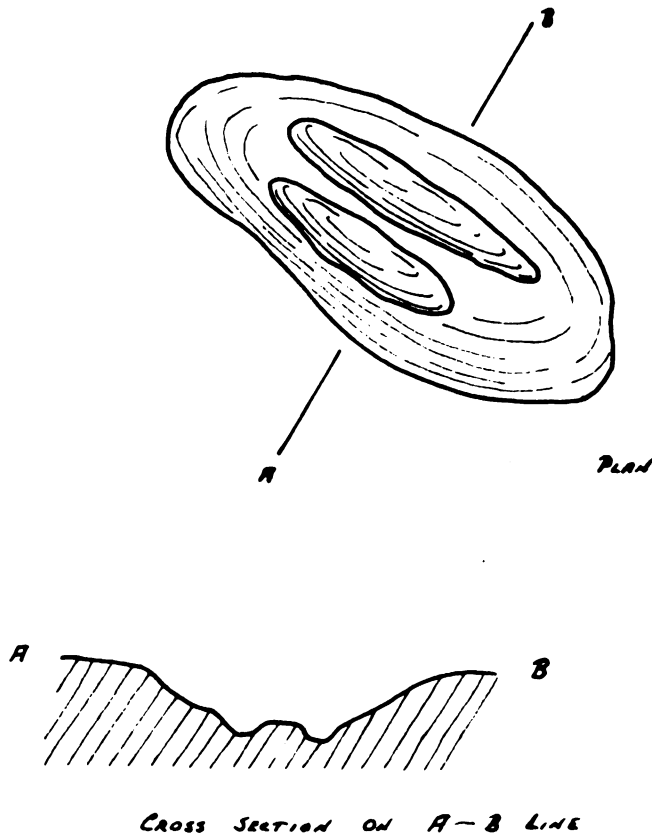
Niche 2 is 9 cm deep and cut within the knot of the head band, partially obliterating a line which had been cut by the sculptors of the head. It shares this characteristic with Niche 5, and our assumption that the niches represent a defacement-type that post-dates the sculpturing of the head rests upon this fact. Altar 4 of La Venta and Monument 14 of San Lorenzo also "have had the carvings at one end carefully defaced, and in the area thus produced, deep rectangular niches were excavated" (Stirling 1955:16).

Niche 5, on the upper part of the back, forms almost a straight line with Niche 3 in the center and Niche 6 on the bottom. These three niches also share a characteristic in that they are the shallowest (depths: Niche 5, 4.5 cm; Niche 3, 3 cm; Niche 6, 4.8 cm), and are roughly equal in that respect. The deepest niche on SL 2 is Niche 4 (15.5 cm), which is also the largest. It is probable that the lower surface in which Niche 4 occurs is due to an original imperfection in the stone, but the possibility remains that it may have been purposefully carved, since in Monument 14 from San Lorenzo niches were carved in a new surface of the head created after carefully chipping away earlier decoration to a depth of 2.5 cm (Stirling 1955:16).

The main difference between the niches in SL 2 and in the aforementioned monuments is that in La Venta Altar 4 and San Lorenzo Monument 14 they are almost twice as long as they are wide (ranging from 20.3 to 27.4 cm in length and from 10 to 17.5 cm in width), while in the SL 2 head they are almost invariably square. The variation in size, shape, depth, and relative position of these niches does not suggest what their use may have been.

We believe that the holes were carved after the head had been completely sculptured, and that they must have been finished before it was removed from the original vertical position, since Stirling found the head lying on its back. This means, therefore, that at least SL 2 was used in some type of ritual activity involving the cutting of niches which must have served a ceremonial or utilitarian purpose. It is unlikely that the amount of effort and skill that was expended in carving the niches was directed solely to "defacing" the head. Possibly the niches were utilized for depositing offerings or for burning incense. They may have contained figurines since the emergence of a figure from a niche (particularly at the La Venta and San Lorenzo altars) is a frequent theme of Olmec sculptural art. La Venta Stela 1 shows a figure standing fully erect in a large rectangular opening (Stirling 1943, pl. 33a). In this respect, it may be remembered that the large niche on the back surface of San Lorenzo Monument 14 also contains a stone "plug."

Gouges. Large, shallow, concave, gouged-out depressions, present only on the backs of heads LV 2, LV 3, and SL 4, are here referred to as "gouges." LV 3 and SL 4 each have one of these defacement gouges; LV 2 has four on the back surface. These are smoothed-out concavities, and appear to have been ground. The deepest gouge is 6.5 cm, with a length of 38 cm, and is 19 cm across. Three of these contain sharpening grooves which run longitudinally within them and increase their depth. Consequently this type of defacement antedates sharpening grooves and postdates flattening of the back, at least on LV 2. We postulate that these gouges were ground while honing the sides of stone tools, possibly celts or stone axes.



Gouge on back surface of LV 2

Ground pits with dimples. We have labeled ground circular depressions containing smaller depressions in the center of the concavity as grinding pits with dimples in order to distinguish them from other ground pits which lack the central depression. These pits average a depth of 3 cm if the dimple is included, but this depth varies greatly as a function of differential weathering. Diameters range between 7.5 to 10 cm. The largest pit is on

SL 3, and is 12.5 cm in diameter.

This type of defacement occurs on all six of the San Lorenzo heads, on LV 2, and, in somewhat different form, on LV 3. In contrast to the sharpening grooves and rectangular niches which appear on other Olmec monuments, these pits with dimples are restricted to the above specified colossal heads.

At least some of these drilled pits with dimples appear to have been used by the sculptors of the monuments as a sculpturing technique, while the majority are superfluous and appear to us to have been purposefully inflicted defacement. Thus, for example, on SL 1 we counted eleven of these pits (six on the face, four on the right side, and one on the left). Two of these pits occur immediately above the nares and have been ground into each nostril from above. Each ear hole presents a pit with a dimple. Thus, at least these



Pits with dimples on the nares of SL 1

four pits could have been used as a sculpturing technique. Two pits appear on the cheekbones, diametrically opposed, at the same point under each eye. The remainder are distributed at random and may represent true defacement. Two cup-shaped depressions appear in the corner of each mouth, but these lack the characteristic inner dimple depression and are part of the original sculpturing of the head. They obviously represent a different type of drilling technique. We hold that the secondary depressions are a by-product of a drilling technique which we have been unable to reconstruct.

SL 2, which was found lying on its back, exhibits pits with dimples only on the face. Some of these overlap and present different degrees of deterioration through weathering, suggesting that they were made over an extended period of time. They do not have any symmetrical distribution, but are scattered at random, principally over the chin, mouth, and both cheeks. A few appear on the head band, and there is one under the left eye and one on the nose.

SL 3, which was discovered lying face down, exhibits pits with dimples on the head band and headdress. This indicates that the defacement must have occurred before the head assumed the position in which it was found. As on SL 2, many of the pits occur in pairs, their outer edges sometimes overlapping each other. They are all of roughly the same diameter (between 8-10 cm), except for a larger one on the head band above the left eye, which is 12.5 cm in diameter. Also as on SL 2, the pits appear to be differentially weathered, possibly indicating that they were fashioned at different times.

This latter characteristic is also apparent on SL 4, which was found lying on its right side and, interestingly enough, shows 25 pits with dimples, but only on its flattened, otherwise undecorated, back surface. Although some of these pits are more weathered than others, in general they appear to have been exposed to weathering for a considerably longer period than those on SL 2 and SL 3. The majority of the pits are about 10 cm in diameter; smaller ones measure about 7.5 cm. They are dispersed at random over the right side of the back, only two of them overlapping each other. The right ear shows a drilled pit which lacks a dimple. Since SL 4 was discovered lying left side up, these pits could only have been ground when the entire back surface was exposed, possibly even before the head was toppled from its upright position.

SL 5, found lying face up, exhibits two of these defacement pits with dimples. One of these appears beneath the right eye, and the other is centered on the chin.

SL 6, recently discovered, was lying on its left side, and since it is still half buried, we were able to study only the right side, and part of the face. Three drilled pits with dimples appear on the face, one on the center of the nose bridge and two—with overlapping outer circles—immediately below the right eye.

Only two other colossal heads exhibit drilled pits with dimples. One of these, LV 2, shows a large number of the natural circular vesicular pits discussed above. Some of these contain secondary depressions at the bottom which may easily be confused with the artificial defacement pits with dimples, particularly since the heavy weathering exhibited by this head makes it difficult to ascertain whether some of the pits were concentric, and if the dimples were centered at the bottom. We have, however, identified three ground pits with dimples on the top of LV 2. As with the three pits with dimples near the top of the right side of the forehead of LV 3, they do not have the same form as those found on the San Lorenzo heads, being of greater diameter, more cup-shaped and deeper. The inner dimples of the pits on LV 3 are 3 cm deep and 4 cm in diameter, while

at San Lorenzo the dimples contained in the pits average 1 cm in depth and 1 cm in diameter.

Most of the pits appearing on the front and top of both LV 2 and LV 3 do not contain dimples. The circular left ear ornament of LV 3 contains three pits, two without dimples and one with a vertical-walled dimple which does not resemble those from San Lorenzo. Apparently we are here dealing with the same grinding technique as was used at San Lorenzo but executed with a different tool.

The possibility suggested by Stirling (1955:11), that the pits "were used to attach some extraneous decoration," must be discarded since there is no archaeological evidence to support this assumption, and most appear to postdate the sculpturing by a considerable period of time. None of the pits bear any trace of paint or adhesive, and we believe they were not elaborated in any way whatsoever. The only indication that the heads may have been painted is a reference by Stirling (1955:20) to a painted fragment of LV 4.

The possibility remains that, as with sharpening grooves, the pits marked a periodical ritual defacement activity by the Olmecs or later native occupants of the area. This assumption is supported by the fact that this type of defacement is restricted to the colossal heads. However, they may simply be the result of a tool grinding technique which we are unable to reconstruct.

Summary

This section has reviewed the several types—and possible causes—of defacement exhibited by the Olmec colossal heads. We have attempted to determine the time when mutilation was carried out in relation to the time of sculpturing by relating the position of each head to the area where the defacement appears. The data are summarized in Table 16 which follows.

TABLE 16
Summary of Defacement

No.	Position at Time of Discovery	Grooves	Pits and Dimples	Weathering (degree)*
LV 1	Upright <u>in situ</u>	On top only; numerous	None	3
LV 2	Upright <u>in situ</u>	15 on top 56 on back	3 on top (divergent type)	4
LV 3	Upright <u>in situ</u>	43 on top 3 on face 2 on back a few on both sides	(divergent type) 3 right side forehead 1 in left ear ornament (divergent)	5
LV 4	Upright <u>in situ</u>	23 on top	None	3
SL 1	On back, head down slope of steep arroyo	4 on left side	6 on face 4 on right side 1 on left side	1
SL 2 [†]	Lying on back, face up	1 on right side 1 on face	On face only	2
SL 3	Upside down on bottom of deep ravine, in a spring	None	On head band and headdress above face	2
SL 4	Lying on right side	None	25, on back only	1
SL 5	Lying face up	None	2 on face	1
SL 6	Lying on left side	None (possibly on unexposed surface)	3 on face (possibly more, unexposed)	1
TZ 1	Upright <u>in situ</u>	3 on back	None	1
NS 1	Upright <u>in situ</u>	None	None	1

* Number indicates degree of weathering; highest indicated by figure 5, lowest by figure 1. Although purely subjective, this range gives an idea of the relative variation exhibited by the heads in this respect.

[†] Also presents 6 rectangular niches.

TABLE 17

Dimensions and Source Localities of Olmec Heads

No.	Weight (sh. tns)	Height (m)	Circumference (m)	Frontal Width (m)	Length (m)	Stone Source
LV 1	24.0	2.41	6.40	2.08	1.95	Cerro Cintepec
LV 2	11.8	1.63	4.24	1.35	0.98	Cerro Cintepec
LV 3	12.8	1.98	4.05	1.60	1.00	Cerro Cintepec
LV 4	19.8	2.26	6.53	1.98	1.86	Tuxtla Mountains
TZ 1	7.8	1.47	5.49	1.50	1.45	Cerro El Vigía
NS 1	8.5	1.45	4.90	1.34	1.26	Cerro El Vigía
SL 1	25.3	2.85	5.90	2.17	1.68	Cerro Cintepec
SL 2	20.0	2.69	5.44	1.90	1.50	Cerro Cintepec
SL 3	9.4	1.78	4.02	1.60	0.95	Cerro Cintepec
SL 4	6.0	1.78	3.80	1.17	0.95	Cerro Cintepec
SL 5	11.6	1.86	4.60	1.47	1.15	Cerro Cintepec
SL 6		1.67		1.26	1.41	Cerro Cintepec

APPENDIX I

TABLE 18

Element Occurrence on Twelve Olmec Colossal Heads

Element	LV 1	LV 2	LV 3	LV 4	TZ 1	NS 1	SL 1	SL 2	SL 3	SL 4	SL 5	SL 6
Headdress												
Plain	-	x	x	-	x	-	-	-	-	-	-	-
Appliqué	x	-	-	x	-	x	x	-	-	x	x	-
Lattice	-	-	-	-	-	-	-	x	-	-	x	x
Twined	-	-	-	-	-	-	-	-	x	-	-	-
Head band												
Plain	-	-	-	-	x	x	-	-	-	-	-	-
Appliqué	-	x	-	x	-	-	-	x	-	-	-	-
Twined	-	-	-	-	-	-	-	-	x	x	-	x
Sectioned	x	-	-	-	-	-	x	-	-	-	-	-
Seating of head band												
Horizontal	x	x	x	x	x	x	-	-	-	x	-	x
Oblique	-	-	-	-	-	-	x	x	x	-	-	-
Groove between head band and headdress												
	-	-	-	-	x	x	x	-	x	-	-	-
Nasion												
Subrhomboidal	x	x	-	x	-	-	x	x	-	x	x	-
Double	-	-	x	-	-	-	-	-	x	-	-	x
Triangular	-	-	-	-	x	x	-	-	-	-	-	-
Iris form												
Flattened	-	-	-	-	-	-	-	x	-	-	-	-
Raised relief	x	-	-	x	-	-	x	-	-	-	-	-

Flattened & incised	-	x	-	-	-	-	-	-	-	x	x	x	x	x	x
Absent	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-
Eye corners															
Inner															
Upper overlaps	-	x	-	x	-	-	-	-	-	x	-	-	-	-	x
No overlap	x	-	-	-	-	x	-	-	-	-	x	-	-	-	-
Tear duct	-	-	-	-	-	-	x	-	-	-	-	-	-	-	x
Outer															
Upper overlaps	-	-	-	x	-	-	-	-	-	x	-	-	-	-	x
No overlap	-	-	-	-	-	-	x	-	-	-	x	-	-	-	-
Tear duct	x	x	-	-	-	-	-	-	-	-	-	x	-	-	-
Corner pointed	-	-	x	x	-	x	-	-	x	x	-	x*	x†	x	x
Corner rounded	x	x	-	-	-	-	-	x	-	-	-	x	x	-	-

Mouth																
Open, with teeth	-	x	-	x	-	-	-	-	-	-	x	-	-	-	-	-
Open, no teeth	-	-	x	-	-	-	x	-	-	-	-	x	-	x	x	
Closed	x	-	-	-	-	x	-	-	-	x	-	-	-	-	-	

Lip Form																
Upper																
Raised ridge	-	E	E	-	-	x	x	x	x	-	-	-	-	-	-	-
Bow	x	E	E	x	x	x	x	-	-	-	x	x	-	-	x	-
Lower																
Raised ridge	-	-	-	x	-	x	x	x	-	-	-	-	-	-	-	-
U-shaped	x	-	E	-	-	-	-	-	-	-	-	-	-	-	-	-
Bow	-	-	-	-	x	-	-	-	-	-	-	-	-	-	x	-
Straight	-	-	-	-	-	x	-	-	-	x	-	-	-	-	-	-

x = present
 - = lacking or not apparent
 E = present but eroded
 * = left
 † = right

TABLE 18 [cont'd.]

Element	LV 1	LV 2	LV 3	LV 4	TZ 1	NS 1	SL 1	SL 2	SL 3	SL 4	SL 5	SL 6
Pits at mouth corners												
Circular	x	x	x	x	-	x	x	-	-	-	-	x
Bean-shaped	-	-	-	-	-	-	-	x	-	x	x	-
Absent	-	-	-	-	x	-	-	-	x	-	-	-
Chinstrap												
To chin	-	-	-	-	x	x	-	-	-	x	-	x
Abbreviated	x	x	x	-	-	-	x	x	-	-	x	-
Eroded	-	-	-	x	-	-	-	-	-	-	-	-
Not present	-	-	-	-	-	-	-	-	x	-	-	-
Ear ornament												
Lobe plug	-	-	-	-	x	x	x	-	-	-	-	x
Disc with tassel	-	x	-	-	-	-	-	-	-	x	x	-

x = present

- = lacking or not apparent

E = present but eroded

* = left

† = right

APPENDIX II

OTHER LARGE STONE HEADS IN SOUTHERN MESOAMERICA

Although, as noted by Covarrubias (1957:65), Stirling (1965:733), and Coe (1965b:741), the classic Olmec colossal heads are restricted to the sites of Tres Zapotes (including Nestepe), La Venta, and San Lorenzo, monumental stone heads of fairly large size and vague resemblance to the twelve heads reported here have been found at several other localities. Outsized carved stone heads also occur elsewhere in the Olmec heartland: at Copán, Honduras; and on the Pacific slopes of El Salvador and Guatemala, particularly at the site of Monte Alto, Guatemala.

At least six heads are known in the Olmec heartland: two are located at the site of Cerro de las Mesas; at least one at Laguna de los Cerros; two just east of San Lorenzo in the Municipio of Sayula; and one at San Miguel.

Cerro de las Mesas is located on the south bank of the Rio Blanco, fifteen miles east of the Bay of Alvarado. The heads are designated Monument 2 and Monument 8 by Stirling (1943:31, 45-47). Monument 2 depicts a large masked face, 1.3 m high, 1.0 m wide, and 70 cm thick. The facial features are very stylized, and the face has decorations on the forehead, over and under the eyes, below the nose, and on the jowls. These decorations are considered by some to be hieroglyphic in nature (Piña Chan and Covarrubias 1964, ilustracione 1). This head is illustrated by Piña Chan and Covarrubias (op. cit.), Stirling (1943, pls. 26, 27b, 31a), and Gamboa (1963, cat. 237).

Monument 8 at Cerro de las Mesas is 75 cm in height, and is termed by Stirling (1943:46) an "anthropomorphic monkey." It has round eyes without irises, eyebrows, a wide nose, and an open mouth showing six teeth. It appears to have a rudimentary head band and chin strap. Monument 8 is illustrated by Stirling (op. cit., pl. 30c).

Laguna de los Cerros is located in the Rio San Juan drainage, approximately halfway between the sites of Tres Zapotes and San Lorenzo. Here Alfonso Medellin Zenil discovered Monolito Numero 1, a basalt head 75 cm high, 70.5 cm wide, and 70.5 cm thick, with a circular depression on the top of the head to "hold water or blood" (Medellin Zenil 1960:87). This head wears a stylized jaguar mask notable for its rectangular mouth, snub nose, square eyes with irises depicted by X's, and protruding nasion. The hair is described by Medellin (op. cit., 86) as kinky or curly ("crespo o

rizado"). Taking the features as a whole, he feels that the face is Negroid, but probably represents a Tlaloc mask, and that the hair, through analogy with the Mixtec and Aztec codices, relates Monolito Numero 1 to the curly haired gods of the earth and of death. This head is illustrated by Medellin (op. cit., pls. 14, 15; 1963:7), Piña Chan and Covarrubias (1964), Hasler (1959), and Gamboa (1963, cat. 239).

There is a second Laguna de los Cerros head, designated Monolito Numero 2 (Medellin 1963:6), which is reported to be very similar to Monolito Numero 1 (ibid. 1960:86; Hasler 1959:31-32), but it has neither been illustrated nor fully described.

The two heads from the Municipio of Sayula come from the areas of Estero Rabón and Medias Aguas, which are respectively east and west of the Tehuantepec railroad, near the town of Almagres. The Estero Rabón head is 45 cm high and is carved from gray andesite. This head has angular slits for eyes, a pub nose, and an extreme jaguar mouth. It also has a head band and, seemingly, chin straps. The Estero Rabón head is illustrated by Medellin (1960, pl. 1; 1963, pl. 4), who terms it "de un purismo estilo olmeca" (ibid. 1960:76).

The Medias Aguas head is in the form of a mask, 90 cm high, 63 cm wide, and 47 cm thick. The features are very simply depicted. The forehead is plain, the eyes are depressions with pits in their centers, the nose is barely modeled, and the ears are shown only by pits. The main feature is the jaguar-like mouth which is wide and notable for its four large canine teeth. Pits also occur under the nose and on either side of the top of this head. This head is illustrated by Medellin (1960, pls. 4 and 5).

A possible additional head from the Olmec heartland is from the site of San Miguel, located in the State of Tabasco near the headwaters of the Rio Blasillo, perhaps forty miles to the east of La Venta. This head is "incomplete and somewhat atypical" in relation to the classic heads (Stirling 1965:733), and is broken off at the level of the eyes. The extant upper portion of the San Miguel head is 1.05 m high, with a characteristic flat back, and a headdress comprised of a series of round faces evenly spaced over the dome of the head. The remaining facial features are eroded beyond recognition. The San Miguel head is illustrated by Stirling (1957, pl. 50).

While not exactly in the same category as the monolithic heads just discussed, two large tenoned heads from the Olmec heartland should be mentioned. Monument 6 from San Lorenzo (Stirling 1955, pls. 14a, 14b) and Monument F from Tres Zapotes (ibid. 1943, pl. 5a) are different in the

treatment of their facial features from the colossal heads (*ibid.* 1955:13), and probably form part of a sculptural subclass distinct from them. Nevertheless, since these tenoned heads are over sized, show careful sculptural attention only to facial details, and were fashioned in the same geographical area as the colossal heads, they and the monolithic heads should be considered as components of a single Gulf coast artistic tradition which has as two of its attributes a tendency toward gigantism and an emphasis on the head as opposed to the rest of the body.

Together, the heads from Cerro de las Mesas, Laguna de los Cerros, Sayula, and San Miguel stand quite apart from the twelve colossal heads reported here. With the possible exception of Monument 8 from Cerro de las Mesas, which bears a superficial resemblance to LV 2, the heads just discussed are more stylized, much less purposely human, and smaller than the heads from Tres Zapotes, La Venta, and San Lorenzo. What the heads just discussed do emphasize, however, is that in the Olmec heartland the tradition of carving heads without bodies was not limited to the naturalistic giants. Rather it would appear that there was a larger Gulf coast artistic tradition featuring the carving of big heads, which may have persisted in time well past the demise of the pure Olmec style (see Coe 1965a, table 1; Stirling 1965:735; Medellín 1960:78).

Another location which has yielded a large carved stone head is the Mayan site of Copán in Honduras. The Copán head was found at the northeast corner of Temple 11 ("Temple of the Inscriptions") and is thought by Stromsvik (1947:67) to be one monolithic "part of a human figure of heroic size." The face is angular, with a jutting, pointed chin, and what was probably a pointed nose before it was broken. The cheeks and jowls are quite lined and protuberant, framing the mouth and chin. The mouth is open and lacks the central incisors, while the eyes are large and tear-shaped. The head wears a head band knotted in front, appears to lack ears, and seems to be sculptured only in the three-quarter round. This head from Copán is illustrated by Stromsvik (1947).

All in all, the Copán head seems to depict an old man, and to be quite distinct stylistically from the Olmec heads. Nevertheless, it does resemble the old fire god figurines found in Trench 34 at Cerro de las Mesas (Drucker 1943, pl. 8) and in Trench 3 at Laguna de los Cerros (Medellin 1960, pl. 20). If there are any stylistic similarities between the two areas, however, they are most likely the result of both locations having either a primary or secondary influence from the Teotihuacán "X-T" horizon (see Lathrap 1957:59-61; Coe 1965a:702; Longyear 1940:269-270) rather than their influencing each other. There are several other large stone heads from Copán (John A. Graham, personal communication), but they seem to be even less related stylistically to the twelve colossal heads of

the heartland than the Copán head just discussed.

The final group of large stone heads in Middle America is concentrated on the Pacific slopes of Guatemala and El Salvador. These heads occur at the sites of El Baul and Monte Alto in Guatemala, and in the Departments of Santa Ana and Ahuachapán in El Salvador. The El Baul head has been described by Thompson (1948:22), who designates it Monument 3. Noting its resemblance to the old fire god, he emphasizes its aquiline nose, wrinkles, and large eyes. Furthermore, Monument 3 has a smiling mouth, is bearded, and wears a distinctive head band whose central element is a human face. This head is 1.72 m in height, and is illustrated by Thompson (op. cit., fig. 10d) and Dieseldorff (1926, table 28, No. 155). Whether the similarity of Monument 3 to the Copán head and to the Cerro de las Mesas and Laguna de los Cerros ceramic figures is due to influences on El Baul from Cerro de las Mesas, to Teotihuacán influence, or to influence on the Pacific slopes of Guatemala from Copán is a subject that must await further research (for a discussion of these possibilities see Miles 1965:268-269).

There is another "large head of the old fire god from the Pacific slopes (exact provenience unknown), very like [the] one at Copan" (Miles 1965:269). This head is illustrated by Miles (op. cit., pl. 19d), and, although it lacks a head band, parallels the Copán head in its angular features, large eyes, lined face, lack of ears, and three-quarter round sculpturing.

The colossal heads of Monte Alto more closely resemble the classic Olmec heads than any of the others we have so far discussed. These heads, designated Monument 1 and Monument 2 by Parsons and Jenson (1965) are so similar in size (Monument 1, 1.4 m high; Monument 2, 1.38 m high) and method of depiction that they may be considered together. The Monte Alto heads are bald, with closed eyes underscored by incised lines, wide, flat noses, and thick closed lips. The nose and mouth areas are marked off from the cheeks by an "inverted V-groove" (ibid. 135), and the ears are stylized and adorned with perforated discs. While there is a basic similarity of design and motif between these heads and the Olmec examples, the Monte Alto heads differ in their treatment of the eyes, their lack of helmets and chin straps, and in the fact that they are flatter-faced and sculptured in lower relief and less in the round than the Olmec heads. Monument 1 is illustrated by Richardson (1940, pl. XVIIIa) and Parsons and Jenson (1965, illus. 3 and 4); Monument 2 is illustrated by Parsons and Jenson (op. cit., illus. 5 and 6), Richardson (op. cit., pl. XVIIIb), and Villacorta (1938, photo on p. 27).

Whether the Monte Alto heads predate or postdate the Olmec heads is

still an open question. On the basis of their pottery collection from Monte Alto, Parsons and Jenson (1965:141-143) believe the heads to be from the middle transitional to late Preclassic periods and thus to slightly postdate the Olmec heads. Miles (1965:244, 252), on the other hand, on the basis of her pottery collection from the site, believes the heads to belong to the early Preclassic period and thus to predate the Olmec examples. Miles further feels (*op. cit.* 252) that the Monte Alto heads are "related, possibly lineally, possibly collaterally" to the Olmec style, while Parsons and Jenson (*op. cit.* 133) believe that there is a "definite relationship [of the heads] to the Olmec art style, although they are in a class apart."

A third head from Monte Alto of interest to this study is a large (1.65 m in height) Olmec-like jaguar mask which Parsons and Jenson (1965) have designated Monument 3. This head is characterized by its arched upper lip, the scrolls at its mouth corners and on its cheeks, and the angular appearance of its facial features. While obviously differing from the classic Olmec heads, it shows a fair degree of similarity to the heads from Cerro de las Mesas, in the form of the mask of Monument 2, and to Monument 1 from Laguna de los Cerros, which are discussed above. Monument 3 from Monte Alto is illustrated by Richardson (1940, pl. XVIIIc) and Parsons and Jenson (1965, ill. 7 and 8). It is interesting to note that this head also shows stylistic relationship to such widely diverse sculptures as the Miraflores or Arenal phase large stone incensarios from Kaminaljuyu (Monuments 16, 17, 18, for which see Miles 1965, pl. 16a; Villacorta 1938:179), the undoubtedly chronologically early low relief jaguar head boulder sculptures from the Departments of Santa Ana and Ahuachapán in El Salvador (Richardson 1940, figs. 33, 34; Spinden 1915, fig. 77), and the coastal slopes of Guatemala (Miles 1965:247-248, 257). The latter two examples, while technically not giant heads, are so closely related in concept as to demonstrate a long standing tradition of head carving on the Pacific slopes as well as on the southern Gulf coast.

Another group of heads that have been considered by some to be related to the giant heads are the "cabecitas colosales" (colossal headlets) found in the Mixteca Baja of the upper Rio Balsas near the town of Acatlan, Puebla (Paddock 1966:178). According to Paddock, Covarrubias (personal communication) considered these "rather uncommon" pottery heads to have "a conceptual similarity to the true cabezas colosales." However, in our opinion, they appear to be quite different stylistically from the Olmec examples. They are made of clay, employ appliqué work for details, and have an entirely different style of facial depiction from the Olmec heads, for their oval eyes and open oval mouths are quite distinct from the Olmec method of mouth and eye sculpturing. If the fashioning of heads without bodies implies an artistic connection, then the colossal headlets are related to the Olmec giants; otherwise, in size, shape, facial features, and artistic style, they are

distinct. The headlets are illustrated by Paddock (op. cit., pls. 199-207).

To conclude, it seems likely that there were Preclassic traditions of carving naturalistic stone heads both in the Olmec heartland and on the Pacific slopes of Guatemala and El Salvador, and that these traditions were stylistically connected. It would further appear that these traditions persisted over time in each area, even after the cultures that had originated the carving of the heads had disappeared. That the later Olmec style of head-carving in the heartland influenced the sculpture of the Pacific slopes seems probable, and a parallel influence on the Olmec from the Pacific slopes is also a fair possibility, at least in late Preclassic times (see Coe 1965b:769-774). Furthermore, the tradition of head-carving in both areas persisted even when seemingly modified by art traditions from the Mexican highlands which did not include monumental heads as part of their artistic inventory. The major work, however, is yet to be done, for while the stylistic relationships of the heads parallel the suppositions of many archaeologists concerning the cultures that made them (see, for example, Coe 1965b; Longyear 1940; Lathrap 1957; Miles 1965; Richardson 1940), they have not yet been placed in strict chronological relationship, either to their cultures or to themselves, nor have their cultures been adequately anchored in time or space. Only when this is done can the suggestions we have made concerning the relationships of the heads be taken as more than mere possibilities.

ADDENDUM

Since this monograph was written and printer's copy prepared, publications have appeared which contain information having a bearing on the subject. These are cited below, with an indication of their content.

Heizer, Robert F.

- 1967 Analysis of Two Low Relief Sculptures from La Venta. Contributions of the University of California Archaeological Research Facility, No. 3, 25-55, Berkeley.
(Some observations on Olmec sculptural techniques and productions.)

Coe, Michael D.

- 1967 La segunda temporada en San Lorenzo Tenochtitlán, Veracruz. Instituto Nacional de Antropología e Historia, Boletín 28, 1-10, México, D.F.
(Excellent photographs of new sculptures discovered in 1967 at San Lorenzo site; first frontal photograph of SL 6 colossal head in upright position; contour map of San Lorenzo site showing structures and locations of 43 monuments known to date. Plate 36 and Figure 29 of the present paper are taken from this article.)

Acosta, J. R.

- 1967 Traslado de la cabeza de Tres Zapotes. Instituto Nacional de Antropología e Historia, Boletín 28, 47-48, México, D.F.
(Account of moving colossal head TZ 1 in June, 1967, from its original find spot to the nearby village of Tres Zapotes. Statement made that "su peso es aproximadamente de ocho toneladas.")

Heizer, Robert F. and P. Drucker

- n.d. The fluted pyramid (Complex C) of La Venta. (To be published.)
(Details on size and form of the La Venta pyramid; corrects errors published in Drucker, Heizer and Squier 1959.)

Explanation of Illustrations

Plate 1	LV 1, front view
Plate 2a	LV 1, right profile
2b	LV 1, left profile
Plate 3	LV 2, front view (courtesy National Geographic Society)
Plate 4a	LV 2, right profile
4b	LV 2, left profile
Plate 5a	LV 2, right three-quarter view (courtesy National Geographic Society)
5b	LV 2, left rear
Plate 6a	LV 1, rear view
6b	LV 4, rear view (courtesy National Geographic Society)
Plate 7	LV 3, front view
Plate 8a	LV 3, right profile
8b	LV 3, left profile
Plate 9	LV 4, front view (courtesy National Geographic Society)
Plate 10a	LV 4, right profile
10b	LV 4, left profile
Plate 11	TZ 1, right three-quarter view
Plate 12a	TZ 1, right side
12b	TZ 1, rear view
Plate 13	NS 1, front view
Plate 14	NS 1, left profile
Plate 15a	NS 1, right profile
15b	NS 1, top rear view
Plate 16	SL 1, front view
Plate 17	SL 1, right profile
Plate 18a	SL 1, left profile
18b	SL 1, rear view
Plate 19	SL 2, front view
Plate 20	SL 2, rear view
Plate 21a	SL 2, right profile (courtesy Dr. Richard R. Randolph)
21b	SL 2, left profile

Plate 22	SL 3, front view
Plate 23	SL 3, right profile
Plate 24a	SL 3, rear view
24b	SL 3, left profile
Plate 25	SL 4, front view
Plate 26	SL 4, right profile
Plate 27a	SL 4, rear view
27b	SL 4, left profile
Plate 28	SL 5, front view
Plate 29	SL 5, right profile
Plate 30	SL 5, left profile
Plate 31	SL 5, right three-quarter rear view
Plate 32	SL 6, right three-quarter view
Plate 33a	SL 3, headband showing pits with dimples
33b	Monument 14, San Lorenzo, right side
Plate 34	SL 1, eye, nose, and mouth detail
Plate 35	TZ 1, front view
Plate 36	SL 6, front view (from Coe, 1967; see Addendum)

Figure 1 Descriptive attributes of the individual heads

Figure 2 LV 1, front view

Figure 3a LV 1, right profile

3b LV 1, left profile

Figure 4 LV 2, front view

Figure 5a LV 2, right profile

5b LV 2, left profile

Figure 6 LV 3, front view

Figure 7a LV 3, right profile

7b LV 3, left profile

Figure 8 LV 4, front view

Figure 9a LV 4, right profile

9b LV 4, left profile

Figure 10	NS 1, front view
Figure 11	NS 1, left profile
Figure 12a	NS 1, right profile
12b	NS 1, rear view
Figure 13	SL 1, front view
Figure 14	SL 1, right profile
Figure 15a	SL 1, left profile
15b	SL 1, rear view
Figure 16	SL 2, front view
Figure 17a	SL 2, front view (reconstruction)
17b	SL 2, rear view
Figure 18a	SL 2, right profile
18b	SL 2, left profile
Figure 19	SL 3, front view
Figure 20	SL 3, right profile
Figure 21a	SL 3, rear view
21b	SL 3, left profile
Figure 22	SL 4, front view
Figure 23	SL 4, right profile
Figure 24a	SL 4, rear view
24b	SL 4, left profile
Figure 25	SL 5, front view
Figure 26	SL 5, right profile
Figure 27	SL 5, left profile
Figure 28	SL 5, rear view
Figure 29	SL 6, front view

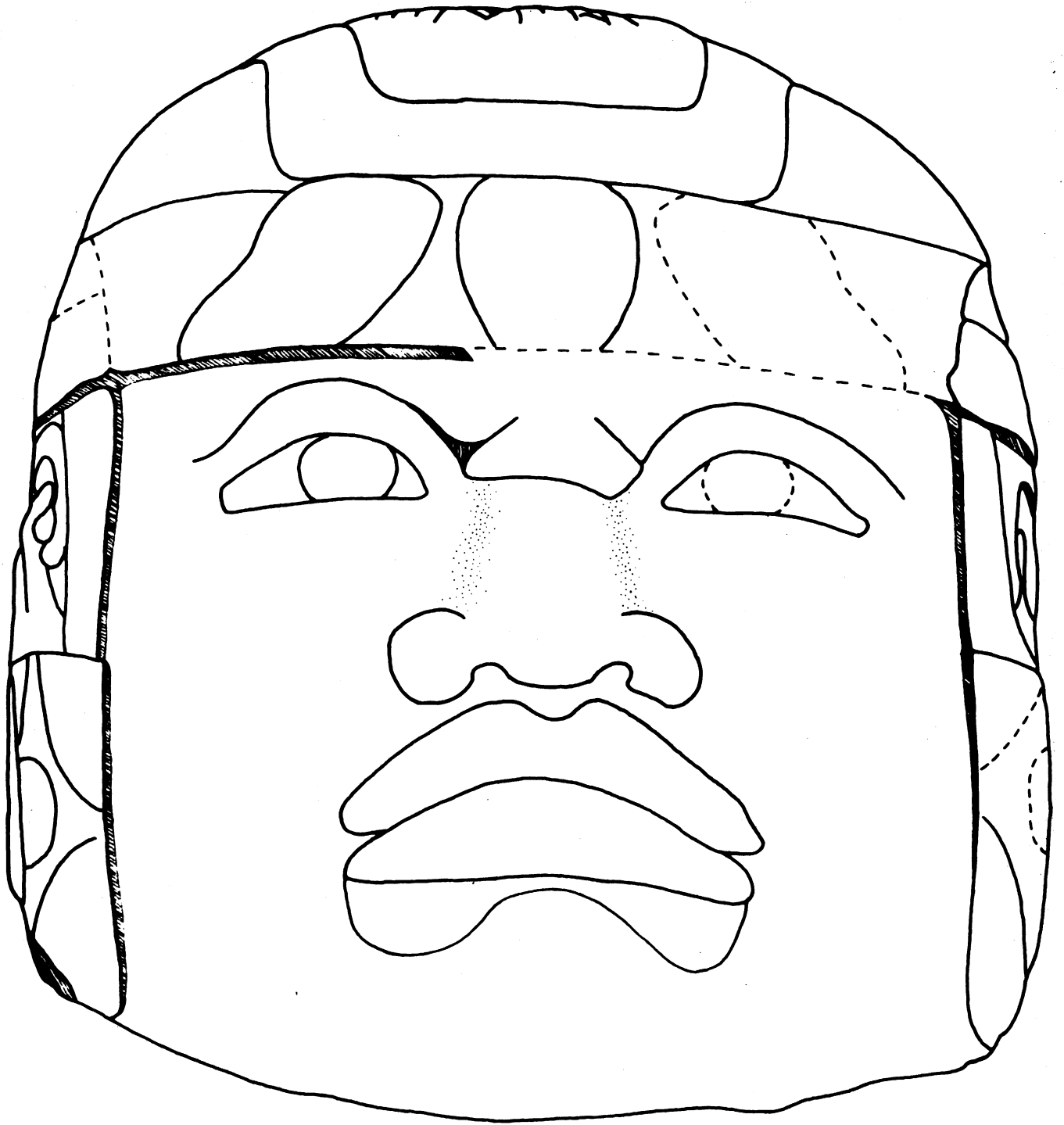


Figure 2 LV 1

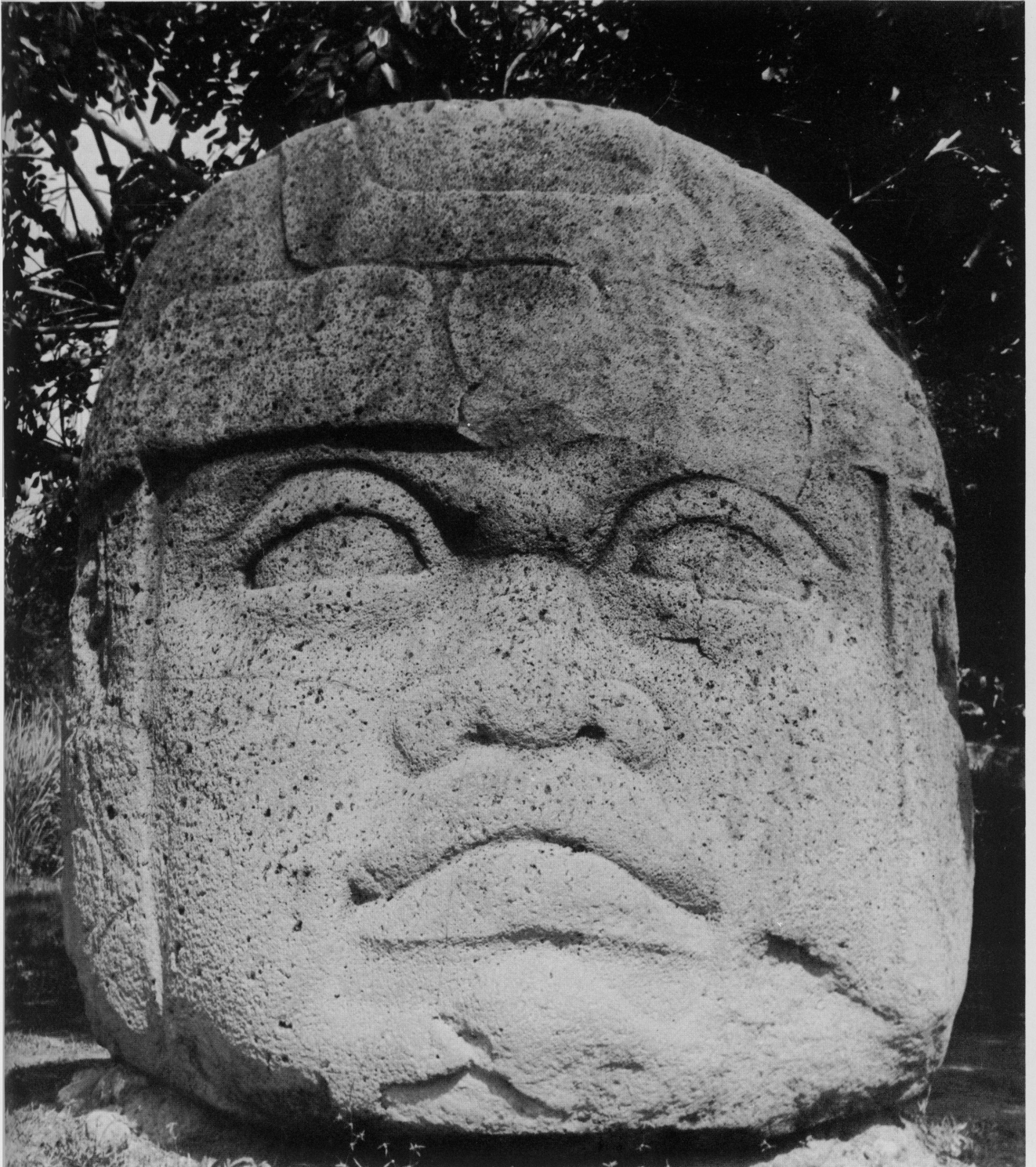
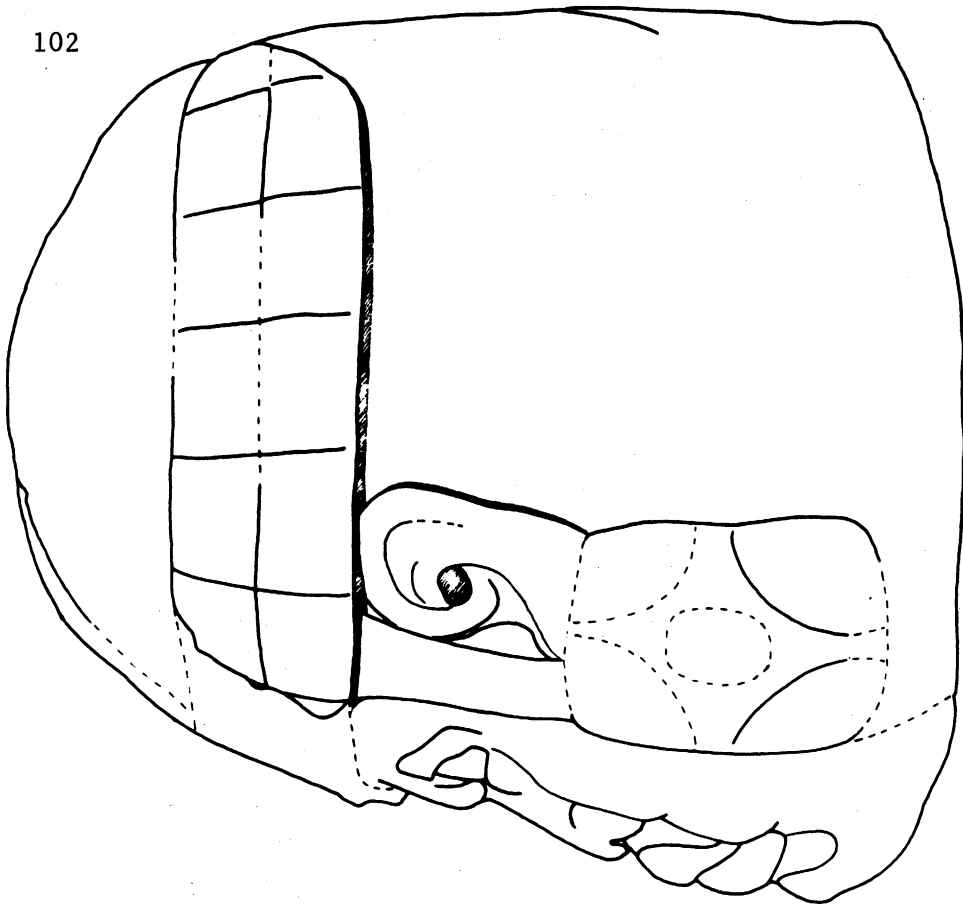
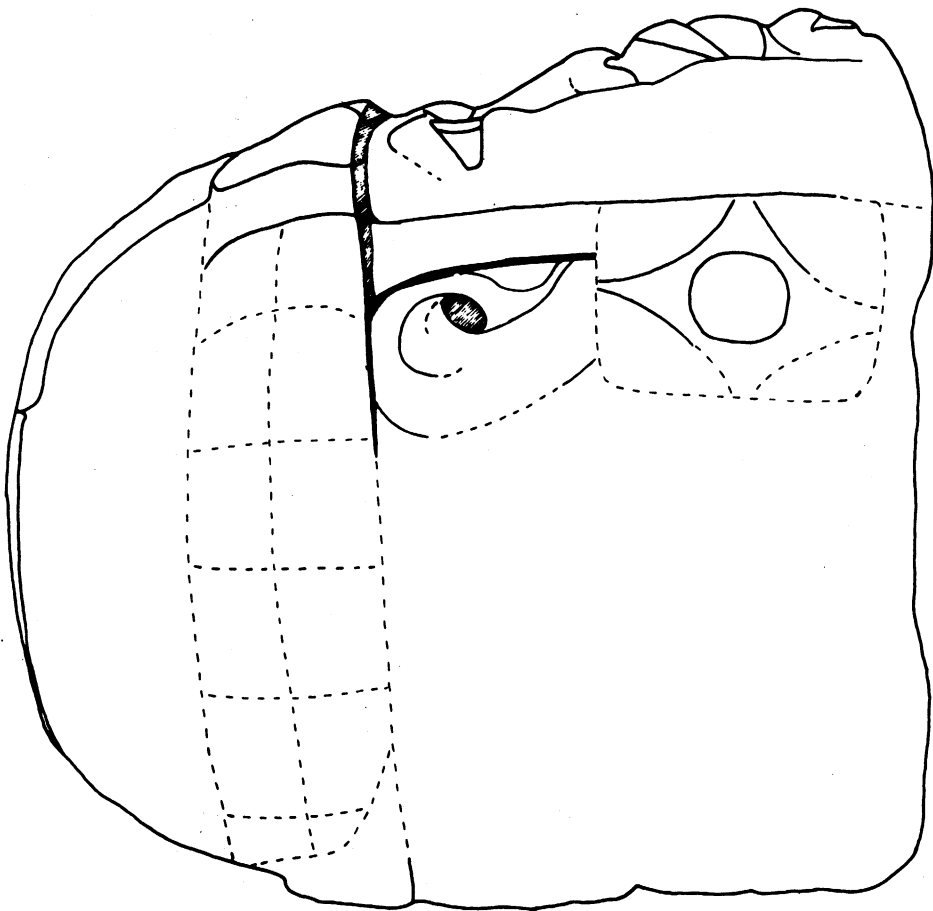


Plate 1 LV 1



b



a

Figure 3 LV 1



b



a

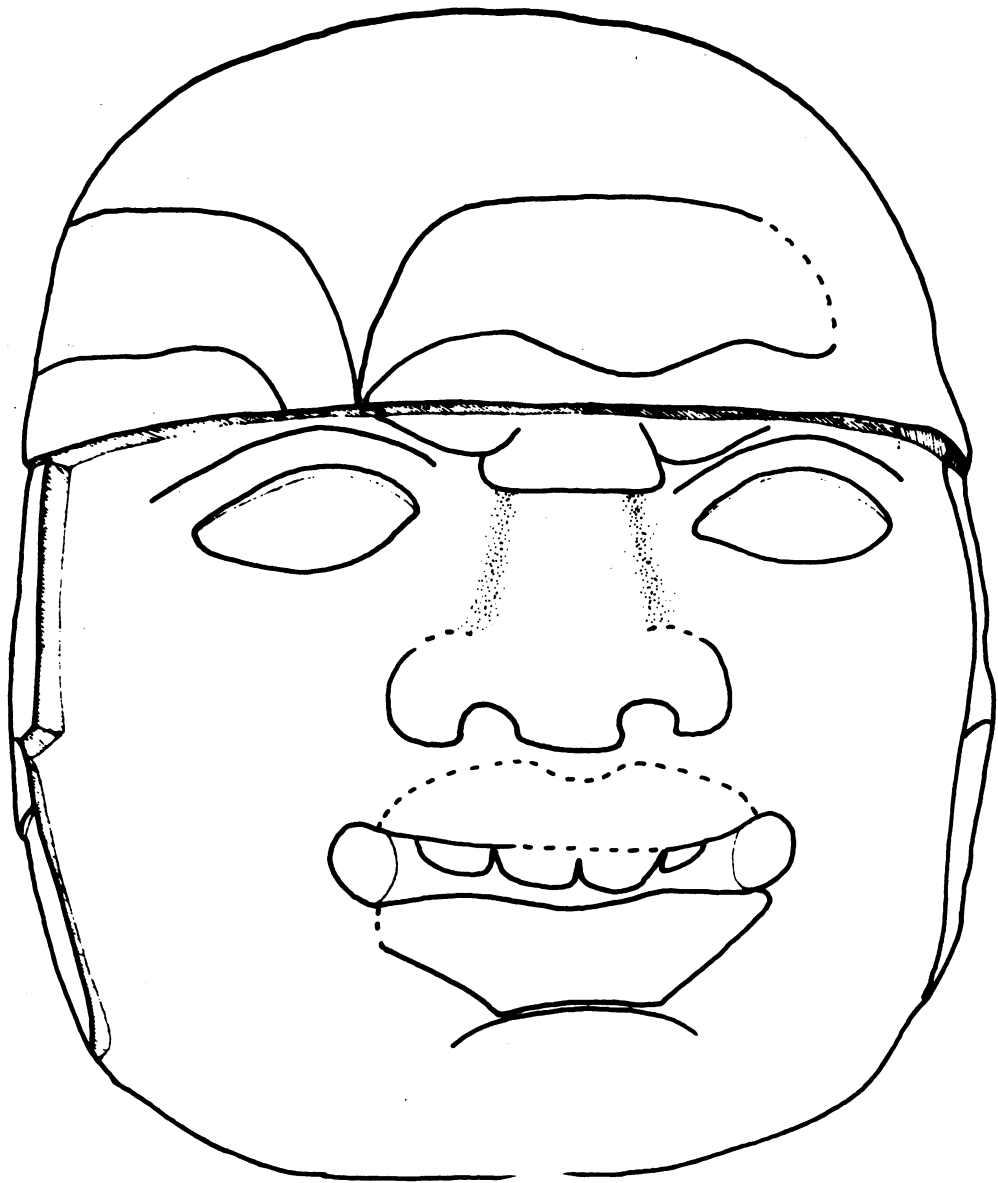


Figure 4 LV 2

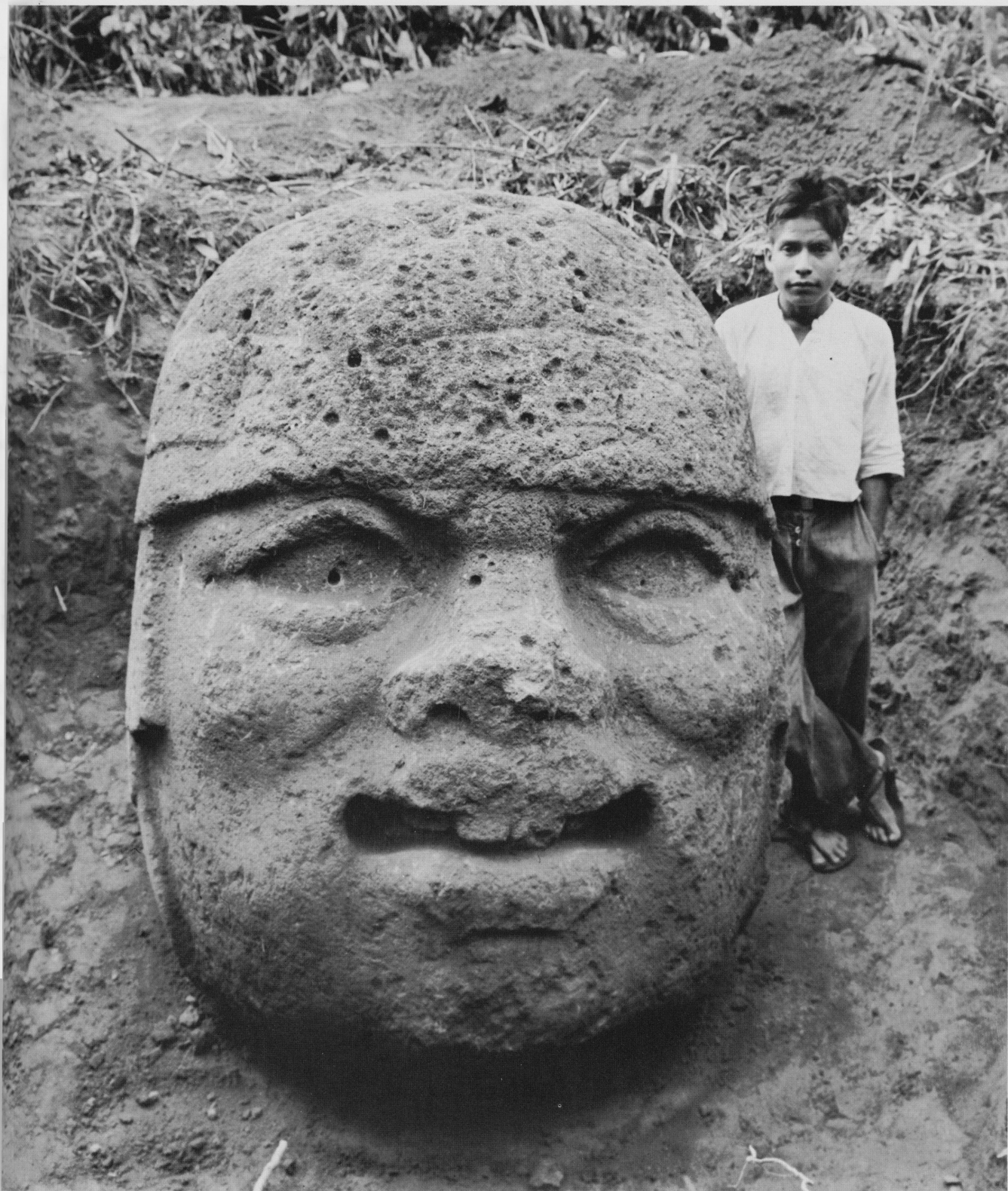


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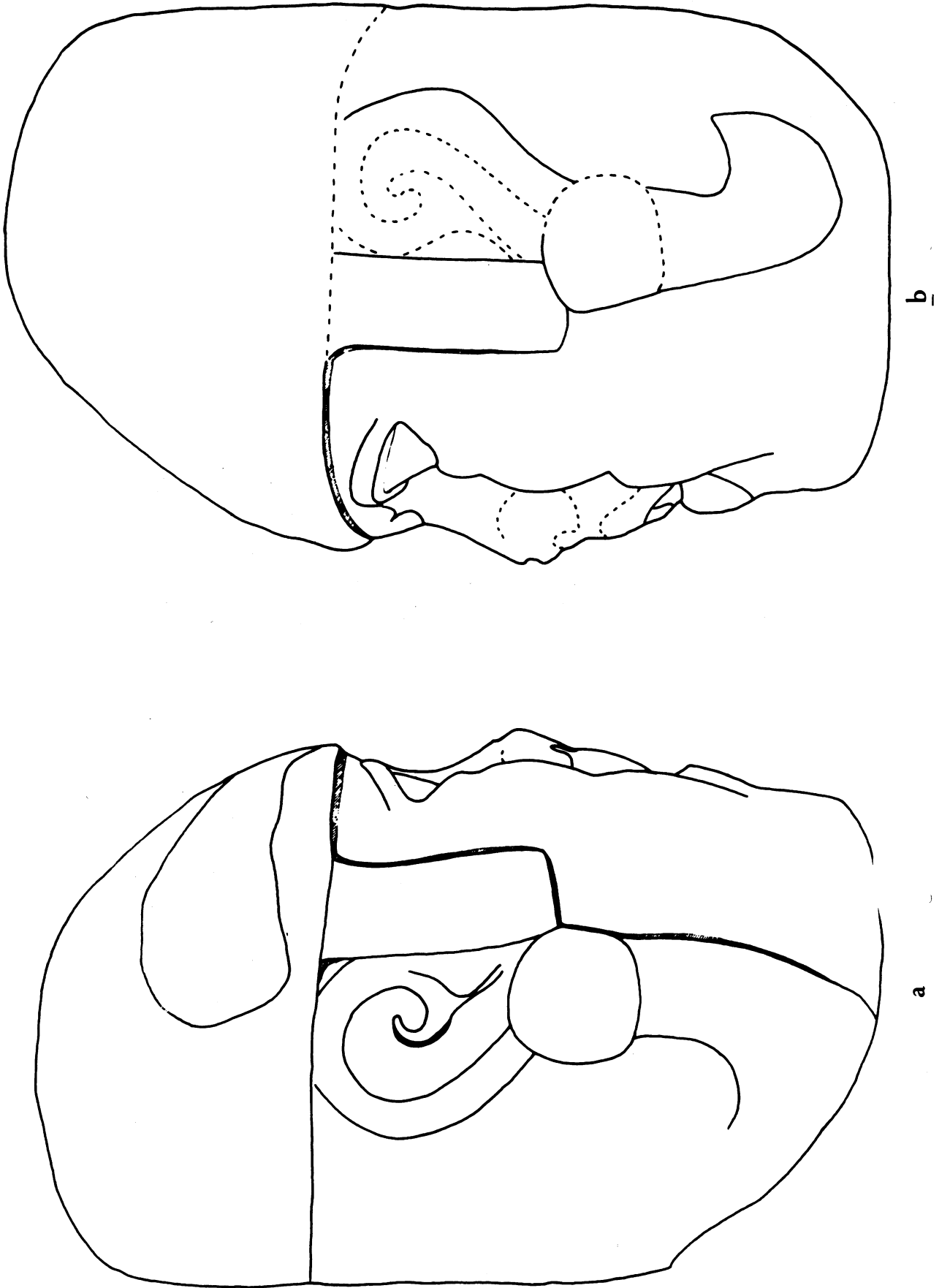


Figure 5 LV 2



a



b

Plate 4 LV 2



b

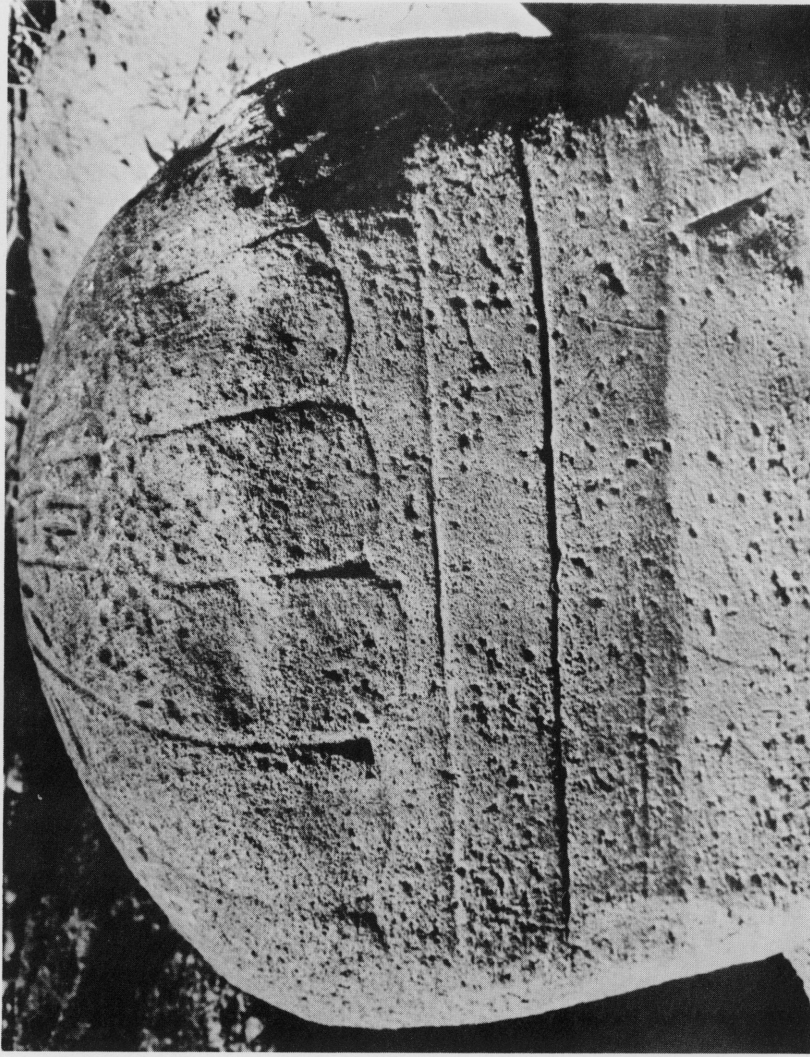


a

Plate 5 LV 2



a LV 1



b LV 4

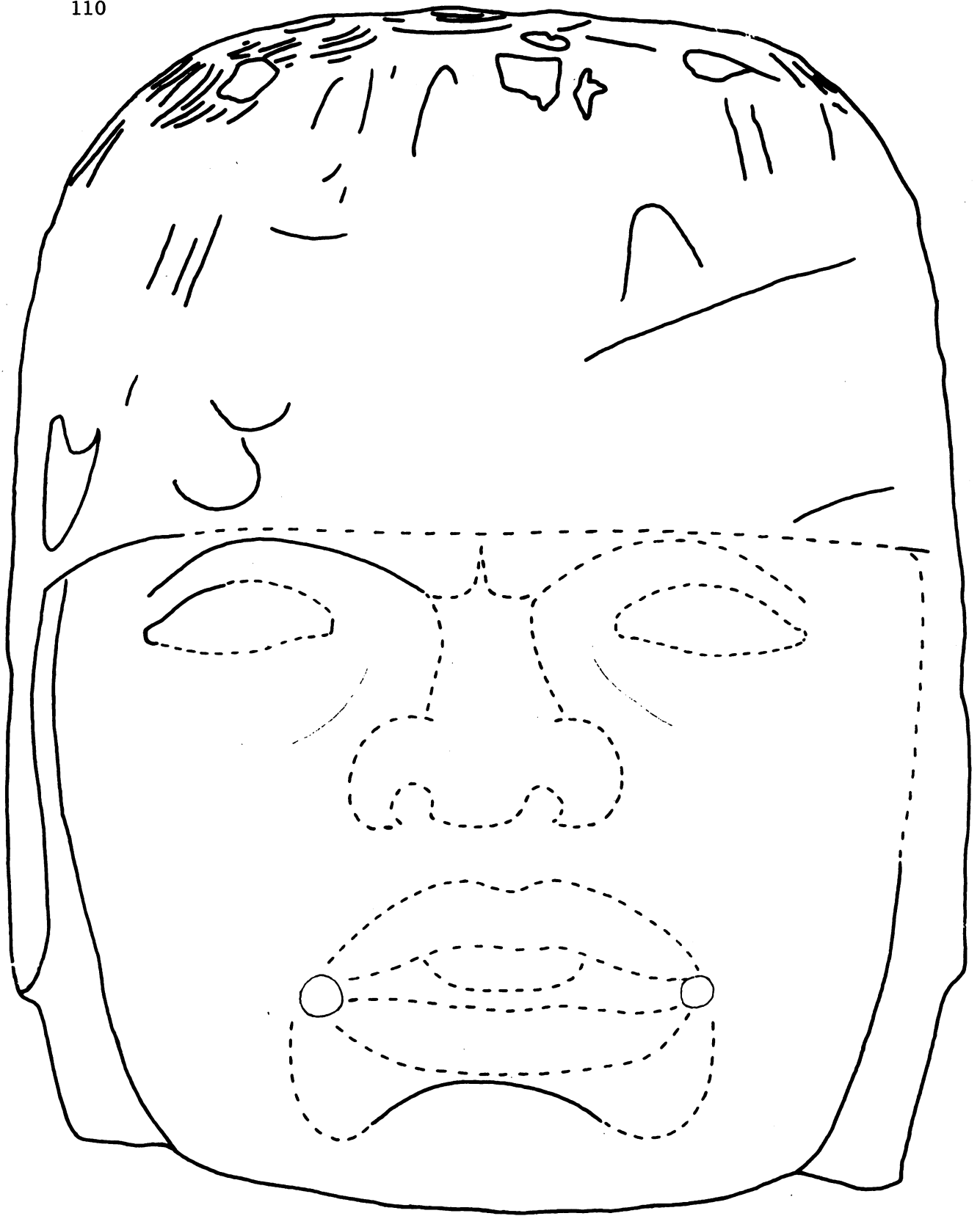
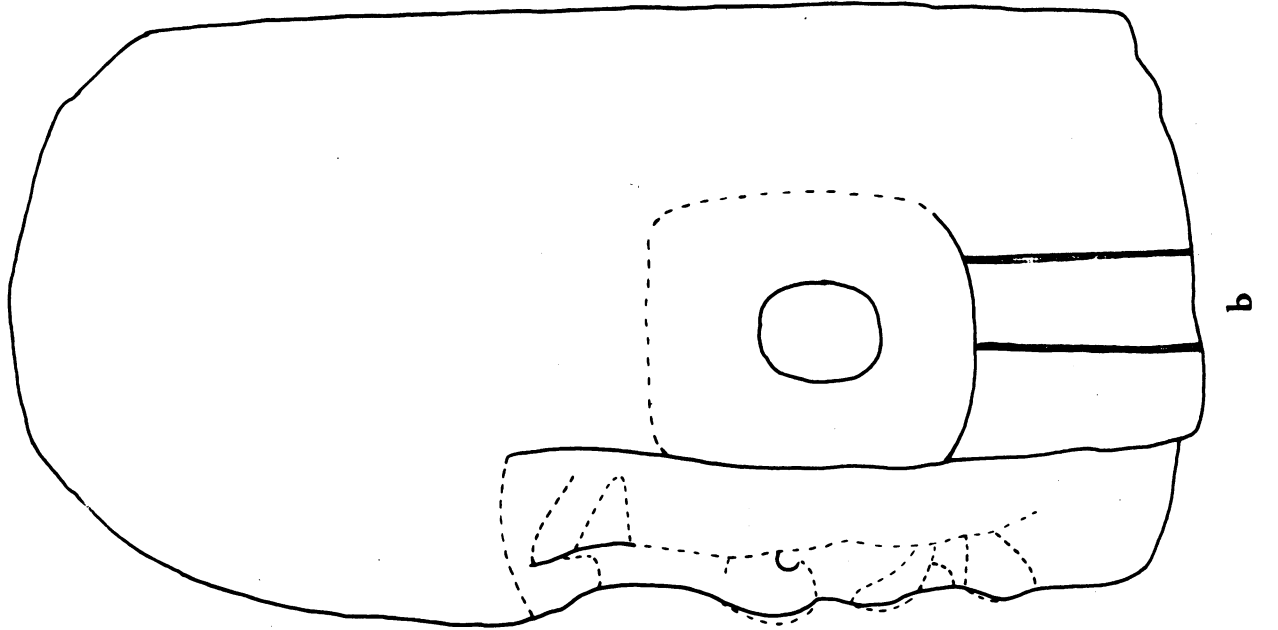
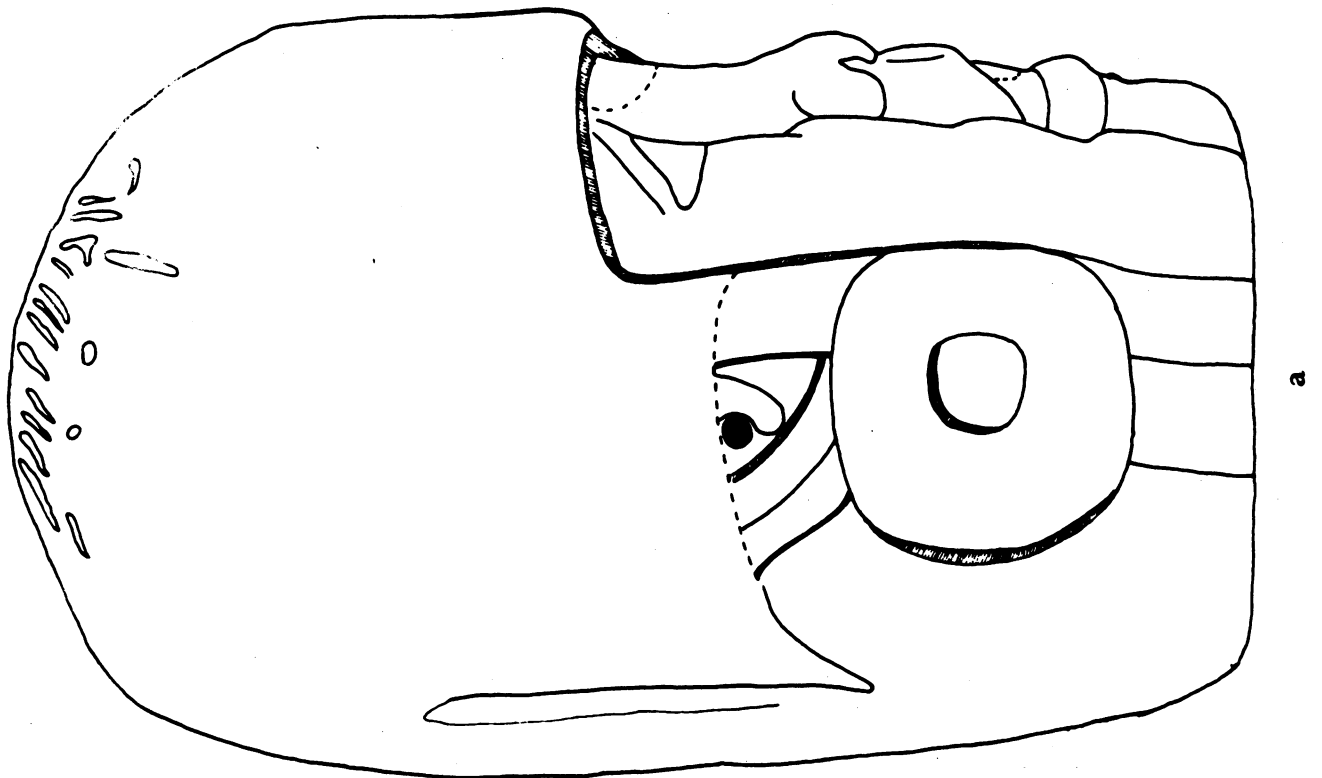


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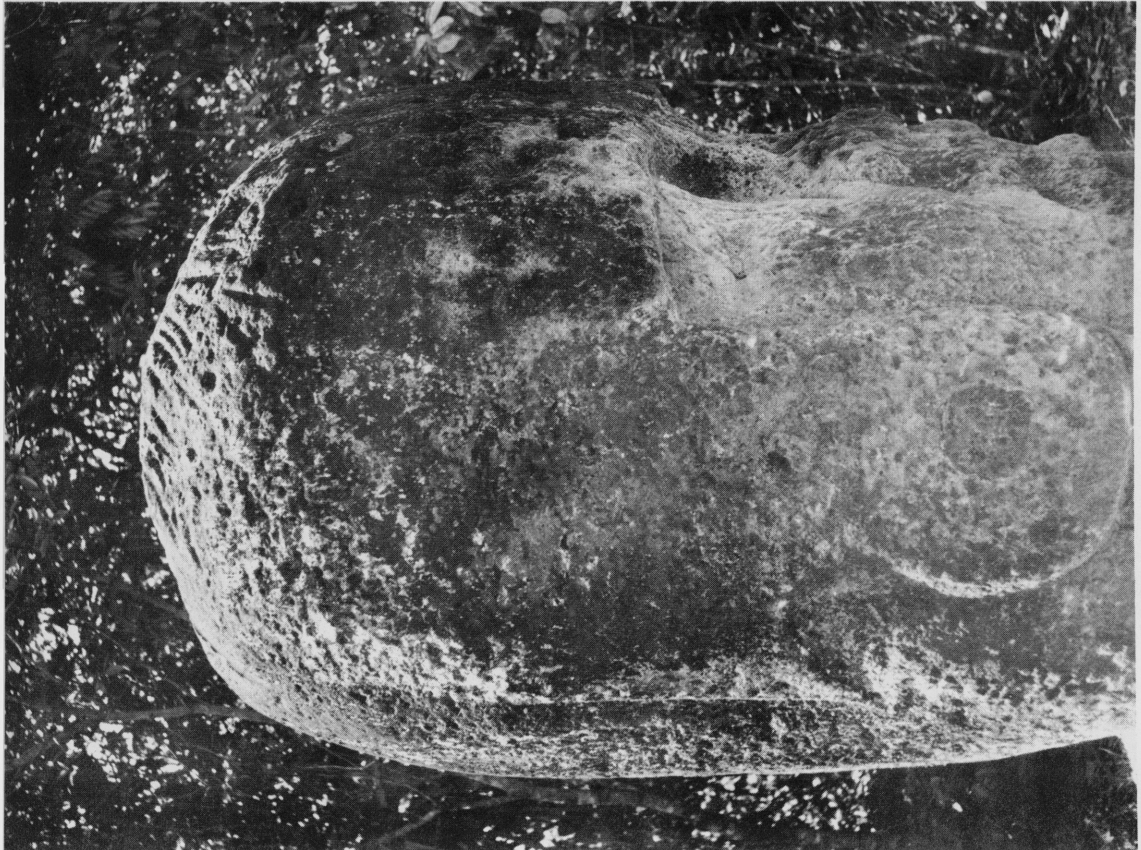


Plate 7 LV 3





b



a

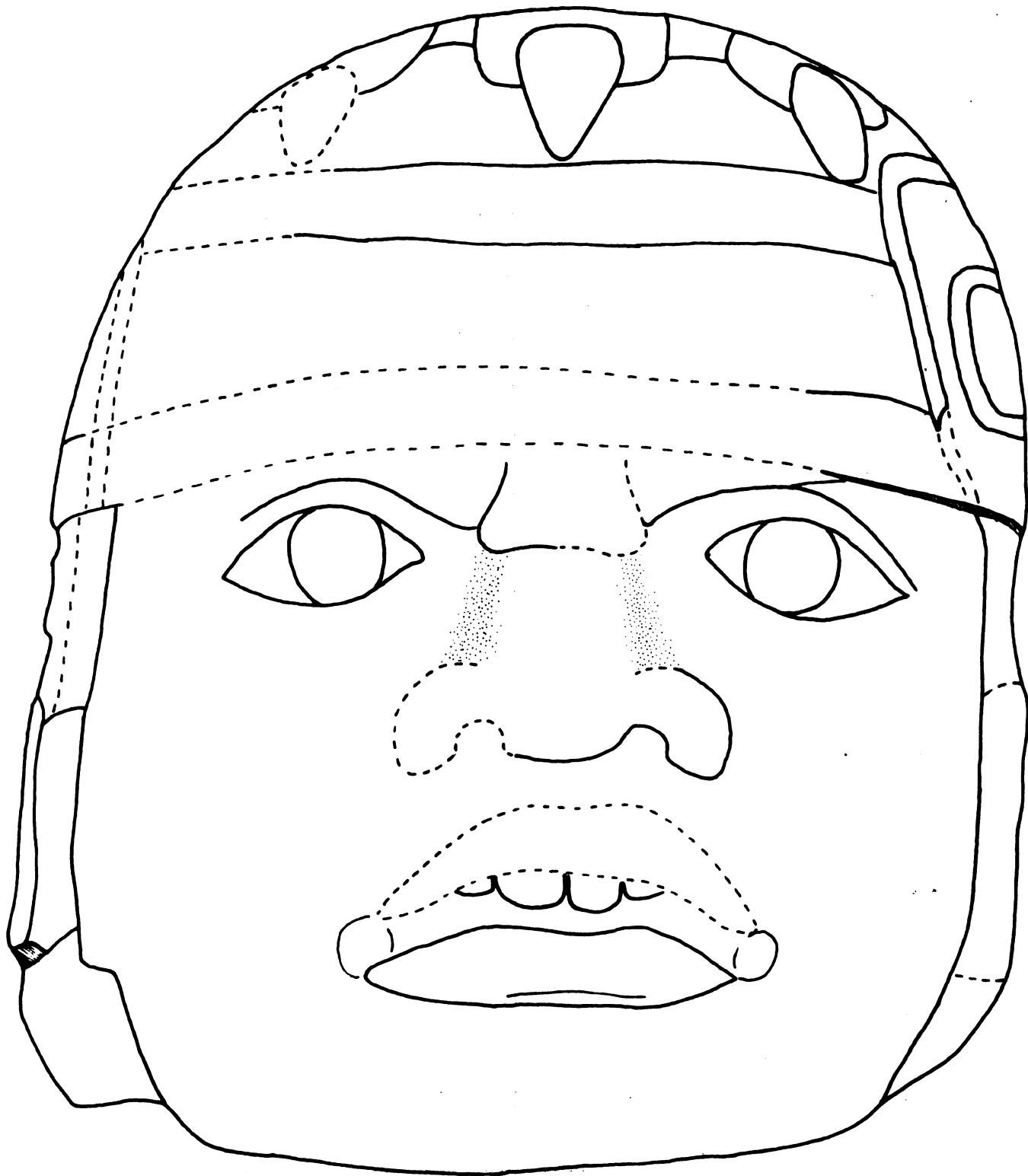


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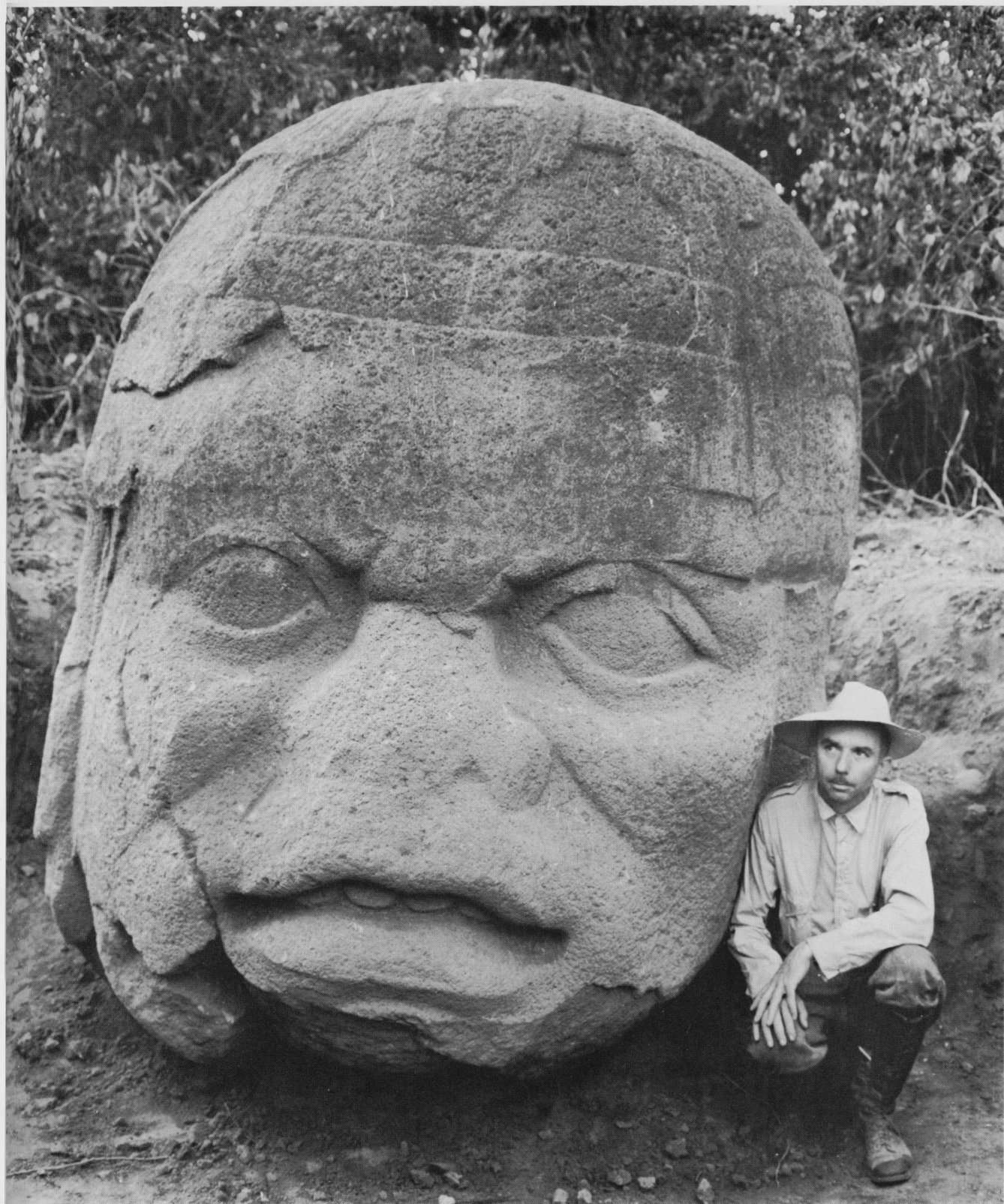
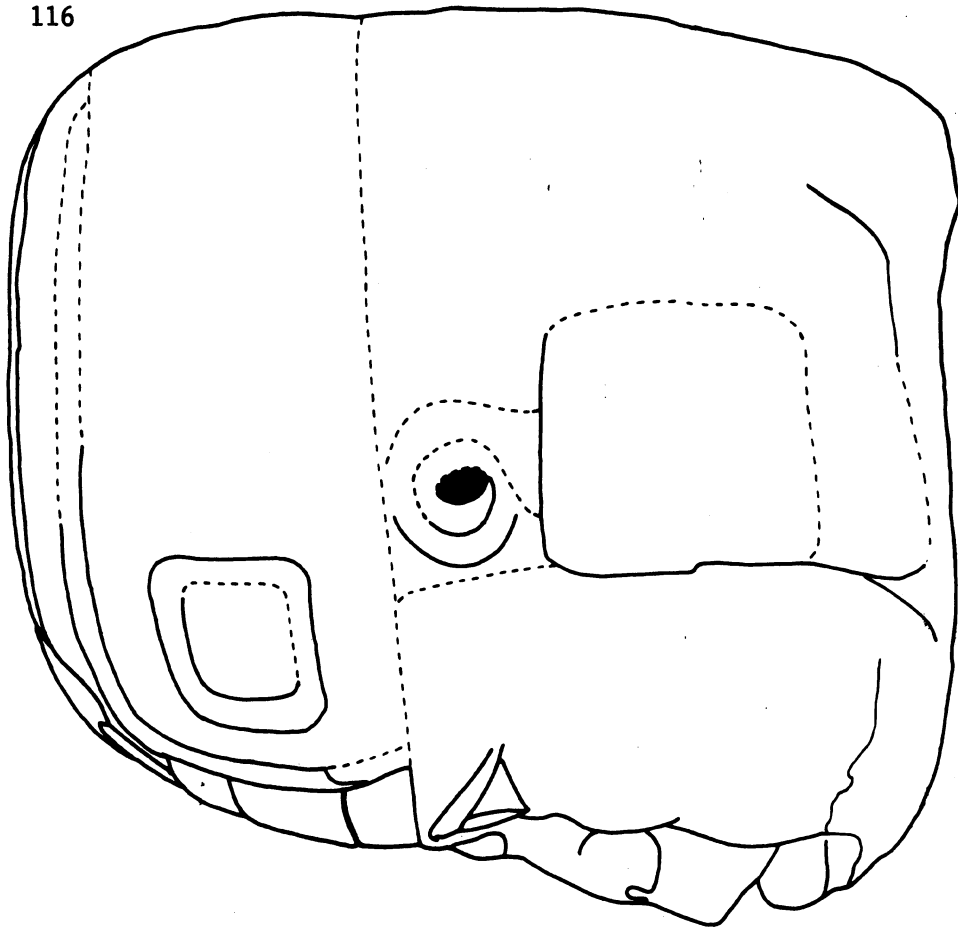
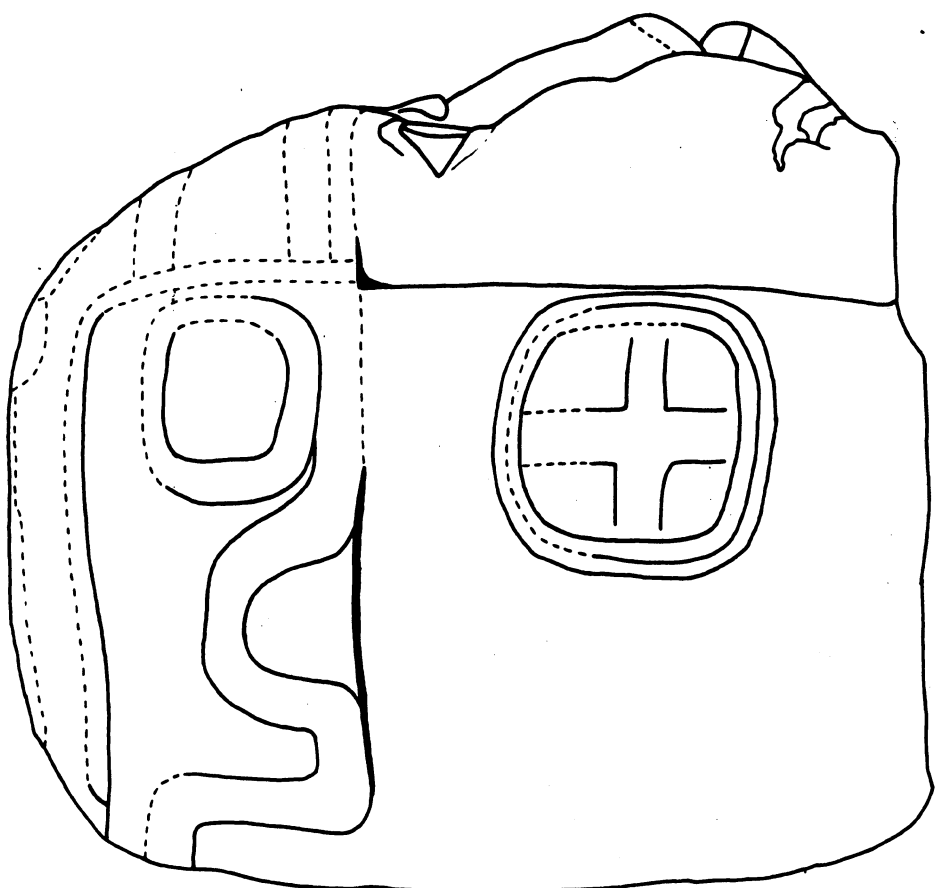


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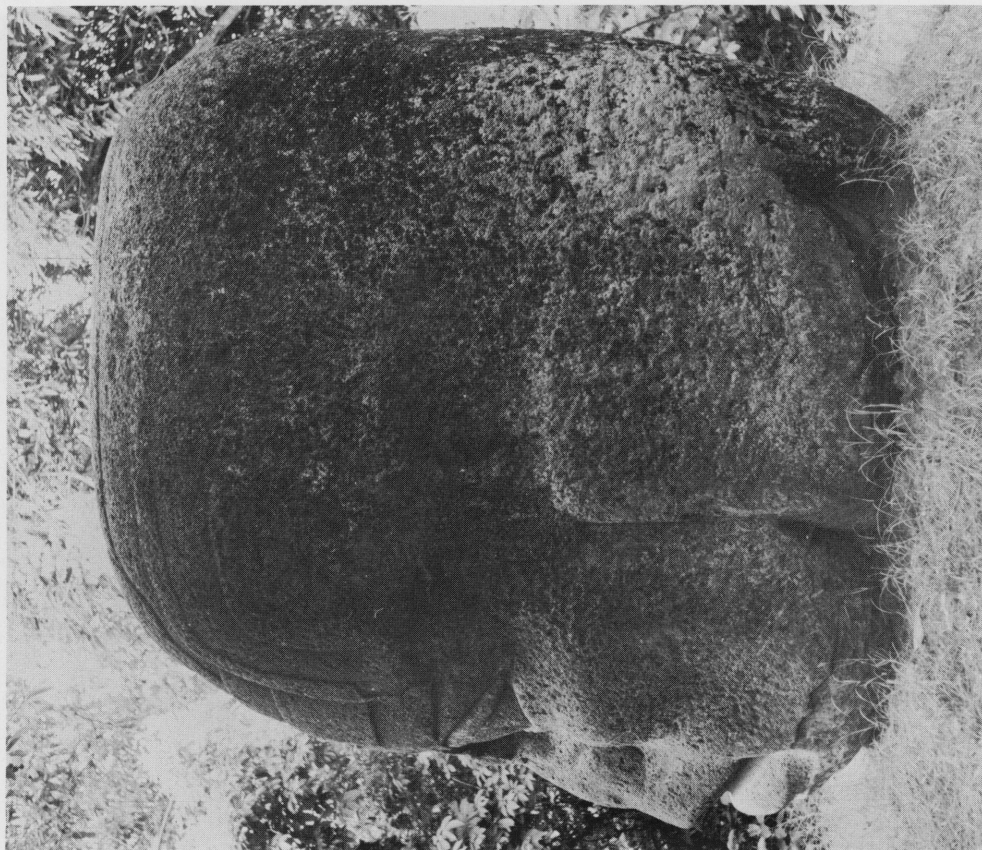


b



a

Figure 9 LV 4



b



a

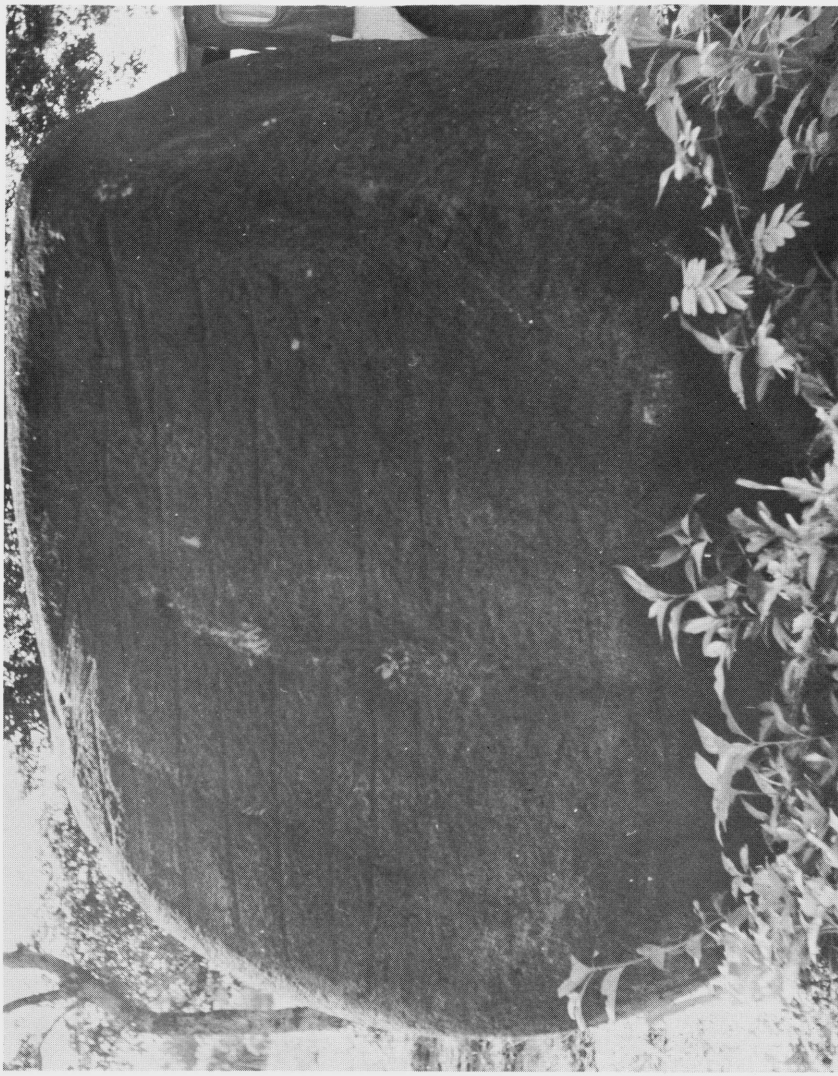
Plate 10 LV 4



Plate 11 TZ 1



a



b

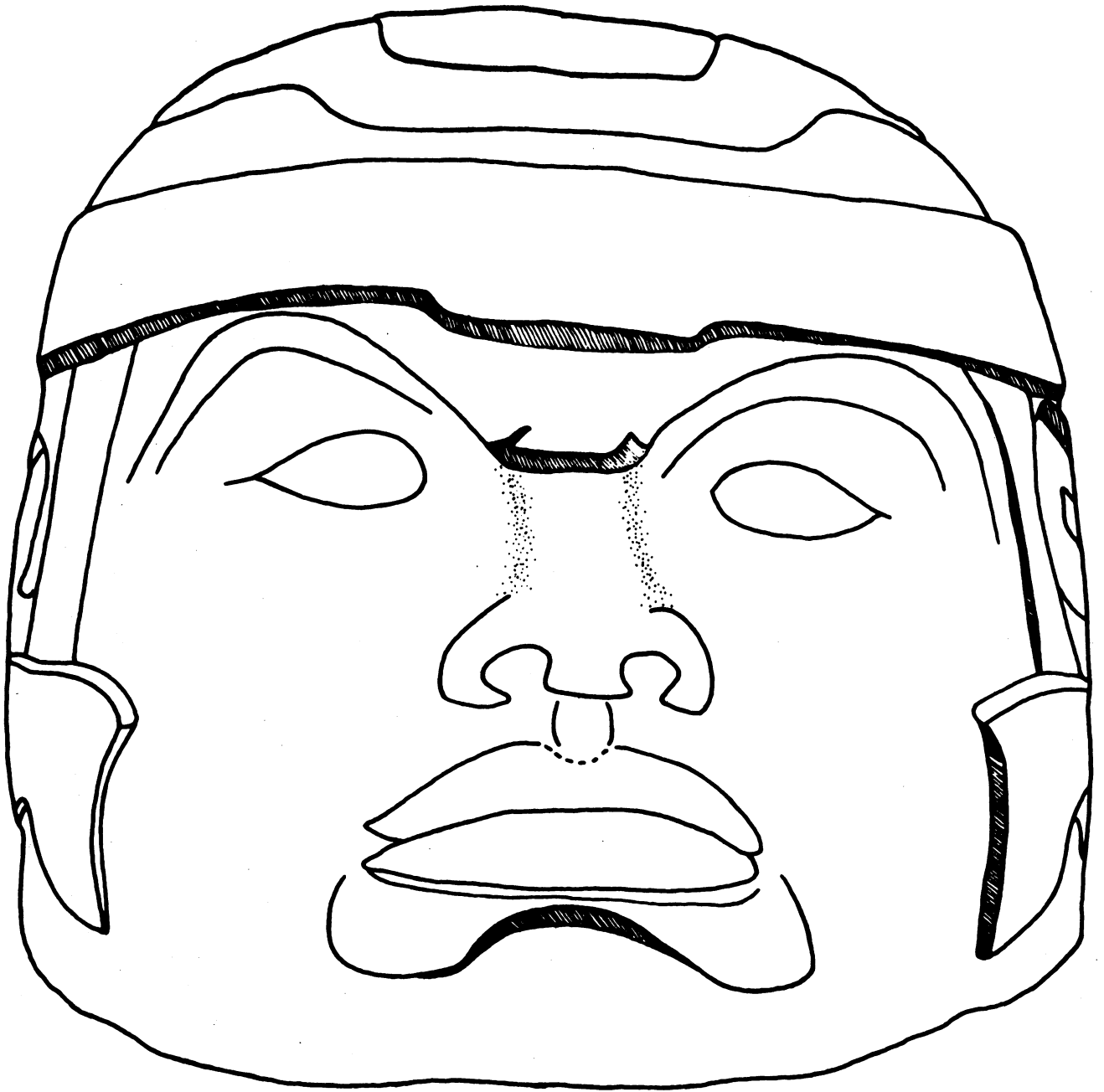


Figure 10 NS 1



Plate 13 NS 1

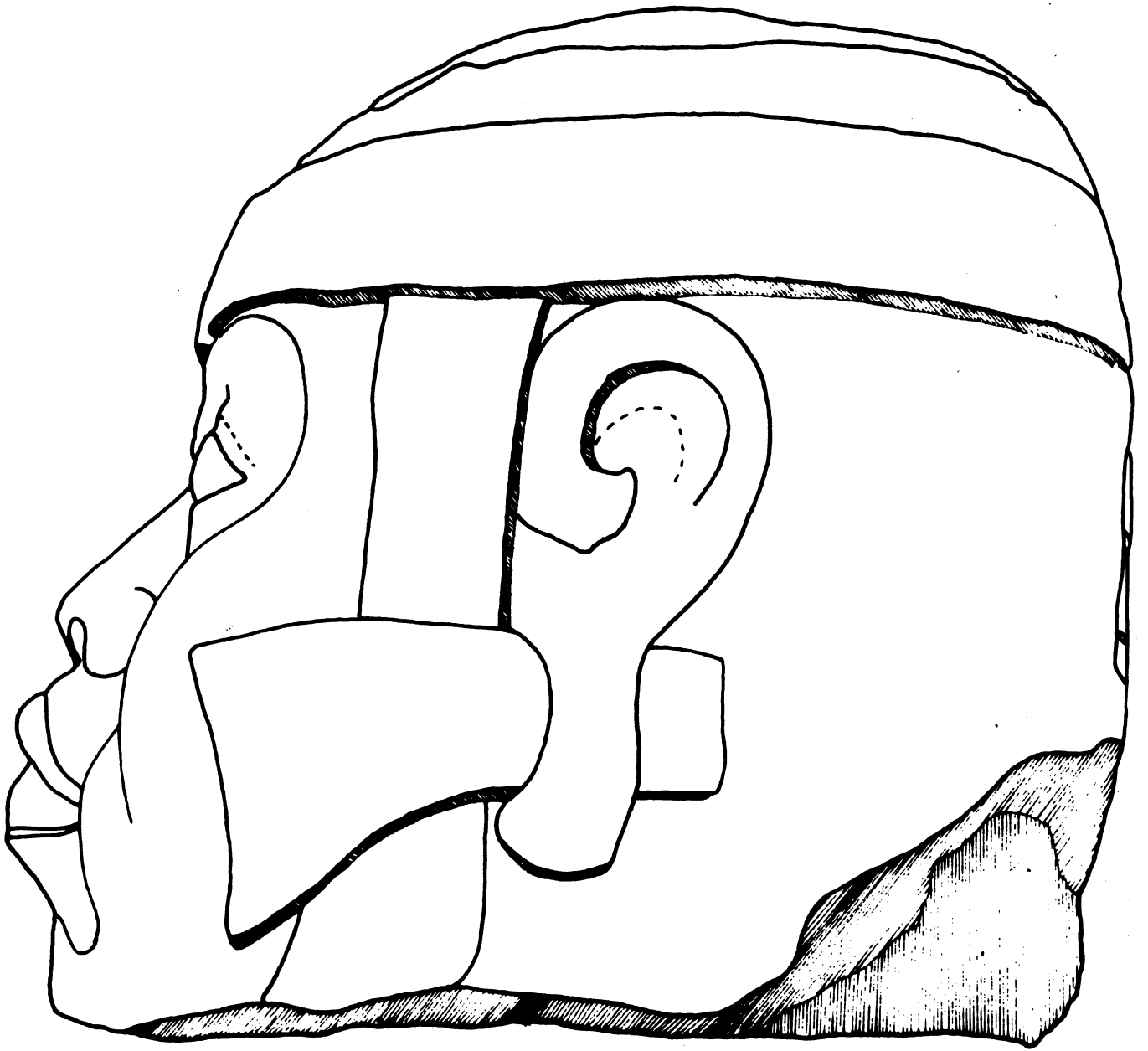
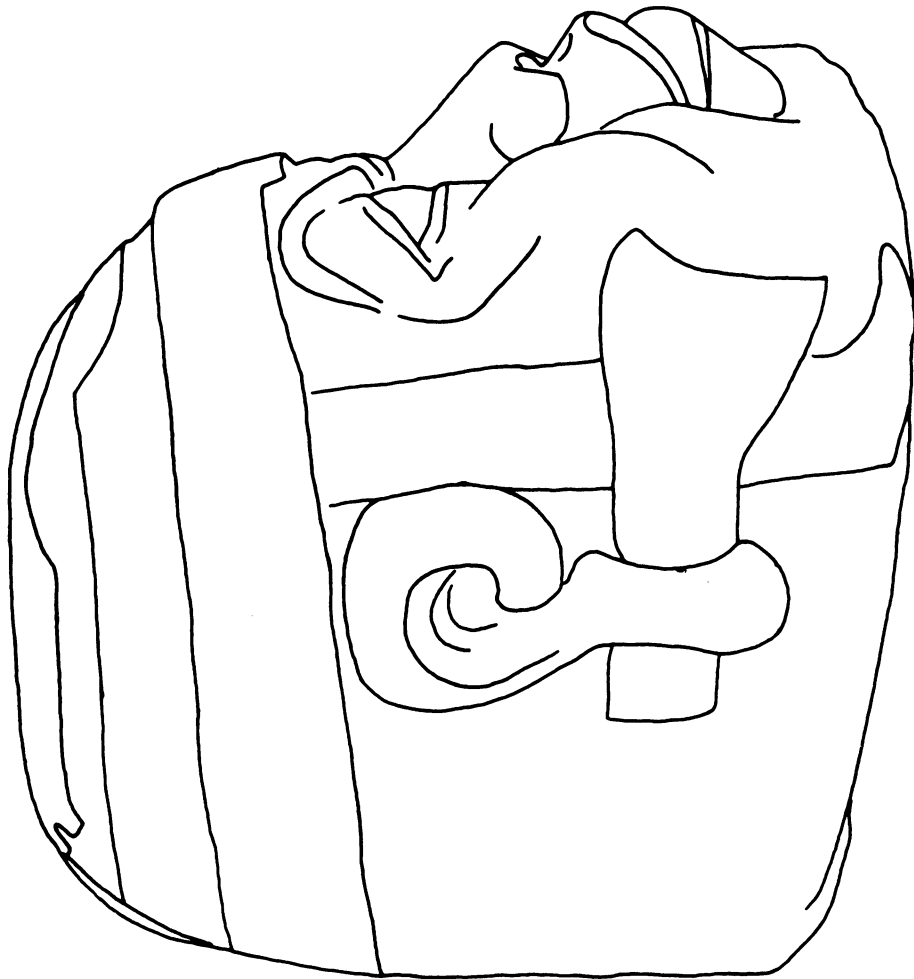


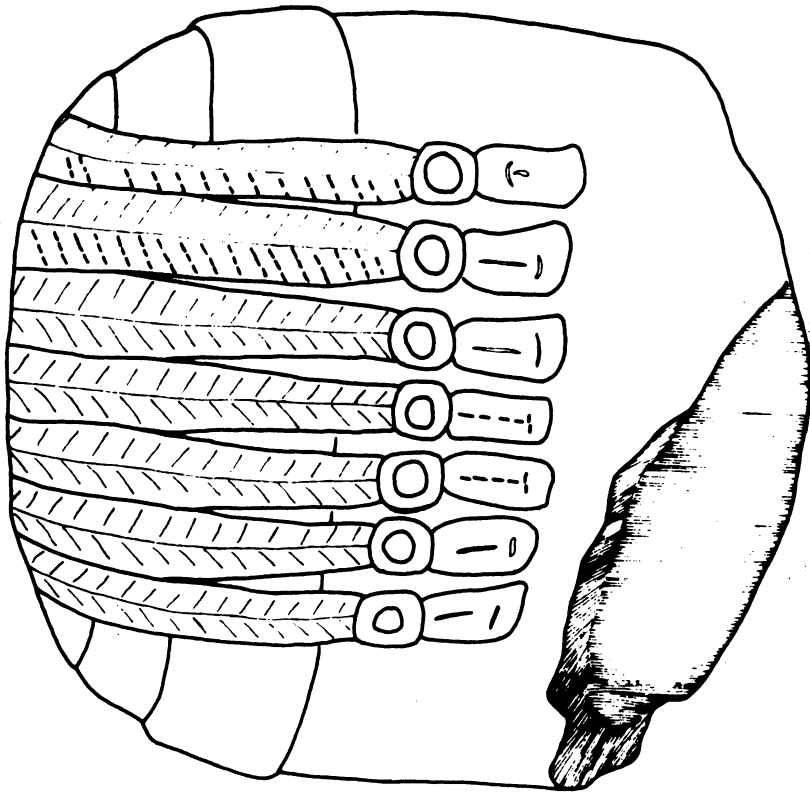
Figure 11 NS 1



Plate 14 NS 1



a



b

Figure 12 NS 1



a



b

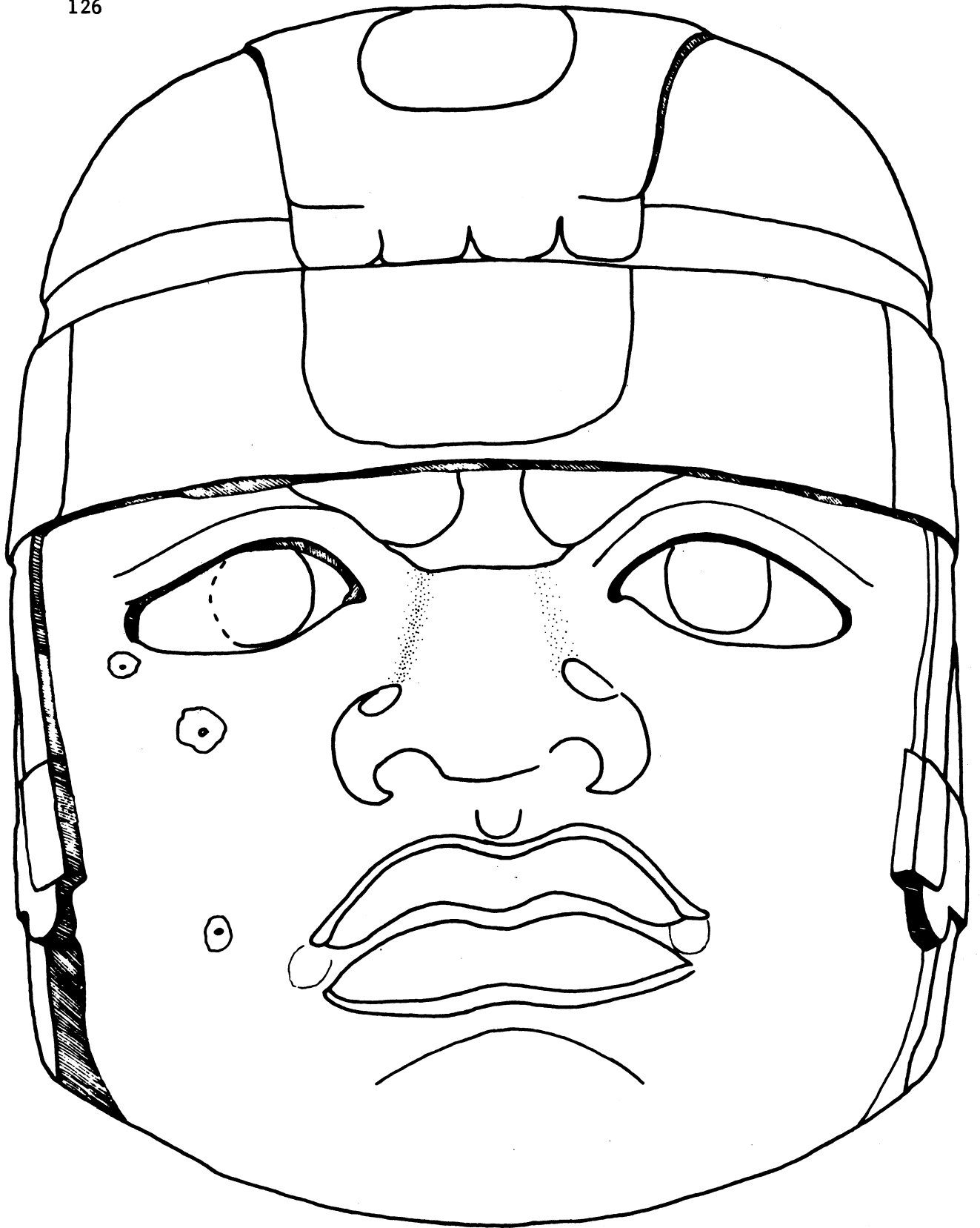


Figure 13 SL 1



Plate 16 SL 1



Figure 14 SL 1



Plate 17 SL 1

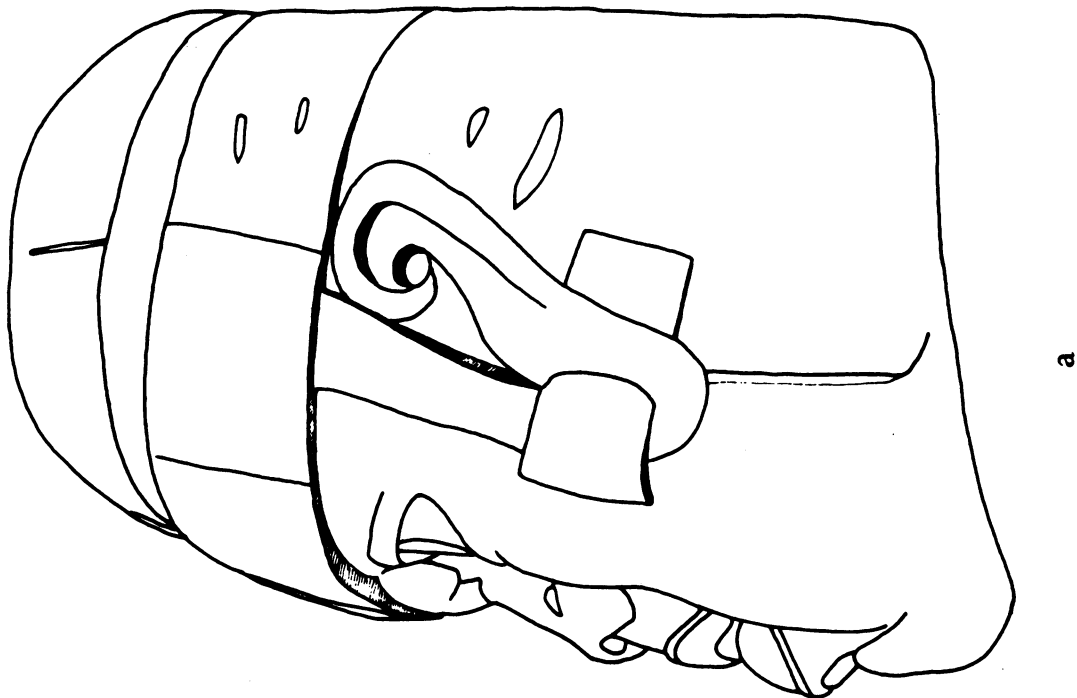
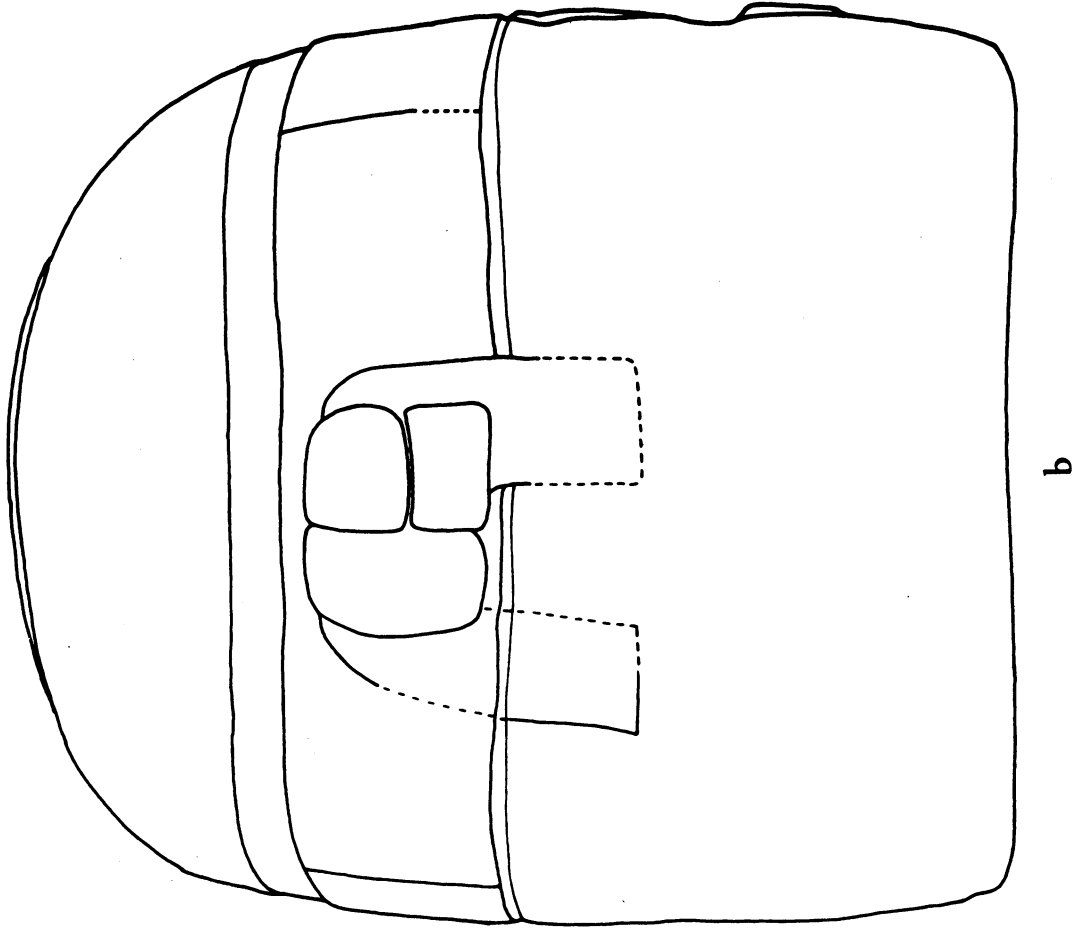


Figure 15 SL 1



b



a

Plate 18 SL 1

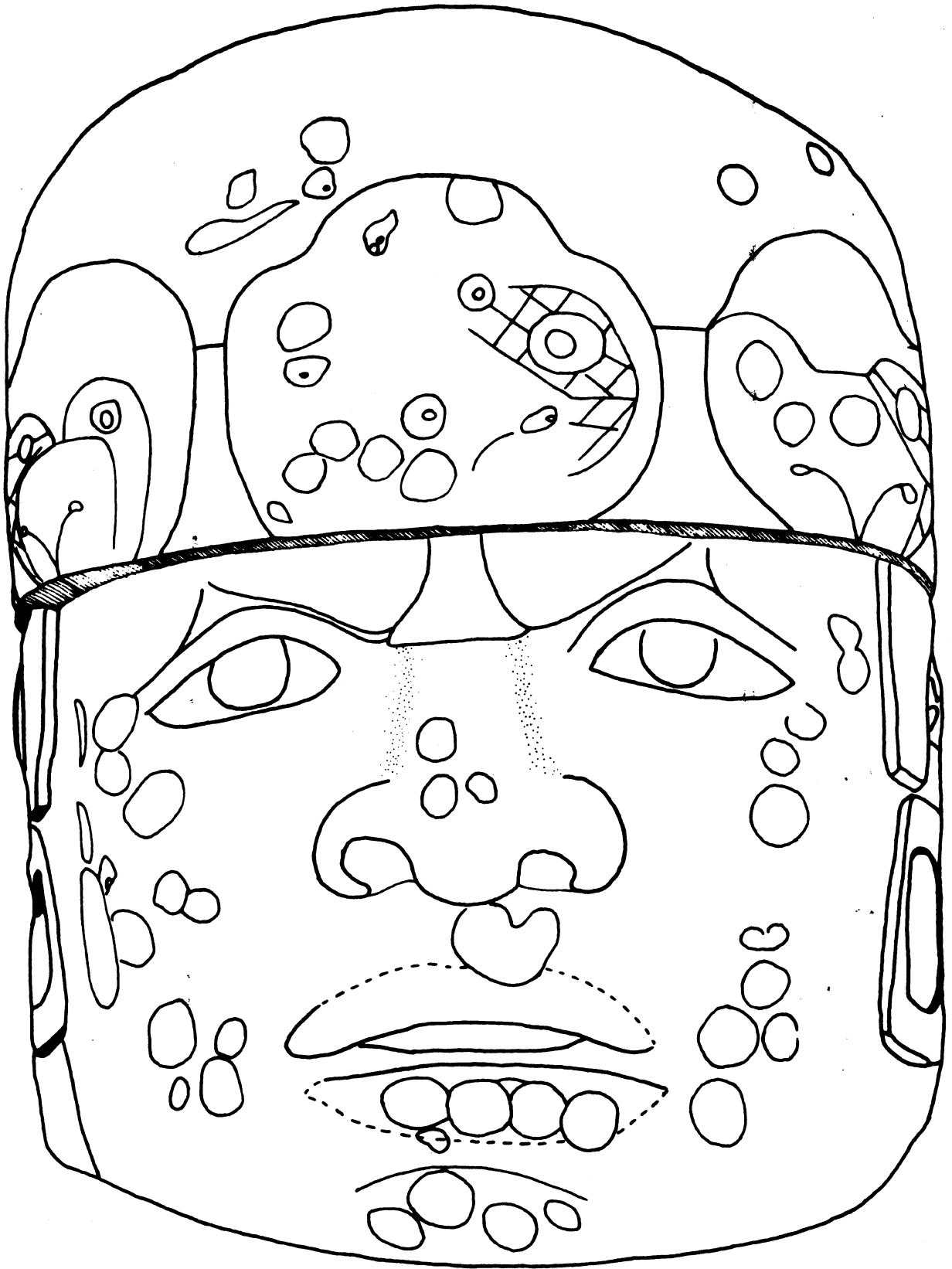


Figure 16 SL 2



Plate 19 SL 2

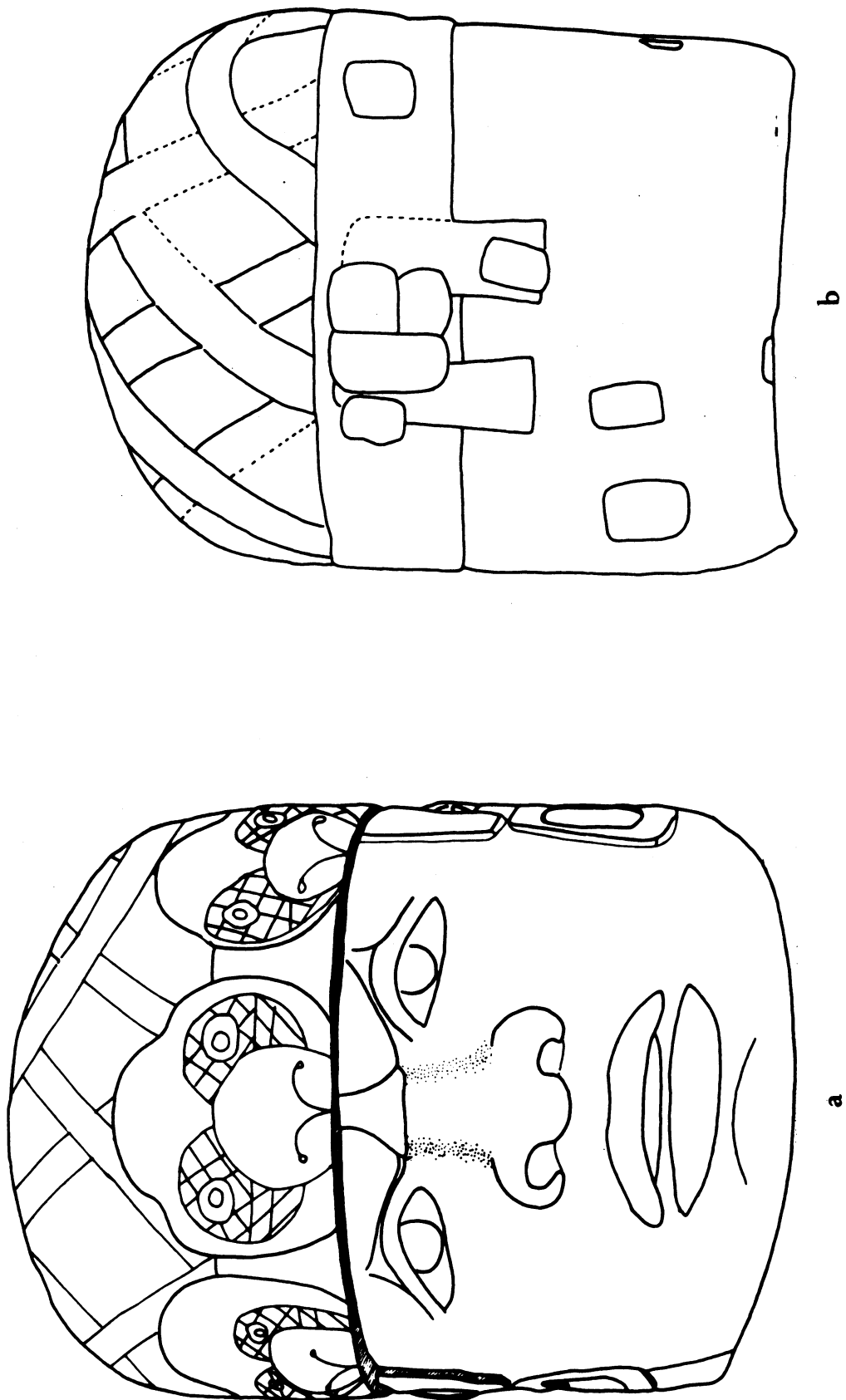
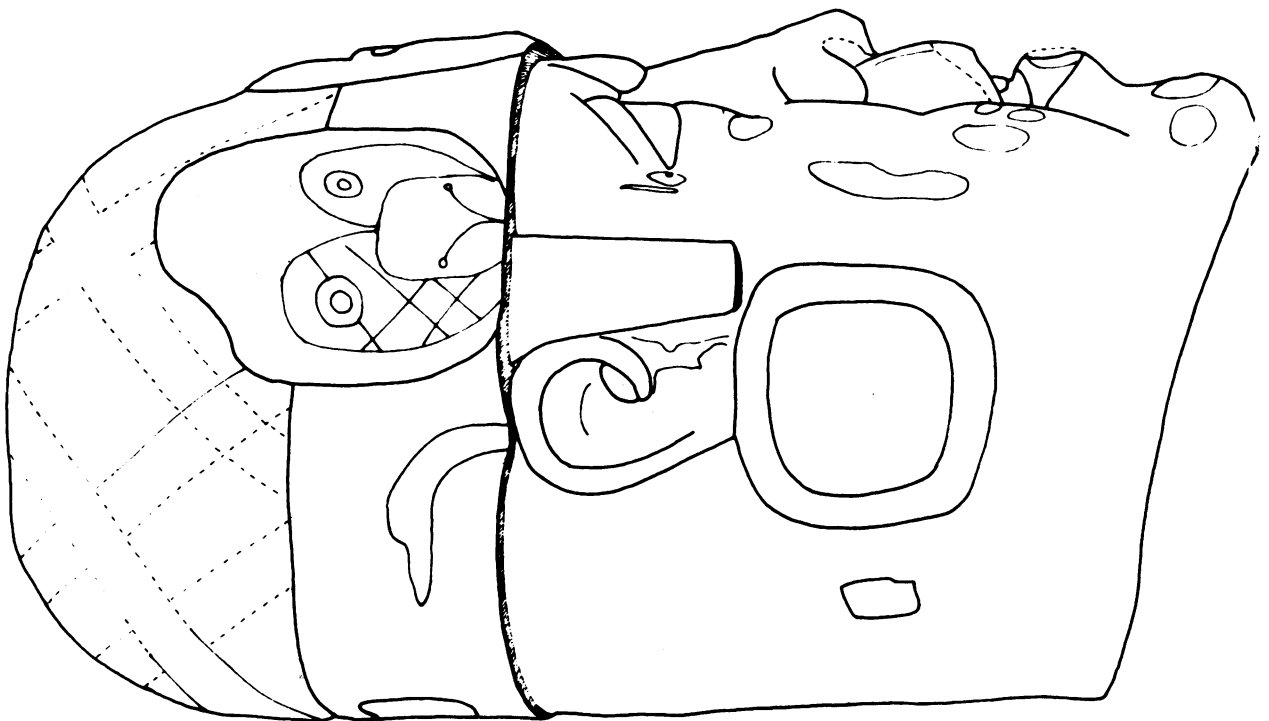


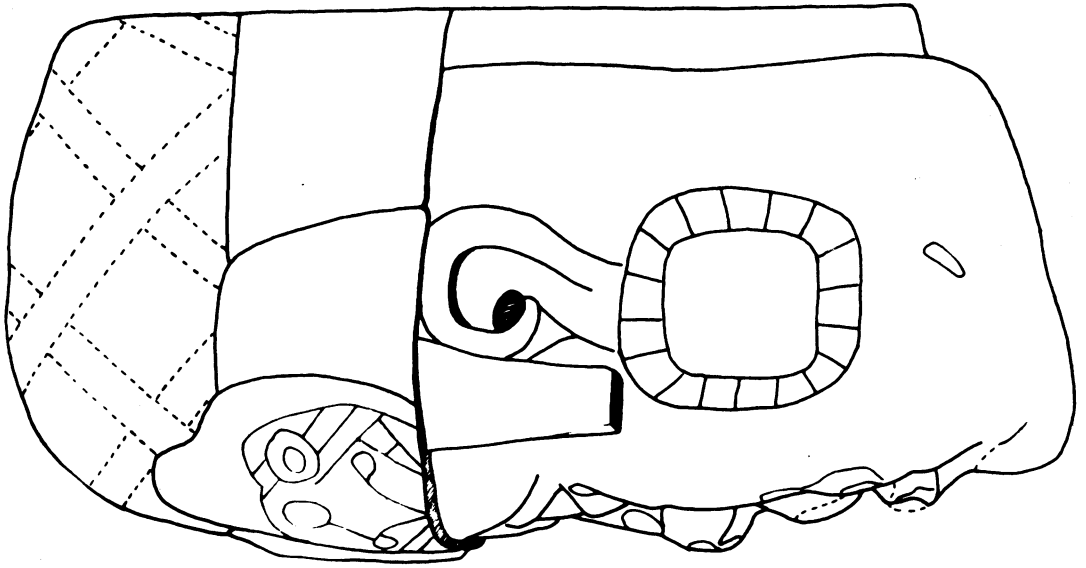
Figure 17 SL. 2



Plate 20 SL 2



a

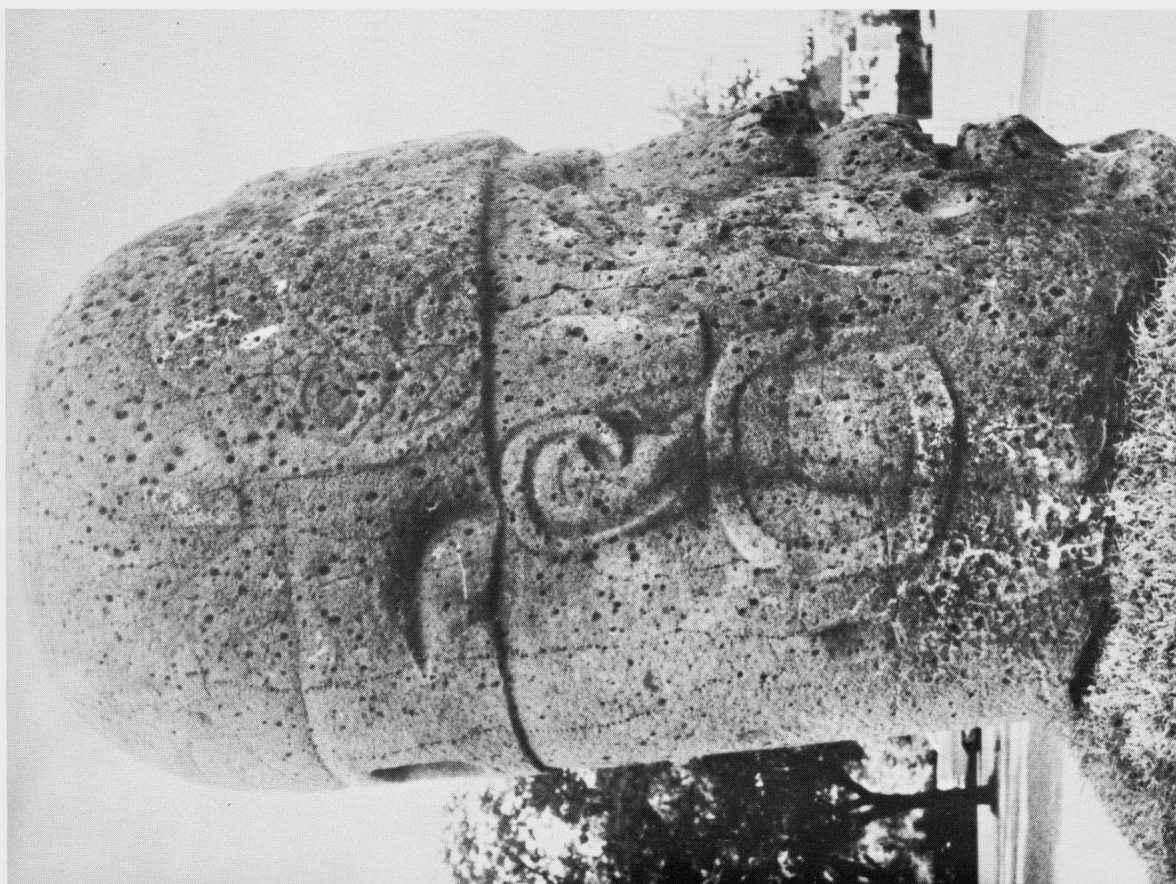


b

Figure 18 SL 2



b



a

Plate 21 SL 2

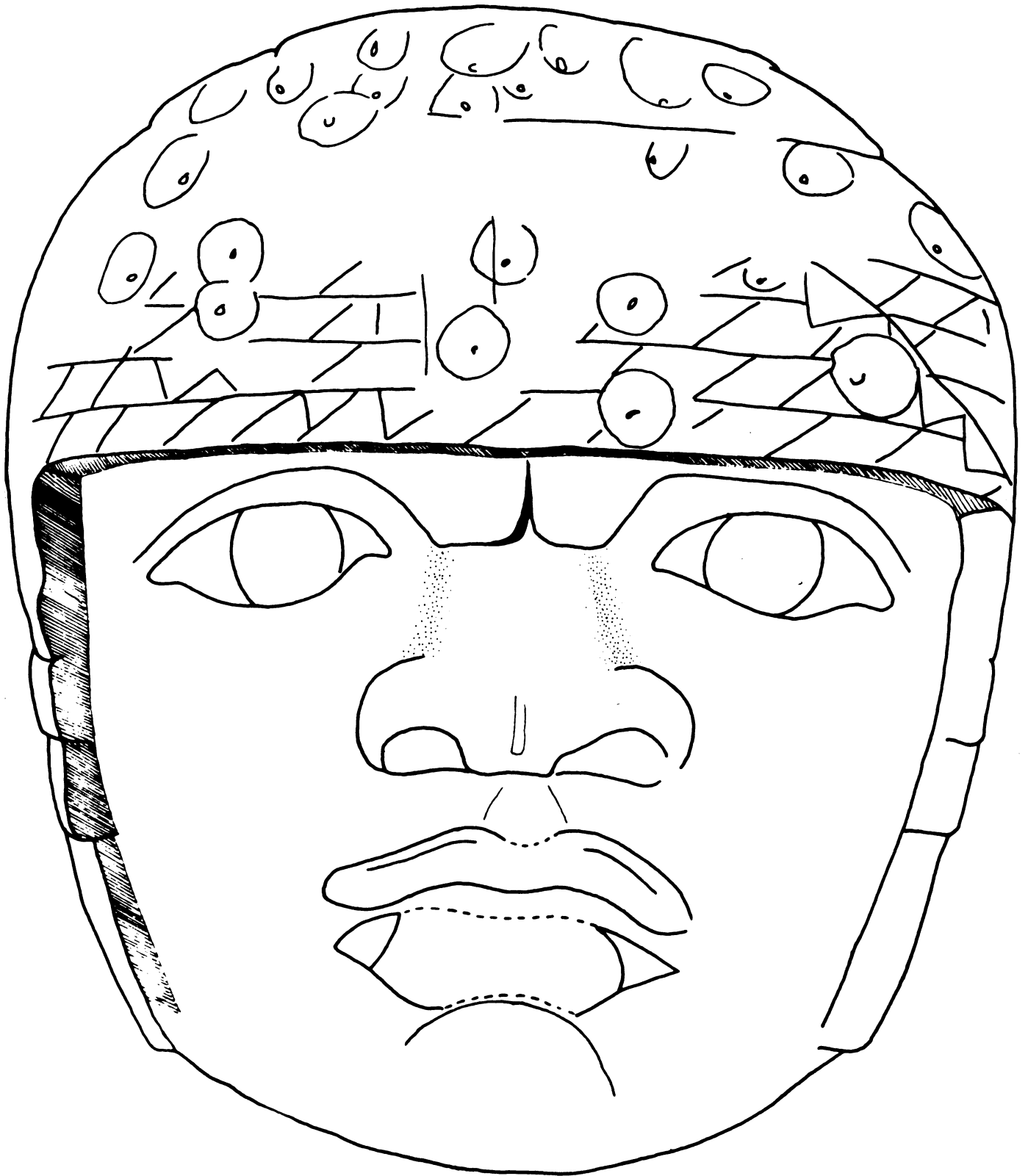


Figure 19 SL 3



Plate 22 SL 3

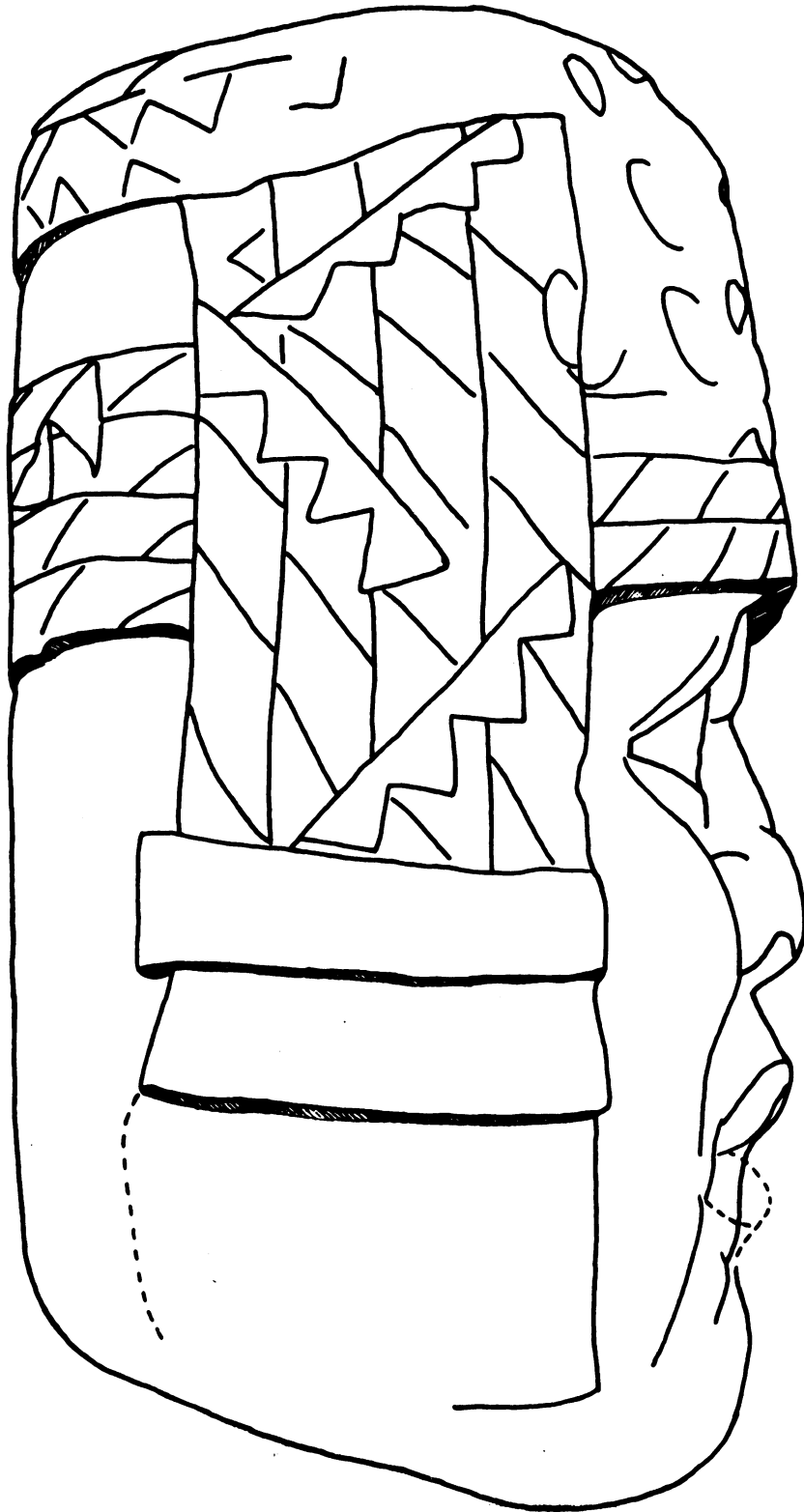


Figure 20 SL 3



Plate 23 SL 3

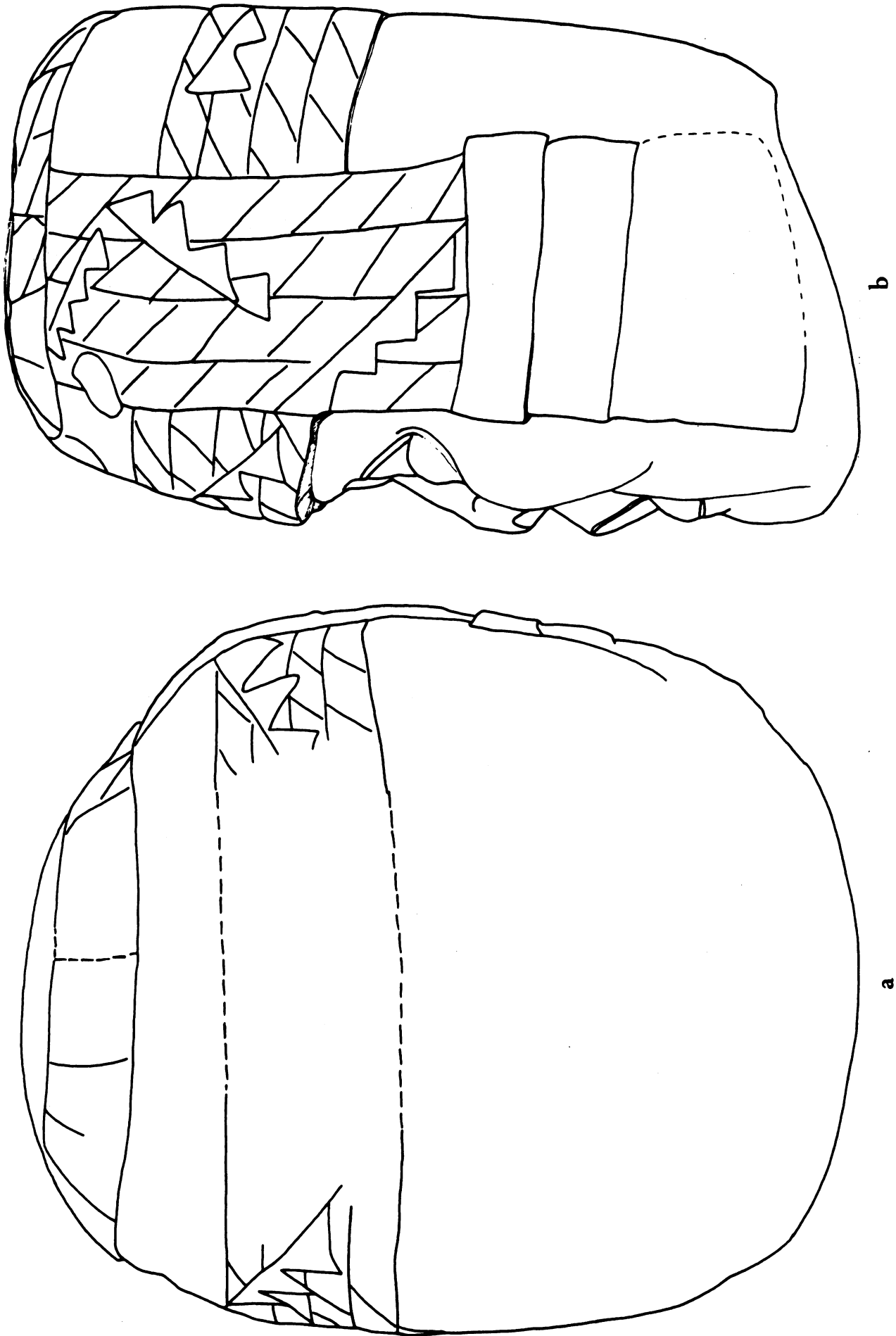
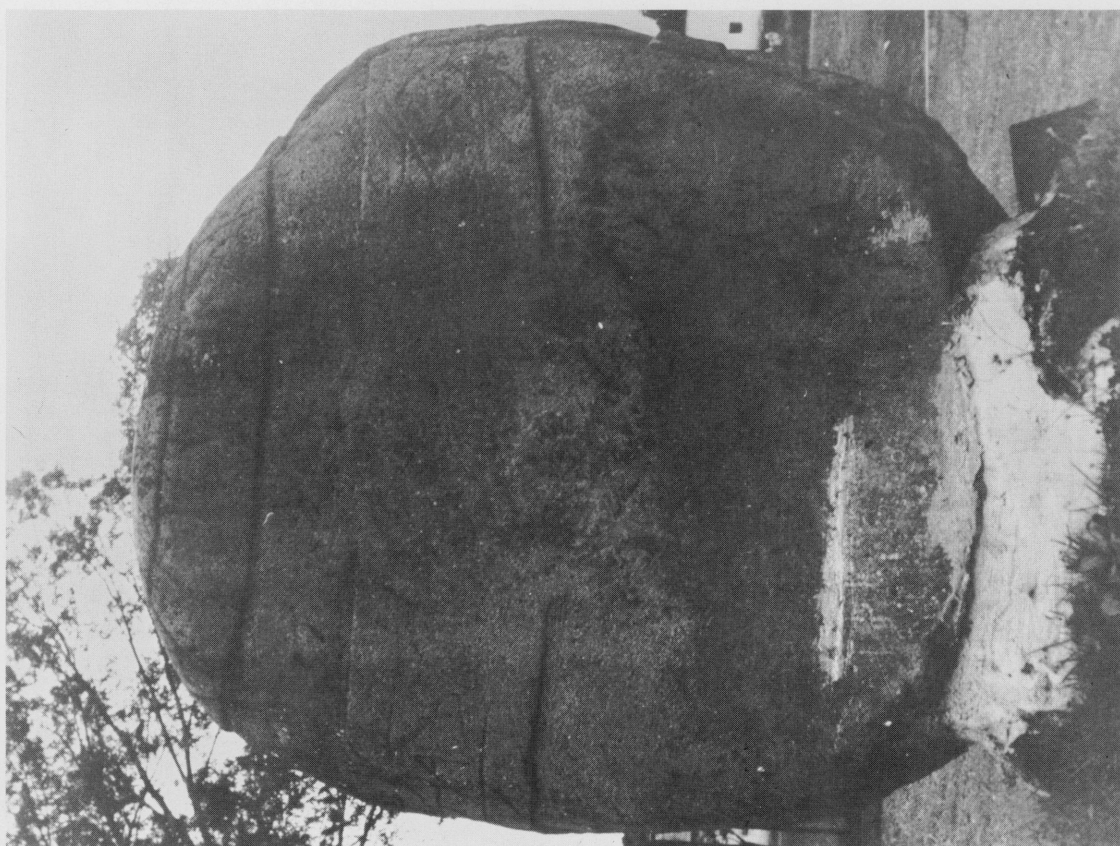


Figure 21 SL 3



b



a

Plate 24 SL 3

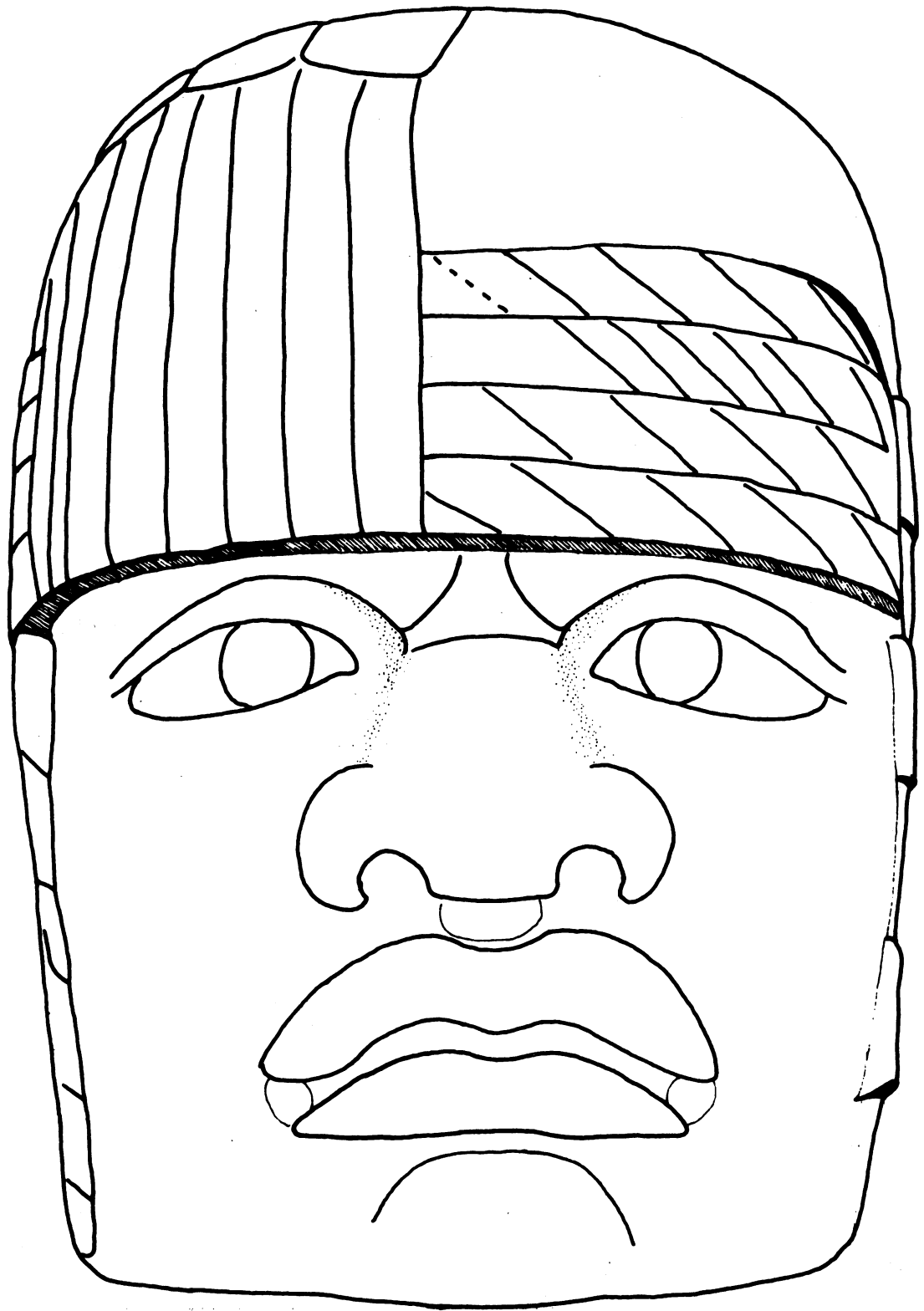


Figure 22 SL 4

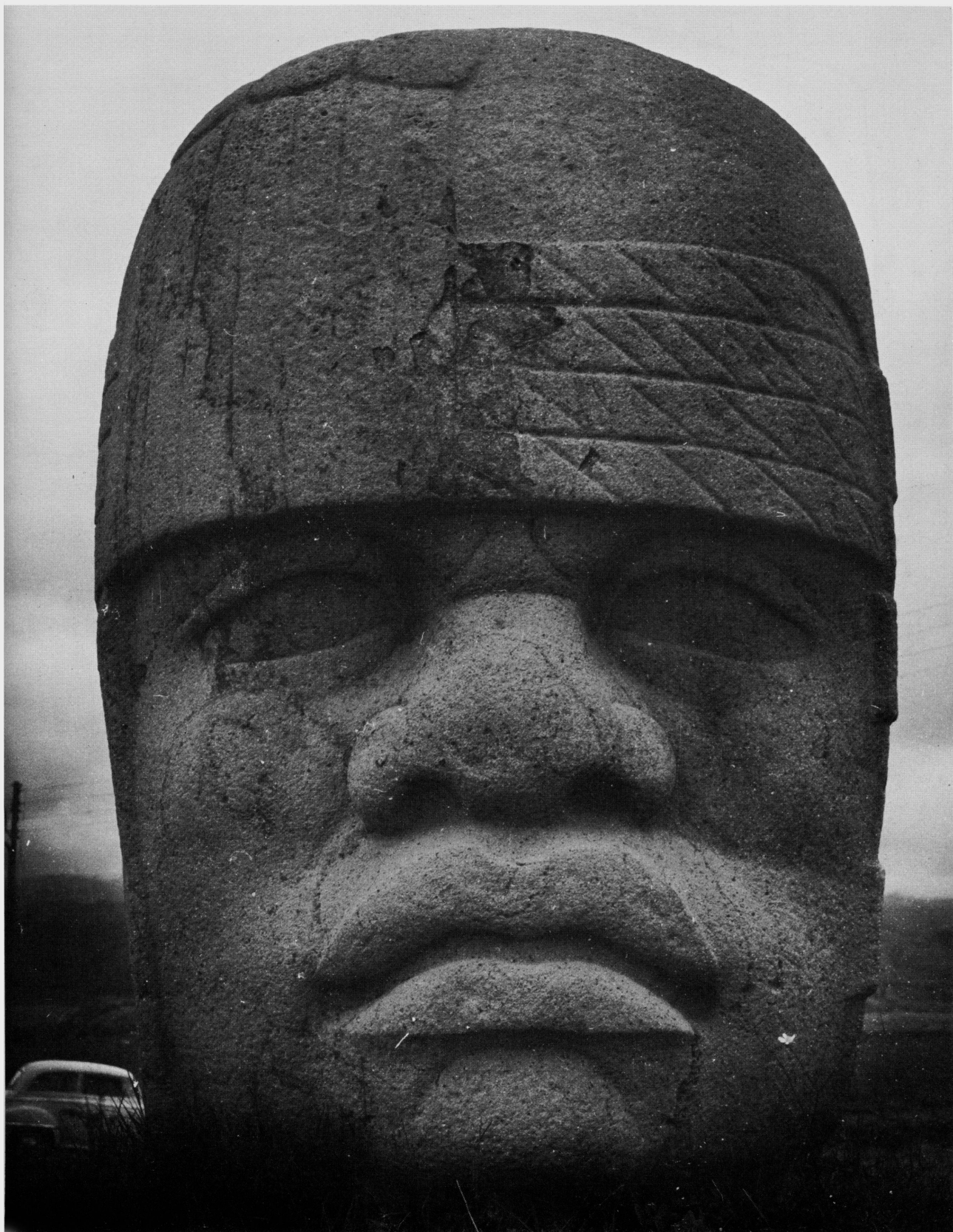


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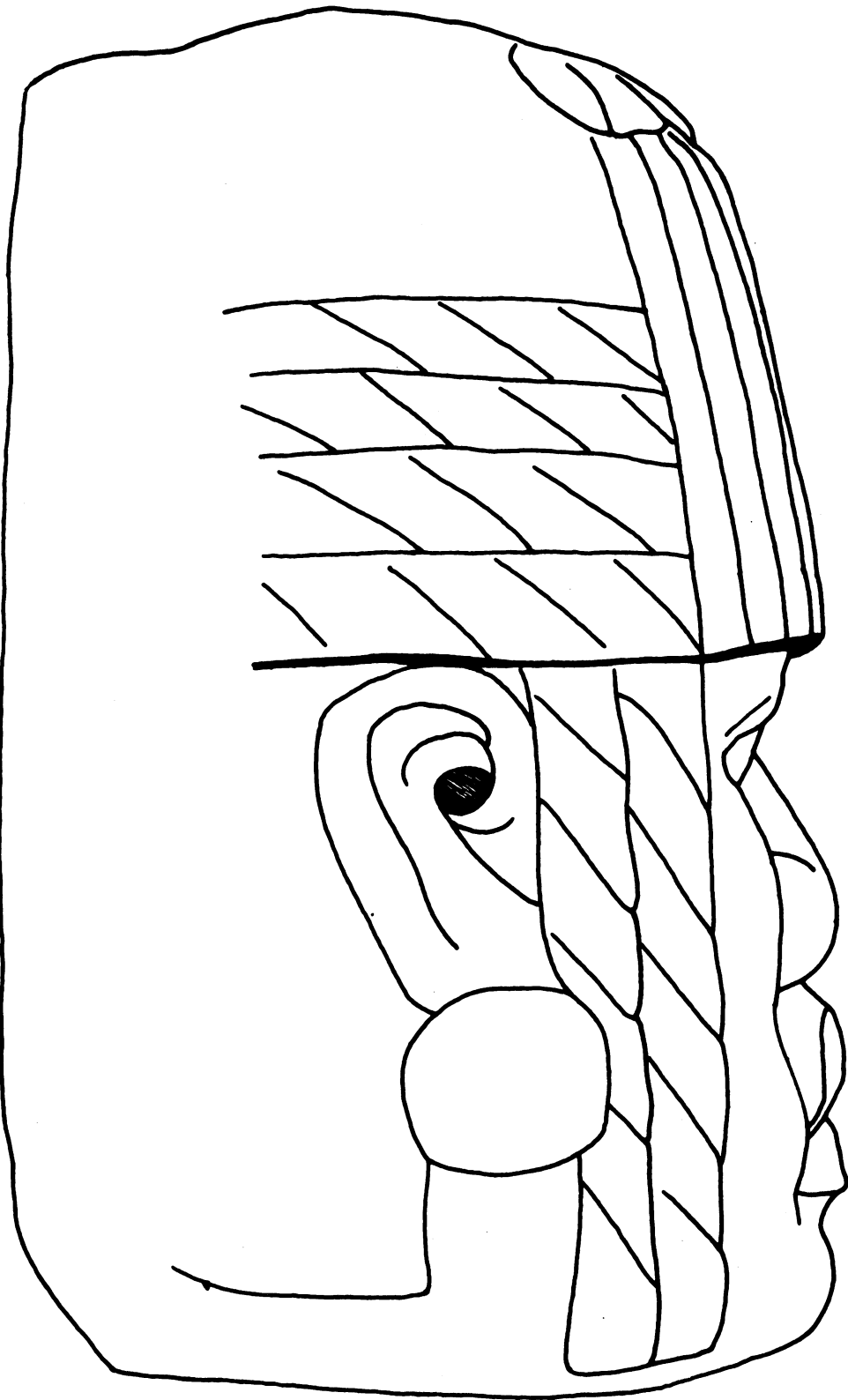
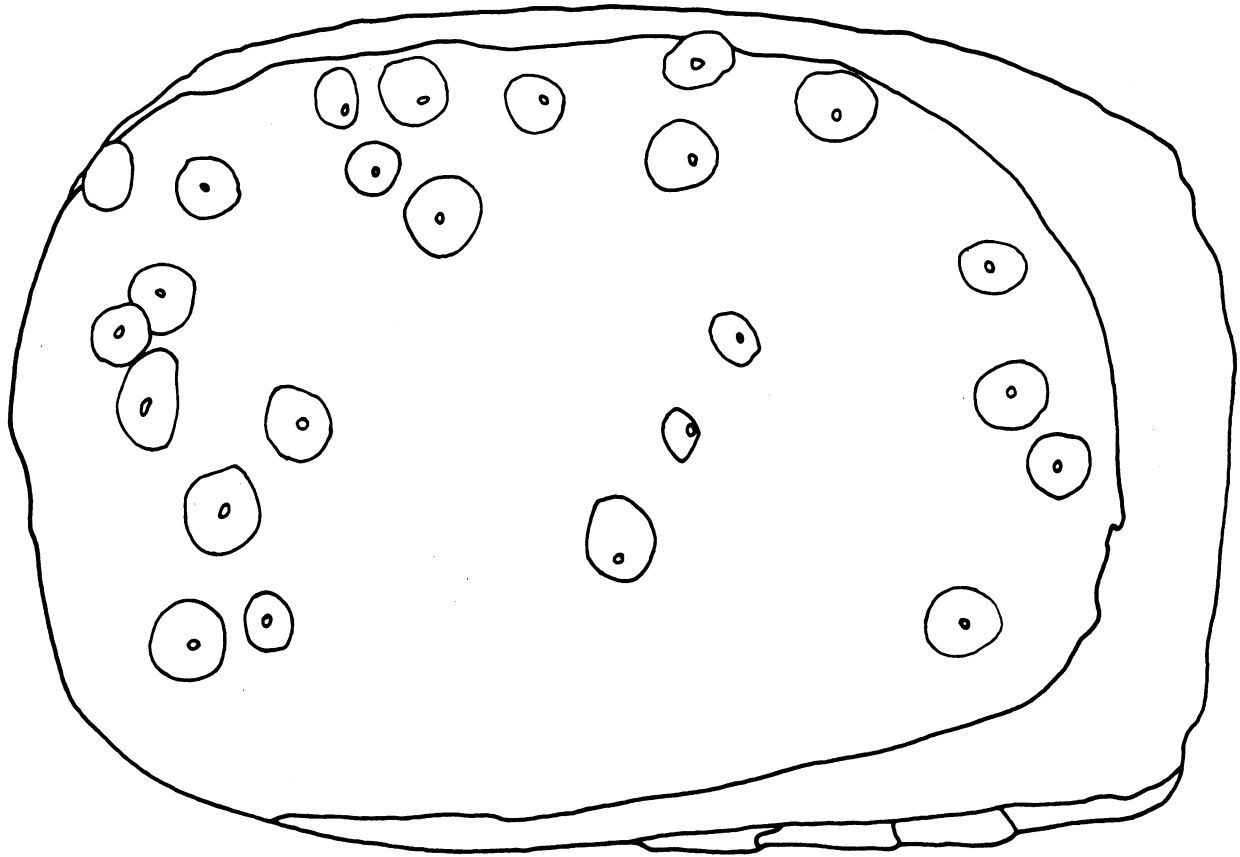


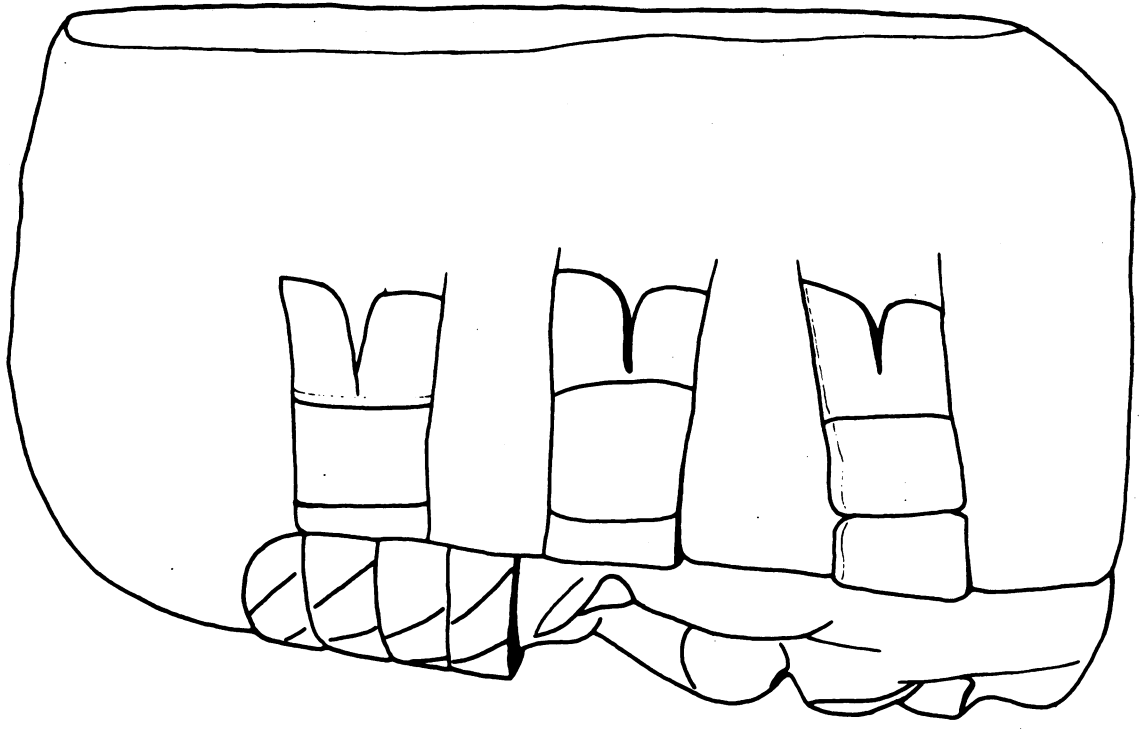
Figure 23 SL 4



Plate 26 SL 4



a

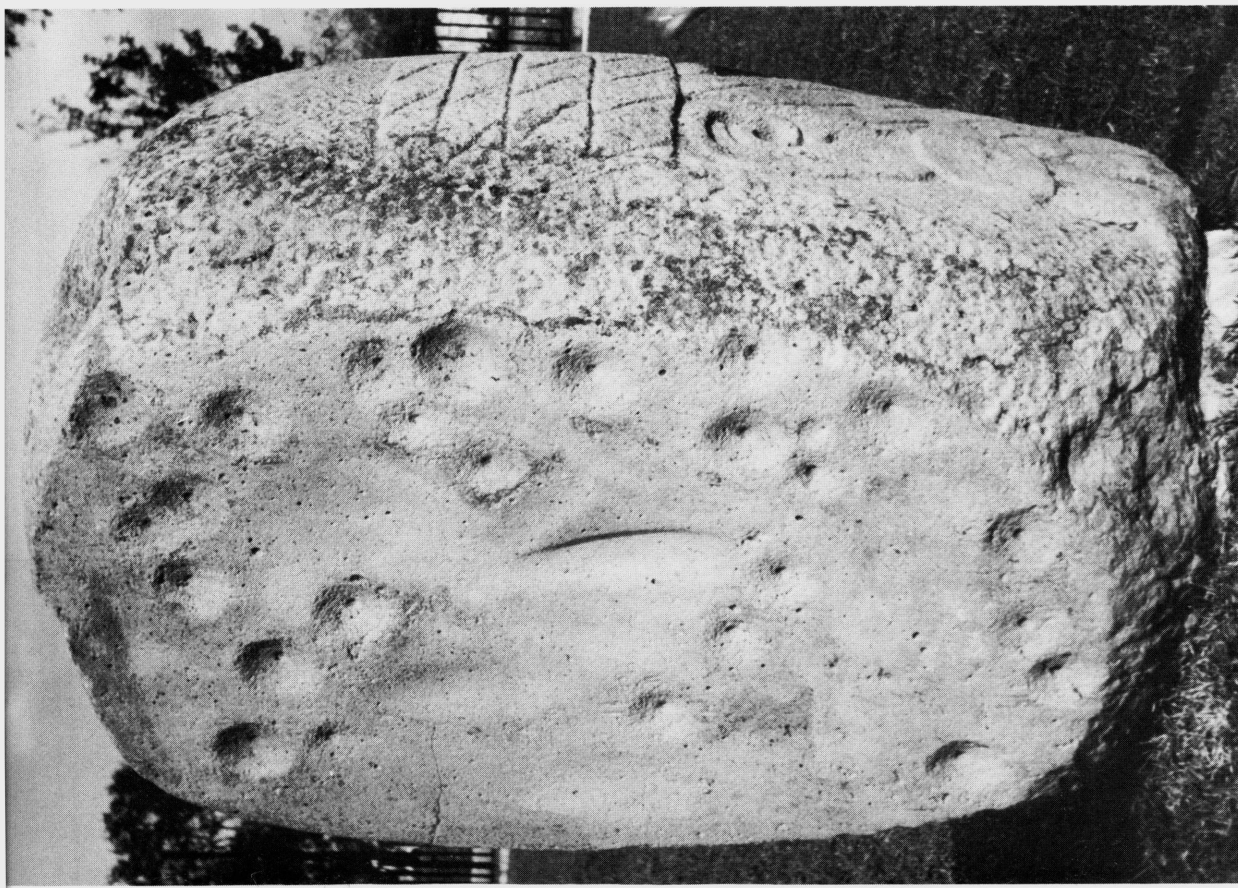


b

Figure 24 SL 4



b



a

Plate 27 SL 4

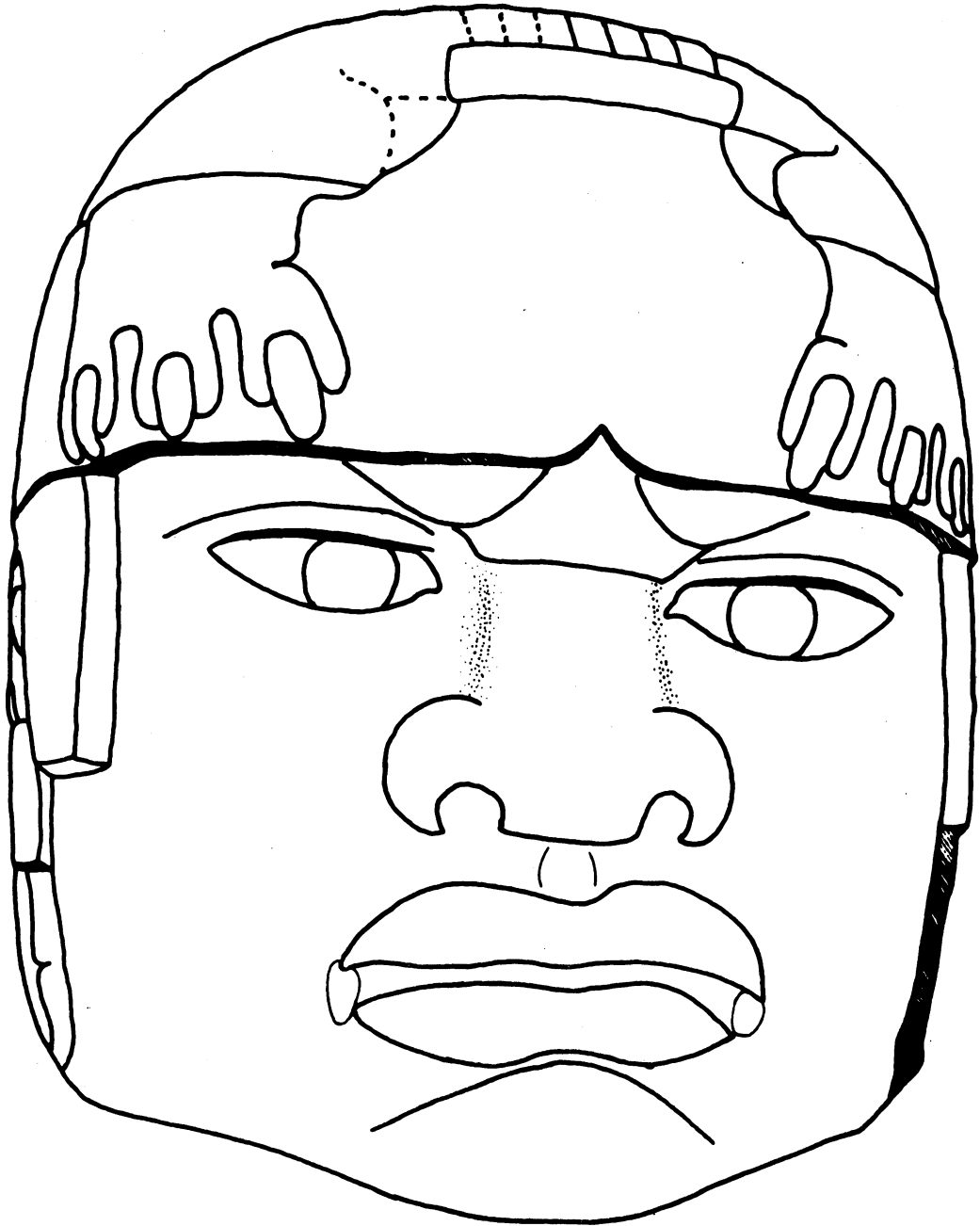


Figure 25 SL 5

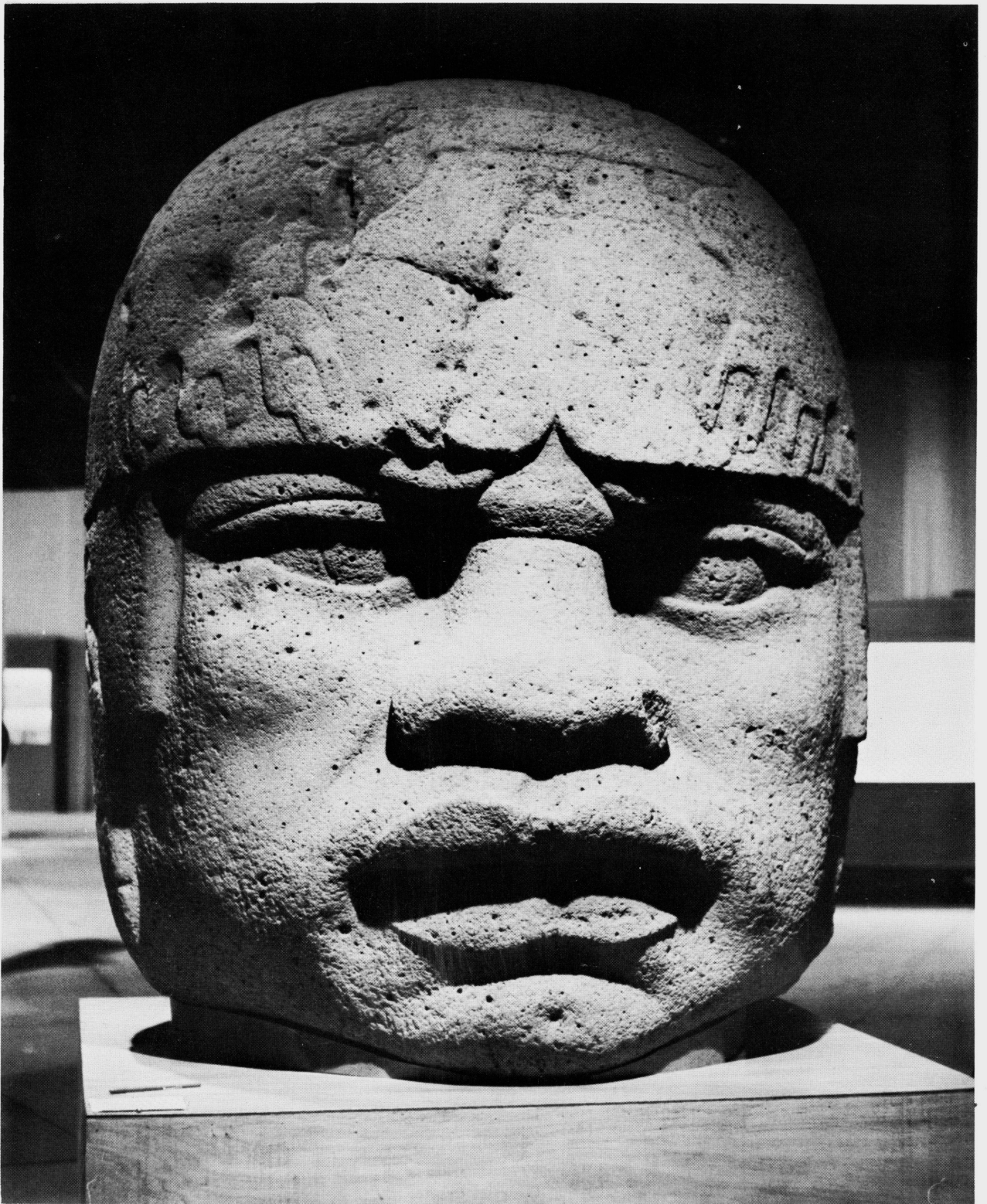


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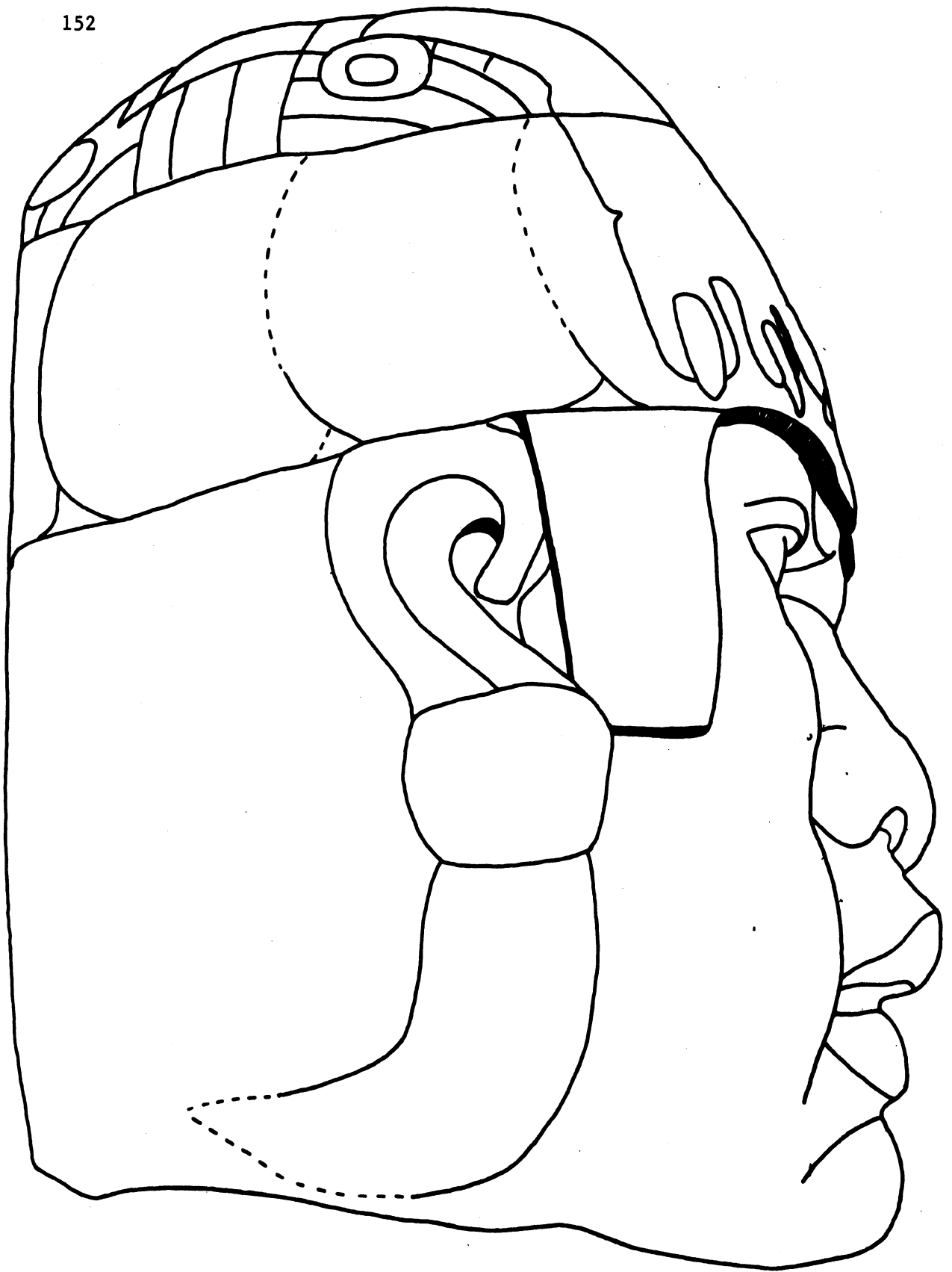


Figure 26 SL 5

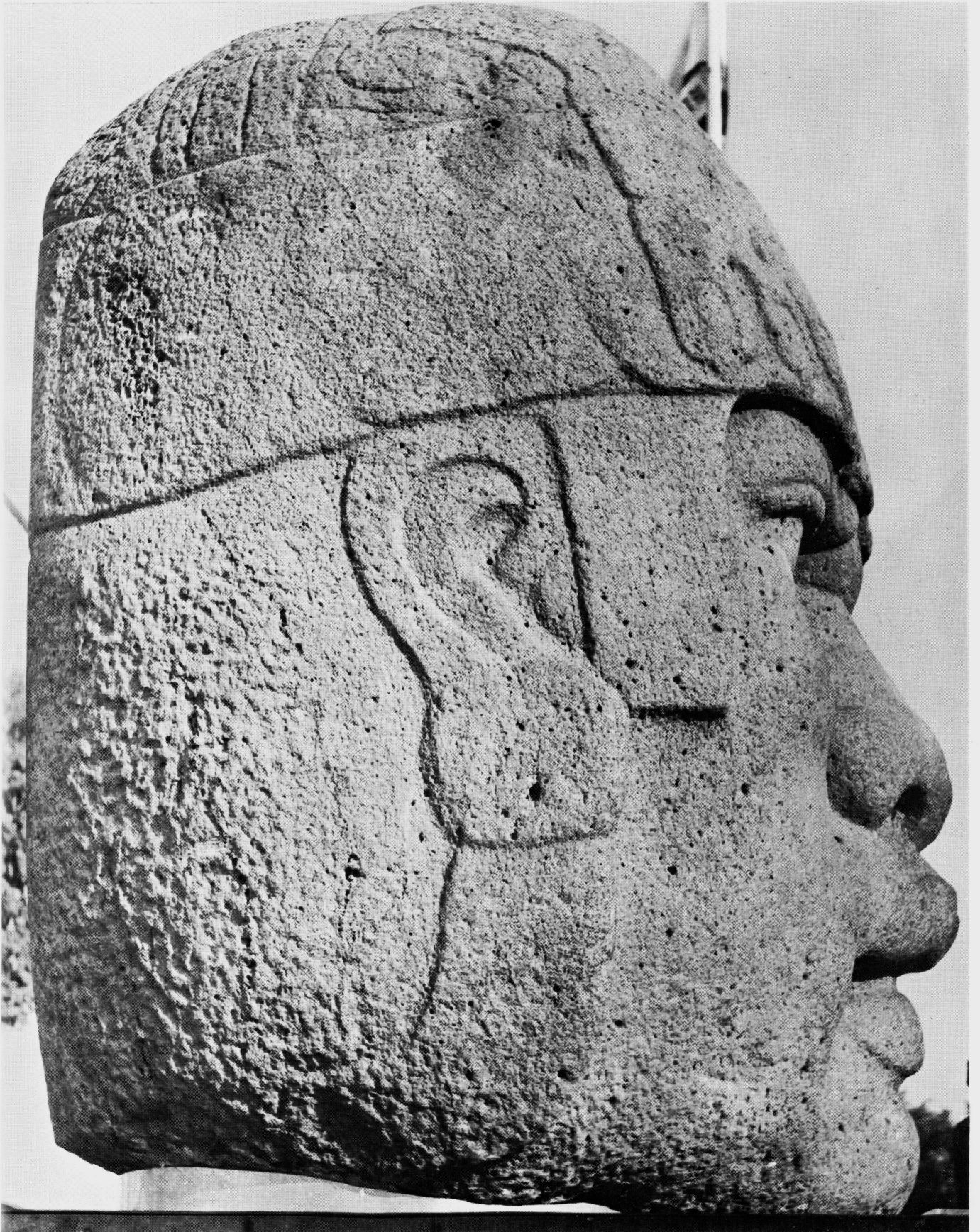


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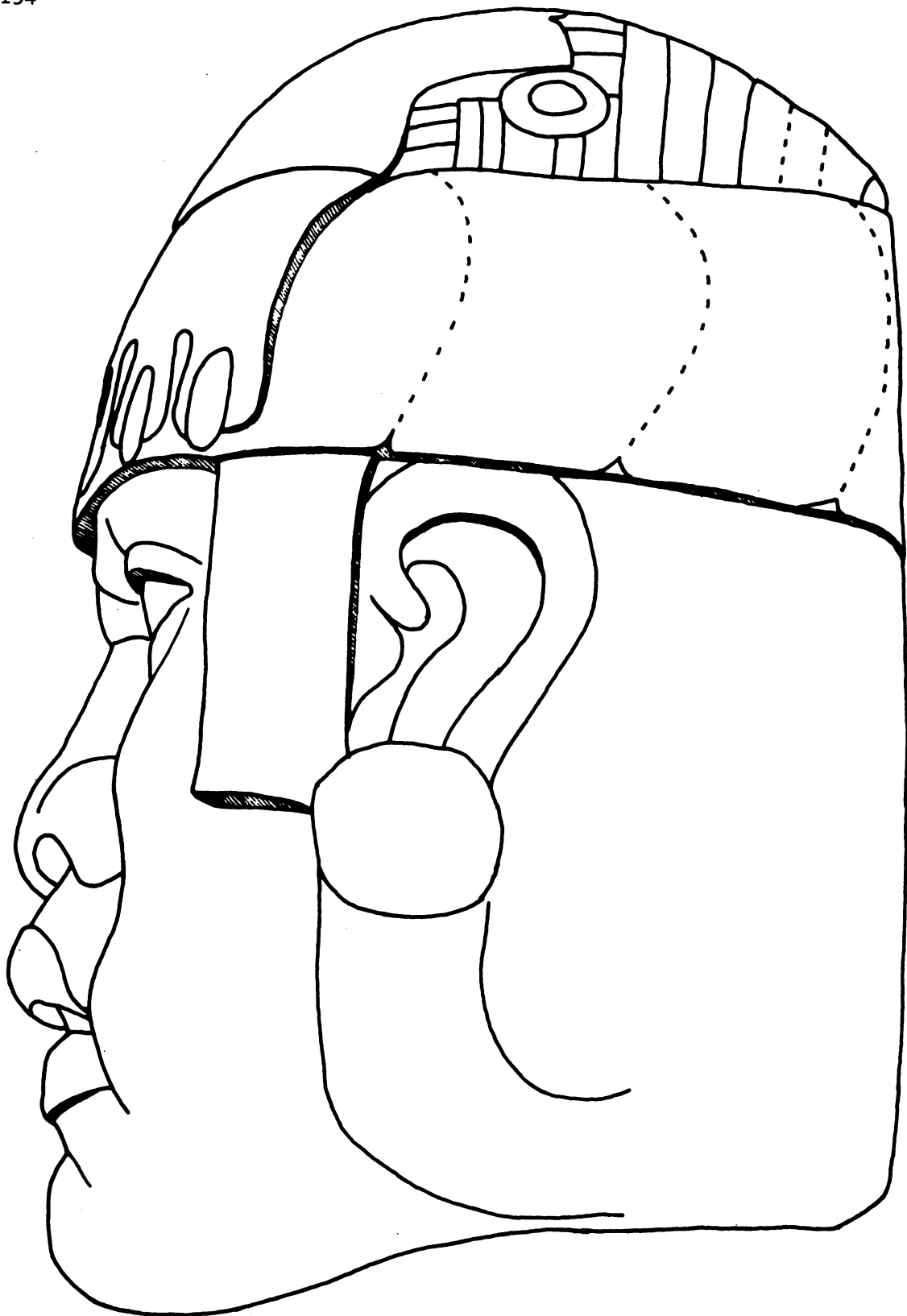


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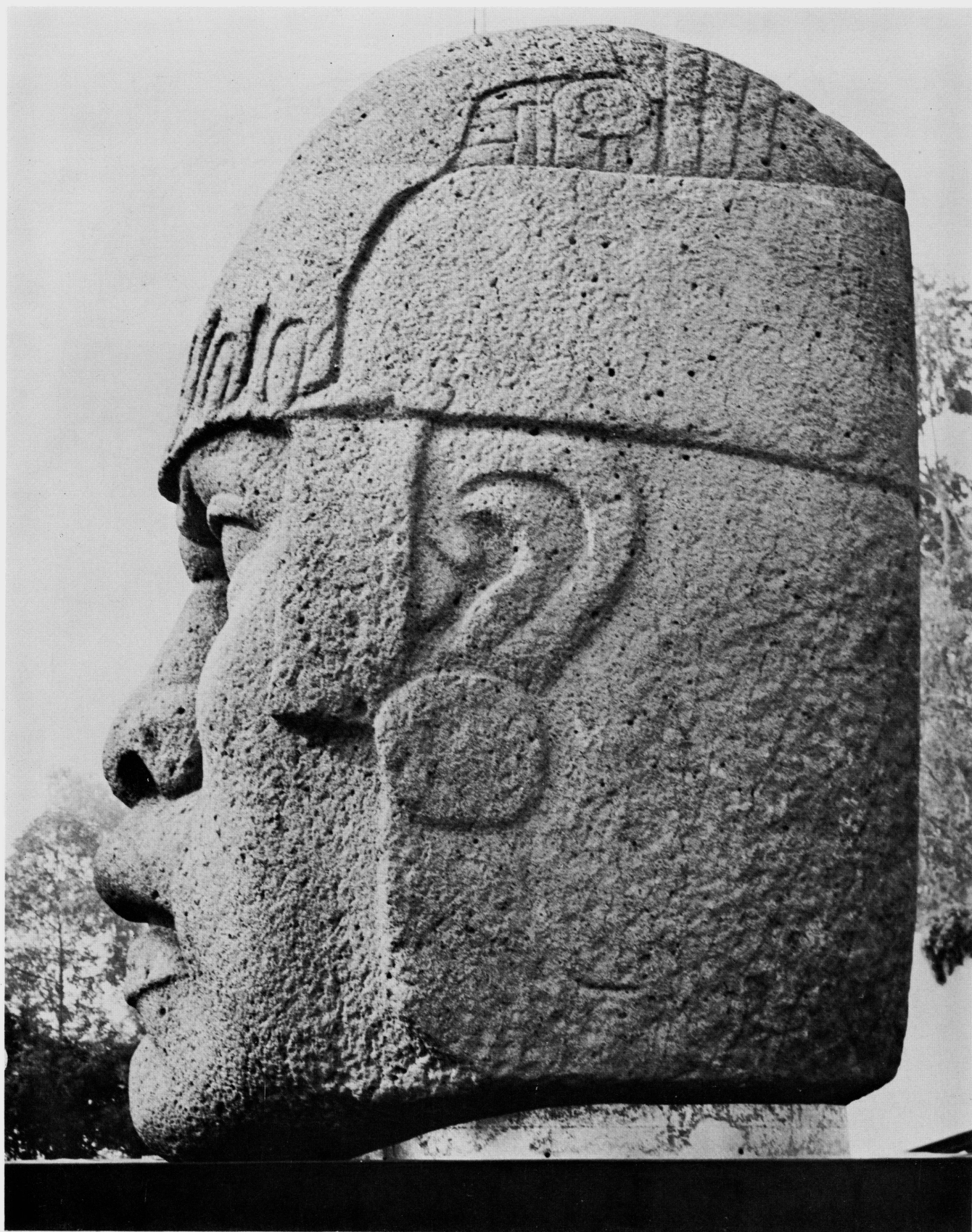


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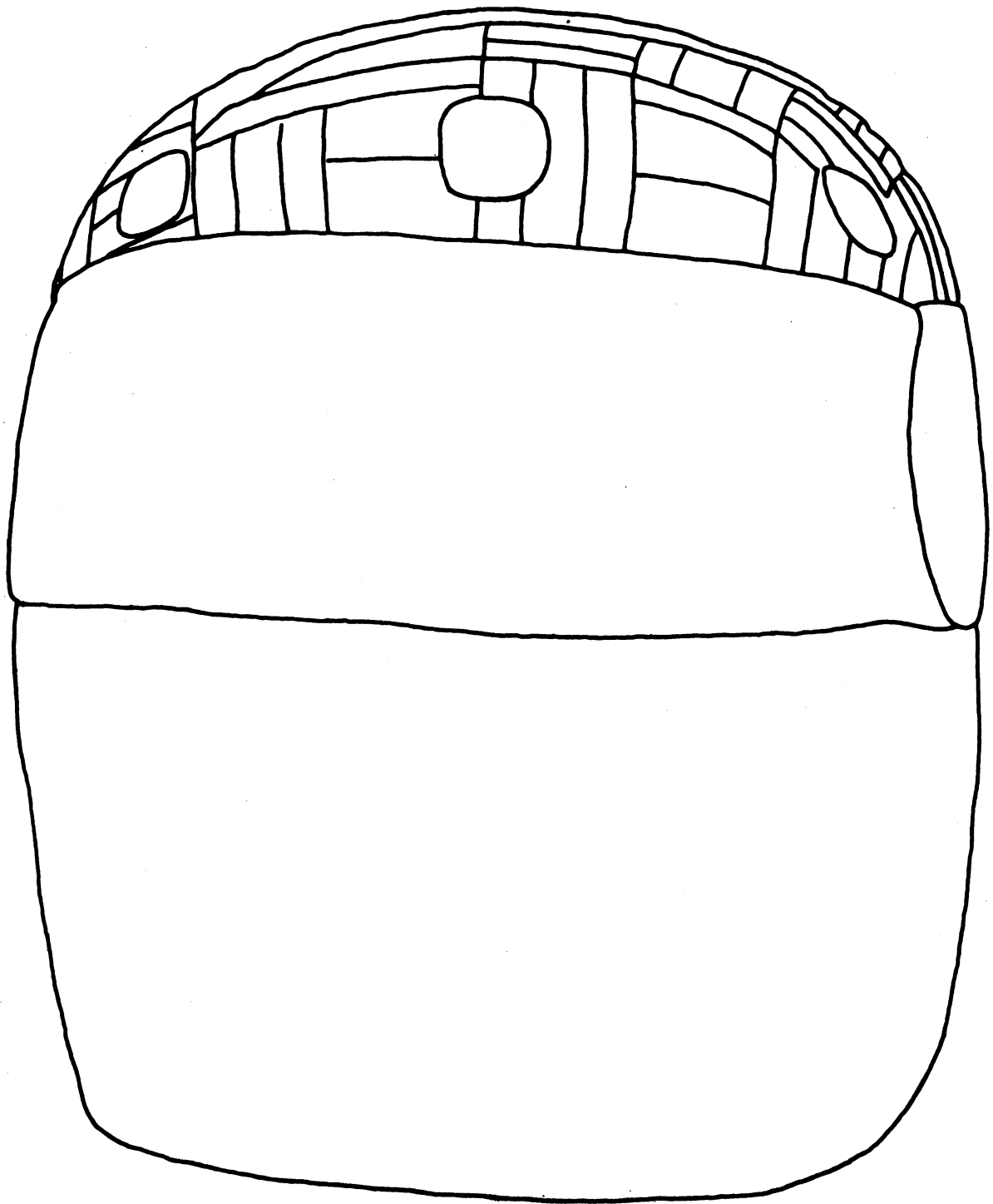


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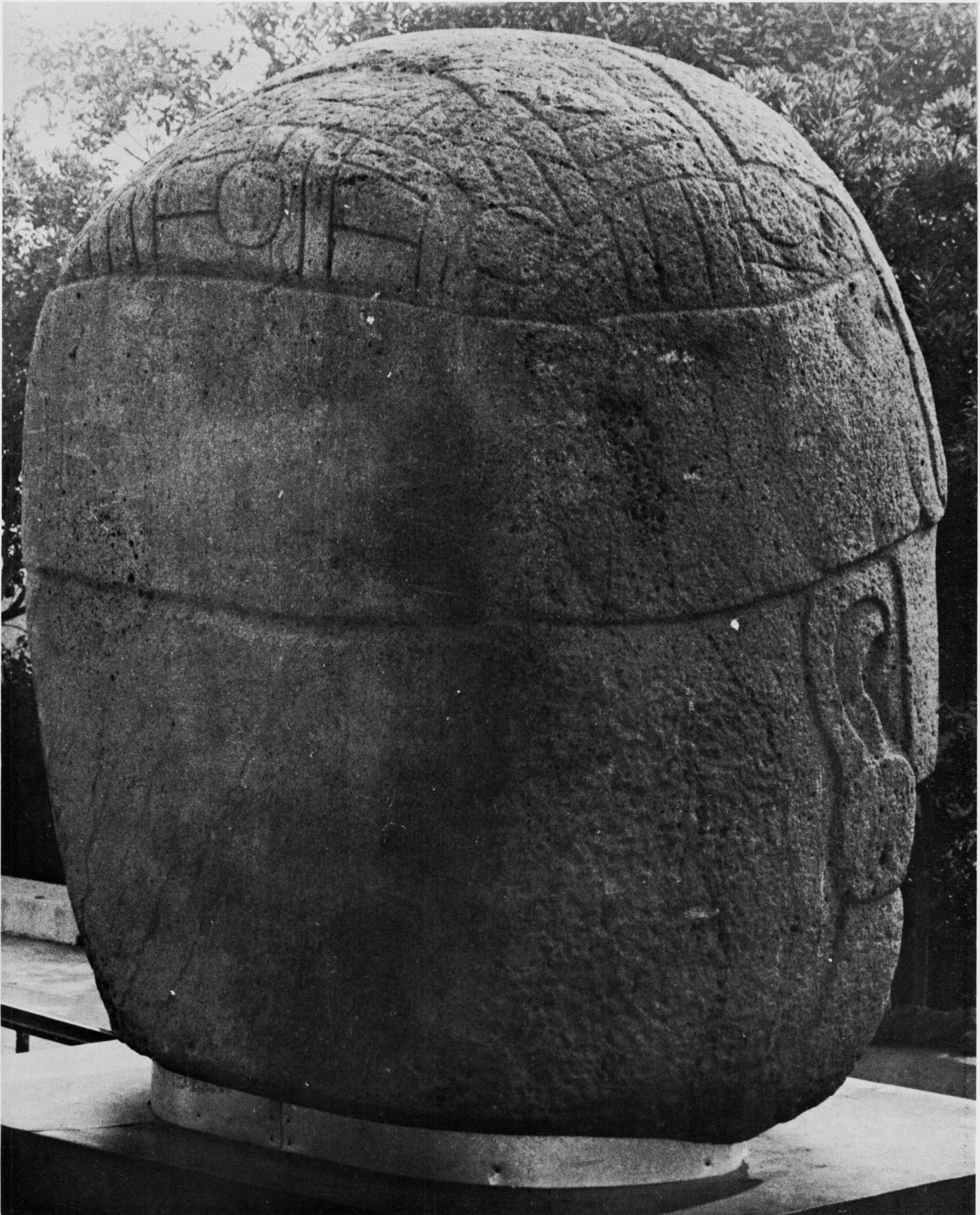




Plate 6 SL 6



a Pits with dimples, SL 3



b Right side Monument 14, San Lorenzo

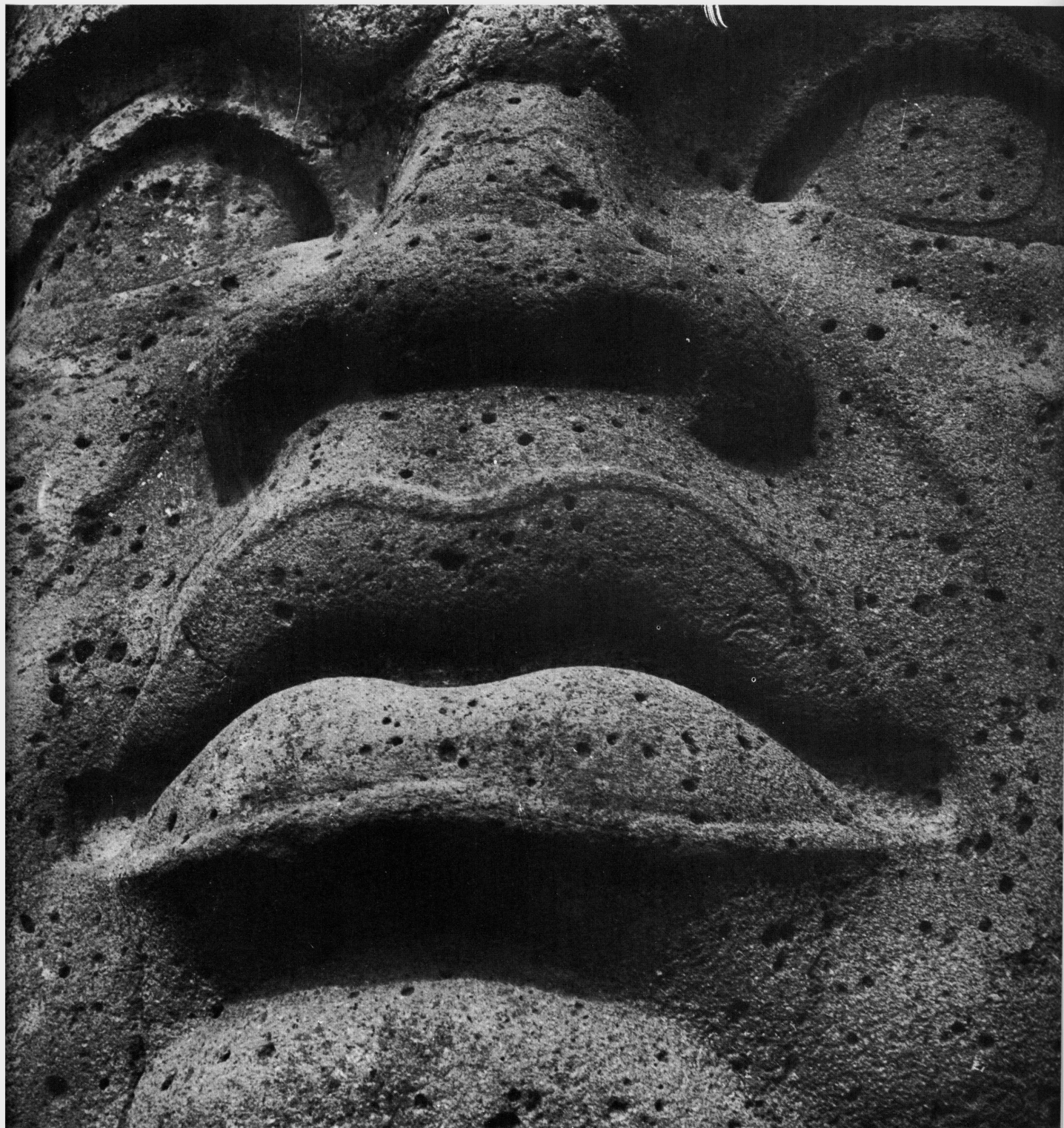


Plate 34 SL 1



Plate 35 TZ 1

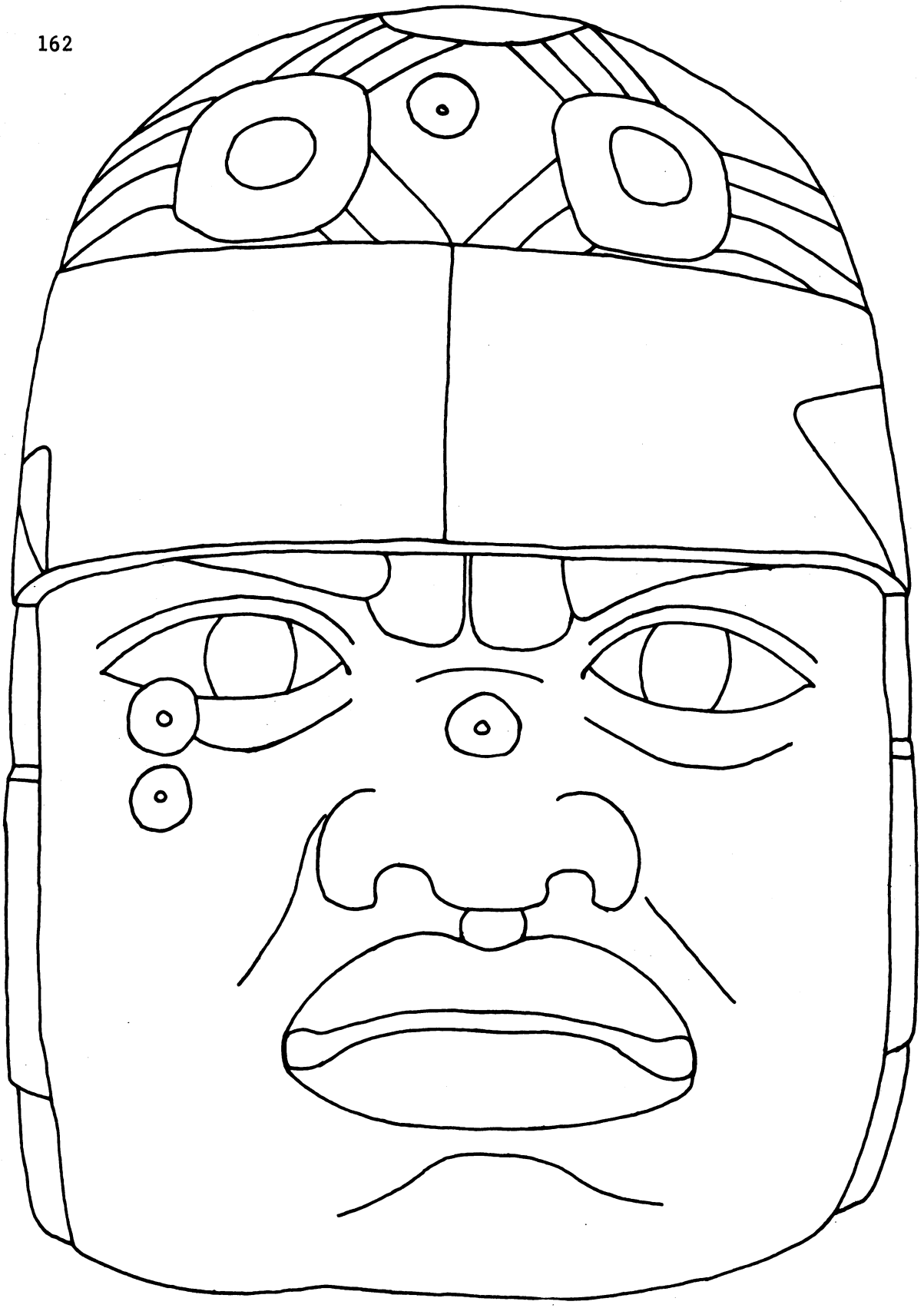


Figure 29 SL 6

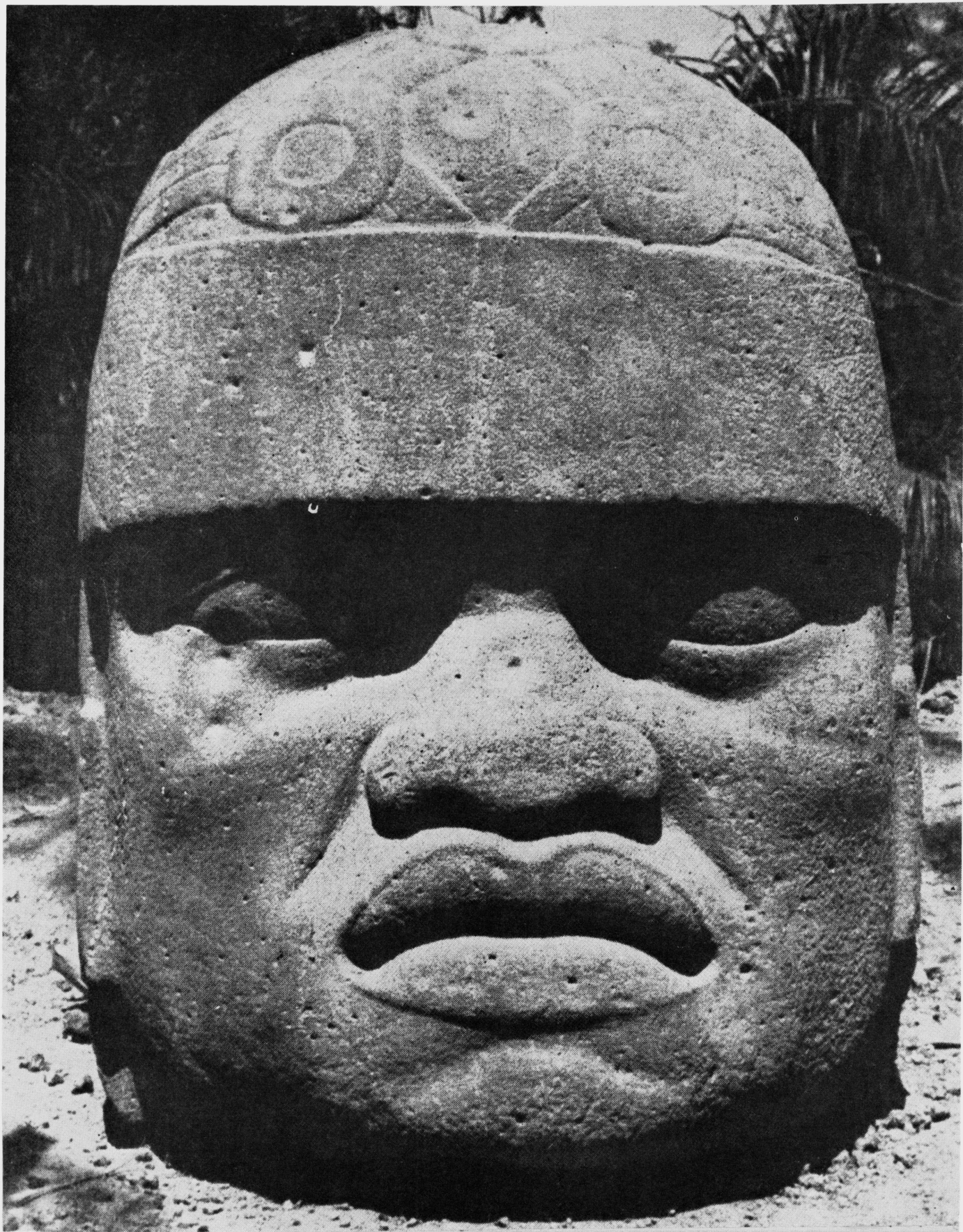


Plate 36 SL 6

BIBLIOGRAPHY

Abbreviations Used

AA	American Anthropologist
AAnt	American Antiquity
CIW	Carnegie Institute of Washington
HMAI	Handbook of the Middle American Indians
INAH	Instituto Nacional de Antropología e Historia
KAS	Kroeber Anthropological Society
-P	Paper
MARI	Middle American Research Institute
-P	Publication
MPA	Museum of Primitive Art
NGM	National Geographic Magazine
SI	Smithsonian Institution
-BAE-AP	Bureau of American Ethnology, Anthropological Papers
-BAE-B	Bureau of American Ethnology, Bulletin
-MC	Miscellaneous Collections
UC	University of California
-ARF-C	Archaeological Research Facility, Contribution

Armillas, Pedro

- 1964 Northern Mesoamerica. In Prehistoric Man in the New World, J. D. Jennings and E. Norbeck, eds. University of Chicago Press.

Artforum

- 1966 Cover illustration, Vol. V, No. 2, Los Angeles.

Aveleyra Arroyo de Anda, Luis

- 1965 Una Nueva Cabeza Colosal Olmeca. INAH Boletín 20:13-14, México, D.F.

Ayala Anguiano, Armando

- 1966 Los misteriosos Olmecas. La Aventura de México, Vol. 1, No. 2, Publicaciones AAA, S.A., México, D.F.

Berger, Rainer, J. A. Graham and R. F. Heizer

- 1967 A Reconsideration of the Age of the La Venta Site. UC-ARF-C 3:1-24, Berkeley.

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CIW	Carnegie Institute of Washington
HMAI	Handbook of the Middle American Indians
INAH	Instituto Nacional de Antropología e Historia
KAS	Kroeber Anthropological Society
-P	Paper
MARI	Middle American Research Institute
-P	Publication
MPA	Museum of Primitive Art
NGM	National Geographic Magazine
SI	Smithsonian Institution
-BAE-AP	Bureau of American Ethnology, Anthropological Papers
-BAE-B	Bureau of American Ethnology, Bulletin
-MC	Miscellaneous Collections
UC	University of California
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Armillas, Pedro

- 1964 Northern Mesoamerica. In Prehistoric Man in the New World, J. D. Jennings and E. Norbeck, eds. University of Chicago Press.

Artforum

- 1966 Cover illustration, Vol. V, No. 2, Los Angeles.

Aveleyra Arroyo de Anda, Luis

- 1965 Una Nueva Cabeza Colosal Olmeca. INAH Boletín 20:13-14, México, D.F.

Ayala Anguiano, Armando

- 1966 Los misteriosos Olmecas. La Aventura de México, Vol. 1, No. 2, Publicaciones AAA, S.A., México, D.F.

Berger, Rainer, J. A. Graham and R. F. Heizer

- 1967 A Reconsideration of the Age of the La Venta Site. UC-ARF-C 3:1-24, Berkeley.

Bernal, Ignacio

1963 Teotihuacán, Descubrimientos y Reconstrucciones. INAH. México, D.F.

n.d. The Olmec World. University of California Press, Berkeley (in press).

Blom, Franz and Oliver La Farge

1926 Tribes and Temples. MARI-P 1:1, Tulane.

Chavero, Alfredo

1883 Historia Antigua de México. In México a Traves de los Siglos. Libro Primero, Capitulo Primero, México, D.F.

Coe, Michael D.

1965a Archaeological Synthesis of Southern Veracruz and Tabasco. HMAI 3:679-715. University of Texas Press, Austin.

1965b The Olmec Style and Its Distribution. HMAI 3:739-775. University of Texas Press, Austin.

1965c The Jaguar's Children: Pre-Clasic Central Mexico. Museum of Primitive Art, New York.

1966 Preliminary Report on the First Season's Work at San Lorenzo Tenochtitlán, Ver. Yale University. (Mimeographed.)

1967 Olmec Civilization, Veracruz, Mexico: Dating of the San Lorenzo Phase. Science 155:3768:1399-1401.

n.d. Letter quoted as footnote 40 in Bernal n.d.

Covarrubias, Miguel

1942 Origen y Desarrollo del Estilo Artistico Olmeca. In Mayas y Olmecas, 46-49. Tuxtla Gutierrez, México.

1946 Mexico South, the Isthmus of Tehuantepec. A. Knopf, New York.

1957 Indian Art of Mexico and Central America. A. Knopf, New York.

Dechelette, J.

1908 Manuel d'Archéologie Préhistorique Celtique et Gallo-Romaine. Librairie Alphonse Picard et Fils, Paris.

Dieseldorff, E. P.

1926 Kunst und Religion der Mayavolker, Vol. 1. Berlin.

Drucker, Philip

- 1943 Ceramic Sequences at Tres Zapotes, Veracruz, Mexico. SI-BAE-B 140. Washington, D.C.
- 1952 La Venta, Tabasco, a Study of Olmec Ceramics and Art. SI-BAE-B 153. Washington, D.C.
- 1955 The Cerro de las Mesas Offering of Jade and Other Materials. SI-BAE-B 157, AP 44:25-68, Washington, D.C.
- 1961 The La Venta Support Area. KAS-P 25:59-72, Berkeley.

Drucker, Philip, R. F. Heizer and R. J. Squier

- 1959 Excavations at La Venta, Tabasco, 1955. SI-BAE-B 170. Washington, D.C.

F.L.

- 1965 Histoire d'une Tête Olmeque. *Archeologia* 2:41-47, Paris.

Foster, George M.

- 1942 A Primitive Mexican Economy. American Ethnological Society, Monograph V. New York.

Gamboa, Fernando

- 1963 Masterworks of Mexican Art. Los Angeles County Museum of Art (Exhibition Catalogue).

Guttman, Louis

- 1944 A Basis for Scaling Qualitative Data. *American Sociological Review* 9:2:139-150.

Harrer, H.

- 1964 I Come from the Stone Age. Rupert Hart, Davies, London.

Hasler, Juan A.

- 1959 Due Teste litiche Olmeche con Capelli Crespi. *Archivio Internazionale di Etnografia e Preistoria*, II:31-34, Torino.

Heizer, Robert F. and T. Smith

- 1965 Olmec Sculpture and Stone Working: a Bibliography. UC-ARF-C 1:71-88. Berkeley.

Heizer, Robert F., T. Smith and H. Williams

- 1965 Notes on Colossal Head No. 2 from Tres Zapotes. *AAnt* 31:102-104.

Jeffries, D. W.

- 1953 Pre-Columbian Negroes in America. *Scientia*, Vol. 88, Nos. 495-496, Series 6, 202-217, Bologna.

Jones, Julie

- 1963 Bibliography for Olmec Sculpture. MPA, Primitive Art Bibliographies, No. II, New York.

Judd, N. M.

- 1959 Pueblo del Arroyo, Chaco Canyon, New Mexico. *SI-MC* 138:1, Washington, D.C.

Kennedy, Alexander

- 1821 Notice Regarding the Working and Polishing of Granite in India. *Edinburgh Philosophical Journal*, Vol. IV, Art. XIX, 349-351.

Kennedy, R. A.

- 1962 Grinding Benches and Mortars on Fernando Po. *Man*, Vol. 62, Art. 213, 129-130, London.

Kubler, George.

- 1961 Three Regions of Primitive Art. MPA, Lecture Series No. 2, New York
- 1962 The Art and Architecture of Ancient America. Penguin Books, Baltimore.

Lathrap, D. W.

- 1957 The Classic Stage in Mesoamerica. *KAS-P* 17:38-74, Berkeley.

Longyear, John

- 1940 Ethnological Significance of Copan Pottery. In The Maya and Their Neighbors. Appleton-Century Crofts, New York (268-271).

Medellin Zenil, Alfonso

- 1960 Monolitos Ineditos Olmecas. *La Palabra y el Hombre*, No. 16:75-98, Jalapa, Ver.
- 1963 The Olmec Culture. In J. J. Sweeney, The Olmec Tradition. (Fourteen unnumbered pages in Spanish and parallel English.)

Melgar, José

- 1869 Notable Escultura Antigua. *Antiguedades Mexicanos*, I:292-297.
- 1871 Estudio sobre la Antigüedad y el Origen de la Cabeza Colosal de Tipo Etiopico que Existe en Hueyapan. *Boletín de la Sociedad Mexicana, Epoca 2*, Vol. 3, 104-109.

Miles, S. W.

- 1965 Sculpture of the Guatemala-Chiapas Highlands and Pacific Slopes and Associated Hieroglyphs. HMAI 2:237-275.
University of Texas Press, Austin.

Muhammad Speaks

- 1962 (Newspaper) Vol. 1, No. 7, pp. 1, 23-28, May, 1962.
Mohammad's Mosque No. 2, Chicago.

Paddock, John

- 1966 Oaxaca in Ancient Mesoamerica. In Ancient Oaxaca, 81-242.
Stanford University Press, Palo Alto.

Parsons, Lee A. and Peter S. Jenson

- 1965 Boulder Sculpture of the Pacific Coast of Guatemala.
Archeology, Vol. 18, No. 2, 132-144.

Piña Chan, Román and Luis Covarrubias

- 1964 El Pueblo del Jaguar. Museo Nacional de Antropología,
México, D.F.

Richardson, Francis B.

- 1940 Non-Maya Monumental Sculpture of Central America. In The Maya and Their Neighbors. Appleton-Century Crofts, New York (395-418).

Sejourné, Laurette

- 1963 Exploración de Tetitla. In Teotihuacán, Descubrimientos y Reconstrucciones, I. Bernal, ed. INAH. México, D.F. (46-49).

Seler-Sachs, C.

- 1922 Altertumer des Kanton Tuxtla im Staate Veracruz. In Festschrift Eduard Seler, W. Lehmann, ed. Von Streckler and Schroeder, Stuttgart (543-556).

Smith, Tillie

- 1963 The Main Themes of the Olmec Art Tradition. KAS-P 28:121-213,
Berkeley.

Spinden, H. J.

- 1915 Notes on the Archeology of El Salvador. AA 17:446-487.

Squier, Robert J.

- n.d. A Reappraisal of Olmec Chronology. (Ph.D. thesis, Dept. of Anthropology, University of California, Berkeley, 1963.)

Stirling, Matthew W.

- 1940 Great Stone Faces of the Mexican Jungle. NGM 78:309-334, Washington, D.C.
- 1943 Stone Monuments of Southern Mexico. SI-BAE-B 138. ✓
Washington, D.C.
- 1947 On the Trail of La Venta Man. NGM 91:137-172. Washington, D.C.
- 1955 Stone Monuments from the Rio Chiquito. SI-BAE-B 157, AP 43:1-24, 164, AP 53:213-240, Washington, D.C.
- 1957 An Archeological Reconnaissance in Southeast Mexico. SI-BAE-B 164, AP 53:213-240, Washington, D.C.
- 1961 The Olmecs, Artists in Jade. In Essays in Pre-Columbian Art and Archaeology, S. K. Lothrop, ed. Harvard University Press, Cambridge (43-59).
- 1965 Monumental Sculpture of Southern Veracruz and Tabasco. HMAI 3:716-738. University of Texas Press, Austin.

Stromsvik, Gustav

- 1947 Guidebook to Copan. CIW Publication 577. Washington, D.C.

Sweeney, J. J.

- 1963 The Olmec Tradition. Museum of Fine Arts, Houston, Texas.

Tamayo, J. L.

- 1949 Atlas Geográfico General de México. México, D.F.

Thompson, J. E. S.

- 1948 An Archeological Reconnaissance in the Cotzumalhuapa Region, Escuintla, Guatemala. CIW Publication 574, Contributions to American Anthropology and History No. 44.

Villacorta, C. and J. Antonio

- 1938 Prehistoria e Historia Antigua de Guatemala. Guatemala.

Vivo Escoto, J. A.

- 1964 Weather and Climate of Mexico and Central America. HMAI 1:187-215. University of Texas Press, Austin.

Weiand, C. W.

- 1943 An Introduction to the Ceramics of Tres Zapotes, Veracruz, Mexico. SI-BAE-B 139. Washington, D.C.

West, Robert C.

1964a The Surface Configuration and Associated Geology of Middle America. HMAI 1:33-83. University of Texas Press, Austin.

1964b The Natural Regions of Middle America. HMAI 1:363-383. University of Texas Press, Austin.

Westheim, P.

1965 The Art of Ancient Mexico. Anchor Books, Doubleday, Garden City, N.Y.

Weyerstall, Albert

1932 Some Observations on Indian Mounds, Idols and Pottery in the Lower Papaloapan Basin, State of Veracruz, Mexico. MARI-P 4:23-69, Tulane.

Wicke, Charles P.

n.d. The Olmecs: an Early Art Style of Pre-Columbian Mexico. (Ph.D. thesis, Dept. of Anthropology, University of Arizona, 1965.)

Williams, Howel and R. F. Heizer

1965 Sources of Rocks Used in Olmec Stone Monuments. UC-ARF-C 1:1-40, Berkeley.