Reports of the
UNIVERSITY OF CALIFORNIA
ARCHAEOLOGICAL SURVEY
No. 24

TEMPORAL AND AREAL RELATIONSHIPS IN CENTRAL CALIFORNIA ARCHAEOLOGY

PART ONE

By Richard K. Beardsley

Issued November 30, 1954

The University of California Archaeological Survey
Department of Anthropology
University of California
Berkeley 4, California

TEMPORAL AND AREAL RELATIONSHIPS IN CENTRAL CALIFORNIA ARCHEOLOGY

Richard K. Beardsley

University of California Archaeological

Survey Report Number 24

Part One

Part Two - appears as UCAS Report Number 25

EDITOR'S PREFACE

Dr. Beardsley's monograph, the first part of which appears in the present Report, and the second part to be issued as Report No. 25, is a work of fundamental significance in California archaeology. This work was the second doctoral dissertation at Berkeley on the subject of American archaeology, and the first on California prehistory.

Beardsley had held the hope that he might prepare his dissertation for publication, but the press of other duties, chiefly in connection with the University of Michigan program in Japan, made this eventuality increasingly unlikely since 1947 when it was written. In the summer of 1952, when Dr. Beardsley was kind enough to accept the invitation of the Department of Anthropology to conduct the Summer Session class in field archaeology (Course 197) we discussed the matter of publication of his thesis, and finally in the spring of 1953 when in Berkeley on his way for another year in Japan, it was agreed that the Survey would print the work in its Report series.

Although Dr. Beardsley offered us the liberty of modifying any of his statements to bring them into harmony with more recently discovered facts, it has been thought best to leave his statements unchanged, and wherever necessary to add a brief editorial note indicating newer data which might modify or amplify specific problems or constitute important additions of factual data. (Notes to be found at ends of respective volumes include editorial notes and Beardsley's notes, and are indicated by superscript numbers in the text.)

A very tightly-packed synthesis of this Report was published by Beardsley in 1948[1], and in this summary he appended a useful and stimulating attempt to elucidate the problem, first posed in specific form by Haag,[2] of explaining the numerous cultural parallels existing between Central California and the Archaic horizon of the Southeastern United States. Beardsley's contribution to this important problem deserves high commendation, and work is continuing at the present time on this matter by students at Berkeley.

Due to limitation of funds it has not been possible to reproduce here all of the illustrations appearing in the original manuscript. Some sacrifice of proof and demonstration has resulted from these omissions (for which see List of Illustrations), but they are not critical. To any reader of this Report who feels that the deleted maps and figures are actually needed by him for assistance in solving some specific problem in California archaeology, the Survey offers to supply photostat copies of the missing items.

Beardsley wrote just before the University of California Archaeological Survey was founded in 1948. This organization's initial project was to collect and organize in a systematic fashion all records on known archaeological sites. A site designation system was adopted, and sites which had heretofore been only named or numbered according to what

individual or institution was involved in making the original record were incorporated into the statewide numbering system. The above explanation is required for the reason that we have left Beardsley's site names and numbers stand as given by him. For convenience in identifying Beardsley's sites with the UCAS system Mr. Bennyhoff, UCAS archaeologist, has drawn up a synonymy of Beardsley - UCAS site designations.

Robert F. Heizer

Berkeley, California
September, 1954

ACKNOWLEDGEMENTS

The man who prefers only his own company will find it hard to remain a happy archeologist. An archeological project can seldom be a one man affair, and the value of its results is enhanced by the friendly and able assistance of many persons. There are many besides those mentioned here who are remembered warmly for their generous assistance in field work or subsequent studies.

The research programs of the Department of Anthropology at the University of California permitted a majority of the excavations mentioned or described in this paper. Field seasons on the coast of Marin County under my field supervision were made possible by generous research grants from the Board of Research of the University, and were sponsored by the Department of Anthropology. More than nominal measure of gratitude is owed to the several members of the faculty, for sympathetic interest and unobtrusive supervision that smoothed field operations and facilitated study. Use of museum equipment and facilities was provided on all occasions by Professor E.W. Gifford, Curator of the Museum of Anthropology.

The inspiration for excavation on the Marin County coast came from Docotr Robert F. Heizer, who planned the original attack and was in charge in the field during half of the 1940 season. I am indebted to Doctor Heizer for consistent encouragement and constructive criticism. I take pleasure in acknowledging my personal debt to Doctor Heizer and to Mr. Franklin Fenenga for the stimulation which their special knowledge of archeological problems in Central California has given me during years of common interests. My review of Sacramento Valley archeology has benefited in details and in interpretation from their advice; the responsibility for accuracy of description or interpretation, of course, is mine.

Identification of archeological materials has been made generously by several persons: by Doctor Hildegarde Howard, Curator of Avian Paleontology, Los Angeles County Museum, for bird bones; by Professor E.W. Gifford, Curator of the University of California Museum of Anthropology, for shells; by Miss Sheilagh Thompson, graduate student at the University, for animal bones; by Mr. W.I. Follett, Oakland, for fish bones; by Doctor Robert H. Cockrell, Associate Professor of Forestry, University of California, for wood specimens; by Doctor Charles Anderson, Professor of Geology, University of California, for mineral specimens; and by Mr. Arthur Woodward, Curator of Archeology and History, Los Angeles County Museum, for European materials; by Mr. Theodore Y. Hobby, Assistant Curator of Far Eastern Art, Metropolitan Museum of Art, for Chinese porcelain; and by Doctors Colin G. Fink and Eugene P. Polushkin, Department of Chemical Engineering, Columbia University, for iron spikes.

With the special pleasure born of long weeks of campfire companionship, I tender the obligations of all anthropologists to the graduate students, undergraduate students, and others who spent their summers and weekends in hard labor as volunteer crews. The debt to them is acknowledged but not diminished, by mention of their names: Jerry Atkinson, Paul S. Blak, Edward Elias, William H. Hohenthal, Paul Holmes, Clifton Kroeber, Peter Leaf, Alfred Metraux, Eric Metraux, Russel J. Newman, Saul Riesenberg, James Roney, Adan Treganza, William A. Wallace, and Masao Yabuki.

Dr. Treganza's generous donation of transportation in ther service of the field party bears special mention.

The generosity of property owners who permitted our camping and digging on their property merits appreciative thanks. These include Mr. L.S. Murphy of San Anselmo and Mr. John McClure of Inverness, Marin County, California.

The maps and diagrams for this paper were drawn by Doris P. Beardsley, the illustrations by Alice S. Beardsley.

LIST OF ILLUSTRATIONS[4]

Figures

Maps

Tables

---

* Not reproduced. See editor's Preface.

** Not reproduced, but published earlier in Beardsley, 1948, and/or Heizer and Whipple, 1951. (See Footnote 4).

Chapter I

The Problems and Their Background

Archeological remains studied in this paper come from prehistoric and historic middens around San Francisco Bay and in the neighboring areas of Marin County and the Sacramento Valley in Central California. The region surveyed is somewhat more than a hundred miles in diameter. Its boundaries are physiographically determined, to a certain extent, but other considerations, such as the amount of archeological explorations done and the location of collections, are the principal factors which have set the limits of the study. It is this area which will be referred to in the study as Central California.

1. Problem

The principal concern of the present study is to present the evidence for culture succession in Marin County coast sites. In order to assess its bearing on the culture horizons and areal relationships of Central California as a whole, archeological data from the Sacramento Valley and San Francisco Bay areas also need to be examined. Previous publications on the Sacramento Valley materials have given a framework of culture horizons presented in terms of burial associations as well as stratigraphic sequence. Although publications relating to San Francisco Bay area sites represent their artifacts adequately, burial associations and other pertinent information are not fully available. Moreover, the data from twelve out of fifteen of the sites exist only as field notes and artifacts in the Museum collections. Reëxamination of the raw data for all sites around the Bay has been necessary, in consequence.

A systematic method of representing the relations observed in these three areas has been attempted in the classification used in succeeding pages. The following conclusions are derived from the study.

2. Conclusions

1. Two sequential culture horizons are established in four Marin County coast sites. In terms of the culture classification used, they are Late and Middle Horizons.

   a. Late Horizon is divided into two successive stages, called Mendoza Facies and Estero Facies. Mendoza Facies, the earlier phase, is established tentatively. Estero Facies is considered to begin before 1595 and terminate after 1850.

b. Middle Horizon is represented unsubdivided by McClure Facies. This facies is well documented. One further site from Bodega Bay can be regarded as of Middle Horizon affiliation, although it is not certainly within McClure Facies.[5]

2. Precise cultural parallels link the Marin coast culture horizons to the later two of three horizons known in the Sacramento Valley.

a. The subdivisions of Late Horizon match in each area, but there is evidence that they are not strictly synchronous.

b. The oldest known horizon in the Sacramento Valley, the Early Horizon, is not paralleled by any discoveries to date on the Marin coast.

3. Re-analysis of thirteen out of sixteen older excavations near San Francisco Bay shows the presence of two culture horizons, contrary to previously published opinions.

a. These horizons are closely related in culture content and stratigraphic sequence to Late and Middle Horizon cultures of Marin Coast and Sacramento Valley sites. They correspond most closely with coastal sites of Marin County. This is the basis for grouping McClure Facies and Ellis Landing Facies (San Francisco Bay) in a Coastal Province as against the Interior Province of Middle Horizon; Late Horizon components remain separately classed for each of the three areas.

b. A very few slight indications of Early Horizon traditions are known in the San Francisco Bay area. There is reason to believe that coastal areas were inhabited contemporaneously with the earliest known culture of the Sacramento Valley, but no substantial proof for it exists.

These conclusions are consistent with findings of the last ten years of archeology, but they have required radical reorientation of the data accumulated by earlier workers in the Central California field. That their collections can be utilized at all for analysis by methods which they did not anticipate is a tribute to the care with which they worked. Justice to them demands that some account be given of the circumstances which shaped their opinions and outmoded some of their conclusions as the years passed.

3. History of Archeology in Central California

The discovery of aboriginal artifacts and human remains in presumptive association with Tertiary gravels brought California into the archeological limelight on several occasions in the nineteenth century. A period of speculation as to the existence of human beings in California when gold-bearing gravels were deposited in the Sierra Nevada region

had not yet ended when W.H. Holmes reviewed the pertinent evidence, concluding that no unquestionable case of primary association in auriferous, pre-Pleistocene deposits was established.[6] Later explorations in fossiliferous caves in the mountains of north central California produced many thousands of specimens of Tertiary animals, among which were several fragments with pointed ends or small orifices suggestive of human workmanship.[7] These pseudo-tools ultimately were conceded to be inconclusive in themselves.[7a] Even when woven with the geological evidence from auriferous gravels, they formed an extremely thin threat on which to hang theories of early man in California.

By the time that these earlier geological and paleontological approaches to prehistory had run their inconclusive courses, the Department of Anthropology, newly established at the University of California in 1901, had opened another, more direct, line of inquiry into aboriginal occupation of the state with its program of archeological and ethnological field work. The first systematic excavations under the auspices of the University were in the Central California area, by Doctor Phillip Mills Jones, who examined several mounds around Stockton in the delta of the San Joaquin River in 1900,[8] before shifting his field to the Santa Barbara area and the Channel Islands off the coast of Southern California, where the artifact return for the labor of digging is estimated to be at least four times that of Central California sites.

Archeological activity of the department nonetheless continued in the less rewarding Central California area around San Francisco Bay for the next twelve years. One of the earliest excavations was a large trench and tunnel boring into perhaps the largest site of the bay area, at Emeryville, dug by Max Uhle in 1902. His results set the theoretical tone of archeological speculation in California through the next generation, for he saw suggestions of evolution from a primitive to a more advanced Neolithic stage in his finds.[9] Between 1906 and 1915, data were acquired from more or less extensive excavations in eight additional sites on the east, north, and southwest shores of the bay.[10] N.C. Nelson, who was prominent in this bay digging, also made a brief survey of the ocean coast south of the Russian River, and completed a detailed reconnaissance in 1908 during which more than four hundred mounds were plotted within or near drainage of the San Francisco Bay region.[11] Some of these had been damaged or destroyed even by that time as population and industry of the Bay region increased; two of the projects before 1915 were not so much controlled excavation as the salvage of artifact material from mounds along the shore while they were being leveled.[12]

Throughout this period of activity the hypothesis chiefly examined was Uhle's theory of evolutionary change in the culture of the shellmounds. Little support for this theory was adduced from any of the later collections. In fact, the lowest levels occasionally contained most abundant artifacts and objects of the best workmanship. It was properly insisted that no site showed evidence of local cultural evolution. Inter-site differences were seen to be more impressive than any changes within a single site, and no one thought to look for evidence of non-evolutionary culture change. The opinion that evolutionary culture change was lacking changed imperceptibly into the thesis that all culture change was

absent. The mounds were regarded as homogeneous deposits with a fundamentally uniform culture. Culture differences between sites and between areas were discussed only in spatial terms, perhaps in analogy to the depthless areal concepts gaining favor in ethnography.[13]

The puzzle of time depth was not ignored, however. N.C. Nelson attempted a volumetric computation of rate of accumulation of deposit from which he derived a maximum of 3500 years for the growth of Ellis Landing Site. E.W. Gifford attacked the same problem of total age through analysis of mound composition, estimating rate of accumulation in terms of weight, and achieved a similar estimate of 3300 to 3700 years.[14]

Twelve years of work in the limited field around San Francisco Bay thus gave evidence for one meaningful generalization. Around San Francisco Bay, and (it was implied) throughout the state of California, aboriginal culture had remained static for a period up to 3500 or 4000 years. As Kroeber emphasized, duration of a culture "immutable in all its fundamentals" through a span of time long enough to see the Roman Empire built several times over is in itself "a fact of significance in the history of civilization."[15]

Although it might be meaningful, such a conclusion was essentially negative. Local archeology seemed to promise so little of positive value that the resources of the department were diverted to rescue ethnographic information from the survivors of the last aboriginal generation of California Indian groups. Archeology in Central California was shelved for twenty years, except for a foray to salvage remains from the famous Emeryville Site when it was levelled to the ground.[16] The effort was made to preserve existing data, however. Surface collections in the southern San Joaquin Valley were published[17] and the extensive personal collection of Elmer J. Dawson from the neighborhood of Stockton and the Sacramento River delta was also described and illustrated by him and Schenck.[18] These were projects requiring little manpower and financial commitment. The establishment of other institutions with interest in California areas relieved the University of sole responsibility for archeological research in California, but departmental expeditions for survey and excavation opened new horizons in the Columbia River valley and the Santa Barbara area.[19]

The rebirth of Central California archeology dates from 1934. W.R. Wedel found that industrialization of the bay shores had effaced all but a few of the hundreds of mounds once known. After a brief period of digging in the bay region (chiefly at Ala-328) he shifted to work in the Sacramento Valley. The Sacramento Junior College had set up an organized plan of field work in the rapidly vanishing mounds of the valley and, under the enthusiastic direction of its president, the late J.B. Lillard, conducted excavations at more than twenty sites, also establishing a systematic archeological survey of the area before dissolution of its Anthropology Department in 1940. The Lillard collection was later obtained by the University of California, where it adds much to the excellent materials from more than fifteen sites dug by the University's own field parties.

A new idea in California archeology had been introduced in the Santa Barbara area, where Olson's excavations showed a non-evolutionary culture sequence partly corresponding to culture periods first seen by D.B. Rogers.[20] Culture sequence was soon recognized also in the Sacramento Valley by Lillard and his colleague, Purves. Their first interpretative venture,[21] reviewed optimistically by Kroeber[22] in the perspective of the total California picture, was soon superseded. Fuller data were available and new techniques of analysis were used, which emphasized the co-occurrence of objects in burial associations and relied on carefully worked-out typologies. They revealed the presence of three successive time periods: Early, Transitional, and Late; the last period was separated into two prehistoric and one fully historic phase.[23] This culture sequence was not viewed in terms of evolutionary development, but in terms of culture history and culture process. Heizer and Fenenga suggested relationships with the Santa Barbara area on the one hand and with the San Francisco Bay area on the other.[24]

Two ends were served by excavations made by University of California field parties in Marin County coast sites in 1940 and 1941. Historically significant information was gained from finds of Chinese porcelain and antique iron spikes scattered through the archeological sites.[25] It was possible as well to extend knowledge of culture horizons to a new area of Central California.

Chapter II

Classification of Culture and Artifacts

1. On Culture Classification of Central California Archeology

The present conception of cultural sequence in Central California archeology is shown schematically in Table 1. This table represents agreements reached between R.F. Heizer, F. Fenenga, and the present author on problems of culture classification, and has benefited from the advice of members of the faculty of the Department of Anthropology.

For some time, the terminology developed by Heizer and Fenenga for the Sacramento Valley area met the needs of workers in Central California. It was a simple sequence of Early, Transitional, and Late; Late was further broken down into Phases 1 and 2, and the historical termination of aboriginal culture was sometimes segregated for chronological purposes as Late, Phase 3. As new areas were brought into the picture, presenting divergent trait complexes within the same time level, it became increasingly apparent that elaboration of this terminology or substitution of a new system was needed, lest we end up using the same terms for quite different things in separate areas. The search for a

common archeological language led us to examine culture classifications in use in other parts of the country to see which, if any, could best be applied to California data. A somewhat hybrid product has resulted, since we have both borrowed and invented to suit our own problems. We are agreed that this is neither the final classification nor the only one possible even now. It should be profitable to devise classifications of several sorts, each stressing one or another of the three significant factors, time, space, and culture content. We have not yet been able to be equally solicitous of all three factors in a single scheme.

The framework of the present table resembles the time and space coordinates of the Pecos Conference system used in the Southwest. As in the Pecos System, temporal sequence and regional differentiation are clearly outlined, but are somewhat overrigidly expressed. To gain some freedom in manipulating the cultural units, we have borrowed concepts of cultural relationships developed by workers in areas east of the Mississippi. Thus the flavor of both the Midwestern taxonomic system and the Pecos Conference system may be detected, although neither can be applied satisfactorily to California archeology without modification.

We use the term "component" in the sense in which it is applied under the Midwestern system, to designate an archeological record of human occupancy at a single locality at a specific time.[26] Although the components discussed in this paper are entire settlements or communities, a component need not necessarily be so. Moreover, a culturally stratified site such as the majority discussed here contains two or more components. The implication is that two or more settlements were formed at the single locality in successive times. A component is the actual assemblage of traits which is the basis for culture classification. In practice, the analysis necessary to sort out the respective traits of two or more superimposed components injects an element of conjecture between recognition of the actual traits and identification of the components (see Chapters III, V) so that a "component" may be less obviously factual than this statement implies. Cultural content, as expressed in a series of components, is the guide to grouping them in units, whether large or small. The components of a multi-settlement site are denoted by letters (A, B, and so on) suffixed to the site name in order of increasing age. In stratigraphic terms, the surficial component is A Component. Slight intrusive material (a burial or two) is not so segregated, but marked where necessary as A', B', and so on.

A "facies" is a group of intimately related components. In concept, the "facies" is not different from the "focus," which has been made familiar by its use in the Midwestern taxonomic system. It has seemed to us inadvisable to borrow a single term from a well established system when other basic concepts of the system have not been preserved. The term "facies" has been used to prevent mistaken implications or comparisons with other features of the Midwestern system, but its place could be taken by the term "focus," insofar as meaning is concerned.

Several facies are grouped on the basis of cultural resemblance to form the next larger unit, the "province." Because each province

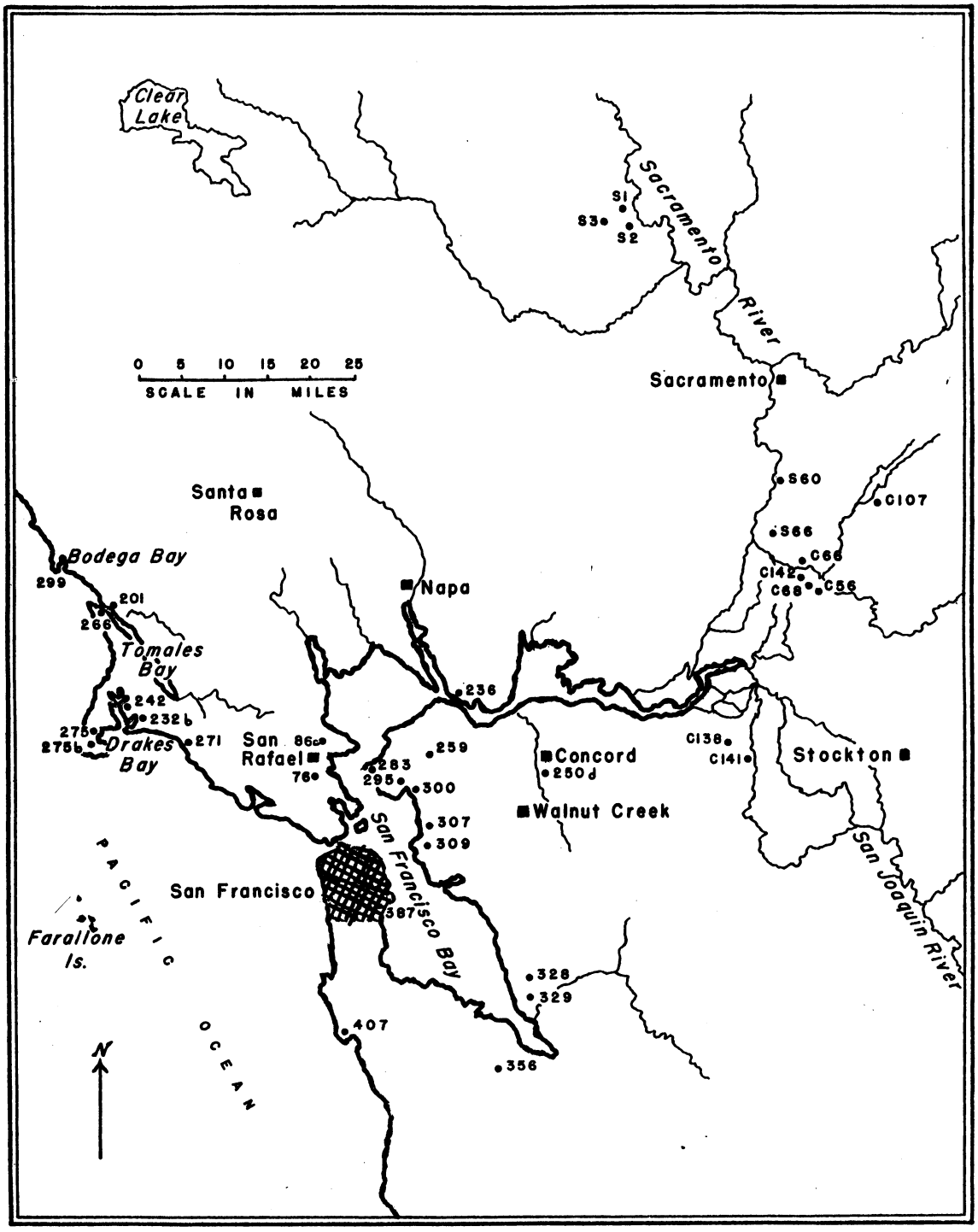
occupies separate territory, the term is not divorced from its normal geographic meaning, but it is given cultural significance as well. Each province is represented by a coherent complex of traits which is localized in time as well as in space. The provinces of each successive time period are separately named in recognition of the fact that the provincial culture boundaries change from one period to the next.

The time periods are called "horizons," because they are definable in terms of culture content, like the smaller units, and are cultural entities, not simply chronological or geographical divisions. Their sequential stratigraphic relationship to each other, independent of culture content, happens to give the a proven time value as well, which is recognized in the names applied to them: Early, Middle (in place of Transitional), and Late. It will probably be possible in the future to distinguish phases of culture change in each Horizon comparable to the division in the present table of Late Horizon into Phase 1 and Phase 2.

The temporal relationship between horizons is only in terms of sequence: Early is followed by Middle Horizon and Middle by Late Horizon. Neither the names applied nor the space allotted to each on Table 1 is intended to convey implications of age in terms of years or of relative duration. This caution is made necessary by the example of the Pecos Conference system used in the Southwest, where exact dating through dendrochronology sometimes works at cross purposes with the classification labels, showing that culture changes were not simultaneous in each area. The same difficulty is to be anticipated when more is known of absolute chronology in Central California. There is already some indication, for example, that the commencement of Phase 2 of Late Horizon may differ by as much as two hundred years in the separate provinces. The horizontal coordinates in this case are clearly not chronological constants.

The divisions in Table 1 termed Littoral Zone and Interior Valley Zone are not categories based on cultural resemblance, and thus stand in contrast to facies, provinces, and horizons. The two zones denote, instead, cultural differences that consistently separate the salt water manifestations of culture in all periods from contemporary manifestations in the Great Valley of the interior. Dissimilar environments working on basically uniform traditions are the factors responsible for much, but not all, of this divergence. The zones as defined are satisfactory divisions only if they are not regarded as being very rigid. For example, it may prove advantageous to recognize an additional Late Horizon facies located geographically between the Littoral Zone and the Interior Valley Zone (i.e., placed between the double vertical lines on Table 1). This facies could not be placed in either zone, because its components would exhibit a complex of traits borrowed from either direction to constitute a hybrid culture. The present uncertainty as to how firm a complex is created by this trait mixture has not justified the segregation of the components, which are now divided between Delta and Alameda Provinces.

In the paper which follows, scrutiny is focussed on the cultural features which permit such a classification as this to be set up. The discussion is necessarily atomistic, rather than narrative, examining



Map I. Archeological Sites in Central California

Site Concordance

The system of site designations current when Beardsley wrote this report consisted of 4 number series with a letter prefix. The C- series was begun by Schenck and Dawson (1929) in the northern San Joaquin Valley and was continued by the University in the adjacent areas. The N- series represents sites recorded by Nelson (1909) around San Francisco Bay. The PB- series were recorded by Peters and Bryant. The S- series represents sites recorded by Sacramento Junior College in the Sacramento Valley.

In 1948 a system of site designations by county abbreviation was adopted by the UCAS. A concordance of the names and site numbers used by Beardsley with the new site designations is given below.

Beardsley Table 1 *	UCAS No.	Beardsley Table 1 *	UCAS No.
Bayshore A,B	SFr-7	Mendoza	Mrn-275
Blossom	SJo-68	Miller A,B	Col-1
Brazil A,B	Sac-43	Monument	CCo-137
Calquhoun	Sac-113	Morse	Sac-66
Cauley A,B	Mrn-242	Mosher	Sac-56
Deterding	Sac-99	Need	Sac-151
Ellis Landing	CCo-295	Newark #1 A,B	Ala-328
Emeryville A,B	Ala-309	Nicolaus #4	Sac-86
Estero A,B	Mrn-232	Nicolaus #5	Sac-83
Fernandez A,B	Cco-259	Orwood #2 A,B	CCo-141
Goethe	Sac-121	Phelps	SJo-56
Glen Cove	Sol-236	Ponce A,B	SCl-1
Greenbrae A,B	Mrn-76	Potrero	CCo-283
Hicks A,B	Sac-60	Princeton	SMa-22
Hotchkiss A,B	Cco-138	Sandhill	Col-3
Hollister	Sac-21	San Rafael	Mrn-315
Howells Point	Col-2	Stege	Cco-300
Johnson	Sac-6	Tom's Point	Mrn-201
Koontz	SJo-59	Van Lobensels	Sac-73
Maltby	Cco-250	Wamser	Sac-157
McClure A,B	Mrn-266	West Berkeley	Ala-307
McGillivray A,B	SJo-142	Windmiller	Sac-107

---

* The terminal capital letters which appear in Table 1 denote multiple component sites.

Site Concordance (Continued)

Beardsley Table 2	UCAS No.	Site Name
C 56	SJo-56	Phelps
C 66	Sac-66	Morse (Glenn)
C 68	SJo-68	Blossom
C 107	Sac-107	Windmiller
C 138	CCo-138	Hotchkiss
C 141	CCo-141	Orwood #2
C 142	SJo-142	McGillivray #1
C150	CCo-150	Veale Tract
PB 201	Mrn-201	Tom's Point
PB 232b	Mrn-232	Estero
PB 235a	Mrn-301	Hall
PB 242	Mrn-242	Cauley
PB 266	Mrn-266	McClure
PB 271	Mrn-271	Bear Valley
PB 275	Mrn-275	Mendoza 1
N 76	Mrn-76	Greenbrae
N 86c	Mrn 315	San Rafael
N 250a	CCo-250	Maltby
N 259	CCo-259	Fernandez
N 283	CCo-283	Potrero
N 295	CCo-295	Ellis Landing
N 300	CCo-300	Stege
N 307	Ala-307	West Berkeley
N 309	Ala-309	Emeryville
N 326	Ala-326	
N 328	Ala-328	Newark (Patterson)
N 356	SCl-1	Ponce (Castro)
N 387	SFr-7	Bayshore
N 407	SMa-22	Princeton
S 1	Col-1	Miller
S 2	Col-2	Howell's Point
S 3	Col-3	Sandhill
S 60	Sac-60	Hicks #1
S 66	Sac-21	Hollister
S 99	Sac-99	Deterding

Published Errata

Fernandez Site (CCo-259) has been referred to incorrectly as site 260 in Lillard, Heizer, and Fenenga, 1939, Maps 3 and 4, and in Beardsley, 1948, Fig. 1. Site 85c in Beardsley, 1948, Fig. 1, should be Site 86c (Mrn-315). The Ponce Site (SCl-1) has been referred to incorrectly as SCl-356 in Bennyhoff, 1950, Map 1, and in Greengo, 1951, Fig. 1A.

traits and trait complexes for significant differences. Only in the summaries has a consciously narrative approach been adopted, to picture what is known of the development of native culture in Central California. A diagrammatic synopsis of culture development, oriented on the better known cultures of the Interior Valley Zone has been prepared.[28]

2. Statement of Typology

The essence of classification is generalization. It is evident that classification may be viewed from many different theoretical standpoints. I incline to the principle enunciated by Drucker, "the ultimate test of any classification of cultural material, of course, is whether or not it is meaningful."[29] One may ask what sort of meaning is required of a classification. Krieger's answer is that a true type must have "demonstrable historical meaning in terms of behavior patterns."[30] Where material objects are concerned, a successful (i.e., meaningful) generalization for historical purposes may be rather barren to the person interested in esthetic or functional problems. No typology can be expected to serve all theoretical and practical requirements perfectly.

Because the main objective of this study has been historical, historically significant features have been sought and, when found, brought to the forefront. This was a relatively simple task for projectile points, for example, because the stemmed-unstemmed division which is a feature common to many point typologies does have historical meaning in this material. In the charm-stone typology, however, only secondary ranking is given to the a and b modes of each shape, although more historical value is discernible in the opposition of a mode to b mode of finish than in the specific shapes.

Those typologies which are arranged taxonomically, i.e., in groups implying genetic relationships, are the ones which rest on the least complete evidence and are, perhaps, the most subject to future modification. They suffer, moreover, from the defect of less readily comprehensible terminology. To make for easier reading, I have used shape names for charmstones in the place of a complicated letter-number terminology. On the same reasoning, I have selected a name to describe the presumable use or function of each type of bone tool or implement; however inept the names may be, they should be easier to understand than a complex of index symbols.

Shell bead and shell ornament typologies were adopted almost without modification from a previous paper.[31] All other typologies were initially constructed to describe archeological material from the Marin County coast. They were later elaborated as required to include material from the San Francisco Bay area.

The following comments very cursorily characterize the artifact types which are pictured in Figures 2 to 7. Fuller description of specimens, detailing size, weight, materials, and variations, is given in Appendix A.

Projectile points (Figure 2) Made almost exclusively from obsidian, with rare examples of chert, chalcedony, and slate. No knife form is distinguished.

Non-stemmed.

N1	Large blade; rare
N2	Lanceolate-shaped point; common
N3	Ogive-based point; fairly common
N4a	Ovate point; rather rare
N4b	Slug; small, heavy, and percussion flaked; rare at most sites
N5	Single shouldered knife; common

Stemmed.

S1a	Small, long-proportioned, frequently serrated; abundant
S1b	Small, short-proportioned, frequently serrated; abundant
S2	Large point, expanding stem; not always obsidian; rare
S3	Large point, contracting stem; rare

Miscellaneous (unique or rare specimens)

1	Straight based point
2	Lozenge-shaped point
3	Side-notched chert point
4	Non-stemmed point, but like S1a, with square serrations
5	Eccentric obsidians in crescentic and other shapes
6	Chalcedony point with fine serration
7	Obsidian saw, percussion flaked
8	Obsidian prisms, angular and reworked, large and small; also called "tinklers"

Mortar types (Figure 3) Four principal types are distinguished on the basis of size, style, and quality of workmanship. Subdivisions recognize significant variations.

A1a	Completely dressed stone, large, flat bottomed, straight sided, with square rim and flattish or rounded bowl
A1b	Like A1a, but with flaring sides and beveled rim
A2a	Like A1a, but with curved sides and flat rim
A2b	Like A1a, but with rounded sides and bottom and sharp rim
B1	Stream boulder or rough block; bowl has circular mouth as seen from above.
B2	Like B1, but bowl has ovoid mouth as seen from above
C	Miniature or "paint" mortar
D1	Hopper mortar with shallow bowl pecked in face of flat slab
D2	Like D1, but bowl pecked in spheroid boulder

Bedrock mortars are not listed, but occur in Marin County and San Francisco Bay area. Types D1 and D2 are not known in the Marin coast area, and type B2 is quite rare.

Pestle types (Figure 4)

1A	Large cobble pestle, unshaped
1B	Small cobble pestle, unshaped
IIA1	Cylindrical, elongate pestle with flattened working ends
IIA2	Cylindrical, thick pestle with quite flattened working ends. Variant: small, cylindrical pestle with conoid ends (one specimen)
IIB1a	Long, tapering pestle with rounded working end.
IIB1b	Short, tapering pestle with rounded working ends
IIB2	Bulb-ended pestle
IIB3	Convex-sided pestle with blunt-pointed working end
IIB4	Tapering pestle with flanged handle and flattened working end
III	Pitted hammerstone or "acorn anvil"

Charmstone types (Figure 5) Classified primarily by form, secondarily by quality of workmanship, viz., mode a is roughly made, often not balanced or symmetrical, whereas mode b is carefully designed, symmetrically turned and smoothly finished. Perforations are not given typological value. In discussion in the body of this paper, the type names are used instead of the more cumbersome numeral-letter system.

IA	Plummet charmstone
IB1a	Piled plummet, mode a
IB1b	Piled plummet, mode b
IB2a	Knob-piled plummet, mode a (one specimen)
IB2b	Knob-piled plummet, mode b (one specimen)
IIA1	Asymmetric spindle, mode a
IIA2	Asymmetric spindle, mode b
IIB1	Symmetric spindle, mode a. Variant: encircling groove at each end (one specimen)
IIB2	Symmetric spindle, mode b
IIC	"Fishtail" with one end flattened into wedge shape
IIIa	Subcylindrical, variable type, dominantly composed of scarcely worked, elongate pebbles, generally perforated
IIIb	Small, subcylindrical or oblate pebbles, scarcely worked, but perforated
IV	Grooved charmstones, variable in shape; all shapes illustrated
V	Phallic charmstones, double-ended or single-ended; (five specimens)
VI	Pendular charmstones, tapers to small end, like miniature pestle.

Shell bead types (Figure 6) A concordance to a separate typology for all California shell artifacts is given in Appendix A, in addition to more complete description. In discussion in the body of this paper, the numeral-letter system is used for reference to Olivella and Haliotis

beads instead of the catch-names which are also listed below.

Clam shell bead types

1. Disc.
2. Tubular.
3. Ovoid.

Haliotis shell bead types

1a. Small rectangular bead.
2. Large rectangular bead.
3. Circular bead.
4. Sub-rectangular bead.

Olivella shell bead types

1a. Small, spire-lopped, whole shell bead
1b. Large, spire-lopped, whole shell bead
1c. Small, diagonally spire-lopped, whole shell bead (not illustrated
1d. Side perforated, whole shell bead
2a. Rectangular bead
2b. Large rectangular bead (not illustrated)
3a1. Lipped saucer bead
3a2. Half shell bead
3a3. Sub-rectangular half shell bead (not illustrated)
3b. Saddle-shaped bead
3b1. Large, saddle-shaped bead
3b2. Sub-rectangular bead
3c. Saucer-shaped bead
3d. Small, saucer-shaped bead
3e. Thick, saucer-shaped bead

Haliotis shell ornament types.

All Marin County coast and San Francisco Bay area types are illustrated. The first symbol of the classification refers to shape, the second to number and position of perforations, and the third to type of ornamentation. A key to the classification is given in Appendix A.

Chapter III

Archeology of the Marin County Ocean Coast

1. Physiography and Climate

Archeological work by the University of California field parties on the coast of Marin County has been concentrated in the Point Reyes triangle, which lies about fifty miles northwest of San Francisco's Golden Gate. The southern base of the triangle juts out west from the general trend of coast line, lifting high cliffs to shelter Drake's Bay and ending in the headland of Point Reyes. The western side faces the open ocean. It begins in high cliffs at Point Reyes, drops to a straight beach backed with sand dunes and rises again to sheer cliffs before reaching Tomales Point at the northern apex. The third and eastern side is bordered by Tomales Bay, a shallow inlet twelve miles long which all but cuts the triangle off from the mainland.

The Point Reyes triangle is a unit geologically and zoologically to some degree distinct from the rest of the Central California coast.[32] Slight depression of Olema Valley, the southern part of the long fault graben which created Tomales Bay, would make the area an offshore island. The San Andreas rift running along the eastern shore of Tomales Bay is the modern expression of an important geological disconformity which today is obscured by recent silts that fill the long trough.[33]

The eastern shore of Tomales Bay, which is part of the general Coast Range structure north of San Francisco, is formed by metamorphosed sedimentary rocks of the Franciscan series from the Lower Miocene, except for a residual cap of Merced sandstones in the north. Interglacial formations at the water's edge of the Bay attest some antiquity for the graben separating the triangle from the mainland. In them are found fossil pine cones of species (P. radiata and P. muricata) now growing only on the triangle and absent from the mainland north of San Mateo. No Franciscan rocks are known on the Point Reyes triangle.

Three principal geological formations are noted on the Point Reyes triangle. One is a coarse, soft biotite granite, broken by long periods of disturbance. It forms the steep ridges on the western shore of Tomales Bay, dips toward the west, is for the most part overlain by Miocene sandstones, and reemerges only at the tip of Point Reyes. Both at Point Reyes and along Tomales Ridge, the granite's ocean face is marked by high, surf-beaten cliffs. The Miocene sandstones and shale of the second principal formation are poorly consolidated and fast eroding. They form the bedrock between triangle and mainland in the south. The third formation which fringes the low, featureless, western shore a mile or more in depth is shifting sand dunes of Recent origin.

Physiographic and biotic zones of the triangle are significantly different from those of the mainland. Whereas the Franciscan hills of the mainland are deeply cut by stream valleys, the granite ridge of the

western shore of Tomales Bay jumps steeply to heights of eight hundred or a thousand feet. Seasonal streams cut its flank into a washboard of shallow canyons which are expressed at the water's edge in a regular alternation of high cliffs and tiny coves. Alluvial fans sufficiently flat to invite habitation fill the larger coves in the northern half of the bay. The steep stream course behind each cove is thickly overgrown with chaparral. On the southern end of the ridge this vegetation is replaced by groves of redwood, Douglas fir, laurel and alder, etc. Tree growth ends abruptly at the ridge crest, beyond which sea winds and fog limit the vegetation, except for an isolated stand of Bishop pine (P. muricata) forming a northward tongue of woods along the ridge crest.

Rolling hills of sandstone and shale west of the ridge slope like a saucer rim down toward Drake's Bay. Their center is a series of drowned stream valleys which constitute the branching arms of Drake's Estero and Limantour Estero. Short grass is the typical cover of the undulating hills, except along the bottoms of permanent streams or on sheltered slopes, where stands of willow and mulberry or thickets of chaparral, poison oak, and bush lupine grow. The marshy bottoms of the head of each estero arm support plants useful to natives such as tule, wild iris, etc. Useful trees, however, such as oak, pine, redwood, and fir, are confined east of Tomales Ridge, and reach the ocean only in deep canyons that slice through rugged hills south of the triangle. Vegetation of the sand dune tract is almost limited to salt grass, clumps of bush lupine, and patches of wild strawberry, except where the march of dunes has dammed westward drainage and formed extensive tule marshes as a secondary fringe back from the ocean.

The unusual variety of landscape and cover within the confines of the Point Reyes triangle, though not conducive to a large population, would seem to offer in its resources year-round support for aboriginal life. The principal items of diet must have been the fish and shell fish of the shallow waters and mudflats of bay and estuary. The grass-grown hills around Drake's Bay, besides providing grass seeds and edible roots, supported sizeable herds of deer and other ruminants up to late years. Aquatic and littoral birds are abundant in the bays and small mammals and rodents abound in all parts, although they are reported to suffer cyclical fluctuations. Oak groves, however, are notably lacking or distant from most settlement areas in the triangle;[34] the resulting scarcity of acorns, which were the staple food of the natives of the interior, helps make economic patterns of Indians living near the coast different from those of the interior. No live timber is close at hand, but driftwood, which today is piled high along parts of the Drake's Bay beach, must have been available even in pre-sawmill days.

Communication with the interior is open by way of several stream valleys, of which the Lagunitas-San Geronimo gorge, turning southeast from Tomales Bay, is most important. Somewhat to the south, Olema Valley offers an easy path to Bolinas Lagoon. Farther west, communication along the shore of Drake's Bay is virtually always open, since only very narrow channels separate the expanses of mudflats in the Estero at low tide. The mean tidal variation for this latitude on the open coast is 5.8 feet. To the north, boat traffic is required for access to the triangle across

mile-wide Tomales Bay, but from the east shore northward, Bodega Bay is accessible across sand dunes and shallow estuaries.

The climate of the coast falls into the Csb (cool Mediterranean) group of the Köppen system by reason of moderate temperatures, marked winter rainfall and a cool summer.[35] Freezing temperatures rarely occur in winter, and the maritime character of the climate is reflected in relatively even temperatures throughout the year. The projection of Point Reyes into the ocean some seven miles beyond the general trend of coast line, however, augments the cooling effect of the summer fogs that are common to all the coast, and subjects the triangle to fuller force of both the prevailing northwest winds and the storm winds from the southwest.

Point Reyes is the foggiest weather station on the California coast. During the summer it averages twenty-six foggy days each month.[36] It is also exceedingly windy; velocities up to fifty miles per hour are not uncommon. Because of the daily fog blanket blown inland by the northwest winds, summer temperature rises only 7.02° from the lowest winter monthly mean, 49.46° F., to the September high mean of 56.48° F. A summertime offshore well of cold sea water gives rise to the fog, and contributes directly to this reduced temperature, which is 21.42° F., lower than expectable for the latitude and ranges 30° to 40° lower than summer temperature in the Sacramento Valley only fifty miles to the east. Where wind, low temperature, and the high humidity of 88% to 91% are felt, the summer climate seems much colder and damper than the mesothermal rating of the Köppen climate classification would indicate. Winter rainfall, though moderate (twenty-four to twenty-seven inches annual mean), comes in heavy downpours which turn the area into a muddy wilderness impassable for vehicles and discouraging to travel afoot.

Despite the general fogginess, variations in terrain produce marked local differences. An elevation 518 meters high suffices to stop passage of fog completely, and a height only of 150 meters is a strong deterrent to its eastward course.[37] Sheltered locations on the south or east sides of higher hills in the triangle may thus be sunny through much of a summer day, even while fog blankets all the surrounding countryside. The same locations are relatively sheltered from winter winds sweeping down unobstructed from the Aleutian storm center. As would be expected, they often harbor midden deposits marking Indian settlements. The importance to livability that a few added feet of hill height can make can be seen if one reads between the lines of pleased commentary by settlers who approached the area from the sunny interior after 1850, and contrasts their emotional response with the complaints voiced by explorers of earlier times who arrived from the fog-bound sea.[38]

Native population densities undoubtedly varied considerably from point to point though no point was without some habitation. Kroeber, speaking of Marin County as a whole, says for the ethnographic period, "much of the district must have been unusually favorable to native occupation. Settlements clustered mostly about estuaries or their vicinity. Bodega Bay was surrounded by several. Others stretched along the sunny side of Tomales Bay. Point Reyes seems to have been uninhabited."[39]

Although archeological survey shows this last statement not to have been true throughout native history, it is certain that almost any settlement in the triangle balanced attractions with disadvantages. Though most of the population clung to the shore, heights were not ignored. From the native viewpoint there were virtually no uninhabitable areas.

2. Historical Background

Colonization of the Drake's Bay-Tomales Bay area was late. Settlements established by the Spanish at San Francisco (1776) and inland at San Rafael (1817) and by the Russians north of Bodega Bay (Fort Ross, 1812) were a good many years old before much attention was paid to settling the ocean coast of Marin County.[40] But the region from the earliest days of Spanish exploration north of Mexico had a surprising number of incidental visitors by sea.

Juan Rodriguez Cabrillo, on a voyage of exploration, anchored on November 13, 1542, in a "large inlet, which came from a turn in the shore, which appeared to have a port and a river";[41] this he called Bahia de los Pinos because it was "all covered with pines to the sea."[42] Sir Francis Drake, anticipating a long voyage across the Pacific in the Golden Hinde with his loot from the Spanish in the South, spent five weeks careening his vessel in a bay of this vicinity from June to July, 1579.[43] While his anchorage is very much in dispute, Kroeber and subsequently Heizer have concluded from the long account describing Drake's strange reception by the natives that he was almost certainly in territory of the Coast Miwok Indians, a territory which includes the Point Reyes triangle.[44] Sixteen years later, the San Agustin, piloted by Sebastian Rodriguez Cermeno and bound from Manila to San Blas with exploration of the coast as an incidental project, was wrecked in Drake's Bay, November, 1595.[45] Although the ship was almost a total loss, the crew arrived in Mexico after an arduous voyage in an enlarged longboat. Vizcaino was next to see the port. He anchored behind Point Reyes on January 7, 1603, seeking the wreck of Cermeno's ship.[46] Vizcaino stayed only overnight at this anchorage, which he called the Puerta de San Francisco.

There follows a gap of a hundred and seventy-two years during which the Spanish in Mexico were engrossed in their frontiers in Texas and Lower California and sent no expeditions north as far as Point Reyes. But finally fear of Russian and Brittish encroachments on lands northward along the Pacific coast stimulated Bucareli, viceroy of Mexico, to send new expeditions of exploration and colonization. An overland party stumbled on San Francisco Bay in 1769, a year before the Ayala expedition entered the bay aboard the San Carlos. Canizares, first pilot of the latter expedition, was received in friendly fashion by Indians on the bay shore of Marin County, and got "pinole and tomales" in exchange for gifts of beads and trinkets.[47] In 1775 the Bodega y Cuadra exploration expedition, coasting southward, discovered and charted Bodega Bay,[48] while looking for the river of Martin Aguilar reported in the vicinity. Some notes on the Indians of Tomales Bay are included in the pilot's journal.

The "busy" period of the Bodega-Tomales Bay area began fifteen years later, when James Colnett, commissioned in the British Royal Navy, anchored in Bodega Bay aboard the Argonaut on September 11, 1790. Some notes and sketches concerning the Indians are included in his journal.[49] In 1793 the Spanish at San Francisco were instructed to cooperate in a combined land-sea operation, sending an exploring party overland to Bodega Bay to make contact with Juan Bautista Matute who was to be set ashore from the Sutil, which was coasting south from Nootka. Lt. Felipe Goycoechea was dispatched across the bay to go up the coast on August 5, and returned nine days later after making contact under difficulties.[50] Misdirected by the Indians, he had taken the west shore of Tomales Bay, a blind alley from his viewpoint, since he had to retrace his steps and go up the east shore to arrive by land at Bodega Bay. This accident gives us our first account of the Tomales Ridge area which he describes as containing "a wonderment of various settlements." Goycoechea went down to the shore to meet Matute near the opening of the bay, probably at our McClure Site (P-B #266) (which is directly across from Tom's Point at the narrowest neck of the bay), and exchanged dispatches with Matute after the latter had been ferried across in a tule balsa. Then Goycoechea returned southward by a circuitous route west of the ridge, noting many deer on the open grassland; he turned the head of the bay, and continued to Bodega, where the natives mentioned two ships (Colnett?) that had earlier left them some pigs and chickens.

Less than a month after Goycoechea's return to the San Francisco peninsula, the Mexicana spent a week surveying the ensenada which we now know as Tomales Bay. Second pilot Don Juan Martinez y Zayas' account adds several items to the ethnographic notes of his predecessors.[51] Then, dispatched from the Vancouver expedition for the purpose, Lt. Peter Puget reconnoitered Bodega Bay in the brig Chatham, with the naturalist-historian, Archibald Menzies, aboard. Arriving October 20, 1793, and spendint the next several days, Menzies left observations not only on the Bodega environs but also on the natives of the west side of Tomales Bay, where he visited.[52] Finally, a few words are to be found in Broughton's account although his stay was only for a few hours.[53]

It might be profitable to pause and take account of the native life reflected in the cursory notes of these pre-nineteenth century accounts. They offer a few items to supplement previously published information[54] on the now virtually extinct Coast Miwok Indians. Fuller and more accurate data await publication.[55] The summary presented in the following paragraphs, which is intended as an interim account rather than as an ethnographic sketch, is drawn only from the accounts already mentioned. Sources for each item are noted within parentheses after the item. The following abbreviations are used: Drake (Dr), Cermeno (Cer), Mourelle (Mou), Colnett (Col), Goycoechea (Goy), Martinez y Zayas (Mar), Menzies (Men), and Broughton (Bro). Their wording in description of objects unfamiliar to them has been changed, or identity with ethnographic items assumed, for the sake of brevity.

Villages and housing: Villages were at or near beach (Cer, Goy, Dr?); some have more than 30 (Men) or more than 50 (Cer) adult inhabitants; "scattered houses" (Mar). Two house types are noted, an earth-covered, semi-subterranean house (Dr, Cer) with central firepit (Dr); and grass or

tule-thatched huts (Cer, Goy, Mar). Inland at Olema Valley, village population of 150 to 200 is mentioned (Goy).

Economy: Foodstuffs remarked on include fish and shellfish (Dr, Col, Goy, Mar); seeds (Dr, Cer "like sesame," Col, Mou "like walnuts"); deer (Dr, Cer, Col); acorn (Cer); small rodent (?) (Dr "coneys"); a root (Dr "petah"). Mush (Goy, Mar, "pinole"); bread (Dr "cheepe," Mar "tomales"); and an herb (Dr "tabah") are also mentioned in connection with foods. Weapons for hunting, etc., are the bow and stone-tipped arrow (Dr, Cer, Col, Men) with quiver of deerskin (Dr, Men). Other weapons denied (Cer, Col). On the water, nets (Col "seines," Goy, Mar "they cast their nets") were used; a "canow" (Dr) is elsewhere specified to be a double-ended tule balsa (Cer, Mou, Col, Goy, Mar) propelled by double-bladed paddle with pointed blades (Cer, Col). Baskets (Dr, Mou, Col, Men) are described in use for gathering grass seeds (Col) and as being of watertight weave (Dr) or ornamented with feathers, shell beads, etc. (Dr).

Clothing: (some items only for ceremonial or eventful occasions?) Most men are semi-naked (Cer, Men, Bro), but deerskin garments are noted (Col). Women are most often noted wearing an apron of grass or tule (Dr, Cer) or of fringed deerhide (Cer, Mar, Men); capes of woven small skins were seen on women (Dr, Men) and on a chief (Dr).

Except for body painting (Dr, Cer, Men "tattoed in a streak"), ornament may be scarce (Men) or may appear most plentifully on special occasions when it includes especially shell disc beads and perhaps other kinds in strings (Dr "bone," Mou "bone," Goy "bones of abalorios"((abalone?)), Col "rock"). Beads are worn both as necklaces (Dr, Col) and bracelets (Col). Manifold uses of feathers are noted; as plumes (Dr, Mou) or full headdresses (Dr, Mou, Col "hawke" feathers), woven into body garments (Mou, Mar "jacket of birdskins"), and on ornate ceremonial staffs denoting a chief's talker (Dr, Cer).[56] Ceremonial black feather bundles were presented (Dr, Mou, Col) when the visitors arrived or departed.

Social and ceremonial behavior: Chieftain status is imputed (Dr, Mou) from dress and actions; the chief is accompanied by a messenger (Dr, Mou) who orates at length according to whispered instruction (Dr, Cer, Mou). The ceremonial staff, when noted, is carried by this messenger chief's talker. Details of frenetic behavior suggest manifestation of a mourning ceremony (Dr), which may include a circular dance (Cer) although the latter was interpreted by the Spanish as a war dance.[57] Mostly characterized as "unwarlike" or "peaceable" (Dr. Goy, Mar, Men), the natives are nonetheless specified by the one visitor who was accompanied by interpreters to "preserve little harmony among themselves" (Goy).

Population: white contacts and trade: Conspicuous lack of agreement in the various explorers' estimates of Indian population no doubt is partly attributable to differences in background or motivation of the visitors. Would-be colonizers speak of "very many" (Dr, Goy, Mou), while others indicate fairly thin population (Col, Mar). Colnett in 1790 saw no evidence of European objects or implements any more than did Cermeno in 1595. Menzies, however, mentions horse and cattle dung (at Bodega?); Goycoechea mentions the natives' claim that pigs and chickens had been

Indian settlement was maintained consistently into the 1850's in the refuge area constituted by the Point Reyes triangle. The region was difficult to reach from Spanish settlements and seldom visited, to judge from its consistent use as a base by sea-otter hunters, who were illegally poaching in Spanish preserves. Perhaps testimony of aboriginal survival in the 1850-1860 period indicates return by Indians to their homes after the break-up of Mission San Rafael in 1835, but it is significant to note that the only area in which inhabited rancherias, or villages, are reported after mission days is the Tomales Bay area and west. At Marshall on the bay's eastern shore, occupation by Indians is noted, and they are reported to have returned to the spot after 1860 to cremate the dead and to hold mourning ceremonies.[63]

Tom's Point, at the mouth of the bay, takes its name from Thomas Wood, a one time sailor, who lived there with "his Indian wife and her relatives" at least through 1854.[64] The archeological site at Tom's Point (Site 201), discussed below, may be the location of Wood's village, although other sites are known near by. It is in the secluded coves of Tomales Bay, in fact, that beachcomber shacks of various Indians or part-Indians exist to the present day, adding their quota of refuse to the shell mound accumulations on which the shacks are built.

Dairying was the principal occupation of the first American settlers, other than beachcombers and deserters from ships, who went to the Point Reyes triangle.[65] This has been supplemented in the past generation by farms given over to grain raising or to artichoke cultivation, but dairying is still an important part of the economy. The region is still thinly populated and retains back-country characteristics of poor roads, scattered farmhouses, and extensive uncultivated areas. Tourist and fishing resorts and oyster farms cultivating imported Japanese oysters form an intermittent fringe of seashore settlement.

Survey of the historical background thus shows that the Marin County coast was visited at a remarkably early date by both English and Spanish. More than two hundred years intervened between the late sixteenth century explorers' contacts, which give us some knowledge of the Indians, and extended visits in the early nineteenth century by sea-otter hunters, from whom little is known. The proselyters from Spanish missions came almost simultaneously with the sea-otter ships, and, by 1820, had, at the least, turned the coast into a refuge area for Indians unwilling to be converted, and at the most virtually depopulated it together with the rest of Marin County. Survivors, or those who returned when the mission period ended, continued to live in modified aboriginal fashion until after 1855 or 1860, even while permanent white settlers were bringing dairy cattle and agriculture to the area.

Correspondences between ethnographic data from the Coast Miwok and the earliest historical accounts are so close in those items for which comparison is possible as to justify the conclusion that cultural groups did not shift in the intervening two hundred years. As is shown in the following pages, this conclusion is borne out by archeological evidence.

3. Distribution and Character of Sites

Survey

Archeological sites on the Point Reyes triangle of the Marin County coast are known through four surveys. The earliest was made by Nels C. Nelson in 1907. He located consecutively numbered sites from the mouth of the Russian river down the outer coast along Drake's Bay and Estero and along the east shore of Tomales Bay. Between 1911 and 1913 Jessie Peters extended a separate numbering system from Sonoma County south to the Marin County coast. Peters' site numbers were added to in 1927 by Commander Stewart F. Bryant, U.S.N., ret., who located new sites by rowing alongshore in Tomales Bay and Drake's Estero. Finally, the University of California field parties added a few locations in 1940 and 1941. The numbers used in this paper and in original field records are those of the Peters-Bryant surveys. The entire region has been fairly well investigated, with emphasis on the Tomales Bay shoreline. Because of divergent notions as to how much deposit or how many worked stones constitute a site, it is hardly possible to say that the 78 numbers in the area ranging from Site 201 to Site 278 represent as many village locations, but an estimate of 50 temporary or permanent camps probably is safe.

Sites excavated

Four principal excavations[66] on Drake's Bay and Drake's Estero and one near the mouth of Tomales Bay will be described. Additional information is included on the artifacts associated with a small series of burials from Tom's Point Site (201), also near the mouth of Tomales Bay. Minor excavations on nine additional sites were made during the field seasons of 1940 and 1941; they are treated here as secondary sites. Locations are given in longitude and latitude, since township divisions have never been extended to the coast.

Principal sites

Mendoza Site. A tour of principal site locations may be made starting from the westernmost rim of Drake's Bay. Here where the tip of Point Reyes hooks toward the east the most sheltered water of the bay is found. Within a mile of this point, however, the long eastward sweep of the bay shore exposes high cliffs of soft whitish sandstone to storm waves from the southwest. Driftwood is scattered along the sandy beach and intermittent streams cut occasional troughs to the sea. Mendoza Site (275 and 275a, location 38°0'2" North latitude, 122°59'0" West longitude) is a shallow deposit resting on a terrace which flanks either side of the mouth of an intermittent stream. The eroding beach face is about 30 feet above the beach, and deposit spills downslope to the stream bed. Although favored with fresh water and a good clam beach, the site is exposed to wind funneled downstream from the northwest, is often covered with fog,

and is entirely on a slope. Firewood must have come entirely from driftwood on the beach; bush lupines and grass are to-day the sole vegetation of the surrounding slopes. The larger deposit (275 on the left bank) measures about 40 feet from the eroding face by 80 feet up from the stream bed. With the permission of the owner, Mr. J.V. Mendoza, trenches totalling about 1100 cubic feet were dug through the unstratified deposit 36 inches to yellow clay base. (See site transect. Fig. 8). The trenches were parallel to the beach face and were successively dug inland, yielding a total of fourteen burials and twelve cremations. Test pits near the face of the smaller deposit (275a) produced three burials.

Cauley Site. Three miles farther northeast along the bayshore, the high white cliffs are replaced by a sandbar three miles long, behind which lie the shallow waters of Drake's Estero and Limantour Estero. The sandbar is broken by a single shifting entrance which is nearly dry at low tide. Drake's Estero, scarcely a mile at the widest point, extends four miles inland and has three branching arms, all of which reach into the marshy bottoms of drowned stream valleys. Mud flats covering most of the area at low tide are teeming with shell fish and crowded with ducks and shore birds. Small herds of sea lions still find sanctuary in the quiet waters. Limantour Estero stretches east along the sheltering sandbar to end in an extensive marsh two miles from the entrance. There are virtually no dry, flat areas at beach level along the shore of the esteros. Where hillslopes do not dip steeply into the mudflats, cliffs of from ten to fifty feet in height mark the edge of more gentle slopes. Archeological sites are more common on the eastern shores, where the cliff-bordered gentle slopes are most prevalent.

Cauley Site (242) is a shell midden deposit on top of a forty-foot cliff, located just at the base of the eastern arm of Drake's Estero. It is 1.6 miles north of the Estero entrance, at 38°03'20" North latitude and 122°56'20" West longitude. Although much of the deposit has been lost through erosion of the soft sandstone cliff, it covers an area about 90 by 120 feet and is at maximum 76 inches deep. It is somewhat sheltered from the westerly wind by a higher terrace running southeast and east from the shore, although to the north and northeast it faces a wide expanse of water and mudflat. Less than 200 yards up the hill behind the site seepage springs provide water both for Cauley and for a smaller site (242a) two hundred yards northeast along the shore. To-day there is no firewood nearby and access to the beach is difficult. Yet the richness of deposit indicates that Cauley Site was a favored location from the Indian viewpoint.

The site surface is disturbed almost to the cliff face by the 24-inch deep furrows of artichoke rows covering the hillside behind it, by a gullied ditch five feet wide dug to drain a sump at its rear edge, and by a small frame shack built near the ditch on the southern side. With the permission of Mr. L.S. Murphy, owner of the ranch, and Mr. S. Cauley, tenant at the time, about 6500 cubic feet (ca. 31.5% of the total deposit) were excavated during 23 days in 1940 and 1941. North-south trenches worked eastward from the face and were supplemented by test pits elsewhere. A subsurface knoll at the northern edge rises to within 24 inches

of surface, while inland to the east and south the deposit reaches 65 to 76 inches down to a yellow clay base. (See site transect, Fig. 8). Between 30 and 40 inches down from surface a "whole-shell layer" separates a lower compact, relatively sterile soil horizon (Level I) from the upper deposit of loose black dirt and shell (Level II). The "whole-shell layer" is made up of whole or very nearly whole clam shells thickly bedded together in a hard soil matrix. It diminishes from a maximum thickness of about six inches to non-existence forty feet inland. Test pits near the eastern side, however, cut through a continuation or recurrence of the layer apparently extending farther east. The layer may once have been a double cap over two adjacent rises in the original surface, obscured by mingling of subsequent deposit into one mound.

Cultural stratification appears in Cauley Site. Two components are postulated, Cauley A and Cauley B; there are hints that typological segregation may subdivide Cauley A into two phases. Surface disturbance and exuberant rodent activity make it impossible to draw a clear line of cleavage at any given depth. The change seems to occur between 20 and 35 inches depth. Burial data show that the whole-shell layer dividing the soil horizons is part of the lower, or Cauley B, component. This means that the cultural transition takes place above in Level II of the soil horizons. The evidence for this interpretation is presented under discussion of traits below.

Estero Site. Estero Site (232b) also is within an estuarine environment, in a setting very much like that at Cauley Site. It is situated atop a 25-foot cliff on the eastern shore of the largest north-pointing arm of Limantour Estero, nearly at the base of the arm. Its location is 38°00'10" North latitude, 122°54'27" West longitude. Dimensions are 150 feet along-shore (north-south) by 80 feet inland (east-west). Estero Site overlooks the above mentioned sandbar on the south, and lacks shelter from the fog and wind. The eroding cliff face looks out on mudflats where birds are exceedingly numerous. Wood is now available only across these mudflats among the flotsam on the sandbar. Drinking water has to come from trickling shore seepages. The nearest creek is a full mile away. Not only in food and water supply, cliff top location, and rapidly eroding face, but also in stratification of deposit, Estero Site is fundamentally a poorer duplicate of Cauley Site. A whole-shell layer is sandwiched between a relatively loose, black Level II on the surface and a more compact and sterile Level I extending to a yellow clay base at 54 inches maximum depth near the face. This subsurface shell cap over Level I deposit is 18 inches thick at the cliff face and thins out to disappear thirty to thirty-five feet back from the cliff. (See site transects, Fig. 8)

Cultural stratification is present, but more tenuously distinguishable than at Cauley Site, since cultural material was disappointingly poor and scarce. Outline of the deposit and trends of the strata hint that the larger part of the midden has been lost through erosion of the face.[67] The assumption is strengthened by the paucity of artifact material. Porcelain fragments and iron spikes which mark the European contact level of Drake's Bay sites, however, were by far most numerous in Estero Site.

Because of these highly interesting finds of articles indicating contact with white people at an early date (see pp.), thirty-six days were spent in 1940 and 1941, again with the kind permission of the owner, Mr. L.S. Murphy, in excavating almost 11,000 cubic feet of the estimated extreme total of 25,000 cubic feet of deposit. A trench parallel with and near the face was followed by a series of similar trenches, each cut farther inland until the heart of the site was completely excavated. The remaining half of the deposit extending around the periphery is extremely shallow material cut through by rows and furrows of the artichoke field.

McClure Site. McClure Site (266), the last of the four sites with principal excavations, lies twelve miles overland north from the mouth of Drake's Estero. It is on the west shore of Tomales Bay near the mouth, at 38°10'38" North latitude, 122°57'35" West longitude. The soft sandstone cliffs and rolling grassland environment around Drake's Bay give way northward to increasingly steep granite hills along the narrowing peninsula. Two miles short of the actual mouth of the bay the peninsula is less than one mile wide, with high, rough cliffs on the ocean side and steep, chaparral-covered slopes dropping to Tomales Bay on the east. Two short stream courses converge downslope and empty in a single cove which is occupied by McClure Site. The midden fills the hollow between the two small streams, and opens directly upon a sandy beach. In most respects the situation is unusually favorable for habitation by a hunting or gathering group. Indeed, McClure is one of the largest sites on Tomales Bay. The spot is well sheltered, warm and sunny by reason of the high ridge that blocks the wind and fog. Deer trails interlace the chaparral of the hillsides and the bay to the east offers shellfish in the extensive mudflats or fish and crustaceans either in deeper water near shore or in the swifter channels out in the bay. Small mussels abound on the rocky shores to either side. Year-round water supply is assured in the small creeks flanking the mound. Added to these desirable factors is the short distance to Tom's Point on the eastern shore directly opposite McClure Site, which narrows the bay width to half a mile at this spot. For a boat-using people, this water approach is much easier than the steep half-mile climb down from Tomales Ridge to the beach.

McClure Site is remote enough to be virtually undisturbed. Eucalyptus and cypress trees remain from the garden of a ranch house reported to have been at one time in the cove, but the soil surface has remained almost untouched. Field parties from the University of California spent forty days excavating on the site in the 1940 and 1941 field seasons, and returned when possible, with the indulgent permission of the owner, Mr. John McClure, during fall and spring of these years and again in 1946. The 7000 and more cubic feet removed amount to only about 8% of the total estimated volume of 91,000 cubic feet. Deposit extends 190 feet along the beach and 130 feet inland. More excavation is still needed to work out the details of the mound structure. It appears to be only 40 inches in depth near the inland edge of the north flank, but deepens rapidly southward and bayward to more than 120 inches. Excavation below this level has been prevented by ground water. The bayward part of the basal layers appears to extend two feet or more below mean high tide level.

Stratification of deposit is clearly present but not thoroughly explored (see schematic transects, Fig. 9). The black dirt and shall midden of the surface (Level II) becomes more sandy within 15 inches depth and ends at depth of 20 to 30 inches in a very compact horizon of relatively sterile brown sandy deposit (Level I). At the rear of the site the top part of the compact horizon appears to be replaced by large beds of burned and unburned shell. Elsewhere it is continuous to a gravel bottom, though laminated with shell or charcoal lenses or layers. The hard surface of Level I is extremely rutted and uneven, though the break is always clear. Toward the rear of the site, the shell beds rise almost to the surface; here no deposit proveably of Level II is present.

As in Estero and Cauley Sites, cultural stratification is clearly present. The zone of cleavage in culture lies above the juncture of soil horizons, so that all of Level I and the sandier portion of Level II are features of McClure B cultural component, while the uppermost 15 inches (or more, in places) of topsoil represent McClure A component.

Several features of interest shown in the schematic profiles of McClure Site (Fig. 9) can be mentioned but briefly here. The sudden drop of mound base below surrounding land surface seems best explained by postulating more or less constant alluviation of soil from the surrounding hillside. This soil, infringing on the edge of deposit in wet seasons, was in turn overlapped by a wedge of deposit in dry seasons, so that growth of the edge was upward rather than outward. At least one sizeable slide or flow of hillside soil is evidenced by the intrusion of completely sterile wedge of soil 38 inches thick at the base over deposit. This wedge was covered over and buried by later midden accumulation. This sort of growth phenomenon bears on questions of year-round occupation, duration of growth of the site, total age, etc., which will require assistance of soil scientists to answer.[68] Taken by itself, the significance of this type of growth is hardly estimable yet. The additional circumstance of midden deposit below water level must be considered as part of the same physiographic problem. Parallel situations in the San Francisco Bay area will be mentioned in Chapter V.

Tom's Point Site. The environmental situation of the Tom's Point Site (201) is identical to that of McClure Site, since it lies directly across Tomales Bay. Greater degree of exposure and fluctuating water supply from a marsh inland from the site are the only very different circumstances. The cultural material known from this site cannot be correlated with stratigraphy, since its exact location within the site is unknown.

Secondary Sites

Minor excavations were made in 1940 and 1941 in sites with environmental settings essentially similar to those described above. Of the nine secondary sites investigated, three should be mentioned here for certain features of interest. Hall Site (235a, Mrn-301) is a small midden on a stream terrace at the western edge of Drake's Estero. Bear Valley Site (271, Mrn-271) and Hidden Site (274, Mrn-274) are slightly south of Drake's Bay proper, near the outlet of streams pouring directly into the ocean. Bear Valley Site, which is linked with the head of Tomales Bay by its stream valley and a low pass northeast into Tomales Bay drainage, is the larger of the two, but yielded very little cultural material in twelve days of excavation. Hidden Site is quite small, and lies a mile south of Bear Valley Site.

4. Marin Coast: Artifacts and Traits[69]

a. Preface: Stratigraphic and typological segregation

Details touched upon in the foregoing site descriptions indicate that each site has its own peculiarities of environmental setting and midden composition. In certain important respects, however, the mound structures are similar: a whole-shell layer separates horizons of different character at Cauley and at Estero Sites, and a change in soil structure occurs at McClure Site. These features are regarded as stratigraphic links. Mendoza Site, which shows no differentiation of soil characteristics, is assumed to have been formed subsequent to the development of whole-shell layers elsewhere. A schematic summary of these correlations follows, in which the stratigraphic break is taken as a point of departure. The depths from surface to this line, actually measuring between 22 and 26 inches in the several sites, are equated and the depth of remaining deposit adjusted in proportion.

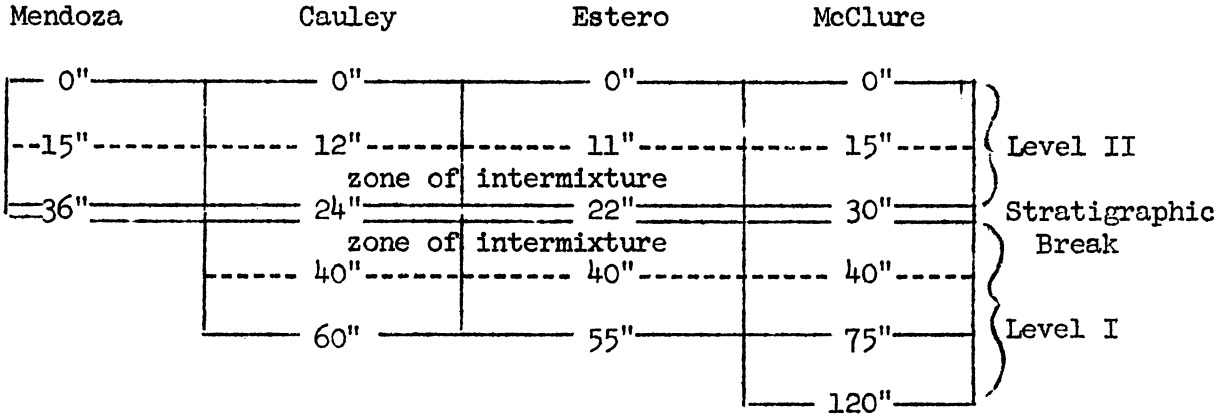


Table 3. Stratigraphic Links Between Marin Coast Sites.

I have used the form of Table 3 in the following tables (4 through 9) to present as concisely as possible the depth distribution of significant artifacts and traits. These fall into two groups -- those associated with burials and those found isolated in deposit. Disturbance of burials can be detected immediately, whereas there is no such assurance in the case of unassociated artifacts. In unstratified, homogeneous deposit disturbance is of minor consequence, but it can become a real stumbling block to interpretation in shallow, stratified deposit. Since three of the four principal Marin Coast Sites are clearly stratified and two of these are shallow, burial associations must be emphasized in working out cultural affiliations. But grave goods have a limited repertory; a clear picture of total culture content cannot be gained without taking unassociated artifacts into account. I have been reluctant, therefore, to throw out unassociated finds as useless, and have attempted a technique for placing the mass of material found loose in deposit into proper perspective by using burials as stratigraphic measuring stick.

Burial Typology and Stratigraphy.

Typological segregation of burial-associated artifacts, with especial reference to bead and ornament types (see Table 10) shows that two groups are distinguishable on each site. The groups on Mendoza Site, where deposit

is unstratified, are simply those burials with and those without beads, so Mendoza Site may be disregarded for the moment. The two groups of burial associations in each of the three stratified sites, however, not only show no mixture of significant artifact types, but tend to separate by depth location in the midden. They are in large measure correlated with the two soil levels distinguished above. On this basis, each site is presumed to have been occupied by two temporarily distinct settlements. The lower (and earlier) settlements of each site, which will be termed B Components, are more closely related to each other in specific artifact types than they are to any of the later settlements, or A Components, and vice versa. Cremations are aligned exclusively with the burials of the A Components on typological grounds. Similarity of B Components links them together as B Horizon; A Components also collectively form A Horizon.

Contrary to earliest expectations in the field, however, is the proof offered by overlap in burial depths that the midden accumulation of Levels I and II are not the exclusive products of B and A Components, respectively. Burials overlap the soil cleavage lines in both directions, i.e., not only are A Component burials sometimes intrusive into the compact soil of Level I (as shown by the soil marking), but a few burials belonging to B Components on typological grounds are found lying over the surface of the whole-shell layer. Accordingly, the lower part of Level II must be an accumulation created by the people of B Component.

It is going ahead of the argument to introduce classification terms at this point, but it may be mentioned here that the lower level components compare closely with Middle Horizon components in the Sacramento Valley, while those of the upper level compare with Late Horizon components of the same region. Correlations of soil levels, village components and cultural horizons are as follows:

Level II	A Component	Estero Facies, Late Horizon
Base of Level II Level I	B Component	McClure Facies, Middle Horizon

Unassociated Artifacts: Stratigraphic Relations.

The cultural content of an A Component obviously cannot be guaged simply by assigning to it all unassociated artifacts found in Level II, since some of them must be the implements of B Component refuse at the base of Level II. Various disturbances such as gopher activity also are responsible for intermixture in both directions. During excavation, of course, every piece found could not be identified as in place or out of place, and in some instances even its relation to the line of cleavage was not clear. I have made an allowance for intermixture by establishing a "zone of intermixture" extending 12 to 15 inches above and below the juncture of Levels I and II. (Table 3, above, shows the juncture by double lines, the "zones of intermixture" by broken lines above and below). Unassociated artifact types occuring in reasonably high proportions above this zone, at shallow depths, are assigned to A Component context if they are also very rare below the line of cleavage. In the same fashion, artifact types which are characteristic below the zone of intermixture

and occur only near the base of Level II are attributed to B Component.

Whereas the stratigraphic position of burial groups has been determined by extremes of depth, cultural affiliations of individual burials rests on typological comparisons. Consequently, a few A Component burial and cremation finds are lifted out of the Level I context into which they intruded in order to represent them in proper context in the tables which follow. All burial and cremation occurrences are designed by superscript numbers in the tables (4 through 9) for identification. They are the keys to the culture horizons postulated here.

b. Burial Complex

Burial or Cremation in Village Midden.

Marin coast sites conform to the general custom in archeological Central California of burying the dead in or near the village confines. Among the possible reasons for this custom may be mentioned easier digging in the soft dirt of the midden and the desire to keep bodies from being molested. Although the procedure naturally leads to clustering of burials, there is no evidence of true cemetery plots. Distribution of burials within the site is shown on each site plan (Maps 2-5). Depth to which graves were dug is uncertain since soil markings are absent except for dark midden of those Level II pits which intrude in the lighter soil of Level I. However, some burials were found within as little as six inches of the present surface. Allocation to cultural horizon on the basis of artifact association or depth gives the following division. (Note that burials without artifacts cannot be certainly assigned.)

	MIDDLE (B Components)	LATE (A Components)	
	Burials	Burials	Cremations
Mendoza	0	14	12
Cauley	7	18	7
Estero	4	6	3
McClure	24	17	10

One burial not noted above was found at Bear Valley Site and one cremation at Hall Site.

Burial Position

A definite but elastic pattern of complete flexure characterizes the burials of both horizons in all sites. All but two burials fall within this pattern ranging from tightly flexed position to semi-flexed position. Loose flexure on either side or on the back, resembling a relaxed sleeping posture, is the position of nearly 70% of articulated burials on each site. The torso frequently is twisted with back or chest down and the legs to one side. Disarticulation of neck vertebrae, leaving the skull as much as twleve inches above the body skeleton, indicates that the head and shoulders of many burials were originally bent upward, perhaps when forced into too narrow grave pits. Two semi-extended burials, which follow a pattern of extension except for slight bending at the knee and are thus logically segregated from flexed burials of all varieties, were found, one in McClure B Component and one in Cauley B Component.

Orientation of Burials

A tendency to orient the head in a westerly direction is noticeable in all sites except Estero, where the number of observable adult burials found (5) was too small to make valid distinctions in this trait. All directions were favored by one or more burials, yet out of this apparently indiscriminate assortment, the heads of between 58% and 63% lay within a 60° arc centering on true west. Since Cauley Site is on an eastern shore, Mendoza on a northwestern shore, and McClure Site on a western shore, this vague sentiment of the propriety of westerly orientation could not well have reference to inland or seaward direction in a local sense, but may be connected with the general setting of the ocean to the west. The land of the dead for the historic Coast Miwok and Southwest Pomo groups was at Point Reyes,[70] and orientation may indicate cognizance of some such idea. The burials of McClure B Component cluster somewhat north of west; B Component burials in Estero and Cauley Sites are too few to indicate such a trend.

Intrusive Burials and Group Burials

Ten instances of burials intrusive into earlier interments are noted (Mendoza, 2; Cauley, 5; McClure, 3). These occurrences make it apparent that grave markings were not used or were not very permanent. B Component burials, naturally, suffer more from this distrubance, since they were interred earlier. In four cases, however, the articulated bones of from two to five individuals of B Components are so interlaced that intrusion of a later burial is out of the question. One case involves an adult female and an immature male (McClure, 10AB); another, two adolescent males and a female adult (McClure, 23A-C); and a third mingles a richly adorned sub-adult female with a mature male, an adolescent, and a child (McClure, 13, 15-17) in a common grave thickly spread with red ocher. The limbs of several individuals in group burials are exceedingly distorted and in one case (Cauley, 4A-D) the skull of one person is out of place under the arm of another, but with no accompanying evidence of violent death by warfare or murder, such as projectile points in lethal positions, etc. Group burials are found invariably in B Components.

Burials of females with infants up to two years, however, occur in both levels; three instances were found.

Burials with Grave Goods

The few burials of Estero were very poorly furnished: one of six A Component burials and one of four B Component burials had artifacts. A Component burials of the remaining three sites were accompanied by grave goods in from 53% to 76% of all cases; 75% of the 24 burials in McClure B and three (75%) of the four burials in Cauley B had artifacts. No significant temporal change in this trait is noted. A recurrent feature of B horizon burials in particular is the presence in the grave of unworked bones of sea mammals, birds, etc., and chunks of chert or rounded pebbles in considerably greater quantity than the general nature of the deposit would justify. No complete non-human skeletons or articulated bones are recorded.

Cremations with Grave Goods

Artifacts normally accompany every cremation. In Mendoza Site only nine out of twelve had at least one type of object. The remaining three, with which nothing was found, may have been furnished with perishable offerings, since the evidence from the remaining three sites, including even impoverished Estero A, is that the cremated dead were not buried without grave goods.

Modes of Cremation

Examples of three modes of cremation were noted. In two cases (Mendoza 7, 8) the body was apparently burned in situ, as evidenced by a large pit with ash lining and abundance of bones. In at least two other cases (McClure, 33; Cauley, 10) the body had been interred in a pit containing coals and ahses hot enough to scorch the bones; this may represent the practice of pre-interment property burning in the grave pit frequently noted in the Sacramento valley area, although no artifact material was found preserved among the ashes. The third and most common practice was to burn the body elsewhere, and return the collected ashes for burial in the mound. A small pit, lack of ash lining, and scarcity of bone fragments are evidences of this procedure. Charcoal and charred timber fragments from cremations have been identified through the kindness of Dr. Robert H. Cockrell, Department of Forestry, University of California. In every case Douglas fir (Pseudotsuga taxifolia) or redwood (Sequoia sempervirens) are represented, despite the fact that stands of these trees at present are much more distant from all sites than Bishop pine or other soft woods. Near Drake's Bay, driftwood may have been utilized. Cremation is exclusively characteristic of A Components.

c. Household and Food Preparation

Food and Cooking

Shellfish, sea mammals, and fish were staple articles of diet. It is more difficult to estimate the importance of seeds and acorns, since evidence of their utilization comes from finds of mortars and pestles and from historical records but there is no doubt that techniques of using vegetal foods were well developed in all periods of occupation. Disconformity between Level I deposit and Level II deposit, the latter of which is blacker and softer from greater percentage of organic charcoal, may represent some physiographic or climatic change, as much as cultural change in food patterns or fire-building habits.

Several techniques of cooking were known. Beds of shell burned to red or grey color, noted especially in McClure Site, suggest that shellfish were roasted; rock mussels (Mytilus Californianus) predominate in these beds, which are a feature of Level I. Upper site strata normally contain a higher percentage of clam (Saxidomus nuttali, S. giganteus, Macoma nasuta). Another technique indicated for McClure B Component is steaming. Isolated basin-shaped structures of baked earth were found at various depths in Level I, and in two areas similar basins were grouped into a complex united with hard packed and baked sterile soil. The complexes were at the surface of Level I (up to 18 inches depth), but the artifacts found sealed in double bottoms of certain basins used for storage, together with deeper occurrences, prove the basins to be features of McClure B. Since few show any evidence whatever of fire or other use, the suggestion that the basins were built for steaming clams in kelp with hot rocks has been adopted.[71] Probably stone boiling in baskets was extremely common, since it is well attested by multitudinous fire-burned and heat-cracked stones in all parts of the deposits.

Mortars (see Fig. 3)

Mendoza	Cauley			Estero			McClure				Total				
A1	A1	B1	C	A1	B1	B2	A1	A2	B2	C	A1	A2	B1	B2	C
1				1					1	1	2			1	1
6^{6}	1^{1}	1^{1}		2			2^{2}	2^{2}			11^{9}	2^{2}	1^{1}		
					1	1							1	1	
		1	1										1		1

Table 4. Mortar Distribution

(Superscript nos. refer to burial occurrences.)

Mortar types, as defined on page , are condensed into broader groups in the diagram above. Carefully made, fully dressed, flat bottomed Types Ala and Alb are subsumed under Al, round sided, fully dressed Types A2a and A2b under A2. One Al specimen found at Bear Valley Site may be added to the above. Several noteworthy observations may be made. Group Al is relatively very numerous and is conspicuous on Mendoza Site. Both Al and A2 occur only in A Horizon; this is apparent not only from depth of occurrence but from their association only with cremations or burials with scorched bones (pre-interment burning at grave-pit). In interments, most are purposely damaged, either by being chipped at the rims or by being completely shattered. About half are made from basalt, of which there are no suitable sources known nearer than thirty miles inland, close to Petaluma. These ornamental mortars must have had connotations over-reaching their food-grinding function; otherwise it is hard to account for the labor of carrying mortars weighing up to eighty pounds over thirty miles of hills and marsh only to destroy them as funeral offerings. Spots of asphaltum at quadrants on the rims of two seem more likely to be remains of ornamentation than attachment for a basketry hopper.

Groups B and C coexist with each other and with mortars of the A group, but are also present in B Horizon. Mortars are a rare class in B Horizon; a single B group fragment, uncertainly identifiable, was the only mortar occurrence in McClure B Component. Except for a complete B2 specimen from Estero B Component, no complete mortars were found unassociated in deposit. Fully dressed, carefully shaped mortars (A group) thus appear to have been added as a new form to A Horizon without replacing the older forms inherited from B Horizon.

Pestles (See Fig. 4).

Mendoza			Cauley			Estero				McClure					Total				
a	c	e	a	c	e	b	c	d	e	a	b	c	d	e	a	b	c	d	e
1			1	1	5	2	2	1	3	1	1	1		2	3	3	4	1	10
1	2^1	2^1	2^1	1	2^1	3	2^1		3	6		2^1		1	9^1	3	7^3		8^2
			2	1	2^1				2	2	1		1	2	4	1	1		5^1
			1						2	1				2	2			1	4

Table 5. Pestle Distribution

(Superscript nos. refer to burial occurrences.)

The columns of the diagram above represent the following pestle types:

a. Types IA, IB (Unshaped cobbles, large and small).
b. Type IIAI (smoothed cylinder).

c. Types IIB1a, IIB1b (tapering cylinder, with blunt distal end and with sharper proximal end).
d. Type IIB2 (tampering, with distal bulb).
e. Type IIB3 (convex sides and narrow distal end).

Not listed is one specimen of Type IIB4 with flanged tip, which was in cremation association in McClure A Component.

The great majority of specimens are fragmentary, whether found in burial association or separate. More than 20 fragments were unclassifiable. An interesting feature is a secondary pit found principally on unshaped cobbles and on convex sided pestles. This pit may have served as an anvil for cracking acorns and the like. Several finds of paired pestles, one large and one small, suggest that if pestles were commonly used in pairs, one might serve as hammer to the anvil hole pecked in the other. (See also Pitted hammerstones, below).

Distribution presents curious anomalies. Mendoza, richest in mortars, is poorest in pestles; the reverse is true of Estero Site. Beyond hazards of incomplete sampling, I offer no hypothesis to account for this. Pestles are at any rate more numerous in A Horizon (41, plus six with A Horizon burials and cremations, vs. 17 and one with a B Horizon burial); this is in conformity with the greater number of mortars in A than in B Horizon.

Most common types are unshaped cobblestones, absent from Estero but occurring elsewhere in both horizons, and convex sided pestles, which likewise are common throughout. The bulbed pestle occurs once very shallow and once quite deep, without evidence of disturbance. The only B Horizon examples of the cylinder and tapering cylinder are within a very few inches of the line of cleavage. Both types may turn out to be Late, with further evidence. No very clear temporal distinctions for any type can yet be made. One variant specimen, a miniature cylindrical pestle with conical ends, was found on the beach at McClure Site. Its cultural affiliation is unknown.

Table 6. Hammerstone, Pick, and Chopper Distribution.

Mendoza	Cauley			Estero			McClure					Total					
d	a	b	c	a	b	d	a	a'	b	b'	c	a	a'	b	b'	c	d
			1				2	11		2	1	2	11		2	2	
			1[1]				3	12	1	2	2	3	12	1	2	3[1]	
	3	1		1	1		4		6	1		8		8	1		
	1	1					5					6		1			
7*				2*	1*	2*	11*		4*			13*		5*			9*

Legend:

a. Igneous hammerstones.
b. Igneous picks, choppers.
c. Granite, sandstone hammerstones.
d. Siltstone choppers.
a',b'; Assoc. with baked earth complex.
*No depth record

Among these exceedingly unspecialized tools, four types can be distinguished on the basis of material used, technique of manufacture, or probable function. Most numerous, and concentrated at McClure Site, are hammerstones made from beach pebbles of diorite, rhyolite, and other hard, igneous stones. They are about the size of a goose egg, but flattened, and are battered at one or other ends (a). The same sort of beach pebble is more rarely given a chopper edge or a pick-like point by percussion flaking; the presumable difference in function sets these stones apart as a second type (b). McClure Site has a virtual monopoly on both types, even though materials of this sort occur all along the Central California coast as weathered out inclusions of various sedimentary strata, and are equally available in all environments. Implements of the third type are discoid to sub-spherical beach pebbles of granite and sandstone (c). Hammerstone use is evidenced by battering of the edges, but generally the edge also has been pecked to produce a smoother curve. The fourth type is made from spalls of the fine grained sandstone of Drake's Bay (d). These implements are larger than the preceding types, about fist size, and have been given a chopper or scraper edge by percussion flaking. Too soft for rough use such as hammering shells open, this tool type may have served in fleshing hides or stripping blubber from stranded whales and porpoises.

To draw temporal distinctions among tools of such generalized nature may seem unwarranted on a priori grounds. Yet the distribution and associations do suggest that the separate types were favored at different times. As the table shows, the soft sandstone choppers are limited to Estero and Mendoza Sites, where the stone is easily available. The pecked-edge hammerstones of granite are at particularly shallow depths, as though favored in A Horizon. At McClure Site, almost all the shallow occurrences of igneous, percussion-flaked hammerstones, picks, and choppers are associated with or found above baked earth pit complexes, which are of B Horizon affiliation, and a general distribution from that level to a depth of 65 inches was noted. Site 278 (Mrn-278), a small, hardpacked, and almost sterile deposit at the cliff edge on the ocean coast, may be mentioned here for the remarkable number of igneous hammerstones and choppers picked from in front of its eroding face. The site lies at the very edge of a shell filled midden (278a, Mrn-287), but appears to produce a different series of artifacts as well as differing notably in soil matrix. The few surface materials and artifacts taken from deposit, besides the hammerstone-chopper series, are entirely consistent with B Horizon inventories from excavated sites.

The total evidence is thus hardly clear cut, but links percussion-flaked hammerstones and chopper-picks with B Horizon. Perhaps a habit of preparing utilitarian hammerstones by percussion flaking gradually gave way to a habit of shaping hammerstones by pecking the work surface or handgrip, and crystalline raw materials were then chosen as more suitable to the pecking technique.

Obsidian or Chert Scrapers:

Flakes of obsidian and a few of chert are scattered sporadically through each site. Scrapers for temporary use are made by slightly retouching one or more edges. Only a few of the total of 58 specimens from

the four sites are well made. Side scrapers, side and end scrapers, end scrapers, snub-nosed scrapers, and one notched scraper are distinguishable, but neither horizontal nor vertical distribution data have much to tell of cultural preference or change. Chert flakes are more rare in A Horizon than in B Horizon.

Obsidian flakes are found in greatest frequency at McClure Site, from which access to the mainland sources (in small amounts in the coastal hills or abundantly in Napa County fifty miles east) is easier than from other sites.

Chipped Stone Saw (Point typology, Fig. 2, Miscellaneous: 7).

This is a provisional trait, established to set apart rough obsidian blades, the jagged edges of which are formed by percussion flaking. All are squarely broken at both ends, so that the longest (70 mm. length) may be either fragmentary or represent the implement as it was used. The appearance is that of large blades which have been "killed" by battering, except that each is unusually thick in cross section to have been originally a blade. Vertical distribution is from 28 to 62 inches depth for the nine specimens at McClure Site and 52 inches depth for the single specimen from Cauley B. These distributions indicate definite affiliation with B Horizon, as does also the association of one with a McClure B baked earth basin complex.

Chipped Stone Drill

Two fragmentary pieces of obsidian and chert show a narrow point possibly suited to use as a drill. These are doubtful specimens from McClure and Cauley Sites and uncertainly located. The absence, rather than the possible presence, of a well attested drill type seems significant, for it suggests that pipes, stone beads, and even shell beads were drilled and perforated with perishable tools or were made elsewhere.

Pitted Hammerstone (Pestle Typology, Fig. 4; Type III).

An ovoid granite pebble 135 mm. by 100 mm. in diameter from Estero B Component by pecking all around the perimeter and features a small pecked pit in one face. It is of uncertain use. The type has previously been described as an "anvil" or "acorn anvil" (e.g., Cole and Deuel, 1937: 275), although the pit might serve as a fingergrip, especially in specimens with pits in opposing faces. The type is relatively numerous at Bear Valley Site (6 specimens), which is much nearer to stands of oak trees than the four principal sites discussed here. Comparative evidence from the San Francisco area, however, shows the pitted hammerstone to be a link between sites fronting on the open ocean, which is hardly consistent with the proposal of a specialized function in cracking acorns. Net sinker or hammerstone functions are also possibilities. Occurrences at Bear Valley Site were relatively deep (22 to 32 inches); evidence is hardly sufficient to demonstrate cultural affiliation with B Horizon, but no shallow occurrences have been noted.

Wedges:

Table 7. Wedge Distribution

Mendoza		Cauley	Estero		McClure		Total	
a	b	a	a	b	a	b	a	b
7	5		3			1	10	6
4[1]		1	3	4	2[1]	1[1]	10[2]	5[1]
			2		4	2	6	2
					1?		1?	

Legend:

a. Whalebone wedge. b. Antler wedge.

Two wedge types are distinguished on the basis of material utilized. Whalebone wedges range from 55 to 130 mm. in length, and tend to group into large and small subtypes. They are made by splitting rib sections, so are lenticular in cross section with sharpened tips which may show polish from use. Complete specimens are badly battered at the butt. Antler wedges are 90 to 140 mm. long, and made by shaving an antler section to a wedge point. Again, the butt end is generally battered. Although antler wedges were described by Uhle as "chisels," use of both antler and whalebone wedges for wood splitting, as Schenck supposes,[72] is indicated by the battering of the butts and the polish which the blades have acquired.

The horizontal distribution pattern of whalebone wedges, like that of siltstone choppers, shows at Mendoza and Estero Sites, a concentration without burial associations. The next largest wedge group, at McClure Site, contains none of the large subtype. Except for the evidence at McClure Site, where small whalebone wedges are in B Horizon at depths consistently a few inches below the line of stratigraphic cleavage, whalebone wedges might be thought a feature of A Horizon. Perhaps use of large whalebone wedges is a custom acquired late, for all the McClure B specimens are small. But from the ecological viewpoint, wedges of any sort are less expectable at McClure Site on Tomales Bay than at sites on Drake's Bay where drift whales provide raw materials and driftwood is more abundant. Consequently, except for puzzling rarity at Cauley Site on Drake's Bay, environmental rather than temporal factors may account sufficiently for greater frequency of all types at Drake's Bay sites.

Bone Awl or Perforator.

Separate types are distinguished on the basis of form or material use, but intergrading between types is so great that the types are best considered as modes within the range of a single tool form. Split ungulate cannonbones are most frequently used. One group, with ends unworked or only roughly trimmed, has a slender blade and a sharp or moderately blunt point (18 specimens; Gifford's types AlBI, AlbII, AlcII

are partly representative). Two cremations in A Horizon have this type associated. A second group is similar except for somewhat broader shank and neatly trimmed butt (7 specimens; not represented by Gifford). Seven split cannonbones are unworked except for sharpened points. (Gifford, types AlbI, AlbII). Splinters awls and perforators, divisable also into subgroups with sharper or blunter points, are frequent (30 specimens; Gifford's type AleII), and occur twice with A Horizon burials. Two bird leg bones, three ungulate ulnae, and one canid ulna have been more or less sharply pointed for use as awls or perforators, and eight animal or rodent ribs are similarly treated (cf. Gifford's types AlaII, A4aII, A4cII, AlbIV). These types are useful chiefly for descriptive purposes, for no significant absences or variations in vertical or horizontal distribution are traceable. Estero Site, however, with 27 classifiable specimens and 28 unclassifiable fragments, is ahead in frequency of occurrence, and by contrast, Mendoza Site is almost unrepresented.

Certain details of treatment applied to awls especially, though noted for other implements, are most characteristic of occurrences in B Horizon. Rough longitudinal scoring, for no observable purpose, marks the blade of awls which have trimmed ends and splinter awls. The heads of complete awls are more regularly trimmed down, and the shank tends to bulge slightly. Ulna awls (cf. flakers) tend to be relatively more frequent in A Horizon. Tool assemblages of each horizon, however, include adequate numbers of each distinguishable type of awl or perforator.

Flaker.

Using their materials as a criterion for division, four flaker types are recognized. Antler tips, somewhat chipped or scored at the end, occur in twelve instances at all sites except Cauley; they are found in both horizons. Three deer ulna flaker (Gifford's type C2) occur at Cauley and Estero Sites, in both horizons. Heavy pointed cannonbone splinters (Gifford's type C1) like awls except for the stout tip, are known from four occurrences at Cauley and seven at Estero Site. A fourth type is more clearly distinguished from the first three; it is long, straight sided strip of whalebone with a blunt, V-shaped point. All of the twelve specimens known appear fragmentary, but the longest piece is 175 mm. long. In use the tool was probably bound to a stick for much of its length, the stick extending past the elbow and under the shoulder of the user to give added steadiness. The whalebone flaker alone is restricted in distribution. All specimens are from McClure B Component, where four were associated with burials. Longitudinal scoring marks the face of these flakers and of a few ulna flakers.

Split Bone Flesher.

A longitudinally split cannonbone with one epiphyseal end preserved was found in McClure B Component. A slight degree of polish along the smoothly split edges suggests that, instead of being simply raw material for a smaller tool, it was put to use as a beamer or flesher in scraping hides (Gifford's type I). Two similar specimens are known from relatively deep deposit at Bear Valley Site (25 and 33 inches depth).

Notched Scapula.

Two deer scapulae found together in Cremation 7 in McClure A Component are marked by notching or dentation along the cut down blade and trimming away of the ridge. (Gifford's type H1). The function of this widely distributed implement type is uncertain. There is no evidence for its use in weaving as Uhle suggests.[73] Polish along the toothed blade might be considered siliceous deposit from use in cutting grass or beating seed heads into a basket. Similarly notched bones which lack a handle (such as the socket of the scapula offers) would be awkward or impossible to use as seed beaters, and give negative support to the view that they served as notched rasps.

Cylindrical Needle.

Seven occurrences of perforated cylindrical bone needles are known from McClure B Component. Length ranges from 115 to 174 mm. in the four complete specimens. Four were associated with three McClure B burials, together with other bone tools, etc. Several are oval in cross section, and the slender shafts generally are gently curved. Perforations are biconically drilled (Gifford's type P3a).

Flat Thatching Needle.

Three perforated needles found unassociated in McClure B Component differ from the preceding type in flattening, which is most pronounced at the perforated end, and in size. The largest, a long slender whalebone shaft, is 220 mm. long, though fragmentary (Gifford's type P3b). Like the cylindrical needles, the few specimens known are clearly affiliated with B Horizon.

Abrading Stone.

From depth 19 inches in Estero A Component comes a rectanguloid, thin slab of fine sandstone 210 mm. long, 85 mm. wide, and 21 mm. thick. Its edges are roughly but regularly chipped and on both faces a gentle concavity is developed as though from wear. It could have been used for abrading ocher for pigment, although it shows no stain, or for grinding beads as described for the Pomo monopolists of clam disc bead manufacture in historic times.[74] The singularity of this occurrence emphasizes the general absence from these sites of paraphernalia suited to bead-making, although clam disc beads appear in A components and the raw material is abundant in the profusion of clam shells in the middens.

Whetstone.

Flat or irregularly angular blocks of fine-grained sandstone displaying grooves worn in the surfaces occurred at McClure twice and at Cauley three times. The grooves are the only artificial features of the specimens, which appear to have been incidental blocks kept handy for

sharpening awls, etc. Their locations range from 18 to 36 inches in depth. They are assumed to be common to A and B Horizons.

Evidence Concerning Houses.

Nowhere abundant in Central California, evidence for house remains in coastal shell mounds is minuscular, although several unexcavated sites show housepit depressions on the surface. Several fragments of clay bearing impressions of sticks and tule, and baked red, were found in Estero Site. These are slightly shaped on one surface and perhaps are part of mud covering or chinking of a structure using an outer covering of brush, grass, and clay. A solid layer of charcoal one to two inches thick at 44 inches depth in McClure B Component was covered by nine to twelve inches of clean sand; it overlay hard, clean sand, stretching twelve feet between upturned edges, as though a burned roof had fallen on the sandy floor of a slightly sunken structure. Lower in McClure B, at 55 inches depth, were charred slabs of wood (species unidentifiable) criss-crossed randomly over an area ten by twelve feet and bordered by formless areas of charring. If not the remains of some form of housing, these slabs at least demonstrate utilization of timbers fourteen feet and more in length. (See also "Iron Spikes," under Porcelain Fragments and Iron Spikes, below.)

d. Fishing

Grooved or Notched Stone Net Sinker.

Beach stones from golf ball to baseball size (maximum diameters 5.5 cm. to 9 cm.) are notched or grooved around the shorter circumference, presumably for use as net sinkers. Flat and angular shapes as well as water worn round shapes occur. The rock is generally crystalline. Although some are marked by merest notches and others are fully encircled by a carefully pecked or cut groove, no typological distinctions seem valid because complete gradation occurs between the two equally numerous extremes and all forms are found associated. Groups of 5, 12, 25, 28, and 38 sinkers lie at and below 30 inches depth in McClure B Component. Some are in close proximity to baked earth pits. Five possible burial associations are noted; in each case, the single sinker found may well have been merely a stone in the pit-fill of the grave. The single occurrence on Mendoza Site is of an atypical, flattish stone longitudinally grooved around the perimeter.

	Mendoza	Cauley	Estero	McClure	Total
	1?	6[1]	2	9[2] 17*	10[2] 17*
		15[1]	12	19 18*	27[1] 18*
		3	1	24 5*	51[1] 5*
				31[1]	35[1]
Total specimens in above occurrences:	1	26	16	291 40*	332 40*

Table 8. Grooved or Notched Net Sinker Distribution.
(*Associated with baked earth pit complex.)

The distribution shown in Table 8 disregards types of sinkers.[75] Several considerations of distribution in time and space are raised. To consider site to site distribution first, it is clear that McClure Site on Tomales Bay overshadows the Drake's Bay Sites in frequency. It might be significant that none of the historical accounts summarized above notes the use of nets on Drake's Bay and that Drake's chronicler is unaccountably ambiguous in his remarks on fishing. Nets may have been absent from Drake's Bay by the time of European contact, though they were indubitably used by the natives of Tomales Bay and San Francisco Bay on either side. Loss of nets as a trait in Late times on Drake's Bay would account fairly well for the site-to-site configuration shown above.

Vertical distribution, however, suggests more regarding the notched or grooved net sinker. The second column under McClure Site and in the total represents sinkers found in the vicinity or incorporated into the matrix of baked earth basin complexes, which are McClure B features. If these occurrences be abstracted, the frequency in A Horizon is greatly reduced and none above 29 inches depth are occurrences of groups. It is suggested that the trait of grooving or notching stone sinkers for nets which definitely links B components dwindled or disappeared in late times, thus accounting for scarcity or absence in the top levels which are definitely A component deposits. Note, however, that occurrences above the whole shell layer or stratigraphic break seems definitely established. Furthermore, the absence postulated for Late levels has little or no bearing on the question of use of seine nets or set nets, since unworked stones can be -- and in ethnographic times are stated to be -- bound on to nets as sinkers.

Bipointed Gorge Hook.

A single bipointed short rod, length 34 mm. with slightly constricted waist, found at 24 inches depth in McClure B, is assumed to be a gorge hook tied near the waisted center (Gifford's type T1g). Other possible uses are as barb on a compound hook or fish spear. It shows no clear marks of binding to prove one or another interpretation. Among two similar fragments in McClure B and four in Cauley B deposits, one is associated with decorative bone implements in a McClure B burial of an infant. No pieces of the sort are noted in A Horizon. Longitudinal scoring marks one of the Cauley B fragments.

Bone "Mesh Guage".

This trait, postulated from fragments only, is evidenced in three occurrences of polished animal rib (?) sections with rectangular end and a lenticular cross-section (Gifford's type E1?). Although fragmentary, these strongly resemble Sacramento Valley specimens from Middle Horizon components for which mesh-gauge use is assumed.[76] One occurred in a disturbed cache of broken bone implements (see Hairpin, Headscratcher, below) in Level I deposit at McClure Site; the remaining two clearly belong to McClure B Component at 65 and 80 inches depth. "Shoe-horn-shaped spatulae," (discussed under Miscellaneous) may have the same function.

Side Barbed Bone Spear (Harpoon?) Head.

A burned central fragment of a heavy bone spear or harpoon head with a large barb on one side is noted from Mendoza Component, at 15 inches depth. Near the broken tip of the barb are three parallel incised lines of decoration. From breadth and thickness of the section preserved, original length of 15 cm. or more can be estimated. Its fragmentary condition precludes reliable estimate of its use or adequate comparison with other specimens. Gifford shows no similar types in California collections, and spear types with such heavy shafts are absent to the north as far as Alaska, where some of the fish spear heads and harpoons found by Jochelson[77] in the Aleutian Islands resemble this in shape and even in decoration. The chance that this fragment was dropped by an Aleut hunting sea otter in the early nineteenth century seems as strong as the chance of its being a local implement.

e. Hunting and Warfare

Mendoza			Cauley					Estero					McClure					Total				
N2	S1a	S1b	N2	N3	N5	S1a	S1b	N2	N5	S1a	S1b		N2	N3	N5	S1a	S1b	N2	N3	N5	S1a	S1b
	1	4	1		1	5^1	7	1	1	11	3		4	2		3^1	1	6	2	2	20^2	15
1	1	1	2	1^1	1	2	1	2		5	1		7*	2	6*	5^3	2^2	12*	3^1	7*	13^3	5^2
			2^1	2		1		4	3	1	1		1	2	3^1			7^1	4	6^1	2	1
			1					1						1^1				2	1^1			
													1^1					1^1				

Table 9. Projectile Point Distribution

(* 5 type N2 and 2 type N5 associated with baked earth pit complex.)

Fundamental segregation of stemmed from non-stemmed points is shown in Table 9. No distinct knife form is present, although obsidian blades (type N1) must have served as such and the asymmetry of the single-shouldered type (N5) suggests some such function. Table 9 shows distribution of only the more common types, which comprise about five-sixths of the total of 130 identifiable specimens. The lanceolate-shaped point (type N2) is present on all sites and generally distributed between horizons, though occurring only in McClure B and Cauley B burials. The finest and the most crude flaking alike are found in McClure B Component. Five occurrences above 30 inches are attributable to McClure B because of association with baked earth basin complexes. General distribution of the less common ogive-based point (N3) is likewise apparent; it is shared by burials of both A and B components. The asymmetrical shouldered point also may be common to both horizons. One inclusion in a Marin B component burial, and occurrence of two specimens in association with a baked earth basin complex strengthen B Horizon affiliations, but top level occurrences indicate that the type was retained in Late times. Temporal distinctions within each type of the non-stemmed series are evident only in the

use of chert and slate for several B component specimens, whereas all A component examples are obsidian.

Small stemmed points, however, are found associated with none but A Horizon cremations, and few unassociated specimens have penetrated to the upper part of Level I. The two types differ almost entirely in proportion of length to width, being similar in the technique of stem and generally delicate flaking, as well as in added details such as serration of the edge. Both characterize A Horizon deposits and cremations. No small stemmed points occurred with burials. It is noteworthy that small stemmed points found unassociated in McClure A Component are overshadowed by higher ratio of large, non-stemmed points, whereas the reverse is true in other sites.

Both long and short stemmed points were numerous (six S1a, eight S1b) in Bear Valley Site at shallow levels. Two burials from Tom's Point Component, facing McClure Site across Tomales Bay, (assigned to Estero Facies of Late Horizon), contained groups of 46 and 15 type S1a points, respectively.

Among the more rare point types, three are non-stemmed and two stemmed. The large obsidian blade (N1) is known only from McClure Site, where one is a surface find, three are associated with a richly equipped B Component burial, and two are associated with baked earth pit complexes in B Component. The ovate point (N4a) of obsidian is represented by seven specimens shared by A and B horizons of McClure, Cauley, and Mendoza; a burial of Cauley A carries one as an associated artifact. Most of the small, thick, ridged points showing very little care in manufacture (N4b) are known from Bear Valley Site, perhaps because they went unnoticed elsewhere in deposit that was not put through screens. Of the three from Mendoza, Estero A and McClure B Components, two are made of chert. Chert also is the material of two large stemmed points (S2) from low levels of McClure B Component. These large stemmed specimens are the only stemmed points certainly attributable to B Horizon. The remaining stemmed type (S3), with thick blade and narrowing stem, is represented from Mendoza and Cauley A, and from Estero B (?) in the whole shell layer.

Miscellaneous specimens include a side notched, small but heavy point of beautifully flaked chert (weight 4.9 grams) from Mendoza Site, and an equally small but heavy tear shaped point of chalcedony from McClure B Component (Fig. 2, Miscellaneous, 3 and 6 respectively). Two small, light points identical to the S1a series except for lack of a stem are shown separately, from Estero A and Mendoza Components (Fig. 2, Miscellaneous, 4). Square serration, rare in all sites, marks the edge of the Estero A specimen.

The following features in projectile points set A and B horizons apart: A Horizon has small stemmed points with serrated edges and, rarely, square serrations. B Horizon has only fairly large points, which may be well flaked but lack serrations; chert is utilized in greater ratio than in the subsequent period. Stemmed points rarely occur in B Horizon, and are heavy.

Ringed Dagger.

This implement, 270 mm. to 295 mm. long, is made from deer cannonbone split from front to rear, leaving the distal epiphysis intact. The epiphyseal knob, hollowed out through the center, forms a ring at one end, which is trimmed down neatly to the thickness of the stout pointed blade. Such finely finished pieces, found in rather elaborate burial associations, contrive to look ceremonial rather than purely utilitarian. Although the function is unproven, use as a dagger is ascribed to the four pieces found because the implement is clearly strong enough and wellshaped to serve as a weapon. Two occurred in association with a cluster of bone implements and other ornamental-ceremonial paraphernalia accompanying Burial 13 of McClure B Component, and one lay with similar bone objects at the side of Burial 23 of the same component. The fourth, a tip fragment, lay in a cache of similar but broken implements at 15 inches depth. The cache clearly lay in black midden matrix when found, yet the fragmentary condition of the objects and the adherence of sand grains much like Level I matrix to the blades give grounds for believing the cache to have been disturbed aboriginally. (See also Head Scratcher and Hairpin). This trait is considered a link trait for B Horizon.

Split Bone Dagger.

This object also is made from a cannonbone split from front to rear, but shows the proximal epiphysis at its base. The three specimens found were together in a group of problematical bone implements accompanying Burial 15 of McClure B Component. (See also Elongate Antler Triangle, Shoehorn Shaped Spatula, and Hairpin.) Two specimens, partly fragmentary, are 160 and 185 mm. long; the complete specimen measures 173 mm. in length.

"Bolas" Weight.

Small pebbles about the size of a chicken egg (maximum diameter 50 mm.) which are grooved around the longest circumference occur in one cremation of McClure A Component. Five others are recorded from McClure Site (Levels I and II, depth 10 to 56 inches). They are distinguished from net sinkers principally by small size and by being grooved longitudinally instead of transversely. They closely resemble small stones found archeologically in great numbers during low water periods at Clear Lake, where the Pomo are known to have used bolas for duck and bird hunting. Affiliation of the present examples to which this function is attributed is almost equal to both horizons, though burial association is with A Horizon.

Separate Skull as Trophy Heads (?).

Head taking is tentatively attributed as a trait of B Horizon on the basis of extra skulls and missing skulls in burials of McClure B and Cauley B Components. A separate skull lay at the feet of Burial 28 of McClure B. The skull of Burial 4a of Cauley B Component was removed and lay at the lumbar vertebrae under the right elbow, in a position almost impossible to imagine from subsequent disturbance. Neither skull shows

cut marks at the foramen magnum. Head-taking thus is poorly evidenced from Marin coast sites, although its ethnographic distribution over the entire length of California and its apparent presence (on evidence better than that stated here) as early as Early Horizon components in the Sacramento Valley make it plausible and even expectable in either horizon of Marin coast sites.

f. Dress and Ornamentation

Table 10 expresses in graphic form the persistent association of common types of ornamental grave goods. To the four principal sites which have been considered throughout is added Tom's Point Site, cultural content of which is known only from trait associations with nine burials. Two trait groups are readily discernible. The group distinguished by clam disc beads is marked by association with items of Caucasian manufacture (especially trade beads) as being partly of historic date. The group characterized by Olivella bead type 3c and red ocher is earlier by lack of historic associations and on stratigraphic grounds, the deepest burials being at greater depths than any of the first group. The first group of traits characterizes A Horizon, the second typifies B Horizon in the stratified sites.

In a few respects, the sharpness of the cleavage is misleading, as the brief discussion of these traits which follows will show. The seriation shown here, however, is the typological bedrock upon which the twofold cultural classification of Marin County sites is predicated. Utilitarian items and non-ornamental items in burial association or found free in deposit are relied on to round out the cultural picture, but it is defined chiefly on the basis of the items shown in Table 10.

Caucasian Objects in Burial Association

Glass trade beads occur with four burials at Tom's Point Site and two cremations at McClure A Component. Three other sites in the area have produced one or more burials with glass beads. Of the nineteen bead types represented, five are shared among the five sites in such a way as to leave no doubt of their essential contemporaneity. Mr. Arthur Woodward, Curator of History and Archeology at Los Angeles County Museum, has kindly examined the various types, and is of the opinion that their dates of use range from 1840 or earlier to 1860; this accords with the views of collectors of historical material in this area that certain of these types were made in San Francisco no earlier than 1850. Thus, these bead-bearing burials and cremations can be dated with some probability past 1850. The ones at Tom's Point Component, at least, could have been interred by the Indian wife and relatives of Thomas Wood living there in 1854.

Glass trade bead associations at McClure A Component thus bring the A Horizon complex into the fully historic period of the middle nineteenth century. Supplementary material comes from a McClure A cremation in which clam beads and glass beads were mingled with a long, sharp

pointed iron spike and twisted strap iron fragments, the last appearing to be remains of a small brandy keg or powder cask. Other burial associations of Caucasian material lead us back putatively to the terminal sixteenth century, but the evidence at this point is quite weak. One Cauley A burial (Burial 25) was found with a rusty, square shanked, iron spike eleven inches distant from the skull; no other artifacts were associated. A similar bent and rusty spike lay at a like distance from an infant burial (Burial 6) at Estero A Component, and is thereby tentatively linked with a single clam disc bead associated with the burial. These rusty spikes and unassociated finds of Caucasian materials identified with the 1595 of Sebastian Cermeno's ship, the San Agustin, are discussed more fully below. No more is intended at this point than to indicate the existence of a tenuous link between burial associations of A Horizon and this sixteenth century material.

Clam Disc Bead.

Twenty-four occurrences (1,773 beads) are divided between nine burials and fifteen cremations. The three species of shell used (Saxidomus nuttali, S. giganteus, and Tivela stultorum) show no significant seriation in occurrence, although Tivela, which is almost unknown to conchologists north of Half Moon Bay below San Francisco, is the least frequent type. The beads are generally in strings near the neck of burials, and occur in groups of 5 to 590; very few burials have more than 100 beads, a circumstance which, when compared with the incidence of up to fifteen feet of strung beads for single burials in the Sacramento Valley, bespeaks a striking contrast in wealth of the two areas.[78]

Clam disc beads are taken as a definitive link trait between components of A Horizon. Mendoza Component shows a special configuration: clam disc beads are the only bead type known at the site, and occur with two burials which are barren of artifacts characterizing other interments in the site (Type Ala, Alb mortars, charmstones, pipes). Since clam disc beads elsewhere are only once associated with traits of the latter group (Type Ala mortar, McClure A Component, Cremation 7), the group is tentatively set apart as a special phase of A Horizon.

Steatite Disc Beads.

In five occurrences totalling 42 specimens, small steatite discs are invariably associated with clamshell beads, the shape of which they appear to imitate. The stone discs are normally alternated with clam discs in a string. The fact that steatite does not occur locally, taken with the lack of evidence for local manufacture of clam discs, makes it a tenable speculation that steatite beads came to the Marin area strung together with finished clam discs traded from the Pomo or Bodega Miwok in the north, since the northern groups are the closest known source of both materials in ethnographic times.[79]

Except for Estero A, steatite discs occur once or more in each component of A Horizon.

Magnesite Tubular Beads.

Small tubular beads of magnesite, which are of clam disc bead diameter but range from 7 to 11 mm. in length, are rare in Marin coast sites. They are known from three interments (one McClure A cremation, two Tom's Point component burials (?)), and one isolated find in McClure A Component. Those from burials, as shown in Table 10, invariably accompany clam discs. The argument for derivation of steatite disc beads from Pomo territory to the north applies equally to magnesite beads, which are reputed to come from quarries monopolized by Pomo in ethnographic times.[80]

Olivella Bead Type 3a1.

"Lipped" Olivella beads vary somewhat in size, but are marked as a rule[81] by retention of the lip of the shell. Thirteen such occurrences in Cauley A, McClure A, and Tom's Point Components are shared by burials and cremations, totalling 746 specimens. The correlation with clam disc beads reaches almost 70%. Although these beads also are noted in strings, it is obvious that they, like clam discs, are too few to make very impressive strings. The two greatest quantities (around 200) occur in one case with a large number of clam disc beads, in one case separate.

Olivella Bead Type 3d.

This is a tiny disc bead, shared in small numbers by McClure A cremations and an Estero B burial (total 71 beads). The trait is carried on Table 10 as an example of the many such traits (most of which exemplify utilitarian rather than esthetic aspects of culture) which set the fundamental theme of unity linking the cultures of the two horizons.

Olivella Bead Type 3b2.

From Cauley B Component comes the only occurrence of this bead type (155 specimens). It stands isolated in Marin coast sites, but recurs elsewhere as one of the common "index types" of horizons corresponding to the B Horizon of Marin. Burial 19 of Cauley B, accompanied only by these beads, lay in a pit dug slightly into the whole-shell layer from the black soil of Level I. It is attributed B Component on the basis of Sacramento Valley typological associations as much as by comparison with other B Component traits noted at shallow depths. As a B Component burial, it is one link in the evidence for continuation of B Component culture above the stratigraphic break in the three stratified sites.

Olivella Bead Type 3c.

The 1,900 specimens of this "saucer" bead with large central perforation found in eight burials are prominent in the ornamental complex identifying B Horizon burials. The bead numbers range from four (with Olivella bead type 3d in Estero B Component) to 1,100. Rather than occurring in strings, they are most commonly shingled like rows of scales, with a one-third overlap, or set on a now decayed garment as sequins.

Wearing of beads in strings may be limited to A Horizon. A cache of a small handful of this bead type below a secondary bottom of one feature in the shallower baked earth basin complex of McClure Site helps to identify the complex as belonging to McClure B Component.

Mica Ornaments.

Irregularly cut ornaments of Muscovite mica, centrally perforated and set as sequins on an apron, cap, or overall cape, are striking elements of B Horizon burials. Their frayed and disintegrating condition may disguise an original hexagonal or pentagonal shape, approximating 50 mm. by 80 mm. dimensions. Accurate estimate of their true numbers is difficult because of splitting, although three burials wore from one hundred thirty-five to more than two hundred pieces each. Source of the rare material is probably in the granite of Tomales Ridge, although no deposits are known to-day.[82] Association of a group of three of four mica ornaments with the shallower baked earth basin complex again ties it to McClure B Component.

Red Ocher.

Traces of red ocher stain are found with two A Horizon burials, although the accident of lack of other ornamental associations does not reveal this fact in Table 10. Its use in abundance characterizes B Horizon burials, however. Half of the fourteen burials with red ocher must have been very nearly covered by the pigment, which stains bones, artifacts, and the dirt fill of the grave pit or literally forms a bed under the skeleton. Among those less favored with ocher, artifacts such as shell beads are colored as though they had been painted with the red stain before burial.

Bone Hairpin.

Slender, pointed shafts from the proximal end of deer cannonbone, the butts partly trimmed or completely cut away to leave a smooth, rounded end (Gifford's type B1) occur in clusters of three to forty with each of nine McClure B burials. Their name is predicated on their occurrence near the skull and the binding marks noted on many, possibly from feather bunches attached to the bones, which served as skewers fastened in the hair. This implement form is closely associated in burials with several bone types of presumably ceremonial significance and the complex is linked exclusively with McClure B burials. One cache at a shallow depth without burial association, which included several of these types, is considered to be out of position through aboriginal disturbance.

Obsidian Prisms.

Two related types are included. The first is a prismatic stick subdivisible into two extreme but intergrading sizes, 35 to 110 mm. long. A clouded surface characterizing both sub-forms is attributed to burning of

the surface. To judge from historic use of the small form on dance skirts from Northwest California, from their position in clusters around the skull of B Horizon burials as though originally attached to a headdress or folded garment, and from the fact that burning reduces their natural brittleness and perhaps increases their ringing quality, these obsidian prisms are presumed to have functioned as jangles or tinklers. A few small specimens occur with an A Horizon cremation. Both small and large sizes are known from Estero B Component (See Fig. 2, Miscellaneous: 8, center and to right).

The second type is much different in appearance, being in essence a long, slender, carefully worked point with quadrilateral cross section. Of one group of 113 festooning the skull of Burial 13 in McClure B Component, about half are bipointed, whereas a small nib for suspension has been worked at one end of the other 50%. Clouding of unflaked surfaces indicates that these may have been worked down from prismatic tinklers with burned surfaces in order to restore the luster. Careful inspection of the prismatic type, in fact, reveals partial flaking of several larger specimens in the same manner (Cf. Fig. 2, Miscellaneous: 8 left and bottom right). Reworked prisms are exclusively associated with B Horizon burials.

The following paragraphs contain a series of more rare traits of decoration not included in the table of co-occurrences. These, like the foregoing, are most commonly in burial associations.

Olivella Bead Types 1a, 1b, 1d, 2a, 3e.

Three A Horizon occurrences of type 1a, two of types 1b, 1d (single specimens), and 1e, and one of type 2a link them all tentatively to A Horizon as regards Marin Coast sites. It will be shown that in neighboring areas types 1a and 1b are shared between horizons; type 1d is a very rare type of uncertain affiliation shared only with San Francisco Bay sites in Central California; type 3e is essentially of late occurrence and type 2a is an index to an early phase of the Late Horizon. All these are not only infrequent in Marin, but occur also in too small numbers to serve reliably as guides or markers to cultural affiliation.

Haliotis Ornaments.

Only a very small handful of ornaments is known from Marin coast sites. Three occurrences of rectangular ornaments with single perforations (B1) are shared by A and B Horizons (Mendoza, 6 specimens, McClure B, 30 specimens). The remaining types (B2_, C_, E1_, G1H) are known only from Mendoza burials and McClure A cremations, in A Horizon. Of these, only type G1H (a simple relative of the so-called "banjo" type) occurs in as many as four interments (12 specimens). As with other decorative types of A Horizon, numerical scarcity seems typical.

Stone Pendant, Earplug, Eccentric.

Pendants of steatite are known only from a single Mendoza Component cremation and from Estero A deposit. With a single McClure B burial, on

the other hand, is noted a pendant of slate. Two small cylinders of sandstone, 35 mm. diameter and 28 mm. in length, each with slightly concave sides and a small pit in one face, are recorded: one is from Estero B deposit, the other from McClure Site without location. Obsidian eccentrics known from McClure B Component may have served as pendants of some sort; three are crescentic (Fig. 2, Miscellaneous: 5), two are lozenge shaped with exaggerated points. Except for one crescent found in a chache with mica ornaments and Olivella type 3c beads in a basin of a baked earth pit complex, these are in burial association together with clusters of re-flaked obsidian prisms, bone hair-pins, etc. Eccentrics are consequently affiliated with B Horizon.

Bird Bone Bead, Tube, and Hairpin.

Undecorated bone beads and short tubes, divisible into a short, broad type up to 18 mm. long and a longer, narrow type up to 40 mm. long, occur in all levels of the four principal sites (Gifford's types EE1a-b, EE2b). Of five burial occurrences, three are from A components, but the remaining two, in McClure B Component, contain the greatest number of specimens. Perhaps by chance, four of these burials are infant burials. Thirty-three specimens occur at various levels of deposit; Estero Site though most impoverished in many traits is best situated for bird hunting , and yields most bird bone in its midden. It stands out from other sites with 13 specimens of beads and tubes.

Incised decoration of bird bone is infrequent (five examples from the principal sites, plus one each from Tom's Point and Hall Components) and designs are simple. Not only beads or tubes, but hairpins of bird humerus (two, fragmentary, cf. Gifford's type A4a III) are so decorated. This trait of incised decoration with spirals and cross-hatched lozenges is limited to McClure A, Estero A, Tom's Point, and Hall Components. It is absent from B Horizon.

Spatulate Bone Pendant.

Two tear shaped, perforated pendants and two elongate, subrectangular pendants with perforation or groove for suspension occur in deposit of McClure B and Cauley B Components at depths of 58 to 65 inches. The elongate specimens, which are well polished, may be for use as strigils, or sweatscrapers. (Cf. Gifford's types Q3, E2). Longitudinal scoring on the face of each one, similar to that on B Horizon awls and whalebone flakers, may indicate utilitarian rather than ornamental functions for these, or may evidence the decorative intent of the scoring, which would otherwise be highly questionable.

Hair Net (?).

Knotted strings 1 mm. in diameter with a loose Z-twist were preserved by carbonization in a Mendoza Component cremation. Half-hitch knots (?) binding the separate fibers together imply that they may have composed a hair net or net cap such as worn by Central California men in modern times.

Grooved Animal and Shark Teeth; Miscellaneous Bone.

Two canine teeth of small sea mammals marked with faint encircling grooves near the root were found in the graves of McClure B Component burials. The presence of unworked animal bone through the grave fill prompts question as to whether these were used for ornament. A similar tooth occurring with a burial on Mendoza Component strengthens the supposition of ornamental use, since extraneous bones were lacking; it links the proposed trait also with A Horizon. In a cremation and a burial of Cauley A Component are single shark's teeth of a fossil shark (Carcharodon. Sp.).[83] These may have functioned as knives or scrapers, or may simply have been retained as curios. Pieces of fossil whalebone occasionally found in deposit could have been picked up from any of numerous fossiliferous localities around Drake's Bay, and were put to no observable use by the Indians. No fossil whalebone occurred with burials.

g. Ceremony and Recreation

	Pl	As	SSa	SSb	Fi	Sc	Gr	Pe	Ph
Level II	1	3^2	2^1	3^2	1 3^1	2^1 1	1	1	3^3
Level I	1	3		3 1^1				1	
Unlocated:	7	1			1		2		

Legend:

Pl	Plummet
As	Asymmetric spindle, mode a
SSa	Symmetric spindle, mode a
SSb	Symmetric spindle, mode b
Fi	"Fishtail"
Sc	Sub cylindrical
Gr	Grooved
Pe	Pendular
Ph	Phallic

Table 11. Charmstone Distribution. (Total from four principal sites)

Nine types tentatively distinguished in Marin Coast sites are represented by 41 specimens distributed, as shown in Table 11. Except for the plummet, grooved, pendular, and phallic types, fragments rather than whole pieces are the rule. Plummet-type charmstones, as well, are characteristically carelessly made and badly chipped. Other types include unsymmetrical specimens, and the subcylindrical type includes scarcely worked drilled stones. Breakage in many cases seems due to rough handling rather than to purposeful destruction. Perforation or lack of it probably has little meaning, since asphalted string binding on the end of an unperforated spindle type mode a specimen from a Cauley A Component cremation proves that unperforated charmstones were also equipped for suspension. Ethnographic information on the function of charmstones as ceremonial objects imbued with supernatural power derives from a period when such objects were no longer made,[84] yet some such attribution seems probably true at least for the carefully made prehistoric specimens. Those which are battered from misuse, however, may well have been utilized non-ceremonially (e.g., fish net or line sinkers, etc.).[85] All types are open to this question except the phallic charmstone.

Charmstones are of little help in unraveling the cultural relations of Marin coast cultures. They are almost evenly distributed among sites. From McClure Site, however, come all but two of the plummet type; six of the seven McClure specimens were found in beach washings, the remaining example, from McClure B deposit, being the only charmstone located in situ at McClure Site. Phallic charmstones are shared between Cauley A and Mendoza Components, in cremation associations.

Charmstones are more than twice as numerous in A Horizon than in B Horizon. In addition, they are much more evident in cremation associations (nine examples) than with burials (two examples). Phallic charmstones are unequivocally associated with A Horizon. The remaining types are scarcely attributable with reliability; none seem limited to B Horizon, and those apparently restricted to A Horizon are rare or only tentatively defined types. Careful workmanship, rare in ground stone work from B Horizon in general, appears only in one broken example from an Estero B burial (Burial 2).

Tubular Stone Pipe.

Mendoza Component cremations supply two of the four pipes known, another is from fifteen inches depth in Mendoza Component, the fourth a fragment without location from beach washings in front of McClure Site. All are tubular. Two complete Mendoza pieces are biconically drilled, and the fragment from McClure is probably so drilled; but the third Mendoza specimen broken near the bowl end shows a straight bore with longitudinal grooving indicating that a gouging technique was used at least to finish the work. Materials used are mica schist, chlorite schist, steatite, and a stone which is unidentified because of alteration by burning in the cremation where it was found. The two longest specimens (length 118 mm.) have flanged mouthpieces, while the short complete piece (length 37 mm.) tapers smoothly at the mouthpiece. Like the mortars and charmstones in the group of cremations with which they are associated in Mendoza Component, they are cleanly designed and well made.

A stream polished pebble of steatite in Cauley A Component is partly perforated by a drilled hole, 47 mm. at the edge, which grades in several increasing diameters from bottom to top. It may represent an unfinished pipe, rejected before completion because a chip was knocked off at one end. If this conjecture is correct, it illustrates a point in the technique of pipe manufacture, namely, drilling the bore with drills of increasing sizes as a first step before commencing to finish the exterior.

With such associations, tubular and flanged pipes are definitely assignable to A Horizon.

Bird Bone Whistle.

Four or more bird bone whistles with single stops are known from McClure Site, where two fragmentary specimens (plus fragments of others?) are associated with Burial 13 (McClure B), and two are from deposit at 17 and 41 inches. An asphaltum plug is preserved as a stopper for one.

Binding marks preserved in the red ocher which stains the couple from Burial 13 suggest that they may have been paired. To judge from the fragmentary specimens, the stop was drilled more or less midway along the bird bone shaft.

The McClure B burial association definitely links the whistle to McClure B Component. Its presence in A Horizon is not reliably attested by the single fragment from the "zone of confusion."

Quartz Crystal.

A very small quartz crystal is recorded in association with a McClure B burial. It does not show wear, asphaltum traces, or other evidence of use. Only one of three other tiny crystals from McClure, Estero, and Cauley Sites has a location in deposit, i.e., 18 inches depth in Cauley A (?) Component.

Forked Head Scratcher.

Among the spatulate, polished bone implements abundantly represented in burials of McClure B Component is a pointed blade with grooves at the broad end creating four to six tines. A variant shape, represented by two of the 20 specimens occurring in seven burials, has a rod-like instead of a spatulate shaft, well separated tines, and is smaller than the greater number of other scratchers. One such specimen is associated with two of the usual spatulate, forked type, but lacks tines. The type is described as a head-scratcher, following Nelson, on the basis of its resemblance to the head-scratcher especially associated with modern California Indian girls' adolescence ceremonies.[86] A too specific parallel is unjustified for the type has not occurred in contexts like A Horizon, which is linked to modern times. Furthermore, the burials furnished with this implement include three males and two infants, as well as two subadult females. On the other hand, head scratchers were not only widely used in ethnographic times in California, but were common to both men and women undergoing crises in most of these groups. Considerable probability exists, therefore, not only that the name given is accurate, but that its implications of religious usage, transferred in time from the ethnographic period, may not be far amiss.

Decorated Whalebone Gaming Piece (?).

A small, fragmentary, whalebone object, originally of ovate shape, measuring 36 mm. in breadth, has one convex face which shows three transverse grooves with punctuations at the termination of each. This is tentatively interpreted as a gaming piece for a hand game. It comes from Mendoza Component.

h. Miscellaneous

Human Figurines.

Two somewhat fragmentary female figurines of fired clay from McClure Site and one reportedly found in the vicinity of Estero Site have been described in detail and pictured in a previous publication.[87] All three are rudimentary representations of female figures without appendages. Clothing or ornamentation is indicated on two by lines in the clay and by streaks of ocher on the third. Their cultural affiliation, determined by analysis subsequent to the publication cited above, is with B Horizon. One McClure B figurine fragment was accompanied by a group of Olivella 3c beads and several fragments of Muscovite mica in a cache at the bottom of a pit feature of a baked earth basin complex. The other was found at 48 inches depth nearby, without association. Precise source of the Estero Site specimen is unknown; its finder and owner, Mr. A. Gambastiani of Inverness, California, reports only that it came from natural soil in a cutbank neighboring the site. It is open to conjecture whether this locus represents an outlying edge of the near-sterile Level I of Estero Site.

A slightly modeled fragment of baked clay (?) from 48 inches depth in Cauley B deposit may represent a still further schematized figurine. In general appearance, it has the form of a new type of charmstone, swelling below and above a central waist. Although it is fragmentary above the sharper swelling at the top, some indication of a perforation remains. Assuming it also to be a female figurine requires that a perforated figurine type be recognized; considering it a charmstone necessitates setting up a separate, waisted, type of charmstone. In either case, it is definitely affiliated with B Horizon by its depth of occurrence.

No very comparable fragments have appeared in A Components. Baked clay is extremely rare, and its forms are limited to these figurines and several incidental fragments with grass and stick impressions described as evidence of housing. The technique of baking clay is presumably known in both horizons. The figurine form appears only in B Horizon.

Elongate Antler or Bone Triangle.

Spatulate, elongate triangular implements of antler and one of bone (?) are included in two of the clusters of hairpins, head-scratchers, and other bone implements found with McClure B burials. Two examples lay with Burial 15 and with Burial 34; six additional fragments are unassociated in Level II deposit of McClure B Component. They have been made by steaming, hammering, or shaving antler into flat, dimpled spatulas up to 270 mm. long, which swell from a point at one end to a ragged end at the other, approximately 90 mm. in breadth. Their use is completely unknown, although the majority are marked on one or both faces by longitudinal scoring of the irregular type found on B Horizon awls, whalebone flakers, etc. This is a trait unique to B Horizon.

"Shoehorn-shaped" Spatula of Bone.

Equally problematical are fragmentary implements of bone distinguished by a latteral curve. Each of the six specimens resembles the other closely

in size (breadth 32-35 mm., length fragmentary 61-78 mm.), lateral curvature, and rectangular end. Three burials of McClure B Component include two pieces each. No fragments or whole pieces occur elsewhere, and affiliation is with the spatulate bone tools of generally ceremonial aspect noted previously for B Horizon.

Worked Haliotis Shell.

Despite the general scarcity of ornaments made of Haliotis shell in all levels of Marin Coast sites, numerous unworked shell fragments prove that the readily available species was utilized for food, and worked fragments of the shell occur in all sites. Unless familiarity with the shell as food source bred contempt for the esthetic potentialities of the waste shells, it is difficult to understand rarity of better worked ornaments. Most but not all occurrences are in A Horizon deposit.

i. Modes and Techniques

Certain characteristic treatments of artifacts and materials have occasionally been noted in the preceding pages. In this section these are gathered together and considered as traits apart from the artifacts on which they appear. The term "mode" is used to denote these abstractions.[88]

"Killing" of Artifacts.

Purposeful destruction of artifacts has been noted, especially in burials and cremations, and is interpreted as "killing" of these objects in order to release their incorporeal essence, presumably for use by the dead. A few possible instances are noted in B Horizon context, such as finding the broken half of an otherwise undamaged charmstone with an Estero B Component burial. The trait is presumably present in the lower horizon. More abundant evidence is present, however, in the fragmented mortars piled in cremation pits of Mendoza Component, or in broken pestles from McClure A, the fragments of which are mostly or entirely present. Charmstones broken and burned in cremations may also have been "killed," although the damage may be unintentional, effected by tossing them in unquenched flames of the pyre.

Longitudinal Scoring on Bone.

Longitudinal scoring is conspicuous on the face of certain bone artifacts of B Horizon. This looks almost random and certainly composes no recognizable pattern or design. Yet its frequent recurrence on elongate triangles and perforated pendants as well as on awls and whalebone flakers argues that this marking is more than an incidental effect of use, and its selective recurrence precludes the assumption that it is merely the unobliterated marks of manufacture. Longitudinal scoring appears to be characteristic of B Horizon, probably absent from A Horizon. It is noted in similar context from San Francisco Bay sites.[89]

Use of Non-Obsidian Materials.

Although obsidian was gotten by trade or expedition and commonly used for projectile points and scrapers in both horizons, B Components display a somewhat greater tendency to use other materials, especially chert. Burial associations of B Horizon include occasional unworked lumps of chert, ostensibly kept as material for future artifacts. Although flakes, scrapers, and small, crude, chert points show up in A Horizon context, chert, slate, or similar non-obsidian materials are not ever chosen for carefully made implements. By contrast, some of the most skillfully worked pieces of B Horizon chipped stone artifacts are made from chalcedony,chert, etc.

Designs on Bone and Baked Clay.

Ornamented bone in Marin coast sites is found only in A Horizon (if longitudinal scoring is excepted). The designs are punctations, lozenges, spirals, and encircling bands, made conspicuous by cross-hatching in fine line incision. Although few examples are known (McClure A3; Estero A, Tom's Point, and Hall Components, one each), and the only pieces alike are two bone beads with ends ringed by punctations (McClure A and Tom's Point Component cremations), a similar style is obvious in all of them. This style is identical to the bird bone tubes of the Late Horizon (Hollister, Mosher, and Miller Facies) of the Sacramento Valley, where whole and fragmentary pieces occur in profusion.

Baked clay figurines provide the sole examples of ornament in B Horizon. Patterns are adapted to the whole piece; they appear to represent clothing or painted ornament, and are simple and heterogenous. In all cases but one, which is decorated with lines of ocher, the designs are produced by broad, grooved lines, which are straight or zigzag. It may be noted here that decorated bone spatulate forms in Middle Horizon components of the Sacramento Valley and San Francisco Bay areas are also distinguished by a style of broad, grooved lines.

Angular Serration of Projectile Points.

Although approximately 25% of A Horizon small, stemmed projectile points have serrated edges, right angle serrations are produced with apparent intention on only two points (Estero A Component; see Fig. 2, Miscellaneous: 4). This rarity is in marked contrast to the number and variety of projectile points and special forms of the Hollister and Mosher Facies of Late Horizon in the lower Sacramento Valley, although the single coastal occurrence shows an indubitable relationship to the Valley manifestation, which is known as "Stockton-type" serration.

Flanged Pestle Handle.

Similarly limited is the occurrence on the coast of a pestle with a slight flange near the proximal end, which occurs in one example from a McClure A Component cremation. This feature recurs in San Francisco Bay (see Ellis Landing) and in Hotchkiss and neighboring components of Hollister Facies, Late Horizon in the delta area of the Sacramento Valley.

5. Porcelain Fragments and Iron Spikes

Sixty-nine fragments of Chinese porcelain and thirty-eight bent iron spikes of archaic character were found in the middens of two principal and four minor sites around Drake's Bay in the field seasons of 1940 and 1941. From the standpoint of absolute chronology of the native cultures, they are the most significant finds of these excavations, important not only to the late archeological manifestations of Drake's Bay but, through them, to all Central California. Heizer has shown in a paper devoted to the problem of source and dating[90] that these bits of porcelain and ironware came to the Drake's Bay sites in all probability from the wreck of the San Agustin, the Spanish galleon piloted from Manila by Sebastian Rodriguez Cermeno which was driven ashore in Drake's Bay by a winter storm in 1595. Their occurrence in direct association with the archeological remains of native settlements offers a precise chronological datum 350 years in the past for the cultural assemblages of these settlements. Hitherto, the beginning of the Mission period, about 1775, gave the earliest positive dating of Indian-European chronological material. The porcelain and spikes push chronology back almost two centuries earlier. They and the post-1850 glass trade beads described above bracket a 250 year period in the archeological remains of this single area.

Estero Site, Cauley Site, and Hall Site may well have been villages noted by Cermeno in Drake's Estero, insofar as the wording of his Declaracion permits identification.[91] Porcelain and iron spikes are very much more numerous in Estero Site collections (48 and 24 pieces respectively) than in those of Cauley Site (four porcelain fragments and three spikes) or of Hall Site (two porcelain fragments). On the coast three miles south of the Estero, however, eighteen porcelain fragments were found at Bear Valley Site, where screens were used in all excavations as a check on completeness of recovery; one large fragment also came from Hidden Site on the next stream southward. One iron spike and three porcelain fragments are from Site 236a at the eastern end of the Esteros. To judge from the Bear Valley Site excavations, a small percentage of fragments under one square inch in size was missed in Cauley and Estero excavations, but this probably does not affect the relative frequency of occurrence within those two sites.

A number of fragments of undecorated white porcelain occur in the collections from these sites. Being unidentifiable, they have not been included in counts nor in this discussion. Identifiable fragments at Estero Site alone come from at least twelve original pieces of porcelain. For the most part fragments are less than two square inches in size; four pieces have been reconstructed from them. The forms include a rice bowl, a small deep-sided bowl, and two plates (See Fig. 10). These pieces are porcelain decorated with blue underglaze.[92] The greatest number are known to be ware made for export at Ching-Te-Chen in northern China during the reign of Wan Li (Ming dynasty emperor from 1573 to 1619).

The iron spikes are less precisely identifiable. All are similarly made, square shanked and square headed, their hand-forged surfaces and interiors badly corroded by oxidation. They range from 3 cm. to 28 cm. in length. The majority are bent at obtuse or sharper angles. Metallurgical analysis of the metallic cores, taking into account the probable

nature of sixteenth century forging and the degree of rust expectable in the chemically neutral soil of the middens in which they lay, indicates that "the spikes are undoubtedly of ancient origin."[93]

No indubitably intentional immediate associations of these contact materials with native artifacts or burials have been observed. One bent spike lay 11 inches from the skull of Burial 11, of Cauley A Component, and a bent spike was in similar relation to Burial 6, of Estero A Component. These may have been in the ends of boards from the shipwrecked hulk which were used to cover the burials. Burial 11 had no native grave goods; a pestle (type B1) and a single clam disc bead were found with the infant of Burial 6. One porcelain fragment comes from dirt forming the matrix of Burial 2 of Cauley A Component, but it was not observed in situ. Another small fragment lay within six inches of fragments of a type A1a mortar, broken and buried in Bear Valley Site near Burial 1. All these associations are in general with items or burials of A Components, but, as distribution of porcelain and spikes throughout deposit makes clear, these intimate associations may almost as well be fortuitous as purposeful.

It is unfortunate that the burials and cremations were few and poor in Estero Site, where the abundance of porcelain and spikes makes possible the clearest check on the nature of Caucasian-aboriginal associations. In the absence of numerous burial associations, such as may have existed in the large part of deposit lost by erosion, synchronism of porcelain, spikes, and native materials must be determined as well as possible by stratigraphic principles previously applied to aboriginal artifacts. Distribution of spikes and porcelain are shown in Map 6, of Estero Site excavations.

The principle of stratigraphy, applied without qualification, would require that a large number of artifacts arriving simultaneously in a deposit be spread through the deposit at a single uniform level. Vertical distribution of the porcelain and spikes shows what was obvious to all who worked in the excavations, that factors such as rodent disturbance and puttering incidental to habitation have made considerable changes from the ideal situation. Both spikes and porcelain are spread essentially throughout the deposit; matching fragments of porcelain occur as much as forty feet apart in seven instances. No evidence is forthcoming from the porcelain itself or from its distribution that any use was made of it or that it was regarded as anything but a curious trifle. Some slight clustering of spikes in two areas (one centering 12 feet south and 12 feet east of Datum A and the other centered 25 feet north and 12 feet east of Datum A, each from 20 to 25 feet in diameter) suggests that houses at these points may have been covered by planks ripped from the wreck of the San Agustin, spikes and all. No supporting evidence was obtained for house construction in these areas.

Even though the depth of porcelain fragments and spikes from all over the site ranges from surface to 36 inches, the distributional maximum falls above the 24-inch level taken as the average level of cleavage between Level I and Level II. Pieces of porcelain found at greater depths fitted fragments found above 12 inches or often showed evidence of their intrusion through the whole shell layer via gopher holes, etc. Depth distribution coincides closely with that of small, stemmed projectile points, for example, and is significantly shallower than that of grooved

stone sinkers. It appears impossible to draw finer distinctions, but it seems safe to conclude that the people of Estero A Component, who used small arrow points with angular serrations and large, flat based stone mortars and who wore clam disc beads and steatite pendants, were the ones who brought porcelain bowls and archaic iron spikes into their village. These people shared the culture of A Horizon.

6. Summary: Marin Coast Culture Horizons

In order to bring to mind a clear picture of the culture of A Horizon and its relationship with the earlier culture of B Horizon, I present a summary review of the salient archeological traits of each. It will then be advisable to proceed with an examination of neighboring areas, to determine their temporal and cultural relationships with the Marin Coast area which has been under consideration in this chapter.

Terminology.

Our archeological universe has thus far been limited to a group of sites on and near the Point Reyes triangle of Marin County. The sites have been linked to each other on the basis of stratification and cultural content. Points of difference between the cultural materials of top and bottom levels in the stratified sites have been attributed to separate occupational components which have been labeled from the surface downward as A Component and B Component. There is close similarity between Cauley A, Estero A, McClure A, and Mendoza, which comprise a group in A Horizon. Cauley B, Estero B, and McClure B resemble each other in B Horizon more closely than they resemble any A Horizon components. The several components and the two horizons are thus established by a process of generalization starting from artifact content.

As this universe is expanded toward neighboring areas, however, it becomes awkward to use this A Horizon-B Horizon terminology without confusion, since the "horizons" adequately represent only time differences whereas areal differences must now be considered also. A change in terminology is therefore proposed as a means of keeping time and space relationships reasonably clear. The concepts underlying the classification to be used henceforth have been outlined in the Introduction. It should suffice here to equate the terminology with that used up to this point. B Horizon in Marin Coast sites will henceforth be known as McClure Facies of the Coastal Province of Middle Horizon; Marin A Horizon will be represented by two facies tentatively distinguished as Mendoza and Estero Facies of the Marin Province of Late Horizon. The temporal sequence proposed for Marin County coast begins, thus, with McClure Facies and continues through Mendoza Facies to Estero Facies.

General.

The culture changes which set each of the proposed facies apart from the preceding one are non-evolutionary in nature. It might be assumed

that the comparative sterility of McClure Facies deposits in food and camp residues, which may reflect reduced rate of deposition, indicates a population less numerous than the later ones which built the shell and refuse laden deposits of Mendoza and Estero Facies. The change, however, whether due to population increase or to climatic, physiographic, or other factors occurs before the termination of McClure Facies. Except in this feature of possible population increase, McClure Facies is in no important respect logically antecedent to the others. It is stratification, rather than logically construed evolution, which proves McClure Facies the earliest of the cultural divisions known on the coast.

Clear-cut differences in the total cultural assemblage of each facies, do not disguise the fact that, in fundamental respects, life among the people of one facies was much like that among the others. No fundamental shifts in the way of life comparable, say, to those effected by acquisition of agriculture, metals, or machinery are adumbrated in the archeological record. On the contrary, quite extensive uniformity links one cultural manifestation to the next from earliest times to latest. The people of all facies lived in small villages in sheltered spots, near drinking water and along the beach from which they derived their chief diet in shellfish and fish. Their dead were flexed for burial in small pits within the village; intrusive burials found in successive periods suggest that these graves were unmarked. In almost three quarters of the graves are found various articles of use or ornament which were laid with the dead without apparent distinction as to sex or age. This practice suggests belief in a land of the dead, perhaps in the west as judged from frequent westerly orientation of the body.

Throughout the history of the known sites, their inhabitants were oriented toward a littoral economy, using various patterns of food collecting but none of food producing. They dug shellfish on the shore, and caught fish in deeper channels with nets and gorge hooks. They collected driftwood and split it with antler and whalebone wedges. They gathered various wild seeds and acorns, and ground them to meal in stone mortars. They cooked by roasting, steaming in pits, and boiling, and heated stones in quantities to assist the cooking. Numerous sharp bone awls imply that baskets were the receptacles for stone boiling techniques. Their littoral position made sea mammals a frequent item of the villagers' diet, but especially deer were hunted on land not only for food but to get bone for implements as well. Birds were eaten, but their bones were rarely used except for ornamental objects or ceremonial whistles. Many resources of the neighborhood, from asphaltum seeps and driftwood alongshore to the acorn groves and chert outcrops of the hills across Tomales Bay, were utilized in all periods. By trading or by making expeditions, the Indians got obsidian and perhaps other items (basalt, quartz crystals) from the interior during both horizons. The fundamentally Central Californian base upon which life was built is emphasized by the carry-over of basic classes of utensils and implements of utilitarian or ceremonial nature, such as mortars and pestles, awls and needles, shell beads and ornaments, and, not least, charmstones.

McClure Facies, Coastal Province, Middle Horizon.

Uniformities of many fundamental living patterns notwithstanding, the distinctiveness of McClure Facies among coastal manifestations does not reside only in inconsequential trifles. It is true that small details of ornament set apart Olivella bead types 3b2 and 3c, mica ornaments, obsidian eccentrics, the simple pendant of slate, etc., as clearly defined link traits for McClure Facies. But overshadowing these in implications for major cultural orientations are traits such as projectile points of large size and heavy weight, suggesting absence of bows and arrows; rarity of mortars and pestles, and absence of ostentatiously artistic mortar types; and the association with the dead of numerous and various special types of bone implements, the meaning of which is unclear at present except that it falls in the unspecific frame of ceremonialism. Contortion of burials in group interments is perhaps meaningfully related to the clusters of ringed daggers, bone hairpins, head scratchers, "shoehorn-shaped" spatulae, and elongate antler triangles, and to the beds of ocher permeating the grave fill. It is impossible as yet to guess at the sociological meaning of these specialized traits, but their existence is a mark of McClure Facies. At the same time, these traits give evidence of an interest in bone transcending that in other materials.

Specific traits of household and domestic life noted only in the context of McClure Facies include baked earth "steaming" basins, the saw of chipped obsidian, mesh gauge, flat-ended thatching needle, and longitudinally scored whalebone flaker. Several important features appear to carry over only slightly if at all into Estero Facies: grooved stone sinkers, hammerstones and chopper-picks made from igneous pebbles, and possibly the finely worked, long obsidian blade (type N1). With McClure Facies elements already mentioned, which are classed either as decorative or ceremonial but really suggest both aspects, are found large prismatic or reworked obsidian "tinklers," the simple cylindrical ear plug, perforated bone pendants, and the human figurine of baked clay. Bird bone whistles are known only from McClure Facies on the Marin coast.

The Marin coast components of McClure Facies (McClure B, Estero B, Cauley B) share only thirty-four burials. A sample for comparison is available nearby at Bodega Bay (Son-299), where 137 burials were excavated at a single site. The brief description of this excavation is written by the amateur archeologists who did the work.[94] Numbers of artifact types are not given, and burial associations are not consistently distinguished from unassociated finds, but the traits described fit precisely with the culture of McClure Facies. I reproduce the principal traits listed because they are particularly detailed and specific, for the unorthodox source in which the report appears:

50% of burials have artifacts.
Large, uniform, granite mortars "of rounded bottom type" (type A2?).
Groups of obsidian eccentrics, end turned sharply at right angle.
Long slender spears, up to 12 inches length (reworked obsidian prisms?)
Finely worked drills from five-eighths inch to five inches length (reworked obsidian prisms?)
Olivella beads, "cupped wampum type" (see 3c?)

Haliotis ornaments
Quartz crystals with pitch on one end
Perforated mica ornaments
Plentiful red ocher
Awls carved at one end (Head scratchers?)
Bird bone tubes with asphalted rows of beads
Bone ornaments decorated with beads
Bird bone whistles
Bone needles, awls, chisels, and daggers
Crude stone sinkers "by the hundreds"
"Plum bob charmstones, some with a hole through the upper end."
Large obsidian blades
Arrowheads "which had a suggestion of a shoulder" (type N3, N6?)

Negative traits mentioned are: notched arrowheads, cremations. These traits duplicate the associations of McClure B burials and corroborate the list of traits defining McClure Facies, as well as adding a few interesting items, such as asphalted bead decoration and type A2(?) mortars. The report shows beyond doubt that Middle Horizon, probably of McClure Facies, was well established at Bodega Bay.

Marin Province, Late Horizon.

Some of the most significant sociological features of Late Horizon culture are completely new to the Marin Area. Cremation of the dead is introduced as an alternative method of disposal within the village, and the coexistence of cremation and burial is perhaps responsible for the hybrid custom of burning property in the gravepit before interment of the body, for which there is some slight evidence. Small, stemmed arrow points definitely made for use with the bow are an innovation undoubtedly presaging changes in techniques of war and hunting. A different economic orientation may be responsible for the increase in numbers of mortars and pestles; but artistic values are also concerned, as evidenced by the predominance of an elaborately worked, flat-bottomed type with smooth, straight or flaring sides (type A1), and ceremonial customs are seen at work in their frequent inclusion with cremations and in their purposeful destruction.

In Late Horizon components, the panoply of bone implements known in McClure Facies disappears. The Late ornamented bird bone hairpin may be a functional substitute for the earlier deer bone hairpin, but it is rare. A few Olivella bead types (1a, 1b, 3d) continue from McClure Facies, but the more characteristic Middle Horizon ornaments and beads are completely absent in later times. In their place come clam discs, Tivela clam tubular beads, Olivella types 3a1 and 3e, and possibly the rare type 2a and 3a2 Olivella bead. Stone beads of steatite and magnesite make their appearance as corollaries of the clam disc bead trade. Bird bone tubes and beads with fine-line incised decoration join this complex, and glass trade beads arrive late from historic white sources. In contrast to the merging of ornamental with ceremonial qualities in traits of earlier components, the ornament of Late Horizon is generally unambiguously meant for esthetic purposes. Carry-overs from McClure Facies include simple rectangular shapes of Haliotis ornaments, but to them are added triangular ornaments and a simple variety of the "banjo" shape (type G). Beads

and ornaments are no more abundant in Late Horizon burials or cremations than they were formerly.

Ceremonial affairs show an increase in the total numbers of charmstones; the phallic charmstone (type V) and possibly other types are new. In addition, a tendency is noted toward more careful manufacture and more skillful finishing of the individual pieces. Probably ceremonial use is to be ascribed to the flanged, tubular pipe (no pipes are known from McClure Facies). Traits known only from Late Horizon components which are not considered exclusive to it because of their general rarity include the notched scapula "saw," flanged pestle, perforated steatite pendant, and hairnet.

Although Late Horizon is an outgrowth of Middle Horizon culture in many ways, some gap in time is required to account for the sharpness of cultural changes noted here. There is no direct evidence yet to fill the gap or to suggest how long it was.

No stratigraphic break separates components within Late Horizon. A division is nonetheless tentatively suggested, which is based on typological segregation of burials into two groups. These are named Mendoza Facies and Estero Facies, each being best represented in the component at the site of the same name.

Thus, the burials and cremations of Mendoza Component furnish the trait inventory of Mendoza Facies, except for two burials which are considered intrusive. Two cremations from Cauley A Component and one cremation from McClure A Component are included because of their typological similarity. The traits thus segregated comprise: complete cremation; numerous mortars of types Ala and Alb; predominance of type IIBlb pestles; "killing" of mortars and pestles; phallic charmstones; flanged and biconically drilled tubular pipes; undecorated bone beads; tabbed Haliotis ornaments (type G); and large whalebone wedges. There are, unfortunately, no beads in burial association with these interments.

Estero Facies, represented by the two burials regarded as intrusive into Mendoza Component, as well as by the majority of Late Horizon interments in Cauley A, Estero A, and McClure Components, shares certain of the Mendoza Facies traits, although type Al mortars, pipes, and charmstones are more weakly represented, and other more rare traits are not demonstrable from the evidence at hand. The most significant accretion to Estero Facies is the clam disc complex of clam disc beads, steatite and magnesite beads, Olivella type 3a1 beads, and the large Tivela tubular bead. Fine-line incising on bone beads and hairpins, and square serration of obsidian points are rare traits found as frequently in deposit as in burial association, so that although they occur only in Estero Facies interments, they cannot be denied for Mendoza Facies. Those in deposit may have been used by Mendoza Facies people.

Estero Facies certainly lasts into the full historic period, because glass trade beads are mingled with clam disc beads and other items in cremations. As to its earliest existence, the Drake accounts imply that clam disc beads, at least, antedate the seventeenth century along this part of the coast. This alone, of course, is not evidence for extension of the facies as a whole back to so early a date; but it has been observed

that porcelain occurs on sites which have burials and cremations with the full clam disc complex as well as less intimately certified traits of Estero Facies.

There is thus some support for the conjecture that Estero Facies as a whole is the cultural manifestation characterizing the Marin coast from some time before 1595, or perhaps 1579, to some time after 1860. There is no internal evidence to indicate whether Mendoza Facies is a contemporaneous manifestation. It could hardly be later, since the extinction of aboriginal culture must be dated not long after 1860, and the clam disc beads of Estero Facies are, of course, perfectly familiar to all surviving Indians. It must, therefore, be contemporaneous with or earlier than Estero Facies; if it is earlier, the evidence suggests that it terminated before the seventeenth century. But on the evidence in hand, Mendoza Facies remains a partly hewn block which we are ready to fit near the top of the culture column but for which we find no ready made niche.

The artifacts from Marin coast excavations described in this chapter are the bricks from which a culture column has been erected. Needless to say, with more artifacts we could build a better column. Its foundation is Central Californian, and its component segments rest comformably on each other. But their lines of juncture are not clearly articulated, and each has fragments missing which disturb its balance. The important thing is that it stands by itself. To fill in the gaps and polish up the lines, it is necessary to compare it with other columns. We have excavations in the Sacramento Valley and in the San Francisco Bay area for help.

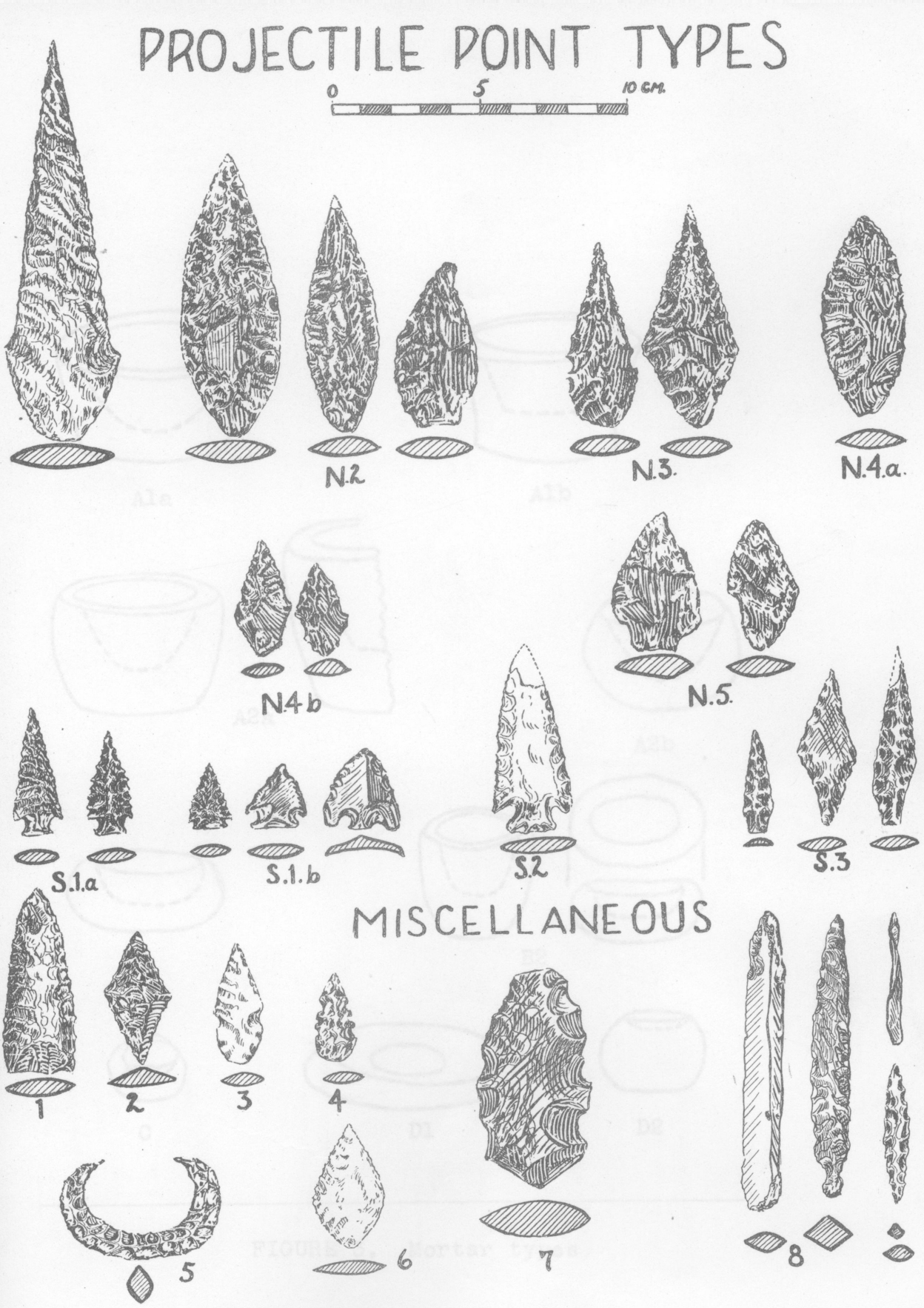

PROJECTILE POINT TYPES
0 5 10 CM.
N.2
N.3.
N.4.a.
N4b
N.5.
S.1.a
S.1.b
S.2
S.3
MISCELLANEOUS
1
2
3
4
5
6
7
8

Figure 2

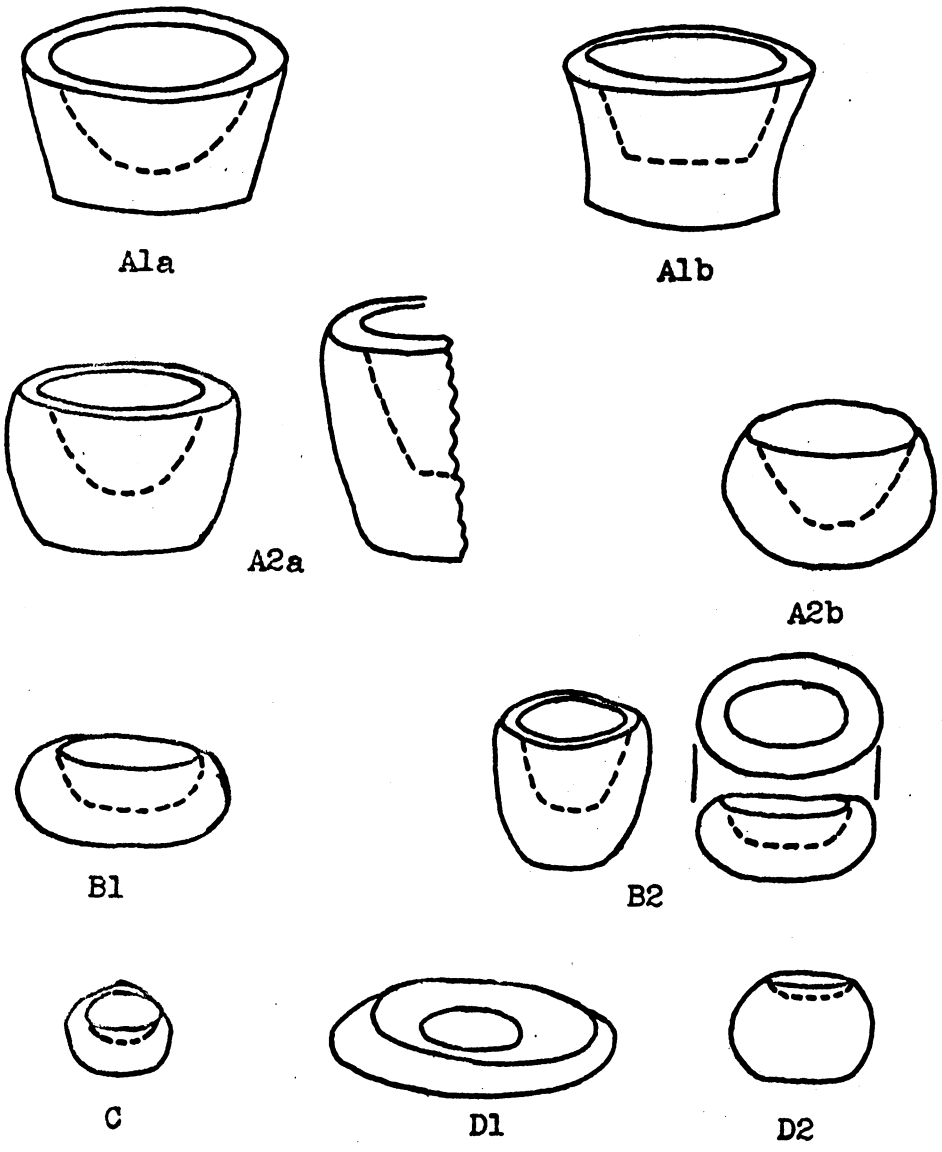


FIGURE 3. Mortar types

FIGURE 6 - SHELL BEAD TYPES

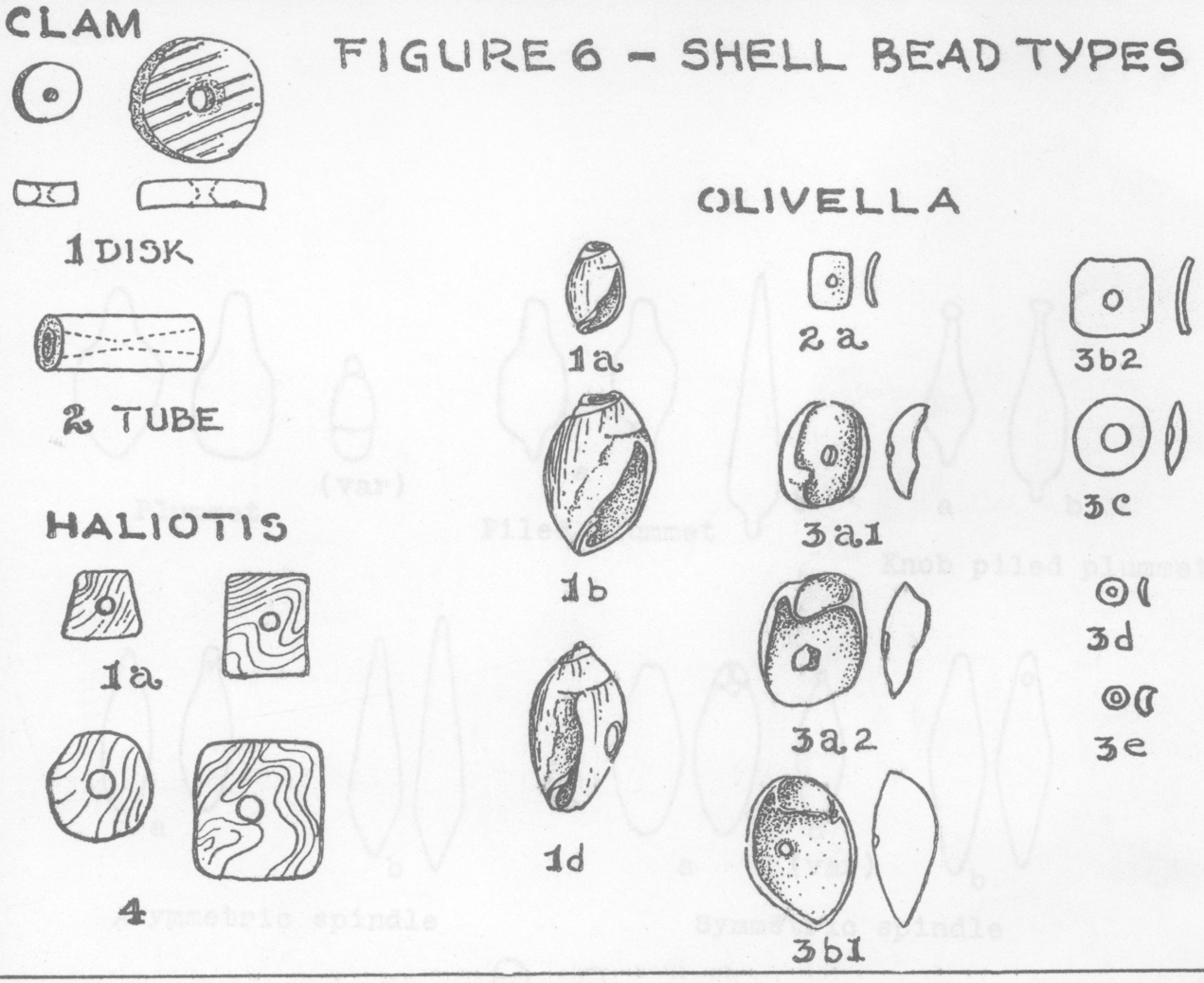
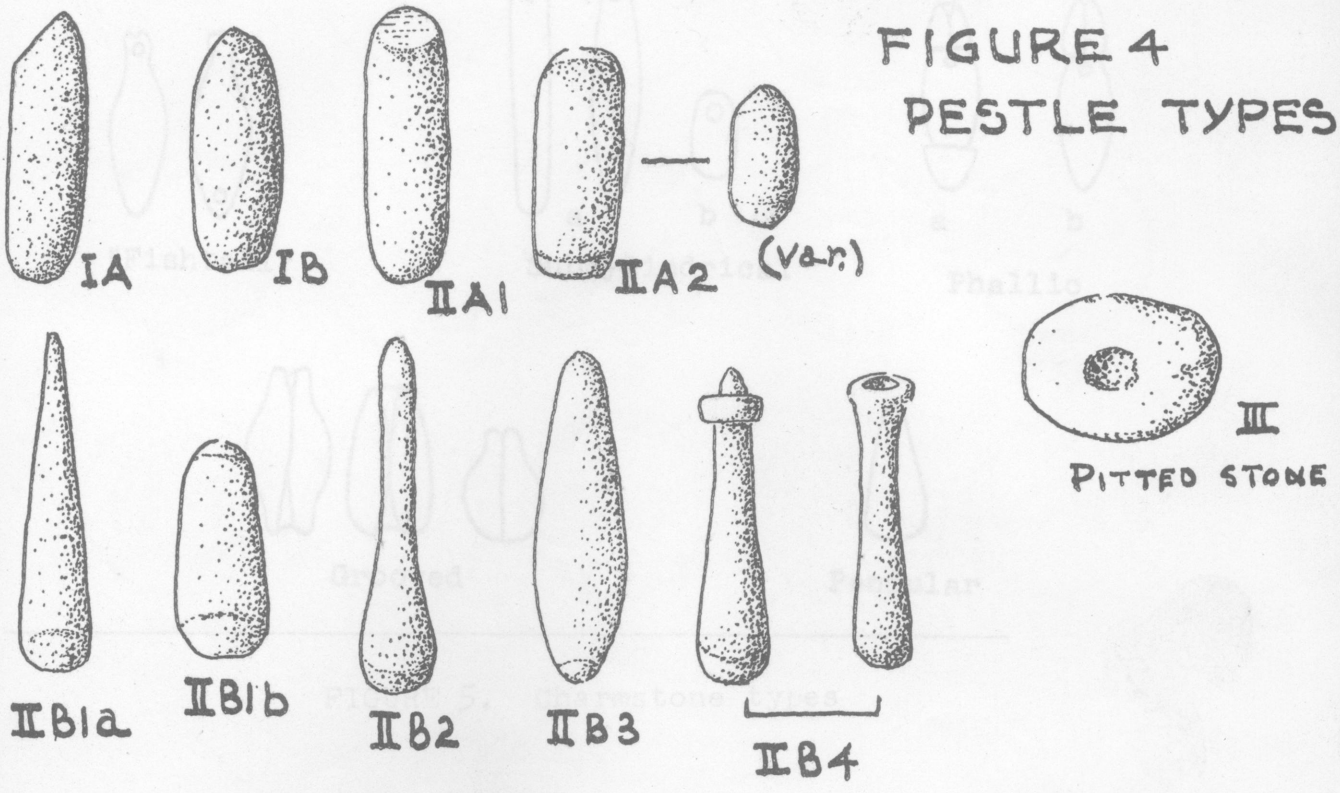


FIGURE 4 PESTLE TYPES



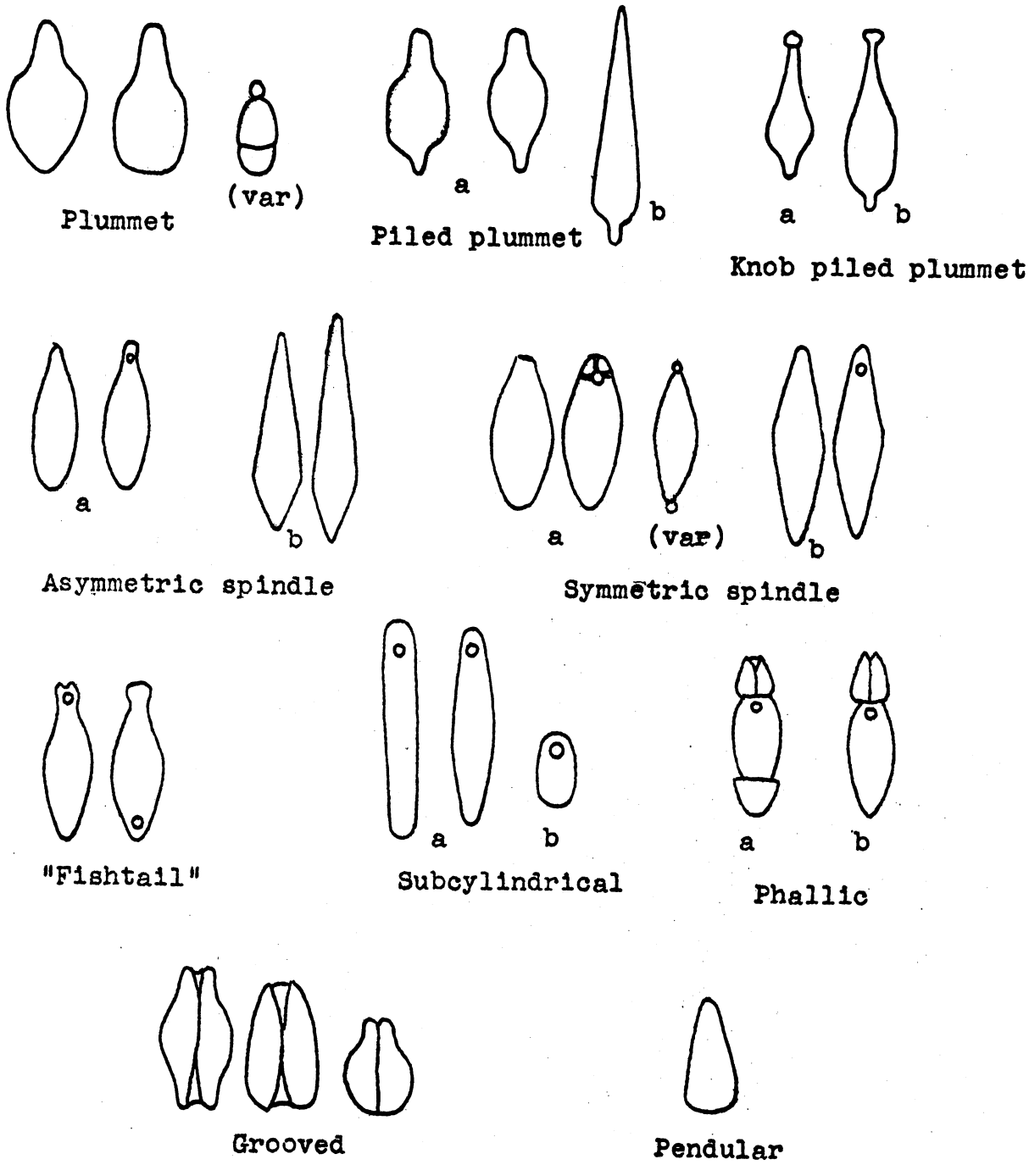


FIGURE 5. Charmstone types

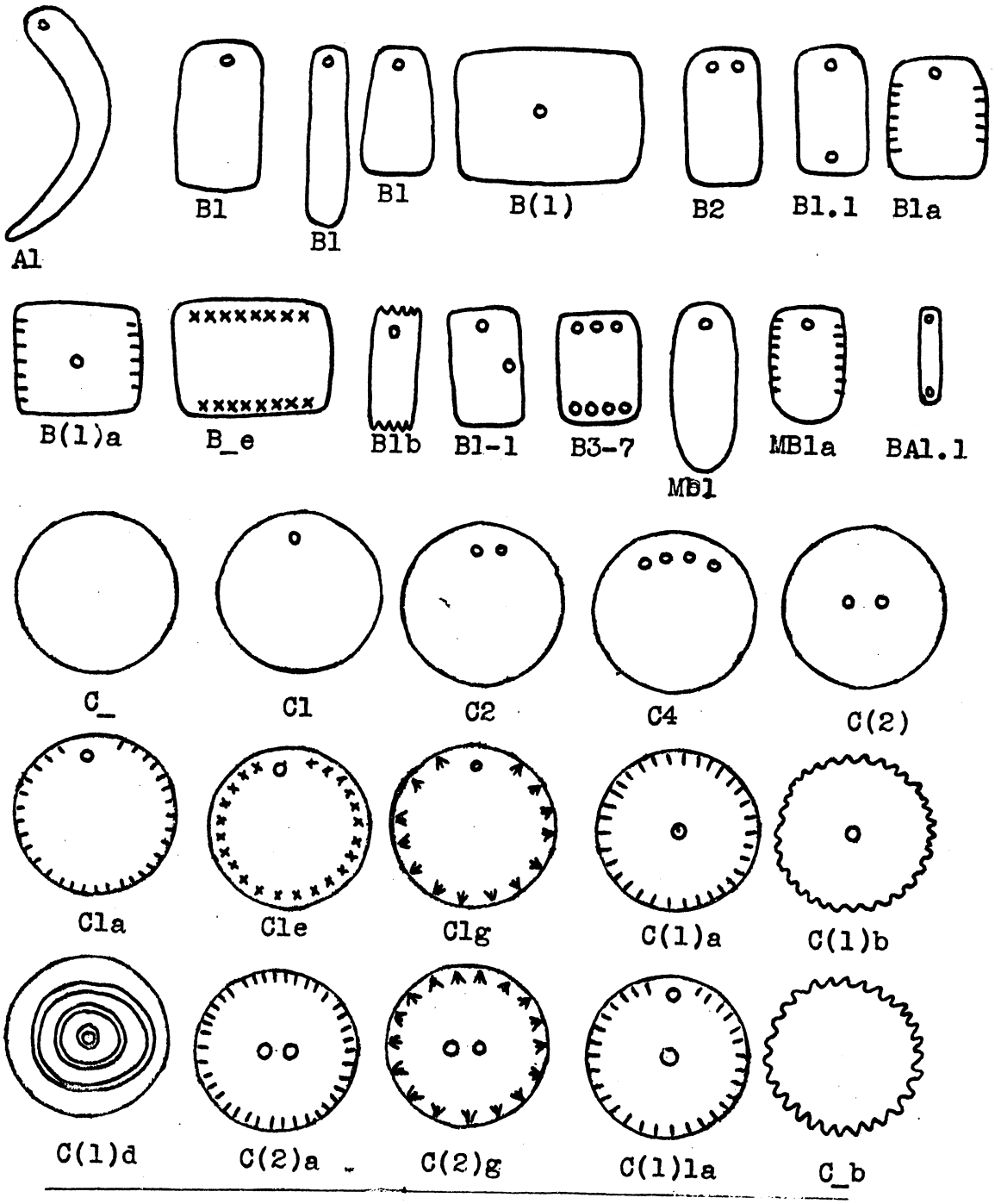


FIGURE 7a. Haliotis ornament types (I)

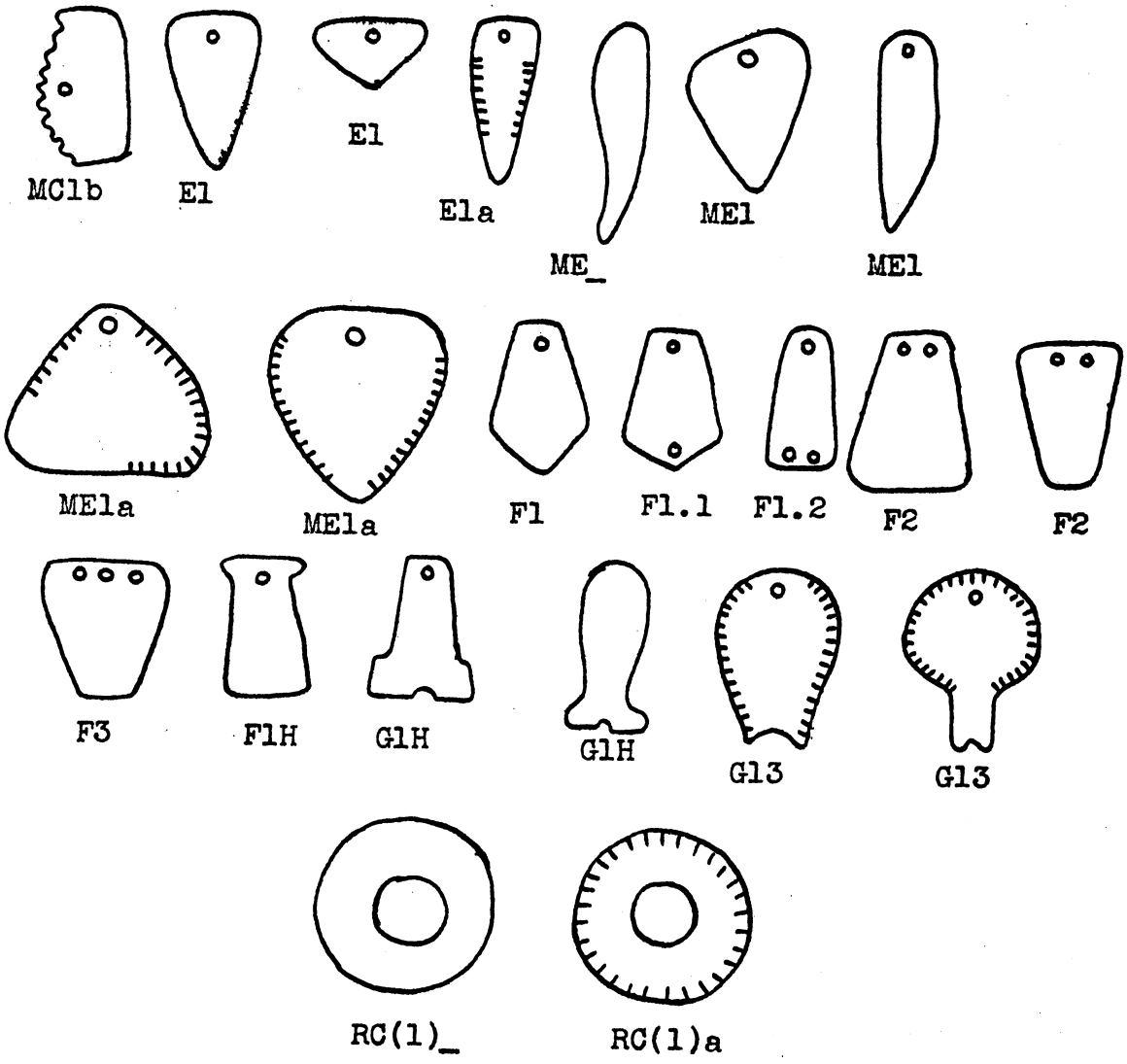


FIGURE 7b. Haliotis ornament types (II)

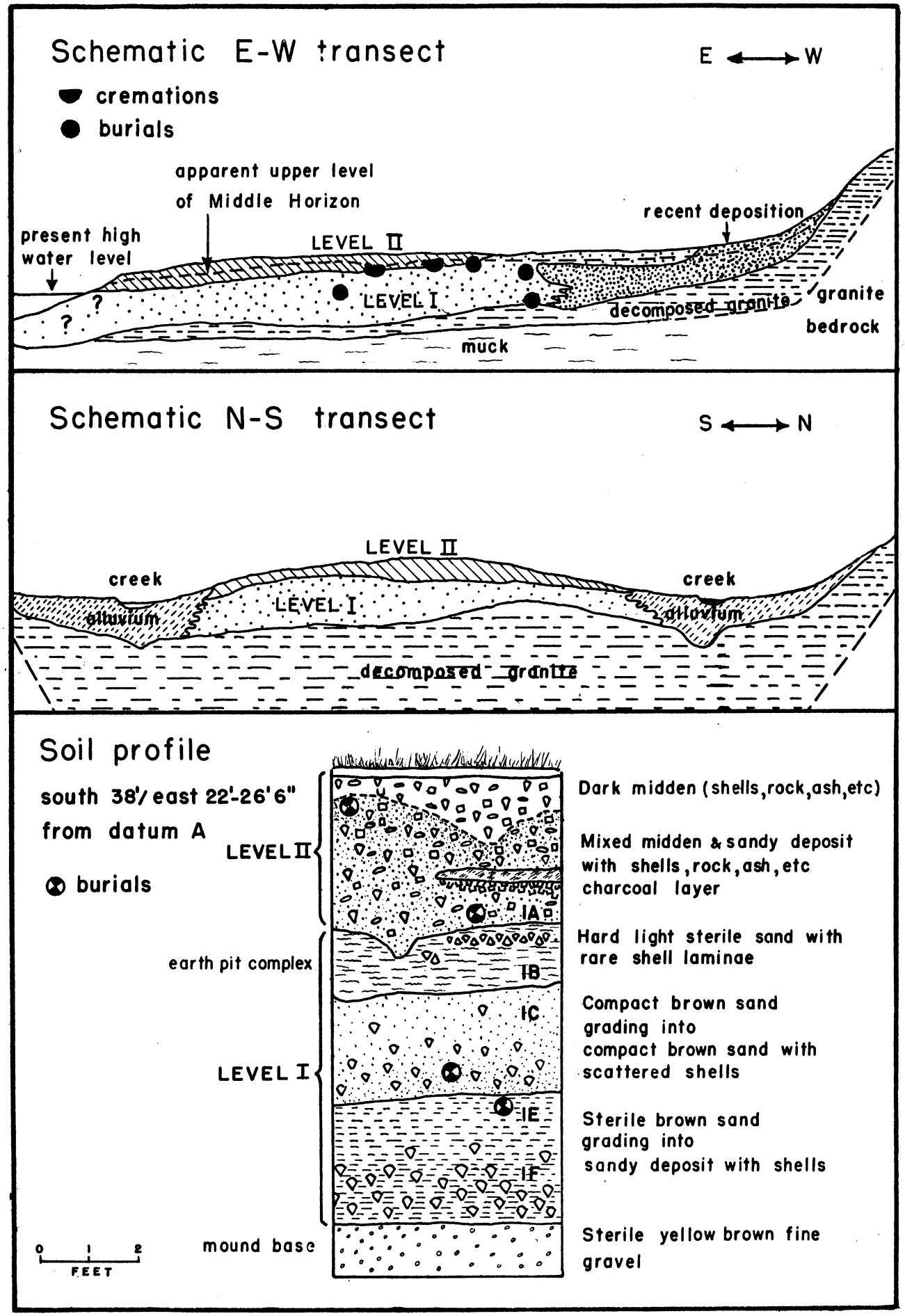


Fig. 9. Site 266 Tomales Bay

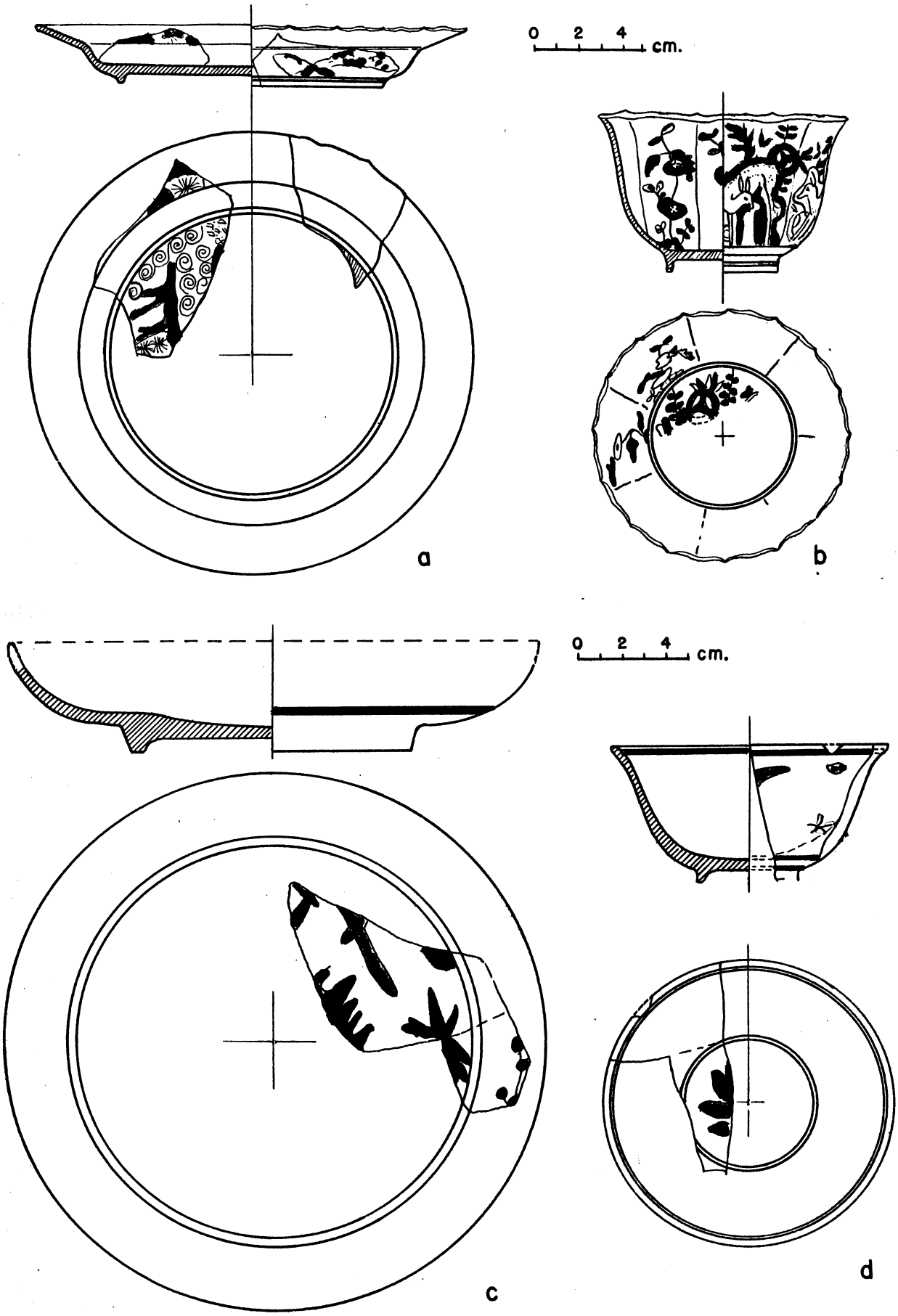
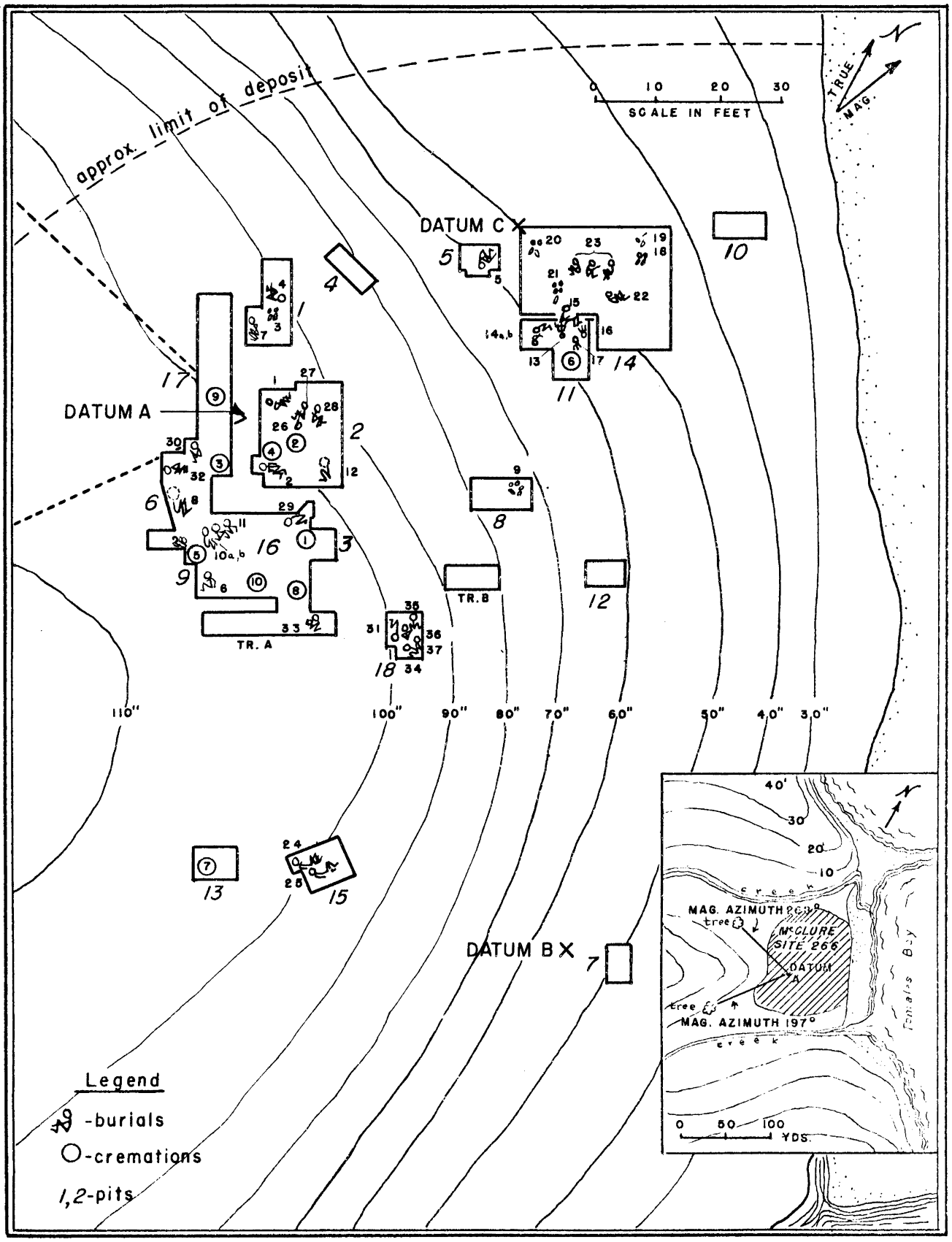


Figure 10



Map 5. McClure Site 266

		LITTORAL ZONE		INTERIOR VALLEY ZONE	
		MARIN PROV.	ALAMEDA PROV.	DELTA PROVINCE	COLUSA PROVINCE
LATE HORIZON	PHASE 2	ESTERO FACIES: Estero A, McClure A, Cauley A, Toms Pt.	FERNANDEZ FACIES: Fernandez A, Newark #1 A	MOSHER FACIES: Mosher, Johnson, Goethe, Nicolaus #4, Nicolaus #5, Hotchkiss A, Hicks A	MILLER FACIES: Miller A, Howells Point A
	PHASE 1	MENDOZA FACIES: Mendoza, Cauley A	EMERYVILLE FACIES: Emeryville A, Greenbrae A, Bayshore A, Ponce A, Maltby, Glen Cove	HOLLISTER FACIES: Hollister, Brazil A, Hotchkiss B, Hicks B	SANDHILL FACIES: Sandhill, Miller B
		COASTAL PROVINCE		INTERIOR PROVINCE	
MIDDLE HORIZON		McCLURE FACIES: McClure B, Estero B, Cauley B	ELLIS LANDING FACIES: Emeryville B, Greenbrae A, Bayshore B, Ponce B, Ellis Land., Stege, Potrero, West Berk., San Rafael B, Newark #1 B, Fernandez B?, Monument (?)	MORSE FACIES: Morse, VanLobensels, McGillivray A, Calquhoun, Koontz, Hicks C	DETERDING FACIES: Deterding, Wamser; BRAZIL FACIES: Brazil B; NEED FACIES: Need, Vail; ORWOOD FACIES: Orwood #2 B
				(Province Unnamed)	
EARLY HORIZON		(unknown)		WINDMILLER FACIES: Windmiller C, Blossom, McGillivray B, Phelps	

TABLE 1. CULTURE SEQUENCES IN CENTRAL CALIFORNIA ARCHAEOLOGY

Lower case names are components. Classificational terms are capitalized.

	EARLY		MIDDLE			LATE		
	Site	Burials	Site	Burials	Crem.	Site	Burials	Crem.
Sacramento Valley	C107	54	C107	15	4	N250a	19	1
	C68	51	C66	90	5	S66	37	13
	C56	47	S60	73	2	S60	16	5
	C142	45	C142	5	5	S1	54	
			S99	77	2	C138	(125)	
			S1	1	0	C150	12	1
						C141	2	
Total	4	197	6	261	18	7	(265)	20
San Francisco Bay	(N356	1?)	C259	2		N259	0	15
	(N328	1?)	N387	8		N387	14	
			N309	32		N309	16	
			N356	8		N356	15	
			N295	38		N295	4	
			N307	10		N326	7	5
			N283	(21)				
			N407	8				
			N76	1		N76	6	
			N86c	6		N86c	5	
			N328	11		N328	9	
			N300	(5)				
Total	2	2?	12	150	0	9	76	20
Marin Coast			PB266	24		PB266	17	10
			PB232b	4		PB232b	6	3
			PB242	7		PB242	18	7
						PB275	14	12
						PB271	1	
						PB201	8	1
						PB235a		1
Total	0	0	3	35	0	7	64	34

TABLE 2. TOTAL BURIALS AND CREMATIONS

Central California components. Except on the Marin Coast, many additional burials and sites are known which are attributable to the several horizons. The selection shown represents the burial data utilized in the text, and provides a rough index of sampling in the three areas.

Total Burials			a	b	c	d	e	f	g	h	i	j	k	l	m
7	a.	Glass trade bead		7	2	1		6							
28	b.	Clam disc bead	7		5	3	1	9	1						
5	c.	Steatite disc bead	2	5		1		2							
3	d.	Magnesite bead	1	3	1			1							
2	e.	Tivela tube bead		1											
13	f.	Olivella bead 3a1	6	9	2	1									
3	g.	" " 3d		1							1		1		1
1	h.	" " 3b2													
8	i.	" " 3c								1		5	5	4	1
8	j.	Perforated mica ornament									5		6	6	
14	k.	Red ocher								1	5	6		6	3
9	l.	Spatulate bone hairpin									4	6	6		2
4	m.	Large obsidian prism								1	1		3	2	

a. Marin Coast Area. (Data from five sites)

			a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
8	a.	Clam disc bead		3	3	7	1			2							
8	b.	Magnesite/steatite bead	3		3	4	1			1							
7	c.	Olivella bead 3a1	3	3		7	1			1							
23	d.	Cremation	7	4	7		1	5	2	3							
4	e.	Tubular stone pipe	1	1	1	1		1	1	2							
28	f.	Olivella bead 2a				5	1		2	2							
7	g.	Mode b charmstone				2	1	2									
42	h.	Red ocher	2	1	1	3	2	2			2	8	1	4	3	1	2
14	i.	Olivella bead 3b2								2		11	2		1	2	1
34	j.	" " 3c								8	11		1	3	1	2	1
7	k.	Haliotis bead 4								1	2	1		2	1	2	
6	l.	Center-perfor. Haliotis								4		3	2			1	
4	m.	Perfor. mica ornament								3	1	1	1			1	
7	n.	Spatulate bone hairpin								1	2	2	2	1	1		1
2	o.	Large obsidian prism								2	1	1				1	

b. San Francisco Bay Area. (Data from thirteen sites)

TABLE 10. CO-OCCURRENCE OF SELECTED BURIAL TRAITS

Note: Each burial sharing traits is listed as a unit.
Total of burials with each trait shown in column at left.
Four or more specimens of one bead type are counted as one occurrence.

NOTES

1. Beardsley, 1948. (Ed.)

2. Haag, 1942. (Ed.)

3. Chapters I-III appear in this Report; Chapters IV-VI appear in the next Report (No. 25). (Ed.)

4. Starred items (*) have not been printed. See editor's Preface for explanation. Double starred items (**) have been published earlier. Figure 1 appears in Beardsley, 1948, Figure 2, and in Heizer and Whipple, 1951, p. 149. Figure 11 appears in Beardsley, 1948, Figure 3. Tables 14 and 15 are published as Tables 3 and 4, respectively, in Beardsley, 1948. (Ed.)

5. This site, Son-299, was excavated in 1949, but the final report has not been prepared. (Ed.)

6. "With respect to the question of Tertiary man in California no final conclusion can be drawn." (1899: 469)

6a. Recent finds prove the existence of crude stone tools, probably to be interpreted as quarry-workshop refuse, in "auriferous gravels" in Stanislaus County. These are now assigned an early postglacial age, and no grounds for believing they are Pleistocene or Tertiary exist. See Treganza and Heizer, 1953. (Ed.)

7. Sinclair, 1904, 1908; Merriam, 1906; Putnam, 1906.

7a. Krieger (1953) accepts these as undoubted man-made tools (p. 242). I specifically disagree with Krieger, and believe that most archaeologists would also rate these as fortuitous. Both Krieger's and my judgments are matters of opinion, but I consider it bad method to state as a simple fact that these bone scraps are artifacts. (Ed.)

8. Jones, 1923: 113-122.

9. Uhle, 1907: 36-41. His speculations were suggested by paucity of artifacts from his tunnel into the lowest layers, and by the occurrence at low levels of various flakes of chert, which he singled out as typical artifacts, minimizing the import of well shaped bone implement fragments.

10. These and other San Francisco Bay excavations are summarized in Chapter V. Only three are described in published reports: Uhle, 1907' Nelson, 1910; Loud, 1924.

11. Nelson, 1909.

12. Because of large quantities of artifacts, reports were published (Nelson, 1910; Loud, 1924).

13. Kroeber's synthesis in the Handbook of the Indians of California (1925) deals with fuller material than his survey written ten years before (1909), but is almost equally handicapped by absence of time-depth perspective.

14. Nelson, 1909: 346; Gifford, 1916: 12-14. See also Nelson, 1910, and pages of this paper for description of the site.

15. Kroeber, 1925: 930.

16. Schenk, 1926.

17. Gifford and Schenk, 1926.

18. Schenk and Dawson, 1929.

19. Strong, Schenk, and Steward, 1930; Olson, 1930.

20. Olson, 1930: 10-11, 20-21; Rogers, 1929: 342-419.

21. Lillard and Purves, 1936.

22. Kroeber, 1936.

23. Heizer and Fenenga, 1939; Lillard, Heizer, and Fenenga, 1939.

24. 1939: 394-396.

25. Heizer, 1941a.

26. Still more precise definition, quoted by Griffin (1943: 329) from a mimeographed release, incorporates terms which are not used in this paper; "A component, then, would be a localized, and usually incomplete manifestation at a single site, of a culture which may be shown to be related to a larger cultural class by an analysis of determinants (marker traits) present in the component."

27. "The complete cultural manifestation of a local group, or as much of it as is determinable by archaeological exploration." (Cole and Deuel, 1939: 278).

28. This chart is not printed in the present report, but has appeared elsewhere, in Beardsley, 1948, Fig. 2, and in Heizer and Whipple (Eds.), 1951, p. 149. (Ed.)

29. Drucker, 1943: 35.

30. Krieger, 1944: 272.

31. Lillard, Heizer, and Fenenga, 1939: 4-5, 12, 14-17.

32. Lawson, 1914: 3; Anderson, 1895: 119.

33. Dickerson (1922) is the principal source for the following sketch.

34. Lawson (1894) includes one oak (Quercus agrifolia) in his list of type vegetation marking the dichotomy of coast and mainland. He adds Pinus muricata, Umbellularia californica, as characteristic only of the coastal triangle. A list of similarly distinct shrubs is also given. These floral assemblages, he believes, are divergent from

those of the neighboring mainland not only because of soil differences, but because of a fairly long period of physical separation along the San Andreas rift line.

35. Kesseli, 1942: 477.

36. Byers, 1939: 318.

37. Byers, 1939: 316.

38. Compare, for example, Munro-Fraser (1880: 94) with the Drake account (Anon., 1927: 53).

39. Kroeber, 1926: 273.

40. The first record of settlement "by white people" I have come across is in 1834, by a William Smith, who is implied to have deserted from a whaling ship and taken to beach-combing (Munro-Fraser, 1880: 296).

41. Ferrel, 1879: 310. Henshaw's identification of the Bay as Bodega is disputed by Wagner (1929: 77-78) who believes it to be Drake's Bay.

42. Ferrel, 1879, loc. cit.

43. Of several accounts, the most detailed is, The World Encompassed (Anon., 1628).

44. Kroeber, 1925: 274 ff.; Heizer, 1947. See also Heizer and Elmendorf (1942) for linguistic evidence, and Chickering (1937) for documentation offered by the find of Drake's "Plate of Brass."

45. Wagner, 1924; Heizer, 1941b.

46. Wagner, H.R., 1929: 249.

47. Mourelle, 1920: 92. "Pinole" probably refers to acorn-meal; "tomales" may refer to an acorn-meal bread baked in earth ovens (Isabel Kelly, ethnographic notes, MS).

48. Idem: 54. The land features generally distinguished today by mapmakers and by local inhabitants as Bodega Bay and Tomales Bay, separated by a 10 mile long, shallow bight, by earlier navigators were lumped as a single shallow bay called Bodega. Tomales was regarded as an estuary or as "the mouth of a considerable river." (Mourelle, 1920: 54).

49. Colnett, 1940: 174-6.

50. Wagner, 1931: 342-345.

51. Martinez y Zayas, 1931.

52. Eastwood, 1924.

53. Broughton, 1804.

54. Kroeber, 1925: 272-8. To details in the Drake account, Kroeber was able to add place names and boundaries, and judgment as to numbers and cultural affiliations of the pre-Hispanic population, but little in the way of ethnographic detail.

55. Heizer, 1947; Isabel Kelly, ethnographic field notes, University of California. In Dr. Kelly's materials for a Coast Miwok ethnography, distinctiveness of certain aspects of coastal life from interior life become apparent. I am indebted to Dr. Kelly for her kindness in making the field notes available to me, and to Dr. Heizer for permitting free use of his manuscript analysis of the Drake account.

56. ". . . of a certain kind of blacke wood, and in length about a yard and a halfe. . . . Whereupon hanged two crownes (feathered) a bigger and a lesse, with three chaines of a marvelous length, and often doubled; besides a bagge of the herb Tabah." Anon., 1926: 57.

57. They "performed a caracole and skirmished in a circle, like the Chichimecos, with loud cries." (Wagner, 1929: 159) Singing and dancing by men, voiceless dancing by women, is recorded in a different Drake account (Hakluyt, 1927: 244).

58. Data regarding sea-otter hunting have been taken from Ogden (1941: ch. 4, Appendix and passim); regarding the history and function of Fort Ross, from Du Four and others, 1933.

59. Hodge, 1910: art. "San Rafael".

60. Cook, 1943, I: 182.

61. Cook, 1943, III: 99. Gibbs' "Journal" of 1851, in Schoolcraft, 1853, 3: 112.

62. Munro-Fraser, 1880: 84-89.

63. Munro-Fraser, 1880: 250-54.

64. Ibid.: 123-4. It is interesting to note that his chief occupation was gathering abalone (Haliotis sp.) shells to sell to French (?) coastwise boats for Indian trade in the north, and that this business made the point something of a nautical landmark. On the significance of shell trade to the Northwest Coast, see Heizer, 1940.

65. Munro-Fraser, 1880: 296 ff.

66. University of California field parties, 1940-41 seasons. These field parties, from the Department of Anthropology, were made possible by research grants from the Board of Research. Dr. Robert F. Heizer was in charge of excavations to July, 1940; Richard K. Beardsley took charge for the remainder of the 1940 season and through 1941.

67. Local farmers' estimates of cliff erosion in Drake's Bay go as high as five feet per year. If this be reduced to one foot each year, a not unreasonable figure, up to three hundred feet may have disappeared since the terminal 16th century.

68. A survey study, made by Robert Ayres and Robert Hagan, Department of Soils, College of Agriculture, University of California, is on file in MS at that Department.

69. A selection of characteristic traits of each cultural horizon is shown in site by site tabulation in Table 12 (Part 2 - UCAS R. 25).

70. Heizer, 1947: 277.

71. This explanation is not completely satisfactory. Similar isolated basin structures not obviously firepits have been noted elsewhere, e.g., Wedel, 1941: 85, pl. 13; Webb and De Jarnette, 1942: 214. Willey lists a number of possible uses for related and equally mysterious structures in southern Argentina (1946: 44-45).

72. Uhle, 1907: 80; Schenck,1926: 229. Gifford (1940) segregates the antler tools as chisels (type D5), whalebone as wedges (type D6). My references in the following pages to Gifford's types and illustrations are all taken from the paper cited here. His alphabetic typology makes paginal citations unnecessary.

73. Uhle, 1907: 78. See Gifford's discussion (1940: 172).

74. Loeb, 1926: 177.

75. De Laguna (1934: 167-172) questions the pre-Columbian existence in America of the seine net and offers alternate interpretations of notched, pierced and grooved stones. This is not the place to argue the merits of her position; in this paper, alternative function is suggested for similar but smaller grooved stones (p.), but net-sinker use seems by far the most acceptable view for the present very numerous group.

76. Lillard, Heizer, and Fenenga, 1934: pl. 18.

77. Jochelson, 1925: pl. 23: 18, 25, 38-39.

78. For all bead types it has seemed best to set a lower limit of four specimens as a minimum for inclusion in the trait counts, in order to reduce the possible error from chance associations.

79. Heizer and Treganza, 1941: 306; Loeb, 1926: 176.

80. Heizer and Treganza, 1941: 334.

81. Possibility of confusing poorly made Olivella beads of one type with other types augments the reasons for counting only occurrences of four or more specimens as a certain occurrence.

82. Heizer and Treganza, 1944: 340-341.

83. Identified through the courtesy of Mr. Wm. I. Follett of Oakland, California.

84. Kroeber, 1925: 926.

85. Numerous suggestions made by various students are tabulated by Pennypacker (1938: 141-3).

86. 1907: 394 and pl. 46: 1.

87. Heizer and Beardsley, 1942.

88. "Mode" as used here has a broader connotation than is given to it in the archaeological studies of Irving Rouse, to whose work I am indebted for the concept (e.g., 1939: 11, 26, and passim). I use it here as a convenient device for categorizing significant attributes or non-concrete aspects of artifacts.

89. E.g., Nelson, 1910: 392, pl. 46: 5, 10.

90. Heizer, 1941a. (Since Beardsley wrote in 1947, the following additional information has been published: Meighan, 1950; Meighan and Heizer, 1952. Ed.)

91. Heizer, 1941b: 7.

92. All fragments were examined by Mr. Theodore Y. Hobby, Associate Curator of Far Eastern Art, Metropolitan Museum of Art, whose identifications are given for each site by Heizer (1941b: 11).

93. Report of Drs. Colin G. Fink and E.P. Polushkin, in Heizer, 1941b: 30.

94. Porter and Watson, 1933.