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Seri Prehistory: The Archaeology of the Central Coast of Sonora, Mexico.

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Some images in this book have been redacted due to sensitive content.

About the Author . . .

THOMAS BOWEN has done field work at several locations in the western United States and in Sonora, Mexico, his main area of interest. He holds a Ph.D. in anthropology from the University of Colorado, and he has written several articles on Seri material culture and on the archaeology of northwest Sonora. In 1974 he was invited to participate in the first *Reunión* on the anthropology and history of Sonora sponsored by the Instituto Nacional de Antropología e Historia. In 1969, he joined the faculty of anthropology at California State University, Fresno.

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PREFACE

This report is based on a doctoral dissertation submitted to the University of Colorado in 1969. It is, however, an extensive revision of that original paper. In the years since 1969, new data have been accumulating at a slow but nonetheless steady pace. Moreover, it is a fact of life that in a poorly known area even small gains in information can require inordinately large changes in interpretation. Such has been the case here. Although the broad outline of central coast prehistory still remains much the same, changes from the original manuscript are substantial, and the present paper gives a considerably fuller and hopefully more accurate account.

The field work that provides the core of the data was sponsored by the Arizona State Museum, funded by a grant from the National Science Foundation (GS-1369), and carried out under Permit No. 4/66 issued by the Instituto Nacional de Antropología e Historia.

The Project Director was the late William W. Wasley, to whom I am greatly indebted for incorporating the survey of the central coast into his basic project design and for graciously permitting me to initially present the results in my dissertation.

The other project members were Stephen D. Hayden and Susan Adams Samuelson. Mr. Hayden accompanied me during most of the field work. It was a pleasure to work with him, and I am grateful for his perception and critical evaluations in the field. The laboratory was in the capable charge of Mrs. Samuelson, who undertook the processing and cataloging of the artifacts. The thoroughness and care with which she carried out these tasks has greatly facilitated the preparation of this report.

Many other individuals have contributed to this paper, and I gratefully acknowledge their roles. Manuel Robles O., now Director of the Museo Regional de la Universidad de Sonora, shared much of his personal knowledge of sites and Sonoran archaeology. The project profited greatly from the information he provided, and his continuing friendship is one I value highly.

We were assisted in a variety of ways by Harry and Jane King of Santa Fe, who joined us for a month in Hermosillo. A special thanks is due Mrs. King for the restoration of our pottery vessels.

A number of people have provided additional information, much of it gathered since the field work was conducted. Glen Conklin of San Diego, George E. Fay of the University of Northern Colorado, Julian D. Hayden of Tucson, Manuel Robles O. of the Museo Regional in Hermosillo, Alexander Russell, Jr., of Tucson, and Richard S. White, Jr., of the American Museum of Natural History, kindly allowed me to use specific data.

Shell identifications were made by Joseph C. Bequaert of the University of Arizona and Keith Woodwick of California State University, Fresno. Identification of historic artifacts and osteological analysis were undertaken respectively by Bernard L. Fontana and Walter H. Birkby, both of the Arizona State Museum. The chemical composition of metal projectile points was determined by Dean Marino and Robert Papazian of California State University, Fresno.

My debt to Edward and Mary Beck Moser of the Summer Institute of Linguistics is enormous, as this report amply testifies. Many of the artifacts reported here, especially the more exotic materials, are from the well-documented Moser collection, which was freely placed at our disposal for study. The ethnographic information and the Seri interpretations of the remains, which this report utilizes extensively, were provided largely by the Mosers, and I am deeply indebted to them for critical checking of innumerable points.

The entire manuscript was read by the Mosers and by Julian D. Hayden of Tucson, and specific portions were checked by Richard Felger of the Arizona-Sonora Desert Museum. Each of these individuals helped with detailed comments and advice. Final preparation of the photographs and maps was undertaken by Helga Teiwes French and by Charles Sternberg of the Arizona State Museum. R. Gwinn Vivian, of the same institution, gave tireless assistance and sound advice that have been indispensable in readying this report for publication. I wish to express thanks also to the members of my dissertation committee—David A. Breternitz, James J. Hester, Dorothea V. Kaschube, and Robert H. Lister—for their suggestions and encouragement. Finally, I owe a special word of gratitude to my wife, Irena, for her assistance throughout the preparation of the manuscript.

THOMAS BOWEN

Note on Pronunciation

The following phonetic symbols are used to write Seri terms in this volume. (For a detailed description of Seri phonemes, see Moser and Moser 1965.)

p	voiceless bilabial stop	*X*	voiceless back velar spirant
t	voiceless dental stop	*m*	labial nasal
k	voiceless velar stop	*n*	dental nasal
kw	voiceless labialized velar stop	*ŋ*	velar nasal
?	glottal stop	*y*	palatal semivowel
f	voiceless bilabial spirant	*i*	high close front vowel
W	voiceless labial grooved-rounded spirant	*e*	low close front vowel
s	voiceless alveolar spirant	*a*	low open central vowel
S	voiceless alveopalatal spirant	*o*	mid close back vowel
ɬ	voiceless lateral spirant	*ˊ*	accent
x	voiceless velar spirant		

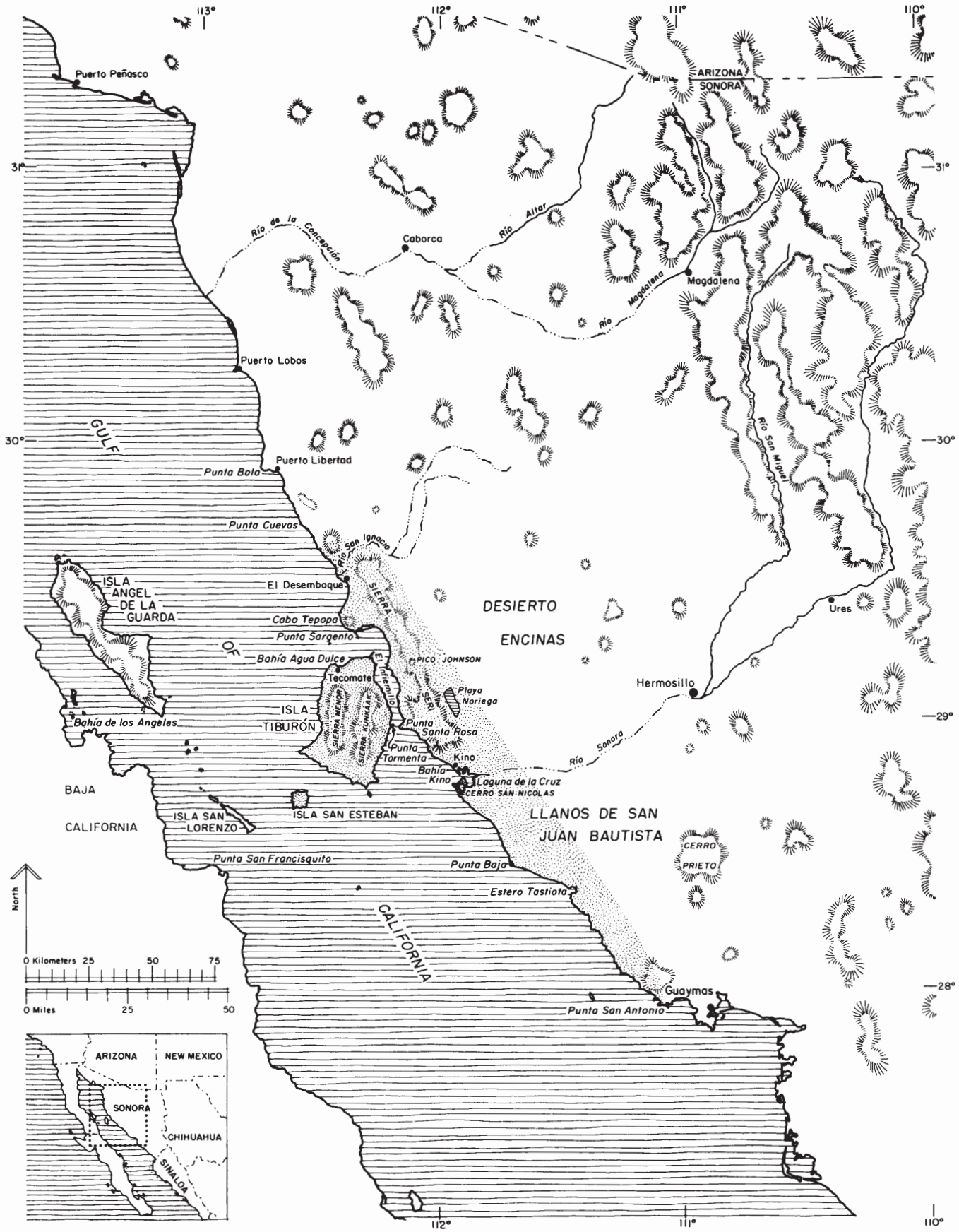

Fig. 1 The Sonoran coastline and the northern Gulf of California. The area defined as the central coast is indicated by stippling.

1. INTRODUCTION

This paper deals with the archaeology of the central coast of Sonora, Mexico. Its objectives, in line with the present state of knowledge of this region, are basic and modest. It is, first of all, a report of a surface survey conducted in 1966–67 under the sponsorship of the Arizona State Museum. Second, it attempts to place the archaeological remains of the central coast in a broad cultural and historical perspective.

PREVIOUS STUDIES

The central coast, as defined here, consists of a strip of coastline extending from just north of the city of Guaymas to somewhat north of El Desemboque de los Seris, and it includes two of the large Gulf of California islands, Tiburón and San Esteban (Figs. 1 and 2). Although this area has not been entirely *terra incognita* from an archaeological standpoint, few regions of the greater Southwest have received as little systematic study. It has been known for some time that sites on this coast are characterized by shell deposits and that they contain a very thin hard pottery, sometimes referred to as "eggshell pottery," and occasional ceramic figurines. However, the geographic extent of this culture, its temporal position, and its cultural affinities have never been determined, nor has it been established whether all of the remains belong to a single culture. The present survey, although in many respects superficial, obtained enough information to shed some light on such basic questions as these.

It is not surprising that sites on the central coast did not attract early attention, considering their unspectacular contents, the inaccessibility of the region, and the hostility of the Seri inhabitants. The earliest information on central coast archaeology comes from McGee's (1898) monograph on the Seri, which gives a description of the general character of the sites along with comments, sometimes of dubious accuracy, about their contents. By the 1920s Seri-Mexican relations had become reasonably peaceful, and the portion of the central coast near the fishing settlement of Kino had become accessible by road. As tourists began to filter into the area, small collections of artifacts began to find their way into museums. Occasional visits by anthropologists resulted in a few, mostly casual, notes, but no formal studies were undertaken. As late as 1950, McGee's monograph was still the principal source of information, supplemented only by Saville's description (1924) of a single figurine, a listing of a few sites in an archaeological atlas compiled by the Instituto Nacional de Antropología e Historia (1939), and a few brief remarks by Hayden (1942).

Information increased between about 1950 and 1966, but at a snail's pace. In 1949, Lehmer and Bannister spent three days collecting in the vicinity of Estero Tastiota as part of a survey of selected regions of Sonora. Although a brief description of the trip was published (Lehmer 1949), only a preliminary analysis of the artifacts was undertaken (Lehmer n.d.), and nothing further has appeared. In 1953 Fay conducted a survey of several parts of Sonora, including the area around Bahía Kino. Several eursory notices pertaining to this work have since appeared (for example, Fay 1955; 1956a; 1961), but the full results are not yet available. Hayden's careful observations on several coastal sites, made in the early 1940s, were described briefly (Hayden 1956), and Ives (1963) commented on the relationship of Sonoran coastal remains to ancient shorelines. The remainder of the reports prior to 1966 deal with artifacts recovered by tourists, in some cases single specimens. These are descriptions of two Clovis points and a stone pipe (DiPeso 1955, 1957), discussions and interpretations of coastal figurines (Fay 1956a; Owen 1956; Dockstader 1961; Manson 1961), and a description of a collection of artifacts from Estero Tastiota (Holzkamper 1956).

Thus in 1966 when the present field work began, the central coast was still largely unknown archaeologically. Except for Ascher's (1968) sampling of modern trash at Desemboque, there had been no excavations whatever and not a single extensive survey. The few previous survey efforts had been limited to a few days of field work, confined to local areas, and the results had remained incompletely reported. Existing artifact descriptions were, for the most part, concerned with "unusual" items and were often based on a small number of specimens, usually of unknown provenience. The most prevalent artifact class, pottery, had never received more than superficial description. The geographic distribution of the sites and artifacts had never been established and tem-

Fig. 2 The northern Gulf of California looking northwest from the Gemini V spacecraft, altitude more than 100 miles. The Baja California peninsula dominates the upper left in this view while a portion of mainland Sonora fills the lower right corner. Most of the central coast is visible, from El Desemboque at the extreme right center to Estero Tastiota at the bottom center, along with Isla Tiburón and Isla San Esteban. The extent of recent agricultural development of the Llanos de San Juan Bautista is clearly visible at lower right.

poral relationships were virtually unknown. Although a brief summary of existing reports was compiled by A. E. Johnson (1966: 30–1) no attempt had ever been made to synthesize the data. With so little known, the present survey was conceived as something of an exploratory venture and was geared primarily toward obtaining basic kinds of information.

THE ARIZONA STATE MUSEUM SONORA-SINALOA PROJECT

It is important to point out that the survey of the central coast was not undertaken as an independent project; in fact it assumed a relatively minor role in a much larger project directed toward other objectives. Since the extent and nature of the central coast survey was determined to a considerable degree by its place in the parent

project, it may be useful to outline the manner in which the entire project came into existence.

The Arizona State Museum Sonora-Sinaloa Project, as it was formally called, materialized as a result of the 1964–65 excavations at Snaketown. The results of this work suggested that Hohokam culture had not evolved from an indigenous Cochise base, but that the earliest bearers of Hohokam culture had immigrated into the Gila basin, presumably from somewhere in Mexico (Emil W. Haury: pers. comm.). The route for such a migration, logically, would have passed through some portion of northwest Mexico.

It was believed that the Sierra Madre per se and its eastern slope were well enough known through studies by Lister (1958) and the Amerind Foundation (DiPeso 1966) to preclude the possibility of an early Hohokam migration through either of these areas. Similarly, the arid coast of Sonora did not appear to be a suitable corridor for an agricultural people, and previous surveys in the Trincheras area had produced no evidence of Hohokam remains. The region that seemed most favorable as a corridor of slow migration was the eastern half of Sonora, characterized by north-south-trending river valleys situated between narrow chains of mountains. Not only did these river valleys provide a relatively direct route from the south, but they were also well suited to irrigation agriculture, a technique in use by the indigenous inhabitants when the Europeans first arrived. Moreover, very little was known of the archaeology of this part of Sonora.

By the fall of 1965, the late William W. Wasley, who had been assistant director at Snaketown, began designing a program of survey and excavation in eastern Sonora. Its purpose was to investigate the possibility of an early Hohokam migration and to identify, if possible, Hohokam antecedents.

My own interest in Sonoran archaeology stemmed from an informal survey of the Guaymas area undertaken in 1964 (Bowen 1965). Ample evidence of aboriginal occupation along that portion of coast was obtained, but there existed no distributional, temporal, or cultural framework to which the material remains could be related. There was a clear need for a more extensive reconnaissance at the very least. By the time I had formulated plans for further survey and limited excavation on the coast, with the intent of basing a doctoral dissertation on the results, Wasley had begun to seek personnel for his project. As funding for work on the coast was then uncertain, Wasley suggested I assist him in eastern Sonora and, in addition, generously offered to incorporate into his proposal a brief survey of the coast in order to provide me with dissertation material. The survey of the coast thus became appended to a broader project under Wasley's general direction.

Eventually, the project expanded in scope even further, ultimately to include a survey of the entire state of Sonora and selected portions of northern Sinaloa. Although investigation of possible Hohokam antecedents in Sonora was to remain the central concern, secondary objectives now included the definition of several local prehistoric cultures, among them the culture of the central coast.

THE SURVEY OF THE CENTRAL COAST

The location and recording of sites required about four full weeks of work by two people. It was carried out during several separate trips to the coast, mainly in November and December 1966.

The most fundamental problem faced by the survey was the limited time available for its completion, and it was largely this time restriction, in conjunction with difficult terrain and problems of access to certain portions of the coast, that dictated the manner in which the survey was conducted. The most accessible region is the narrow strip adjacent to the shoreline, and this is the area most susceptible to rapid survey. However, this constitutes only a small portion of the central coast. Behind this strip lie rugged mountains or extensive, largely featureless alluvial plains. Some mountainous areas are accessible, but their rugged topography makes surveying a slow procedure. On the plains, most of the existing roads are separated by miles of uninterrupted wasteland, and animal burrows and sandy arroyos limit the effective use of vehicles, including those equipped with four-wheel drive. On foot such terrain is slow and tedious and the lack of water makes it impractical to venture more than a day's round trip from the vehicle.

It was known from the experience of previous visitors that sites were abundant along the shoreline strip, but there was little information regarding sites in the mountains and on the interior alluvial plains. Since we recognized the desirability of drawing the site sample from physiographically distinct areas, attempts were made early in the survey to locate sites both in the plains and in mountainous areas in order to determine whether reasonable productivity could be expected by giving such terrain the same areal coverage as the shoreline strip. These tests did not produce a single site, and they amply demonstrated how little ground could be covered in a given time in the inland areas, as compared to the shoreline strip. Since we believed that it would not be possible to form even a general picture of central coast culture without recording a reasonably large number of sites, it seemed preferable to maximize the chances of obtaining a large, even if unrepresentative, sample, rather than to risk the possibility of a nominally representative sample consisting of very few sites. It was therefore decided to concentrate the survey in the easily accessi-

ble shoreline strip, where sites were known to exist. The few sites recorded in other parts of the central coast were found mainly through informants' leads and fortuitous encounters.

Surface artifacts were collected primarily for descriptive purposes rather than for quantitative analysis, and no attempt was made to sample site surfaces on the basis of probability. Except for pottery and flakes, most classes of artifacts, such as projectile points, scrapers, and figurines, were represented on site surfaces by few or no specimens. These items were actively sought, and a policy of total collection was applied. Mano-like stones were sometimes fairly common, but comparatively few displayed clear signs of use; all specimens with evidence of wear were collected or recorded in the field. Flakes, although numerous, were rarely retouched, and few were collected.

Pottery is the most abundant class of artifact, but by far the majority of sherds are of a single type, Tiburón Plain. This type of sherd was collected at all sites at which it occurred, although after we became familiar with it the collections were limited to small samples. Somewhat less than half the sites yielded other indigenous or intrusive types along with Tiburón Plain, but usually in small quantities. Rather than take a representative sample of the pottery at such sites, which often would have resulted in massive numbers of Tiburón Plain and few sherds of the other types, we intentionally biased the collections in favor of the other types in order to insure an adequate number of specimens for study. This, of course, meant that the collected frequencies bore no relationship to the relative type frequencies at the site from which such collections were taken. We therefore recorded the direction of collecting bias and estimated its intensity, and we attempted to estimate, by broad orders of magnitude, the quantity and approximate proportions of the different types actually present on the site surface. It was hoped that this estimate, although a poor substitute for hard figures, would make possible at least rough comparisons of pottery frequencies among the sites.

In view of the uncertainty that is frequently experienced in trying to locate and identify previously recorded sites, we left white plastic markers, the size and shape of credit cards, with embossed lettering identifying the project; on each card we added a strip of plastic tape impressed with the site number by means of a Dymo hand embosser. The cards were affixed with wire to a short iron stake and planted on each site. The precise location of the site tag was recorded on the site survey cards now on file in the Arizona State Museum. Some markers will undoubtedly be removed by insatiable curio hunters, but a few, at least, have reportedly remained intact.

THE MOSER COLLECTION

Many of the artifacts reported in this paper are part of the collection of Edward and Mary Beck Moser. During twenty years of residence in the Seri settlement of Desemboque, the Mosers have amassed a diverse collection of artifacts, both archaeological and recent Seri. Many of the specimens have been found by the Seri themselves. In the past, minor artifacts were usually ignored by the Seri while larger items, such as whole pottery vessels, were generally sold to passing tourists. In recent years these chance finds have been redirected to the Mosers, who have been preserving them and recording such provenience data as can be obtained. These materials are, in turn, being passed on to the Museo Regional de Sonora in Hermosillo.

It was a great privilege to be allowed to study and photograph the Moser collection and to report on it here. It includes several kinds of artifacts not encountered at all by the survey and several examples of artifacts represented in the survey collection by only one or two fragmentary specimens. Study of this material has helped clarify a number of aspects of central coast culture.

THE ETHNOGRAPHIC ASPECT

By virtue of the fact that the central coast has been occupied by the Seri since the first European contacts, it has sometimes been suggested that some or most of the archaeological remains might be Seri. Although this hypothesis is reasonable, very little solid evidence has been available to support it. Not only have the archaeological remains been imperfectly known, but the lack of reliable information on Seri material culture has precluded direct comparisons. In order to address the question of cultural continuity, it was clear that we would have to obtain additional data on Seri culture as well as data on the archaeological remains.

We were able to gather some relevant information in the course of the survey. A number of known Seri camps were visited and were recorded in the same manner as the remainder of the sites. Some of these were fully contemporary camps that had been occupied within the year; others were camps remembered by the Seri but no longer used. This information has made it possible to compare Seri camps directly with the other sites, in terms of both general site characteristics and specific contents.

More important, however, we were supplied with a large body of information on material culture and other

pertinent aspects of Seri culture by Edward and Mary Beck Moser, who gave us access to their unpublished data and checked innumerable specific details for us. This contribution has enabled many of the remains described here to be accompanied by notes on corresponding aspects of Seri culture, and in many cases by Seri interpretations of the archaeological materials. A great deal of traditional culture is remembered from personal experience by the older Seri, and some of their recollections have been quite useful in suggesting the function of certain items as well as in identifying certain of the remains as Seri. This information, in conjunction with several other lines of evidence, suggests that the archaeological culture of the central coast, at least since the introduction of pottery, is Seri.

2. ENVIRONMENT

AREAL EXTENT OF THE CENTRAL COAST

The area under consideration, designated here as the "central coast," consists of a narrow strip of the Sonoran coast and two of the major Gulf of California islands (Fig. 1). The mainland strip extends from slightly north of the Río San Ignacio, near El Desemboque de los Seris, southward to the vicinity of Punta San Antonio, near Bahía San Carlos, northwest of Guaymas. The two Gulf islands are Tiburón and San Esteban. As used here, the term "central coast" refers to a cultural rather than a natural area, and its extent is defined by the distribution of characteristic archaeological remains, the most diagnostic of which is Tiburón Plain pottery. However, the central coast is part of, and nearly coterminous with, the Central Gulf Coast of Sonora subdivision of the Sonoran desert as defined by Shreve (1964: Map 1, pp. 99–103).

On the northern frontier, between Desemboque and Puerto Libertad, the archaeological remains of the central coast give way abruptly to those of the Trincheras culture. The southern boundary is less well defined; in the Guaymas area (discussed in the Appendix), central coast remains appear to be mixed with those of a different but as yet undefined complex. The eastern limit of the central coast cannot be precisely specified, although a few sites belonging to central coast culture occur at least 20 km inland from the shoreline. The western boundary, formed by Isla San Esteban, is sharp: the next island west of San Esteban is San Lorenzo, which has apparently never been inhabited, and beyond is Baja California.

MAJOR LANDSCAPE FEATURES

Physiographically, the central coast is part of the basin and range province (Fig. 3). In the northern mainland portion of the central coast the landscape is dominated by the Sierra Seri, a rugged northwest-southeast-trending range paralleling the shoreline a few kilometers inland. Several smaller mountain masses, mostly of volcanic origin, dot the shoreline itself. The most northerly of these, and the most prominent, is Cerro Tepopa (or Tepoca), which lies to the west of the Sierra Seri and forms a cape of the same name. On its south side is a small conical hill known as Punta Sargento, formerly an island but now a tombolo connected to Cabo Tepopa by a long sandbar (Fig. 4). Similar low peaks to the south are Cerro Prieto and Cerro San Nicolas, adjacent to Bahía Kino, and Cerro Tastiota. At the southern end of the central coast is the Guaymas monadnock, a rugged mountainous area bordering the shoreline.

The narrow strip to the west of the Sierra Seri is primarily bajada, nearly reaching the shoreline over much of its extent. To the east, the Sierra Seri opens onto the Desierto Encinas, a broad alluvial plain extending far into the interior of Sonora. At the western edge of this plain, near the southern extremity of the Sierra Seri, lies the largest dry lake on the central coast. This feature, known as Playa Noriega (or San Bartolo), extends about 12 km in length and 4 km in width (Fig. 5).

South of the Desierto Encinas, between Bahía Kino and Estero Tastiota and extending far inland, is another great alluvial plain called the Llanos de San Juan Bautista. Much of the surface of this plain consists of fine-textured soil that turns to mud during the rainy season. Except for a narrow strip near the shoreline, most of this area is now under intensive cultivation.

The central coast has no streams with a perennial surface flow (McGee 1898: 25; Shreve 1964: 13). The main drainage system emptying into the Gulf is the Río Sonora, with its terminus at Bahía Kino. During the early nineteenth century this river is said to have ended in "a large lake about three or four leagues from the coast" (Hardy 1829: 96). In recent years it has carried surface water to the Gulf only rarely (Shreve 1964: 13). Another major drainage channel is the Río San Ignacio, about 2 km north of Desemboque. At best it carries water to the coast a few days per year (E. and M. Moser: pers. comm.).

The shoreline itself throughout the mainland part of the central coast consists principally of beaches lined with dunes. Sea cliffs occur locally in conjunction with the shoreline mountains and are extensive between Estero Tastiota and Guaymas. Several *esteros* (saline lagoons) are found on the mainland coast (Fig. 6). The largest are Estero Tastiota, Laguna de la Cruz at Bahía Kino, and those on Punta Santa Rosa and on the south side of Cabo Tepopa. They support dense mangrove

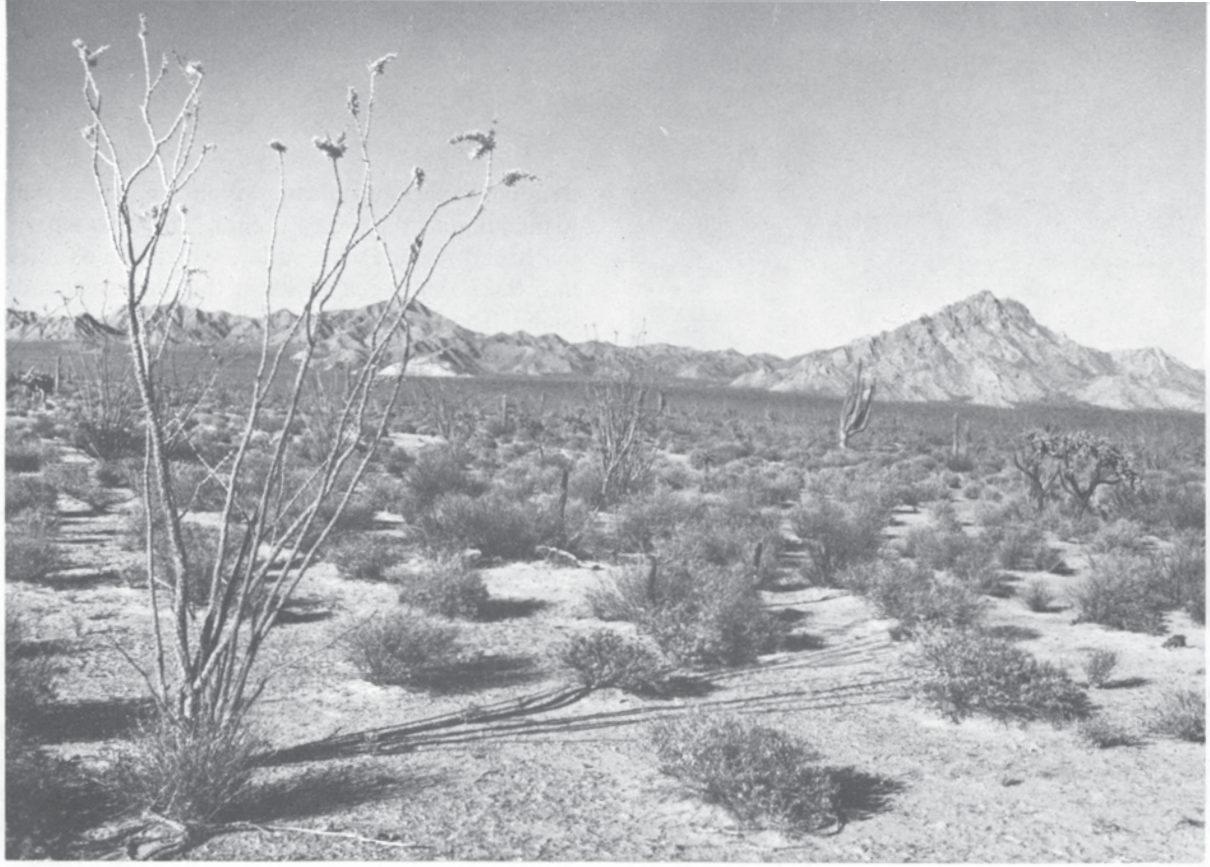

Fig. 3 Characteristic landscape of the northern part of the central coast.

Fig. 4 Punta Sargento (right center) from the air looking southeast, with Cabo Tepopa at left and the Sierra Seri in the distance.

Fig. 5 Playa Noriega (or San Bartolo) from the air, looking north.

thickets and, according to the Seri, abundant food resources (E. and M. Moser: pers. comm.).

The closest point on the mainland to Isla Tiburón is Punta Santa Rosa, termed Punta Miguel by McGee (1898: Pl. 1). It is separated from Punta Tormenta on the island by El Infiernillo strait, which is less than 2 km wide at this point. As Kroeber points out (1931: 52–3) in regard to possible Seri origins, Islas Tiburón and San Esteban, along with Isla San Lorenzo, form insular "stepping stones" across the narrowest portion of the Gulf to the peninsula of Baja California. None of these points of land are separated by more than about 20 km of open water.

Isla Tiburón, the largest island in the Gulf, is about 50 km long and a maximum of about 30 km wide. Topographically, it is dominated by two north-south-trending ranges of volcanic origin known as the Sierra Kunkaak and the Sierra Menor. They are separated by the broad Agua Dulce valley, which drains northward into the Bahía Agua Dulce at the northwest end of the island. The Seri camp of Tecomate is located on this bay near a permanent spring known as Pozo Hardy. This is also the location of one of the largest of the few known stratified archaeological sites on the central coast.

Isla San Esteban, about 7 km long and 6 km wide, is largely mountainous except for its central valley, which drains toward the southeast coast. Much of the shoreline consists of rocky cliffs (Fig. 7).

CLIMATE AND WATER RESOURCES

The aridity and summer heat that characterize the climate of the central coast have, directly or indirectly, greatly affected the potential for human occupation of this region, in both prehistoric and post-Spanish times. The seasonal temperature pattern is one of excessive summer heat and moderate winters, with slightly greater seasonal variation in the north (Table 1). Maximum daytime temperatures in July and August regularly exceed 100° F. (37.8° C.) and sometimes climb well above 110° F. (43.3° C.). Near-freezing nocturnal temperatures, often accompanied by heavy dew, occasionally occur in December and January, although the temperature rarely drops below the freezing point (E. and M. Moser: pers. comm.).

The precipitation pattern throughout the central coast is characterized by seasonality, low mean annual rainfall, and marked fluctuation in both seasonal and total annual rainfall from year to year (Table 2). The seasonal variation is more pronounced and the mean annual precipitation is greater in the southern portion of

Fig. 6 The *estero* system on Cabo Tepopa, looking east. The Sierra Seri and the coastal bajada are visible in the distance.

Fig. 7 Isla San Esteban from the air, looking northeast. Isla Tiburón appears in the distance.

the central coast than in the north because the south generally receives much more rain during the summer months. However, during some years Guaymas may receive less rain than Desemboque (Hastings and Humphrey 1969: 11, 15). The most predictable and significant aspect of the annual cycle is the spring dry season. Over the entire region April and May are normally dry months, and in some years this drought is prolonged. Guaymas has occasionally experienced five consecutive months, from January through May, without measurable precipitation, and in 1965 Desemboque received no rain during the six-month period from January through June (Shreve 1944: Table 2; Hastings and Humphrey 1969: 11).

TABLE 1

Mean July and January Temperatures at Three Central Coast Stations

	El Desemboque			El Benjamin*			Guaymas		
	Period	*°C.*	*°F.*	*Period*	*°C.*	*°F.*	*Period*	*°C.*	*°F.*
July	1963–66	29.9	85.9	1963–67	31.8	89.2	1963–67	31.1	88.0
January	1964–67	12.0	53.6	1964–67	13.3	55.9	1963–67	18.0	64.4

*On the Llanos de San Juan Bautista, several kilometers from the shoreline.
Source: Hastings and Humphrey (1969)

TABLE 2

Precipitation at Three Central Coast Stations, 1963-1967

	El Desemboque		El Benjamin		Guaymas	
	mm	*inches*	*mm*	*inches*	*mm*	*inches*
Mean seasonal precipitation						
December–February	44.3	1.74	24.2	0.95	38.5	1.51
March–May	6.0	0.02	1.7	0.06	6.0	0.02
June–August	35.1	1.38	89.8	3.53	115.0	4.52
September–November	25.7	1.01	76.9	3.02	73.1	2.87
*Mean annual precipitation**	105.5	4.15	203.0	7.99	235.2	9.25
Range of annual precipitation	—	—	126.5–304.0	4.98–11.96	78.6–262.1	3.09–10.31

*Because some monthly data are missing, mean annual figures do not equal the sums of the mean seasonal figures.
Source: Hastings and Humphrey (1969)

Fig. 8 A violent storm *(chubasco)* heading westward over the Sierra Seri.

Summer rainfall comes chiefly in July, August, and September, and is usually associated with convectional thunderstorms. These are typically local and of brief duration, but are often violent. Although some precipitate very little rain, a single storm may deliver a significant percentage of the total annual rainfall to a given area. The most spectacular of these storms, known in the Gulf region as *chubascos* (Fig. 8), are not uncommon, and they are viewed with great concern by Mexican and Seri fishermen who navigate in small open boats. One experience of a *chubasco* in a small boat is sufficient to confirm local residents' reports of the sudden ferocity of these storms.

The biological utility of precipitation on the central coast depends in part on the total amount of rainfall, but it is determined by other factors as well. The seasonality of the rainfall pattern is particularly important in that much or most precipitation occurs when air and ground surface temperatures are at their maximum, and the result is an excessive evaporation rate. Frequently, rain precipitated in smaller summer storms evaporates before it reaches the ground, and much of the moisture that does reach the ground quickly disappears. Flash floods are common in established drainage channels during intensive downpours, and the sparse ground cover encourages sheet erosion and arroyo cutting on sloping terrain. Because of the high evaporation rate and pervious soils, water in drainage channels rarely flows more than a short distance even after a major storm, and any remaining surface water usually disappears within a few hours. During most of the year drainages remain dry, and standing water is extremely scarce (Shreve 1964: 23). In contrast, the lesser amount of precipitation occurring during the winter rainy season may be proportionately much more useful. It is normally deposited at a slower rate than during summer storms, and the lower air and ground temperatures prevent wholesale evaporation.

For both human and animal consumption, water on the central coast may be obtained from three natural sources. These are playas, *tinajas,* and springs. Artificial wells constitute a further resource for human use.

Dry lakes or playas are found in several parts of the central coast, but they are by no means distributed evenly throughout. The largest is Playa Noriega, in the Desierto Encinas some 20 km from the Gulf. Four or five smaller playas are situated just east of Cabo Tepopa. Playas accumulate water mainly during the summer when rains may be sufficiently intense to provide some water by runoff as well as by direct precipitation. The larger playas have been very significant sources of water for both human and animal life. Despite the tremendous evaporation rate of the coast, water sometimes remains in the Cabo Tepopa playas for several weeks after a heavy rain. The older Seri say that years ago, when there was more rainfall than there is now, Playa Noriega sometimes would retain water for several months. The importance of this lake both to

animal and human populations is borne out by the archaeological remains around its shore and by the fact that the region was a favorite hunting area of the Seri (E. and M. Moser: pers. comm.).

For the Seri, springs and *tinajas* have been the most important sources of water. The latter are natural bedrock depressions that serve as catch-basins for runoff or seeps. They are found sporadically over much of the mainland coast and on Isla Tiburón. Some *tinajas* receive enough water and are in sufficiently protected locations to be perennial, but the majority hold water only for short periods. Springs also occur in scattered locations throughout the central coast. A few of those known to the Seri provide a permanent water supply, but most are intermittent.

It is also possible to obtain water by excavating in the sandy bottoms of arroyos. Both the Seri and the Mexicans have tapped ground water in this manner, and in some localities the Seri have obtained water by excavating behind shoreline dunes (McGee 1898: 29; E. and M. Moser: pers. comm.). The water from these sources is potable but often saline. Sometimes such wells will supply water for two or three months after a heavy rain, but they usually will not yield water during April and May, the height of the dry season.

The scarcity of water has undoubtedly been a limiting factor for central coast culture. Water resources were utterly inadequate for the development of agriculture, given the indigenous technology, and probably in most areas they were insufficient to support a localized sedentary population of any appreciable size. Although the cyclical nature of the food supply has been the main determinant in the seasonal nomadism of the Seri, the availability of water has also been a consideration in their movements, especially during the dry season (E. and M. Moser: pers. comm.).

The lack of adequate water resources has also greatly affected the character of historic contact between the Seri and Europeans. In light of their own technology, the Spaniards viewed the central coast as unsuited to agriculture; consequently there was no motivation to settle in the area. Even missionary work, as the Europeans conceived it, could not be effectively pursued unless the missions could be made self-supporting. Since the Spaniards saw little prospect of making the central coast agriculturally productive, they attempted to relocate the Seri at such sites as Nuestra Señora del Pópulo on the Río San Miguel and Pitic (Hermosillo) on the Río Sonora rather than bring the missions to them. However, the Seri did not adapt well to mission life and most were eventually able to escape to the coast and their old way of life. In combination, the lack of incentive for Spanish settlement, the failure of the mission program, and the eventual hostilities with the Spaniards and later with the Mexicans were sufficient to isolate the central coast and preserve Seri culture during most of the eighteenth and nineteenth centuries.

It was not until the middle and latter part of the nineteenth century that outsiders were able to make the slim resources of Seri country profitable. The earliest encroachment took the form of ranching enterprises that pushed gradually westward into Seri territory. Had hostilities ceased at an earlier date, these ventures would undoubtedly have begun sooner, although their success hinged largely on a technology adequate to construct deep wells capable of providing livestock and men with a permanent and dependable water supply. In recent decades the use of pumps to tap ground water for irrigation has been responsible for the extensive farming operations in the Llanos de San Juan Bautista. However, parts of the coast did not become fully accessible to outsiders until the development of roads made it possible for water to be hauled in by truck.

Thus the scarcity of water has played a major role in delaying the encroachment of Europeans on Seri territory, and this in turn has enabled the Seri to maintain much of their traditional way of life until well into the twentieth century. They have effectively dealt with the limited water supply through mobility and an intimate knowledge of the available resources. Even at present the Seri recall the locations of a great many seeps and tanks on the mainland and the islands, although most of these supply water only seasonally and in limited quantities (E. and M. Moser: pers. comm.). It is worth noting that in 1895 the *vaqueros* of San Francisco de Costa Rica ranch, northeast of Bahía Kino, knew of only three permanent and three ephemeral sources of water in the entire area (McGee 1898: 30).

FLORA AND FAUNA

As noted earlier, the central coast corresponds closely with Shreve's Central Gulf Coast of Sonora subdivision of the Sonoran desert (1964: 99–103). Major works on the vegetation and flora of this region are I. Johnston (1924), Shreve and Wiggins (1964), Felger (1966), and Hastings, Turner, and Warren (1972). A great many plants have been crucial to the Seri as resources for food and materials. A comprehensive ethnobotanical study of the Seri is in progress (Felger and Moser: in preparation), and several papers based on this work have already appeared (Felger and Moser 1970; 1971; 1973; 1974a; 1974b).

The vegetation of the interior landscape (see Fig. 3) behind the immediate shoreline is dominated by the columnar cacti, sahuaro *(Carnegiea gigantea),* cardón or sahueso *(Pachycereus pringlei),* organ-pipe or pitahaya

dulce *(Lemaireocereus thurberi),* and senita *(Lophocereus schottii).* Other succulents occurring widely are the cholla (*Opuntia* spp.) and barrel cacti (*Ferocactus* spp.). Mesquite *(Prosopis glandulosa* var. *torreyana),* ironwood or palo fierro *(Olneya tesota),* blue palo verde *(Cercidium floridum),* and catclaw *(Acacia greggii)* are characteristically found along the major drainageways. Other trees or large shrubs typical of this region are foothill palo verde *(Cercidium microphyllum),* palo blanco *(Acacia willardiana),* torote or elephanttree *(Bursera microphylla),* and ocotillo *(Fouquieria splendens).* Several shrubs with thickened semisucculent stems are collectively known as torote (for example, *Bursera* spp. and *Jatropha* spp.). One of the most common of these, *J. cuneata,* is used by the Seri to make baskets (B. Johnson 1959: 10; E. Moser 1973).

The immediate coastal strip is an area of sparse coverage and relatively few species. The most conspicuous species is *Frankenia palmeri;* others include *Lycium californicum, Suaeda ramosissima,* and stunted *Jatropha cuneata* (Shreve 1964: 100–1).

Three species of mangrove occur in the *esteros: Avecinnia germinans, Laguncularia racemosa,* and *Rhizophora mangle.* During historic times these dense thickets are said to have served as virtually impenetrable refuges for Seri groups pursued by European forces (Bahre 1967: 30; E. Moser: pers. comm.). A plant of exceptional interest is eelgrass *(Zostera marina* L.*),* a marine seed plant that thrives in the waters of the Infiernillo. The seeds, harvested by the Seri, served as a very important food resource (Felger and Moser 1973).

The mammalian fauna of the central coast consists principally of species that occur widely in northwestern Sonora, Baja California, and northward into California and Arizona (Burt 1938: 12). Those important to the Seri have been the mule deer or *buro (Odocoileus hemionus),* desert bighorn *(Ovis canadensis),* peccary or javelina *(Pecari angulatus),* the black-tailed jackrabbit *(Lepus californicus),* and the desert cottontail *(Sylvilagus audubonii),* all of which were hunted and eaten (Malkin 1962: 9). Other prominent terrestrial mammals are coyote *(Canis latrans),* gray fox *(Urocyon cinereoargenteus),* kit fox *(Vulpes macrotis),* badger *(Taxidea taxus),* raccoon *(Procyon lotor),* a variety of rodents including the kangaroo rat *(Dipodomys merriami),* and occasionally mountain lion *(Felis concolor).* Sea mammals include porpoises, whales, and the California sea lion *(Zalophus californianus).* E. Moser reports that the latter was eaten by the Seri of Isla San Esteban (pers. comm.).

The herpetofauna of the central coast is rich and varied (Van Denburgh 1922; Bogert and Oliver 1945; Smith and Taylor 1945, 1950). According to Malkin (1962: 22–3), both lizards and snakes were eaten by the Seri. Of particular importance is the large chuckwalla endemic to Isla San Esteban, *Sauromalus varius,* which served as an important food resource for the San Esteban Seri and which continues to be eaten (E. and M. Moser: pers. comm.).

Bird life is also abundant and varied, and includes both land and sea birds. According to van Rossem (1945: 23–4), the avifauna of the mainland coastal strip and Isla Tiburón belong to the Sinaloan avian province, while those of the Isla San Esteban are affiliated with the San Lucan province of Baja California. Several species were reportedly eaten by the Seri (McGee 1898: 190; Malkin 1962: 17–8). One of the more significant birds to the Seri was the pelican; it was consumed as food and the skins were sewn into kilts and robes (McGee 1898: Pl. 23; Coolidge and Coolidge 1939: 89–90; Quinn and Quinn 1965: 213–8).

The Gulf of California adds a very important dimension to the flora and fauna of the central coast. In addition to sea mammals and birds, the Gulf supports a diversity of fishes and sharks, and some species occur in abundance. Also present are large populations of clam, oyster, mussel, cockle, and other mollusks along with such crustaceans as crab, lobster, and shrimp. Many of these organisms inhabit the intertidal zones where they are easily accessible to man. Until recently, all five genera of sea turtle were abundant in the Gulf. The most important to the Seri has been the green sea turtle *(Chelonia mydas).* During warm weather these animals were often found in the shallow waters of the Infiernillo near stands of eelgrass, on which they feed (Felger, Moser, and Regal: in preparation).

The proximity of the Gulf sets the central coast apart from most North American desert environments, and its resources have been of great importance to the aboriginal inhabitants of this area. Long exploitation of the littoral is evident from the accumulations of shells on archaeological sites. The maritime orientation of the Seri has been noted since the early days of European contact, and a strong reliance on sea products has continued well into the twentieth century. Evidently, however, the resources of the Gulf were considerably more important to some Seri groups than to others. According to traditional accounts, the band living on Isla San Esteban were the most proficient fishermen and were heavily dependent on sea foods (E. Moser 1963: 24). Considering the limited terrestrial resources of their small island, this is not surprising.

An additional subsistence resource that assumed respectable proportions during the eighteenth and nineteenth centuries was livestock. Horses, cattle, and burros were looked upon by the Seri as food, and the

raiding of European settlements for livestock became a highly successful way of life for some of the bands (E. Moser 1963: 22–5). While not native to the New World, these animals were obviously viewed by several generations of Seri as part of the "natural" environment, and their introduction precipitated a major economic and demographic reorientation among certain groups.

It also appears that the contact period Seri may have supplemented their diet to a limited extent with agricultural products obtained through trade. Although information on this is sketchy, the seventeenth-century chronicler Pérez de Ribas reports that the Seri were said to barter salt and deerskins with inland farming peoples for maize (Griffen 1961: 13).

In summary, the central coast people have had a wider range of food resources available to them than the inhabitants of most other desert regions, principally because of the presence of the Gulf. The food supply was apparently sufficiently varied and abundant to permit some latitude in the subsistence patterns of the historic bands. Although the Seri experienced some exceedingly lean years during the late nineteenth and early twentieth centuries, this condition was not so much an indication of a marginal food supply as a reflection of the cultural disruption created by continual warfare, epidemic diseases, a nearly disastrous population decline, and other effects of culture contact. The more critical commodity under aboriginal conditions was probably water rather than food.

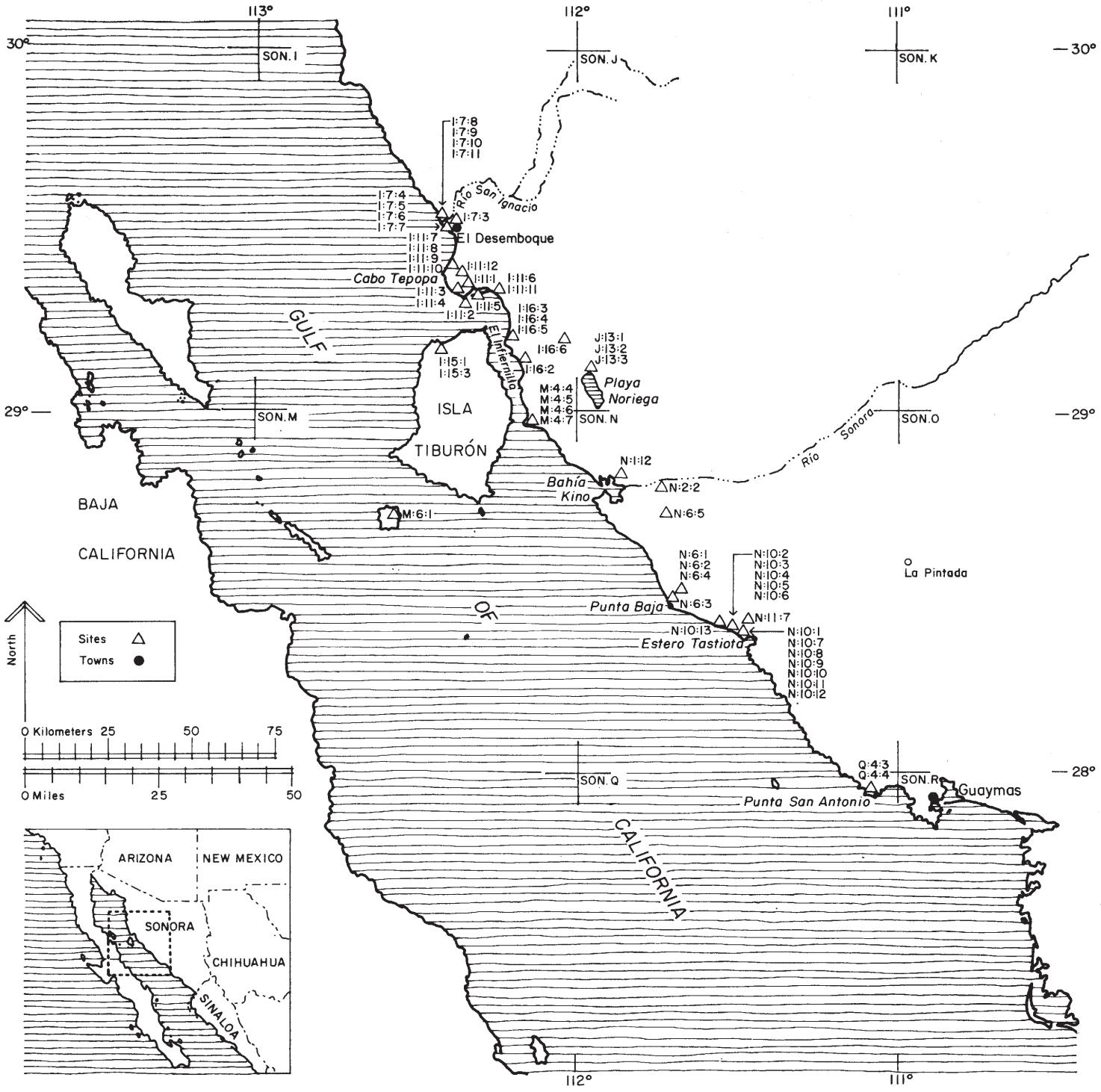

Fig. 9 Central coast sites recorded by the survey.

3. SITES

INTRODUCTION

Fifty-nine sites were recorded on the central coast by the survey (Fig. 9) and given designations in accordance with the Arizona State Museum quadrangle system (Wasley 1964).

Most of the sites are fundamentally very similar, and few warrant a detailed description. Surface indications usually consist of shells along with a basic assemblage made up of unmodified stones, oval or irregular beach cobbles (some bearing evidence of grinding), broken rocks, flakes, and pottery. Occurring less regularly are other classes of artifacts and several kinds of features. Since the basic assemblage is essentially the same as that found at older Seri camps, it is assumed that the archaeological sites, with few exceptions, were also camps.

The great majority of the sites are situated on geologically recent beach dunes or on older secondary dunes within a few hundred meters of the shoreline. For the most part these sites are best characterized as dune sites rather than shell mounds, although they have often been referred to by the latter term. Dense middens of shell and cultural refuse do occur locally, most notably in the Bahía Kino area. The mounded appearance of most sites, however, is due to the fact that they are situated on dunes. Cultural deposits are frequently shallow and sparse compared to the volume of sand with which they are mixed.

Inland from the shoreline strip, dunes or sand hills can be found bordering some playas. The three sites recorded on the edge of Playa Noriega are all on such terrain. The assemblage at the few interior sites recorded is similar to that at sites near the shoreline, although shell is much more scarce.

Two important sites, however, are neither dune sites nor camps. One, Son M:6:1 on Isla San Esteban, is a rock shelter and is probably associated with the Seri vision quest. The other is Son I:15:3, a site area on Isla Tiburón that includes groups of rock outline figures and two quarry-workshop areas.

The Seri, many of whose camps are on dunes, give several reasons for preferring such locations. In the first place, sand is soft and hence more comfortable for sitting and sleeping than is rocky terrain or dried mud. Often the floors of Seri brush houses are covered with a layer of clean beach sand. Low areas are avoided since they tend to be muddy and collect standing water during the rainy season. Dunes are also preferred because they are not usually frequented by snakes. An advantage of dune locations in times past was that their elevation above the surrounding terrain enabled the occupants to keep a better lookout (E. and M. Moser: pers. comm.).

The location of camps near the shoreline is a matter of obvious convenience for a people who exploit both littoral and maritime food resources. Although faunal remains were not specifically sought or studied by the survey, those observed suggest a heavy reliance on sea products. Mollusk shells were by far the most abundant remains, occurring at nearly every site and sometimes in enormous quantities. The next most common animal remains seen were turtle bones, which were noted at eight sites and occurred in some quantity at a few of these. Parts of crabs were found at seven sites, fish bones at four, and pelican bones at one site, Son I:16:3. Remains of terrestrial animals were seen at only six sites. Five of these yielded deer bones, while the sixth, Son I:16:6, produced the burned bones of a cow. A much more detailed study of faunal remains has been undertaken by Hills (1973), who sampled the contents of several central coast sites.

The regular occurrence of shells at inland sites throughout the central coast and the presence of crab remains at Son J:13:1 and J:13:2, about 20 km from the shoreline, indicate that food products were sometimes transported over considerable distances. However, many traditional Seri camps are well known for their convenience to seasonally abundant food resources, and it is likely that the location of many archaeological sites occupied in the more distant past was also influenced by the seasonal cycle.

Another resource affecting site location is water. A few sites, such as Son I:15:1 and Son I:16:6, are adjacent to permanent water sources, and some, such as the Playa Noriega sites, would have been close to seasonal supplies. Other sites are a considerable distance from the nearest surface water, although at certain localities, ground water could have been obtained seasonally from shallow excavations.

Curiously, McGee states (1898: 181–2) that the Seri never camp next to water. Although this is demonstra-

bly false, they evidently considered it no hardship to travel several kilometers on a daily basis to obtain it. For the Seri, it appears that water has played a secondary role in determining the *specific* locations of camps, but it should be noted that it was necessary to abandon camps in certain parts of the central coast during the dry season for lack of accessible water (E. and M. Moser: pers. comm.).

If the Seri were willing to travel long distances for water, it is doubtful that the distribution of raw materials would have exerted much influence on the location of habitation sites. Many commonly utilized materials, such as rock suitable for chipping, were readily available throughout much of the coast. In the recent past, materials of limited distribution, such as *carrizo* for *balsas,* have been the object of special trips undertaken by the Seri when needed.

SITE DESCRIPTIONS

Many of the recorded sites are clustered in specific localities, reflecting for the most part the portions of the coast most intensively surveyed. These groupings (Table 3) serve as a convenient framework for the site descriptions, but it should be understood that they bear no further significance.

Except as noted, the sites are camps situated on dunes and conform to the general pattern outlined above. For some, there is little significant information to add. The following comments are therefore brief and are confined to the more noteworthy characteristics.

Desemboque

Fourteen sites were recorded in the vicinity of Desemboque. Nine of these are north of the settlement itself, including several near the mouth of the Río San Ignacio. The remainder lie to the south between Desemboque and Cabo Tepopa. All are situated within a few hundred meters of the shoreline, except Son I:11:12, which borders one of the Cabo Tepopa playas. Son I:7:10 is the largest of the group, extending about 1200 m in length and 50 m in width. The smallest are Son I:11:8, I:11:9, and I:11:10, none of which exceeds about 20 m in diameter. Son I:7:3, I:11:7, I:11:8, I:11:9, and I:11:10 are situated on secondary dunes; the remainder are located on beach dunes.

Son I:7:3 (Fig. 10). This site is believed by the Seri to be one of their old camps, but it has not been used for so long that its name is no longer remembered (E. and M. Moser: pers. comm.).

Son I:7:4. A number of grinding implements were found at this site, but other artifacts were scarce. Traces of a Seri brush house were seen. Prior to the survey, four burials had been excavated from this site.

Son I:7:6. This small site produced little more than unmodified stones and flakes. The virtual absence of pottery at such a small site is probably an indication that no vessels were broken here, rather than an indication of specialized function or preceramic age.

Son I:7:7. This site includes a small rock cairn that may mark a fairly recent Seri grave. It probably postdates the main occupation.

TABLE 3

Central Coast Sites Recorded by the Survey, Grouped Geographically (North to South)

Desemboque	Infiernillo	Playa Noriega	Bahía Kino to Punta Baja	Estero Tastiota	Punta San Antonio	Islands
Son I:7:3	Son I:11:1	Son J:13:1	Son N:1:12	Son N:10:1	Son Q:4:3	Son I:15:1
I:7:4	I:11:2	J:13:2	N:2:2	N:10:2	Q:4:4	I:15:3
I:7:5	I:11:3	J:13:3	N:6:1	N:10:3		M:6:1
I:7:6	I:11:4		N:6:2	N:10:4		
I:7:7	I:11:5		N:6:3	N:10:5		
I:7:8	I:11:6		N:6:4	N:10:6		
I:7:9	I:11:11		N:6:5	N:10:7		
I:7:10	I:16:2			N:10:8		
I:7:11	I:16:3			N:10:9		
I:11:7	I:16:4			N:10:10		
I:11:8	I:16:5			N:10:11		
I:11:9	I:16:6			N:10:12		
I:11:10	M:4:4			N:10:13		
I:11:12	M:4:5			N:11:7		
	M:4:6					
	M:4:7					

Fig. 10 A portion of Son I:7:3. Cultural material lies on the dune crest, where the person is standing, and on both slopes.

Son I:7:8. This site is located at the mouth of the Río San Ignacio on a beach dune. The Seri consider it to be one of their oldest camps; it is known as *?aat ?àX* (E. and M. Moser: pers. comm.).

Son I:7:10 (Fig. 11). This is the largest site in the Desemboque group. It extends more than 1 km along the crest of a continuous dune and averages 50 m in width. Features include the frames of three Seri brush houses (Fig. 12), a circle of stones, and a circle of shells.

Son I:7:11. This small site lacks pottery, but stone, including waste flakes, occurs in slightly denser concentration than at most sites. It is likely that this was a briefly occupied workshop associated with Son I:7:10, a habitation area only a short distance away. The site contains no more lithic debris than could be produced by several men in a few hours' time.

Son I:11:7 (Fig. 13), *I:11:8, I:11:9, and I:11:10.* These are all small sites, the latter three being less than 20 m in diameter. All four contain moderate quantities of shell and all yielded some lithic material, but pottery was found only at Son I:11:8. Probably no vessels happened to be broken at the other three sites.

Son I:11:12. This site covers an area of about 800 m by 250 m. It consists of small sporadic pockets of trash

Fig. 11 Son I:7:10 extends along the dune in the background for about 1 km, from beyond the photo at left nearly to the end of the dune system at the extreme right.

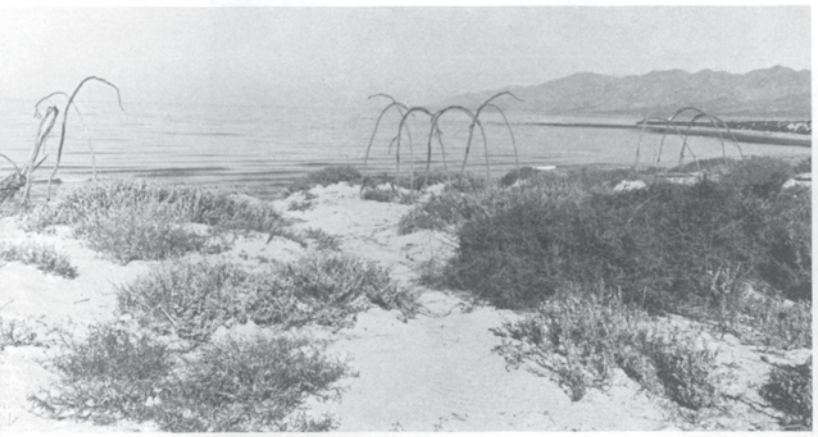

Fig. 12 Remains of Seri quonset-style houses, Son I:7:10.

on the dunes that line the shore of one of the Cabo Tepopa playas. The abundance of animal bones seen here, some of which are charred, suggests that this may have been a hunting camp.

Infiernillo

All but one of these sites are situated near the beach along the Infiernillo strait, between Campo Dólar, on the south side of Cabo Tepopa, and Punta Santa Rosa, at the narrowest part of the strait. The exception, Son I:16:6, is located several kilometers inland. Most are dune sites; however, there is considerable variation in specific setting.

Son I:11:2. This site is located on Punta Sargento. It is one of the more complex sites on the central coast, involving diverse remains and possibly some time depth. Much of the site is a dense shell midden, which in some places reaches a depth of about 1 m (Fig. 14). Nearby are ramps that were excavated for landing fishing boats, small stone enclosures, and a hearth. Artifacts range from Tiburón Plain pottery to glass and paper wrappers. Xavier (1946: 16) notes that this site was a shark-fishing camp in the 1940s. The paper indicates that the camp is still occasionally occupied.

Son I:11:4 (Fig. 15). There are two separate concentrations of cultural material at this site, one on each end of a small dune. The east end contains only Tiburón Plain pottery, while the west end contains Historic Seri pottery in addition to Tiburón Plain. The site borders an *estero* on the south side of Cabo Tepopa. It is isolated and well protected, and somewhat difficult of access, since water surrounds it on one side while dense mangroves block all approaches by land. It is possible to reach it during low tide by wading across the *estero,* but during high tide only by swimming or with a boat.

Son I:11:5. This site is the most extensive of the Infiernillo group. It consists of two spatially distinct con-

Fig. 13 Son I:11:7 is situated on the crest of the low secondary dune at left. More recent shoreline dunes are visible at the right center. The mountains in the background are part of the Cerro Tepopa massif.

Fig. 14 Shell midden at Son I:11:2.

centrations of material sufficiently important to warrant separate designations, I:11:5A and I:11:5B.

Son I:11:5A, about 5 km in length, covers most of a long sandbar on the south side of Cabo Tepopa as well as a portion of the mainland from which this peninsula projects. The sandbar is accessible by land only from the east, where it joins the mainland. On the south it faces the sea, and on the north it is protected by an *estero* and a dense mangrove thicket. Two separate components at Son I:11:5A are indicated by the pottery, which consists of a very large quantity of plain and decorated Trincheras sherds, along with an unusual abundance of the indigenous Tiburón Plain.

Son I:11:5B, also on the sandbar, covers an area of about 100 m by 50 m. It lies just west of Son I:11:5A, and its western boundary coincides with the limits of vegetation on the sandbar, although the bar itself continues a short distance farther. Trincheras pottery does not occur at Son I:11:5B. Although there is some Tiburón Plain, the predominant pottery is Historic Seri.

According to the Seri, two of their old camps were located on this sandbar. One of them, known as *xoxtís,* corresponds with the position of Son I:11:5B (E. and M. Moser: pers. comm.).

Son I:11:6. This small site covers two portions of a horseshoe-shaped dune. It is noteworthy because of what appears to be an excavation for water in a stand of *Lycium* between the two portions of the site. This is the only example of a beach well that was encountered during the survey, if indeed this is a correct identification.

Son I:11:11. The surface of this small site consists of a comparatively dense accumulation of trash. A single shovel hole produced sporadic cultural material to a depth of 2 m.

Son I:16:2. This is a site with two chronologically distinct components. The earlier component consists of two adjacent dunes, separated by about 40 m, each of which contains Tiburón Plain pottery. A few meters to the north is the modern Seri camp known as *?ónna*

Fig. 15 A portion of Son I:11:4 on the dune at left, which borders an *estero,* right.

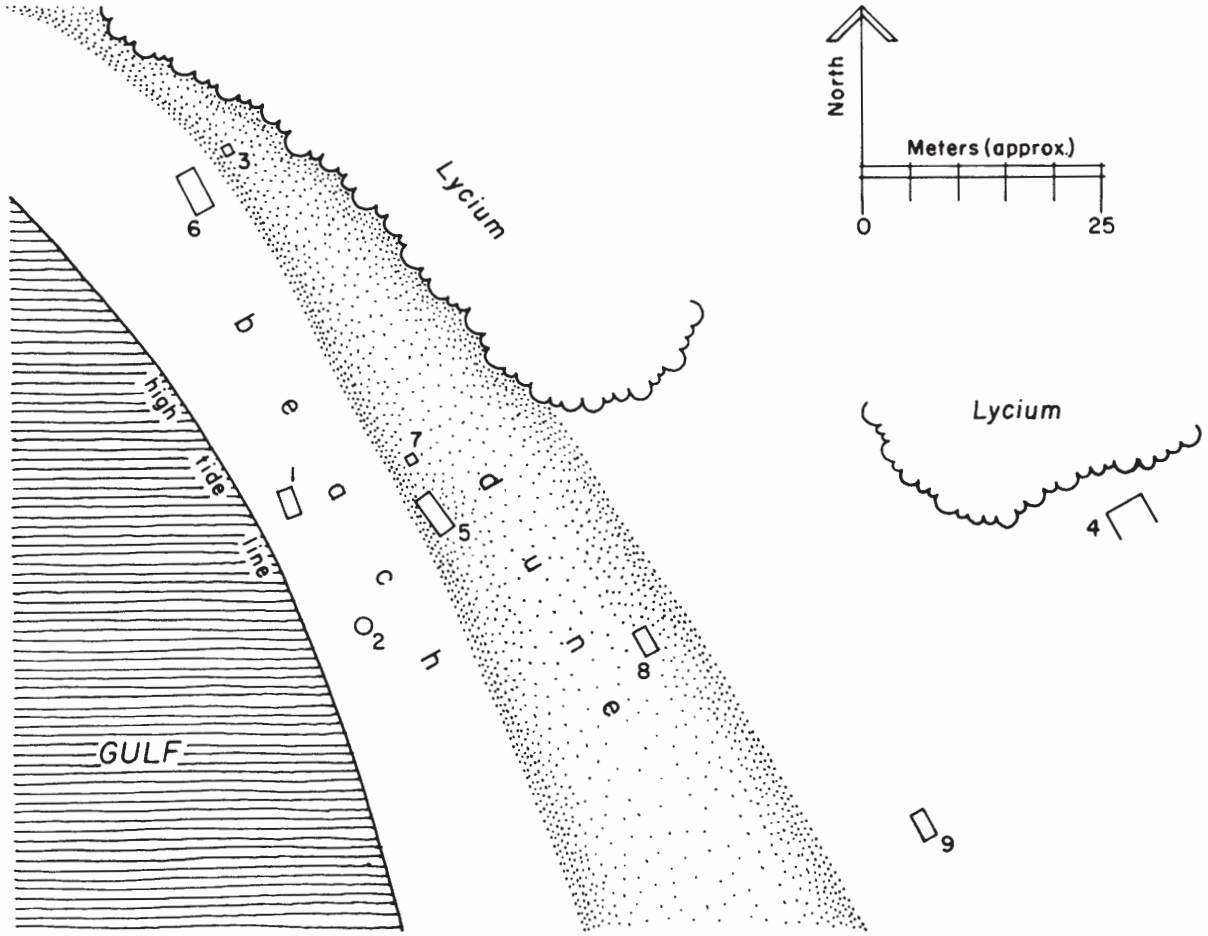

Fig. 16 Sketch map of the modern component of Son I:16:2, Campo Ona. Numbered features are ocotillo house frames (see Table 5 and Fig. 43). (Redrawn from sketches by Stephen D. Hayden.)

(Campo Ona), with ocotillo house frames still standing (Fig. 16). The trash of the two components overlaps.

It is worth noting that the Seri often camp on a site that has previously been occupied unless it is known to contain burials, in which case they camp elsewhere, although often very close by.

Son I:16:3 (Fig. 17). This modern Seri camp with house frames still standing is called *Xáan* by the Seri, and Campo Almond by the Mexicans.

Son I:16:4 and I:16:5 (Fig. 18). These two sites lie on dunes that form the banks of an extinct *estero.* Son I:16:5 is on the west side of the *estero,* on both a low older secondary dune that formed the original bank and a newer beach dune that now partly covers it. Both dunes contain the same cultural material, although there is less trash on the newer dune. Both Tiburón Plain and Trincheras pottery are represented in some quantity.

The east bank of the *estero* is defined by a long high secondary dune, designated Son I:16:4. It produced a large number of Tiburón Plain sherds, along with smaller quantities of both Trincheras and Historic Seri pottery.

Son I:16:6. This site is known today as Pozo Posado but was referred to by McGee (1898: 41) as Tinaja Trinchera because of the three dry-laid rock walls at the site. It is located in the Sierra Seri on the east side of Pico Johnson, along a well-defined trail that leads over the mountains to the coast. At present, the *tinaja* provides the only water, but in the past water also issued from a spring. The tank had apparently filled with about 1.5 m of refuse at some time in the past, and has since been excavated by treasure seekers. The trash, which includes shell, Tiburón Plain and Historic Seri pottery, and a large quantity of animal bone, some of it burned, suggests that this site served as a camp as well as a water source.

The Seri consider Pozo Posado to be one of their old camps and refer to it as *?ekot ?áX* 'desert water'. According to tradition, it was later taken over by the Papago, and this action resulted in a major battle

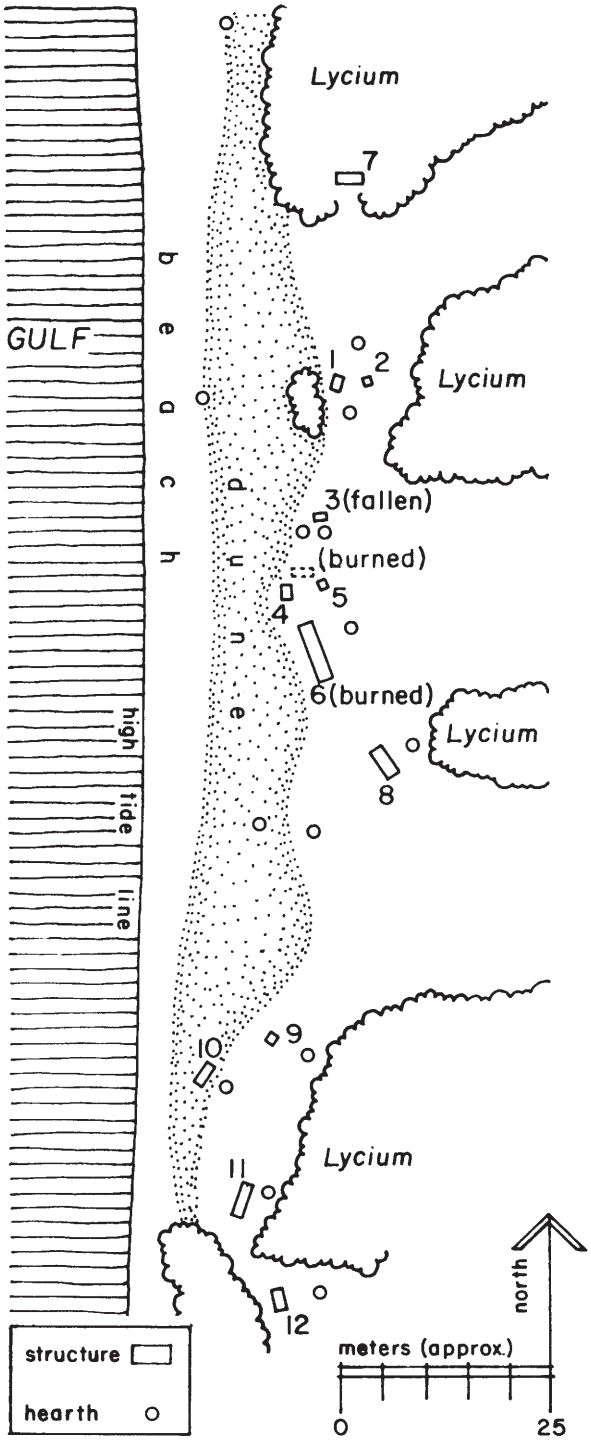

Fig. 17 Sketch map of Son I:16:3, Campo Almond. Numbered structures are identified in Table 5; a hearth and several structures are pictured in Figs. 37, 40–42, 44. (Redrawn from sketches by Stephen D. Hayden.)

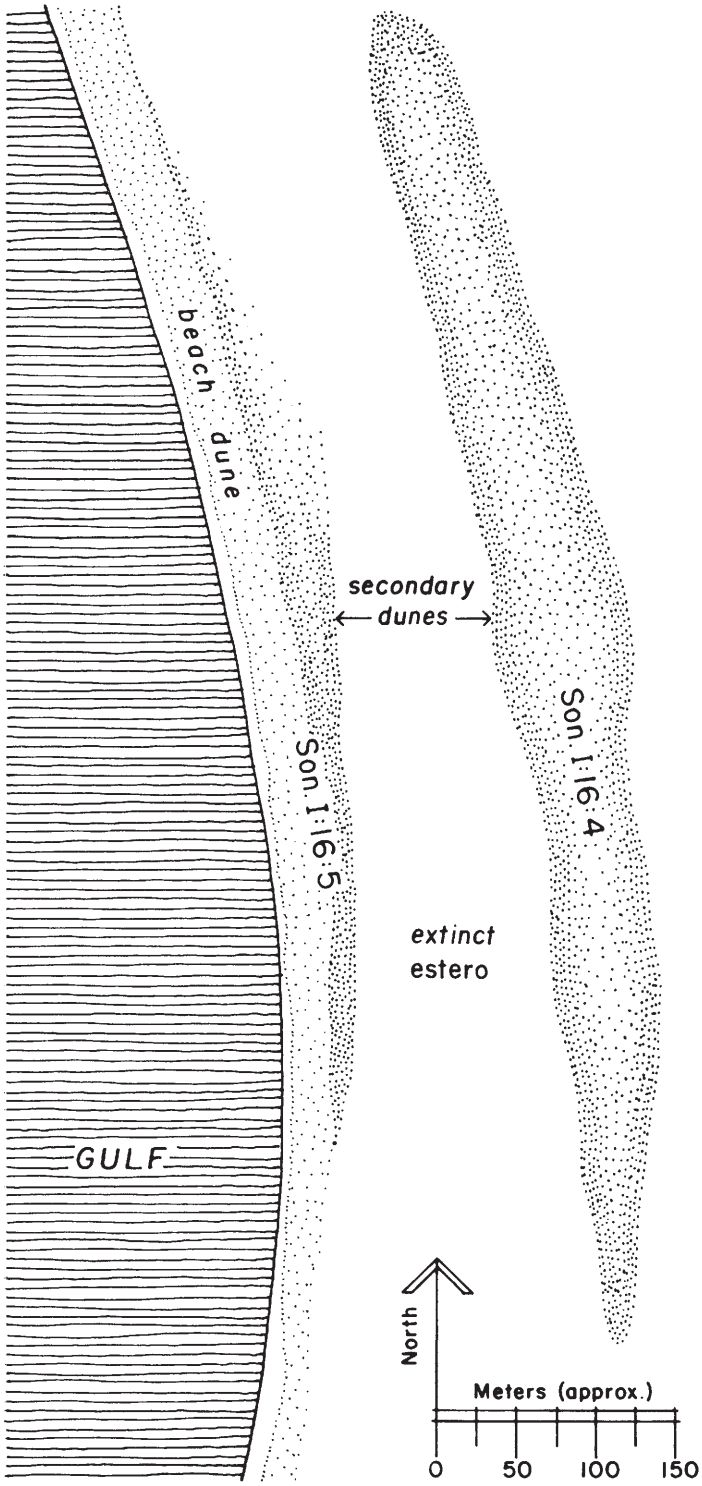

Fig. 18 Sketch map of Son I:16:4 and Son I:16:5. (Redrawn from sketches by Stephen D. Hayden.)

between the two groups (E. Moser: pers. comm.).

Son M:4:4. This small site, about 60 m in diameter, is situated on the bajada some 7 km inland from the Gulf. It consists solely of a thin surface scattering of shell and pottery on rocky ground.

Small inland shell deposits much like Son M:4:4 are fairly common, but they usually lack any trace whatever of artifacts or other cultural refuse. Because Son M:4:4 contains pottery in addition to the shell, it was recorded as a site.

Son M:4:5, M:4:6, and M:4:7. These three typical dune sites are all located on Punta Santa Rosa. None is particularly noteworthy except for the fact that Son M:4:6 produced both Tiburón Plain and Historic Seri pottery in some quantity as well as the remains of a recently carved and painted Seri model boat.

Playa Noriega

Son J:13:1–J:13:3. These three sites are neither large nor distinctive. Two are located at the north end of the playa, and the third, Son J:13:3, is near the southern tip. All three sites are situated on sandhills that form much of the shoreline of the playa. Shell is relatively scarce, reflecting the distance from the coast. The Seri remember this as an excellent hunting area.

Trincheras Shell Bracelet Manufacturing Site. A very important site not far from Playa Noriega has come to light since the survey was completed. It contains a great abundance of *Glycymeris* bracelet fragments and central cores from the manufacture of these items. The pottery, also abundant, consists almost exclusively of Trincheras types, both plain and decorated. Only a very few sherds of Tiburón Plain are present, although typical central coast sites containing this pottery occur in the vicinity. Other remains include lithic debris, manos and metates, and a large quantity of animal bone (Manuel Robles O.: pers. comm.; Richard S. White: pers. comm.). It should be noted that this site is more than 100 km south of the Trincheras area proper. There is no doubt as to its importance in understanding the *Glycymeris* bracelet industry and the relationships maintained between the Trincheras and central coast peoples.

Bahía Kino to Punta Baja

The vicinity of Bahía Kino is rich with sites. However, it has been a haven for tourists and sportsmen since the early 1930s. Artifact collecting has been an increasingly popular activity, and most of the accessible sites in the area have now been picked clean.

Because collecting has been so extensive, only two sites were recorded in the immediate vicinity. One, Son N:1:12, is an accessible site that has been badly disturbed but still produced some cultural material. The other, Son N:2:2, has probably not been seriously disturbed. It is located some distance from the bay in a dense mesquite thicket and was encountered by accident. Its main interest lies in its comparatively large yield of Trincheras pottery.

In general, the sites in the Bahía Kino area are small but numerous. The greatest concentration of sites is probably in the vicinity of the Laguna de la Cruz. Most contain large quantities of shell, and several are dense shell middens. The most outstanding site, however, and one that has impressed a number of visitors since McGee's day, is the extensive dune site comprising Punta Antigualla. This huge site is now the roadway between the fishing village (Old Kino) and the tourist community to the northwest (New Kino). Thousands of sherds, mainly Tiburón Plain, can still be found at the side of the road. Because the Punta Antigualla site has suffered massive destruction it was not recorded.

The number of sites around Bahía Kino and the sheer size of the Punta Antigualla site indicate long and intensive occupation of the area. Both the *estero* and the bay would have provided abundant food resources, and there is a permanent spring nearby (Pozo Escalante).

Five sites were recorded on the Llanos de San Juan Bautista southeast of Bahía Kino, between Cerro San Nicolas and Punta Baja. These are Son N:6:1 through Son N:6:5. Unfortunately, much of this area is now under cultivation, and many other sites have long since been plowed under.

Son N:6:1, N:6:2, and N:6:4. These are all small occupation areas located on the plain a few kilometers inland. They consist of a scattering of shell and Tiburón Plain sherds.

Son N:6:3. This site is located among a cluster of old, compacted, and eroded dunes about 200 m from the shoreline. The site itself extends over an area of about 200 m in diameter. The pottery, exclusively Tiburón Plain, is abundant, but there is little shell or lithic material.

Son N:6:5. This site, which covers an area of about 50 m in diameter, is located in an eroded plain about 12 km from the shoreline. Its location is not distinctive, but the site yielded an unusually wide variety of artifacts, including projectile points, Tiburón Plain pottery, several ceramic figurine fragments, several perforated sherd disks, pipe fragments, *Glycymeris* bracelet fragments, and shell beads. A small cache was found consisting of eight bivalve shells nestled between two whole bowls. Manuel Robles O. reports that since the survey, burials have come to light at this site (pers. comm.).

The Topete Site (Son N:5:1). This bizarre and unique site was previously entered in the Arizona State

Museum survey file. Although not revisited by this survey, it deserves special mention. The site is situated among a group of eroded dunes and mud flats near the shoreline, between Cerro San Nicolas and Punta Baja. It is not a quarry site nor is it near an obvious source of rock; yet the site has produced more than a thousand projectile points along with considerable chipping debris, three cruciform objects, a small quantity of pottery, figurine fragments, shell, and a few manos (Manuel Robles O.: pers. comm.).

Estero Tastiota

Most of the sites recorded in this area are northwest of the *estero* and are situated on older dunes near the gulf. Cultural material generally lies on the dune slopes and in blowouts between crests of the dunes. The smallest sites cover areas less than 20 m in diameter (Son N:10:8 and N:10:12), while the largest are about 1.5 km in length (Son N:10:1 and N:11:7). The material inventory at all of the sites is similar but varies in quantity from a sparse scattering of pottery and stone to considerable concentrations. At all sites, the pottery is exclusively Tiburón Plain. Only two sites warrant individual mention:

Son N:10:13. A distinctive aspect of this site is the large number of *Terebra* (auger) shells on the surface. The site covers an area of about 200 m by 100 m and consists of two dense concentrations of cultural material separated by a nearly sterile dune crest. Pottery, lithic waste debris, and grinding implements are all unusually abundant.

Son N:11:7. This site, which covers an area of about 1.5 km by 300 m, is one of the largest in the vicinity of Estero Tastiota. It includes a small, circular, stone-lined hearth.

Punta San Antonio

These two sites are situated on beach dunes northwest of Punta San Antonio. Although they both yielded Tiburón Plain pottery, the stone artifacts suggest some influence of the Guaymas area culture.

Son Q:4:3 (Fig. 19). This site is located on two beach dunes separated by the mouth of a deep wash. The bulk of the pottery recovered from both dunes is Tiburón Plain, but several foreign sherds characteristic of the Guaymas area sites are also present. Several projectile points were recovered, and chipping debris is plentiful. Fire-cracked rocks suggest the use of hearths. A burial that was eroding from the face of the western dune was excavated; associated with it was a necklace of more than 6,300 shell beads.

Son Q:4:4. This site is situated on part of an extensive

Fig. 19 A portion of Son Q:4:3. The person is standing on the location of a burial, which was subsequently excavated (see Fig. 45).

beach dune. Tiburón Plain pottery and a small amount of stone is scattered among blowouts over an area of about 150 m by 40 m. A partially buried stone-lined hearth containing some ash was encountered just northwest of the main artifact deposits; it is probably recent.

Islands

These sites were recorded during a three-day trip to the islands. The two sites on Isla Tiburón were previously known. Son M:6:1, on Isla San Esteban, was the only site recorded during the few hours spent on that island, although several isolated features, described in Chapter 4, were also encountered.

Son I:15:1 (Fig. 20). This well-known site is located at Tecomate on the north end of Isla Tiburón, near a permanent spring known as Pozo Hardy. It was occupied by the Seri during Hardy's visit in 1826, and it remains a favorite Seri camp. Although it has become known as the "Tecomate shell mound," it is actually a dune site. Wave action and slumping, which are eroding the face of the dune, have exposed cultural material to a reported depth of about 6 m. The main concentration of artifacts covers an area at least 1 km long by 50 m wide.

The importance of this site cannot be overstated. It is one of the few central coast sites with significant depth. It is by far the deepest known, and the deposits appear to be stratified. According to Richard S. White (pers. comm.), 15 of the 16 strata are culture-bearing and pottery is absent from the lower levels. Surface remains include not only Tiburón Plain and Historic Seri pottery, but also a small amount of Trincheras pottery and Lower Colorado Buff Ware. Chipped stone and possible grinding implements are reasonably abundant, and a *Glycymeris* bracelet fragment has been recovered. A great many burials have been observed eroding from various levels of the dune face.

Excavation at Tecomate is badly needed and should be undertaken without delay, as the site is in danger of destruction from two sources. The most persistent is natural erosion, which is destroying the seaward face at an alarming rate. The other is human disturbance, and while it is not in serious evidence at this writing, there has been considerable interest in developing tourist facilities on Isla Tiburón, specifically at Tecomate; some construction has already taken place not far from the site. Although these activities have temporarily ceased, the site stands little chance of escaping disturbance if development of the area resumes.

Son I:15:3. Since several spatially distinct areas of human activity are included under this designation, Son I:15:3 might best be regarded as a site area rather than as a discrete site. It is located in the Agua Dulce valley not far from Tecomate. The most conspicuous remains are two separate areas of rock constructions about 1 km apart. The southern group is the simpler, consisting primarily of two irregular but roughly parallel alignments of stones, about 80 m in length, on the sides of a partially cleared area. The northern group is composed of a series of geometric stone outline figures, stone alignments, and low cairns or clusters of rocks (Fig. 21). Most of these occur within an area 140 m by 70 m, but other probable figures exist in the general vicinity. Neither area of figures has produced a single potsherd or shell. Stone implements are not abundant, but the degree of oxidation and weathering of flake scars suggests that most of those that do occur are early, in some cases very early.

Both groups of constructions are near low rhyolitic hills, each of which was the scene of extensive quarrying

Fig. 20 The western tip of Son I:15:1, the huge dune site at Tecomate, looking east.

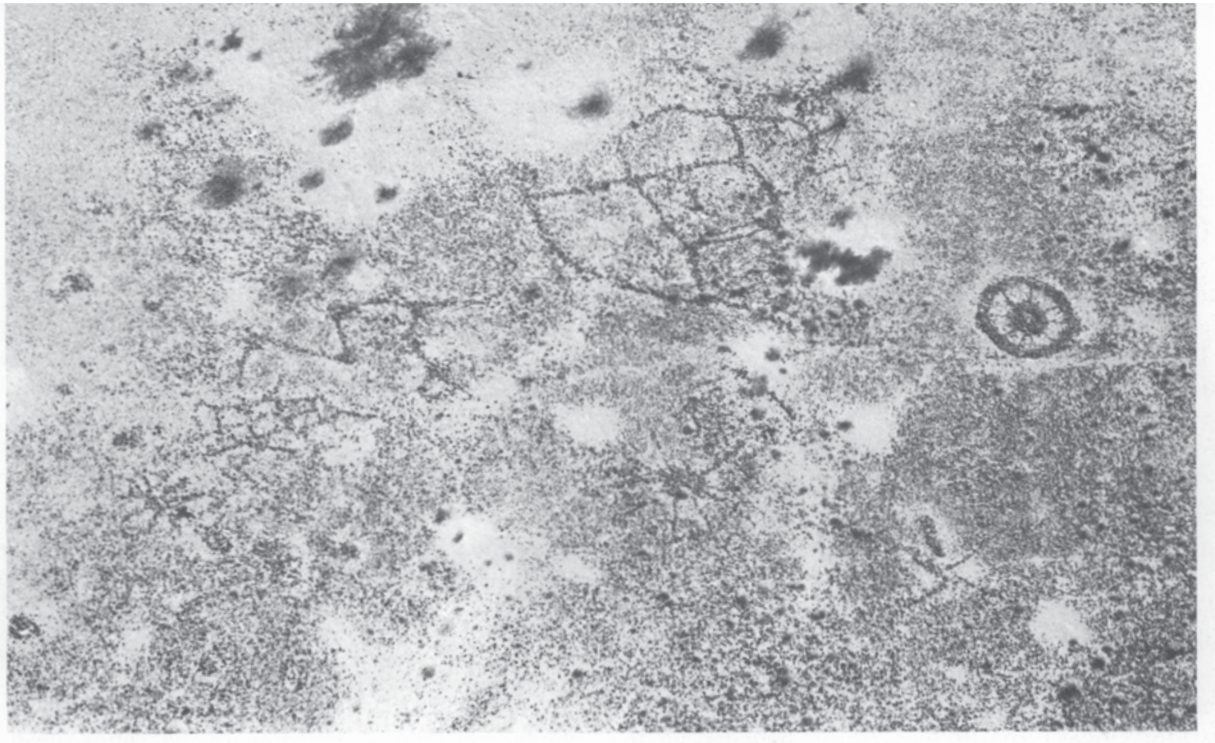

Fig. 21 Son I:15:3. Aerial view of the northern group of stone outline figures. The diameter of the "spoked wheel" figure, right center, is about 8 m. (See also Figs. 29 and 30.)

and stone working. E. Moser reports that these quarry-workshops were not discovered until 1973 (pers. comm.), and so far they have been visited only briefly. It appears, however, that much of the activity at these workshops is comparatively recent, raising some question whether they are associated with the nearby areas of rock figures.

Son M:6:1. A single site was recorded near the northeast corner of Isla San Esteban. It was the only rock shelter encountered during the survey. There are two areas of occupation which are almost certainly related—the shelter itself and a nearby stone circle essentially identical to those used by the Seri in seeking visions. The rock shelter is small, about 8 m wide, 1.5 m high, and 3.5 m deep. The roof has been blackened by smoke. The fill, which includes some charcoal, is less than 15 cm deep. A few turtle and fish bones were seen, but shell was scarce. Scattered flakes were noted, and a small number of sherds were collected. The sherds are of considerable interest since they resemble Historic Seri in most attributes but lack organic temper. Several bear red or yellow painted designs, and one painted sherd is also incised.

The Seri who inhabited Isla San Esteban are said to have utilized caves for habitation (E. Moser 1963: 24). Since a small amount of cultural refuse accompanies Son M:6:1, interpretation as a habitation site would be superficially plausible. However, both caves and stone circles were used in the vision quest, and the Seri state that they do not seek visions near camps, nor do they camp near an earlier stone circle vision ring (E. and M. Moser: pers. comm.). For this reason it seems most unlikely that Son M:6:1 was a domestic habitation site. Moreover, the Seri know of a cave at approximately the location of Son M:6:1 which was used in seeking visions; in all probability Son M:6:1 is that site.

Turtle-Shell Slide. One area on the east coast of Isla San Esteban, just north of the main valley, is of interest even though it was not given a site designation. This is a steep, unstable slope of gravel above a cliff 25 m high that drops off onto the rocks of the shoreline (Fig. 22). According to Seri tradition, this slope was used by the San Esteban band in the local version of the game of "chicken" (E. and M. Moser, pers. comm.). Starting at the top of the slide area, each man would take a running start, jump into an inverted sea turtle shell, and begin sliding down the gravel slope. The object of the game was to determine who could slide the closest to the lip of the cliff before leaping out of his shell and scrambling to safety.

The San Esteban people were known by the Tiburón and mainland Seri as incorrigible gamblers, and in many contests a man might stake his own life. The turtle slide game was no exception. Those who failed to abandon their shells in time sailed over the cliff to their death on the rocks below.

However, the simple possibility of death apparently did not offer sufficient excitement for these hardy people. Polygyny, while not common among the Seri, was occasionally practiced (Griffen 1959: 27–8). The Seri maintain that when a San Esteban man on the turtle slide failed to eject in time, the first man who shouted "Your wife is mine" could take the wife of the deceased as a second spouse (E. and M. Moser: pers. comm.).

Fig. 22 Turtle-shell slide, Isla San Esteban; the slide is the bare gravel slope in the center of the photo.

Parsons (1937: 51) reports a similar turtle-shell slide used by Seri children on the mainland. However, there was no cliff at the bottom, and the activity seems to have been just harmless fun.

Other Recorded Sites

Despite the lack of extensive survey on the central coast, brief checks of local areas and visits to the coast for nonarchaeological purposes over the years have resulted in notes on some 30 sites in the Arizona State Museum survey file. In many cases the casual nature of the site descriptions and collections limit their comparative value, although detailed notes are available on some, especially those recorded by Julian D. Hayden. As far as can be determined nearly all are conventional camp sites that correspond closely with those reported here. The major exceptions are Son I:15:2, on Isla Tiburón, and Son N:5:1, the Topete Site. The former, a nonceramic site not far from Tecomate, is said to bear faint traces of stone circles and alignments. As noted earlier, Son N:5:1, south of Bahía Kino, has produced an extraordinary yield of more than a thousand projectile points.

In 1949 Donald J. Lehmer recorded 11 sites in the vicinity of Estero Tastiota as part of a survey of several widely separated areas of Sonora. Most of these sites seem similar to those encountered in the same area by the present survey, and a few may have been the same sites. However, Lehmer recorded one cave site that apparently yielded Tiburón Plain pottery and a predominantly lithic site that produced about 25 projectile points (Lehmer n.d.). Only a brief note on this project was published (Lehmer 1949), and the artifacts, which were shipped to Mexico City, have since been lost.

George E. Fay has conducted a survey of the Bahía Kino area, but full results have not yet been published.

Since 1967, Richard S. White has recorded several central coast sites, and these have been added to the Arizona State Museum survey file. R. James Hills (1973) has undertaken an ecologically oriented survey of the northern portion of the coast. Ongoing survey and limited excavation is being conducted by Manuel Robles O., Director of the Museo Regional de la Universidad de Sonora in Hermosillo.

4. FEATURES

STONE FEATURES
Masonry Structures

Son I:11:2 and I:16:6 (Pozo Posado) contain the only masonry structures encountered by the survey. Two structures occur at Son I:11:2 (Fig. 23). They are roughly rectangular, approximately 3.0 m long by 2.5 m wide, and both are situated at the head of underwater clearings (described in the next section). The walls consist of piled natural beach cobbles of all sizes. No mortar was used. The maximum height of the walls is 1.2 m. The "rock-pile" character of the walls makes it impossible to state their thickness precisely, and a figure of 0.5 m is an approximation. All four walls of one of the structures are still visible, but two walls of the other structure have nearly collapsed.

Son I:11:2 served as a Seri fishing camp during the 1940s (Xavier 1946: 16). The function of the two structures is uncertain, but since they are located on the beach proper below the high tide line, it is possible that they served as pens to incarcerate turtles caught during extended turtle-hunting trips.

Son I:16:6 contains three structures, all of dry-laid unshaped rocks piled on top of one another. One structure is fully enclosed and circular in plan. Its diameter is about 3 m, and the walls are a maximum of 0.5 m high. The other two structures consist of curved walls that abut a rock face, creating enclosed areas.

An unusual site near the north end of Isla Tiburón, consisting of a cluster of stone structures and rock mounds, was discovered in 1972 by Glen Conklin. It has since been revisited but has not been studied in detail. The structures, of which there are perhaps 30 in various stages of disrepair, are situated on the summit and ridge of a low hill. They are approximately circular in plan but open on the south or southeast, the side away from the prevailing wind (Fig. 24). Most of the construction appears to be nothing more than piled rocks, but several structures utilize slabs set on edge for the basal course (Fig. 25). In a few cases the walls were clearly intended to lean progressively inward toward the center of the structure, as if the final structure were to be a dome. Whether the structures were actually roofed, however, is not known. Size range is from about 0.5 m to 2 m in diameter. Present wall height of some of the larger structures reaches nearly 1 m although the quantity of fall

Fig. 23 A stone enclosure at Son I:11:2. The debris at the far end marks the high tide.

Fig. 24 Stone hillside structures, north end of Isla Tiburón. Foreground structures have an open side. Collapsed structures, middle distance, appear in profile as mounds of rock.

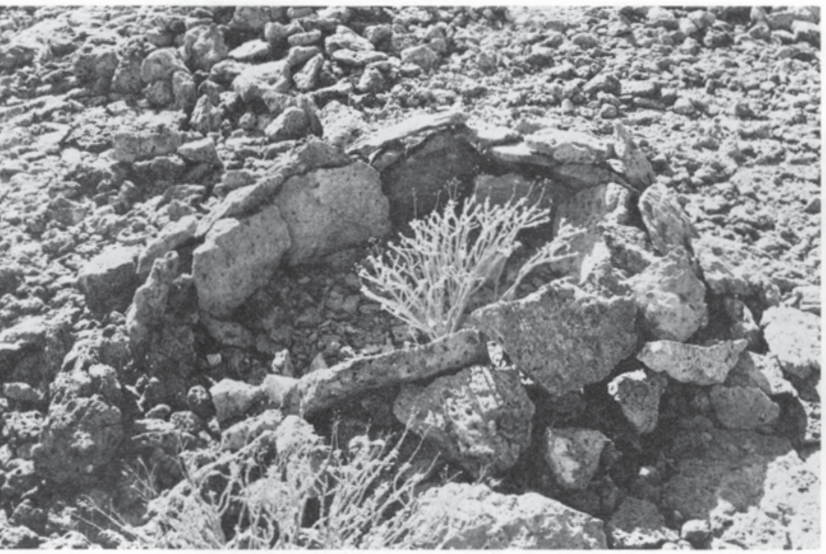

Fig. 25 Stone hillside structure utilizing upright slabs, north end of Isla Tiburón. Diameter, about 1 m.

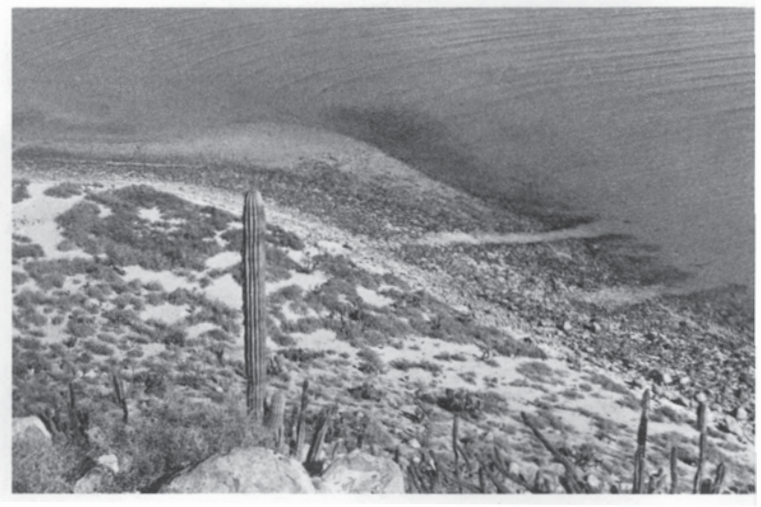

Fig. 26 Son I:11:2 from the summit of Punta Sargento. Two underwater clearings (boat landing ramps) are visible at right.

rock indicates that most were much lower. The form and orientation of these enclosures suggest that they might have been used as windbreaks, especially if they were fitted with brush superstructures. However, some appear to be too small to house anything but an infant. Moreover, one wonders why anybody would climb a hill to get out of the wind.

Some 50 mounds of stones below the hill were not revisited. These mounds are oval in form and are apparently randomly oriented. They range in length from about 1 m to 4 m and in height from about 0.3 m to 1.2 m. Removal of stones from the middle of one mound revealed nothing underneath (Conklin: pers. comm.).

The area in which the structures and mounds occur is devoid of artifacts and shells. Although the Seri know of this site, they have no explanation for it (E. and M. Moser: pers. comm.).

Underwater Clearings

Son I:11:2 on Punta Sargento includes at least six cleared areas where rocks have been removed in strips perpendicular to the shoreline and below the low tide line (Fig. 26). Rocks line the beach rather thinly here and can easily be removed and piled along the sides of the clearings. Sandy-bottomed ramp-like inclines, about 2.5 m wide, are thereby created which enable boats to land and embark without damaging the bottoms. Similar ramps may be found at Desemboque and elsewhere on the coast; they are used by both Seri and Mexican fishermen.

Talus Pits

Two dubious structures, adjacent to each other, were discovered in the main valley of Isla San Esteban about 1 km from the east coast of the island. They are located on a steep north-facing talus slope about 50 m above the valley floor. Both are vague pits, about 2.5 m long by 2.0 m wide, apparently created by removing boulders from the slope. It appears that some of the excavated rocks were piled on the downhill edge of the excavations to create a low "wall." The depth of these excavations, measured from the "walls," is somewhat over 1 m. Neither pit is well preserved, and it is unclear whether they were ever more distinct than they are now. The reason for these excavations is obscure. No artifacts were seen, and any that might have been dropped in the area would have immediately disappeared into the interstices between the underlying boulders.

Excavated Pits and Rock Squares

Alexander Russell (pers. comm.) reports the existence of five excavated pits adjacent to four square rock designs in the main valley of Isla San Esteban, about 2 km from the shoreline. They are situated on a nearly level bench about 2 m above the valley's main drainage channel.

The rock squares all appear to be similar, although three are not well preserved. The best preserved is a square that consists of four distinct quadrants forming a checkered pattern. The stones are set on edge in parallel rows so that the rows in each quadrant lie parallel to those in the diagonally opposite quadrant and perpendicular to those in the adjacent quadrants.

The pits range in depth from about 1 m to 3 m, and charcoal has been seen in the immediate area. While it is possible that the pits were constructed by the small group of Mexicans who tended goats on the island for a short time prior to 1900, they are more likely of Seri

construction. Very large pits are said to have been used by the San Esteban band for roasting agave (Felger and Moser 1970: 164).

Stone Outline Figures

Geometric stone outline figures were observed in four locations—near Pozo Coyote on the mainland, on Isla San Esteban, on the west side of Isla Tiburón, and at Son I:15:3 on Isla Tiburón. The Pozo Coyote figure, located about 15 km north of Desemboque near the road to Puerto Libertad, consists of two adjacent rows of nine large rocks. It is 2.9 m long and about 0.9 m wide. It is not known who built it, when, or for what purpose.

The San Esteban figure was encountered on the first terrace above the floor of the main valley. It consists of a single row of large stones in the shape of a "U" with squared corners, open on the eastern side. The lengths of the northern, western, and southern arms are 4 m, 6 m, and 3 m, respectively. Since there are two nearby stone circles that may have been used by the Seri in vision quests, E. and M. Moser (pers. comm.) suggest that the U-shaped figure may be a representation of a form shown a vision seeker by the spirits.

The figure on the west side of Isla Tiburón is about 100 m from the beach. It consists of two roughly parallel alignments of stones that converge at one end. It was observed from the air but has not been visited.

The most complex and varied outline figures occur within the site area designated Son I:15:3. As indicated in the site description, Son I:15:3 includes two distinct groups of figures. The southern is the simplest, consisting primarily of two alignments of stones somewhat similar to those on the west side of the island, noted above. The alignments are about 80 m long and are separated by a maximum of 20 m. Although roughly parallel, they converge slightly at one end (Figs. 27 and 28). The space between them appears to have been partly cleared of large stones, although two low cairns or clusters of rock occur near the middle of the figure.

Some of the stones that compose the alignments are deeply embedded in the soil, but many are only lightly embedded and a considerable number lie on the surface. The caliche deposits on the undersides of embedded stones are very thin but apparently equivalent to those on undisturbed rocks in the vicinity. Rocks that have cracked in place generally bear lightly oxidized flake scars, as does much of the rather sparse chipping debris in the immediate area. While this suggests that the alignments are probably not recent, it argues against extreme antiquity.

The other group of outline figures lies about 1 km to the north (Figs. 21, 29). Here a diversity of rectilinear designs, short alignments, low cairns or rock clusters, and other figures are concentrated in an area about 140 m by 70 m, although isolated figures occur nearby. The

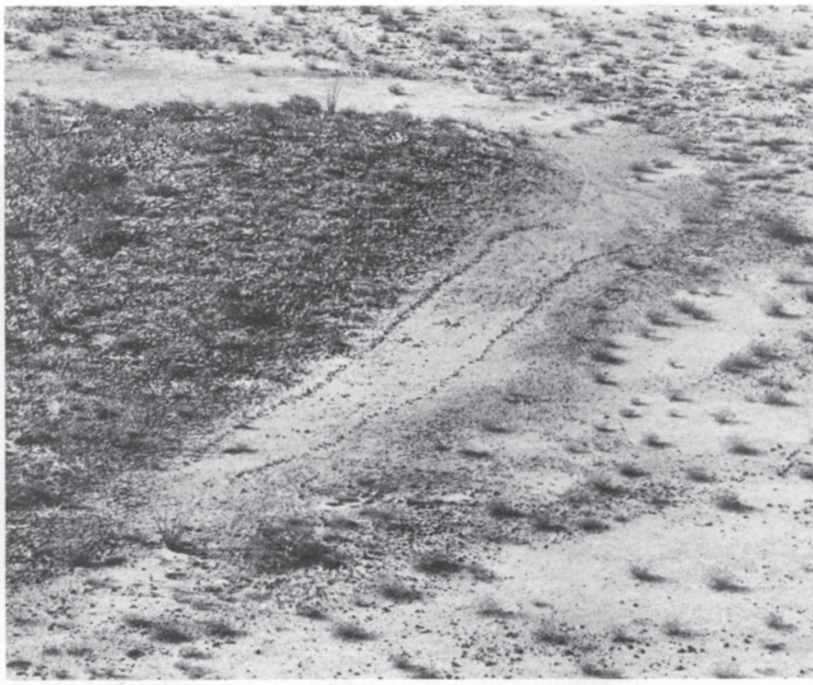

Fig. 27 Son I:15:3. Aerial view of alignments in the southern group of stone outline figures, looking south.

Fig. 28 Detail of the stone alignments shown in Fig. 27, (Son I:15:3), looking southwest.

Fig. 29 Sketch map of the northern group of stone outline figures, Son I:15:3 (see photograph, Fig. 21).

most conspicuous figure is in the form of a "spoked wheel" (Fig. 30). It was produced in part by raking, so that there is a border around its rim that is free of large stones. Some of the rock clusters or cairns were built in this manner, and a few small circular areas have also been cleared of large rocks. The rectilinear designs and short alignments, however, are of individually arranged stones and were not produced by raking.

The figures occur in an area of desert pavement, in which the stones of some figures are deeply embedded. They do not bear deposits of caliche, which evidently does not form in the immediate locality. A few stones have fractured in place, and some of these display heavily oxidized surfaces. Some of the chipped implements occurring with the figures have flake scars that are as weathered and oxidized as the cortex, whereas others display only moderately oxidized scars. Interestingly, lithic debris with unoxidized flake scars is essentially absent, although it predominates at the large quarry-workshop adjacent to the figures. On the basis of these and other criteria, Julian D. Hayden, who has visited the site, notes a marked correspondence between the stone implements occurring with the outline figures and tools from the Sierra Pinacate ranging temporally from Malpais (basal San Dieguito I) to Amargosa (pers. comm.).

The purpose of the alignments and outline figures at Son I:15:3 is obscure, and the several Seri who have been queried about them were unaware that they even existed. However, the Seri are familiar with the general vicinity in which the figures occur. They believe it to be the domain of a large number of spirits who live underground; consequently the area is believed to be endowed with very great spirit power and is a location where visions may be sought. One Seri man who saw the figures from the air, but who had previously expressed ignorance of them, conjectured that they might bear a relationship to the vision quest. He suggested that the two southern rock alignments might have been constructed to mark the subterranean abode where the chief spirit of the area and his assistants dwell, and that the northern group of figures might represent forms shown the seeker by the spirits. If this interpretation is correct, each series of figures would have been made singly and at different times by different individuals (E. and M. Moser: pers. comm.).

Even though the outline figures at Son I:15:3 appear to be far too ancient to be "Seri" in any meaningful sense, they may well have been built for reasons similar to those expressed by the Seri interpretation. At least archaeologists can take heart that they are not the only ones to interpret otherwise inexplicable remains as "ceremonial."

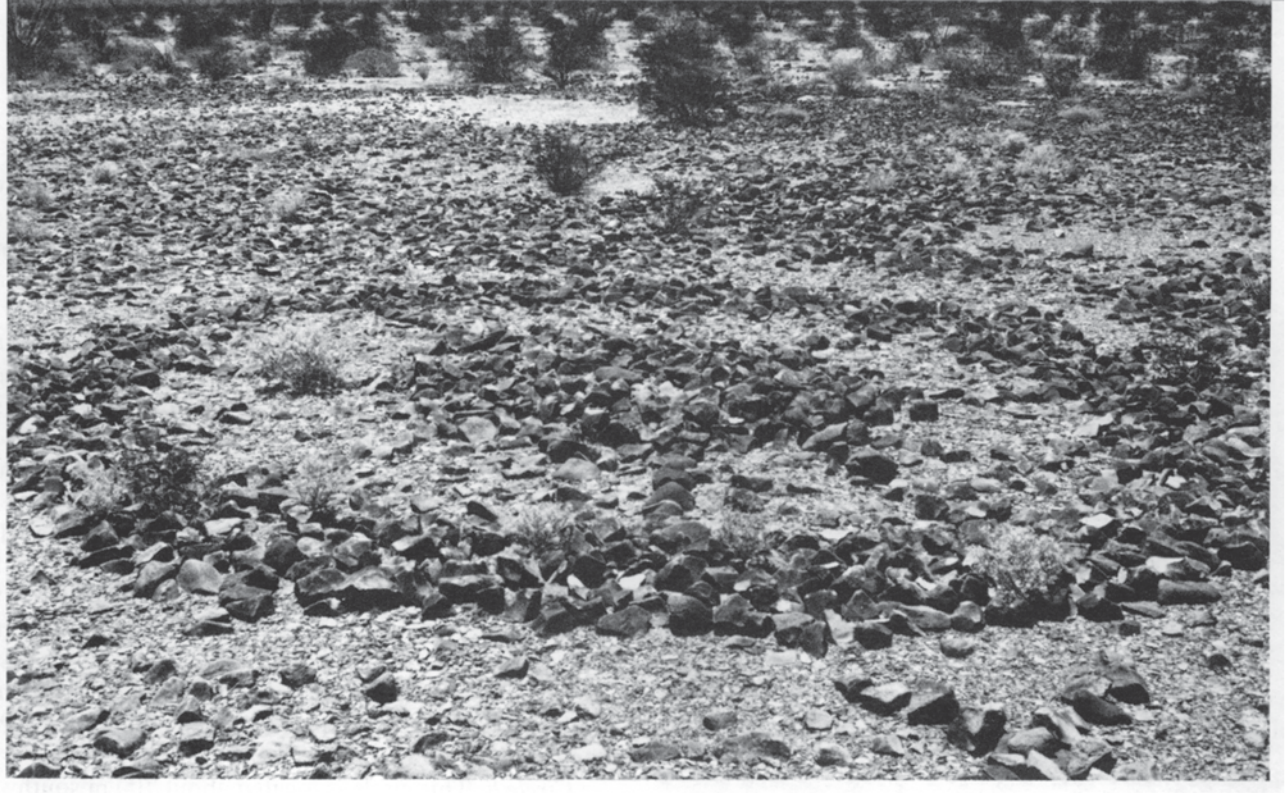

Fig. 30 Detail of "spoked wheel" figure, Son I:15:3.

Stone Circles

Nine features are classified as stone circles (Table 4). Seven of these are genuine circles or ovals of stones, one is a greatly elongated oval, and one is a circular enclosure formed by the abutment of two arcs of stones against a curved outcrop of rock. Most circles occur in isolation and are a considerable distance from the nearest habitation site. Nearly all are completely devoid of artifacts. Typically, the stones themselves are fist size or somewhat larger, with each stone separated from the next by about 10 or 20 cm. In a few cases the stones are embedded in the ground, but most lie on the surface.

Circles 1 and 2. These badly eroded circles are about 1 km north of Desemboque and are separated from each other by about 30 m. Circle 2 (Fig. 31) is unusually elongated. The Seri regard these two structures as vision rings and believe them to be very old (E. and M. Moser: pers. comm.).

Circle 3. This structure, the only circle encountered on or near a habitation site, lies within the occupation area of Son I:7:10, about 50 m north of three abandoned Seri houses. It is situated on the seaward slope of the dune, just below the dune crest.

Circle 4. This circle is located near the summit of Punta Sargento. It is not a complete enclosure. The rocks that comprise it are unusually large, and a few are piled on top of each other.

Circle 5 (Fig. 32). This structure, also near the summit of Punta Sargento, is not a true circle of stones, but

TABLE 4
Forms and Dimensions of Stone Circles

Circle No.	Location	Form	Dimensions (meters)
1	Near Desemboque	circular	diameter about 2.5
2	Near Desemboque	elongated oval	7.0 by 1.6
3	Son I:7:10	oval	3.0 by 2.5
4	Punta Sargento	circular	diameter 2.5
5	Punta Sargento	circular	diameter about 2.0
6	Punta Santa Rosa	oval	2.5 by 2.1
7	Isla San Esteban	oval	2.6 by 2.0
8	Isla San Esteban	oval	1.9 by 1.7
9	Isla San Esteban	oval	1.7 by 1.6

Fig. 31 Stone circle 2, an unusually elongated example north of Desemboque.

Fig. 32 Stone circle 5, on Punta Sargento, an enclosed space rather than a true circle of stones.

rather a circular enclosed space created by two concentric arcs of stones abutting a curved outcrop of rock. The separation between the stone arcs is about 1.3 m.

Circle 6. This well-preserved circle is on Punta Santa Rosa, about 50 m from the beach and about 300 m north of Son M:4:5. The stones appear to be carefully chosen and placed. They are of nearly identical size and are placed on edge, each with the long axis pointing toward the center of the circle. Curiously, small cacti encircle the entire structure about 50 cm from the stones, giving the impression of having been planted.

Circle 7 (Fig. 33). This well-defined circle is on Isla San Esteban. It is situated on a terrace above the island's main drainage channel, about 100 m from the beach and 3 m east of the U-shaped stone figure described in the preceding section. Since some stones of this circle are embedded in the ground and the ground patina is equivalent to that on virgin stone in the area, the circle may have considerable antiquity.

Circle 8. This circle is located about 100 m southwest of Circle 7. Bits of charcoal were seen in the vicinity.

Circle 9 (Fig. 34). This circle is also located on Isla San Esteban. Together, the circle and the rock shelter about 35 m away constitute Son M:6:1 (see site description, Chapter 3), known to the Seri as a location where visions may be sought. This is the only circle that was accompanied by artifacts.

The Seri have constructed stone circles as part of the procedure for seeking visions, the primary means of becoming a shaman. According to E. and M. Moser, who have provided the following information on the vision quest, the vision seeker constructed a brush hut away from camp where he slept for three nights. During

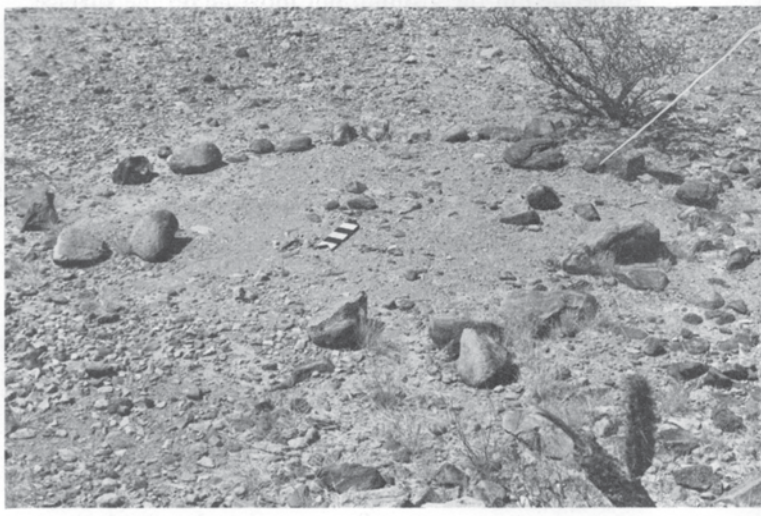

Fig. 33 Stone circle 7, on Isla San Esteban.

Fig. 34 Stone circle 9, on Isla San Esteban. This circle constitutes one portion of Son M:6:1.

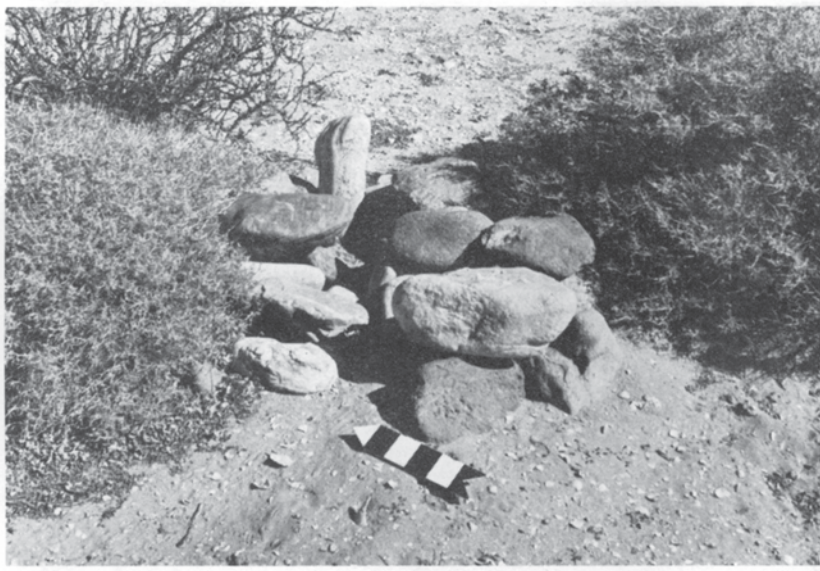

Fig. 35 Stone cairn at Son I:7:7.

three days he wandered alone in the desert, eating nothing and drinking only the juice from a certain plant. Near evening on the third day he either went to a sacred cave or constructed a circle of stones in which he sat and waited for the vision. He would leave the cave or stone ring before sunrise on the next morning whether or not the quest had been successful.

The spirits are thought to live underground, especially inside mountains. To the Seri, mountains are like large houses inhabited by the spirits. The "doors" to these "houses" are often, but not always, caves, and they are shown to the vision seeker by the spirits. If the entrance is not an actual opening in the ground (that is, a cave), a ring of stones, either circular or oval, is constructed to mark the entrance. Thus the Seri name for a vision ring, and the area it marks, is *Sáax ?apésXW* 'cave hidden'. Both caves and rings could be reused by different seekers.

Since visions were sought in isolated locations, seekers would avoid inhabited areas or areas that had once been inhabited. The Seri also avoid camping on the location of a vision ring. The Mosers have observed a number of isolated stone circles on hilltops and in the mountains, and all but one of the circles reported here are in isolated locations. Two of the circles described above have been identified by the Seri as vision rings, and it is likely that most of those recorded were in fact used as vision rings. Circles occurring at camps, such as Circle 3, might be either the result of children's play or game circles used during the girls' puberty fiesta.

Cairn

A stone cairn (Fig. 35) was observed at Son I:7:7. It is about 1 m in diameter and 30 cm high, and may mark a historic or fairly recent Seri grave. The piling of rocks or brush on a grave to prevent coyotes from digging up the body was first reported by McGee (1898: 290) and continues as an occasional practice (E. and M. Moser: pers. comm.).

Hearths

Seventeen hearths were observed. All but two are clearly modern, and it may be that all are quite recent.

Son I:11:2. The hearth at this site consists of a circle of small stones 70 cm in diameter (Fig. 36). Its contents included ash, glass, a rusted tin can, and a fragment of a Combate coffee wrapper. It may have been built by either Mexican or Seri fishermen.

Son I:16:3 (Campo Almond). Fourteen hearths were seen at this modern Seri camp (see sketch map, Fig. 17). Thirteen are merely areas of ash and sand, in and around which are a few burned and fire-cracked rocks. The remaining hearth, which is associated with Struc-

Fig. 36 Stone-rimmed hearth, Son I:11:2.

Fig. 37 Hearth of burned earth, Son I:16:3.

Fig. 38 Shell outline figure at Son I:11:2.

ture 3, is a U-shaped ridge of burned earth containing ash (Fig. 37). It is 51 cm long, 39 cm wide, and 9 cm high.

Son N:11:7. The remains of a hearth were observed at the base of one of the dunes on which this site is situated. It is a small circle of fire-cracked rocks and contains burned earth.

Son Q:4:3. Evidence of hearths at this site consists of scattered fire-cracked rocks.

Son Q:4:4. A hearth, partly buried by sand, was noted in a blowout just northwest of the main concentration of artifacts. It is a circle of small burned rocks, 70 cm in diameter, and contains ash. It is probably modern.

Hayden (1956: 20) encountered "hearth stones" at a site near Estero Tastiota and evidence of hearths in the form of burned and fire-cracked rocks at San Augustin and Morro Colorado.

SHELL FEATURES

Shell Outline Figure

A design created with bivalve shells (Fig. 38) was observed on the eroded face of the shell midden at Son I:11:2. It is about 1 m square. The design consists of a rectangle with one side extended and three arms radiating from one corner. Very likely it is the recent doodling of a Mexican or Seri fisherman.

Shell Circles

A ring of oyster shells was seen at Son I:7:10 about 25 m north of the abandoned Seri houses at the site. It is an oval 1.9 m long and 1.7 m wide. In form and size it is essentially identical to the stone circles presumed to have been vision rings; however, the Seri deny that vision rings have been constructed of shell (E. and M. Moser: pers. comm.). As noted earlier, visions are never sought near camps, nor do the Seri camp next to vision rings. The shell circle is probably the result of children's play.

A different kind of shell circle was encountered about 200 m west of Son I:11:3. This is a large oval ring of bivalve shells about 12 m long by 9 m wide. The shell, much of it burned, is piled to a depth of about 0.5 m. This portion of Cabo Tepopa is often frequented by North American tourists, and this shell circle might be a result of their activities.

Fay (1961: 56) briefly describes two circular areas of

shell near Bahía Kino. Both are surface features about 6 m in diameter and neither contains artifacts. Their purpose is not known; as noted above, circular areas of shell are sometimes produced by children playing.

Shell Cache

A cache of eight large bivalve shells was found sandwiched between two pottery bowls at Son N:6:5 (Fig. 39). Six of the shells were nested one inside the other and lay inverted in the lower bowl. The remaining two shells stood on edge flanking the other six, one on each side. The upper bowl lay over the shells in an inverted, tilted position.

The bowls are poorly constructed and poorly fired. Although somewhat atypical, they are probably Historic Seri. The shells are *Laevicardium elatum*.

Possibly the shells in the cache served as utensils. The Seri use of unmodified shells as cups or spoons has been noted by several observers (McGee 1898: 185–6, 233–4; Thomson 1931: 56; Hayden 1942: 28).

BEACH WELL

A small excavation roughly 2 m in diameter and 1 m deep was discovered in a dense stand of *Lycium* at Son I:11:6, about 100 m from the beach. The main site area is a horseshoe-shaped dune surrounding the lower ground where the *Lycium* and the excavation are situated. The excavation did not contain water when it was discovered, but the bottom consisted of dried and crackled silt.

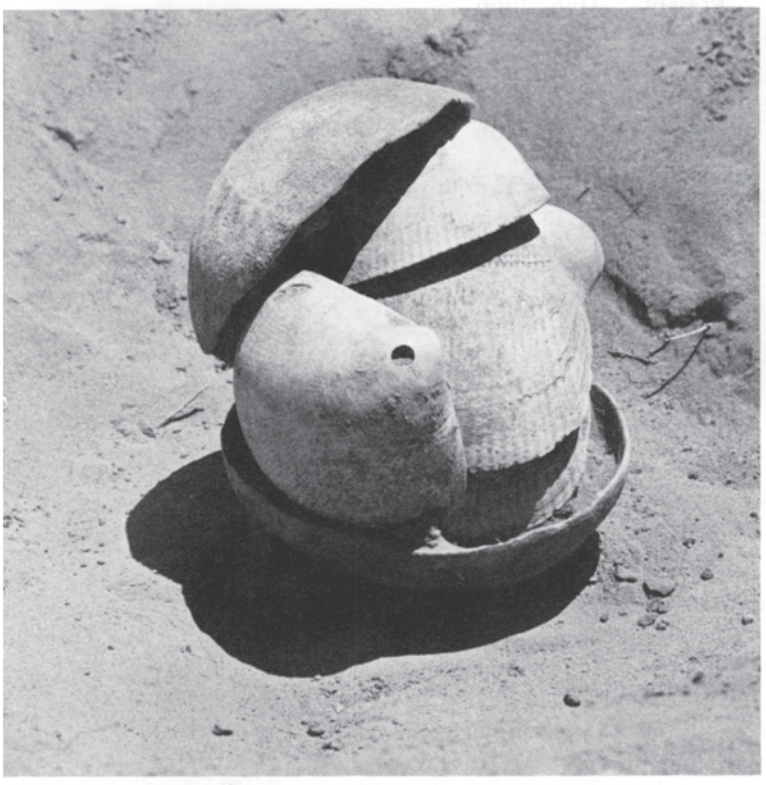

Fig. 39 Shell cache at Son N:6:5 (after excavation).

HOUSES AND ASSOCIATED STRUCTURES

Frames of traditional Seri houses and associated structures were observed at four sites (Table 5). Two of these sites, Son I:16:2 and I:16:3 (see sketch maps, Figs. 16 and 17), are modern Seri camps still occupied on a seasonal basis. Although the house remains at the other two sites, Son I:7:4 and Son I:7:10, attest to recent habitation, the fact that the dominant pottery is Tiburón Plain indicates that the main occupation was much earlier. Most of the recorded structures were unquestionably houses constructed in the traditional manner, which has remained unchanged since McGee's time (1898: 221–4).

Of the two traditional forms, the most prevalent takes the shape of a Quonset hut (Figs. 40–42). The framework consists of ocotillo branches set in the ground in two parallel rows (formerly, organ-pipe cactus ribs were sometimes used). Each branch is bent over and joined with the branch opposite it, forming an arch. The arches, numbering up to six, are usually reinforced by additional branches, so that each arch may consist of three or four branches tied together. They are then connected by longitudinal stringers, also of ocotillo branches. The joints are fastened with pliable twigs, string, wire, or some other suitable material. Traditionally, these houses were covered with brush, seaweed, and turtle shells. In recent years, cloth, cardboard, and plastic have often been used along with the traditional materials.

Entry is usually gained through one end, which is left uncovered, although some houses are entered through an uncovered portion of one side. A few side entries are small vestibules, constructed with one or two arches perpendicular to the main arches of the house. After the house covering has deteriorated, the vestibule side entries are the only ones that can be identified.

A variation of this form was observed at Son I:16:2 (Structure 2). This is a small dome-shaped structure of ocotillo arches. E. Moser (pers. comm.) suggests that it might have been built by children as a play house.

The other traditional house form is constructed of the same materials but is box-shaped, with vertical walls and a flat roof (Fig. 43).

Four small Mexican-style structures are probably chicken pens (E. and M. Moser: pers. comm.). They are cubical, with walls of closely spaced vertical or horizon-

TABLE 5
Characteristics of Traditional Seri Houses and Associated Structures

Site	Structure No.	Form	Dimensions in Meters Length	Width	Height	Side Entry	Use	Remarks
Son I:7:4	—	Quonset					Habitation	
Son I:7:10	1	Quonset					Habitation	
	2	Quonset					Habitation	
	3	Quonset					Habitation	
Son I:16:2 (Campo Ona)	1	Box	3.0	1.6	1.5		Habitation	
	2	Dome	*diameter:* 2.0		1.0		Children's playhouse (?)	
	3	Box	1.0	1.0	1.1		Chicken pen	Mexican construction technique
	4	Box					Mexican trader's house	Mexican construction technique
	5	Quonset	5.0	1.5–2.1	1.5	Present	Habitation	
	6	Quonset					Habitation	
	7	Box	0.5	0.5	0.5		Chicken pen	Mexican construction technique
	8	Box					Habitation	
	9	Box					Habitation	
Son I:16:3 (Campo Almond)	1	Quonset	3.5+	1.9	1.5	Present	Habitation	
	2	Box	1.1	1.1	1.2		Chicken pen	Mexican construction technique
	3	Quonset					Habitation	
	4	Quonset	2.5+	1.6	1.3		Habitation	
	5	Box	1.3	1.0	1.2		Chicken pen	Mexican construction technique
	6	Quonset	7.4	1.2–2.1	1.3		Habitation	Burned
	7	Quonset	3.3	0.9	1.3	Present	Habitation	Possible entry on both sides
	8	Quonset	1.8	1.3	1.5		Habitation	
	9	Quonset	1.8	1.9	1.4		Habitation	
	10	Quonset					Habitation	
	11	Quonset	2.9	1.6	1.5	Present	Habitation	Entry on both sides, one blocked off
	12	Quonset	2.9	1.7	1.4		Habitation	

tal ocotillo branches fastened to vertical ocotillo corner posts (Fig. 44). A similar, full-sized structure at Son I:16:2 (Structure 4) was probably a Mexican trader's house (Thomas B. Hinton: pers. comm.).

According to McGee (1898: 222), Seri houses are not consistently oriented but tend to face "away from the prevailing wind and toward the nearest sea, with a secondary preference for southern and eastern exposure." Among the houses we observed, entries face all directions but the northwest, the direction of the prevailing wind. With one exception, the orientation of these houses tends to be north-south, ranging from northwest-southeast to northeast-southwest. In most cases house orientation approximately parallels the shoreline, so that one side of the house faces the sea. This usually means that the house is also parallel to the crest of the dunes. The latter may be the principal factor in house orientation, since a house parallel to the dune

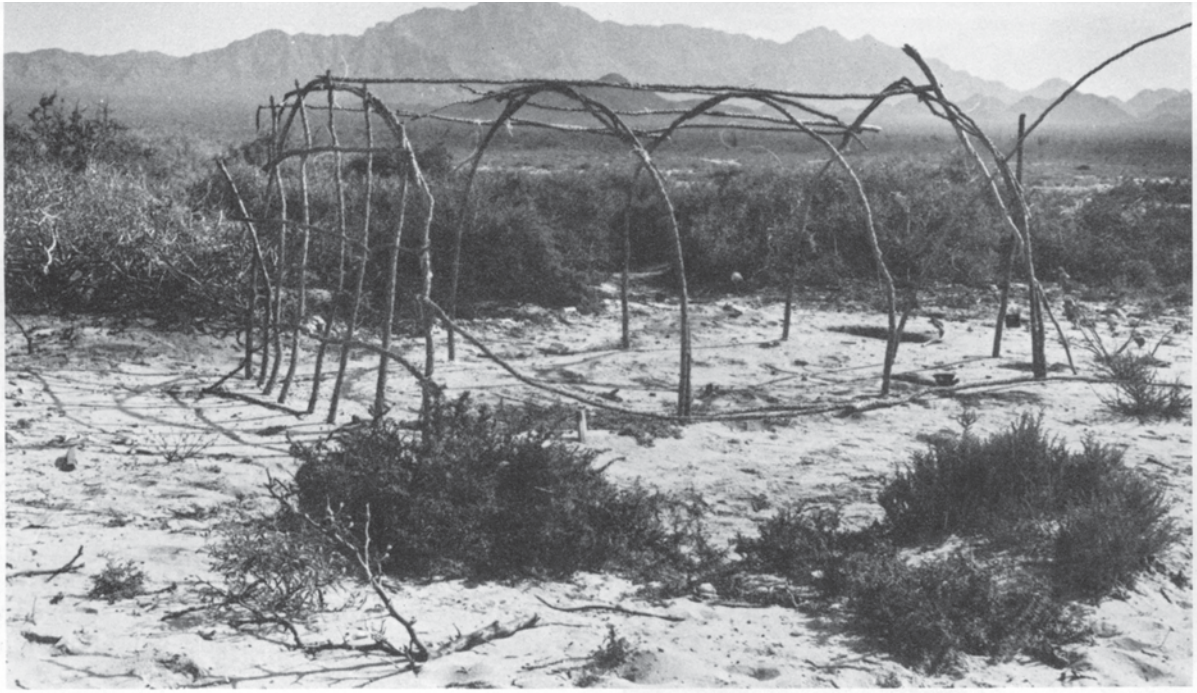

Fig. 40 Traditional Seri house frame (Son I:16:3, structure 8).

Fig. 41 Traditional Seri house frame (Son I:16:3, structure 9).

Fig. 42 Traditional Seri house frame (Son I:16:3, structure 10).

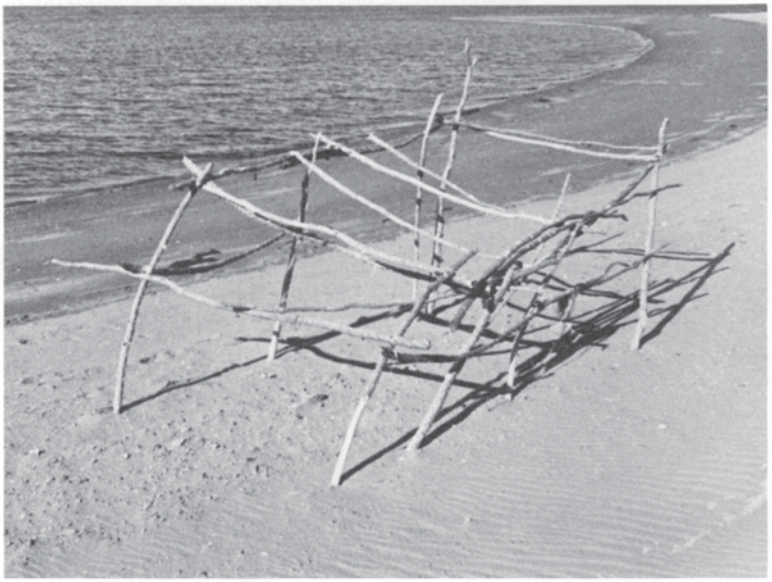

Fig. 43 Traditional Seri house frame, box style (Son I:16:2, structure 1).

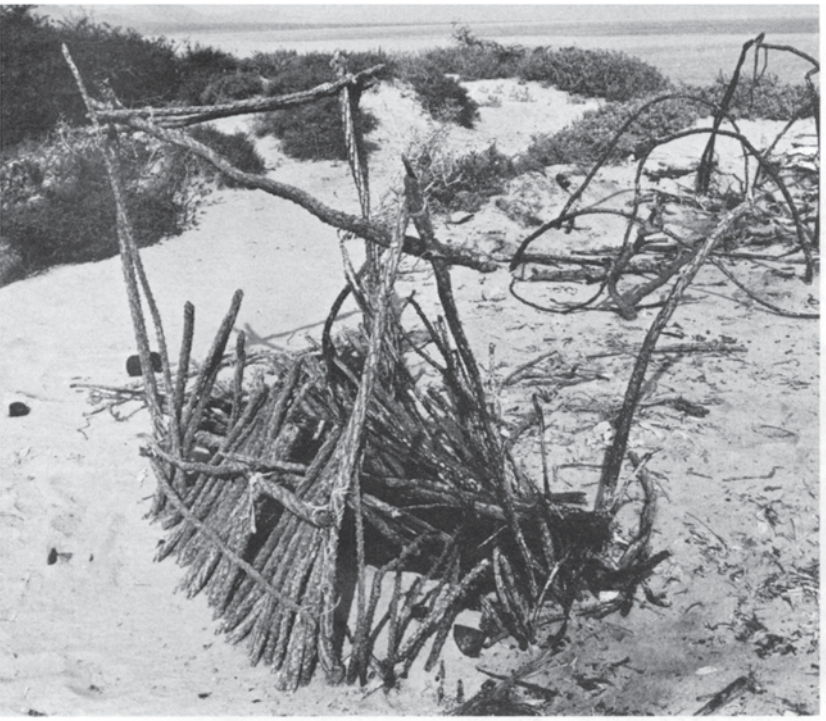

Fig. 44 Chicken pen, Mexican construction technique (Son I:16:3, structure 5).

crest requires less floor leveling. Some of the houses observed are nearly on the crest itself, but most are somewhat downslope on the inland (and leeward) side.

The spatial relationship of houses within a Seri camp is not subject to close regulation. A newly married couple will sometimes append their house to that of the husband's parents or build a separate house nearby. Generally, however, the precise location of houses is a matter of personal preference and convenience.

The antiquity of the traditional Seri house forms is a matter of some doubt. The earliest description of the Quonset-style house is by McGee (1898). Hardy, who visited the Seri during the summer of 1826, saw numerous "huts," but the only structure he actually describes is a shade ramada (Hardy 1829: 282). Mention of houses goes back to the early eighteenth century (McGee 1898: 68). Padre Gilg, however, is explicit in citing a lack of houses among the Tepocas in the late seventeenth century (DiPeso and Matson 1965: 43), and the sources cited by Pérez de Ribas in 1645 also held that the Seri were without houses (McGee 1898: 56).

E. and M. Moser (pers. comm.) have observed that surface indications of abandoned house frames disappear completely in about two years. Since many coastal sites are situated on dunes, shifting sand would preclude any preservation of post indications after the collapse of a structure.

At present, traditional ocotillo frame houses are in use at the seasonal camps, but Seri houses in the two permanent communities of Desemboque and Punta Chueca are of Mexican *jacal* construction.

BURIALS

Only one burial was excavated, but information is available on several others.

Son Q:4:3 (Fig. 45). This burial was the only one excavated by the survey. The skeleton, that of a young adult male, was found eroding from the middle of the dune face (see Fig. 19). The body was supine with the head facing slightly to the left. Both the legs and the arms were fully extended. Orientation was north-south, with the head to the north. Although the grave type and

Image Redacted

Fig. 45 Burial of a young adult male, Son Q:4:3.

dimensions could not be determined, the body must have been placed in an excavated pit. Several unmodified rocks rested immediately over the skeleton, and an inverted basin metate and an oval mano were found resting on the head area. A second mano lay on the sternum. The body was accompanied by a necklace of more than 6,300 shell beads.

In addition to this burial, several human bone fragments were seen on the site surface. A small cluster of bone fragments about 20 m east of the burial may have been the last remnants of another skeleton that had completely eroded out of the dune.

Son I:7:4. This site, near Desemboque, has produced two burials. One is a multiple burial of three adults; the other is that of an infant. Although these burials were excavated by amateurs visiting the area, E. and M. Moser were able to obtain the following information. The multiple burial was found eroding out of the middle of the dune face approximately 3 m above its base. The skeletons lay about 30 cm apart. Body position was identical for all three—supine with legs and arms fully extended. Orientation was north-south, with the heads to the north. The bodies were presumably placed in pits. There were no associated artifacts. The infant burial was found a short distance from the triple inhumation. Apparently the skeleton was too fragmentary for a determination of position and orientation to be made. The body rested under a metate, and a shell bead necklace accompanied the skeleton.

Son I:15:1. At the Tecomate site on Isla Tiburón, Richard S. White (pers. comm.) has observed several burials eroding from the wave-cut face of the dune. Information was obtained on three that had not been completely destroyed. Two of these, exposed about 1.5 m below the crest of the dune, were adult inhumations. Both bodies were lying on their right side in a partially flexed position. In both cases, the left arm was partly flexed, with the lower arm lying across the lower rib cage, and the right arm was tightly flexed, with the hand in front of the face. Orientation was east-west, with the head to the west. No pit outlines were discernible. A mano lay under the femur of one burial, and two Tiburón Plain sherds and a flake were found close to the body. No artifacts were seen near the other burial. The third burial was that of an adolescent. Its orientation and position were identical, except that both arms were tightly flexed. No artifacts were associated.

Many other burials have been seen eroding from Son I:15:1 by other observers. One, noted by W. N. Smith, was a "semi-flexed" skeleton from the basal levels of the site. This burial was accompanied by a tubular stone pipe and two cruciform objects (Hemmings 1967: 163). In 1972, a series of five skeletons became exposed by wave action at the lowest levels of the site and were rapidly eroded out. According to Glen Conklin (pers. comm.), these skeletons were all supine and extended. Orientation ranged between northwest-southeast and northeast-southwest, with the head approximately to the north in all cases. Apparently no artifacts were associated. These burials noted by Smith and by Conklin are especially important because they are from the basal levels of the site, about 6 m below the dune crest and some 4.5 m below the flexed burials observed by White, noted above.

Son N:5:1. Near the Topete Site, south of Bahía Kino, Manuel Robles O. (pers. comm.) has encountered a multiple secondary burial consisting of an adult, a child, and possibly a third individual. Although the skeletons were disarticulated, the orientation was fundamentally east-west, with the heads to the west. No artifacts were found, and the grave type could not be determined.

Son N:6:5. At Son N:6:5, southeast of Bahía Kino, Robles has excavated another multiple secondary burial, this one consisting of four disarticulated adult skeletons. Orientation was east-west, with the heads to the west. No artifacts were noted, and no indication of the grave type remained. Single primary burials have also been observed eroding from Son N:6:5 but have not been excavated. Evidently the body position of these primary burials is uniformly supine, with the arms and the legs fully extended. Orientation is east-west, with the heads to the west (Robles: pers. comm.).

Information on Seri methods of disposing of the dead extends back to Padre Gilg's letter of 1692, which states that the dead were placed in trees (DiPeso and Matson 1965: 52). Since then, tree or platform burial has been frequently cited as a Seri practice. Although elevated burial of adults has occurred in the remembered past, these instances have been rare and have probably been occasioned by ground conditions unsuited to the excavation of a pit grave (M. Moser 1970a). Although both Griffen (1959: 28) and M. Moser (1970b: 209) affirm that stillborns and aborted fetuses are currently placed on platforms in large cacti, inhumation has been the normal manner of disposing of the adult dead at least during the past century and probably for much longer.

McGee's expedition encountered a number of Seri graves marked by stone cairns. Although there is no indication that McGee ever witnessed a burial, his is the earliest description of Seri inhumation. He states that a grave about 90 cm deep was scooped out of the ground with shells. A pelican-skin robe was placed in the pit, then the corpse was "compressed into small compass by closely flexing the knees and bringing them against the thorax, extending the arms around and along the lower

limbs so that the hands and feet are together, and bending the head forward on the chest." The body was then placed in the grave "in such a manner as to lie on the left side, facing northward." The numerous burial furnishings, including food and personal property, were deposited in the grave. The pelican-skin robe was then wrapped around the body, two turtle shells were laid over the bundle, the grave was filled in, and stones and brush were heaped on the grave (McGee 1898: 287-91).

McGee's description refers specifically to "matrons," and he implies that deceased males were not so well treated (1898: 287). Although Griffen has pointed out that burial practices are in fact the same for both sexes (1959: 28), M. Moser (1970a: 213) substantiates McGee's claim that the slain Seri warriors were usually abandoned where they fell.

Edward H. Davis provided a detailed description of the burial of one of the more illustrious Seri, Juan Tomás, whom M. Moser estimates to have died around the mid-1930s:

> His body was wrapped in an old *zerape,* fastened around by rope of native fibre. His grave was dug with paddles from the canoes, four and one-half feet deep in the sand hills near the sea. He was placed in the grave with his head to the north, face up, with the carapace of a sea turtle covering his head. Amid much lamentation and mourning, the grave was partially filled, and then a heavy layer of *cholla* cactus spread over. The grave was then filled and mounded up and covered with *chollas, mesquite,* shells, and thorny growths, and also a five-gallon can. The cactus spines were to discourage coyotes [Quinn and Quinn 1965: 211].

Kroeber (1931: 9) states only that the dead are inhumed and that cremation is unknown.

Griffen (1959: 28–30) presents a description of the social context of death based on much more solid information than McGee's description, although he says less of the burial itself. Griffen states that the body, along with a few items of personal property, is placed in a pit about four feet deep with a space hollowed out of one side. The grave is then filled in and covered over with brush or rocks.

At present, the Seri bury their dead in cemeteries that have been established at Desemboque and the other camps. Dunes were formerly preferred as burial locations if the death took place near the coast, because they offered easier digging and their elevation above the surrounding terrain insured that the body would not end up under a puddle during the rainy season. In mountainous areas where the ground was too rocky for digging a grave, the dead were sometimes placed in caves or crevices in rocks. Stones, brush, or ashes are still occasionally piled on the grave (M. Moser 1970a: 213; pers. comm.).

Status is not reflected in burial. The body is usually wrapped in a blanket and placed in a simple excavated pit. A few prized possessions of the deceased are included in the grave, but the Seri deny that the various mortuary items claimed by McGee, including food, have ever been interred with the body. Formerly, turtle shells were sometimes laid over the body, but the Seri claim that grinding implements were not. The body is placed in the grave on its side, either right or left. The legs are tightly flexed and often tied to the body with cord (formerly mesquite twine or horsehair cord). The arms are either tucked between the legs, or partly flexed with the elbows at the sides of the body and forearms crossed in front of the chest. The Seri say that the reason for the flexed position is to save work in digging the grave—a small bundle will fit in a small pit.

The most critical and purportedly the most closely observed requirement is cardinal orientation. The body is oriented approximately on an east-west axis with the head to the west, where the hereafter (*kóaXiat*) is located. The Seri believe that the spirit of the deceased makes a flip, landing on its feet as it departs from the body on the fourth night after death. Evidently the flip involves a quarter twist as well, since the spirit is said to land *facing* west. It is believed that if the spirit is not facing *kóaXiat* after the flip, it will travel in the wrong direction (E. and M. Moser: pers. comm.; Alexander Russell: pers. comm.; E. Moser and White 1968: 150).

An exception to this pattern occurs when the deceased is buried in a coffin, a practice learned from the Mexicans. Such burials began in the 1940s, and early coffins were usually made of planks from old boats. Since a flexed body does not fit conventional coffin design, the body position is supine, with the forearms folded across the chest and the legs fully extended. All other aspects of coffin burials are normally identical to those of pit burials, including the orientation of the body with the head to the west (E. and M. Moser: pers. comm.).

As Table 6 indicates, there is broad correspondence between the archaeologically known burials and historic Seri practices with respect to dune location, grave type, grave depth, objects placed over the grave, and the uniform sparseness of furnishings (McGee notwithstanding). It is also likely that some of the differences are of no significance. For example, any material wrapped around the archaeological burials would have deteriorated long before excavation. And while the Seri *sometimes* placed turtle shells over the body, their absence among the excavated burials probably reflects the fact that this was not a required practice. Although the Seri claim not to have made the kind of shell bead associated with the burials from Son I:7:4 and Q:4:3 (and those

cited by McGee?), they have a name for these beads and attribute their manufacture to the legendary Giants who once inhabited Seri territory and Baja California (E. and M. Moser: pers. comm.). In this context it is worth noting that the ascription of objects and events to the Giants is probably a convention for indicating the distant Seri past beyond the memory of specific events (see *Seri Oral Tradition* in Chapter 8).

The flexed burials in the upper levels of Son I:15:1 correspond so closely with contemporary Seri practices that there is no reason not to regard them as Seri. Whether they are of considerable age or recent is not known. However, comparative recency is suggested by the depth of the skeletons below the present ground surface, which approximates modern Seri grave depth, and by the fact that the site itself continued to be a favorite camp into the 1960s.

Certain characteristics of the remaining burials, such as supine extended position, orientation with the head to the north, and secondary burial, all represent clear departures from conventional Seri burial of the present time. Nevertheless, the simplest interpretation is that this diversity is subsumed under a single, rather variable Seri tradition that has become somewhat more standardized only in recent times. Although some changes through time in burial pattern may have occurred among the Seri generally, it is possible that much of the variation encountered archaeologically reflects different preferences or requirements among the former Seri bands. As band structure collapsed and the Serian speakers amalgamated into a single group, the idiosyncrasies of certain of the bands must have been adopted generally while other practices, characteristic of the other bands, were abandoned. Those that persist today may represent only a segment of the variation that existed in the past.

Judging from current attitudes, standardization of body position, involving the relinquishing of the extended supine position, would not have required the giving up of any hallowed beliefs. The flexed side position is viewed only as a matter of convenience, and, as coffin burials demonstrate, the modern Seri have no proscription against placing the body in an extended supine position. Moreover, this standardization would appear to be quite recent, since Davis indicated that Juan Tomás, who died shortly before coffin burial began, was buried "face up" (Quinn and Quinn 1965: 211). Although Davis did not specifically state that the legs were extended, they probably were; had the body been supine and flexed, Davis almost certainly would have mentioned it.

The differences in orientation present an enigma that may be more apparent than real. Although the prescribed orientation is based directly on fundamental and presumably enduring beliefs pertaining to the afterlife, even in recent years not all of the Seri dead have been buried with their heads to the west. A baby that died in 1972 was buried with her head to the east, and a man who died in the middle 1950s is oriented with his head to the north; the latter orientation corresponds with that of Juan Tomás, as described in Davis's statement quoted above. The varied placement of head crosses in a cemetery near Desemboque indicates that orientation is far from uniform.

One Seri, while maintaining that the dead should be and usually are buried with the head to the west, states that exceptions may have occurred in the past. According to this man, a person might be oriented in the most convenient direction if there were not adequate space for an east-west placement, or if the group were under pressure to leave the area. Such conditions might explain reported occurrences of archaeological burials with seemingly random orientations. In all probability, orientation with the head to the west has long been a matter of strong preference, but is evidently not an inviolable requirement.

The basis for ascribing the secondary burials at Son N:6:5 and the Topete site to the Seri tradition is less satisfactory. Although in both cases orientation is with the head to the west, secondary burial is neither a contemporary practice nor is it remembered by the present Seri. The purpose of secondary burial is equally obscure. It might be speculated that the bones or partly decomposed remains of individuals slain in battle and initially abandoned might later have been gathered together and buried. If so, this practice must have disappeared long ago. The present Seri say that they would not even consider bothering to bury the remains of someone who died alone or was killed in battle, even if the victim were a close relative. The Seri know where the surface remains of several remembered individuals lie, most of them on Isla Tiburón. One of these is a man who was killed in a skirmish; neither his surviving son nor anyone else has felt any obligation to bury the remains (E. and M. Moser: pers. comm.).

Another possibility is that secondary burial was performed by Mexicans, who may have encountered abandoned Seri corpses from time to time. However, if Mexicans were responsible for the two known examples, it remains to be explained why their orientation is consistent with current Seri beliefs.

One Seri, when asked about secondary burial, postulated that it might have been performed by the members of Band II (E. and M. Moser: pers. comm.). Although little more than conjecture, this belief gains some credence from the fact that both examples are

TABLE 6
Comparison of Central Coast Burial Characteristics

	Son Q:4:3	Son I:7:4	Son I:15:1: Upper Levels	Son I:15:1: Lower Levels	Son N:6:5: Primary Burial
Number of individuals	1	4	3	Several	Several
Orientation	N-S	N-S	E-W	Varying, NE-SW to NW-SE	E-W
Orientation of head	N	N	W	Generally N	W
Position	Supine	Supine	Right side	Supine	Supine
Legs	Fully extended	Fully extended	Partly flexed	Usually fully extended; 1 partly flexed	Fully extended
Arms	Fully extended	Fully extended	Rt: tightly flexed Left: partly or tightly flexed		Fully extended
Location	Dune	Dune	Dune	Dune	Level ground
Grave type	Pit?	Pit?	Pit?	Pit?	
Grave depth below present ground surface	1.7 m		1.5 m	6 m	
Body wrapping					
Objects placed over body					
Furnishings	1 metate, 2 manos, shell beads	3 burials: nothing. 1 burial: 1 metate, shell beads	2 burials: nothing. 1 burial: 1 mano	Most burials: nothing. 1 burial: 2 cruciforms, 1 stone pipe	
Objects placed over grave	Rocks				

from the territory once held by this band (see Moser 1963).

Despite the absence of convincing evidence linking secondary burial to the Seri, it is a possibility that cannot be discounted. The Seri bands may have differed considerably in their manner of disposing of the dead, and the *known* diversity of methods ranges from inhumation in level ground, dunes, caves, and crevices to deposition in the branches of large cacti and utter abandonment of the body.

PICTOGRAPHS

La Pintada

Just east of the highway between Hermosillo and Guaymas, and about half way between those cities, lies a small but very rugged mountainous area that has become known as La Pintada (see Fig. 9), because of its pictographs. The area was visited briefly but for lack of time was not studied in detail. Recently the Museo Regional de Sonora (1971) has reported on these pictographs.

Most of the pictographs occur on the walls of a canyon near a large permanent *tinaja*. The panels include a variety of animal, bird, and human representations, seemingly in several different styles, as well as six-fingered hands and an array of geometric designs. The colors employed are black, red, white, yellow, and orange. There are unmistakable representations of a cow, a Christian cross, and a horse with a rider which appears to be an animal holding the reins. One human figure carries what appears to be a stylized sword. Of special interest is a "spoked wheel" design, which is identical in form to the most prominent stone outline figure at Son I:15:3 (Museo Regional de Sonora 1971).

Son N:6:5 and Topete Site: Secondary Burials	Seri: Late 19th Century (McGee 1898)	Seri: 1930s (Juan Tomás)	Seri: Post-1950 Burials	Seri: Post-1940 Coffin Burials
6		1	Many	Many
E-W	E-W	N-S	Normally E-W	Normally E-W
W	W	N	W	W
(disarticulated)	Left side	Supine	Either side	Supine
	Tightly flexed	Probably extended	Tightly flexed	Fully extended
	Extended, hands next to feet	?	Partly flexed or extended with hands between knees	Forearms folded across chest
Level ground	Dune? or elsewhere	Dune	Cemetery (formerly dune preferred)	Cemetery
	Pit	Pit	Pit	Pit
	0.9 m	1.5 m	1.2 m	1.2 m
	Pelican skin robe	Serape	Blanket	Blanket
	Turtle shells	Turtle shell	Turtle shells (occasional)	
	Personal items (e.g., mano, shell beads, awls, food in pottery vessels or shells, fetishes)	?	Personal items	Personal items
	Rocks, brush	Shells, brush	Rocks, brush	

Artifacts are scarce in the vicinity of the pictographs, but a few sherds of Tiburón Plain were found along with sherds that may be Piman. The Museo Regional collection from this area includes shell, central-coast style ceramic figurines, beads, projectile points, and incised central-coast style ceramic and stone pipes.

Elsewhere in the La Pintada area, refuse in rock shelters indicates fairly extensive habitation. The artifacts, only some of which can be attributed to the central coast people, suggest occupation of the area by more than one cultural group. It is clear from the European animals represented in some of the pictographs that the occupation was at least in part post-Spanish. Since La Pintada was almost certainly part of the Cerro Prieto stronghold, where a group of disaffected Seri, Pima, and others held out against the Spaniards between 1751 and the 1770s (Museo Regional de Sonora 1971; Spicer 1962: 108–10, Map 8), the area would be well worth further study.

Other Pictograph Sites

On the central coast proper, there are several caves containing pictographs that are known to the Seri. One, in the mountains east of Desemboque, has been recorded by Richard S. White. This cave consists of two chambers connected by a passageway. On the floor of the site were found a small number of Tiburón Plain and Historic Seri sherds along with a few flakes and shells. Several additional sherds, probably from a single vessel, were seen scattered on the talus below the site. There are seven pictograph panels (Fig. 46), all but two of them in the smaller chamber. Most of the figures were rendered in red with yellow-orange, blue-black, and white employed to a lesser extent (White: pers.

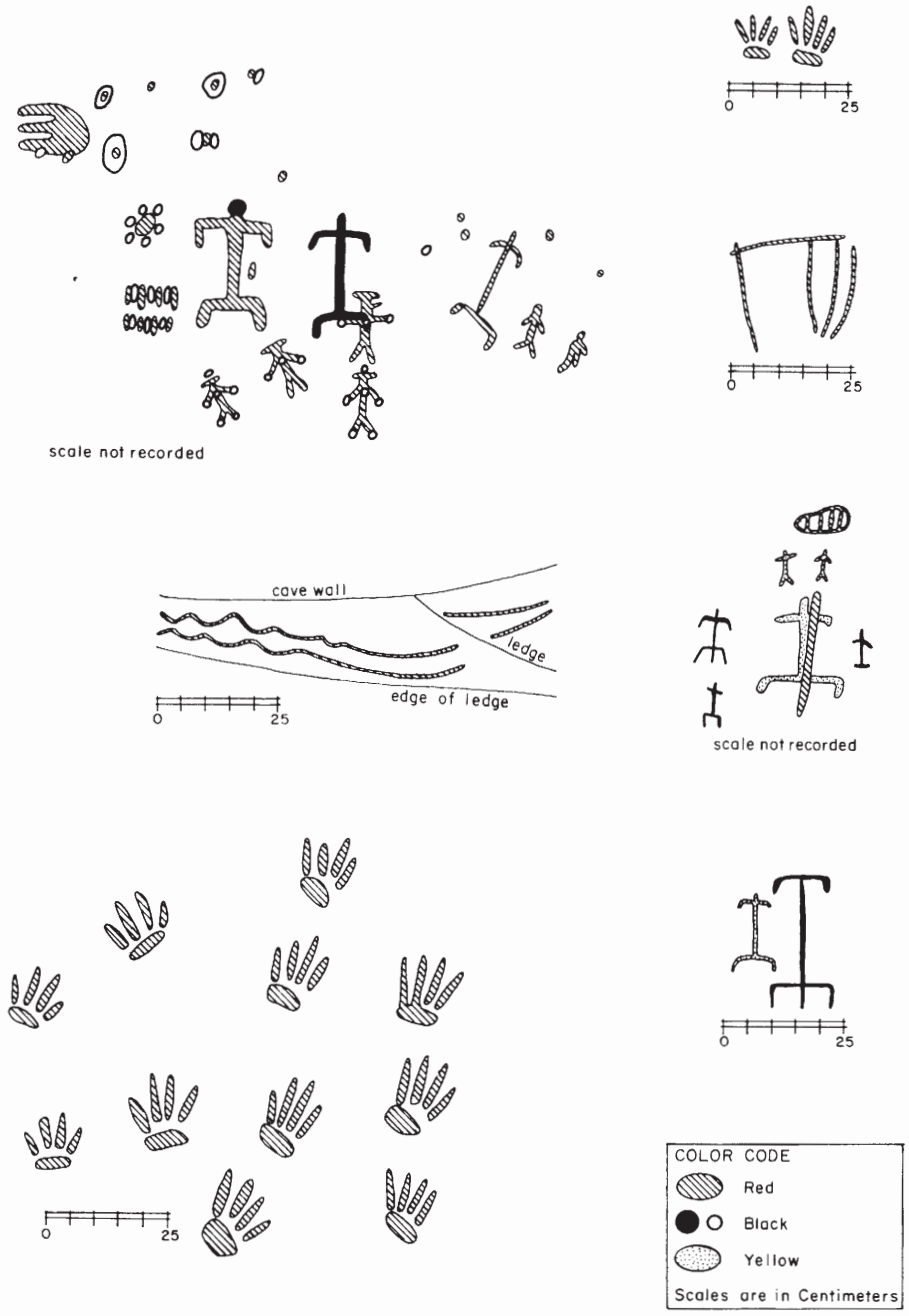

Fig. 46 Pictograph panels at a cave site east of Desemboque. (Redrawn from sketches by Richard S. White.)

comm.). The figures do not bear much resemblance to the paintings at La Pintada, either in forms represented or in style.

This cave and the others said to contain pictographs are regarded by the Seri as places where visions may be sought. The Seri believe the paintings to be representations of spirits or forms shown the vision seeker by the spirits (E. and M. Moser: pers. comm.).

Grant (1967: 128–9) has also encountered a number of pictograph sites on the central coast, including some on Isla Tiburón. He apparently recognizes two styles, one consisting of figures of animals and stylized humans in red, and another of "animals and triangular human figures without legs" in black and white (1967: 129). All are characterized as simple and crude.

5. CERAMICS

The pottery of the central coast appears to form a single lineal sequence. The early pottery is a hard, well-fired plainware that has often been referred to as "eggshell pottery" because of its thinness. Changes in a number of attributes through time, including those dependent upon the adoption of organic temper, eventually transformed this well-made pottery into the crumbly, poorly fired product of the contemporary Seri. For purposes of analysis and discussion, this temporal continuum will be divided into three segments, forming a sequence of provisional types. The earliest of these, which will be designated Tiburón Plain, encompasses the bulk of all central coast pottery. A second type, which will be designated Historic Seri, evolved from Tiburón Plain and is the only other type of archaeological importance. The third and latest type, which will be designated Modern Seri, comprises the ethnographically known portion of the continuum; it has been manufactured since about 1930, exclusively for sale to outsiders. Since the Seri have never used this type themselves, its archaeological significance is negligible.

This classification of sherds into Tiburón Plain and Historic Seri is based on a single criterion, the presence or absence of organic temper, although this is not the only diagnostic attribute. Pottery that lacks organic temper is defined as Tiburón Plain, and pottery that includes it is Historic Seri. The selection of organic temper as the criterion for type assignment is arbitrary, in the sense that many other criteria could have been used as appropriate bases for classification, but it is not capricious. In the absence of stratigraphic information, organic temper is of great value as a time marker, since there is some basis for estimating when it was first introduced. In differentiating Historic Seri from Tiburón Plain solely on the presence of organic temper, there is some justification for assuming that these two types are temporally, and not merely formally, distinct. At present organic temper is the only pottery characteristic for which a time estimate can be made.

Like any typological classification, the sequence proposed here obscures the continuity in the process of ceramic change because of the inherently static nature of the type concept itself. As Brew has eloquently pointed out (1946: 44–66), the type concept creates an appearance of stability throughout the temporal duration of a given type, followed by a sudden transformation into an equally static subsequent type. With respect to the pottery of the central coast, it is important to recognize that many attributes appear to have undergone change within the span of each of the proposed types, and that the transition from Tiburón Plain to Historic Seri was almost certainly gradual.

POTTERY TYPE DESCRIPTIONS

The discussion below is based primarily on the pottery collected by the survey and that in the Moser collection, the Museo Regional de Sonora, and the Arizona State Museum.

Tiburón Plain

Defining Attribute:. Absence of organic temper.

Synonyms. "Eggshell pottery," *"cáscara de huevo"* (colloquial); Tiburón Island Thinware (W. Smith 1970: 8).

Range. Coastal Sonora from slightly north of El Desemboque de los Seris to the Guaymas area and extending at least 20 km inland. Also present on Isla Tiburón and Isla San Esteban. Tiburón Plain is comparatively homogeneous throughout its range. For the most part the differences among sherds from widely separated sites are no greater than the formal variation among the sherds at any given site.

Time Span. From sometime between A.D. 700 and 1400 until at least 1800.

Construction. Coiled, probably scraped.

Paste. Fine sandy clay.

Temper. Probably none added.

Hardness. Tends to be very hard, ranging from 3.5 to 6.0 and averaging about 4.5 (Moh's scale). Many sherds emit a characteristic ring when dropped on a hard surface. Sherds are generally brittle; fracture is straight and clean.

Surface Color. Generally ranges from tan or buff to brown but includes pink and light gray. Fire clouds common.

Core Color. Same range as surface color and usually the same as the surface color.

Exterior Surface. Generally fairly smooth but ranges from very smooth to very uneven and dimpled. On a few sherds coil marks are not fully obliterated. Striated sur-

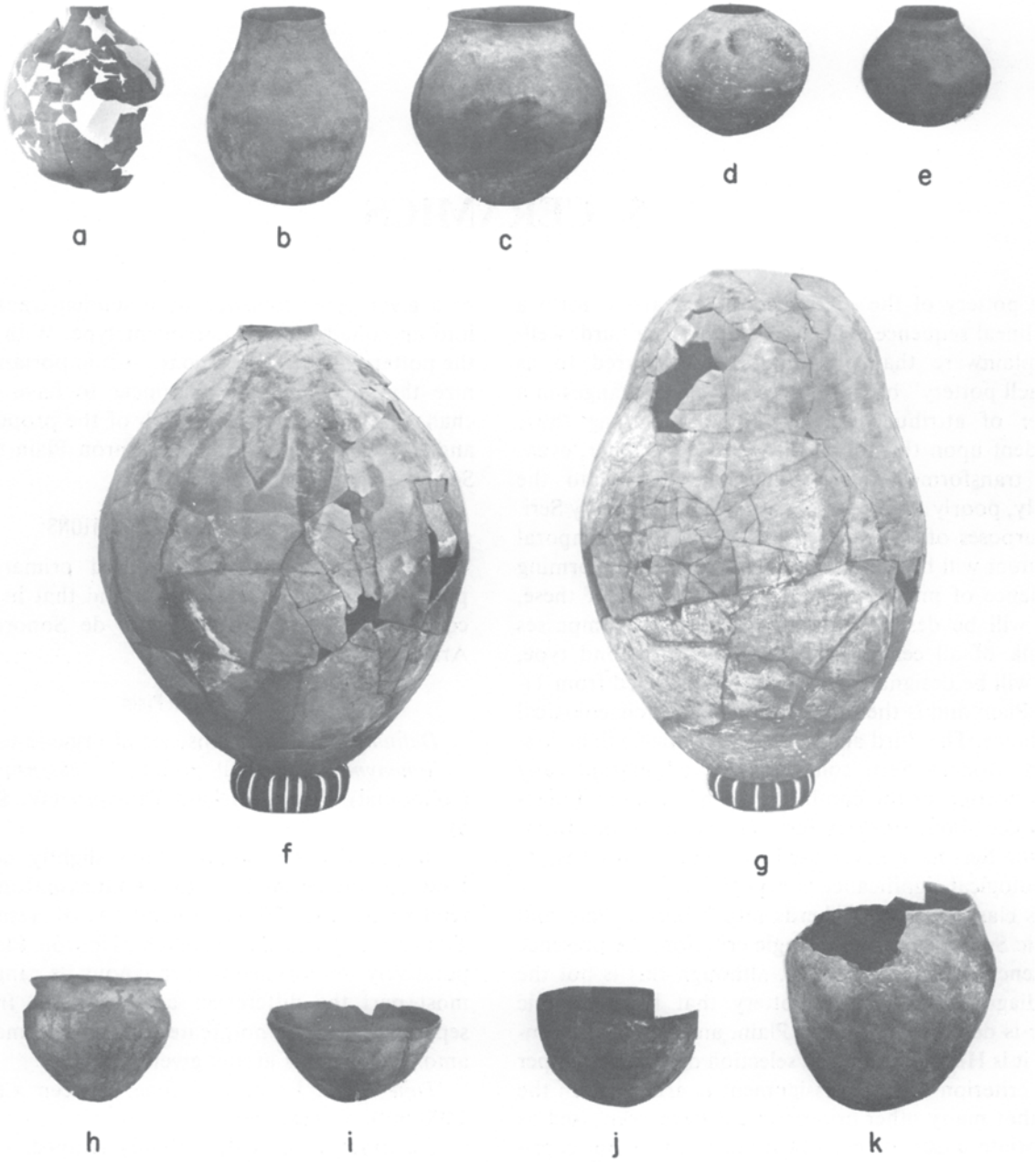

Fig. 47 Tiburón Plain vessels. Painted designs on vessels *a, b, e* are illustrated in Figure 52 *d, e, a* respectively. All specimens from the Moser collection except *a,* Museo Regional de Sonora. Height of *g,* 66.5 cm.

faces are very common. Striations vary in width and depth. They are either vertical or oblique with respect to the rim, never horizontal. Striations from opposite sides may overlap at the bottom of the vessel. Evidence of stone polishing occurs on a minority of sherds. On sherds that exhibit polishing over the striations, polishing marks are few and widely spaced, often running counter to the direction of the striations, and they may be either light or heavy. On sherds lacking striations, polishing marks may be few and widely spaced, or the entire surface may be fairly well polished.

Interior Surface. Generally very smooth. Occasional sherds may show evidence of scraping, polishing marks, striations similar to those on exteriors, or depressed fingerprints. A few sherds have fairly prominent gouge marks produced by thinning, and rare specimens display the rough, deep scoring common in Trincheras pottery.

Thickness. Usually very thin. Range is from 2 mm to about 5 mm, averaging about 3 mm.

Vessel Shapes (Fig. 47). Information on vessel shapes is sketchy. Many vessels, both ollas and deep bowls, are spheroidal with slightly conical bases (for example, Fig.

47 *f*); others are globular. Ollas generally lack a pronounced shoulder. A few wide-mouth ollas are known (Fig. 47 *c* and *h*) but most vessels, even large ones, have very small mouths, suggesting use as storage containers. Bowls tend to be deep; very few shallow bowls are known. Specialized forms are small disk-shaped potlids and small rounded or flat-bottomed vessels the size and shape of conventional drinking glasses.

Rim. The rims of most ollas and bowls are direct, and a few are slightly everted. Tapered rims are common. On bowls it is generally the interior surface that is tapered; on ollas the rim is usually tapered from the exterior.

Lip. Both rounded and squared, sometimes on the same sherd.

Vessel Size. As has often been noted on the basis of sherd curvatures, very large vessels were sometimes made of this thin ware. The largest measurable vessel known is 66.5 cm in height and 45.0 cm in diameter (Fig. 47 *g*).

Decoration. A few vessels are painted or incised, but they are too scarce to warrant separate type designations (see discussion of decoration below, under *Ceramic Attributes*).

Historic Seri

Defining Attribute. Presence of organic temper.

Synonyms. "Eggshell pottery" and *"cáscara de huevo"* (colloquial).

Range. Coastal Sonora from the vicinity of El Desemboque de los Seris to Punta Santa Rosa and extending about 20 km inland. Also present on Isla Tiburón.

Time Span. Possibly began as early as 1700, but probably not common before the early nineteenth century; continued until about 1930.

Construction. Coiled, probably scraped.

Paste. Fine sandy clay.

Temper. Organic temper in all specimens (by definition). About a third of the specimens classed as Historic Seri also have micaceous inclusions, a characteristic noted by McGee (1898: 183).

Hardness. Moderate, ranging from about 3.0 to 4.5 and averaging about 3.5 (Moh's scale). Fracture is sometimes clean and straight, but some sherds tend to be crumbly, partly because of excessive quantities of organic temper.

Surface Color. Usually dark gray or brown; less frequently tan or reddish. Fire clouds common.

Core Color. Light gray to black.

Exterior Surface. Generally uneven or dimpled, but some are very smooth. On a few sherds coil marks are not fully obliterated. Most specimens are fully but lightly polished. Striations are absent. Many specimens have a pitted surface left by combustion of fibrous temper particles during firing. In some cases a slip was applied.

Interior Surface. Very smooth, lacking any sign of scraping, gouging, or finger marks. Widely spaced polishing marks are common. Pitted surface is very common.

Thickness. Range is from about 3 mm to 5 mm, tending toward the former.

Vessel Shapes (Fig. 48). The characteristic Tiburón Plain ellipsoidal vessels persisted in Historic Seri (Fig. 48 *e;* McGee 1898: Pls. 32, 33), but there appears to have been an increase in the popularity of globular forms. Shallow bowls are also present. A characteristic Historic Seri form is a wide-mouth pot, similar to the Papago bean pot, which was probably used for cooking (Fig. 48 *b* and *c*). Both McGee (1898: 184–5, Pl. 10) and Kroeber (1931: 18) noted that the bases of broken ollas were also used as cooking pots. Miniature vessels are reported by McGee (1898: 185) and are known from the Moser collection.

Rim. Direct rims occur but moderately everted rims are more common, especially on wide-mouth pots. A few rims are flared. Tapered rims are absent. Rim coils are fairly common, especially on wide-mouth pots.

Lip. Rounded.

Vessel Size. The largest known measurable vessel (Fig. 48 *e*) is 47.0 cm high and 38.0 cm in diameter. The smallest vessels are hand-modeled miniature wide-mouth pots and bowls, which may be only 4 cm in diameter or height.

Decoration. Decoration is not common. Vessel bodies were decorated with painting and appliqué. A few rim coils were decorated with punctate bands, thumb indentations, or incising.

Modern Seri

Defining Attribute. None. This "type," defined primarily for the sake of convenience, differs from Historic Seri in only a few respects. It is distinguished merely because it is the pottery manufactured since about 1930 for sale rather than use. It is described in detail by Bowen and Moser (1968).

Synonyms. None.

Range. Does not occur archaeologically.

Time span. Post-1930.

Construction. Coiled and scraped.

Paste. Fine sandy clay.

Temper. Organic temper, consisting of ground rabbit dung. Proportion of temper to clay is about 1:3. Mica is not present.

Hardness. About 2.5 (Moh's scale). Fracture is irregular and crumbly.

Surface Color. Dark brown or reddish, less frequently dark gray. Fire clouds common.

Core Color. Dark gray to black.

Exterior Surface. Generally very uneven, sometimes

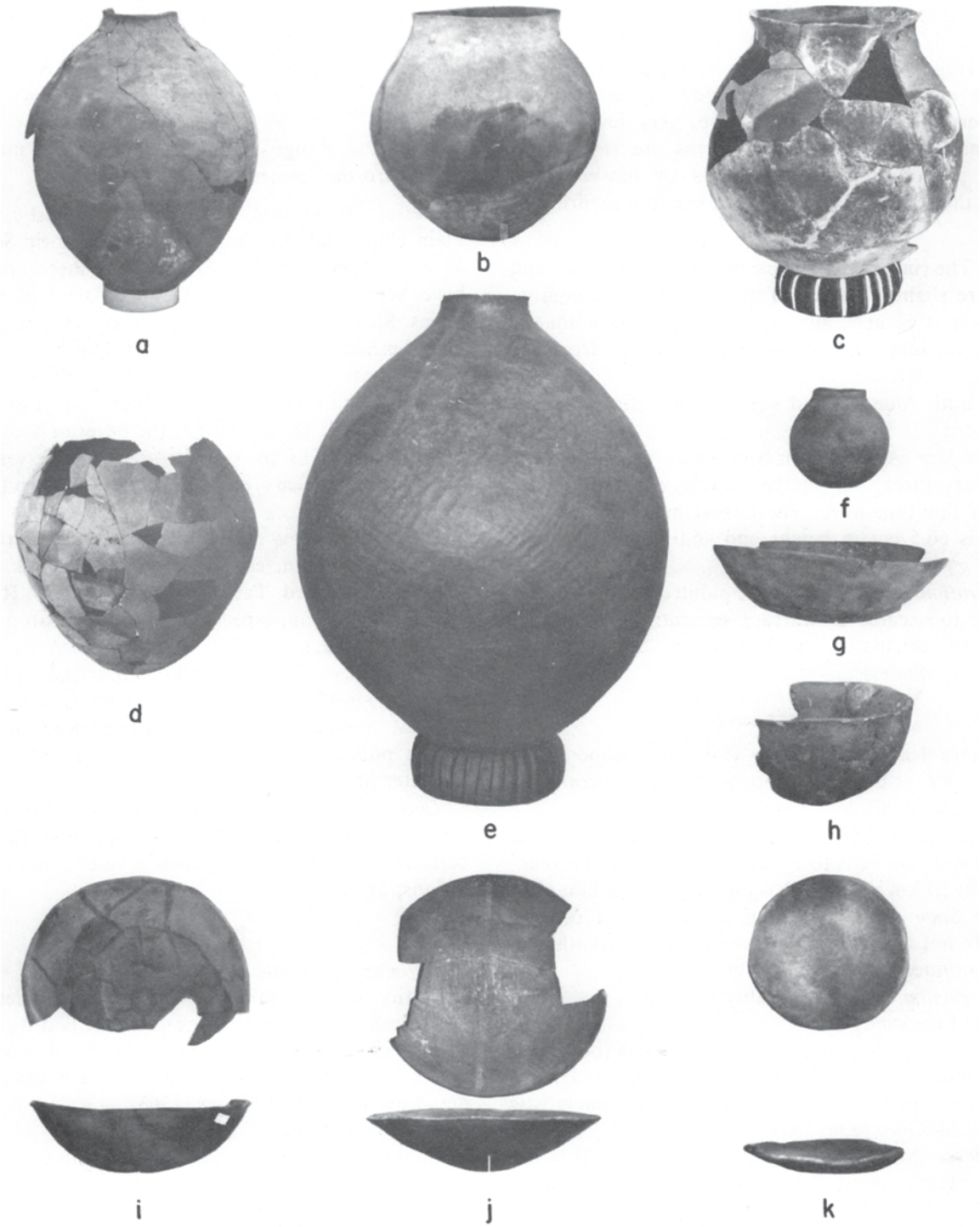

Fig. 48 Historic Seri vessels. Painted designs on *e, i, j* are illustrated in Figure 52 *b, g, h* respectively. All specimens from the Moser collection except *d* and *e*, Museo Regional de Sonora. All are same scale except *e* and *k*. Height of *a*, 39.0 cm; height of *e*, 47.0 cm; diameter of *k*, 12.1 cm.

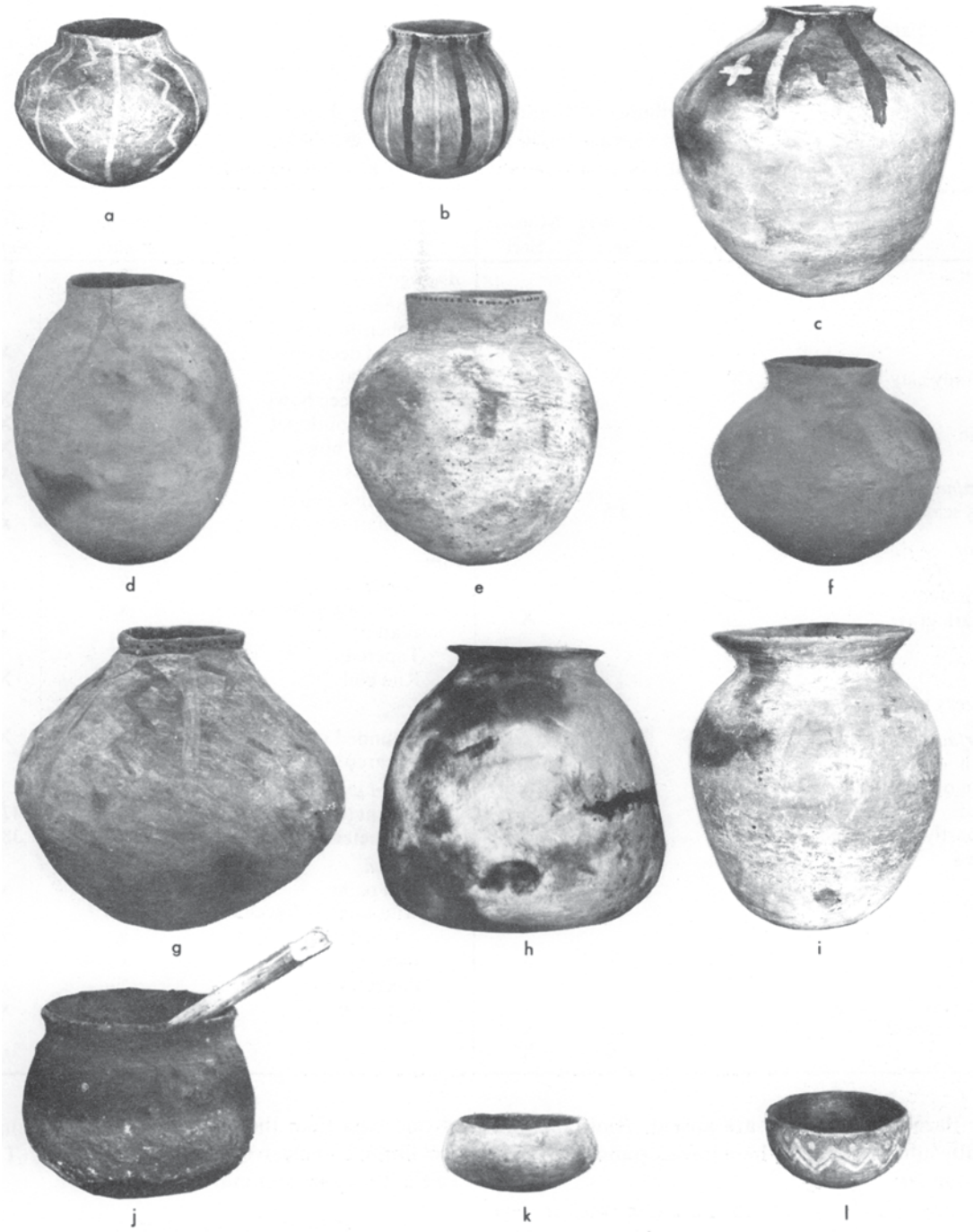

Fig. 49 Modern Seri vessels. Specimens *a–f* are typical ollas, *g–i* are aberrant forms; *j* is a tar pot, *k* and *l* are bowls. Punctate rim bands on *b* and *e;* partial punctate rim band on *g;* incised zigzag rim band on *l*. Painted designs: alternating straight and zigzag white lines *(a)*, alternating white and blue lines *(b)*, alternating lines and crosses in light and dark blue *(c)*, alternating straight red and zigzag blue lines *(g)*, encircling dots and double zigzag line *(l)*. Vessels *b, e, g, j, k* from the Moser collection. Height of *c*, 28.5 cm.

slightly dimpled. Most specimens are polished. Unslipped exteriors are pitted because of combustion of fibrous temper particles, but pitting is inconspicuous or absent on slipped vessels.

Interior Surface. Rough and uneven. Scraping marks usually are not entirely obliterated, and some polishing marks may be evident.

Thickness. Only a few specimens measured, all about 5 mm thick.

Vessel Shapes (Fig. 49; Bowen and Moser 1968: Fig. 26). The great majority of modern vessels are ollas, and most of these are globular. Less common forms are wide-mouth pots, bowls, and miniature vessels.

Rim. Most rims are moderately everted and some are

TABLE 7

Attributes of Central Coast Pottery Types
(X = characteristic attribute; x = attribute present but not characteristic; blank = attribute absent)

	Tiburón Plain	Historic Seri	Modern Seri
Construction			
Coiled	X	X	X
Scraped	X	X	X
Paste			
Fine sandy clay	X	X	X
Temper			
Organic		X	X
Mica		X	
Average hardness (Moh's scale)	4.5	3.5	2.5
Surface color			
Tan	X	x	
Dark brown or dark gray		X	X
Core color			
Tan	X		
Light gray to black		X	X
Exterior surface			
Smooth	X		
Uneven or dimpled	x	X	X
Striated	X		
Coils partly obliterated	x	x	
Polished	x	X	X
Pitted		X	x
Slipped		x	X
Interior surface			
Smooth	X	X	x
Scrape or gouge marks	x		x
Polishing marks		x	x
Pitted		X	X
Average thickness (mm)	3	3.5	5
Vessel shapes			
Spheroid olla and deep bowl	X	X	x
Globular olla and deep bowl	x	X	X
Wide-mouth pot	x	X	x
Shallow bowl	x	X	
Flat disk (potlid)	x	x	x
Drinking vessel	x	x	
Miniature vessel		x	x
Rim			
Direct	X	x	
Moderately everted	x	X	X
Flared		x	x
Tapered	X		
Rim coil		X	x
Lip			
Rounded	X	X	X
Squared	X		
Maximum known vessel size			
Height (cm)	66.5	47.0	28.5
Diameter (cm)	45.0	38.0	30.5
Decoration			
Red paint	x	x	X
Rim band—descending line design	x	x	X
Incising	x	x	
Punctation		x	x
Appliqué		x	

markedly flared. Direct rims are absent. Rim coils are occasionally added; some of these have a punctate band.

Lip. Rounded.

Vessel Size. The largest vessel measured was an olla 28.5 cm high and 30.5 cm in diameter (Fig. 49 *c*). One miniature vessel is known.

Decoration. Painting is common. Other techniques are punctation (several examples) and incising (one known specimen), both confined to the rim area.

CERAMIC ATTRIBUTES

Continuity as well as change is readily apparent when the central coast pottery types are viewed in terms of individual attributes, as in Table 7. The table makes a rough distinction between attributes that are characteristic, although not necessarily omnipresent (upper-case *X*), and those that appear only occasionally (lower-case *x*). While many attributes are much more characteristic of one type than the preceding or succeeding type, few are limited exclusively to a single type. The data in Table 7 may be summarized as follows:

Number of attributes common to all three pottery types	14
Number of attributes shared by:	
Tiburón Plain and Historic Seri	6
Historic Seri and Modern Seri	11
Tiburón Plain and Modern Seri	1
Number of attributes occurring only in:	
Tiburón Plain	5
Historic Seri	2
Modern Seri	0

This continuity of attributes is a primary reason for assigning the pottery of the central coast to a single tradition.

Construction

The basic construction for all three types was coiling. For Tiburón Plain and Historic Seri, the method is indicated by occasional sherds with the coils only partly obliterated. Modern Seri pottery is constructed by coiling on a small hand-modeled base, and it is thinned by scraping with a shell or metal spoon. The interiors of Tiburón Plain sherds occasionally bear scraping marks, but the exteriors are usually too well smoothed to leave any evidence of scraping. The interiors of Historic Seri sherds are usually well smoothed, but the exteriors are sometimes dimpled, as are those of most Modern Seri vessels. Although dimpled exteriors superficially suggest paddle thinning, comments on Seri pottery extending back to the time of McGee's visit specifically state that paddles have not been used. The paddled appearance is probably produced in much the same way as in the modern pottery from the San Miguel Valley described by Owen (1957), in which a dimpled effect resulted from hand smoothing over gouges produced by scraping. At present the Seri use only their fingers as anvils, although Kroeber (1931: 17) states that a stone was pressed against the interior while the exterior was scraped.

Paste

Fine sand is present in the paste of all three types. Rather than being an additive, it probably occurs naturally in the clays that were used.

Temper

Micaceous inclusions are visible in about a third of the sherds classified as Historic Seri. It is not certain whether mica is a natural constituent of the clays at certain quarries or was added as temper.

From an archaeological perspective, the introduction of organic temper was the single most important change in the pottery. The presence of organic substances is indicated by several attributes, most notably a dark core and a pitted interior or exterior surface resulting from the combustion of fibrous particles near the surface of the vessel. Pitted exteriors are somewhat less common among Historic Seri sherds than pitted interiors, however, because of the occasional practice of applying a slip. Since most Modern Seri pottery is slipped, pitting is not usually conspicuous.

Evidently, organic temper could have some effect on surface color if it was included in sufficient quantity and no slip was applied. In contrast to Tiburón Plain, some Historic Seri sherds are dark brown or even black, as are the interiors of many Modern Seri vessels. Black surfaces are not the result of smudging, since the entire core may also be black. In some cases the interior surface and the core are a dense black, whereas the exterior, if slipped, fires to a brown or reddish hue.

Vessels made with organic material also tend to be structurally weaker than those with no organic material, especially when large quantities are incorporated. This can be seen both in the reduced hardness and in the increasingly crumbly fracture of the later pottery.

The importance of organic temper is that it bears at least rough chronological implications. Over most of the Southwest the idea of using organic temper appears to have been introduced by the Europeans, and horse manure seems to have been the most widely used material. Thus it is usually assumed that the use of organic temper in the Southwest probably dates no earlier than the arrival of the Europeans and the horse. Fontana and others (1962: 57, 102), on this reasoning, assume that Papago pottery bearing a black core is more likely post-Spanish than pre-Spanish, and give a compromise and somewhat arbitrary date of 1700 for the beginning of Papago-European contact.

At present the Seri use ground rabbit dung as temper, but they say that in the past the preferred substance was horse manure (Bowen and Moser 1968: 93). Although rabbit dung was certainly available for use in pre-Spanish times, it is probably safe to assume that the Seri did not invent the idea of organic temper and that rabbit dung has come into use only in comparatively recent times.

The ultimate source of the Seri use of organic temper was presumably the Europeans, although they might have received the idea indirectly through another Indian group, since Seri-European relationships were largely hostile. One such group might have been the Papago, with whom the Seri have long had contact; in this case, the Seri use of organic temper would have been no earlier than its earliest use by the Papago, about 1700. Another source might have been the Pima with whom some Seri groups confederated against the Spaniards in the Cerro Prieto from 1751 until the 1770s (Spicer 1962: 108). It may be, however, that at least a few of the Seri learned to use organic temper directly from the Europeans through the short-lived Seri missions, particularly Nuestra Señora del Pópulo, founded in 1679. Since DiPeso's survey of the Pópulo mission site turned up only organic-tempered pottery (pers. comm.), either the resident Seri were using organic temper or the pottery was being manufactured by the Europeans or other Indians. If it is assumed that the Pópulo Seri were making pottery, the initial Seri use of organic temper would date to shortly before 1700.

This date is probably misleading, however, because it would refer to a use of organic temper by a small minority of Seri living at an inland site under direct European influence. The majority of Seri, living on the central coast proper, experienced very little contact with the Europeans at that time. Although the idea of

organic temper might initially have been transmitted to the Seri on the coast at this early date, perhaps by Pópulo escapees, the archaeological distribution and frequency of organic-tempered sherds suggests that it did not come into general use until much later, probably not until the nineteenth century (see the discussion under *Frequency and Distribution,* below).

Hardness

As Table 7 indicates, the hardest pottery is Tiburón Plain. Hardness seems to be one of the attributes affected by organic temper, and central coast pottery shows a steady decrease in hardness up to the present as the use of organic temper increases. Similarly, fracture is clean and straight in Tiburón Plain, whereas it is crumbly in Modern Seri. Firing temperature is also involved in hardness and fracture, and it is likely that firing temperatures in the past were much higher than for the poorly fired contemporary product.

Exterior Surface

The surfaces of most Tiburón Plain sherds are very smooth and even. Specimens that show an uneven exterior are usually dimpled and polished, looking very much like Historic Seri sherds, but lacking any sign of organic temper. Such sherds may be late. A considerable number of Historic Seri exteriors are very smooth, but some are dimpled. The surfaces of Modern Seri pottery are not so much dimpled as simply uneven, as a result of careless construction.

Exterior striation, although limited to Tiburón Plain, is one of the most diagnostic attributes of central coast pottery. The striations could have been produced in a number of ways, one of which is smoothing with the back of a shell. The Seri traditionally have thinned and smoothed the surface with the shell of a particular species of bivalve, *Mactra dolabriformis* Conrad. The edge of the shell was used for thinning, and the ridged back is said to have been used in the past to smooth the exterior while the clay was still damp (Bowen and Moser 1968: 99–100, 127–8). The possibility that the striations on Tiburón Plain sherds were produced by this shell was tested by stroking a flat piece of modeling clay with the back of one of these shells, obtained from a Seri potter. The resulting striations were indistinguishable from those on many Tiburón Plain sherds, which suggests that the use of this species for smoothing has considerable time depth. However, it is likely that other species of shells and perhaps fiber bundles have also been used, since the striations of some Tiburón Plain exteriors could not have been produced with *Mactra* shells and since the Seri say that this shell is found only in certain localities on the coast.

Polishing appears to be an attribute that developed independently of, and did fully not coincide with, the use of organic temper. Some Tiburón Plain sherds have widely spaced polishing marks, and a small number are fully polished. Historic Seri pottery was normally fully polished, and more or less complete polishing of the vessel has continued to the present. As with modern pottery, the polishing implement was probably a smooth beach pebble.

Pitted exteriors are faily common among Historic Seri sherds but are not as typical of Modern Seri vessels. At present a thick slip of pure clay lacking any organic inclusions is applied with the fingers. Although some Historic Seri vessels are slipped, this technique does not appear to have become popular until the 1950s. Nearly all vessels made since about 1960 are slipped, but many dating from the 1930s are not. At present, slips are sometimes of a different clay from that used in construction, but it appears that they were never intended to change the surface color of the vessel.

Thickness

Along with striations, the thinness of Tiburón Plain and (to a lesser extent) Historic Seri is a hallmark of central coast pottery. The slight increase in thickness of Historic Seri may have been necessitated by a reduction in strength resulting from the use of the organic temper.

Modern Seri pottery is markedly thicker than the earlier types. As contemporary Seri potters put it, they could still produce very thin pottery, but they see no point in doing so since they do not use it themselves. The purpose of making pottery so thin, they say, was to make the vessels light and easily transportable (Bowen and Moser 1968: 128).

Vessel Shapes

Vessel shapes and their remembered uses are summarized elsewhere (Bowen and Moser 1968: 118–23), but a brief description of the more unusual forms is in order.

Flat Disks. The Moser collection includes several flat pottery disks, one of which the Seri definitely identify as a potlid, used to seal storage ollas. This specimen (Fig. 48 *k*) is 12.1 cm in diameter, has a depth of 1.5 cm, and is about 4 mm thick. There are finger indentations around the circumference that may either be decorative or the result of pinching the clay to form an even edge. Typologically, the Moser potlid is Historic Seri. One Modern Seri example was made in 1966.

Drinking Vessels. These are the most common small pottery containers; however, it is not always possible to distinguish a drinking vessel fragment from a miniature bowl sherd. Most of the 35 fragments seen are in the

Moser collection. Since it is not certain that these objects were manufactured or finished in the conventional manner, typological placement for many is uncertain. However, the fact that three have striated exteriors and one is tempered with organic material permits this form to be assigned to both Tiburón Plain and Historic Seri.

Drinking vessels have either a flat or a rounded base and relatively straight walls. Average specimens, probably about 10 cm high and 5 cm in diameter, are thick-walled and usually have gouged interiors that suggest haphazard attempts at thinning. These objects are remembered by the Seri, who attest to their use as containers for drinking (Bowen and Moser 1968: 122).

Miniature Vessels. These are hand modeled. A fragment of one specimen was recovered during the survey, and the Moser collection contains several specimens. The Seri say that they were made as playthings for children, not for mortuary or other ceremonial purposes, as McGee (1898: 185) and the Coolidges (1939: 88) claimed.

"Tar Pots." From sometime between about 1870 and 1900 until about 1930 the Seri used a native tar-like substance to caulk their boats. It was prepared in pottery vessels, usually small wide-mouth pots. The substance adheres firmly to the container in which it is mixed, and such vessels were not considered fit for other uses (Bowen and Moser 1968: 121). Sherds with a coating of this "tar," all Historic Seri, were encountered at three sites near Desemboque, and a restorable tar pot (Fig. 48 *d*) was recovered from Son I:11:5B, a remembered Seri camp near Cabo Tepopa.

A Modern Seri tar pot appears in Figure 49 *j*. It is worth mentioning that of the more conventional vessel forms, very few bowls and wide-mouth pots have been made since about 1930, presumably because the tourist demand for ollas is much greater.

Rim

A prominent development over time was an increasing tendency toward everted rims. The direct rim, the most common Tiburón Plain form, declined with Historic Seri, and it did not survive into Modern Seri pottery. Mildly everted rims, vertical at the lip, are also a common Tiburón Plain form, and are typical of the other two types. Flared rims are probably a late development of Historic Seri pottery. They appear on some Modern Seri vessels, but have never been especially common.

The addition of a rim coil was a fairly frequent Historic Seri practice. Rim coils do not occur in Tiburón Plain vessels, and they are only occasionally seen on Modern Seri ollas. Most coils are about 1 cm wide and are applied to the exterior, either at the lip or about 1 cm below it (Fig. 50 *a* and *b*). Some have encircling punctate bands, a few are thumb-indented (Fig. 50 *c*), and a few are grooved or incised (Fig. 50 *d*). Since the addition of a rim coil is a highly diagnostic attribute of Papago pottery prior to the twentieth century (Haury 1950: 351), it is likely that the Seri learned this technique from the Papago.

Lip

Historic Seri and Modern Seri lips are rounded. The lips of a considerable number of Tiburón Plain sherds are squared, but the several instances of a section of squared lip merging into a rounded lip on the same sherd suggest that the makers of the pottery did not view these forms as distinct.

Vessel Size

The size of the largest known whole vessel decreases successively from Tiburón Plain to Historic Seri and then to Modern Seri, suggesting a trend through time away from very large containers.

Decoration

The contemporary Seri decorate their vessels to increase their attractiveness to potential buyers. In the past, vessels were rarely decorated despite the fact that several different techniques were known at various times.

Painting. Painting was, and continues to be, the main decorative technique, although it was not common prior to 1930. Only 21 painted sherds were encountered during the survey. Six more are included in the Arizona State Museum survey collections, and the Moser collection contains 57 specimens. Only a few Tiburón Plain and Historic Seri whole vessels with painted decorations are known; most of these are in the Moser collection. One decorated Historic Seri olla is described and illustrated by McGee (1898: 175, Pl. 32).

Approximately equal numbers of Tiburón Plain and Historic Seri decorated sherds are known. Only three of the Tiburón Plain painted sherds are striated, and most of the remainder, although lacking organic temper, have some of the attributes of Historic Seri. This suggests that painting may have developed rather late.

Designs are poorly known. The majority of the decorated sherds bear a design fragment consisting of only a single straight painted line. The lines range from 5 mm to 13 mm in width, and their imprecision suggests application with the finger, the technique used today. Only 20 sherds bear more than a single line, or have a line that is not more or less straight (Fig. 51). Designs known from whole vessels are illustrated in Figure 52.

Judging from the whole vessels known and a few

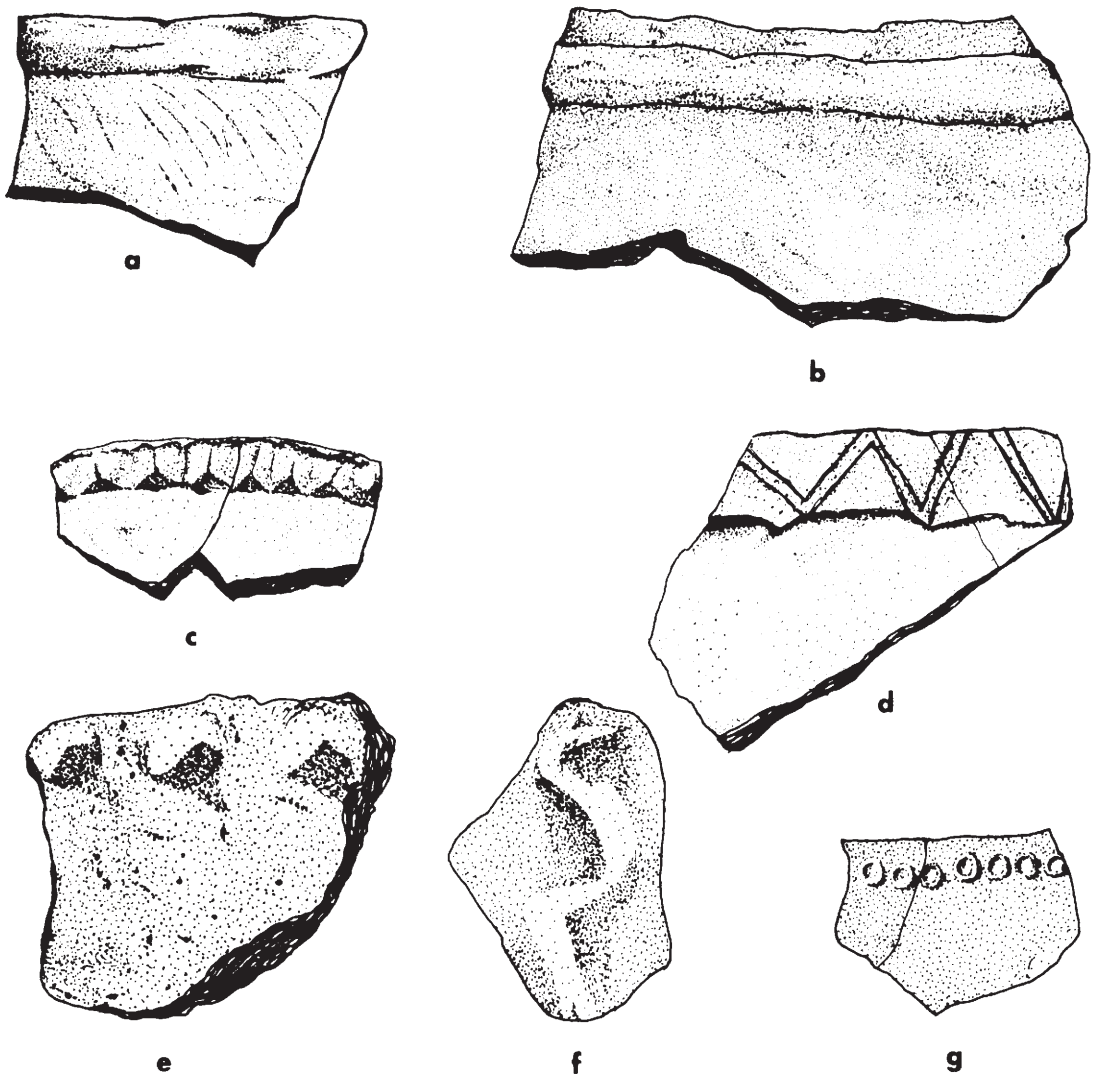

Fig. 50 Surface alteration of Historic Seri pottery. Rim coil *(a, b);* thumb indented rim coil *(c);* incised rim coil *(d);* appliqué decoration *(e, f);* punched rim band *(g).* All specimens from the Moser collection.

decorated rim sherds, it appears that nearly all olla designs are variations of a single basic pattern, consisting of a series of vertical lines descending from the rim. The lines are usually straight for their entire length, although zigzag lines and other variations are known. A column of circles or dots occasionally substitutes for a line. In a few cases the lines descend from a rim or neck band, and some ollas are decorated with only a neck band. This basic pattern (Fig. 52 *a-f*) has spanned the entire temporal continuum, and it remains characteristic of Modern Seri pottery decoration. It is of note that this format is analogous to the horizontal bars and pendant lines of many Seri face paintings (Xavier 1946: 16).

Much less is known about bowl designs. Two decorated Historic Seri bowls are known. Both are shallow forms and are painted on the inside. The design consists of lines radiating out from the center of the vessel, six lines in one of the specimens and four in the other (Fig. 52 *g* and *h*). The one known decorated Modern Seri bowl is a somewhat deeper vessel that carries both a painted and incised design on the exterior. The painted design consists of an encircling double zigzag band and a parallel band of dots, all just below the rim, which bears an incised zigzag band (Fig. 49 *l*). The one painted Historic Seri potlid is decorated only with a series of dots around the edge (Fig. 52 *i*).

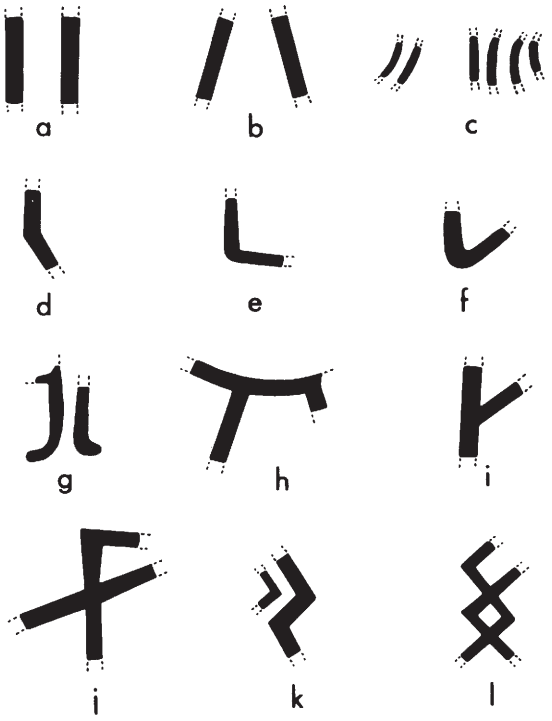

Fig. 51 Tiburón Plain and Historic Seri painted design fragments. Designs *a, b, h* are known in both red and yellow paint; *c, d, e, f, g, i* in red only; *j, k, l* in yellow only.

The predominant color of Tiburón Plain and Historic Seri painted designs is red. Red paint takes a variety of shades, however, and its hue appears to vary considerably with firing conditions. On one group of sherds, undoubtedly from the same vessel, the color varies from red through red-orange to yellow-orange, and in a few cases the entire range of this continuous gradation is visible on a single sherd. However, the occurrence of a few sherds and ceramic figurines painted a bright yellow suggests that this shade was intentionally produced. White was also occasionally used.

Polychrome designs are limited almost exclusively to Modern Seri vessels. The only known polychrome vessel made prior to 1930 is a Tiburón Plain olla with a design based on descending red lines, each of which is highlighted by a parallel white line (Fig. 52 *d*). Modern Seri pottery may be decorated with red or white paint, but the most common pigment today is laundry bluing. This substance produces a blue-gray shade when fired or a fugitive bright blue when applied after firing (Bowen and Moser 1968: 107–8).

It may well be that painting was more common in the past than it appears, especially on Tiburón Plain. Sandblasting and other severe forms of weathering can obliterate even evidence of surface striation on Tiburón Plain sherds, and can certainly destroy any trace of painted design.

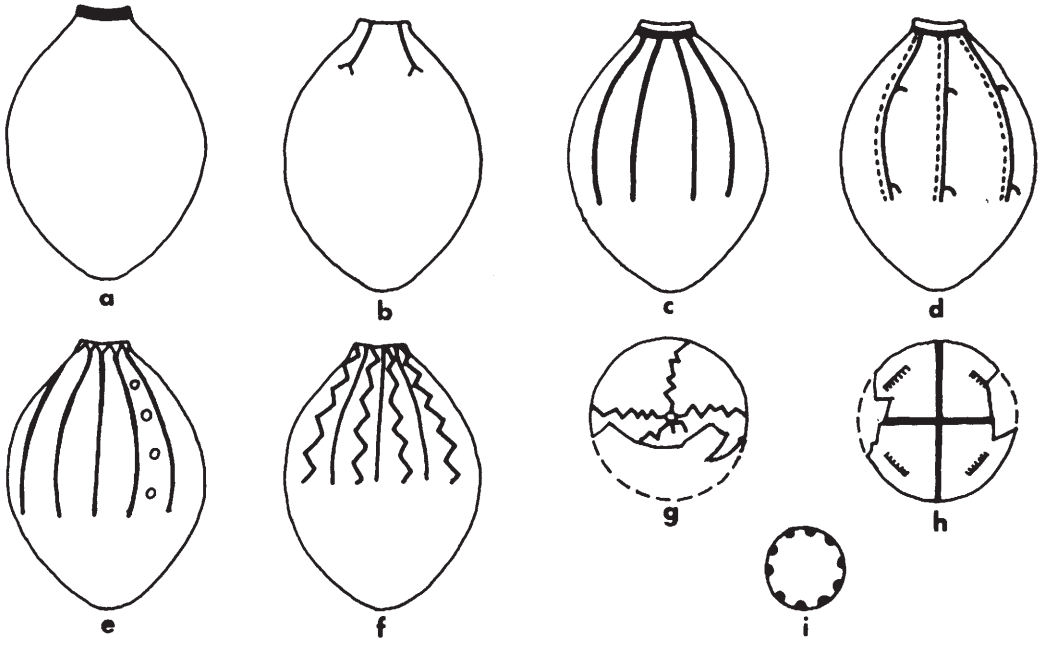

Fig. 52 Painted designs on Tiburón Plain *(a, c, d, e, f)* and Historic Seri *(b, g, h, i)* whole and restored vessels. Designs of bowls *(g, h)* and potlid *(i)* are on the interiors. Most of the designs are in red. Dotted lines in *d*, quartering lines in *h*, and rim dots of *i* are white. The figures in each quadrant of *h* are scratched, not painted.

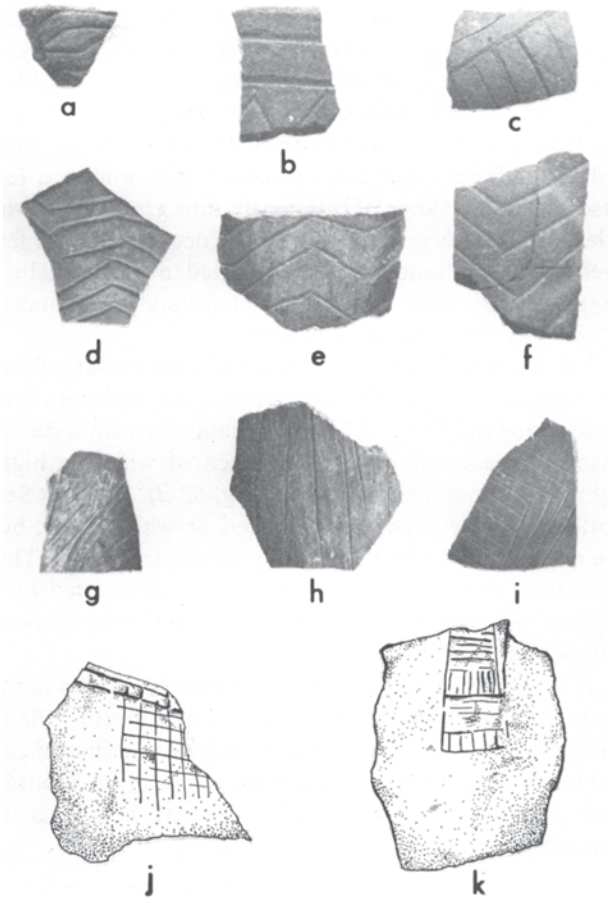

Fig. 53 Grooved and incised Tiburón Plain sherds.

Incising. Incised designs are much more frequently found on clay figurines and pipes than on vessels. They occur on only a small number of Tiburón Plain olla and bowl sherds, a few Historic Seri rim coils, and on a single Modern Seri bowl (Fig. 49 *l*), but they are common on drinking vessels. The designs were produced with both sharp and blunt instruments, and the results vary from fine incisions to grooves. Designs range in complexity from single lines or grooves encircling the rim to fairly intricate patterns (Fig. 50 *d* and 53). Most typical are parallel straight and zigzag lines, chains of diamonds, and grids. One sherd that is both painted and incised was found at Son M:6:1 on Isla San Esteban.

Punctation. Punctate bands occasionally encircle the rims of Historic Seri and Modern Seri vessels (Fig. 49 *b* and *e;* McGee 1898: Fig. 39). They sometimes occur on rim coils.

Appliqué. A few Historic Seri sherds bear small nubbins or curved ridges of clay (Fig. 50 *e–f*). The Seri state that they employed appliqué decoration in the past but have not done so for some time (Bowen and Moser 1968: 107).

Punched Design. A single Historic Seri sherd with a punched design was encountered (Fig. 50 *g*); it consists of a band of rings that apparently encircled the vessel rim. The design was probably produced by pushing the end of a reed into the soft clay.

Basket Impression. One sherd from the Moser collection is basket impressed. Although the Seri formerly produced a basket-impressed tortilla griddle for trade with Mexican ranchers (Bowen and Moser 1968: 122), the impressions in this sherd do not correspond with those that recent Seri baskets would create. Very likely the sherd is intrusive.

UNIDENTIFIED POTTERY

Some 80 undecorated sherds were encountered that may be of indigenous manufacture but differ markedly from the bulk of central coast pottery. None bears evidence of organic temper, but paste differences suggest that the clays utilized were not quarried at deposits normally exploited. The sherds tend to be thick and, most notably, have extremely rough and uneven surfaces, but otherwise they are nondescript.

E. Moser suggests that the vessels represented by these sherds might be accounted for by the former occasional Seri practice of semi-abandonment of old people who were no longer able to participate in the mainstream of activity. An old woman ignored in this fashion might not be able to gather clay from distant deposits and would not be able to persuade others to gather clay for her. She might be constrained to use nearby materials of poor quality and might construct crude vessels that were only minimally functional. An alternative possibility is that such vessels were manufactured during times of warfare by capable potters who used the nearest available clay-like materials. Under such conditions, which persisted intermittently for about three centuries, there may well have been times when it was necessary to construct pottery in great haste. Such vessels might have been intended to meet only minimal requirements of serviceability.

One small bowl in the Moser collection has a highly polished smudged interior. In some respects it resembles Historic Seri, but smudging does not appear to be a central coast technique. The smudging may have been unintentional, or the vessel may be intrusive.

INTRUSIVE POTTERY

Although Trincheras pottery is a common intrusive, very little foreign pottery from other areas has found its way into the central coast. The numbers and types of intrusive sherds collected by the survey and contained in the Moser collection are listed by site in Table 8. In addition, large quantities of Trincheras pottery have been

TABLE 8
Numbers and Types of Intrusive Sherds Collected at Central Coast Sites (Central Coast Survey and Moser Collection)

	Trincheras Plain	Trincheras Purple-on-brown*	Trincheras Purple-on-red*	Trincheras Polychrome	Piman Redware	Lower Colorado Buff Ware
Son I:7:3	6	1	3			
I:7:5					24	
I:7:7	2	1				
I:7:8	2	1				
I:7:9	4	2				
I:7:10	5	3	2			
I:11:1	3					
I:11:4	7					
I:11:5A	109	68	5	1		
I:11:5B	1			1		
I:11:6	6	4				
I:11:11	9	4	2			
I:11:12	9					
I:15:1	1	9				2
I:16:2	2	2	3			
I:16:4	14	3				
I:16:5	34	11	2			
J:13:1	2	2				
M:4:6	1	1				
N:2:2	5	21				1
N:6:2	4					
N:6:3	1					
N:10:5	15					
N:10:6	7					
N:10:7	5					
N:10:9	2					
N:10:10	4					
N:10:13		1				
TOTALS	260	134	17	2	24	3

*In contrast to previous usage, the term *Trincheras Purple-on-red* is here restricted to those sherds bearing a red slip in addition to designs in purple paint. The term *Trincheras Purple-on-brown* is used to designate the more common unslipped but otherwise similar pottery. A recent survey of Trincheras culture sites indicates that these two forms may have considerably different time spans (Bowen: in preparation).

found at three sites not recorded by the survey. The collection from Son N:6:1, a site previously entered in the Arizona State Museum survey file, contains 39 Trincheras decorated sherds. Another site in the Bahía Kino area, one that has recently been leveled for agriculture, is reported by Manuel Robles O. (pers. comm.) to have contained a very large quantity of Trincheras pottery. The third is the pure Trincheras shell bracelet manufacturing site near Playa Noriega, mentioned above in the site descriptions.

The "Piman Redware" sherds listed in Table 8 correspond with Papago Red, Period One, which is dated approximately 1700–1860 (Fontana and others 1962: 104–5). The Lower Colorado Buff Ware sherds were not identified as to type.

From a different perspective, it is of interest that central coast pottery is not often found as an intrusive at sites outside the central coast, and that the specimens that do occur are exclusively Tiburón Plain. Table 9 gives the numbers of Tiburón Plain sherds that were collected at sites outside the central coast by the Sonora-Sinaloa Project survey.

A few other occurrences of Tiburón Plain outside its native area have been noted previously. The Arizona

TABLE 9
Numbers of Intrusive Tiburón Plain Sherds Collected at Sites Outside the Central Coast (Sonora-Sinaloa Project Survey)

Site	Number of Tiburón Plain Sherds
Son E:11:1	1
F:13:3	1
I:2:2	1
I:2:6	1
J:3:2	4
K:5:1	20
O:1:1	1
O:5:2	17
O:9:2	15
J:16:1	7
J:16:2	9
J:16:3	32*
J:16:4	4
TOTAL	113

*Identification of the Son J:16:3 sherds is uncertain.

State Museum survey collection from Son O:5:1, near La Pintada, includes five sherds of Tiburón Plain, and Manuel Robles O. (pers. comm.) reports that Tiburón Plain has been found in small quantities at other sites in this region. In 1956, Walter W. Taylor excavated a small rock shelter, also near La Pintada. He reports that although cultural deposits were shallow and stratigraphic differentiation was unclear, some Tiburón Plain was found both in a level containing a few Trincheras sherds and also above and below this level (pers. comm.).

At the ruins of Santa Teresa mission, northeast of Átil, Thomas B. Hinton (pers. comm.) encountered a few sherds of Tiburón Plain. The northernmost occurrence of central coast pottery known at present is in the vicinity of Puerto Peñasco, where Tiburón Plain has been noted by Julian D. Hayden (pers. comm.).

Together, Tables 8 and 9 provide a number of indications about the culture of the central coast people and their relationship with outsiders. First and perhaps most important, the widespread occurrence of Trincheras pottery at central coast sites indicates strongly that Tiburón Plain was at least in part contemporary with both the plain and decorated pottery of the Trincheras culture, and that it therefore has some degree of antiquity. A. E. Johnson (1963: 182–3) provisionally places the Trincheras culture in the span from A.D. 800–1100, although evidence obtained since then indicates that Trincheras pottery continued to be produced into the fourteenth century (Bowen: in preparation). While the association between Trincheras pottery and Tiburón Plain does not make it possible for the latter to be dated with much precision, there can be little doubt that it was manufactured at least as early as the fourteenth century.

Second, the near absence of foreign ceramics other than Trincheras pottery at central coast sites, in conjunction with the scarcity of Tiburón Plain outside the central coast, suggests that the only significant contact maintained with outsiders was with the Trincheras people.

Third, Trincheras pottery occurs in small amounts at many sites, which suggests that it was a trade item. However, it shows up in great quantity at only a few sites, and these, with the exception of the bracelet manufacturing site near Playa Noriega, are all clustered around *esteros*. The greatest concentration is at Son I:11:5A, where it constitutes a major component of the site. Trincheras pottery is also plentiful at Son I:16:4 and I:16:5, the two sites that surround an extinct *estero* a few kilometers south of Son I:11:5A. It was abundant at the site near Bahía Kino that was reported by Robles and that has since been plowed under, and it occurs in significant quantities at Son N:1:6 (recorded previously) and at Son N:2:2, also near Bahía Kino. Why an abundance of Trincheras pottery is limited primarily to sites near *esteros* is unclear, unless these *esteros* were close to *Glycymeris* beds. The *Glycymeris* bracelet manufacturing site near Playa Noriega leaves little doubt that these shells were the main reason for the Trincheras presence on the central coast.

FREQUENCY AND DISTRIBUTION OF POTTERY TYPES

The frequencies of Tiburón Plain and Historic Seri pottery at each site are indicated by Tables 10 and 11. Table 10 should not be regarded as an accurate statement of sherd frequencies, since it merely specifies the number of sherds *collected* at each site. As indicated earlier, collections were not taken by a random sampling procedure. Furthermore, total collections were made at a few small sites, while only a small fraction of the surface pottery was collected at some of the larger sites. As a result many of the sherd frequencies tabulated in Table 10 have little bearing on either the actual number of sherds present or the relative frequencies of the types.

Table 11 provides a more realistic estimate of the pottery frequencies. Since pottery collections were often purposely biased, the direction of the bias and its intensity were recorded at the time the collections were taken, and an attempt was made to estimate the actual proportions of pottery types on the surface of each site. Table 11, which is based on these estimates, distinguishes

TABLE 10
Numbers and Types of Indigenous Sherds Collected at Each Central Coast Site

	Tiburón Plain	Historic Seri		Tiburón Plain	Historic Seri
Son I:7:3	93	73	Son J:13:3	54	
I:7:4	8	4	M:4:4	77	
I:7:5	16	71	M:4:5	131	2
I:7:6	2		M:4:6	66	38
I:7:7	16	9	M:4:7	76	8
I:7:8	4	31	M:6:1	78	1
I:7:9	18	5	N:1:12	45	
I:7:10	80	21	N:2:2	45	
I:7:11			N:6:1	50	
I:11:1	105		N:6:2	96	
I:11:2	25	17	N:6:3	274	
I:11:3	19	19	N:6:4	58	
I:11:4	128	5	N:6:5	26	
I:11:5A	223	4	N:10:1	64	
I:11:5B	42	67	N:10:2	79	
I:11:6	50		N:10:3	31	
I:11:7			N:10:4	17	
I:11:8	6		N:10:5	28	
I:11:9			N:10:6	16	
I:11:10			N:10:7	14	
I:11:11	68	3	N:10:8	21	
I:11:12	27	1	N:10:9	18	
I:15:1	3		N:10:10	29	
I:15:3			N:10:11	13	
I:16:2	30	9	N:10:12	15	
I:16:3	10	13	N:10:13	62	
I:16:4	322	12	N:11:7	75	
I:16:5	137	1	Q:4:3	142	
I:16:6	28	13	Q:4:4	44	
J:13:1	42				
J:13:2	36				
			TOTALS	3,282	428

TABLE 11
Estimated Relative Quantities of Tiburón Plain and Historic Seri Sherds Present at Each Central Coast Site

(L = large quantity; M = moderate quantity; S = small quantity; blank = virtual absence of pottery)

	Tiburón Plain	Historic Seri		Tiburón Plain	Historic Seri
Son I:7:3	L	L	Son J:13:2	S	
I:7:4	S	S	J:13:3	M	
I:7:5	S	L	M:4:4	L	
I:7:6			M:4:5	L	
I:7:7	S	S	M:4:6	L	L
I:7:8	S	L	M:4:7	L	S
I:7:9	S	S	M:6:1	S	
I:7:10	L	M	N:1:12	L	
I:7:11			N:2:2	L	
I:11:1	L		N:6:1	L	
I:11:2	S	S	N:6:2	L	
I:11:3		M	N:6:3	L	
I:11:4	M	S	N:6:4	L	
I:11:5A	L	S	N:6:5	L	
I:11:5B	M	L	N:10:1	L	
I:11:6	M	S	N:10:2	M	
I:11:7			N:10:3	S	
I:11:8	S		N:10:4	S	
I:11:9			N:10:5	M	
I:11:10			N:10:6	S	
I:11:11	L		N:10:7	M	
I:11:12	L		N:10:8	S	
I:15:1	L	M	N:10:9	M	
I:15:3			N:10:10	S	
I:16:2	M	S	N:10:11	S	
I:16:3	S	M	N:10:12	S	
I:16:4	L	S	N:10:13	M	
I:16:5	L		N:11:7	L	
I:16:6	S	M	Q:4:3	L	
J:13:1	S		Q:4:4	M	

broadly between a large quantity of a given type (L), a moderate quantity (M), and a small quantity (S). While obviously imprecise, these categories offer some consistency in differentiating among gross quantities of sherds and provide at least a rough basis for comparing type frequencies at different sites.

The frequency and distribution of the two indigenous pottery types bear directly on the general chronology of the central coast and on the questions of ceramic and cultural continuity. In the first place, the occurrence of some type of pottery at all but six sites suggests that the region was occupied principally in postceramic times. Moreover, it is not certain that any of the six nonceramic sites, with the exception of Son I:15:3, is preceramic in age. One nonceramic site, Son I:7:11, was probably a briefly occupied lithic workshop and is almost certainly associated with a nearby pottery-bearing camp, Son I:7:10. The other nonceramic sites—Son I:7:6, I:11:7, I:11:9, and I:11:10—are very small occupation areas. They are probably camps and lack pottery only because none happened to be broken there during the short time they were occupied.

A primary basis for identifying the Seri as the makers of Historic Seri pottery is, of course, the formal similarity between this type and Modern Seri pottery. Further support for this identification is the fact that at least 10 of the 20 sites that yielded Historic Seri pottery are known to have been Seri camps. Three of these—Son I:15:1 (Tecomate), Son I:16:2 (Campo Ona), and Son I:16:3 (Campo Almond)—are modern camps that con-

tinue to be occupied on a seasonal basis. Son I:11:2 served as a Seri shark fishing camp in the 1940s. Recent occupancy of Son I:7:4 and Son I:7:10 is evident from the remains of Seri brush houses. Son I:16:6 (Pozo Posado) is one of the sites visited by McGee and is still known to the Seri. Two camps, Son I:7:8 and Son I:11:5B, are no longer in use, but their locations and names are remembered. The Seri identify Son I:7:3 as one of their old camps, but its name has been forgotten. It is pertinent to note that Tiburón Plain is also present at each of these sites; moreover, it occurs at all but one of the remaining 10 sites at which Historic Seri was found. This indicates that many of these sites may have had a long occupational history, and it is suggestive of ceramic continuity between Tiburón Plain and Historic Seri.

The difference in the gross quantities of Tiburón Plain and Historic Seri sherds throughout the central coast provides strong evidence that Historic Seri is a late type. As Table 10 indicates, only 428 Historic Seri sherds were collected during the survey, while the Tiburón Plain collection amounts to more than 3,200 specimens. Despite the fact that these figures are not based on random samples, there is no question that the scarcity of Historic Seri as compared with Tiburón Plain is both genuine and significant since the collections were consistently biased *against* Tiburón Plain—collections of Tiburón Plain frequently consisted of only a very small proportion of the sherds present, whereas the majority of Historic Seri sherds seen were collected.

If it can be assumed that the per capita production of pottery vessels was more or less constant through time until the introduction of metal containers, which occurred around 1900, the relative scarcity of Historic Seri sherds must indicate that this type was used by a much smaller population, that it was made for a much shorter span of time, or, most likely, both. The population estimates of various early observers do in fact indicate a drastic decline in population, largely the result of warfare and epidemic disease. In 1692 Gilg estimated the Seri population at 3,000 (DiPeso and Matson 1965: 48), and subsequent estimates up to 1841 all exceed 1,000 and reach as high as 4,000. The Encinas War of 1855–65 reduced the population from about 600 at the beginning of the hostilities to about 300, and a native estimate in 1894 placed the figure at between 250 and 350 (McGee 1898: 134–5). By 1930 the Seri numbered only about 175 individuals (Kroeber 1931: 30). Even allowing for a wide margin of error in the earlier estimates, it is clear that the population suffered a serious decline during the nineteenth century. The relative scarcity of Historic Seri pottery indicates that it was not commonly manufactured until Seri numbers had been greatly reduced, which in turn suggests that it must have been primarily a nineteenth-century type. If this is correct, it would also account for the abundance of Tiburón Plain, which would have been made not only by a much larger population, but also over a much longer span of time, extending back at least to the fourteenth century (on the basis of its association with Trincheras pottery) and probably much earlier.

The difference in the geographic distributions of Tiburón Plain and Historic Seri also indicates that the latter is late. Tiburón Plain occurs throughout the central coast, from the Desemboque area to the vicinity of Guaymas, as well as on Isla Tiburón and Isla San Esteban. It is important to note that its distribution (Fig. 54) corresponds fairly closely with estimates of Seri residence during the initial contact period, as indicated by historical sources (Fig. 55). In contrast, the known distribution of Historic Seri pottery (Fig. 54) is confined to the northern portion of the central coast, from Punta Santa Rosa to the Desemboque area, plus Isla Tiburón. Although the nineteenth-century Seri ranged far beyond this restricted region, it has been their main zone of refuge and the area in which Seri residence and activities have become increasingly concentrated since about the middle of the nineteenth century.

Thus it appears that Historic Seri is a late and rather short-lived type. While there is some possibility that the use of organic temper and the manufacture of Historic Seri pottery could have begun as early as about 1700, the available evidence indicates that Historic Seri is predominantly the pottery of the nineteenth century.

The transition from Historic Seri to Modern Seri pottery began in the early 1900s, as commercial Mexican pottery and metal containers began to filter into Seri territory and to replace Seri vessels for domestic use. By the 1930s this replacement was essentially complete, and nearly all of the few vessels that continued to be made were sold to outsiders. Although Modern Seri pottery is more commonly decorated than the earlier types, as a response to tourist demand, it is also thick, poorly fired, crumbly, and generally less carefully constructed. The functional requirements of the past that were responsible for the high technical competence characteristic of Tiburón Plain and Historic Seri no longer apply, and the quality of Modern Seri pottery has suffered accordingly.

COMPARISON OF CENTRAL COAST AND YUMAN POTTERY

There have been few attempts to compare central coast pottery with that of other areas or to assign it a place in a broader ceramic framework. Fontana and others (1962: 122) decline to compare Seri pottery with that of the Papago for lack of adequate data. In a recorded conversation Malcolm Rogers (1958) conjectured that "eggshell" pottery from the central coast

"may resemble Corrizo [*sic*] Buff from the W. side Colorado River around Vallecitos and Carrizo . . . . Yuma II or III?" Earlier, Rogers expressed the possibility of a relationship with Yuman ceramics more concretely by including Seri pottery in his monograph on Yuman pottery making (1936), and by assigning central coast pottery to Yuman III times (1945: 194, Fig. 1).

The major points of correspondence between central coast and Yuman pottery, as well as the prominent discrepancies, can be enumerated briefly. The following comparisons emphasize Tiburón Plain and draw primarily on Rogers (1936; 1945), Dobyns and Euler (1958), Schroeder (1958), and Van Camp (1972) for Yuman characteristics.

Construction. Here lies one of the more serious discrepancies. Both Yuman and central coast pottery is constructed by coiling, but the latter is thinned by scraping rather than by the normal Yuman paddle-and-anvil technique. According to Rogers (1936: 2, 41) the Yavapai are the only other potters within the Yuman ceramic tradition to thin their vessels by scraping.

Paste and Temper. These are primarily reflections of local resources. Mica is a common inclusion in Yuman pottery made from residual clays, and it occurs in some Historic Seri pottery. Dung temper was used in historic times by the Yumans, but it was probably used much more regularly by the Seri.

Hardness. A hardness of 6.0 achieved in many Tiburón Plain sherds is equaled by some Lower Colorado Buff Ware sherds from the head of the Gulf of California (in the Arizona State Museum survey collections) and by some historic Kamia vessels (Rogers 1936: 2, fn. 1).

Exterior Surface. Like Yuman pottery exteriors, those of Tiburón Plain are usually smooth but not polished. Striations are also common to both, but they are only superficially similar. On Tiburón Plain they are vertical or oblique lines, never horizontal, and they appear to have been produced by smooth strokes with a shell. Striations in Yuman pottery tend to be horizontal if produced by a fiber brush, or they tend to zigzag in a generally vertical direction if produced by the prominences in the grain of the wooden paddle used for thinning (Van Camp 1972: 155). Stuccoed and scummed exteriors are foreign to the central coast.

Interior Surface. Interiors of Tiburón Plain sherds tend to be quite smooth, whereas those of Yuman vessels are generally not.

Thickness. Yuman pottery can be quite thin, sometimes approaching the minimum thickness of Tiburón Plain (Chace 1967: 51).

Vessel Shapes. Yuman vessel shapes are much more varied than those known from the central coast, but all central coast forms except drinking vessels are found in the Yuman tradition (including potlids and miniatures). Ollas in both areas generally lack a prominent shoulder. The characteristic Tiburón Plain ellipsoidal olla is known in Yuman pottery, but globular forms are more common. The long necks common among Yuman ollas are not found on the central coast, nor are "restricted" bowls (Van Camp 1972: 113). Also absent are the more exotic Yuman forms such as scoops, bilobed ollas, ollas with multiple spouts, and stirrup-spout ollas.

Rim. Many vessels in both areas have short, slightly to moderately everted rims. Ollas with direct rims, typical of Tiburón Plain, are much more scarce among Yuman vessels while flared rims are not found in Tiburón Plain. Tapered rims are common to both areas. Incised rims are not known from the central coast.

Lip. Rounded and squared lips occur in both areas. Other Yuman forms are unknown on the central coast.

Vessel Size. Very large storage ollas are frequent in both areas. Maximum vessel size is approximately equivalent.

Decoration. Decoration is not common in the Yuman area, but it nevertheless seems to be more frequent than on the central coast. In both areas designs are most commonly rendered in red paint. White and yellow pigments are not used in the Yuman area, and black paint is unknown in central coast pottery. Designs in both areas are frequently asymmetrical in layout, and on ollas they tend to be confined primarily to the upper portion of the vessel. The main difference is that Yuman designs on the whole are much more complex and consist of many more elements, but some are strikingly similar to Tiburón Plain designs (compare Fig. 52 with Treganza 1942: Fig. 10 *b* and Van Camp 1972: Pl. 6 *b, d, k*).

Incised designs are also common to both areas. Most of the central coast incised designs have parallels in Yuman pottery, but some Yuman designs are not found on the central coast.

Two other decorative techniques, punctation and appliqué, were used in both areas, but on the central coast they did not develop until Historic Seri appeared. Punctate designs differ but appliqué in both areas consists primarily of nubbins applied to the neck area. Minor Yuman techniques such as corrugation, rim fluting, and multiple neck bands are absent on the central coast.

Other Ceramic Artifacts. Ceramic figurines are found both on the central coast and in the Yuman area but are stylistically quite different. Tubular pipes are common to both areas, but Yuman bow pipes, along with ceramic anvils and rattles, are unknown on the central coast.

Rogers (1936: 17) regarded contemporary Seri pottery making as an aberrant Yuman technique, and the foregoing discussion suggests that the earlier pottery of the central coast also deviates in several respects from

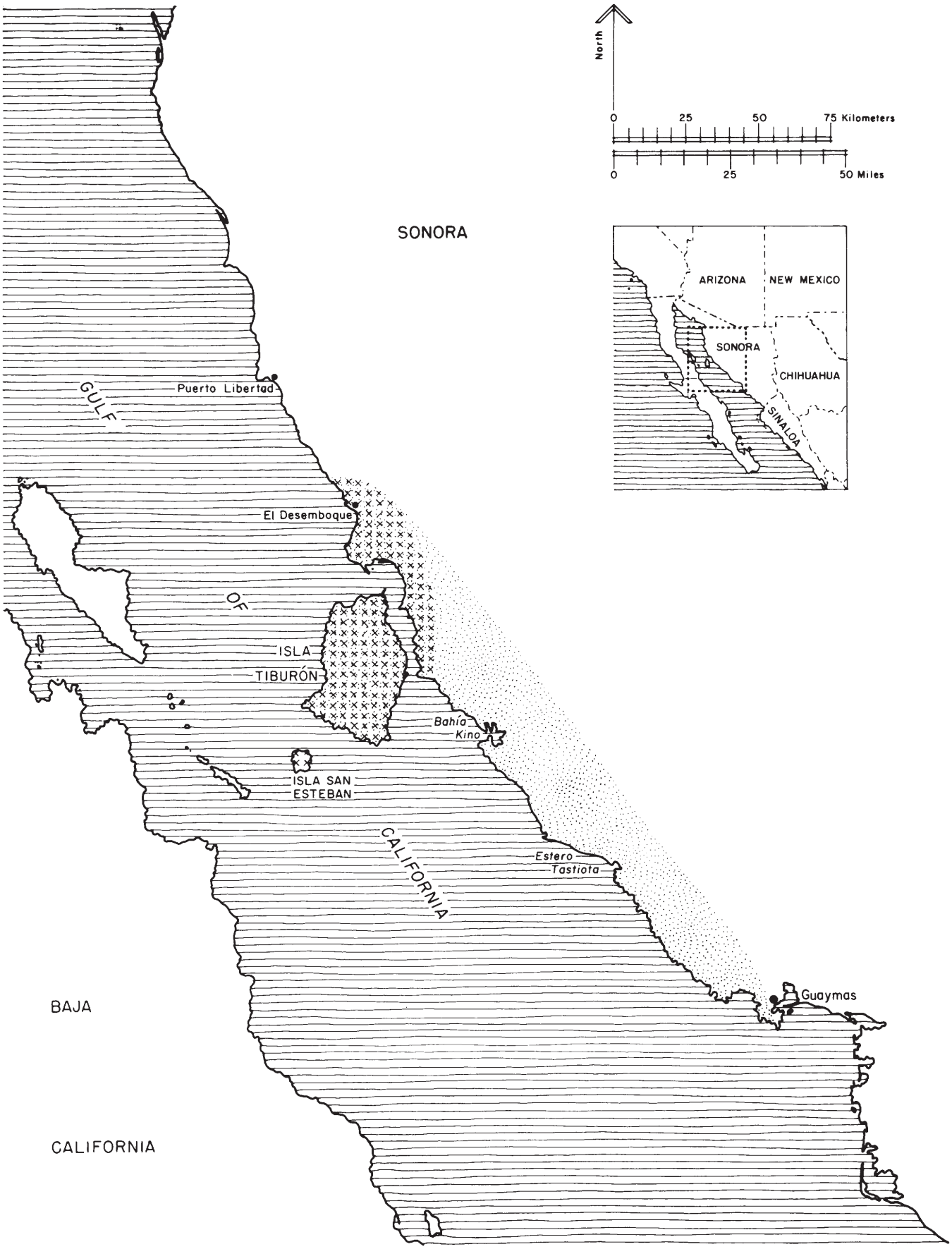

Fig. 54 Distribution of Tiburón Plain (stippled) and Historic Seri pottery (hatched).

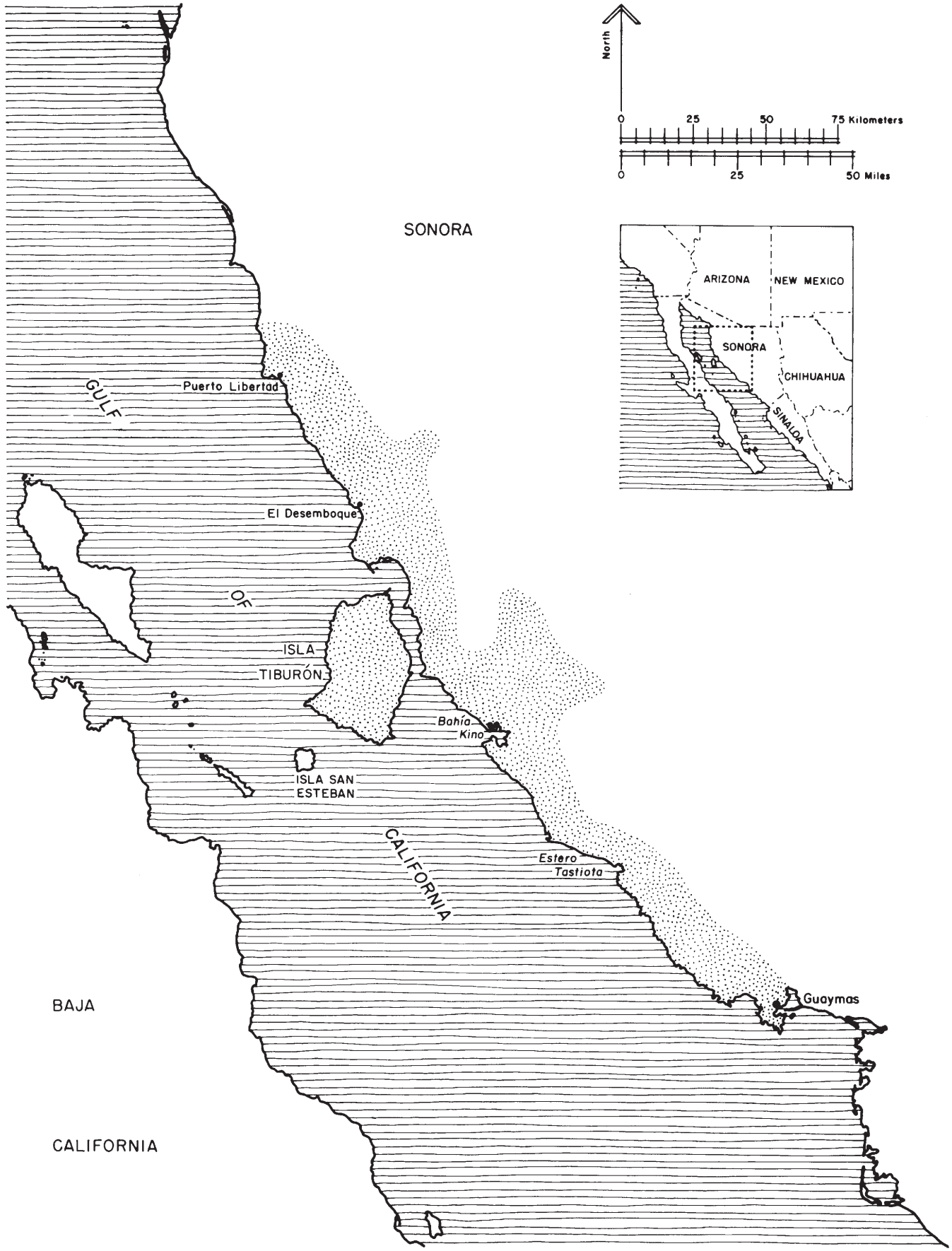

Fig. 55 Estimated Seri residence at the time of first European contact, middle sixteenth century. After Bahre (1967: Fig. 22).

the general Yuman pattern. This, however, approaches the situation from a Yuman perspective. Many of the differences can be attributed to the comparative simplicity of central coast pottery, which simply lacks many of the more striking elaborations that characterize Yuman ceramics. The similarities become more apparent from the central coast perspective; indeed, central coast pottery bears a greater resemblance to the Yuman wares than it does to any other ceramic complex. The most notable departure, at least in terms of conventional taxonomic criteria, is the central coast substitution of scraping for paddle-and-anvil thinning. Despite this anomaly, central coast pottery seems sufficiently similar to Yuman pottery to suggest a fundamental relationship.

Much more needs to be learned of central coast pottery before its precise status with respect to Yuman ceramics can be fully assessed. At present, it appears to be an allied but somewhat deviant tradition, one that does not seem to fit very comfortably within the confines of either Tizon Brown Ware or Lower Colorado Buff Ware.

An important remaining problem is the date when the earliest central coast pottery, Tiburón Plain, first began to be manufactured. There is no direct evidence on which to base an estimate, but if it can be assumed that central coast pottery is related to Yuman ceramics, it might be supposed that the initial appearance of Tiburón Plain does not antedate the beginnings of Yuman pottery farther north. For both Tizon Brown Ware and Lower Colorado Buff Ware this date is generally given as about A.D. 700 or 800 (Rogers 1945: 185; Dobyns and Euler 1958; Schroeder 1958; 1961: 41, 46).

Because of the remote position of the central coast, Tiburón Plain might not have developed as early as Yuman pottery elsewhere. Rogers (1945: 193, Fig. 1) implies such a culture lag in assigning central coast pottery to Yuman III times, beginning about 1500. However, judging from Rogers' chart of ceramic traits of all three Yuman periods (1945: Table 2), Tiburón Plain shows at least as great a resemblance to Yuman I pottery as to later ceramics. This consideration, as well as others, would suggest that Tiburón Plain began much earlier than Rogers' estimate, though not necessarily as early as the first Yuman I pottery.

Since the precise nature of the connection between the Yuman wares and central coast pottery remains to be established, analogy with Yuman ceramics is not a very secure basis for dating the initial manufacture of Tiburón Plain. A date of A.D. 700 or 800 for Tiburón Plain should therefore be regarded as a rather tenuous guess.

OTHER CERAMIC ARTIFACTS

Worked Sherds

The worked sherds encountered by the survey and those known from the Moser collection and the Arizona State Museum survey collections total 58 specimens. All but four of these are pottery disks.

Pottery disks (Fig. 56) were made from both Tiburón Plain and Historic Seri sherds as well as from Trincheras plain and painted pottery. Among the 58 specimens, the ratio of Tiburón Plain to Historic Seri to Trincheras disks is about 16:2:1. Sizes are equivalent regardless of the pottery type. Diameters range from 2.5 cm to 8.2 cm, averaging about 5–6 cm. About 25 percent of the disks lack a perforation, and a very few are incompletely perforated.

Perforation was apparently always begun from the concave side of the sherd. Two unfinished specimens demonstrate that the disk might be shaped either before or after the hole was cut (Fig. 57).

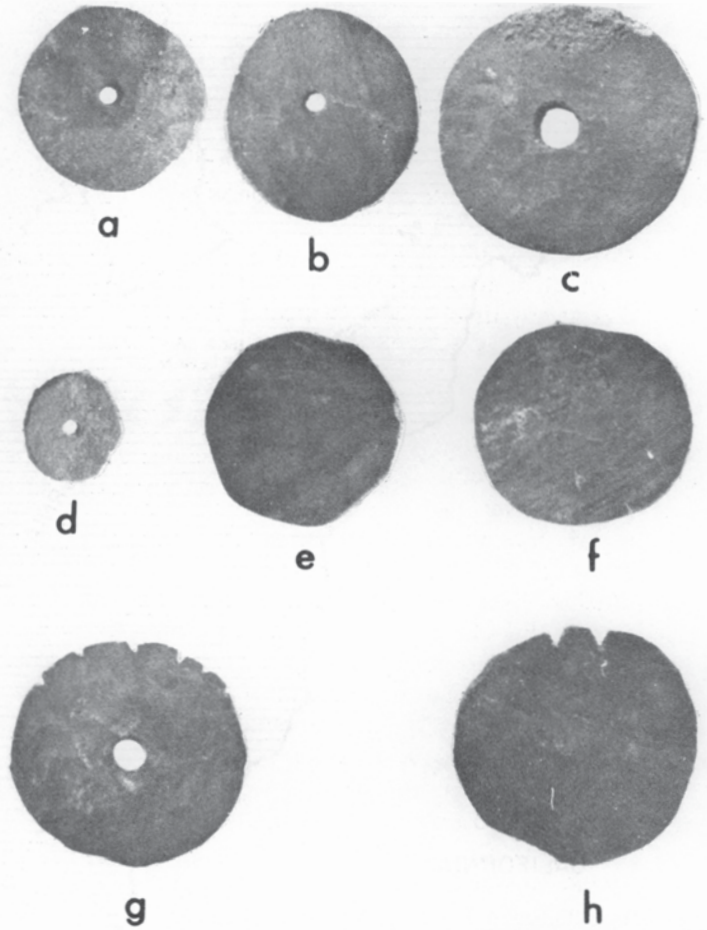

Fig. 56 Pottery disks, all made from Tiburón Plain sherds; perforated *(a–d)*; unperforated *(e, f)*; perforated notched *(g)*; unperforated notched *(h)*. Diameter of *a*, 6.1 cm.

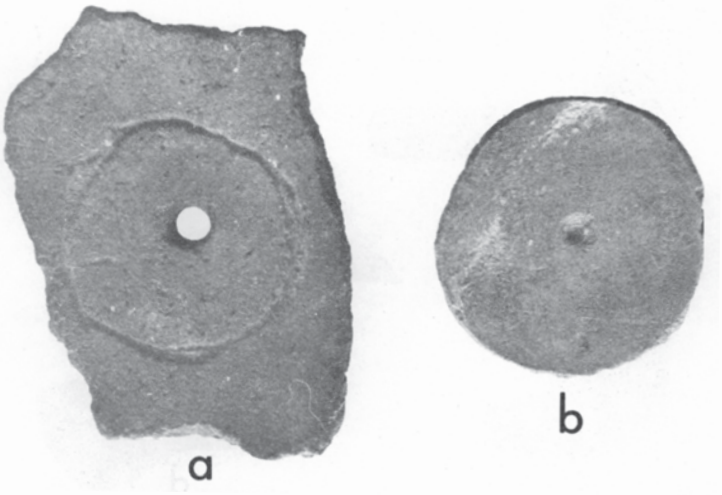

Fig. 57 Two procedures for making a sherd disk: perforation before shaping *(a)* and perforation after shaping *(b)*.

Three disks in the Moser collection, all Tiburón Plain, have notched edges. One specimen (Fig. 56 *g*) has six deep notches and one incipient notch (the latter too small to be seen in the photo), all confined to about a third of the circumference. Another has two adjacent notches, and the third (Fig. 56 *h*) has two deep notches and one incipient notch. There is no way of knowing whether any of the disks are particularly early, since an older sherd could have been picked up and made into a disk at any time. This is particularly true of disks made of Trincheras pottery, which could have been made either at the time the pottery was in use or quite recently.

Pottery disks from elsewhere in the Southwest and Mexico have often been regarded as spindle whorls. The Seri, however, neither grow cotton nor weave, and it is highly unlikely that they did so in the past (Kroeber 1931: 22–3). Although there is no recollection of notched disks, the older Seri remember unnotched perforated disks being used as tops by children. Such a top is called *ʔatâaix* 'thing spun'. They are said to have been made by chipping the edges off a sherd until the piece was roughly circular, then grinding the edges smooth with a stone. A knife point was used to drill the hole and a stick was then inserted. The top was spun with both hands (E. Moser: pers. comm.).

Four worked sherds are not disks. Two, found by the survey, are merely sherds with a single ground edge. One is a Tiburón Plain sherd from Son I:11:12, the other a Historic Seri sherd from Son I:16:4. The other two specimens are part of the Moser collection. One is an elliptical sherd with ground edges. Its length is 8.0 cm and its width 4.3 cm. Its form suggests a bullroarer, which the Seri used to summon the spirits. However, the Seri claim to have manufactured bullroarers only of ironwood (E. Moser: pers. comm.). The final sherd is small, with notches on two edges. Both edges had been ground straight before the notches were cut. Three notches occur on one edge and two on the other. They are separated from each other by 2 to 4 mm. A third edge superficially appears to have two notches. However, the edge is broken, not ground, and the "notches" were apparently mending perforations.

Pipes

Pipes were made both of fired clay and of stone. The latter are described with the stone artifacts.

Fired clay pipes occur in two basic shapes, tubular and stemmed. The former are by far the most common, and nearly all carry incised designs. Four fragments of tubular pipes were recovered from Son N:6:5 and a fifth from Son N:10:10. The Arizona State Museum has one fragment from Son N:10:1, and the Museo Regional de Sonora possesses a well-decorated unbroken pipe. The Moser collection includes a large number of fragments and two nearly complete specimens (Fig. 58).

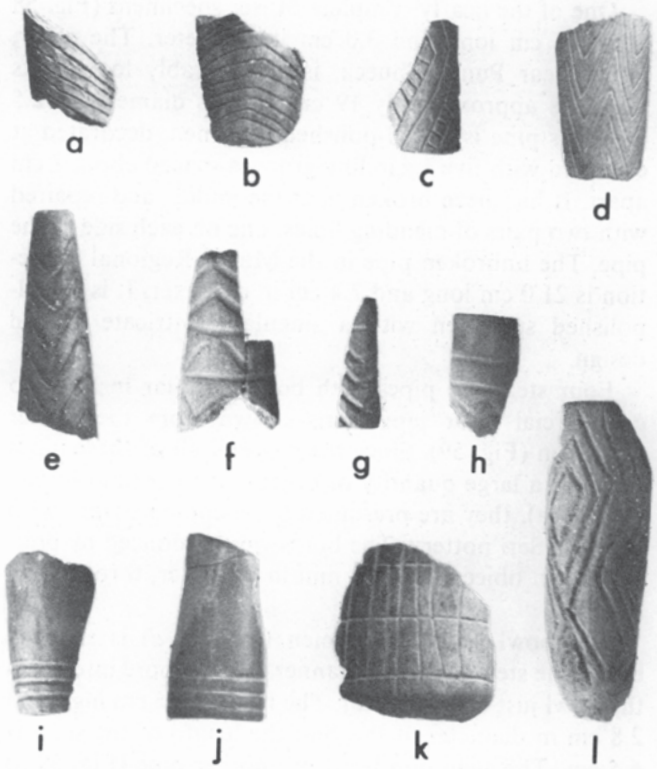

Fig. 58 Incised tubular clay pipe fragments, from the Moser collection. Length of *l*, 9.5 cm.

All tubular pipes are hand modeled and are tapered so that the two ends are of slightly different diameters. They were made by first modeling a solid form and then removing clay to create the bore. In many cases removal of the clay was accomplished by gouging while the clay was still damp, in the same manner employed for drinking vessels. The bore normally expands in diameter toward the larger end of the pipe. In one specimen the bore was produced by poking a thin object through the clay. In another example a gouged hole extends to within a few millimeters of the mouth end, where it is joined by a poked hole. Maximum diameters of fragmentary specimens range from about 2 cm to 3.7 cm, averaging around 3 cm. Wall thicknesses at the bowl end range from about 3 mm to 12 mm, averaging about 5 mm.

The paste of most pipes is fine sandy clay that closely resembles that of Tiburón Plain vessels, and most specimens are fired to a similar hardness. Only two fragments contain organic material, and this occurs in small amounts.

Only three of the fragmentary pipes lack incised decoration, and one of these is coated with red paint. Incised designs were executed with both sharp and blunt instruments, the latter producing fairly wide grooves. Seven specimens are polished.

One of the nearly complete Moser specimens (Fig. 58 *l*) is 9.5 cm long and 3.0 cm in diameter. The other, found near Punta Chueca, is considerably longer. Its length is approximately 19 cm and its diameter is 2.5 cm. This pipe is a well-polished specimen, decorated at each end with five encircling grooves spaced about 1 cm apart. It had been broken near the middle and repaired with two pairs of mending holes, one on each side of the pipe. The unbroken pipe in the Museo Regional collection is 21.0 cm long and 2.4 cm in diameter. It is a well-polished specimen with a singularly intricate incised design.

Four stemmed pipes with bowls, similar in form to commercial briar pipes, are known from the Moser collection (Fig. 59). Since the paste of all of these pipes contains a large quantity of organic temper (and in one case mica), they are presumed to be contemporary with Historic Seri pottery. The bores were produced by poking a thin object, about 3 mm in diameter, through the stem.

The bowl of one specimen (Fig. 59 *d*) is situated below the stem in such a manner that the bore intercepts the bowl just below its rim. The bowl is 2.6 cm high and 2.8 cm in diameter at the rim; the length of the stem is 6.4 cm. The stem and bowl of another pipe (Fig. 59 *a*) are squared; the length of this specimen is 8.6 cm, the height of the bowl is 2.9 cm, and it is 2.5 cm on a side. The length of the pipe in Figure 59 *b* is 9.6 cm; its bowl is 5.3 cm high and 3.2 cm in diameter. This specimen bears a punctate band encircling the rim of the bowl. The other pipes are undecorated.

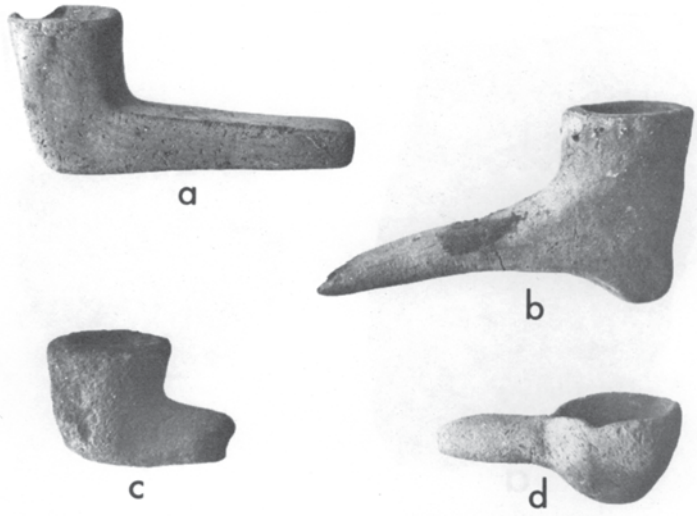

Fig. 59 Stemmed clay pipes, from the Moser collection. Length of *a*, 8.6 cm.

The Seri have smoked tobacco for a considerable time. Oral tradition suggests that it was used at least as early as the 1830s. Originally, native tobacco was gathered. It is said to have been smoked at first in tubular pipes of either clay or stone, and later in stemmed clay pipes. The Seri smoked primarily for pleasure, but a shaman might blow smoke over a patient as a curing technique (E. and M. Moser: pers. comm.). Cane tube cigarettes have also been used, and in 1930 Roberto Thomson witnessed a shaman performing a cure that entailed smoking native tobacco rolled in a leaf of an unidentified plant (Thomson 1931: 54). Commercial cigarettes, smoked at present, probably first became available from the Mexicans during the early decades of the twentieth century. Although a man with a stemmed clay pipe appears in a posed photograph taken about 1960 (B. Johnston 1970), the Seri maintain that these items have not been used for at least fifty years.

Spoon

The Moser collection contains one fragment of a pottery spoon. The handle is about 6 cm long and the blade must originally have been about 11 cm long. The blade is shaped much like that of a common metal spoon. The object was found at Son I:7:8, one of the old Seri camps no longer in use. Several older Seri disclaim having ever seen a clay spoon. Some suppose that such spoons would have been used for eating; one individual thought they might have been used to ladle water from ollas (E. and M. Moser: pers. comm.).

Figurines

Fired clay figurines from central coast sites have been known since McGee's visit (McGee 1898: 185) and have been frequently described and interpreted (Saville 1924; Morss 1954; Owen 1956; Fay 1956a; Dockstader 1961; Manson 1961; Woodward 1967; W. Smith 1967). The most comprehensive study to date, by E. Moser and White (1968), is based on more than 400 specimens.

Twelve figurine fragments were encountered by the survey. Nine are from Son N:6:5, a site that has recently produced several more specimens, according to Manuel Robles O. (pers. comm.). Eight of these correspond with Moser and White's Type 1 (1968: 133–6); the ninth could not be identified as to type. Three of the Son N:6:5 specimens are incised, one with a triple parallel line decoration.

Two of the other fragments were recovered from Son I:11:4 and Son I:11:12; both are Type 1. The remaining specimen was an isolated find in the Punta Chueca area.

The five-fold figurine classification set forth by Moser and White (1968: 144–5) was proposed as a tentative sequence and was based in part on differences in the paste. The antiquity of the earliest, Types 1 and 2, is not known, but the similarity of the paste to that of Tiburón Plain suggests that their temporal span is comparable. The fact that Type 4 figurines often have micaceous inclusions and a black core (1968: 140) indicates that they are probably contemporary with Historic Seri pottery.

The older Seri remember ceramic figurines having been made, despite the fact that they normally attribute these items to the legendary Giants. In the remembered past they were given to girls as dolls although they may originally have been fetishes. The present Seri produce occasional figurines for sale to tourists but apparently ceased manufacturing them for their own use around 1900 (E. Moser and White 1968: 147–8).

Fig. 60 Aberrant clay figurines from the Estero Tastiota vicinity, Museo Regional de Sonora collection. Length of *a*, 4.2 cm. (From photos by Richard S. White.)

Several figurines recovered by the Museo Regional de Sonora from sites near Estero Tastiota represent a marked departure from the prevalent central coast style (Fig. 60). Two of these (Fig. 60 *a* and *b*) bear some similarity to figurines from the Jalisco-Colima-Nayarit area made about A.D. 500 (Clement W. Meighan: pers. comm.), and a third (Fig. 60 *c*) resembles certain early Hohokam specimens (Emil W. Haury: pers. comm.). Whether this group of figurines was made locally or was brought in from elsewhere is uncertain.

6. STONE AND SHELL ARTIFACTS

GROUND STONE

Manos and Metates

Nearly all of the recorded sites yielded small beach cobbles with slightly curved faces, the size and shape of oval handstones. Several hundred such mano-like objects were observed, but only 73 specimens from 28 of the sites display macroscopic evidence of use as grinding implements.

The comparative scarcity of cobbles showing signs of substantial use is probably due to the fact that almost perfectly preshaped blanks suitable for use as manos occur by the thousands on various central coast beaches (see Fig. 11). With vast resources available over much of the area, it is doubtful that any great premium was placed on retaining the same stone and using it repeatedly. Although a small number of specimens did receive considerable use, the prevalence of cobbles showing no evidence of wear suggests that many may simply have been gathered when a need arose, used for the task at hand, and then discarded.

Only the specimens clearly used for grinding were collected (Fig. 61). Many of these are broken. Although some variety exists, differences in form, size, and grinding surfaces among most of the manos are minor. Most are oval in form, some are nearly circular, a few have slightly flattened ends giving them a superficially subrectangular appearance (Fig. 61 *e*), and several are slightly irregular. The largest recorded specimen, from Son I:7:9, is 18.8 cm long, 11.8 cm wide, and 4.9 cm thick.

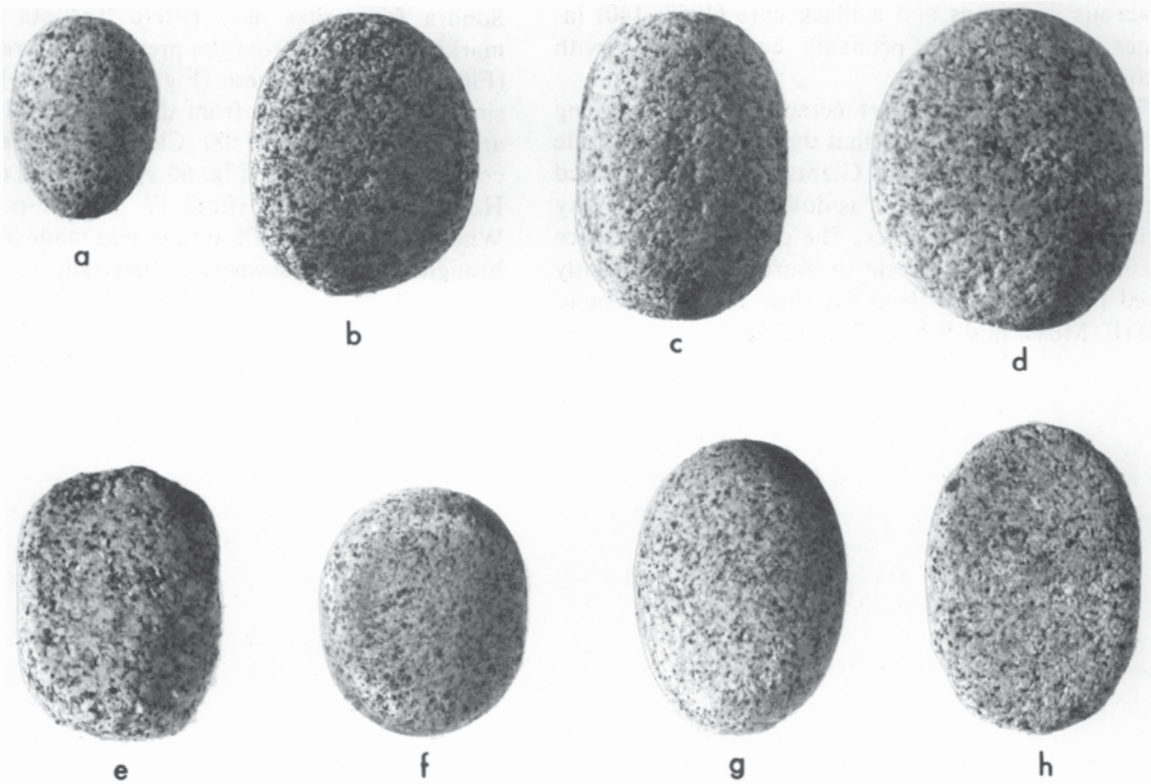

Fig. 61 Manos from Son I:7:3 *(a–d);* Son I:16:2 *(e, f);* Son I:16:3 *(g, h).* These specimens are typical in shape but much more worn than most. Length of *h,* 13.4 cm. (Compare McGee 1898: Pls. 49–56).

Most are in the neighborhood of 10 cm long, 8 cm wide, and about 4 cm thick.

Many of the manos have battered edges, but it seems doubtful that this is indicative of intentional shaping of the stone, considering the ready availability of naturally oval blanks and the fact that some irregular cobbles were used. More likely, battering on the edges came about through the use of these objects as hammerstones.

Grinding surfaces indicate that most manos were used in a back-and-forth rocking motion perpendicular to the longitudinal axis. A few have pecked surfaces. Surfaces are typically convex, although the curvature of the lateral axis may be considerably greater than that of the longitudinal axis. A few manos have nearly flat grinding surfaces, and other variations include faceted grinding faces and faces that are steeply curved on the lateral axis but nearly flat on the longitudinal axis. These forms were presumably used to grind against metates with a flat or very slightly concave surface. One object from Son Q:4:3, the shape and size of a conventional mano, has a grinding surface that is concave on both axes. Two specimens, both from Estero Tastiota sites (Son N:6:3 and N:10:3), have saddle-shaped grinding surfaces, convex on the lateral axis but concave on the longitudinal axis. It is not known what they were used for or how these surfaces were produced.

About 40 percent of the manos are unifacial; all but two of the remainder are bifacial. The majority of bifacial manos are similar to the unifacial specimens, but two distinctive bifacial forms occur, both of them scarce. One has nearly flat grinding surfaces that lie in different planes, thereby producing a wedge-shaped cross section. The other form is circular in outline with grinding surfaces convex on one axis and nearly flat on the other. It is distinctive because the grinding axes of the two faces lie at right angles to each other.

Two trifacial manos were encountered, one at Son N:6:5 and the other at Son Q:4:3. Both are triangular in cross section and display wear on all three faces.

About 74 percent of the manos are of a white decomposing granite that is available over much of the region. The advantage of this material lies in the fact that the surfaces are naturally rough and tend to remain so, as use exfoliates large particles. Most of the manos not of granite are of vesicular basalt and were found at sites in the Estero Tastiota region and at Son Q:4:3 near Punta San Antonio.

Larger metate-size beach cobbles also occur at central coast sites, but are not as numerous as smaller mano-like cobbles. Only 29 specimens from 11 sites show evidence of wear, varying from vague abraded areas to well-worn basins (Fig. 62).

Most of the clearly used specimens are broken. Twelve are of basalt (mainly vesicular), nine are of white granite, and the remainder are made of gneiss, quartzite, and sandstone. Like the manos, the basalt specimens are all from sites in the Punta Baja region and southward to Son Q:4:3.

About half of the metates are oval to irregular unshaped beach cobbles; the remainder appear to have been intentionally shaped. Five of these, all basalt, have edges that were fairly carefully altered by grinding and basins that were roughened by pecking. The other specimens were more crudely shaped, usually by a combination of rough chipping and minor efforts at grinding the edges; in outline, they are more or less oval, but the edges remain uneven.

About 59 percent of the metates collected are bifacial; the remainder are unifacial. The grinding surface is generally a basin depression, corresponding with the convex face of the preponderance of manos. As would be expected from the few manos with flat or faceted grinding surfaces, a few metates with flat milling surfaces were observed, but these had received very little use. Other metates showing somewhat more wear have very shallow but definite basin-shaped concavities. On this basis it would appear that flat milling stones (and flat manos) do not constitute a legitimate type of implement but are merely tools that had not become thoroughly broken in. This is further suggested by Davis' statement that the Seri of the 1920s "ground [eelgrass seeds] on a flat rock like a *metate*—any flat rock" (Quinn and Quinn 1965: 164).

Size is highly variable. The largest metate is about 45 cm long, 38 cm wide, and 10 cm thick. The smallest is 13.5 cm long, 12.2 cm wide, and about 3 cm thick. Most specimens are in the neighborhood of 30 cm long, 15 cm wide, and about 6 cm thick. The basins of thick and well-worn metates may be as deep as 5 cm.

During his brief survey of Estero Tastiota, Lehmer collected nine metates. Seven of these seem to be much like other central coast specimens. Two, however, are trough metates open at one end (Lehmer n.d.: 13). This is the only known occurrence of trough metates on the central coast.

A few general observations on the manos and metates can be made. With respect to materials, the fact that basalt specimens are restricted to the southern portion of the coast is probably nothing more than a reflection of local availability of this material. However, on the northern portion of the central coast the use of white granite for manos was clearly a matter of preference, since well-shaped beach cobbles of other rock are easily available. Why metates were not as frequently made of white granite is not clear, for the roughness would have been equally useful for these implements. It might be mentioned that the Trincheras people to the north also preferred manos of white granite; they were used both at

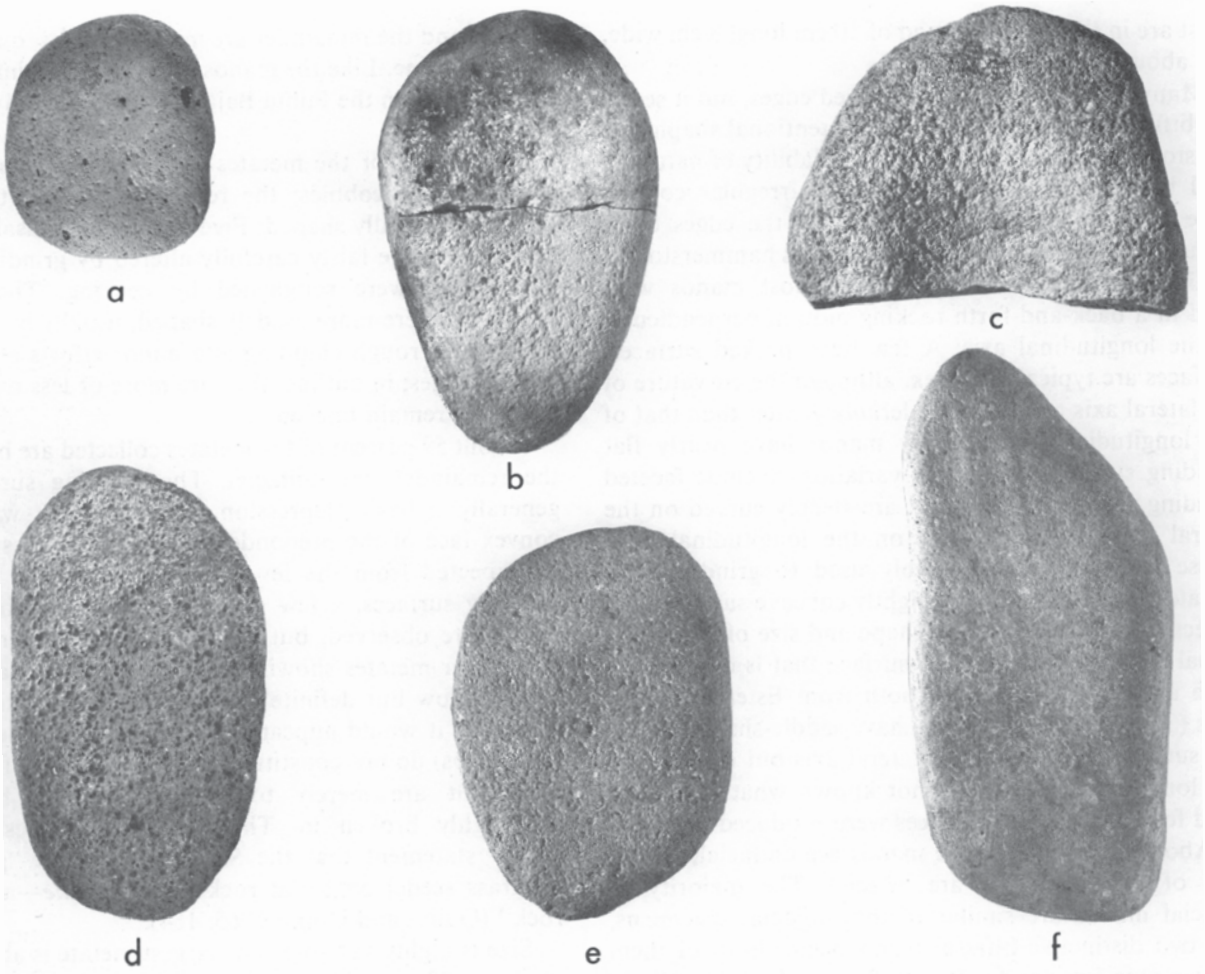

Fig. 62 Metates from Son Q:4:3 *(a, b)*, Son M:4:6 *(c)*, Son N:11:7 *(d)*, and Son I:7:4 *(e, f)*. These specimens are typical in shape but much more worn than most. Length of *f*, 36.0 cm. (Compare McGee 1898: Pls. 34–42).

coastal sites, where the rock was available, and at inland sites a considerable distance from the nearest source (Bowen: in preparation).

Oval manos and basin metates are, of course, extremely widespread in distribution. In most surrounding areas, including much of Sonora, they are characteristic of early horizons and were eventually replaced by other forms. On the central coast no such replacement occurred. Two modern Seri camps (Son I:16:2 and I:16:3) and a remembered camp (Son I:7:3) produced oval manos and basin metates indistinguishable from the majority of those at the remainder of the sites, and the contemporary Seri recall using these forms.

McGee (1898: 234–48, Pls. 34–56) devotes considerable space to a discussion of the form and use of unmodified beach cobbles among the Seri. These implements, many of which were still "smeared with blood and fat . . . and bits of flesh" (1898: 235) when they were retrieved from Seri brush houses, closely resemble the specimens recorded by the survey as manos and metates. Although some of his conclusions are untenable, the number of natural beach cobbles observed by the survey supports McGee's contention that they must have been important implements.

According to McGee, cobbles that were modified only by use served as general-purpose tools for a wide range of tasks. He states that he personally witnessed each of some 13 different uses to which one particular natural beach cobble was put (1898: 238–9, Pl. 43). It is worth noting that most of these uses had nothing to do with grinding food products; yet in any archaeological context this specimen, by virtue of its shape, size, and wear, would certainly be classified as an oval mano and interpreted as an implement used primarily to grind seeds. Since there is no reason to doubt the veracity of McGee's first-hand observations, it is probable that seed grinding was only one of many varied uses served by the cobbles designated here as "manos" and "metates." These two terms should therefore be regarded as labels for formal rather than functional categories.

McGee reports (1898: 234–5) that the Seri made a broad distinction between larger stones (and rock generally), which they called "ahst," and smaller stones they called "hupf." According to E. and M. Moser (pers. comm.), *?ast* is, as McGee indicates, the general term for stone, and "hupf" is probably McGee's transcription of *Xap,* an obsolete word meaning "metate." The current term for metate is *SiX ikáa;* the word for mano is *?ast ikosik.*

In the recent past, the implements used by the Seri to crush mesquite pods were bedrock or earth mortars and hardwood pestles. A series of such mortars is illustrated by Felger and Moser (1971: Fig. 1). Another type of mesquite processing implement, which Hayden (1969) terms "gyratory crusher," is known on the central coast from a single specimen found on Isla Tiburón (Hills 1973: 103). The Seri do not recall having used this device. One man who was shown a photograph of this specimen said he had never seen one of these items before. However, he immediately identified it as a stone from a *Xápkox iyya* 'metates his,' a string of such stones said to have been worn by the legendary Giants as chest armor (E. and M. Moser: pers. comm.).

Pipes

The Moser collection includes four ground stone tubular pipes, three of which are illustrated in Fig. 63. Three of the pipes are made of sandstone and one is of arkose. The latter has a pecked groove encircling the exterior (Fig. 63 *c*). The largest specimen (Fig. 63 *a*) is 6.8 cm long, 5.3 cm wide at the bowl, and a maximum of 4.4 cm thick. The bowl itself is oval in shape and measures 4.5 cm by 3.3 cm. This pipe produces a loud tone when blown through the mouth end as a trumpet. It is similar in shape to, but smaller than, a pipe or trumpet found north of Guaymas and reported by DiPeso (1957).

The Museo Regional de Sonora has a stone pipe similar to those in the Moser collection. It is 11.5 cm long and has a maximum diameter of 4.4 cm. Like pipes made of clay, stone pipes were smoked by the Seri for pleasure or for curing.

Fig. 63 Stone pipes, from the Moser collection. Length of *a,* 6.8 cm.

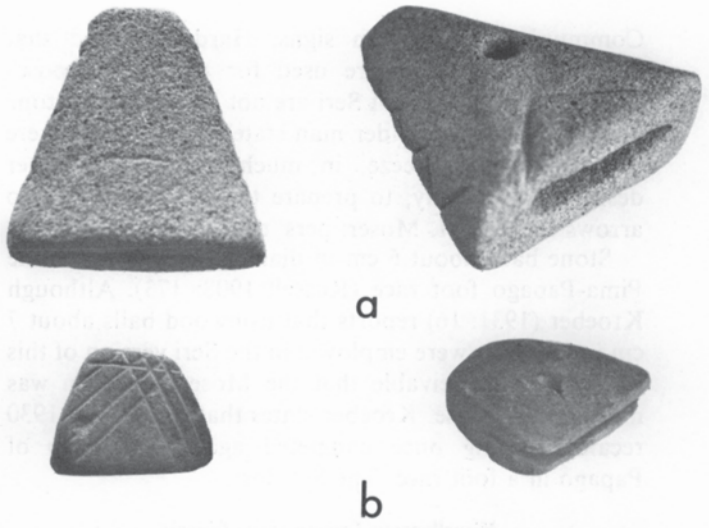

Fig. 64 Two stone whistles (each in two views), from the Moser collection. Length of *a,* 5.4 cm.

Whistles

Two ground sandstone "whistles" are included in the Moser collection (Fig. 64). In both, a slot in one end is intercepted by a small hole drilled in one face, which acts as the stop. Both objects bear an incised line decoration. The larger of the two is 5.4 cm long, 5.2 cm at maximum width, and 2.1 cm thick (Fig. 64 *a*). The smaller is 3.4 cm long, 2.8 cm wide, and 0.8 cm thick (Fig. 64 *b*). According to the Mosers (pers. comm.), the larger object is probably of fairly recent Seri manufacture. Although neither produces a sound, such whistles were used by shamans to summon the spirits (Bowen and Moser 1970: 185, Fig. 5).

Stone Balls

A nearly spherical ball of white granite, 3.4 cm in diameter, was recovered from Son I:7:4. It was apparently ground to shape. The Moser collection contains a roughly spherical ball of scoriated basalt about 7 cm in diameter. It was probably shaped by a combination of pounding and grinding. Another scoria ball was found in apparent association with a cache of ceramic figurines (Dockstader 1961: 191).

In 1826, Hardy observed a stone ball in use among the Seri:

> . . . my attention was directed by the old women to a pile of bushes outside the hut, which had a staff of about five feet in length sticking up through the centre. From the upper end of the staff was suspended by a cord twelve or fourteen inches long, a round stone ball, and to this ball was fastened another string furnished with bits of cork, surrounded with small feathers stuck into them, at the distance of about three inches apart: the only use of the stone ball being to prevent the wind from blowing out horizontally the string which was furnished with feathers [Hardy 1829: 294].

Communicating through signs, Hardy deduced that these paraphernalia were used for magical purposes (1829: 295). The present Seri are not familiar with stone balls, although one older man states that feathers were exposed to the breeze, in much the same manner described by Hardy, to prepare them for attaching to arrows (E. and M. Moser: pers. comm.).

Stone balls about 6 cm in diameter were used in the Pima-Papago foot race (Russell 1908: 173). Although Kroeber (1931: 16) reports that ironwood balls about 7 cm in diameter were employed in the Seri version of this game, it is conceivable that the Moser specimen was made for such use. Kroeber states that the Seri of 1930 recalled having once competed against a group of Papago in a foot race. The Seri lost.

Miscellaneous Ground Stone Objects

Four stone objects in the Moser collection have drilled holes, which suggests that they may have been used as pendants. Two pebbles are unmodified except for the drilled perforations. One is of arkose, 8.5 cm long, 6.7 cm wide, and 4.5 cm thick; the hole, which lies obliquely to the axis of the pebble, is 2.2 cm in diameter. The other is a doughnut-shaped quartzite pebble with a diameter of 6.8 cm and a thickness of 2.3 cm; the hole is 2.0 cm in diameter.

The two other drilled stones are clearly ground to shape. One, from the Bahía Kino area, is oblong, 4.5 cm long, 1.8 cm wide, and 0.8 cm thick (Fig. 65 *a*). It is made of quartzite and has a biconically drilled perforation in one end. All surfaces bear evidence of grinding. The other object is 7.8 cm long, 2.7 cm wide, and 0.7 cm thick (Fig. 65 *b*). It has a biconically drilled hole at one end, but only one face shows grinding.

Two other oblong objects in the Moser collection are similar in form and size but lack perforations. One is of basalt, 7.0 cm long, 2.5 cm wide, and 1.1 cm thick. It is modified only at one end, where it is ground to a blunt point (Fig. 65 *c*). The other object, made of pumice, is 6.5 cm long, 1.7 cm wide, and 0.8 cm thick. It bears a shallow incised line extending the length of one face, as well as two notches opposite each other on one end (Fig. 65 *d*).

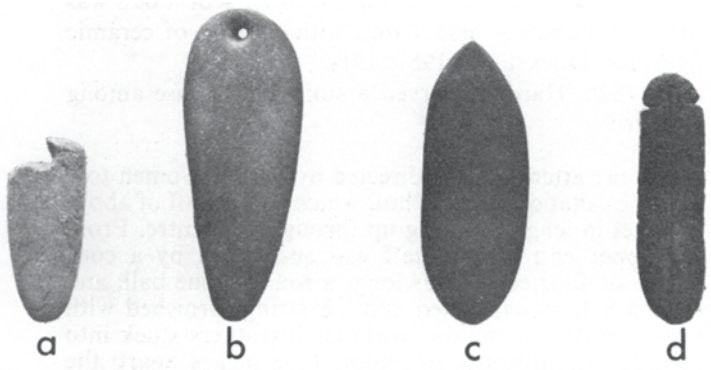

Fig. 65 Ground stone objects, from the Moser collection. Length of *b*, 7.8 cm.

Two small pieces of pumice, both ground, were found at Son I:16:6. One, which merely bears a small ground area, may have been used as an abrading stone. The other is a rectangular object with four parallel grooves each 7 mm wide. The Seri remember using pieces of pumice as arrow shaft smoothers. They were called *?ást ikéep* (E. and M. Moser: pers. comm.).

CHIPPED STONE

Projectile Points and Knives

The survey collection consists of 39 projectile points and knives, most of them broken. Three specimens are isolated finds; the remainder are from 13 sites distributed throughout the length of the central coast (Table 12). There are, fortunately, several additional sources of information concerning points, including specimens in the Moser collection and the Arizona State Museum survey collections, and descriptions of central coast points (Lehmer n.d.; Holzkamper 1956). Since so few points were encountered by the survey, all of these sources serve as the basis for the following remarks.

It appears that the vast majority of central coast points can be assigned to three loose categories based on overall shape and size:

Stemmed Points (Fig. 66). Stemmed points are ap-

TABLE 12

Numbers and Types of Classifiable Projectile Points and Knives Collected at Central Coast Sites

	Stemmed	Triangular with Concave Base	Leaf-shaped
Son I:7:6			1
I:11:7			2
I:11:8	1		1
I:11:9	3	(1)*	
I:11:10			2
I:16:4			2
I:16:5		1	
J:13:1	1		
N:6:3	1		
N:10:1		1	
N:10:13			1
N:11:7	2	4	1
Q:4:3	2		5
Estero Tastiota vicinity			3
Totals	10	7	18

*Single specimen with straight base.

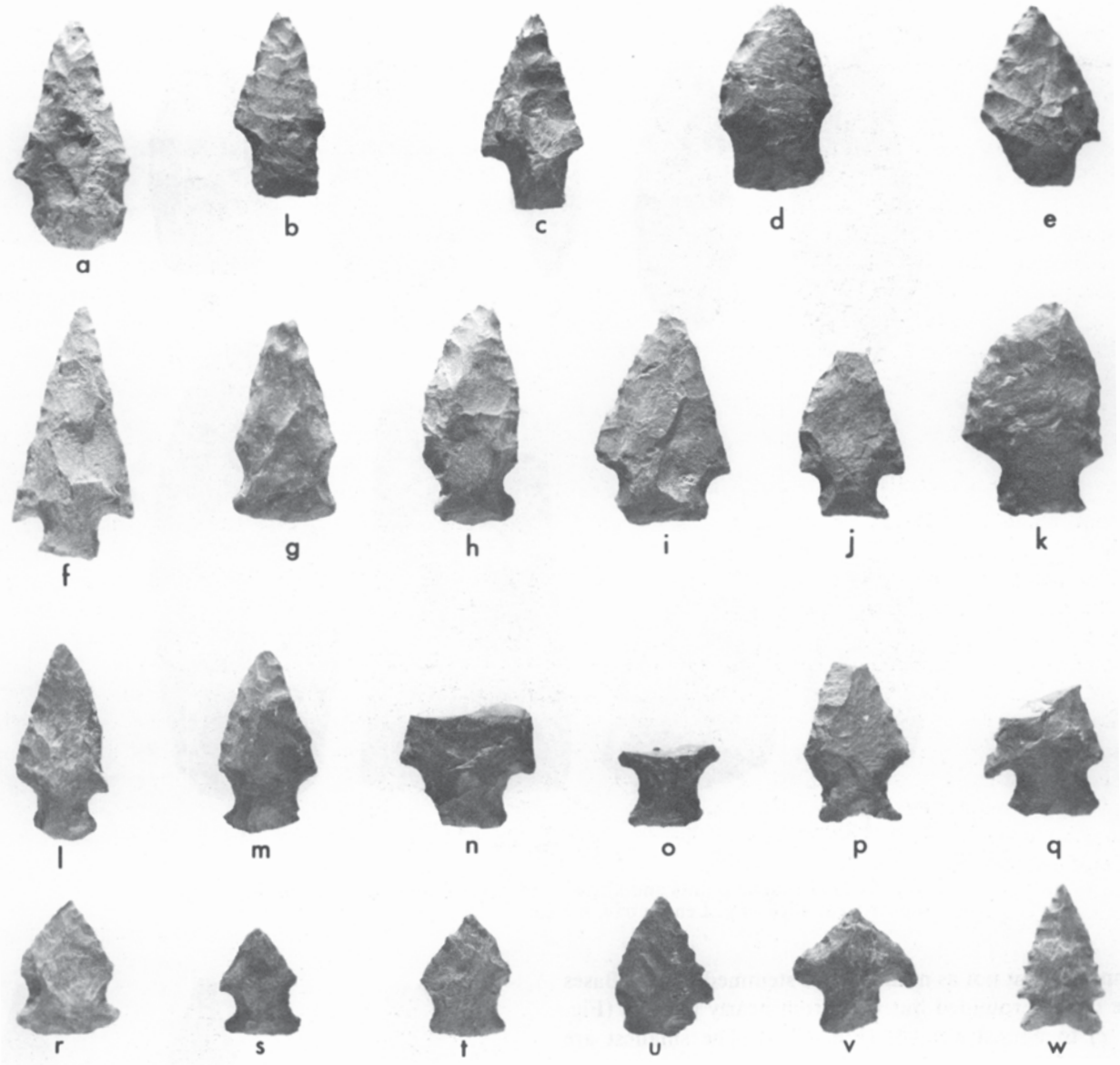

Fig. 66 Stemmed points from the vicinity of Bahía Kino, from the Moser collection. Length of *a*, 4.5 cm.

parently the most common; perhaps half of the points so far known fall into this category. More important, most stemmed points cluster around what seems to have been a fairly well-defined norm, involving a slightly convex blade, a more or less straight base, a slightly to moderately expanding stem, rounded spurs, and a length averaging about 3 cm. The two points found by McGee's party are archetypical specimens (1898: Fig. 37).

The range of variation among stemmed points is comparatively small. Bases are sometimes slightly convex or concave, but usually not markedly so. Spurs are almost always rounded. Stems display somewhat greater variability, occasionally having parallel sides, or more rarely, tapering slightly (Fig. 66 *b, c, e*). A few points have markedly expanding stems, which in some cases produce a corner-notched effect (Fig. 66 *j* and *q*). Tang form seems largely random; frequently the two tangs of a single specimen are quite different in form (Fig. 66 *l*). In length, most specimens fall within a range of 2 cm to 5 cm.

Most stemmed points are not well made. Chipping is predominantly by percussion and is frequently confined to the edges. Such specimens typically retain large areas of cortex or primary flake scar. Some points are excessively thick, and many are markedly asymmetrical (for example, Fig. 66 *k*). At present it appears that formal variability among the stemmed points is more a haphazard by-product of sloppy workmanship than a result of intent.

Leaf-shaped Points (Fig. 67). Leaf-shaped points are

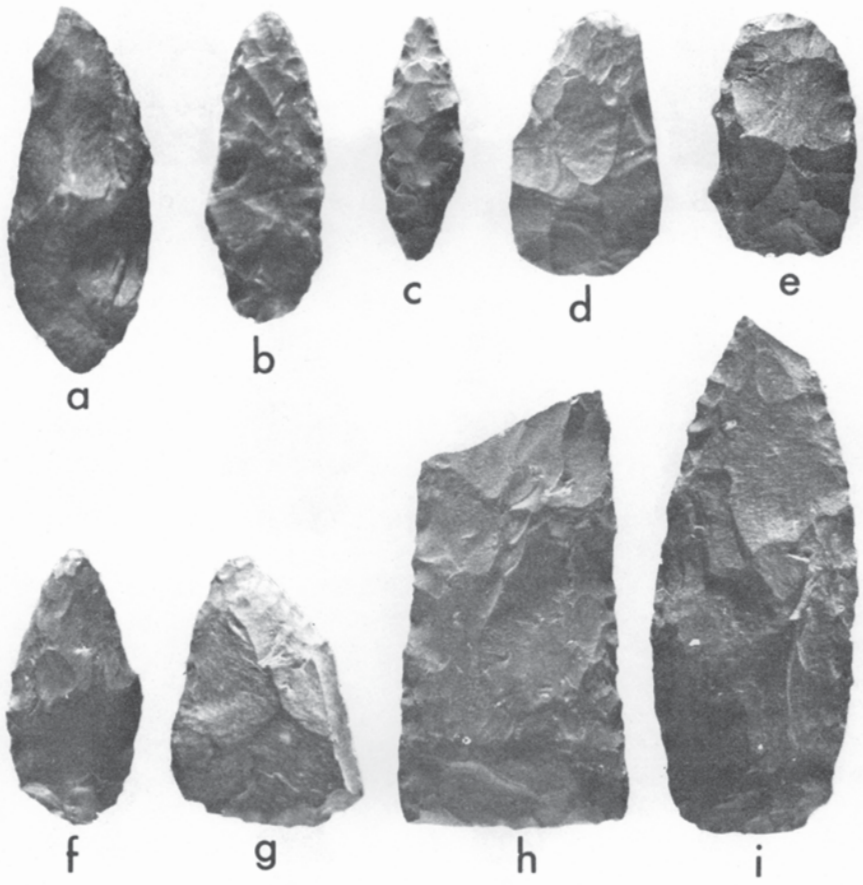

Fig. 67 Leaf-shaped points and knives from several sites. Note reworking on the upper right edge of *g*. Length of *i*, 8.2 cm.

common, but not as numerous as stemmed points. Bases are usually rounded but vary from nearly pointed (Fig. 67 *c*) to almost straight (Fig. 67 *h*). The smallest are about 4 cm long. Most of the large specimens are broken, but the length of some evidently exceeded 9 cm. The larger specimens, at least, are probably too massive to have been used to tip arrows.

In general, workmanship of these points is mediocre. They are often asymmetrical and fairly thick, and many display no evidence of fine retouching. A few, however, are quite well made (Fig. 67 *h*).

Triangular Points with Concave Bases (Fig. 68; Holzkamper 1956: Fig. 4). This is a rather diverse category that may well include points from quite different time periods. Only seven of these points were recovered by the survey, but the collection described by Holzkamper (1956) contains 42. The blades of some are straight, but they are more often slightly convex, and many of the specimens reported by Holzkamper have serrated blades. Apart from the straight base on a single specimen (Fig. 68 *c*), bases vary from slightly to deeply concave. A few of the points with deeply concave bases

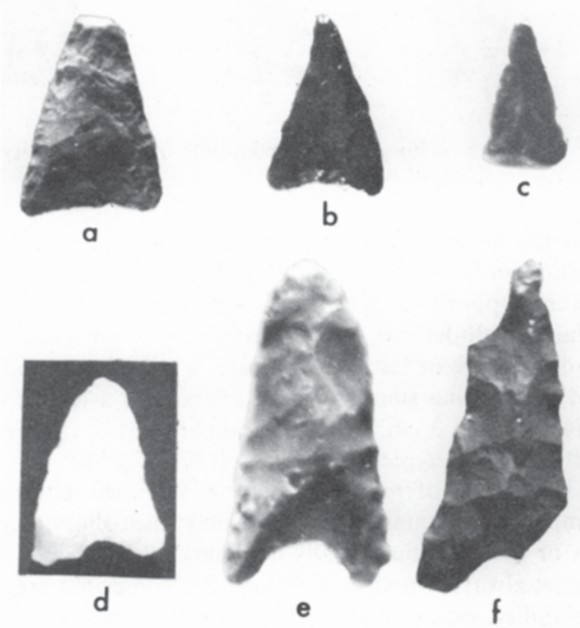

Fig. 68 Triangular points, with concave bases (except for *c*, with straight base), from several sites. Length of *e*, 3.8 cm.

might be considered notched (Fig. 68 *e* and *f*); it is likely that such points are early. Holzkamper gives maximum and minimum lengths as 4.2 cm and 1.3 cm (1956: 14); widths range from about a third to half of the length. Some of the specimens illustrated by Holzkamper appear to be little more than thin flakes hastily brought to shape by pressure retouch along the edges, but some are rather well made. Most of the points in this category have come from south of Bahía Kino.

Several whole or fragmentary Clovis points have been found along the central coast. The two specimens originally reported by DiPeso (1955) are from Punta Blanca, between Guaymas and Estero Tastiota. Another was found in the vicinity of Estero Tastiota, and a fourth is from the Desemboque area. Two additional specimens have been found inland near Cerro Prieto and Cerro de Izabal. Evidently all are isolated surface finds (Robles and Manzo 1972: 201, Fig. 1).

The materials used for projectile points and knives in the northern half of the central coast differ from those that predominate in the south. Nearly all of the points that have been found at sites north of Bahía Kino are made of chert, jasper, rhyolite, quartz, or quartzite. Occasional points made of these materials occur south of Bahía Kino, but the majority from this part of the coast are of basalt and, to a lesser extent, obsidian. Apparently all of the points from Estero Tastiota reported by Holzkamper (1956) are made from these two rocks. In the Guaymas area, just beyond the central coast, basalt and obsidian were used exclusively.

The source of the obsidian and basalt employed at Estero Tastiota has not been ascertained. One possible source lies in the mountains north of Guaymas, where broken projectile points and debitage provide ample evidence of quarrying and manufacture. However, there reportedly exists a source of these rocks closer to the Tastiota area. Probably only local resources were exploited; the scarcity of basalt and obsidian tools north of Bahía Kino indicates that these materials were not considered valuable enough to stimulate long-distance quarrying expeditions or trade.

Obsidian was evidently used only for certain point forms. Holzkamper (1956) reports that the serrated points in his collection (all triangular with a concave base) are exclusively of this material. Very few stemmed points and no leaf-shaped points of obsidian have been found.

McGee (1898: 246–7) expressed considerable surprise at finding only two stone projectile points despite a constant search over a month's time. The total of 39 recovered by the present survey is also a rather small number, but it demonstrates that points are not quite as rare as McGee's results suggest. The scarcity of points at sites today is undoubtedly related to the invasion of the central coast by increasing numbers of tourists; this is certainly suggested by the fact that fully a third of the points collected by the survey are from four sites located along a stretch of coast that had probably not been previously traversed by non-Indians.

On the other hand, it is apparent that the distribution of points is not uniform throughout the central coast. Despite the activities of relic hunters, points seem to have been genuinely more common south of Bahía Kino, a region not visited by McGee, than in the north. For example, the Estero Tastiota area, while now depleted, was the source of the 123 points described by Holzkamper (1956). Lehmer's (n.d.) survey of the same area produced 51 points, and large numbers have been removed by collectors.

Individual sites also vary greatly in the abundance of points. Half of those collected by Lehmer are from a single site. Most extraordinary, however, is the Topete site (Son N:5:1), also south of Bahía Kino. This remarkable site, not visited by the survey, has yielded well over a thousand points from an area of only a few thousand square meters.

Historic mention of Seri arrow points dwells on the notorious use of poison and says little of the points themselves. The earliest reference is by Padre Gilg, who in 1692 wrote only that "points heretofore were of stone" (DiPeso and Matson 1965: 55). Although he did not indicate what kind of tip had replaced stone points, Gilg's remark is of interest because, with only one exception (Son I:16:4), all of the sites where points were encountered by the survey are essentially lacking in Historic Seri pottery. It may be that a decline in the manufacture and use of stone points had indeed begun by the end of the seventeeth century. On the other hand, the use of stone points clearly persisted among some groups until much later, since Hardy observed and purchased some stone-tipped arrows on Isla Tiburón in 1826 (Hardy 1829: 290, 299).

The apparent discrepancy in the two reports may very well be due to differences in the use of stone points among the various bands. This possibility is underscored by the extreme case of the Band VI people of Isla San Esteban, who are said to have made no use of the bow and arrow whatever (E. Moser 1963: 24). Gilg was familiar principally with the Tepocas (Moser's Band I), whereas Hardy was in contact with the Tiburones or Band III people, who may have continued to produce stone points long after they fell into disuse among the Tepocas. Similarly, the differential archaeological abundance of points from various portions of the coast suggests that stone points may have been used more by some groups than by others. It is noteworthy that the coastal strip south of Bahía Kino was the territory of the Band II people, who are said to have subsisted predominantly by hunting and gathering terrestrial

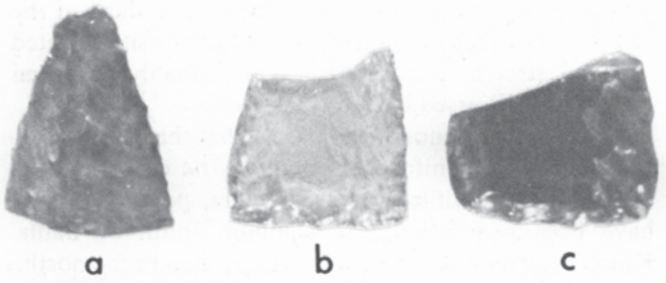

Fig. 69 Glass point fragments, probably triangular in form, from the Moser collection. Specimen *a* is a tip, *b* and *c* are bases. Length of *a*, 2.7 cm.

foods (rather than by fishing and turtle hunting), and later by raiding the settlements of the Europeans (E. Moser 1963: 23).

One Seri woman, born in the 1880s and now deceased, recalled having seen stone points made when she was a small girl (E. Moser: pers. comm.). However, other materials were certainly in use by that time. Evidently, one such material was glass. The Moser collection contains four fragmentary glass points, all probably triangular with straight bases (three are illustrated in Fig. 69). All four are made of green bottle glass, one being from the curved neck of the bottle. Flaking is bifacial but confined to the edges. Widths range from 2.2 to 2.6 cm, and lengths were probably about 4 cm.

The use of stone for projectile points probably did not extend beyond the end of the nineteenth century. McGee (1898: 198, 246) noted two kinds of points in use during his visit, neither of them stone. One form was simply the conventional hardwood foreshaft, sharpened and fire-hardened. According to one Seri (E. Moser: pers. comm.), such points would have been made of ironwood. The other kind of point was made of hoop iron. McGee indicates that these had a long straight blade, sharp oblique tangs, and a short stem fitted into a slot in the foreshaft (1898: 198, Pl. 30). Apparently, however, this has not been the only form of metal arrow point, since the five metal points in the Moser collection are unstemmed triangular specimens with triangular notched bases (Fig. 70), somewhat reminiscent in form of certain stone points (for example, Fig. 68 *e*). This is the form used today on arrows made for sale to tourists. Although iron, either from shovels or from barrel hoops, is said to have been the preferred material for metal points, only one of the Moser specimens (Fig. 70 *a*) is of iron (with about a 20 percent copper content). Spectrographic analysis indicates that the other four metal points are essentially pure copper except for a trace of barium. Today, the points of arrows made for tourists are cut from lard tins.

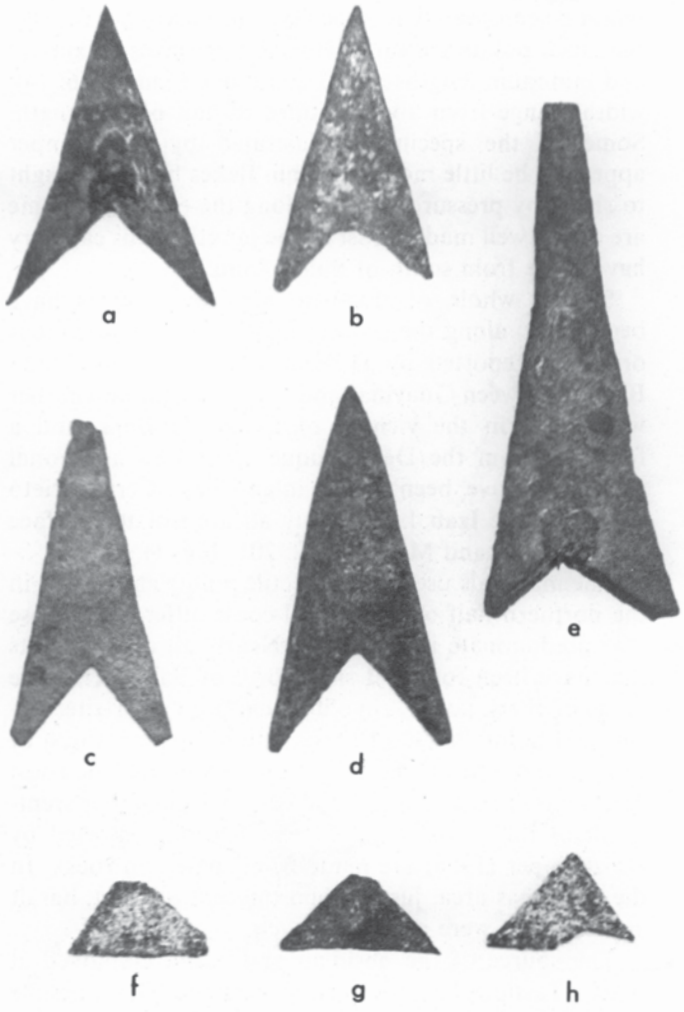

Fig. 70 Metal points *(a–e)* and plugs cut from bases *(f–h)*, from the Moser collection. Length of *e*, 6.8 cm.

Cruciforms

Hemmings (1967) based his very thorough interpretation of cruciform artifacts on some 85 available or reported specimens from Mexico and the Southwest. More than half of this sample is from Sonora, and many of these were found on the central coast (1967: 152–4). Although none were encountered by the survey, the Moser collection contains about a dozen specimens, of both obsidian and basalt. Unfortunately, only one of these was available for study. It is of obsidian and bears a close resemblance to one of the "Type 2" cruciforms illustrated by Hemmings (1967: Fig. 2 *f*). It was first chipped to shape, and then two of the edges were ground. Its diagonal length (between tips of opposite arms) is 25 mm, its thickness, 4 mm. It was found a few kilometers southeast of Bahía Kino.

Hemmings (1967: 160–3) explores several possible functions of cruciforms, concluding tentatively that

most were used as dice or counters for games having ritual significance. However, he also cites W. N. Smith's observation that two cruciforms found with a burial from Isla Tiburón were positioned in such a manner as to suggest use as ear pendants (1967: 163).

More recently, A. S. Johnson (1971), upon reviewing the archaeological context of cruciforms and similar objects along with Conquest period records from the Valley of Mexico, suggests that cruciforms were decorative objects attached to atlatls. This is indicated in part by three graves (none of them in Sonora) in which cruciforms were found in a row alongside the body—the position that would be expected if the cruciforms had been fastened to atlatls placed parallel to the body, and the atlatls had subsequently decomposed. In the case of the Isla Tiburón burial observed by Smith, Johnson hypothesizes that the position of the two cruciforms resulted from placement of the atlatl over the neck region and perpendicular rather than parallel to the axis of the body (1971: 191).

Since the Isla Tiburón burial was apparently from a preceramic level (Hemmings 1967: 163), it could indeed date from a time when atlatls were in use on the central coast, before the bow and arrow made its appearance. However, it is difficult to imagine why an atlatl would have been placed perpendicular to the axis of the body. For this burial, Smith's interpretation of the cruciforms as ear pendants seems more plausible. It might be added that Padre Gilg stated that the Seri of 1692 wore ear ornaments, although he mentioned only the use of shells and ribbons (DiPeso and Matson 1965: 53).

In comparatively recent times the Seri have not used cruciforms either as ear pendants or as decoration for atlatls. The present Seri say that in times past human hair cords were sometimes worn bandolier-style by shamans. The cords would contain stone cruciforms woven into the hair. The precise purpose of these cords is not remembered, but since they were worn by shamans, they presumably had an esoteric function. Whether cruciforms put to such use in the recent past were made by the Seri themselves or were merely found by them is not clear, nor is there any way of knowing how early hair cords containing cruciforms were in use. Nevertheless, it might be noted that a shaman buried with his hair cords in place and with the cruciforms at shoulder level would end up a skeleton with the cruciforms lying in the same position as those accompanying the Isla Tiburón burial observed by Smith.

Other Chipped Stone

In summarizing his census of stone tools at various camps, McGee states 1898: 248) that "the most impressive fact . . . is the practical absence of stone artifacts wrought by flaking or chipping in accordance with a preconceived design; excepting the exceedingly rare arrowpoints there are none of these. And the assemblage of wrought stones demonstrates not merely that the Seri are practically without flaked or chipped implements, but that they eschew and discard stones edged by fracture whether naturally or through accident of use."

Although in fact a considerable quantity of chipped stone occurs at central coast camps, to say nothing of the quantity at the two Son I:15:3 quarry-workshops, McGee's basic contention that *well-shaped* stone tools (other than points) are exceedingly scarce appears to be fundamentally correct. Despite the abundance of unretouched flakes at many sites, the survey encountered only about 60 objects with one or more edges modified by retouching. Moreover, many of these items may not have been tools. Some have dulled or battered edges, but many show only large unworn flake scars and may be nothing more than cores remaining from the production of flakes.

These cores or core implements are predominantly of basalt and quartzite, and a very few specimens are of chert, rhyolite, and quartz. Virtually all are flaked entirely by percussion. About 25 percent are bifacially flaked; on the remainder, flakes were struck only from one face. Very few specimens were chipped around the entire perimeter. In most cases, flaking is confined to a single edge, and many specimens are little more than natural rocks from which two or three large flakes have been removed. Apparently the intent of such stoneworking was merely to produce a sharp (and often irregular) working edge rather than a fully shaped tool. The specimens illustrated in Figure 71 are some of the most fully shaped implements, not characteristic examples.

The massiveness and battered edges of some of the specimens (for example, Fig. 71 *h* and *i*) suggest that pounding or chopping was a characteristic use of these implements. The smaller objects, especially the few with a comparatively uniform retouched edge, may have been used as scrapers or planes.

Flakes are much more numerous. Although none were seen whose overall shape had been significantly altered, a few flakes with minimally retouched edges were noted. Somewhat more common is evidence of use, such as a dulled edge or the loss of an occasional spall, on otherwise unmodified flakes. Most flakes, however, show no macroscopic indication of having been either modified further or used.

The use of glass for projectile points has been mentioned. It is not known to what extent this material was used for other implements, but one piece of glass from which a few small flakes had been removed was found at

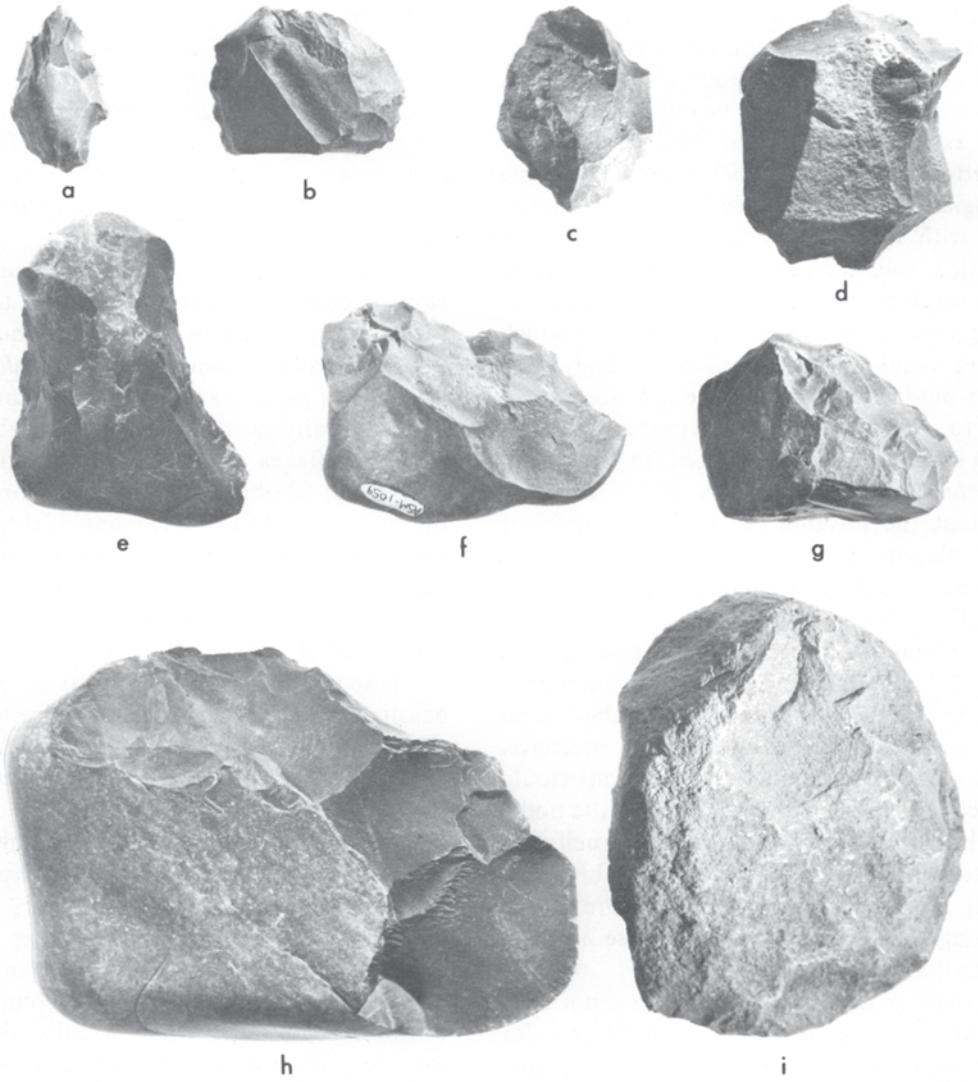

Fig. 71 Chipped stone tools from several sites in the Desemboque area. Possible graver *(a)*; scrapers *(b–e)*; unifacial planes *(f–g)*; bifacial choppers *(h–i)*. Length of *i*, 14.6 cm.

Son I:11:6. A similar flaked object, part of the bottom of a bottle, is in the Arizona State Museum survey collection from Son I:16:1.

Thus it appears that McGee's conclusion (1898: 248), that the inhabitants of the central coast used no chipped stone implements apart from rare projectile points, is an exaggeration but not entirely off the mark. Projectile points are considerably more common than McGee supposed and there is no question that "stones edged by fracture" were once widely used. On the other hand, fully formed stone tools are indeed scarce, and it is quite likely that stoneworking had almost completely died out among the Seri prior to McGee's visit. McGee (1898: 233–4) implies that the edges of shells may have been used for many of the cutting and scraping tasks performed by stone tools in other cultures. In the remembered past, the Seri have indeed put shells to such use (Harrington 1938: 123–4), as well as using split cane for knives and shovel or hoop iron for scraping hides. The Seri do not now recall having seen stone scrapers or other flaked implements in use, but they assume that chipped stone must have been used for tools (E. Moser: pers. comm.).

HAMMERSTONES

In his discussion of the Seri "hupf" and "ahst," McGee (1898: 234–48) stresses the fact that oval water-worn beach cobbles were used for all kinds of pounding, chopping, and crushing operations, as well as for grinding. On the basis of the survey findings there is no reason to dispute this. However, it appears that oval mano-like cobbles were not the only stones used for

pounding. Unmodified rocks, often very irregular in form and up to about 15 cm in greatest dimension, are among the most common items on the site surfaces, and many show evidence of battering. Evidently, when a need for pounding arose, almost any handy rock would suffice.

SHELL ARTIFACTS

Worked shell may be much more common and varied than the following discussion suggests. It is not surprising that so few specimens were recovered, considering their virtual invisibility among the quantities of unmodified shell that litter most sites and the rapid manner in which collections were taken.

Flaked Shell

A *Glycymeris* shell found at Son I:11:12 appears to have been subjected to intentional bifacial flaking around its entire perimeter. The diameter of the object is 5.2 cm. Although natural shells have been used extensively as tools by the Seri, no information has been obtained on flaked shell.

Glycymeris Bracelets

Five fragments of *Glycymeris* bracelets were recovered, one each from Son I:15:1 and N:2:2, and three from Son N:6:5. An additional fragment, from Son N:1:9, is in the Arizona State Museum survey collections. One ground and faceted central core resulting from bracelet manufacture was also encountered at Son N:2:2.

The widths of all six bracelet fragments range from 5 mm to 9 mm, thus falling within the medium width category that predominated at Snaketown in the Santa Cruz and Sacaton phases (Gladwin and others 1937: 142). However, the faceted core indicates that manufacture was by the normal Trincheras technique of sawing around and then knocking out the plug, rather than by the normal Hohokam process of thinning the convex side of the shell by grinding it down (A. E. Johnson 1960: 179–80). It is of further interest that Son N:2:2, the source of the central core and one bracelet fragment, yielded a substantial quantity of Trincheras pottery.

Although *Glycymeris* bracelets were produced on the central coast, as the recently discovered manufacturing site near Playa Noriega clearly indicates, it is obvious that they were made by the Trincheras people, not the indigenous inhabitants.

Shell Beads and Pendants

Two sites produced one shell bead each. One is an *Olivella* bead from Son N:6:5, unmodified except for a perforation in the spire. *Olivella* necklaces were in use among the Seri at the time of McGee's visit (1898: Fig. 11) and continue to be made. The other bead, a tubular object from Son J:13:1, was ground to shape. It is 22 mm long and 8 mm in diameter. The perforation is a biconically drilled hole. The genus was not determined.

A third kind of bead is a small disk of ground shell. A necklace of some 6300 such beads accompanied the burial at Son Q:4:3 (Fig. 72), and apparently identical beads were found with the infant burial reported from Son I:7:4. Those from Son Q:4:3 are about 5 mm in diameter and 2 mm thick, concave on one side and convex on the other. They had been strung in such a manner that the convex side of each bead nested in the concavity of the one adjacent. As indicated earlier, the Seri have a name for this kind of bead *(?áapXix)*, although they deny having made them; they are said to have been manufactured and worn by the Giants.

Holzkamper (1956: 18, Fig. 8) classifies a collection of disk-shaped beads from Estero Tastiota into three

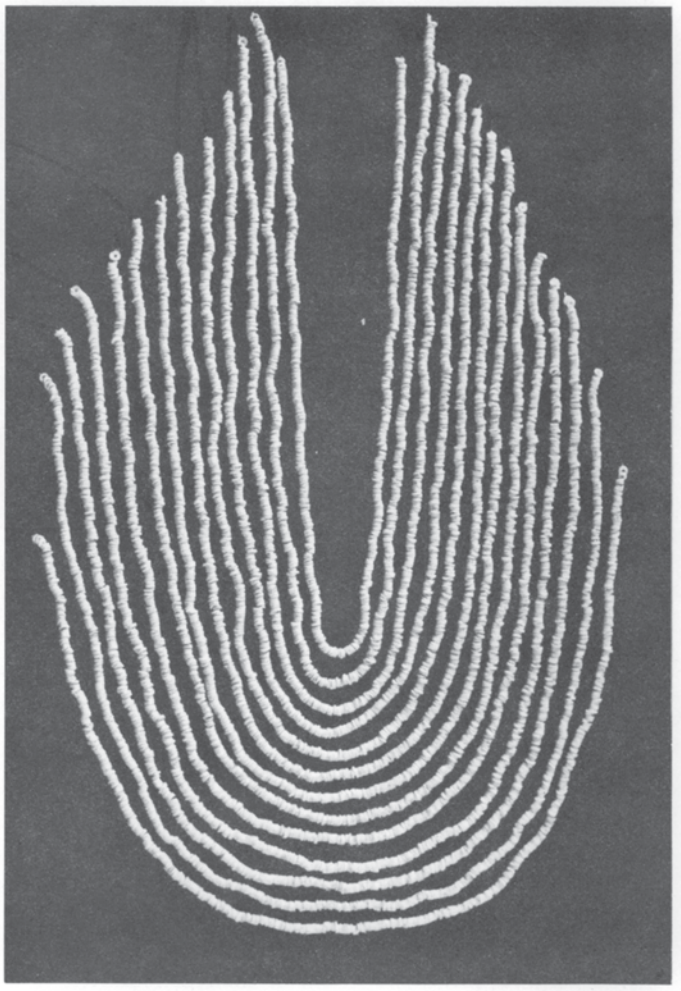

Fig. 72 Shell beads (restrung) accompanying burial at Son Q:4:3.

categories based on size and, apparently, species. All are larger than those described above, the smallest being about 8 mm in diameter.

The Moser collection includes eight worked shell beads. Three are tubular, 8 mm in diameter, and range from 13 mm to 18 mm in length. Although the perforations are not biconically drilled, these three beads are otherwise similar to the tubular specimen from Son J:13:1. Three disk-shaped beads about 10 mm in diameter and 3 mm thick, with biconically drilled holes, conform to one of the types described by Holzkamper (1956: Fig. 8 *z*). The remaining two are unfinished disk beads, chipped around the edges but not ground. All eight specimens were found in association with about 140 glass beads in a blowout near Desemboque.

Dockstader (1961: 84, 89) cites the occurrence of shell and nacre ornaments of unspecified form. Two shell pendants, one of them incised, are described by Holzkamper (1956: 18, Fig. 8).

Pigment-Bearing Shell

A cave site in the mountains east of Desemboque, known to the Seri as a vision cave, was discussed earlier under *Pictographs*. The floor of this site produced two fragments of a shell *(Chione californiensis)* with a reddish pigment adhering to the interior surface. Both Hardy (1829: 286) and McGee (1898: 165–6, Pl. 27) state that pigments used for face paint were prepared in shell cups. However it is possible that this shell served as a mixing cup for the red pigment used to create the cave pictographs.

7. CHRONOLOGY AND CULTURAL CONTINUITY

CHRONOLOGICAL OUTLINE

Most of the specific information bearing on the temporal placement of the remains has been incorporated into the preceding descriptive sections. The present section summarizes the evidence and attempts to place the occupation of the central coast into a broad chronological perspective. It must be emphasized, however, that the available evidence is as tenuous as it is meager, and any conclusions will stand on a most insecure footing. None of the remains have been dated directly, and most of the chronological relationships proposed here are inferential, based on unverified assumptions, or derived from analogy with the chronologies of other areas. Thus there is little prospect that present information will yield more than a general and very hazy picture, one that may require extensive revision in the face of further data.

Clovis Occupation

The earliest inhabitants of the central coast who can be identified with certainty were Clovis hunters. Four Clovis points have been found at three different localities on the central coast proper, and two additional specimens have come from nearby inland locations (Robles and Manzo 1972). In view of the number of points known and their occurrence without cultural context, it seems most likely that these points are remains of a genuine Clovis occupation and were not brought into the area by later peoples.

Other Preceramic Evidence

There are indications that the central coast was occupied during preceramic times by groups other than the Clovis hunters. However, most of the information pertaining to this period is so vague and equivocal that very little of a specific nature can be said about it. Perhaps the best potential source of information is Son I:15:1, the large stratified dune site at Tecomate on Isla Tiburón. Richard S. White, who has examined the eroded face of this site in some detail, reports that he found pottery extending to a depth of about 4 m below the present surface (pers. comm.). No evidence of pottery was found below this level, although shell and stone continues for another 2 m and several of the burials described earlier have eroded from the basal layer. However, cultural material and shell in the nonceramic levels is apparently sparse compared to that in the ceramic levels, suggesting that the occupation of the site did not become intensive until after the introduction of pottery.

Five small lithic sites, Son I:7:6, I:7:11, I:11:7, I:11:9, and I:11:10, were found to contain no pottery, but it is doubtful that any are preceramic in age. It is almost certain that one of them, Son I:11:7, is merely a small lithic work area associated with an adjacent pottery-bearing camp. The remainder are all very small sites bearing only modest quantities of shell and debitage. While it is possible that one or more of the sites were occupied before the advent of pottery, it seems more likely that all are merely briefly occupied camps or work areas where no pottery happened to be broken.

The two quarry-workshops included within the Son I:15:3 site area also lack pottery. Unfortunately, they were discovered only recently and little is yet known about them. Although specialized function rather than age may be largely responsible for the absence of pottery, the more southerly of the two may well have an occupational history extending into preceramic times. This is suggested by the presence of fairly well defined areas of debitage that display markedly different degrees of oxidation.

A few more or less nonceramic sites have been noted by others. One, which apparently contains only a very few sherds, is the Topete site (Son N:5:1, described in Chapter 3). A large dune site recorded by Lehmer (n.d.) at Estero Tastiota yielded pottery, but it is restricted to only a portion of the surface. Some 25 projectile points were found here along with a number of other chipped and ground stone artifacts. Hayden (1956: 21) visited another lithic site in the same general area; apparently it contained no pottery whatever. These two sites are described too briefly to allow further comment.

Estero Tastiota is also the source of the artifact collection described by Holzkamper (1956). Malcolm Rogers, who inspected drawings of some of these artifacts (primarily projectile points), in a few cases noted a resemblance to artifacts ranging from San Dieguito II to Amargosa I in the southern California sequence (Hayden 1956: 22). However, the resemblances could be merely formal and not indicative of any great antiquity. Rogers also noted that many of the artifacts in this collection have no counterpart in southern California.

Considerable formal similarity exists between the central coast stone circles and the Malpais and San Dieguito I boulder-rimmed sleeping circles of the southern California deserts and the Sierra Pinacate (Rogers 1939: 7–8; 1966: 36, 44–7; Hayden 1967: 336–7; n.d.: 5–6). In most cases, however, the resemblance is clearly spurious. Unlike the Malpais–San Dieguito I circles, most of the central coast structures show no evidence of rocks having been cleared from the area within the circle. In fact, in at least one instance the stones for the circle itself had to be brought in, since there is no rock anywhere in the immediate vicinity. It is undoubtedly significant that most central coast circles fail to exhibit the patination, caliche deposits, and deep embedment of the stones that characterize early sleeping circles in southern California, even though these processes may not occur at precisely the same rate in the two areas. Furthermore, early California circles sometimes occur in clusters and may be associated with stone implements; central coast circles generally occur singly and in isolation and are unaccompanied by artifacts.

Nevertheless, one structure, Circle 7 on Isla San Esteban (Fig. 33), appears to be genuinely similar to the Malpais–San Dieguito I boulder-rimmed sleeping circle. It is situated on a gravel terrace of the island's main drainage channel. No tools were recognized in the vicinity, but the area within the circle itself was definitely cleared of large rocks. Some of the stones that compose this structure are embedded in the ground and are patinated to the same degree as undisturbed rock in the area. Further examination will be necessary before the age of this circle can be properly judged. If it should prove to be genuinely early, its insular location would make it especially interesting because Isla San Esteban, in the middle of the Gulf, could only have been reached by some kind of watercraft.

At present, there is no evidence that any of the other stone circles are early. Many or most are probably Seri vision rings, and some may be fairly recent. It is possible, of course, that the Seri rings ultimately derived from the San Dieguito circle and have been endowed with a specialized function.

The stone outline figures and alignments at Son I:15:3 (and the alignments on the west side of Isla Tiburón) may well be related to those of the southern California deserts and the Sierra Pinacate. The alignments would seem to have a close parallel in the stone-outlined cleared strips built during Amargosa times in the Sierra Pinacate (Hayden n.d.: 8). The relative age that this implies is compatible with the moderate embedment and surface alteration of stones in the Son I:15:3 alignments.

Most of the elements that occur in the northern group of outline figures at Son I:15:3 are also found in southern California. These include rock alignments, lines joining alignments at various angles, alignments terminating in a cairn, seemingly random groups of cairns, and alignments of cairns (Rogers 1939: 10–3; 1966: 52–3). The one figure that apparently is not known in California is the "spoked wheel," and the specific combination of figures at Son I:15:3 is undoubtedly unique. Their age is uncertain, but it appears that different figures may have been built at quite different times. Based on analogy with southern California and Sierra Pinacate figures, several factors—including the types of figures represented, the techniques of construction, the degree of oxidation and related processes, and the attributes of the stone implements in the immediate area—all suggest an age range for the Son I:15:3 figures extending from Malpais through Amargosa.

The only other features for which a preceramic age might be postulated are the burials that have been observed eroding out of the lower levels of Son I:15:1. However, grave depth elsewhere on the central coast and among the modern Seri generally exceeds 1 m. If investigation bears out White's observation that only the basal two meters of Son I:15:1 are nonceramic, it is entirely possible that these burials are associated with the ceramic occupation, grave depth accounting for their occurrence below the ceramic levels.

Thus while there are several indications of early occupation, the evidence is sketchy and often ambiguous. The almost total lack of information on preceramic habitation sites is especially unfortunate. To what extent this is due to sampling error is uncertain. It could be, of course, that one or more of the five small lithic sites cited above is genuinely early, despite the reasons for believing otherwise. It is also possible that at some sites a preceramic component underlies the surface materials, as seems to be the case at Son I:15:1. Except under erosional conditions similar to those active at Son I:15:1, such deposits would not be visible from a surface survey. At many of the recorded sites, however, the cultural deposits clearly lack depth, and preceramic materials, if present, are likely to be thoroughly mixed with later remains. If a preceramic component exists at these shallow sites, its identification will depend largely on the ability to distinguish early from later lithic remains on the basis of form. One of the pressing needs for excavation at the few stratified sites is to determine whether there was sufficient change through time in the lithic implements for temporally distinct complexes to be defined.

While these and other explanations might serve to indicate why early materials might have been overlooked or remained unidentified, the preceramic occupation of the region must ultimately be documented with positive

evidence. Insofar as such evidence is still rather slender, the possibility that the coast may have been uninhabited during part of the preceramic period cannot be completely disregarded. At the very least it seems clear that *intensive* occupation of the central coast did not begin until the introduction of pottery.

Ceramic Times

There are only two bases for estimating when central coast pottery first began to be made, and neither is very substantial. The most direct evidence stems from the presence of Trincheras pottery at several central coast sites (Table 8), but the usefulness of cross-dating by Trincheras types is severely limited by their apparently long temporal spans. Associations with late types from southern Arizona indicate that Trincheras pottery persisted into the fourteenth century (Bowen: in preparation); thus the fact that it occurs with Tiburón Plain at central coast sites affirms only that Tiburón Plain was being produced at least as early as 1400.

Since central coast pottery appears to be allied with Yuman ceramics, an initial date for Tiburón Plain might be inferred from the dates generally accepted for the beginnings of the Yuman wares. Although such an inference can hardly be construed as sound evidence, it is possible that the initial dates of A.D. 700 to 800 for Tizon Brown Ware and Lower Colorado Buff Ware might also apply to Tiburón Plain.

Aside from pottery, the only artifacts that provide even a remote basis for dating the beginnings of the ceramic period are the *Glycymeris* bracelet fragments. Similar bracelets in the Snaketown sequence occur primarily between A.D. 700 and 1100. The central coast specimens, however, are affiliated with the Trincheras culture. Since it is uncertain whether the Snaketown bracelet sequence holds for Trincheras culture, there is no assurance that it is valid for the specimens found on the central coast.

Once Tiburón Plain began to be manufactured, however many centuries before 1400 that may have been, it continued to be the sole indigenous pottery of the central coast until at least 1700, and it probably persisted in some areas well into the nineteenth century. At the majority of sites it is the only indigenous pottery, and at most of the remainder it is the dominant type. Since Tiburón Plain apparently persisted for so long, it is of little value in dating the sites at which it occurs or the artifacts that accompany it.

The next time marker is organic-tempered Historic Seri pottery, which must have developed some time between the beginning of the eighteenth century and the early nineteenth century. The basis for the earlier initial date rests on two principal factors: the assumption that the idea of using organic temper was introduced by the Europeans, and the fact that appreciable contact between the Europeans and the Seri did not begin until the late seventeenth century. However, the later date seems more likely because of the relative scarcity of Historic Seri and the correspondence between its restricted distribution (Fig. 54) and the reduced area within which most nineteenth-century Seri activity was centered. On this basis it is probably safe to assume that the 20 sites with appreciable quantities of Historic Seri pottery (see Table 11) were occupied during the nineteenth century, although the presence of Tiburón Plain at all but one of these sites suggests that they had been in use since earlier times. Presumably other clay artifacts tempered with organic material, such as pipes and figurines, date mainly from the nineteenth century.

There are, finally, some ten sites with Historic Seri pottery that are still in use or are remembered by the present Seri. The survey also encountered a number of features and artifacts that are still remembered by the Seri or that are documented in the ethnographic and historical records. Since the importance of these remains lies more in their bearing on cultural continuity than in dating for its own sake, they are enumerated in the section below.

CULTURAL CONTINUITY

Since the Seri have lived on the central coast for some 400 years of recorded history, it is reasonable to assume that they are responsible for some of the remains that are now found archaeologically. The question is whether the Seri and their direct ancestors are the producers of most or all of the archaeological materials, or whether other cultures are also represented. This section summarizes the evidence linking specific classes of archaeological remains with the Seri.

Sites

Ten of the sites are unquestionably Seri camps. Two had been occupied within a year of the survey. Among the other eight, some had been occupied within the decade and the rest are remembered by the Seri.

Most of these Seri camps contain perishable material or artifacts of European manufacture. Apart from such obviously recent items, the contents of the Seri sites include the same kinds of nonperishables as the remainder of the recorded camps, and in terms of general site characteristics, such as specific location, the known Seri sites conform closely to the other camps.

Two important sites, Son M:6:1 on Isla San Esteban and Son I:15:3 on Isla Tiburón, are clearly not camps. In all probability the former is a Seri vision cave. There is no convincing evidence linking the stone outline figures at Son I:15:3 with the Seri, although it is possible that the quarry-workshops were used by them.

Features

Masonry Structures. There is no ethnographic record of the Seri's having built rock walls, enclosures, or other such structures. However, it is reasonable to suppose that the structures at Son I:11:2 and I:16:6 are Seri, since Seri are known to have occupied both sites, the former in the 1940s and the latter during the nineteenth century. There is no information that would associate the Seri with the stone enclosures and mounds near the north end of Isla Tiburón.

Underwater Clearings. The Seri currently use these structures as boat landing ramps. Since ramps are not necessary for beaching cane *balsas,* all the clearings are probably twentieth century constructions, built since the Seri began using plank boats.

Talus Pits. No information.

Excavated Pits and Rock Squares. The present Seri state that agave was roasted in large pits by the San Esteban band, which occupied that island until the 1870s (E. Moser: pers. comm.). Whether the rock squares are Seri constructions is not known.

Stone Outline Figures. As indicated above, the outline figures and alignments at Son I:15:3 and those on the west side of Isla Tiburón cannot be attributed to the Seri.

Stone Circles: Isolated circles identical to those recorded were used by the Seri in seeking visions until shortly after 1900, although the quest persisted in caves until about 1930 (E. and M. Moser: pers. comm.). At least two of the recorded circles are identified by the Seri as vision rings. Those at camp sites are probably Seri game circles.

Cairn. The piling of rocks over Seri graves has continued into the present.

Shell Figure. Probably the doodling of a Seri or Mexican fisherman.

Shell Circles. One form may have been produced by tourists. Seri children sometimes make the other two kinds of shell circles.

Shell Cache. The Seri say that sets of shells, used as dishes, and certain other items were sometimes cached in times of danger (E. Moser: pers. comm.).

Beach Well. These have been used by the Seri into the present century.

Brush Houses. Quonset-style houses have been the standard Seri form and are still used; the other forms have undoubtedly developed under Mexican influence.

Hearths. Most are associated with modern Seri camps; it may be that all are recent.

Burials. There are some difficulties in assessing the correspondence between the archaeological burials and Seri practices because of the extraordinary variety displayed by both. However, this in itself can be viewed as evidence favoring a relationship—it would be much more difficult to postulate continuity if the archaeological burials were uniform and Seri practices highly varied, or *vice versa.* It is also important to recognize that the diversity is limited; neither archaeologically nor ethnographically are all conceivable modes of disposing of the dead represented, and with the single exception of secondary burial, all of the variation known archaeologically can be subsumed under known Seri practices. Two aspects of both Seri and archaeological burials are of particular significance: the simplicity or total absence of nonperishable grave furnishings, and the consistent orientation of the head, which varies primarily between north and west. The possibility that the archaeological burials include several culturally distinct patterns cannot be ruled out, but it is simpler to suppose merely that the diverse Seri methods of disposing of the dead have considerable time depth.

Pictographs. Since the pictograph cave recorded by White is known to the Seri as a vision cave, it is presumably the Seri who produced these paintings. Most of the La Pintada pictographs differ stylistically and therefore may have been produced by a different group.

Ceramics

Vessels. Some of the strongest evidence linking the archaeological remains with the Seri is provided by the pottery; this evidence is based on two main factors, continuity of ceramic attributes and frequency and distribution of the types. Since attribute continuity has already been discussed in Chapter 5 and summarized in Table 7, only the evidence based on frequency and distribution is reviewed here.

First, the geographic distribution of Tiburón Plain very nearly coincides with the estimated residence of the Seri at the time of the first Spanish contacts (compare Figs. 54 and 55). The only discrepancy is the northern boundary, the historic records allowing the Seri a stretch of coast beyond the northern limits of Tiburón Plain. In this case, however, the archaeological data may be more reliable than the meager historic information. Very likely this northern zone was part of Seri range when the Europeans arrived, as it has been throughout the historic period, but was not part of their residence. A distribution of pottery corresponding so closely with Seri residence in contact times provides a strong case for identifying Tiburón Plain with the early Seri.

Similarly, the distribution of Historic Seri reflects the contraction of Seri residence in the latter part of the nineteenth century, after the Seri had become increasingly concentrated in the northern portion of the

coast and Isla Tiburón. At least half the sites at which Historic Seri pottery is found can be identified as Seri camps by other evidence. With only a single exception, all of the sites with Historic Seri pottery also bear Tiburón Plain in quantity, which would hardly be expected had the makers of these two types been culturally distinct.

Second, the frequency of Tiburón Plain compared with that of Historic Seri leaves little doubt that both types were made by the Seri. The survey collected more than three thousand sherds of Tiburón Plain, and this represents only a fraction of the sherds of this type seen. On the other hand, most of the Historic Seri sherds seen were collected. Despite the strong bias in favor of the latter, the entire collection consists of only 428 Historic Seri sherds. In light of these frequencies it would be difficult to maintain that Tiburón Plain was made by some other group than the Seri. To do so would require attributing the thousands of Tiburón Plain sherds to some unknown prehistoric culture while asserting that the Seri—who have occupied the central coast for at least the 400 years of recorded history, and whose population prior to 1841 by all estimates exceeded 1,000 and possibly reached 4,000—left only sparse accumulations of Historic Seri pottery.

Worked Sherds. Most worked sherds are pottery disks. The Seri remember these being used as tops by Seri children as late as 1935 (E. and M. Moser: pers. comm.). There is no information on how the other worked sherds might have been used.

Pipes. The Seri say that tubular pipes preceded stemmed pipes, and that both kinds were used for smoking tobacco.

Spoon. The one specimen known is from a site the Seri consider to be one of their old camps, but they do not specifically recall the use of fired clay spoons.

Figurines. It appears that changes in the paste and temper of fired clay figurines mirror those in pottery vessels. The paste of figurine Types 1 and 2, as classified by E. Moser and White (1968), is similar to that of Tiburón Plain pottery, while mica inclusions and organic temper, both hallmarks of Historic Seri pottery, are characteristic of Type 4 figurines. Thus it is highly probable that the same people who made the pottery vessels also produced the figurines, and it is likely that the time spans of Tiburón Plain and Historic Seri apply to the corresponding figurine types. The Seri generally ascribe the figurines found on archaeological sites to the Giants, but some of the older Seri recall having seen such objects being made and given to girls for use as dolls, probably as late as 1900. On this and other evidence, Moser and White conclude that the central coast figurine tradition is Seri.

Stone Artifacts

Manos and Metates. There are no significant differences between the majority of those found archaeologically and those still used by the Seri.

Mortars. The Seri used mortars to process mesquite pods (Felger and Moser 1971: 55–6).

Gyratory Crusher. One Seri readily attributes the single known specimen to the Giants. There is no record of their use by the Seri.

Tubular Pipes. Like tubular pipes made of clay, these were used by the Seri for smoking tobacco.

Whistles. The Seri believe the specimens in the Moser collection to be whistles, formerly used by shamans to summon the spirits.

Balls. Hardy (1829: 294) reports having seen a stone ball in use among the Seri.

Miscellaneous Ground Stone Objects. Arrow shaft smoothers were used by the Seri. For the other small items included in this category, no Seri parallels are known.

Projectile Points and Knives. Gilg (DiPeso and Matson 1965: 55) stated that the Seri used stone projectile points prior to 1692, Hardy (1829: 290) reported their use at the time of his visit, and the Seri say that stone points were formerly used. By 1894 they had been entirely replaced by hardwood and metal points (McGee 1898: 198). Glass points are obviously historic, but their use by the Seri has not been reported. Nothing is known of the form of Seri stone points. The Clovis points, obviously, cannot be attributed to Seri culture.

Cruciforms. Seri oral history attests to the shamanistic use of these objects.

Other Chipped Stone Objects. The Seri believe that chipped stone was once used for knives and scrapers.

Hammerstones. The Seri frequently carried out pounding operations with natural stones.

Shell Artifacts

Flaked Scraper. The Seri commonly used shells as tools, but it is not known whether shells were flaked.

Glycymeris *Bracelets.* These should be considered intrusive since they were almost certainly made by the Trincheras people.

Beads. The Seri still make *Olivella* bead necklaces. There is no record of Seri use of tubular beads. Disk beads are known to the Seri, who attribute their use to the Giants.

Pendants. Gilg (DiPeso and Matson 1965: 51, 53) mentioned shell nose and ear ornaments, but it is not clear that these were pendants.

Pigment-Bearing Shell. Hardy (1829: 286) and McGee (1898: 165–6) state that the Seri mixed pigments in shells.

Faunal Remains

Shellfish and all of the animals indicated by bones found on the sites have been eaten by the Seri.

* * *

A list of this sort does not easily lend itself to quantitative statements, but it nevertheless indicates quite clearly that most of the classes of archaeological remains are remembered by the Seri, are reported in the literature, or can be linked to the Seri by other means. Unquestionably pottery is of paramount importance, since it is one of the few classes of artifacts that is nearly ubiquitous at central coast sites and, fortunately, also one of the best known. Although stratigraphic evidence is still needed, formal characteristics, distributions, and relative quantities of the two main types all point strongly toward a ceramic continuum and, by inference, toward a cultural continuum from the time when pottery first appeared to the contemporary Seri.

For the comparatively few remains that cannot presently be linked to Seri culture, several rather obvious explanations can be offered. In the first place, the historical and ethnographic records are far from complete. Many classes of remains are either not mentioned in the literature or are referred to in terms too vague to permit specific comparison. Second, some of the remains not yet identified might well be remembered by the older Seri; it has not been possible to check every item with them. Third, very few of the Seri alive today were born before 1900. Personal memory of material culture is therefore confined largely to the twentieth century, although this limit can be extended somewhat through oral history. Since it is also clear that Seri culture has not been static, it is reasonable to suppose that some of the items produced by the distant ancestors of the Seri would have fallen out of use and long since been forgotten.

On the other hand, a preponderance of parallels between the archaeological remains and Seri culture does not prove beyond a doubt that the Seri are responsible for everything that occurs archaeologically. Many of the remains are very simple and undistinguished, and items similar to these can be found over a wide area, both archaeologically and ethnographically. Moreover, a surface survey, especially the kind of exploratory reconnaissance undertaken here, is ill suited to the sorting out of temporally or culturally distinct assemblages that might be mixed together on site surfaces.

Without minimizing these problems, the fact still remains that most of the material inventory can be accounted for within the context of Seri culture, and that most of the remains that cannot be associated with this tradition are relatively insignificant items. The most important exceptions are probably the stone outline figures and early artifacts at Son I:15:3, the enclosures and mounds on Isla Tiburón, and of course the Clovis points.

In barest outline, then, the first inhabitants of the central coast arrived long before the introduction of pottery, and it appears that there may have been a succession of distinct preceramic peoples, including bearers of the Clovis, San Dieguito, and Amargosa cultures. It is also possible that the central coast was uninhabited during part of the preceramic period.

The events surrounding the introduction of pottery are equally hazy, allowing several alternative hypotheses, any of which could be correct. It may be that pottery making diffused to the central coast from elsewhere and was merely adopted by a small preceramic population already living in the area. It is also conceivable that the central coast was uninhabited immediately prior to the ceramic period and that the appearance of Tiburón Plain marks the arrival of the pottery-making Seri in this area. A third alternative, postulated by Hayden (1942: 41), is that a small nonceramic group already living on the central coast was displaced by the arrival of the makers of Tiburón Plain. While this is quite plausible, the remainder of Hayden's hypothesis—that the makers of Tiburón Plain were not Seri but a distinct population that was in turn displaced by the Seri who came sometime after A.D. 900—now seems unlikely. As it currently appears, the entire ceramic occupation of the central coast constitutes a single continuous tradition culminating in the contemporary culture of the Seri.

8. RELATIONSHIPS WITH BAJA CALIFORNIA

A comprehensive assessment of intercultural relationships must await fuller information, both from the central coast and from adjacent regions. Nonetheless, there may be some value in exploring the possibility of relationships with one particular area, the portion of the Baja California peninsula that lies south of roughly the thirtieth parallel. From an ethnographic perspective, the Seri have often been regarded as something of an anomaly in their Sonoran cultural surroundings because of their modest technology, the fact that they are the only major nonagricultural society in Sonora, and the fact that they are Hokan speakers surrounded by Utaztecans. In each of these respects they appear to resemble the extinct peninsular peoples more than they do neighboring Sonoran groups; hence there has been an interest in the possibility of contacts between the central coast and the peninsula, and it has been speculated that the Seri might originally have immigrated to their present territory from Baja California.

In the absence of archaeologcial data, previous suggestions of such connections have had to rely almost exclusively on ethnographic and linguistic evidence. Kroeber's 1931 study, which remains the most comprehensive, was limited to such information and was unable to arrive at any firm conclusions. Since then, further ethnographic and linguistic information has accumulated, and of course some archaeological data are now available from both sides of the Gulf. Although definitive conclusions are still largely beyond reach, a general review of the pertinent evidence seems appropriate.

TRANS-GULF CONTACT

To consider the possibility of trans-Gulf contacts or a peninsular origin of central coast culture, it is necessary to establish that a crossing of the Gulf was possible with aboriginal navigation and technology.

The narrowest part of the Gulf of California is along the northern portion of the central coast. The airline distance between Punta San Francisquito on the peninsula and Punta Santa Rosa on the mainland is less than 100 km (about 60 miles), and on a clear day the peninsula and the mainland are within sight of each other. Furthermore, this expanse of water is broken by the frequently cited "stepping-stone" position of Islas San Lorenzo, San Esteban, and Tiburón (see Figs. 1–2). Thus as Kroeber notes (1931: 5), in crossing the Gulf the "open-water distance nowhere exceeds fifteen miles. This is a difficult but not impossible gap to cross on cane rafts; and the Seri have skillful knowledge of currents and winds." In fact the greatest span of open water is only about 12 miles (19 km), the distance between the peninsula and Isla San Lorenzo.

A crossing of the Gulf from the peninsula clear to the mainland exceeds what is required, however, since Seri residence until the 1870s included two of the Gulf islands, Tiburón and San Esteban (E. Moser 1963: 16). Isla San Esteban, situated in the middle of the Gulf, lies less than 40 km (25 miles) from the peninsula. Thus the real distance from Baja California to the Seri frontier is the 40 km from Punta San Francisquito to Isla San Esteban, and even this span is broken by the intermediate postion of Isla San Lorenzo.

The maritime orientation of the Seri has been noted in many of the early documents and is well known through more recent ethnographic accounts. The aboriginal watercraft used for turtle hunting and all travel by sea was the *balsa,* which consisted of three bundles of *carrizo* cane lashed together and was propelled by a double-bladed paddle (McGee 1898: 216–21, Pl. 31). The earliest specific mention of the *balsa* comes from Gilg's letter of 1692 (DiPeso and Matson 1965: 50–1). Still earlier, however, Cabeza de Vaca's report of 1536 mentioned "rafts" in a statement that probably refers to the Seri (Nuñez Cabeza de Vaca 1966: 172). Water travel in *balsas* continued until well into the twentieth century; the last one made for use was built in the 1920s (E. Moser: pers. comm.). Apparently the Seri were expert navigators in these small vessels, especially the Band VI people who inhabited Isla San Esteban (McGee 1898: 49; Kroeber 1931: 5; E. Moser 1963: 24). It need hardly be stated that crossings of the Infiernillo by *balsa* between the mainland and Isla Tiburón were exceedingly common, and the Band VI people are said to have paddled between their home base on Isla San Esteban and Isla Tiburón with some regularity (E. Moser 1963: 16). In McGee's day, after the Band VI people had been forcibly removed from Isla San Esteban, the Seri still visited that island "in search of water-fowl and eggs" (McGee 1898: 49). Such trips are still made today.

Voyages to the islands lying beyond Seri territory have also been undertaken. McGee (1898: 49) mentions occasional journeys to Isla San Lorenzo to hunt game and to quarry a special mineral pigment used in face painting. The Seri remember numerous trips to this island, and it is the source of a special clay that is still used in pottery manufacture (Bowen and Moser 1968: 92). McGee (1898: 49) also states that the Seri occasionally traveled to Isla Angel de la Guarda in search of game. Visits to this island, if they occurred, are no longer remembered by the present Seri (E. Moser: pers. comm.).

Crossings of the Gulf to Baja California itself are mentioned in the historic records (Kroeber 1931: 5) and are recalled in Seri oral history. One Jesuit, Juan María de Sonora, writing about 1700, attributed linguistic borrowing between the Seri and the Cochimí of Baja California to such crossings. In a letter written in 1824, a Franciscan, Fray Francisco Troncoso, stated that the Seri "frequently" crossed the Gulf to raid the Loreto mission (McGee 1898: 67, 82). If indeed this is correct, it would indicate that the Seri were quite familiar with the Baja California coast, as McGee concludes (1898: 82), since this mission lies some 200 km south of the southern extremity of Seri territory.

In more recent times transnavigation of the Gulf has occurred, although infrequently. Two crossings in the nineteenth century are recounted in Seri oral history; both probably took place in the 1870s. Another voyage, which must have occurred prior to the removal of the San Esteban people in the 1870s, has somewhat legendary qualities. The Seri say that eight large *balsas* of Band VI people left Isla San Esteban for Baja California and never returned. However, it is said that there presently exists a group of dark-skinned people living on the peninsula at Mulegé who are called *Gachanías*. Shortly before 1940 several of these people apparently arrived at Bahía Kino in a large sailboat fitted with an inboard motor. From there they moved north to Desemboque, where they stayed for several months, living and working with the Seri. Relations between the two groups are said to have been very friendly, and they addressed each other by the term *pariente*. The Seri regard the *Gachanías* as the best turtle fishermen in Baja California and believe that they are the descendants of the Band VI people who disappeared (E. Moser: pers. comm.).

Voyages to the peninsula have continued since the *balsa* went out of use, but even with sturdier plank boats and outboard motors the Seri consider the journey hazardous. E. Moser notes that considerable anxiety was aroused when two boats made the crossing in November 1967, and their return was celebrated with a fiesta (pers. comm.).

Throughout the entire Gulf coast of Baja California the cane *balsa* and double-bladed paddle, essentially identical in form to those used by the Seri, were standard equipment; they were found among the Cochimí by Ulloa as early as 1539 (Heizer and Massey 1953: 296, Fig. 5). This watercraft received fairly extensive open-sea use by some groups for fishing and hunting sea mammals and turtles, and in the south, voyages of two leagues from the peninsula were undertaken during the eighteenth century. The objective of such trips was frequently the Gulf islands lying off the southern peninsula, but there is no record of Baja Californians crossing to the mainland (Baegert 1952: 57; Aschmann 1959: 72). However, Massey (1955: 15) characterizes the historic Pericú, who occupied the southern tip of the peninsula, as "aggressive coastal sailors," and Padre Baegert, an eighteenth-century observer, was confident that the Baja Californians were quite capable of crossing the Gulf (1952: 57). Baegert believed that the peninsula was originally populated by land from the north, but he suggested as an alternative that the Baja Californians might initially have emigrated by *balsa* to the peninsula from Sonora by island-hopping over the same route the Seri have followed in historic times (1952: 57–8).

If a migration across the Gulf did in fact occur, it is far more likely to have been *from* the peninsula *to* the Sonoran coast. In either case, the presence of the *balsa* and double-bladed paddle on both shores of the Gulf is of considerable interest, since direct migration from one side to the other could have been effected only through the use of some kind of watercraft. Although the cane *balsa* occurs sporadically on the west coast of Mexico, the Seri are the only mainland people to use the double-bladed paddle. Thus Heizer and Massey state (1953: 296) that "the single occurrence of this paddle type on the Mexican mainland leads to the conclusion that the Seri learned of navigation, at least in part, from the peninsular tribes across the waters of the Gulf of California." Of course, this does not necessarily imply that a migration occurred. It may be that the Seri initially used some other paddle form and acquired the idea of the double-bladed paddle on voyages to the peninsula, or that they learned of this item from Baja Californians visiting Seri territory. On the other hand, it could have been original equipment that the Seri, as emigrants from Baja California, brought with them to the Sonora coast.

The circumstances that might have motivated a migration across the Gulf obviously cannot be fully reconstructed, but at least two suggestions have previously been offered. Baegert (1952: 57–8) stated that peninsular groups that were thoroughly defeated in warfare fled their enemies to settle in safety elsewhere. He offered this as an explanation for the initial migration *into* Baja California, on the assumption that only dire pressure would force people into such a sterile environment, but it could also explain why some groups might

have left the peninsula. Although located far to the north of the warring Guaicura that Baegert was referring to, the Gulf islands opposite the Seri coast would have served as effective yet accessible refuges for a defeated people in need of escaping their enemies. Once in the Gulf, such a group could have continued eastward without difficulty, eventually reaching Isla Tiburón and the Sonora mainland.

Alternatively, Malcolm Rogers (1945: 193) views the Seri as Yumans who were squeezed out of Baja California because of population pressure created by territorial expansion into the peninsula during Yuman III times, about A.D. 1500. Rogers postulates that pre-Yuman inhabitants of Baja California, bearers of the La Jolla culture, were a sparse population and that "the war-like Yumans [including those who later became the Seri] should have met with but slight opposition in driving them into the southern half of the peninsula. As the peninsula continues to narrow to the south and subsistence sources become critical in the latitude of 30°, overcrowding may well explain the peculiar position and culture of the Seri" (1945: 194). However, more recent archaeological data and other information indicate a very different sequence of events on the peninsula (Massey 1949: 303–5, 1966a: 44), and it appears that the Seri were established in their present territory considerably earlier than Rogers suggests.

Movement across the Gulf could, of course, have occurred through simple population drift, possibly encouraged by food shortages. Aschmann (1959: 98, 100) maintains that local overexploitation of littoral and maritime resources may well have led to occasional depletion, and that this might initially have motivated some groups to explore the resources of the islands opposite the Seri coast. Both Isla San Lorenzo and Isla San Esteban are readily visible from the peninsula, and both offer small game and edible plants in addition to products of the sea. Permanent settlement of Isla San Lorenzo is precluded by a lack of permanent water, but Isla San Esteban and of course Isla Tiburón were capable of supporting permanent populations, and did so. Thus occasional expeditions to the islands could have led to more extended stays and could eventually have resulted in a gradual eastward population drift from Isla San Esteban to Isla Tiburón and the Sonora mainland. If, as archaeological evidence presently suggests, the central coast was only sparsely populated in preceramic times, the area would have been available to any people who could make a living there.

ARCHAEOLOGICAL REMAINS IN BAJA CALIFORNIA

Since the middle 1940s the work of Massey and others has greatly expanded archaeological knowledge of central and southern Baja California, but many important gaps still exist. For the earlier horizons, information has come principally from surface materials and collections of amateurs. Several early cultures have been identified—or postulated—with varying degrees of certainty (Massey 1966a). These include Clovis (Aschmann 1952), Lake Mohave (Davis 1968: 191, 200), San Dieguito (Rogers 1939: 71; 1966: 97–101; Davis 1968: 191, 200), Amargosa (Rogers 1966: 97; Massey 1961: 418; 1966a: 44–6), La Jolla (Rogers 1966: 97–101), and the variously interpreted remains from Laguna Seca de Chapala that have been described by Arnold (1957: 250–64). A list of radiocarbon dates from sites on the peninsula has been compiled by Moriarty (1968).

The central coast of Sonora has also produced evidence, limited though it may be, of three of these cultures: Clovis, San Dieguito, and Amargosa. The presence of these three complexes on both sides of the Gulf raises the possibility of population movements or cultural influences across the Gulf at an early time. Whether this actually occurred, however, or whether the central coast and peninsular manifestations of these cultures represent parallel but separate southward extensions from southern California and Arizona is not known. Indeed, these alternatives would be exceedingly difficult to evaluate, so much so that the question may be largely academic.

The two later archaeological cultures south of the thirtieth parallel offer better prospects for comparisons. These are the Las Palmas culture in the Cape Region (the tip of Baja California, south of the Isthmus of La Paz), and the Comondú culture of the central peninsula (Fig. 73). Since both of these cultures have been defined on the basis of excavated materials as well as surface collections, they are known in some detail. There are, however, serious obstacles to directly comparing them with the archaeology of the Seri area. The majority of diagnostic traits of both the Las Palmas and Comondú cultures are perishable artifacts, whereas no perishables are known from the central coast of Sonora.

Las Palmas Culture

The Las Palmas culture, described in detail by Massey (1955), antedates the historic Pericú occupation of the Cape Region, but its chronological position has not been established. Unfortunately, the culture is defined almost entirely on the basis of mortuary practices known from caves. While it is reasonable to suppose that at least some of the open sites in the area represent the same culture, the only artifactual links between open sites and burial caves are ground oyster-shell ornaments and crude choppers (Massey 1955: 268–72).

The few nonperishable aspects of the Las Palmas culture that can be compared with those of the central coast may be enumerated briefly.

Habitation Sites. There are a few inland habitation sites in the Cape Region. These tend to be small and are

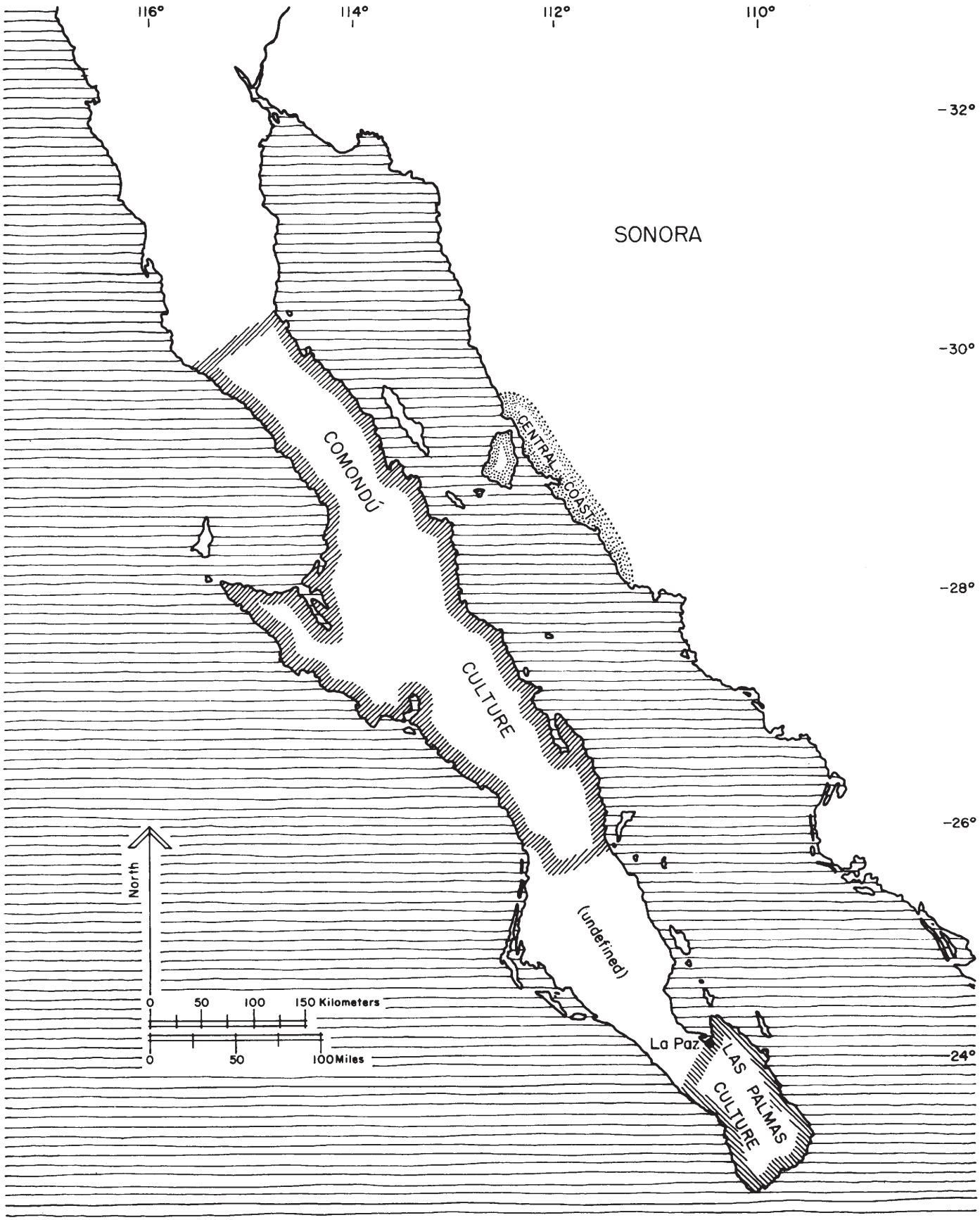

Fig. 73 Later archaeological cultures of peninsular Baja California (after Massey 1961: Fig. 3).

located near springs and *tinajas;* they may be hunting camps. Most of the habitation sites, however, are in open locations near the shoreline. They are predominantly on dunes and contain shell, chipped stone, grinding implements, and occasionally burials (Massey 1955: 269–71), and thus are broadly similar to sites in the Seri area.

Burials. Excavations in the Cape Region have been directed primarily toward cave burials, and with good reason, since they are well preserved and often accompanied by an array of perishable artifacts. Although the Las Palmas culture is defined largely on the basis of burial caves, it is important to recognize that burials are also known from an open dune site and that these burials are included within the Las Palmas mortuary complex. Massey is clear on this point (1955: 268–9; 1966a: 49–50), stating that these open site burials can be related to the cave remains by the presence, in both, of three kinds of items—oyster-shell ornaments, crude choppers, and shells. Rather curiously, he fails to point out that this connection is strengthened by the fact that the orientation and position of the open site skeletons and cave primary burials are virtually identical.

When the burials of the Cape Region are compared with those of the central coast, the sometimes elaborate trappings of the Las Palmas cave burials tend to obscure the more fundamental features. Clearly, any meaningful comparison of the two must be based on open site burials and on only those characteristics of the cave interments that would also be preserved among the burials of the central coast.

Table 13 summarizes the burial characteristics of the two areas, including both cave and open site burials of the Cape Region but omitting traits whose preservation depends upon the protection of the cave environment. Several additional characteristics should also be noted. Primary burials in Cape Region caves are much less numerous than secondary burials, but they are accompanied by more artifacts (mostly perishable). Among primary burials, flexed position is more common than extended but, as on the central coast, the sample is too small for a reliable ratio. Among Cape Region secondary burials there seem to be two distinct patterns. One consists of the bones of only a single individual, painted with red ochre, which are accompanied by burial furnishings. The second and more common pattern consists of unpainted bones, sometimes of several individuals, which often lack any associated artifacts. The secondary burials known from the central coast are most similar to this latter pattern, but those known at present are from open sites rather than caves. Although Table 13 indicates that few or no nonperishable artifacts occur with the Cape Region burials, occasional interments are accompanied by a modest number of such items. In addition to (or in lieu of) artifacts, unmodified shells are sometimes present. Among the open site burials, only one was accompanied by artifacts; this was an infant burial with six oyster-shell ornaments and clusters of deer incisors (Massey 1955: 178–83, 272–8).

TABLE 13
Comparison of Burials from the Central Coast of Sonora and the Cape Region of Baja California

	Central Coast	Cape Region
Flexed primary burial		
In cave		X
In dune site	X	X
Partly flexed	X	
Fully flexed	(Modern Seri)	X
Lying on side	X	X
Head to north	X	X
Head to south		X
Head to west	X	
Few or no nonperishable artifacts	X	X
Extended primary burial		
In cave		X
In dune site	X	X
Fully extended	X	X
Supine	X	X
Prone		X
Head to north	X	X
Head to south		X
Head to west	X	
Few or no nonperishable artifacts	X	X
Secondary burial		
In cave		X
In the open	X	
Single individual		X
Multiple individuals	X	X
Bones painted		X
Bones unpainted	X	X
Head to north or south		X
Head to west	X	
Few or no nonperishable artifacts	X	X

Full evaluation of the mortuary practices of the two areas will require much more information on open burials in the Cape Region, which are very poorly known, and some indication as to whether cave burials exist on the central coast. Considering only nonperishable traits, present information indicates certain specific differences but suggests that there may be a fundamental similarity. The burials of the two areas are in direct and consistent conflict on two characteristics: orientation of the body, which may be of major significance, and degree of flexure among the flexed burials, which may not be especially important. Yet despite these specific discrepancies, there may be an underlying connection in the fact that the Cape Region and central

coast people disposed of the dead by the same three basic methods: primary flexed, primary extended, and secondary burial. The occurrence of secondary burial is of very great interest, since this form of interment is rare in North America (Massey 1955: 336–7). It is possible that certain practices were not emphasized to the same degree in the two areas; this cannot be fully evaluated without further information. However, it is important to note that, apart from orientation and degree of flexure, nearly all central coast burial characteristics are duplicated in the Cape Region. The main difference lies in the fact that the burial complex of the Cape Region also includes some specialized traits, such as cave placement and bone painting, that are not presently known on the central coast.

Features Other Than Burials. Apparently stone circles, outline figures, hearths, and other kinds of central coast structures are completely unknown from the Cape Region. The pictographs are mostly animal representations unlike the abstract figures of the one recorded central coast pictograph site.

Artifacts. Since nearly all of the Las Palmas artifacts are perishable, they cannot be compared with anything from the central coast. Only two nonperishable artifacts are directly associated with this culture: crude choppers, which are too generalized in form to be diagnostic, and oyster-shell ornaments, which do not closely resemble those known from the central coast (Massey 1966a: 49–50). Other artifacts occur on open sites, but since they have not been found in burial caves, they cannot be definitely assigned to the Las Palmas culture.

Ground stone: Cape Region metates appear to be similar to those from the central coast. Manos differ only in being pecked to shape (Massey 1955: 284–5). Girdled round handstones and pecked stone cylinders are unknown on the central coast, while other central coast ground stone items are absent from the Cape Region.

Chipped stone: Cape Region projectile points are all surface finds, and none can be placed chronologically except by form. As a group they do not suggest connections with the central coast. Triangular concave-base points, frequent on the central coast, are rare in the Cape Region. Expanding-stem points, while they occur in the Cape Region, are neither common nor closely similar to those from the central coast. Leaf-shape points with convex bases are very common in both areas, but this form is much too widely distributed for this occurrence to be significant. The most diagnostic Cape Region form, the La Paz point, is unknown on the central coast (Massey 1955: 279–82). As on the central coast, other chipped stone implements tend to be casually made, and well-formed tools are scarce (Massey 1955: 283–4). Cruciforms have not been found in the Cape Region.

Shell: The use of natural shells as scrapers and spoons in the Cape Region parallels the historic Seri usages. *Olivella* beads with ground spires similar to those found in the Cape Region were made by the Seri and reportedly occur archaeologically on the central coast. Several kinds of shell pendants are known from caves in the Cape Region, but none resemble those presently known from the central coast (Massey 1955: 286–7).

Comondú Culture

Comondú is the name applied to the late archaeological culture of central Baja California, directly across the Gulf from the Seri coast. In geographic extent it approximately coincides with the distribution of the peninsular Yuman languages and the historically known speakers of these languages, collectively termed the Cochimí (Massey 1949: 287–8). In time, the Comondú culture includes the material remains of the historic Cochimí and extends backward at least into the late prehistoric period. A radiocarbon date of A.D. 1432± 80 has been obtained from a cave used for habitation (Meighan 1966: 379). Materials are known from excavation, surface survey, and private collections (Massey 1947: 351–3; 1961: 420; 1966a: 50–1; 1966b; Massey and Osborne 1961; Meighan 1966; 1969; Davis 1968).

Habitation Sites. Habitation sites occur both in caves and in the open. As on the Sonoran side, sites along the Gulf coast are characterized by shell deposits (which are often extensive), chipped stone, and grinding implements. Whether cave habitation was more common on the central peninsula is not known. Although several caves on the central coast are said by the Seri to have been used for habitation (E. and M. Moser: pers. comm.), none have been recorded or explored.

Burials. Data on Comondú burial practices are limited to a single site that was excavated in the late nineteenth century. This site was a small mortuary cave that was not used for habitation. At least seven bodies were found, all near the mouth of the cave. They were fully extended primary burials, each oriented with the head to the east. It is not known whether the skeletons were supine or lay in some other position (Massey and Osborne 1961: 341).

Features Other Than Burials. Pictographs in rock shelters constitute the most spectacular remains of the Comondú culture. Although several distinct styles have been observed (Meighan 1969: 26–8), the best known consist of well-executed human and animal figures. Many are depicted with arrows protruding from the body, and Meighan (1966: 385–7) suggests that they may be associated with hunting magic. The main colors used are red, black, and white, all of which are known from central coast pictographs. Yellow and purple, used less frequently, are not known from central coast paint-

ings. Although life forms from the central coast are reported by Grant (1967: 128–9), they are apparently completely different in style from the Comondú paintings.

Cochimí shelters consisted principally of brush huts of several kinds, but the historic accounts also attest to the use of crescent-shaped windbreaks of piled rocks. Unfortunately, very few archaeological occurrences of these stone structures have been reported (Aschmann 1959: 108–10, Pl. 5b; Banks 1972: 17). Whether they bear much similarity to the structures at Son I:16:6 on the Sonoran mainland or the stone enclosures near the north end of Isla Tiburón remains to be determined.

Artifacts. Like those of the Las Palmas culture, most of the diagnostic artifacts of the Comondú culture are perishable and consequently have no known archaeological equivalent from central coast sites. However, several of the perishable items have parallels known ethnographically from Seri culture. Some of these, such as the cane whistle, wooden bull roarer, leather sandal, fire drill, and two-ply cordage (Massey 1966a: 50–1, Fig. 9; 1966b: 37–8; E. and M. Moser: pers. comm.), are also found much more widely. Two items, however—carrying nets and coiled baskets—are of special interest; although both kinds of artifact are widespread, Comondú and Seri specimens share details of construction that are not characteristic elsewhere. Among nets, the unique shared feature is the exclusive use of square-knot construction, a technique that is evidently rare in western North America (Massey 1961: 420). Even in the adjacent Cape Region, nets were made with lark's-head knots. Unfortunately, details of the cordage used in Comondú and Seri nets cannot be compared, since the only known examples of Seri nets are modern and made of commercial cord.

Comondú and Seri coiled basketry, along with the basketry of other nearby areas, has been compared at length elsewhere (Bowen 1973). Comondú specimens have been recovered from several sites (Massey 1966a: 34; Meighan 1966: 375; Tuohy 1970; pers. comm.), and some useful information on Cochimí baskets was recorded by the Jesuit missionaries (Aschmann 1959: 62–3). While it is evident that many shared aspects of Comondú and Seri baskets occur much more widely, and that the two traditions differ from each other in certain details, nonetheless they show greater similarity to each other than to the basketry of any other nearby region. The most notable similarity is in the direction of work, which was from right to left, with the underside of the basket facing the basketmaker. This is significant in part because this combination of working direction and working face does not occur in other adjacent areas. More important, since these working methods reflect basic motor habits and postures that would be learned by the basketmaker early in life and continually reinforced, they would probably be highly resistant to change, unlike such easily adopted attributes as designs, types of start, and basket shapes. These and other factors suggest that Comondú and Seri basketry are historically related traditions, although it is not known whether they represent isolated survivals of an ancient and more widespread pattern or whether they diverged from a common parent tradition in comparatively recent times (Bowen 1973).

Pottery normally does not occur at Comondú sites, although sherds may be found in the vicinities of some of the missions and other sites with European articles, or as occasional trade pieces from the north. However, the Comondú culture includes several other kinds of nonperishable items, a few of which are diagnostic.

Ground stone: Food grinding implements are similar to those on the Seri coast. They consist of oval to irregular unifacial or bifacial cobble handstones and flat to shallow basin metates (Massey 1961: 420; 1966a: 50; Davis 1968: 187, 199).

Tubular stone pipes are an important diagnostic Comondú element. There are two distinct types, a short thick cylindrical or conical form that is by far the most common, and a long, tapered, but scarce type with the length several times greater than the diameter. Both types may bear incised decorations (Massey 1966b: 5; Massey and Osborne 1961: 341–2). In comparing these with central coast pipes, it seems reasonable to include the fired clay pipes from the latter area since they differ only in material. (Apparently, clay pipes had diffused into the northern Cochimí area by historic times [Aschmann 1959: 111–2]). All four stone pipes in the Moser collection are basically similar to the short thick Comondú specimens, although one has a slight projection on one side. The clay pipe in the Museo Regional de Sonora collection and one of the nearly complete Moser clay specimens correspond closely with the long thin Comondú type, and most of the fragmentary clay pipes so far known seem generally similar in form. The decorations on the Sonoran and peninsular pipes appear to employ similar design elements and layout. The fact that nearly all of the clay pipes from the central coast are decorated, in contrast to the peninsular stone pipes, may merely reflect the fact that clay objects are more easily incised than stone. Although the pipes of the two areas exhibit considerable similarity, they are too widely distributed in the Southwest to be of great comparative value. It might be noted that an important shamanistic curing technique among the Cochimí involved blowing smoke over the patient through such pipes (Aschmann 1959: 112), a technique that is also known to the Seri (E. and M. Moser: pers. comm.).

Chipped stone: A variety of projectile-point forms occur on the central peninsula, but the only one regarded by Massey as diagnostic of the Comondú culture is a

small unstemmed triangular point, sometimes serrated, with a convex, straight, or concave base. These are often of obsidian and were made by pressure flaking (Massey 1966a: 50, Fig. 9; 1966b: 10–2, 37). Such points are common in the southern portion of the central coast and farther south in the Guaymas area. Along the Gulf coast of central Baja California, two additional point types, both small, appear to be typical of late sites: a side-notched concave base form and an ovate form with a straight or convex base (Davis 1968: 194–5, 199). Somewhat similar but not identical points occur frequently in the southern part of the Seri coast. Drills, also part of the Comondú culture, have been reported from the central coast but have not been described.

Crude percussion-flaked choppers and scrapers are found at Comondú sites but have not been described in detail. A well-executed chipped rhyolite Christian cross was found in the vicinity of Mulegé (Massey 1966b: 29, Fig. 39); however, it is completely unlike Sonoran cruciform objects.

Bone: Several kinds of Comondú bone artifacts are known. The only parallel objects from the central coast are awls, which are known only ethnographically and are not very similar.

Shell: Two kinds of shell artifacts have been found, *Olivella* beads and ground and perforated disks of *Haliotis* (Massey 1966a: Fig. 9; Massey and Osborne 1961: 342–3). Similar *Olivella* beads were made into necklaces by the Seri. The closest parallel to the *Haliotis* disk on the central coast is the sherd disk. It is conceivable that *Haliotis* disks are imitations of these ubiquitous artifacts.

ETHNOGRAPHIC DATA

The only comprehensive attempt to compare the ethnographically known features of Seri culture with those of the Baja Californians is by Kroeber (1931: 39–51), who approaches the problem through comparative trait lists. His basic list (List 1) is from the Seri perspective, presenting Seri traits and plotting their occurrence among a number of other groups, including the Baja Californians (combining the Guaicura and Cochimí), Southern Californians, River Yumans, upland Yumans (Walapai-Havasupai), and Gila Pima. Kroeber's List 2, from the peninsular perspective, is a compilation of traits recorded for the Baja Californians along with their presence or absence in Seri culture. In this list Guaicura and Cochimí traits are presented separately.

The picture that emerges from List 1 depends very strongly on how the data are organized numerically. Kroeber's tabulation is disarmingly casual, presenting only the raw number of trait agreements and disagreements and the surplus of agreements over disagreements. The greatest number of Seri traits was found to occur among the Gila Pima, followed by the upland Yumans, Southern Californians, River Yumans, and Baja Californians. The surplus of agreements over disagreements with Seri culture was found to be greatest among the upland Yumans, followed by the Gila Pima, Southern Californians and Baja Californians (equal), and River Yumans (1931: 48). However, quite different results are obtained if the raw number of agreements in each comparison culture is expressed as a percentage of the total number of comparable traits (agreements plus disagreements) in each of the groups. On this basis, Baja Californians rank first, with 86 percent of the comparable traits in agreement with the Seri, followed by the upland Yumans (81 percent), Gila Pima (72 percent), Southern Californians (69 percent), and River Yumans (59 percent). If, alternatively, the ratio of agreements to disagreements is calculated, the rank order of the comparison cultures remains the same but the separation between them becomes even more pronounced.

In List 2, Kroeber (1931: 42–4) separates Guaicura and Cochimí (or unlocalized) traits and notes their presence or absence in Seri culture. Kroeber is struck both by the comparatively large number of Guaicura traits found among the Seri and by the large number of Cochimí-Seri disagreements, which exceeds the number of Guaicura-Seri disagreements. Because of this he hypothesizes, "Evidently the Gulf formed a serious barrier to communications, and if the Seri came out of the peninsula, it was a long time ago." However, he further states that "it is conceivable that the Seri came to Sonora from the peninsula when the Waicura, or a culture of their eighteenth century type, were still situated about latitude 29° or 28°, being subsequently dispossessed by Cochimí" (1931: 49).

On the basis of present knowledge, Kroeber's trait lists for the Seri and for Baja California could be expanded and, in a few particulars, revised. The number of Seri-Cochimí discrepancies would be somewhat reduced, but it does not appear that the general picture would be greatly altered.

LANGUAGE

At present the Seri language is represented by a single dialect. Two mutually intelligible dialects, now extinct, are known from fragmentary data (E. Moser 1963: 17–8), and historic records suggest that others may have been spoken in the more distant past. Although Seri (or Serian) has for some time been included among the Hokan languages, it has usually been considered an isolate, and attempts to determine relationships with other Hokan languages at a deeper level have met with varied results.

Comparative work with Seri is summarized by Langdon (1974), as part of a general assessment of the Hokan-Coahuiltecan stock, and by Crawford (in press).

Most of the early work focused on whether or not Seri is related to Yuman. Powell (1891: 136–7) classified it as Yuman; Hewitt (in McGee 1898: 300) and Gatschet (1900) regarded it as non-Yuman; and Kroeber (1915) presented evidence favoring a Yuman-Seri relationship. Kroeber suspected that accurate data would enable Seri to be classified outright as a Yuman language; however, this expectation has not been borne out. His own Seri material indicates that it is related to, but not a member of, the Yuman group (Kroeber 1931: 31). Much the same conclusion is reached by Crawford (in press) on the basis of extensive Seri-Yuman comparisons with fuller data.

Other studies have indicated that Seri may be more closely related to other languages than Yuman. Sapir (1925: 525) classifies Seri with Salinan and Chumash. Bright (1956: 47), on the basis of glottochronological counts, finds four other languages, including Salinan, more closely related to Seri than to Yuman. Swadesh (1967: 100) proposes a subdivision of Coahuiltecan consisting of Seri, Yuma, and Esselen, while Langdon (1974: 86) tentatively postulates a Seri-Chumash-Chontal subgrouping.

The languages of Baja California south of the thirtieth parallel are all extinct and have been so for at least a century, some for much longer. Many of the surviving data come from the records of the early missionaries. The central portion of the peninsula is best known linguistically, even though many of the languages in this region were never recorded. In the Cape Region, specific data are meager or nonexistent.

The major linguistic divisions on the peninsula, from north to south, are Yuman proper (California Yuman) above the thirtieth parallel, Cochimí in the central peninsula, and Guaicurian south of the twenty-sixth parallel (Fig. 74). Although the divisions themselves are not widely disputed, the degree of relationship between the extinct Cochimí languages and the Yuman family has been less clear. Early classifications included Cochimí as a full member of the Yuman group (Troike: in press). Kroeber (1931: 31, 35) viewed Cochimí as related to Yuman, but he was reluctant to accord it full membership. Massey (1949: 302–3) classifies Cochimí as Yuman. He refers to it as the "Peninsular Group" (or "Peninsular Yuman") and considers it to be one of five branches of equal status that make up the Yuman family. A recent study by Troike (in press), involving comparisons between proto-Yuman and two very different Cochimí languages, reaffirms Kroeber's view that Cochimí is related to the Yuman family but should not be considered as part of it. Troike suggests that the relationship with Yuman lies at a deeper level, and that each of the two Cochimí languages probably represents a separate branch of a single protolanguage.

Direct comparisons of Seri and Cochimí have been undertaken by Hewitt (in McGee 1898: 299–344) and Kroeber (1931: 31–5). Hewitt found only one possible cognate (McGee 1898: 297), whereas Kroeber identified several (1931: 35). Troike (in press) states that despite better data, "the number of apparent cognates between Seri and Cochimí is not appreciably greater than that noted by Kroeber." It appears, then, that Kroeber's general assessment of Seri-Cochimí-Yuman relationships remains essentially correct: "the available data indicate the Seri language as about equally related to, and differentiated from, normal Yuman and Cochimí. . . . The relation of the three language groups might be described as an equilateral one—or more exactly as isosceles, with Cochimí and Yuman somewhat the nearest to each other, but Seri equidistant from both" (1931: 35).

For the Guaicurian group in the southern third of the peninsula, Massey (1949: 303) postulates the former existence of three languages, each with dialectical variation, rather than the traditional two. The wider affiliation of these extinct languages has been very uncertain because so little information has been preserved. One of the languages, Guaicura, has been cautiously proposed as a member of Hokan-Coahuiltecan by Gursky (1966), on the basis of a small corpus of new data. Swadesh (1967: 103, Table 1) reaches the same conclusion with considerable confidence on the basis of lexicostatistics. However, the inclusion of Guaicura within Hokan is by no means universally accepted (Fernández de Miranda 1967: 65). Although four of the items in Gursky's list (1966: 43–4) have possible Seri cognates, the surviving data on Guaicura are probably too meager for a relationship between these two languages to be reliably assessed.

SERI ORAL TRADITION

The Seri have a rich store of oral tradition, a portion of which deals with the Giants who are said to have once inhabited the Seri coast and Baja California. This material is of considerable interest for its bearing on trans-Gulf contacts as well as for its broader relevance to the Seri past. Although the hazards of imputing an historical or quasi-historical foundation to oral tradition are obvious, in the case of the Giants tradition there are fairly strong indications that some of these lengendary accounts are based in fact.

Rather remarkably, there is unequivocal evidence that this tradition is an old one. In 1692, Padre Gilg wrote: "The Seris who live on the sea shore are tall and comely, but as they themselves say they are only dwarfs in comparison with the giants who live across the sea, and who to cross over have no need of a ship, but wade through on foot. Now whether the land across the sea refers to the island of [Baja] California, or some other island opposite the Seri island . . . I am unable to tell your Reverence" (DiPeso and Matson 1965: 50). More

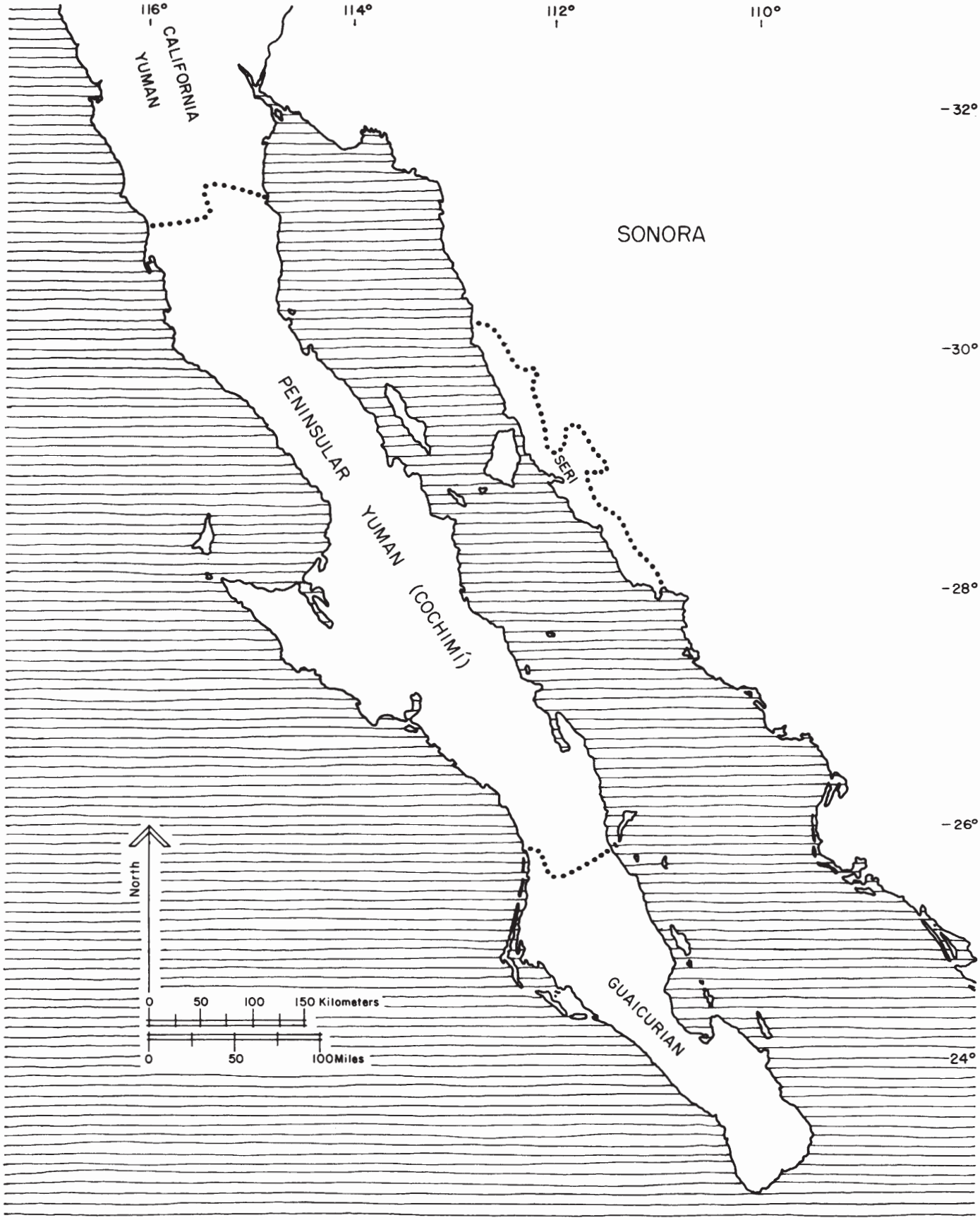

Fig. 74 Major linguistic divisions of Baja California (after Massey 1949: Fig. 1).

recently, the Giants have been discussed by Coolidge and Coolidge (1939: 246–56), who interpret them as Norwegian Vikings who once visited the Seri coast, and by Griffen (1959: 19), E. Moser and White (1968: 146–7), and Bowen (1973: 158, 160).

In part, the bearing of the Giants tradition on Seri–Baja California contacts rests on the possibility that the Giants are merely the ancestors of the Seri themselves, in legendary guise (E. Moser and White 1968: 147). Since this possibility is of considerable importance, a general review of the matter, incorporating the information that has come to light since Moser and White's initial discussion, may be useful.

The Seri say that there were two distinct groups of Giants. The *?ánt i?iyáXXii koŋkáak* 'land its-edge people' were of enormous stature and are said to have lived in Baja California. Apart from one legend recorded by Griffen (1959: 19), the Seri know little about these beings (E. Moser: pers. comm.).

The second and more important group of Giants, those to be considered here, are the *Xíkkaa kóosiatox* 'things singers' (singular: *SiX kóosiat*). According to tradition, these Giants lived in Baja California as well as on Isla Tiburón and the adjoining mainland coastal strip when the Seri first appeared on the scene, and they continued to live on the peninsula and in Seri territory for some time afterward. Many met their ultimate demise through gambling, in which they bet their own lives as stakes, or in duels. Others died in a great flood or were transformed into rocks and various animals. In one version, the survivors are said to have intermarried with the Seri or to have retired to the peninsula (Griffen 1959: 19; E. Moser and White 1968: 146; E. Moser: pers. comm.).

The Seri are able to describe the *SiX kóosiat* Giants and their culture in some detail. Despite their superhuman size, they are said to have eaten the same foods as the Seri and used many of the same kinds of implements. However, they also reputedly made certain kinds of artifacts and practiced certain customs that the Seri claim not to have shared. Some of these disclaimed artifacts are known archaeologically and one such custom is known historically, as the following list indicates.

Gyratory crusher: It is said that the Giants strung large perforated stones together and slung one set over each shoulder bandolier-fashion for use as a chest armor. The name for a string of such stones is *Xápkox íyya* 'metates his'; both of these words are archaic Seri forms. A Seri who was shown a photograph of the gyratory crusher from Isla Tiburón disclaimed having seen such objects previously, but immediately identified it as a *Xápkox íyya* stone (E. Moser: pers. comm.).

Disk beads: The burial at Son Q:4:3 and the infant burial at Son I:7:4 were accompanied by small shell beads. The Seri deny having made such items, attributing their manufacture and use to the Giants. However, they readily recall the name for this kind of bead, *?áapXix* (E. Moser: pers. comm.).

In the case of the gyratory crusher, it is possible that these are artifacts left over from a pre-Seri occupation and that the Seri, occasionally encountering them, have invented an explanation for their presence. However, it is not likely that small items such as beads have been found frequently enough by the Seri to be named and incorporated into their oral tradition. It seems more likely that these are old Seri items that are not quite forgotten but are no longer made.

Pottery: Pottery provides a clearer link between the Giants and the Seri. Several individuals who were specifically asked stated that the thin sherds found on archaeological sites were not made by the Seri but were made by the Giants. However, when the question was rephrased, they responded that Seri pottery made in the past was equally thin and hard. One elderly woman remembers seeing such thin pottery being made when she was a small girl and is able to describe the process in some detail (Bowen and Moser 1968: 127–8).

Ceramic figurines: Like pottery generally, clay figurines found on archaeological sites are attributed to the Giants. Nevertheless, some of the older women recall seeing figurines being made when they were girls (E. Moser and White 1968: 47–8).

Nose ornaments: The Giants are said to have pierced their ears and nasal septum to accept ornaments. The Seri occasionally find small oval bluegreen stones and polished pieces of shell that they regard as Giants' nose ornaments. These are called *SiX kóosiat inéemx* 'thing singer his-nose-ornament' (E. Moser and White 1968: 147).

The historic record leaves no doubt that the insertion of ornaments in nose perforations was a former Seri practice. In his letter of 1692, Padre Gilg stated explicitly of the Seri that "in the center nasal cartilage hangs a blue stone or a skewer and in the ear lobes either shells or ribbons of different colors" (DiPeso and Matson 1965: 53). This practice was again noted in the mid-eighteenth century by Och (1965: 159) and by Pfefferkorn (1949: 81). The latter, basing his remarks on observations between 1756 and 1767, states that the Seri find and prize certain small light green pebbles; "with these stones they adorn themselves in their savage way by sticking them in holes bored through the cartilage of the nose or the lower lip" (Pfefferkorn 1949: 81). At the time of Hardy's visit to Isla Tiburón in 1826, the nasal ornament was "a small, round, white bone, five inches in length, tapering off at both ends, and rigged something like a cross-jack yard" (Hardy 1829: 286). About the middle of the nineteenth century, Velasco wrote that the perforated nasal septum was decorated

"with pieces of greenstone or ordinary glass" (McGee 1898: 92). By 1894, McGee (1898: 148, 170) found no evidence or recollection among the Seri of nose perforation or ornamentation, and the Seri today firmly deny that they or their ancestors ever decorated themselves in this manner, though they readily attribute the practice to the Giants. It should also be noted that certain clay figurines, which the Seri say were made by the Giants, have a protuberance in the "face" area that is often perforated. According to the Seri, this protrusion is the nose, and the perforation is for a nose ornament (E. Moser and White 1968: 147).

The Seri interpretations of the pottery, figurines, and nose ornamentation all suggest what may be a rather common practice, that of relegating material items and customs that have dropped out of use to the realm of the Giants. It may be that attributing things and customs to the Giants serves as a convention by which the Seri disassociate themselves from aspects of their own culture that have become obsolete. Moreover, the transfer to the domain of the Giants appears to be a rapid process; both the figurines and the manufacture of thin pottery are already attributed to the Giants even though a few of the older Seri still recall these artifacts from their childhood. It is clear that the Giants are regarded as fully corporeal beings of the past, and that they are conceived of as non-Seri. However, it appears that certain of the cultural characteristics and exploits ascribed to them are in fact those of the Seri's own ancestors, sometimes exaggerated to superhuman proportions.

The ascription of outmoded aspects of culture to the Giants also applies to language. A limited corpus of "Giants' speech" is known to the Seri, and this is nothing other than archaic Seri speech. Also of interest is the fact that the Seri describe Giants' speech as "musical" and refer to it as "singing talk." The dialect spoken by the Band V Seri, now extinct, was characterized by extreme intonational contours, and the Band VI people of Isla San Esteban spoke a dialect, also extinct, characterized by sharp pitch contours and heavy stress. The present Seri describe the Band VI dialect as musical and refer to it also as "singing talk" (E. Moser 1963: 17–8; E. Moser and White 1968: 147).

It is worth mentioning that the Band VI people differed from the remainder of the Seri not only in language, but in other ways as well—for instance, in their use of fish spears rather than harpoons, their lack of the bow and arrow, their extensive reliance on the *balsa,* their ferocity as fighters, and their penchant for staking their lives at gambling, the latter also being a practice attributed to the Giants. Many of the idiosyncracies of the Band VI people may have been due to their isolated location. While there was some intermixture with other Seri bands, they rarely visited the Sonora mainland and did not participate in any of the raids against the European settlements. Their isolation may also have been a barrier to contact with other Sonoran Indians. Influences from neighboring Sonoran Indian groups are clearly visible in modern Seri culture, which is mainly a derivative of bands other than Band VI. It may be that the cultural changes that occurred among these bands did not diffuse to the San Esteban people, who were regarded by the mainland and Isla Tiburón Seri as backward and primitive (E. Moser 1963: 16; pers. comm.).

Since the culture of the Band VI people collapsed under force in the latter part of the nineteenth century, it is uncertain how much information on them is still accessible. However, as archaic manifestations of Seri culture, many of their characteristics might be expected to correspond with those which the contemporary Seri attribute to the Giants.

The bearing of this material on Seri–Baja California contacts is clear: if the cultural characteristics ascribed to the Giants are based on archaic aspects of Seri culture, those aspects of the Giants legends that deal with Baja California may also have a factual foundation. Two elements of the Giants tradition are especially significant in this regard. The first is simply the belief that the Giants lived in Baja California as well as in Seri territory. If, as speculated earlier, migration across the Gulf from the peninsula occurred gradually through population drift, there might well have been a time when a culturally homogenous population occupied both coasts, the peninsula being later abandoned. The second significant element of the Giants tradition is the repeated reference to crossings of the Gulf. Although there is no question that the Seri made trips to Baja California, the Giants legends give the impression that such trips were commonplace. There is obviously no way of knowing just how frequently crossings were made, but there may well have been more trans-Gulf contact than has been suspected. It is worth noting that the San Esteban Seri, who were situated in the most convenient location for travel to the peninsula, were acclaimed by the other bands as experts in the use of the *balsa.*

Crossings from the peninsula to the Sonora side of the Gulf are also indicated in oral tradition. One such account concerns a song that the Seri claim was taught to them long ago by a Giant who had crossed over from the peninsula. The song itself was composed by this Giant, and the text relates a visionary experience he had had while sitting on the summit of one of the peninsular mountains. The Seri know this mountain by name (it is south of Punta San Francisquito). They say that long ago a group of Seri that crossed to the peninsula expected this mountain to be near the beach and were surprised that it was actually some distance inland (E. Moser: pers. comm.).

As noted earlier, certain structural details of Seri basketry indicate ties with Baja California, and oral

tradition concerning the origin of Seri basketry also suggests contacts. There are three traditional explanations of how the craft originated (Bowen 1973: 157–8). One is uninformative. In another, a coyote man invents the craft and manufactures the first several baskets (a second version of this account attributes the original baskets to a shaman). In the third account, a woman of Band III, who is identified by both a Seri and a Spanish name, is said to have learned of basketry from the Giants. However, because she was old and crippled and could not make one herself, she taught the technique to a Seri man, who then made the first basket.

Although it is of interest that the third legend specifically credits the Giants with the origin of basketry, the most intriguing fact is that this legend and both versions of the second account state that the first baskets were made by men. Except among the Cochimí, basketmaking throughout the entire remainder of North America north of the Valley of Mexico was a women's activity (Driver and Massey 1957: 334, Map 123; Bowen 1973: 160). While the possibility of coincidence cannot be discounted, it seems more likely that the traditional Seri accounts of men as the first basketmakers are based on a past familiarity with Cochimí basketmaking.

Since the Giants are said to have lived in Baja California as well as on the Seri coast, and since the insertion of ornaments in nose perforations is said to have been standard body decoration, it is worth mentioning that this practice was also documented among some of the Baja California groups. Like the Giants, these groups used both shells and worked stones as nose ornaments (Clavigero 1937: 107; Sales 1956: 31; Aschmann 1959: 110).

Finally, there is a single bit of evidence to suggest that the Cochimí themselves may have shared with the Seri an oral tradition about giants. A comment by the Jesuit Clavigero states the Cochimí belief as to the identity of the painters of the well-known central peninsula cave pictographs: "The Californians unanimously affirm that it was a nation of giants who came from the north" (Meighan 1966: 376). Excavations in one rock shelter containing such paintings produced most of the diagnostic artifacts of the Comondú culture; consequently, Meighan (1966: 374, Table 1) regards these rock paintings as an additional diagnostic element of the culture, but one that did not endure into post-Spanish times. Since the Comondú culture represents the material remains of the historic Cochimí and their immediate ancestors, it would appear that the Cochimí, like the Seri, attributed outmoded aspects of their own culture to a legendary population of giants.

EVALUATION AND CONCLUSIONS

If nothing else, this brief review should point out how little is actually known about Baja California and the central coast of Sonora. With regard to the languages and cultures of the peninsula, it is doubtful that we shall ever know very much more than we do now. However, a few comments may be made on the information at hand, slender as it is.

In regard to accessibility, there is ample evidence that the Seri could, and did, cross the Gulf with aboriginal equipment and navigational techniques, and they may have done so with some regularity. Furthermore, the Seri possession of the *balsa* and especially of the double-bladed paddle is explained most simply by assuming that the Seri crossed over from the peninsula with this equipment. Thus there is no question that they could have immigrated to their present territory from the peninsula, but this possibility obviously offers no assurance that they actually did. At the very least, these data suggest that contacts between the Seri and peninsular peoples may have been much more frequent and substantial than has generally been thought.

The archaeological evidence is extremely difficult to assess. With respect to the early material, the peninsula is much better known than the central coast. Although it may be that some of the same early cultures are represented in both areas, they are in effect southern extensions of cultures centered farther north. While it is conceivable that their occurrence on both sides of the Gulf is the result of early trans-Gulf contacts or migration, this would be difficult or impossible to prove.

Since the diagnostic artifacts of the two late peninsular cultures are perishable, and no perishables are yet known from the central coast, there is simply very little basis for evaluating whether there was a close relationship. The most obvious difference in the nonperishable materials, which at present provide the only avenue of comparison, lies in the presence of pottery on the central coast and its absence on the peninsula. This, however, does not argue against central coast culture having derived from Baja California, as the central coast people could have learned the craft after their arrival on the mainland. In this context it is worth noting that the Seri have been wide travelers; one camp at the mouth of the Colorado River is still remembered (E. and M. Moser: pers. comm.).

Other discrepancies may be more significant. On each side of the Gulf, certain kinds of nonperishable artifacts occur that have no counterpart on the other side, while some classes of remains common to the central coast and the peninsula show substantial differences in specific form. On the whole, the remains that display the greatest similarities are simple items that are found much more widely, suggesting that the broad resemblances in the archaeology of the central coast and the peninsula may be nothing more than a reflection of equivalent levels of technology within similar environments. On the other hand, the possibility of an underly-

ing historical relationship is suggested by certain specific features. The most notable of these are the correspondences in the rather wide range of burial practices in the Cape Region and the central coast, including secondary burial, and the close similarity in the details of Comondú and ethnographically known Seri basketry.

In short, present archaeological evidence provides little basis for either accepting or rejecting the hypothesis that central coast culture derived from one of the two late peninsular cultures. All that can be said is that *if* central coast culture is an offshoot of a peninsular antecedent, the split must not have been very recent. The situation is not likely to be clarified until perishable materials are recovered from central coast sites.

The ethnographic data are equally ambiguous. The value of Kroeber's bald trait list approach is dubious, and the evidence he presents is subject to widely differing interpretations depending on how the data are organized. Taken at face value, two results are of interest: the fact that Seri culture shows at least as great a similarity to Guaicura as to Cochimí, and the fact that Seri culture does not closely resemble either. Kroeber's conclusion from the ethnographic data (1931: 49), that "if the Seri came out of the peninsula, it was a long time ago," would appear to be in line with the archaeological evidence, such as it is.

The linguistic evidence leads to much the same conclusion. Seri language is usually classified as an isolate; although relationships with several other languages have been proposed, none are close. With respect to the peninsular languages, whether Seri is related to the Guaicurian group may never be known, for lack of recorded data. Some similarities exist between Seri and Cochimí, but the relationship is distant. Thus if one split off from the other, the separation must have occurred at an early date.

The most difficult material to evaluate is Seri oral tradition. The various superhuman feats attributed to the Giants are obviously exaggeration or fiction; on the other hand, the evidence is rather strong that the Giants tradition also preserves some facets of Seri history in legendary form. In terms of the present discussion, the aspect of greatest importance is that the Giants' territory is said to have included Baja California as well as the central coast. Consideration of this aspect involves at least three related questions. The most fundamental, of course, is whether the territory assigned to the Giants is one of the purely fictional elements of the tradition or whether it is factually based, referring to a time when a culturally homogeneous population actually lived on both sides of the Gulf. Although this question cannot be answered, it is clear that such a situation, if it existed, must have been fairly early, antedating the appearance of pottery. If so, it might be questioned whether oral tradition is capable of accurately preserving historical information over the length of time this would imply. This too cannot be answered, but it is worth noting that Seri opinion that the Giants inhabited the peninsula is still firmly and precisely articulated nearly 300 years after it was first recorded by Gilg, and there is no reason to assume that this was not already a well-established belief when Gilg recorded it.

If the possibility is acknowledged that a factual foundation may underlie the Giants tradition, a second question concerns the identity of this population, whether its members were non-Seri as the tradition literally states, or whether they were the semifictionalized ancestors of the Seri themselves, as E. Moser and White postulate (1968: 147). There is considerable appeal in the literal interpretation, that the Giants were a separate group that preceded the Seri and were partly displaced by them. The archaeological evidence, meager as it is, allows the possibility that the pottery-making Seri moved into the central coast and superseded a very sparse, nonceramic earlier population. It might be speculated that this earlier group occupied both shores of the Gulf when the Seri arrived, and that it is they who have survived in Seri oral tradition as the Giants (even though many of their ascribed characteristics are in fact those of the Seri's own ancestors). Assuming that the Giants tradition is factually based, this alternative would have the Seri originating somewhere other than in the central peninsula. In this context it should be mentioned that the Seri have a migration tradition, though a very weak one, which states that they lived for a time near *kaiʔippooʔ* 'dry-lake its-blackness' in northeastern Baja California (E. Moser: pers. comm.).

On the other hand, the obvious facility with which the Seri attribute their own cultural characteristics to the Giants strongly argues in support of Moser and White's position that the Giants are merely the ancestors of the Seri in legendary form. The implication here is that the Seri themselves at one time lived on both sides of the Gulf and have since withdrawn from the peninsula.

Thus the information is ambiguous, and the question of Seri origins in Baja California remains unresolved. It is worth mentioning, however, that one scenario tentatively proposed by Kroeber (1931: 49) is not implausible in terms of present information. On the basis of Seri-Guaicura shared traits, Kroeber suggested that the Seri might have split off from the Guaicura or a similar culture at a time when this culture was situated across the Gulf from the central coast of Sonora, prior to its movement into the Cape Region and before the arrival of the Cochimí in the central peninsula. This suggestion might account for the archaeological parallels between the central coast and the Cape Region,

and it has the advantage of providing considerable time depth for these cultures to have diverged and developed independently. It also implies that central coast characteristics shared with the Comondú culture and the historic Cochimí are due to later trans-Gulf contact, which, as suggested here, may have been fairly extensive. This hypothesis would, of course, very conveniently circumvent the linguistic problem, since there would be no reason to expect close similarity between Seri and Cochimí, and since the Guaicurian languages are extinct and largely unrecorded. As Kroeber concluded more than forty years ago (1931: 49), if the Seri originated in Baja California, it must have been a long time ago.

Appendix

NOTES ON THE ARCHAEOLOGY OF THE GUAYMAS AREA

The remains of the Guaymas area share much of the simplicity of those of the central coast, but they are distinct enough to be regarded as belonging to a separate culture area. The geographic extent of this culture area is not known, since nearly all of the sites visited so far are within a very small locality extending approximately from Bahía San Carlos on the west to Empalme on the east. Nor is it at all certain that the remains belong to a single culture. Although they are generally simple, their diversity suggests that the Guaymas area may have been occupied by more than one group, and the presence of small quantities of Tiburón Plain pottery indicates that the central coast people at least visited the area.

This section reports briefly on the Guaymas area remains encountered by the Sonora-Sinaloa Project survey, and its focus is on the similarities and differences between the remains of this area and those of the central coast.

SITES

Eight sites were recorded in the Guaymas vicinity. All are sites that were visited in 1964 (Bowen 1965), and a few had been visited still earlier by Fay (1955; 1968). They have been renumbered according to the Arizona State Museum quadrangle system. In a few cases adjacent occupation areas regarded as separate sites in 1964 no longer seem sufficiently distinct to warrant separate designations; hence they are now combined under a single site number.

It should be borne in mind that Guaymas has long been a popular tourist area. The sites described here have been accessible to relic hunters for years; very probably they have all been thoroughly picked over.

Son R:1:7. This site combines MEX:SON:4 and MEX:SON:23 of the 1964 survey (Bowen 1965) and Fay's 53:F-69, 53:F-70, and 53:F-71 (Fay 1968). It consists of several adjacent areas of shell and trash scattered over the alluvial plain just west of San José de Guaymas. The pottery shows a marked diversity and includes thick sherds with organic temper, a few slipped red sherds, and Tiburón Plain. Some, much, or all of the pottery may be historic. Lithic debris is abundant, and the rock, like practically all chipped stone in the Guaymas vicinity, is either basalt or obsidian. Shell artifacts consist of two *Glycymeris* bracelet fragments and a faceted central core. Hearths are common. Because of extensive sheet erosion they appear as clusters of burned and fire-cracked rocks. A fragmentary projectile point closely resembling the Gypsum Cave type was found here during the 1964 survey (Bowen 1965: 23–4).

Son R:1:11. This site, situated on the alluvial plain, combines MEX:SON:8 and MEX:SON:9 of the 1964 survey. It consists of a thin deposit of shell and trash. Three manos were encountered here, and other specimens were noted previously. Lithic debris is common. Only a few small sherds were found, all reminiscent of Tiburón Plain. Two or three clusters of burned rocks from hearths were visible. It appears that the site is rapidly being destroyed by erosion.

Son R:1:12. This site is a large shell midden recorded in 1964 as MEX:SON:25. It is located on the bank of Estero Soldado. A road now cuts through the length of the site. Like most sites in the vicintiy of this *estero,* it has been the scene of extensive collecting by tourists, and little remains on the surface. Only a few sherds were seen. A single, probably modern, hearth was encountered. Two faceted cores from the manufacture of *Glycymeris* bracelets were recovered.

Son R:1:13. This site, previously recorded as MEX:SON:10, is located about 100 m west of Son R:1:11. It consists of a thin scattering of shell and lithic debris. A few grinding implements were observed, but only eight sherds were recovered.

Son R:1:16. This site corresponds to MEX:SON:14 of the 1964 survey. It is an area of shell and trash on a mud flat adjacent to Estero Soldado. Lithic material is present in moderate quantity. Pottery, although scarce, shows considerable variety and includes a few sherds of Tiburón Plain. Several clusters of burned rock from eroded hearths were noted.

Son R:1:18. This apparently fortified site has been recorded as 53:F-15 (Fay 1955: 574–5) and as MEX:-SON:16 (Bowen 1965: 21–2), and its presence is undoubtedly known widely to Guaymas residents. It consists primarily of about 35 room-like structures, all situated near the summit of an isolated hill. Just below these features a continuous but irregular wall partially encircles the hill, on its northern, western, and southern slopes (Fig. 75). Most of the artifactual material at this site is non-Indian trash in the form of tin cans, other metal objects, and broken glass, dating mainly from the late nineteenth and early twentieth centuries. However, the surface is also littered with a modest quantity of lithic debris. Although the pottery consists almost entirely of recent Mexican glazes, a diligent search turned up a few small sherds of Tiburón Plain. Earlier, Fay (pers. comm.) had encountered fragments of a clay pipe.

The function of this site is far from clear. It is doubtful that it was a domestic habitation site used under normal circumstances. The partially encircling wall suggests that it might have served as a fortified retreat, but this would seem an inadequate explanation. Although the wall would undoubtedly have aided in the defense of the site, it protects the steepest access to the hilltop while leaving the gentle eastern slope totally unprotected. This situation is not unlike that of many "fortified" sites in the Trincheras area and the Papaguería, where the walls and terraces are often absent from the side of the hill with the gentlest slope. Fay (field notes) cites a Guaymas historian who suggests that Son R:1:18 and one other site in the vicinity were constructed during the 1910 Revolution and used in local battles. This would readily explain the quantities of historic trash at the site, most of which can be assigned to that time period, but it would not account for the lithic material. Since Mexican soldiers were certainly not chipping stone tools, either the lithic debris was already present when the structures were built or the site was constructed and occupied by Yaqui participants in the Revolution. Alternatively, Fay (pers. comm.) is inclined to the view that the site was originally a semifortified Yaqui village and that it was later occupied by soldiers during the Revolution. Whatever the sequence, at least part of the occupation of the site was aboriginal.

Son R:1:20. Son R:1:20, originally designated MEX:SON:18, is located on an isolated hill directly north of Son R:1:18. It contains about 35 short wall segments constructed of unshaped rocks. Apart from a very few flakes, no artifacts were seen. Because the walls appear to have been very hastily constructed and are no more elaborate than necessary for defense, this site gives a much firmer impression of having been built solely for defense than does Son R:1:18. However, there is no indication of who built the site or when it was occupied.

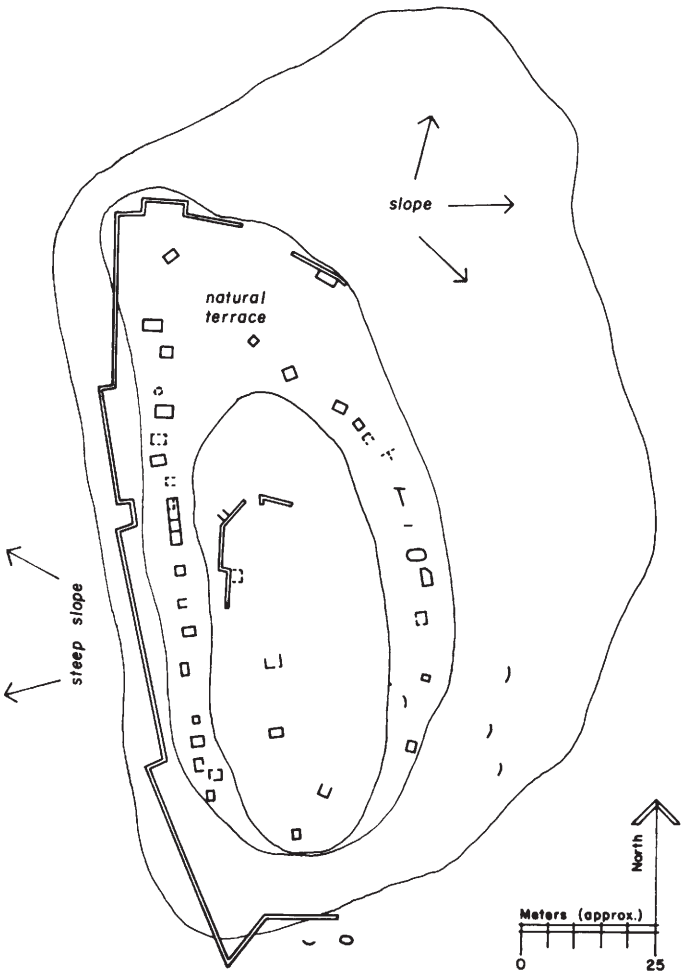

Fig. 75 Sketch map of Son R:1:18. (Redrawn from sketches by Stephen D. Hayden.)

Son R:1:21. This site, recorded in 1964 as MEX:-SON:19, consists of a sparse area of trash and shell near Miramar beach. In addition to chipping waste, only a few small sherds were encountered.

FEATURES

Masonry Structures

Son R:1:18. This site includes some 35 definable room-like structures (Figs. 76 and 77). The majority are isolated structures, but there is one block of three contiguous rooms. One of the rooms on the hill is oval; the remainder are rectangular. Another oval room was discovered about 90 m east of the easternmost structures on the hill.

There is some variation in technique of construction. Most of the walls are dry-laid unmodified rocks, but a few consist of inner and outer courses of unshaped rocks with a thin rubble fill. Wall thicknesses average about 0.5 m. In most instances wall faces are uneven, but a few

Fig. 76 Stone structure at Son R:1:18, looking west.

Fig. 77 Stone structure at Son R:1:18.

walls indicate care in achieving even faces and squared corners. Nowhere is there evidence of mortar. The rooms range in size from about 1.5 by 1.5 m to 2.5 by 4.0 m and average about 2.5 m square. The maximum present height of the walls is about 1 m. Most are badly fallen and some have been reduced to vague outlines.

The wall partially encircling the site is of similar construction, but it is markedly better preserved than the majority of rooms and may have been built at a later time. Since many of the rooms that are now mere outlines are surrounded by no fall rock whatever, it may be that wall debris from the rooms was utilized in the construction of the wall.

Son R:1:20. All of the 35 structures at this site are short sections of wall, either straight or curved, consisting of little more than piles of unshaped rocks. The

wall sections average about 1 m to 2 m in length and a few reach a height of 1.5 m. The crude construction of these walls, their position on the hill, and the virtual lack of artifacts suggest that they were built solely for defense.

Fay (field notes) has recorded three additional sites in the Guaymas area that possess structures of dry-laid rock. Two of these sites contain only a single wall. The third, designated 53:F-10, is situated on a level shoulder of a hill about 3 km from Son R:1:18. It contains several rooms and short walls. A longer wall is defensively located at the edge of the shoulder overlooking the valley below. Fay reports finding a moderate quantity of sherds and a limited quantity of lithic material but no metal artifacts at 53:F-10. This suggests aboriginal occupation of the site, and it supports the idea that Son R:1:18 was also initially built by an indigenous group.

Hearths

Son R:1:7, R:1:11, R:1:16. These three sites all possess small clusters of burned rocks, which presumably are eroded remains of hearths. Ten such clusters were observed at Son R:1:7, three at Son R:1:11, and six at Son R:1:16. Their diameters range from about 0.5 m to 1.0 m.

Son R:1:12: An ash-filled hearth was seen at this site. It is about 70 cm in diameter and is lined by three rocks set on edge. It is probably recent.

Fay (field notes) encountered several hearths and concentrations of fire-blackened rocks at two sites in the Guaymas area.

Pictographs

According to a local resident interviewed by Fay (1968: 4), there are pictographs on some of the canyon walls among the peaks of Cerro Tigre. Apparently they have not been recorded.

Comments

Walls and simple enclosures of piled rocks are common to both the Guaymas area and the central coast, and they occur much more widely in Sonora. The very simplicity of these structures reduces the value of comparison. However, some Guaymas area structures are much more carefully built than those of the central coast, and the use of rubble fill is not known in the latter area. In form, Guaymas area enclosed structures are generally rectangular, while those on the central coast, with the exception of the turtle pens at Son I:11:2, are circular or oval.

A major difference also lies in the apparently defensive nature of the Guaymas area structures. Although two instances of rock structures on hills are known from the central coast (those at Son I:16:6 and the structures on Isla Tiburón), neither of these seems to have been a fortification.

Judging from the prevalence of clusters of burned rock, hearths appear to be a characteristic feature of the Guaymas area. Fire-cracked rocks were noted at a few central coast sites, and Hayden (1956: 20) mentions "hearth stones" at Estero Tastiota. Whether the hearths indicated by these remains were similar in form to those of the Guaymas area is not known.

At least one burial has been excavated in the Guaymas area, but no details are available. So far as is known, such central coast features as stone circles (vision rings) and stone outline figures do not occur this far south.

ARTIFACTS

Pottery

Previously an attempt was made to classify Guaymas area pottery into five loose categories, Types "A" through "E" (Bowen 1965: 29–31). The present survey indicates that that scheme, which was based on a very small collection, should be discarded, but there is still not enough information to propose an adequate classification. One of the problems in dealing with the pottery of this area is that many of the sherds are extremely small and are often badly weathered. It is now clear, however, that Type "A" in its entirety and many Type "B" and "C" sherds should be classified as Tiburón Plain. Types "B" and "C" also include a number of specimens that, while bearing some resemblance to Tiburón Plain, fall outside the range of variability of this type as it is known from the central coast. Many of these sherds are substantially thicker than Tiburón Plain, some contain large amounts of coarse sand temper, and many have rough surfaces. The distinctions between Types "D" and "E" no longer seem valid, and these categories are best discarded altogether.

The bulk of the pottery at most sites near Guaymas is a singularly nondescript plain brownware, much of it thick. It tends to be heavily sand-tempered and in many cases is heavily tempered with a fibrous organic material, which produces black cores and pitted surfaces. Surface texture ranges from rough to smooth and in some cases includes polishing. A certain amount of Guaymas pottery is probably historic. Some sherds are undoubtedly European, but many of them are probably indigenous.

Small quantities of pottery differing from this plain brownware were noted at a few sites. A few polished red-slipped sherds were encountered, and some have organic temper. Several sherds, presumably (but not demonstrably) intrusive, bear a resemblance to some Lower Colorado Buff Ware. Another infrequent intrusive is Trincheras pottery, including both plain and

decorated types. Tiburón Plain, or at least something like it, occurs in small quantities at several sites, apparently as an intrusive, but in considerable quantity at one site (Son R:1:7). This suggests that the central coast people probably visited this area, but the bulk of the pottery seems to be the product of a different, as yet undefined, tradition.

Manos and Metates

Fifteen manos and mano fragments were collected and nine had been recorded previously (Bowen 1965: 28–9). Most are simple oval handstones that correspond closely with beach-cobble manos from the central coast in size, shape, and nature of the grinding surface. The fact that unifacial manos slightly outnumber bifacial specimens, the reverse of the situation on the central coast, may be due to sampling error.

Many of the Guaymas area manos seem genuinely to differ in that they appear to have been intentionally shaped. Judging from the small sample known, the materials also seem to be different. Only three manos are of white granite, the most popular material farther north. Many are of basalt, often vesicular, and the remainder are made from a variety of rocks including sandstone, arkose, rhyolite, and quartzite. Presumably, locally available materials were used.

Three of the manos, from three different sites, are trifacial. One other specimen, from Son R:1:16, is square in cross section and presents four well-defined faces, although only three show wear.

Since only five metates were observed, in addition to the three encountered in 1964, little can be said of these items. Both unifacial and bifacial specimens are known, and the grinding surfaces range from flat to deep basins. The preferred material was apparently basalt.

Projectile Points and Knives

Eighteen points and knives, almost all fragmentary, were recovered from six sites. Because of the amount of collecting that has occurred in the region, it is far from certain that the points and knives that remain are representative of the forms made by the aboriginal artisans. Judging from the present collection, the collection taken in 1964, and the points recovered by Fay (1968), it would seem that the forms are largely similar to those that predominate on the central coast to the north.

The vast majority of points and knives are relatively large and are either leaf-shaped or triangular with a straight base. Most of these specimens were made by percussion, but a sizable minority are reasonably well executed, and some are pressure flaked. The material used is almost exclusively basalt.

Stemmed points constitute the next most numerous category, and these are essentially indistinguishable in form, size, technique, and general quality of manufacture from stemmed points on the central coast. Unlike the specimens from the central coast, these points are made almost exclusively of obsidian and basalt, predominantly the latter.

The 1964 survey encountered four small and rather narrow triangular points, two with straight bases and two with concave bases (Bowen 1965: Fig. 7 *b, c, d, j*). They are very similar to a series of points from the Estero Tastiota collection described by Holzkamper (1956: Fig. 4 *a–k*). No comparable specimens were found either by Fay (1968) or by the present survey.

The most noteworthy point from this area is a fragment showing a close similarity in form, size, and technique to the characteristic lozenge-shaped points from Gypsum Cave (Bowen 1965: Fig. 7 *e*). Although nearly all points from the Guaymas area are of basalt or obsidian, this point is made of pink chert. The similarity could be merely formal, but the point may be indicative of an early local occupation.

Cruciforms

Eight of the cruciforms on which Hemmings' study (1967) is based are from the Guaymas area. According to that classification, one of these, originally reported by Fay (1956b: 410–1), is a Type 1 specimen. The remainder are Type 2. None were encountered by the present survey.

Other Chipped Stone

In marked contrast to the central coast, chipped stone tools other than projectile points are common at sites in the Guaymas area. They include both core implements and flake tools, the latter predominating (a large collection of stone tools, cores, and flakes from Guaymas area sites is illustrated by Fay [1968]).

Secondary chipping on flakes is usually confined to a single edge, and most of these specimens are irregular in outline. A few are fully shaped by retouch around the entire perimeter. Retouching was by both percussion and pressure.

Similarly, core tools are usually irregular in outline, with retouching confined to a single edge, but some are fully shaped implements. The latter tend to be ovoid or discoidal in shape. Two specific forms are worth singling out as characteristic, although they are not especially abundant. One is a small, discoidal form made of obsidian. The flat base, usually a primary flake scar, served as a striking platform for the removal of long flakes around the perimeter of the opposite face. The result, after retouching, is a well-formed dome-shaped

implement. Possibly such objects were used as planes. The second form is crescentic in outline. Unlike crescents from early horizons in the western United States, these have blunt ends and a thick cross section and are much inferior in workmanship.

Guaymas area chipped stone tools are made almost exclusively from basalt and, to a lesser extent, obsidian. The color of the basalt specimens is normally black, but at specific sites a sizable proportion of the implements are of greenish-gray basalt. Much of the rock used in this area may have come from outcrops in the mountains north of Guaymas, where broken tools and waste debris provide extensive evidence of quarrying and workshop activity.

Shell Artifacts

Two *Glycymeris* bracelet fragments, both 7 mm wide, and a ground and faceted *Glycymeris* core were encountered at Son R:1:7. Two more cores were found at Son R:1:12. All are similar to the specimens from central coast sites, and the cores indicate the same proces of manufacture characteristic of the Trincheras culture. As with the central coast bracelets, it is likely that they were made by Trincheras people rather than by local inhabitants.

SUMMARY

The foregoing report suggests both similarities and differences between the archaeology of the central coast and that of the Guaymas area. With respect to the sites themselves, the most notable discrepancy lies in the absence of dune sites, even though some dunes occur near Guaymas. Instead, most camps seem to be located on the alluvial plain behind the beaches, in some cases several kilometers from the shoreline. Guaymas area sites also include dense shell middens adjacent to *esteros,* trash accumulations on tidal flats, rock shelters, and apparently fortified hills.

Whether certain central coast features not presently known in the Guaymas area will eventually come to light cannot be predicted. Of the features apparently absent, stone circles and outline figures seem the most significant. While dry-laid walls and enclosures occur in both areas, their similarity lies mainly in their simplicity. They differ in specific form and, in some examples, in construction technique. Too little is known of hearths in either area to assess similarities and differences.

Although small amounts of Tiburón Plain pottery unquestionably occur with some regularity at Guaymas sites, the type does not appear to be local to the area. The predominant pottery is plain, brown, thick, and heavily tempered. It is not clear whether the scarcer forms such as slipped redware are local or intrusive; in any event they are not indigenous to the central coast.

Central coast and Guaymas metates and manos appear to be similar in general form, although those from the Guaymas area tend to show more evidence of having been genuinely shaped. The difference in materials is probably a matter of local resources.

There seem to be few differences in projectile point forms. Poorly made stemmed points are common to both areas and show no great differences in specific shapes or workmanship. Leaf-shaped points may be somewhat more numerous around Guaymas than on the central coast, but this is not certain. Small, narrow triangular points with concave or notched bases seem to be limited primarily to the Guaymas area and the southern portion of the central coast. The use of obsidian and basalt, both for points and for other chipped stone, also extends from Guaymas to the southern part of the central coast; however, this latter distribution probably reflects nothing more than the occurrence of these rocks near both areas. Cruciforms are characteristic of both the central coast and the Guaymas region.

The remainder of the chipped stone delimits the boundary between the two areas as sharply as any other class of artifact. On the central coast, well-shaped chipped stone tools are scarce; those that occur are generally large core implements bearing a single, rather crude percussion-flaked edge. Such implements are also found around Guaymas, but they are far outnumbered by flakes with retouched edges and to a lesser extent by small well-shaped flake and core tools neatly finished by pressure retouch.

The Guaymas vicinity has usually been given as the approximate boundary between the Serian-speaking bands and the Cahitan speakers in early contact times (Spicer 1962: Fig. 2; Bahre 1967: Fig. 22). Archaeologically, Punta San Antonio, a few kilometers northwest of the city of Guaymas, defines the southeastern limit of the central coast culture, separating it from the culture of the Guaymas area. Since these historic and archaeological boundaries nearly coincide, it is tempting to view the Guaymas area remains (or at least some of them) as Yaqui. At present, however, this can only be speculation, for the archaeology of the Yaqui area is almost completely unknown.

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