

CULTURE ELEMENT DISTRIBUTIONS: I
THE STRUCTURE OF
CALIFORNIA INDIAN CULTURE

BY
STANISLAW KLIMEK

UNIVERSITY OF CALIFORNIA PUBLICATIONS IN
AMERICAN ARCHAEOLOGY AND ETHNOLOGY

Volume 37, No. 1, pp. 1-70
9 tables, 6 diagrams, 6 maps

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY, CALIFORNIA

1935

CULTURE ELEMENT DISTRIBUTIONS: I

**THE STRUCTURE OF
CALIFORNIA INDIAN CULTURE**

BY

STANISLAW KLIMEK

UNIVERSITY OF CALIFORNIA PUBLICATIONS IN AMERICAN ARCHAEOLOGY
AND ETHNOLOGY

Volume 37, No. 1, pp. 1-70, 9 tables, 6 diagrams, 6 maps

Issued December 18, 1935

Price, \$1.00

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY, CALIFORNIA

CAMBRIDGE UNIVERSITY PRESS
LONDON, ENGLAND

CONTENTS

	PAGE
Preface by A. L. Kroeber	1
I. Introduction	13
II. Method	14
Literature	19
III. Material	20
Literature	30
IV. Racial composition	31
Literature	33
V. Analysis	34
Territorial entities	34
Cultural elements	36
Literature	47
VI. Synthesis	49
Literature	60
VII. Historical perspectives	61
Literature	69

TABLES

1. Coefficients of similarity (Q_s) among sixty California tribes	<i>facing</i> 34
2. Distribution of the first section of elements	<i>facing</i> 36
3. Distribution of the second section of elements	<i>facing</i> 38
4. Distribution of the third section of elements	<i>following</i> 40
5. Distribution of the fourth section of elements	<i>facing</i> 42
6. Distribution of the fifth section of elements	<i>facing</i> 44
7. Coefficients of similarity (Q_s) between cultural strata and particular tribes	50
8. Coefficients of similarity (Q_s) between cultural provinces and linguistic families	53
9. Historical sequence of California Indians	64

DIAGRAMS

1. Coefficients of similarity (Q_s) among sixty California tribes	35
2. Coefficients of similarity (Q_s) among the distributions of elements in the first section	37
3. Coefficients of similarity (Q_s) among the distributions of elements in the second section	39
4. Coefficients of similarity (Q_s) among the distributions of elements in the third section	<i>facing</i> 40
5. Coefficients of similarity (Q_s) among the distributions of elements in the fourth section	44
6. Coefficients of similarity (Q_s) among the distributions of elements in the fifth section	45

MAPS

1. Linguistic entities in California	20
2. The distribution of racial components in California	32
3. Cultural provinces in California	52
4. The distribution of cultural strata in California	54
5. The distribution of cultural strata in California	55
6. The distribution of cultural strata in California	56

PREFACE

By A. L. KROEBER

IN DOING US THE HONOR to examine our California ethnography statistically, Dr. Klimek has injected into this body of studies a stream of new blood which is invigorating and welcome. It is a pleasure, in reviewing his methods and results, to express appreciation of this stimulation and faith in the fruitfulness of his approach.

I

Fundamentally, Dr. Klimek's approach rests on the recognition and use of culture elements or traits. These have long been in ethnological employ without criticism on methodological grounds, so far as I know. Examples are: Boas' work of forty years ago on the distribution of folklore motives; Wissler's culture-area classifications; almost all Nordenskiöld's studies; the work of the Danish school on the Eskimo, culminating in Birket-Smith's comparative analysis of long lists of elements; and many other publications. Therefore, the fact that Klimek deals with elements is scarcely open to objection unless the basic methods of almost all modern ethnology, especially that concerned with America, are challenged.

Next is the question of how he has used the elements. It seems to me that here his statistical treatment *per se* is of secondary significance because it is a technique rather than a basic method. The question of first importance is whether the elements operated with are justifiable units. It would seem that the answer must be an unhesitating yes, provided three conditions are satisfied. First, the elements must be sharply definable. Second, they must be derived empirically, not logically. And third, they must be accepted for use without bias or selection.

The need of definable differentiation will be self-evident. It is the equivalent of measurability in other types of material. In the present instance, Klimek's four hundred-odd elements are derived from a list of more than eight hundred which I compiled several years ago, with somewhat different ends in view. Some of these elements he discarded because the distributional data on them were too incomplete. Others he rejected because they proved to be conceptually vague, that is, not sharply definable. Some of these, however, became usable as soon as each had been broken up into two or more smaller elements, which then were definable. Still others of his four hundred were new elements suggested by more intensive consideration of the original list.

Empirical derivation implies definability in empirical terms, not merely logical ones. What has just been said of the history of Klimek's elements, ap-

plies also in this connection. Broad concepts like "Creator," "symbolism," "caste" are in general not usable and have been avoided by him. Some he has been able to use after applying limiting specifications which made them definable and which were derived from empirical consideration of the data on the culture of the area in question. Thus "Creator" might satisfactorily break up into "anthropomorphic" and "animal Creator"; or, in California, at least "Coyote Creator" might be saved for use, though "Creator" might also have to be broken up into "Creator *ex nihilo*," "Creator working on existing material," "Transformer," etc. In practice, elements which are of logical rather than empirical origin tend to reveal themselves as such because data are encountered which do not fit unambiguously into the concepts. If this does not occur, or if unwittingly data are forced into the definition frame of elements, the error may show in the distributions or correlations. Klimek mentions such an instance: wooden smoking pipe with bulbous end. This seemed clear enough and the distribution is continuous, but the correlational adhesion of the element to groups or "strata" of other elements was irregular and recalled attention to the fact that there are really two types of bulbous pipe in California. The bulb at the bowl end of the Pomo pipe is sudden and pronounced; the inflation comes virtually at right angles to the stem and its diameter is several times that of the stem. In the Miwok pipe, the bulb is a gentle and sloping swelling. Historically there can be no serious doubt that the two types, occurring in contiguous regions, are related in origin, especially because their joint area is surrounded by areas of conical, tubular, angled, or concave pipes. Nevertheless, they are distinguishable types, however insignificant the merely conceptual difference between them, and, as Klimek points out and the empirical results show, it would have been better to have treated them separately.

The third criterion, nonselection of data, is of course axiomatic in any statistical approach, and should be equally so in any nonstatistical one. However, because the principle has been more often implicitly held than explicitly stated, there have been and are violations in practice. One of the values of the statistical approach in fields such as ethnology is precisely its tendency to make certain fundamental methodological errors more patent.

Concerning "negative elements," about which Driver and I have previously expressed ourselves with some hesitation, Klimek's apt statement is sufficiently clarifying. He says there are no negative elements, only negative distributions of positive elements. Of course this does not preclude occasional expression of an element in negative form, when convenient. "No dogs kept" with a plus sign is not different from "dogs kept" with a minus. Each reference is to the positive element of dog-keeping as a potential element in a culture.

It goes without saying that elements not occurring in the group of cultures being examined must not be dragged in. Automobiles and ice-cream cones are irrelevant to a consideration of the pre-Caucasian Indians of California, but

would become relevant in a comparison of the Indian culture with ours. This is really an extension of the principle that procedure must be wholly empirical, never merely logical. The point is evident enough, but I mention it because there have been occasional objections to the quantitative approach on the ground that it might commit absurdities of this sort.

Not so simple is the point that the elements dealt with may be of different cultural weight, "size," or importance. For instance, determining whether the bulbousness of a pipe is sudden or gentle, or even whether the pipe is bulbous or concave, is less important than knowing whether tobacco is smoked or eaten; and use or nonuse of tobacco is almost certain to be of less significance, so far as the lives led by the bearers of a culture are concerned, than presence or absence of agriculture. This variability in significance or psychological value of the elements dealt with quantitatively must be freely admitted. It means that statistical treatment cannot, or does not yet, attack problems of psychological value. For its own purposes it is sufficient that the elements, irrespective of size or value, be definable units empirically derived and unselected.

Being a layman in statistical theory, I cannot speak of the correlation formula used by Klimek. If I understand him correctly, any measure of relation that is applicable to a given body of data is valid, its choice being relative, and legitimately basable on operative convenience or sharpness of results expressed. This appears to be another exemplification of the fundamental principle of empirical procedure.

What does seem to be of practical importance is the ranking of the relationships found and the grouping of these rankings. It is inconceivable that anyone should fail to see ethnological significance in groupings as thoroughgoing as those so vividly expressed in Klimek's diagrams.

Another point is unquestionably important. The more hesitant efforts of Clements, Driver, and myself in this direction were limited to a consideration of the varying degrees of similarity or relationship between ethnic groups or tribes. Klimek adds to this an inquiry into the degree of coöccurrence or "adhesion," to use Tylor's famous term, among elements. This gives him what might be called blocks of culture which have actual existence, to a greater or less degree, in the world of nature; in other terms, objective groups of culture material or culture "strata." These blocks or strata he then compares with the blocks or groupings found in the tribes. With this three-step procedure, he attempts more and achieves more than we with our single process. This, perhaps, more than the particular formula he uses, is the reason for his progress over his predecessors.

II

So much for method; now to consider the results of Klimek's investigation. To my mind, the result which claims first attention is the high degree of local specialization demonstrated for the native cultures of California. In a general way we have all known this fact, but it is important to have it proved with

precision. The elements occurring only in part of the State, most of them only in a minority part, greatly outnumber those that are universal. Even such universals as "twined basketry" or "shamanism" are usually only assemblages of more specific units of limited distribution, such as "overlay," "three-strand," or "openwork" twining. When one considers the degree of this local specialization within a basic culture reckoned as low-level, one is impressed by the unceasing strength of the impulses toward new cultural productivity which apparently inhere in all cultures.

More specifically, Klimek's classification on the whole confirms the grouping of Californian cultures previously made on nonquantitative or merely estimative grounds, but with some important differences. As would be expected, the Northwestern and Lower Colorado River cultures and, to a considerable extent, that of Southern California segregate themselves from the others. But the central or proper California culture breaks up into local varieties to a surprising degree. There are Yokuts, Miwok, Pomo, Sacramento Valley, and Upper Sacramento Drainage types, or well-differentiated variants. It begins to look as if there is no culture which can be described as most typically Californian. In the south and north of the State there are patent Southwestern and Northwest Coast influences. The large central area is perhaps most distinctively characterized by the relative absence of these extraneous influences. Its common and distinctive traits appear considerably less numerous than its internal local specializations.

In northwest California, Klimek's figures show some heaping or intensification of the local culture among such central tribes as the Yurok, as compared with marginal ones such as the Shasta or Sinkyone. However, all share a very large stock of elements which do not occur in the rest of the State, and vice versa. Therefore, so far as concerns Californian data alone, the segregation of the Northwestern culture into its internal strata or group-components is not feasible. This problem can be attacked only by comparison with farther Northwest Coast data, and Klimek has chosen this as his next task.

III

Klimek's classification of Californian cultures is a more precise definition and elaboration of the customary groupings, made heretofore on a nonstatistical basis, but he enters a realm of almost wholly new findings when he proceeds to reconstruct the history of California culture. Here his problem is no longer that of discovering ascertainable relations, but of hypothetically interpreting them in a framework of successive events. His conclusions are shown in the table in Historical Perspectives.

A historical reconstruction is difficult because, apart from a few blocks of culture material which have a wider distribution than most other blocks and are therefore presumably older, there is nothing within the frame of California ethnology *per se* by which to judge relative historical sequence. For

this, some *tertium quid* is needed—a fulcrum for the lever. This might be supplied by direct archaeological data, ethnological groupings outside California, or classifications of the bearers of the local cultures by physical type or speech.

Of these *points d'appui*, archaeology has as yet yielded only the meagerest sequence findings in California. On the whole, ethnology in the surrounding regions has been less systematically prosecuted than in California, so that data for as even a treatment of them as Klimek has been able to give California are scarcely at hand or, if they exist, could not be extracted and compiled without inordinate effort. Of the remaining bases, language has two advantages over race: it intergrades less, and normally is more closely associated with culture. With the possible exception of Yuki, all Californian languages have, or are believed by some reputable authorities to have, relatives elsewhere, and many of them show similarities to languages in regions as remote as Alaska, Newfoundland, and Mexico. From the speech classification into families, accordingly, Dr. Klimek has taken his principal external measure.

I must admit to some doubts concerning the strength of the inferences resulting from these speech comparisons, although perhaps not on conventional grounds. *Per se*, I hold the correlating of language and culture justifiable, within reasonable limits. It is true that the correlation is in some instances vanishingly small, in others overwhelming. When, a generation ago, anthropology under the leadership of Boas set itself the task of acquiring genuinely critical method, the clear recognition that the language-culture correlation was sometimes extremely low, and that therefore summary inferences from language to culture might be badly misleading, was an important methodological advance.

However, the fact that a correlation may sink at times to zero is no reason for assuming it normally to be zero, when we know that it often approaches completeness. And yet, in our ethnological preaching to laymen and elementary students, and then to one another, we have too much got into the habit of assuming that what might be an error was an error, of ordering our work as if an inference from speech to culture were *ipso facto* a heresy, and of largely ignoring the findings of even high-grade and cautious scholars like Swanton and Dixon when they depended on such inferences.

These statements apply particularly to American ethnologists, whose data have been in the main wholly timeless and whose ethnological problems, therefore, have tended to take on unhistorical forms. Among European students, who are drawn more largely from circles familiar with history and who concern themselves more often with cultures in some way connected with historical cultures, the attitude has been much less extreme, and their greater historical perspective has prevented them from morbidly shrinking away from culture-linguistic relations. In European ethnology there have probably been more abuses, but also fewer self-imposed blockings of problems.

In short, the correlation of culture and speech is one to be investigated in each instance, not to be puritanically denied or tabooed in advance. Boas himself has always recognized this, but other minds under his influence have sometimes failed to do so.

Therefore, I would not quarrel with Klimek for bringing language into his synthetic reconstruction. But I doubt whether the linguistic data available are sufficiently refined to give much reliable help. The groupings or families with which he can operate are often few and gross and, moreover, of different orders. Shoshonean and Athabascan, for instance, are groups long recognized, with fixed and proven limits of inclusion. Hokan and Penutian, on the contrary, were recognized only twenty years ago, and though perhaps no longer explicitly challenged as families, are still viewed with doubt or reserve in some quarters. Luiseño and Comanche, or Hupa and Navaho, unquestionably have more immediate similarities to each other than have, for example, Shasta and Yuma, or Wintun and Yokuts.

In other words, Athabascan and Shoshonean are relatively homogeneous and Hokan and Penutian relatively heterogeneous families, and this fact is significant even to one who is wholly convinced, as I am, that the various Hokan and Penutian languages, respectively, are genetically unitary in origin. Still more differentiated, apparently, are Yurok and Wiyot from typical Algonkin. Their adhesion to it is still in controversy which, though I believe it needless, at least expresses their separate position. Descriptively, Yurok and Wiyot are no more than Algonkinoid in terms of what was, until recently, universally meant by Algonkin.

In bringing these speech families into his hypothetical synthesis, Klimek is almost forced to disregard the differences in degree of homogeneity or closeness of adhesion to the stock. Hokan and Penutian he has, indeed, at the bottom of his time scale, but much less differentiated Shoshonean immediately follows; whereas Athabascan and Algonkin, one highly homogeneous, the other highly heterogeneous, enter the scene together two periods later.

It would of course be possible to frame subsidiary hypotheses, such as that Wiyot and Yurok had acquired their differentiation from typical eastern Algonkin long before they reached California. But this explanation would raise the question of whether Wiyot and Yurok, although in contiguity, were not highly differentiated from each other as well as from Algonkin.

All these problems may clear themselves up in time, but meanwhile the linguistic data remain far less finely analyzed than the cultural ones which Klimek has defined and to which he relates them. For instance, a classification of the Hokan languages in California has not even been undertaken. The grouping of the five California branches of Penutian has been attempted, but without very clear-cut results, and without reference to the more northerly tongues such as Kus, Chinook, and Tsimshian, believed by Sapir to be related to Penutian in origin.

The solid Penutian block in the great central valley of California presents a number of difficult and important problems. It is essentially within this block that features occur, such as secret impersonating cult societies, exogamous units, cross-cousin marriage, and clan-type kinship systems, which are not found elsewhere in California but reappear farther east. A good deal in the California ethnological situation would be accounted for if a body of relatively undifferentiated Penutians, with a culture of their own, could be brought into California at a fairly early time. This fact Klimek's interpretation accentuates clearly. The difficulty is that there are neither cultural nor linguistic data with which to locate the start of the proto-Penutians' migration: they seem to have left no evidence either at the point of origin or on the way. Of course, this is a difficulty beyond the frame of Klimek's work, and he at least has shown what sort of explanation in outside terms would satisfy the conditions of the local picture.

In general, I am disposed to accept the first three main periods of his historic sequence tabulation, at least with reference to one another, and the priority of the first two to subsequent periods. I base such agreement primarily on the relative geographic extension in recent times of the several cultural strata or complexes of elements. Of these, Y is the most widespread, being represented in the culture of all tribes of the State except those on the lower Colorado. It is also likely that the Hokan peoples, the most widely scattered in California, took an active part in the development of this culture stratum. The Z stratum, the next most extensive, is represented everywhere except on the lower Colorado and in the Northwest province. The area of this stratum is greater than that of the Penutians, and consists of three subcomplexes of different distribution: Z_1 , within the North Central province; Z_2 , in the North Central province and San Joaquin valley; Z_3 , in both the others plus southern California. For this reason an original association of Z with Penutian bearers seems less compelling than of stratum Y with Hokans.

Period III, the development of the C_2 stratum, now found in southern California and the San Joaquin valley, together with the entry of Southwestern influences and the occupation of southern California by Shoshoneans, seems well enough placed after I and II, but its definite priority to all the subperiods and complexes of IV appears much less certain.

Again, within period IV the order of the stages C_1 -B, E-F-G, D-L seems reasonable enough as a tentative hypothesis.

Klimek dates the establishment in California of the Northwest Coast culture, I, in connection with Athabascan and Algonkin immigrations in period V, which seems too late. This is the point on which I would dissent most from Klimek's historical scheme, on a variety of grounds besides the ethnic-linguistic considerations. The Northwest Coast culture may be, as he says, a recent one among the major ones of the continent. Yet even this would involve an age greater than is allowed for by the next to the last place in his table.

A culture of such rich individualization and geographic extension as this one requires a considerable period to develop. Doubtless, certain expressions of it are rather recent, but these rest on other old ones: the totem pole and the plank house are examples. Reasonable antiquity also must be attributed to the Northwest California culture because it is not merely Northwest Coast culture of, say, the Oregon type extended to California, but a distinctive provincial variant of it; a variant, moreover, which seems much more an active specialization than a dilution with Californian elements. Again, if this culture were recent in its area, it presumably would be underlain by a culture of California type such as Y or Z, or possibly Pomo, G. Of such an underlying there is no archaeological trace except possibly the occurrence of stone mortars. To be sure, there have been very few archaeological excavations in the area; but such material as has come to light through sporadic digging, hydraulic mining, and erosion consists—apart from mortars—of forms characteristic of the region in the historic period, not of Californian forms.

I suspect that we interpret the age of this Northwestern culture differently because, as Klimek says, there is nothing in the Californian ethnologic data which enables him to break up the I culture block, but when comparable data from north of California become available, this block will differentiate itself into earlier and later strata.

It is rather strange, as I have remarked on other occasions, how abruptly the Northwest Coast culture dies away in northern California after having persisted for several thousand miles; how little of California, after all, it succeeded in penetrating. At first glance, this suggests recent arrival. However, I believe the causes for its abrupt ending to be largely environmental: a sheer, shelterless coast, the absence of large streams beyond the Klamath and lower Eel, and the change of vegetation from heavy forest to parkland and chaparral. Farther north, in the heart of the culture, such geographical factors might have been transcended; at the southern outpost, with other cultures already established beyond, the altered terrain was more likely to operate as an effective barrier.

Klimek's period VI probably will be generally accepted as late, but it does seem clear that its two strata, M and K, can scarcely be on exactly the same chronological horizon. The final shaping of Modoc-Klamath culture under Plains influences is a quasi-historic event which, at least in the main, must have occurred after 1800. The influencing of Wintu and Achomawi by the Northwestern culture was essentially accomplished by that date, and must have been started centuries before.

Those who concern themselves with such matters at all, may be interested in comparing Klimek's reconstruction with one which I attempted a dozen years ago in volume 20 of this series, and which, incidentally, appears to have been pretty consistently ignored except for a few protests on general methodological grounds. Our two schemes, although quite variously arrived at—mine is

frankly intuitional—agree fairly well in substantial but differ in detail, as might be expected.

In any event, it is important to remember that Klimek's hypothetical historical reconstruction is limited to his section on Historical Perspectives, and represents an inferential extension from his classificatory findings. Its modification or rejection does not impair determinations made in his first six sections.

IV

Not least in importance are certain by-products of Dr. Klimek's work which will influence further study of the ethnology of western North America. First of all, his quantitative survey revealed at once the extent of deficiencies in existing knowledge. Such deficiencies need no comment when they are caused by the disintegration or extinction of native cultures or the limiting of investigation to orientation reconnaissances, but almost invariably they have other causes also. Even in intensive ethnographic monographs, items simply are overlooked. The ethnographer is particularly interested in some things and forgets to inquire about others, or he inquires about a certain thing, receives a negative reply, and fails to include this in his report. Spier is perhaps the most honorable exception. He consistently reports negatives.

It is not surprising that authors' data are not entirely comparable: one is most interested in patterns, another in psychology, a third in values, a fourth in change processes, and a fifth in age or history; one begins study with the problem of social structure, and another with that of religion or technology. California ethnology has been prosecuted more systematically than that of many regions; for more than thirty years each investigation has been a part of a continuous program; and yet we were appalled at the frequency with which a given specific item was represented by data from only a dozen, or not more than three or four, of the sixty tribes dealt with by Klimek.

We decided that these gaps in distribution knowledge should be filled, not by gradual and more or less haphazard by-products of studies primarily directed at other objectives, but by a special survey. A list of elements was drawn up, consisting of those used by Klimek, some which he had been forced to disregard, and such others as were suggested by these or otherwise promised to yield results. This was not a "Notes and Queries" questionnaire for novices, but a complete reminder list based on specific California experience, and so framed throughout that, while opportunity was left informants to amplify, they would at least affirm the presence or absence of each particular item in their culture.

Of course no such list could take the place of a standard ethnographic description because it would neglect whole masses of information on subjects as diverse as attitudes, values, individual variations, important personages, territory, ethnic geography, etc. However, it was hoped that inquiries from the list would readily yield reliable results on comparative distributions of ele-

ments known to occur somewhere in California, and thus allow further and more accurate inferences.

Joint field work was begun by E. W. Gifford and Klimek among several groups of the Sacramento valley—Yana, Wintun, Patwin, and Lake Miwok—and then extended to sixteen surviving Pomo groups or tribelets. Klimek and H. E. Driver each assisted Gifford with certain groups, and I was present at one investigation. The rest of this work was done by Gifford alone. The method thus was adequately tested in the field, and, incidentally, the basic list was modified in detail at many points as work progressed.

The results were gratifying. Most Indian informants quickly grasped the purpose and method of the list-questioning and accepted it coöperatively; some preferred it. It helped many to focus their attention on the old cultures as distinct from the hybridized ones in which they live, and on differences between their particular tribelets and adjacent ones. In short, the information tended to particularize, as compared with that yielded by the usual full-descriptive method. Its reliability we felt to be fairly high, for a first attempt; an informant unreliable or vague about the type of data sought quickly revealed himself.

A worker with previous field experience in the area and accustomed to dealing with the natives, in from one to three days was able to secure presence and absence information on perhaps a thousand cultural items, plus numerous bits of additional information often invaluable as leads for future fuller inquiry. The full-description method would have required from one to three months, and the list inevitably would have shown gaps.

This is of some importance to distributional studies, when it is remembered that native California contained about five hundred separate ethnic groups or independent communities, each with a certain degree of cultural distinctness, and from about a third of these data can still be obtained. Obviously these two hundred minute groups cannot each be treated monographically. Full descriptions will have to be somewhat generalized accounts of groups of related tribelets, or accounts of particular tribelets selected as illustrations. On the other hand, the comparative and distributional data will never be known accurately unless each tribelet is given some individual attention by some such method as the questionnaire survey. This information is as necessary for understanding the dynamics—processes of change, and the like—of the native cultures, as for reconstructing their history.

For instance, after Loeb's and my recent studies of the Kuksu cult, it became evident that deeper understanding of this interesting system could be attained only through more data on its local variants. There was really no Patwin or Pomo form of the cult, nor even an Eastern Pomo or Northern Pomo form. Instead, there were a dozen or so communities each speaking a form of the Northern Pomo language and possessing a Kuksu cult with certain distinctions. Obviously the Kuksu system in its history has been locally

altered innumerable times, and the nature of these changes can be determined only through intensive local comparisons. Until these comparisons are made, reconstructions of the history of the whole system will necessarily be summary and lacking in the degree of reliability which they might have.

All this indicates that we in California must supplement the ethnographic work which we have been and are doing, with organized comparative work on the element basis, and must do so as soon as possible. In many instances one aged person alone retains memory of the culture of a group.

The method also must be extended to adjoining areas—Northwest Coast, Plateau and Great Basin, and Southwest—to obtain comparable knowledge without which many situations in California will remain unintelligible. Klimek hopes to aid in this task by preparing a preliminary element list to serve as a basis for fieldwork in one of these regions. Obviously the bulk of the fieldwork must be done by Americans who can return to it again and again, and coöperate with one another systematically.

All this is program, and therefore should not be unduly elaborated here. It is mentioned because it illustrates the fuller significance of Klimek's work. In addition to the value the statistical approach has in itself—and of this value I am convinced—it clarifies concepts, sharpens definition of problems, and reveals new problems which call for more exact factual investigation. It does not do away with established methods of fieldwork, but supplements them with a new method. This we might have groped toward and ultimately found, but Klimek's work speeded our understanding because the precision of his attack called for data of greater precision; and we are grateful.

THE STRUCTURE OF CALIFORNIA INDIAN CULTURE

I. INTRODUCTION

THE AIM of this work is to determine the structure of California Indian culture and to interpret it historically. The basic material was provided by the researches of the California school of ethnology, under the direction of A. L. Kroeber. For the analysis of the material, I have employed the method of J. Czekanowski.

This collaboration is not the result of accident. It has its foundation in the similarity of aims and interests of the California and Polish schools of anthropology. Both have in common the sense of historical reality, which explains their negative attitude toward *a priori* psychologizing and dogmatic patterns of culture complexes. The chief effort of the California school has been to obtain the most complete and reliable evidence of the source material. We find the same motive behind the researches of the Polish school. This positive relation to ethnographic material explains the fact that California and Poland today are ethnographically the best known areas in the world.

However, the most important common aim of the California and Polish schools has been to introduce more exactness into ethnological research and to avoid meaningless pseudo-methodological phraseology. The present work is thus a continuation of the ideas represented in the contemporary ethnology of Kroeber and Czekanowski.

This work was done during the academic year 1933–1934. It would have been impossible to accomplish the presentation and analysis of such a large body of material in so short a time without the kind assistance offered by the staff and associates of the Department of Anthropology at the University of California. First I should like to express my sincere gratitude to Dr. A. L. Kroeber. He not only placed at my disposal his ethnographical data, but also discussed with me the results of my analysis.

For supplementary data concerning the cultural inventory of particular tribes, I am indebted to Dr. R. H. Lowie (Washo), Mr. E. W. Gifford (Coast Yuki), Mrs. G. Nomland (Sinkyone, Nongatl, Mattole, Bear River), Dr. Cora Du Bois (N. Wintun), Dr. Isabel Kelly (Paviotso, Chemehuevi, Las Vegas, Coast Miwok), Miss S. Brandenstein (Achomawi-Atsugewi), Mrs. E. Voegelin (Tübatulabal), Dr. R. L. Beals (Nisenan), Mr. H. E. Driver (Wappo), and Mr. P. Drucker (Tolowa). I am deeply grateful for their kind assistance. Further acknowledgments are due the authorities of the University of California who financed my fieldwork among the Yana, Wintun, and Pomo, done in collaboration with Mr. E. W. Gifford. My sojourn in California and the opportunity of undertaking this work I owe to the fellowship granted me by the Rockefeller Foundation.

II. THE METHOD

This section is given over to the presentation of the general principles of the ethnological method.

The method to be applied to any knowledge is determined by three criteria :

1. The epistemological nature of the knowledge.
2. The aim of the investigation.
3. The material itself.

Applying these criteria for the purpose of defining the method of ethnology, we are able to establish (1) that ethnology is an inductive or *a posteriori* science, (2) that its aim is the reconstruction of the history of those ethnic groups for which we have no written documents, (3) that its material consists of ethnographic observations.

Therefore, the method of ethnology must be inductive and, through it, an historical interpretation of ethnographic material may be given. The first of these two conditions does not need further explanation because the foundations of induction are common to all *a posteriori* sciences.¹ A consideration of the second will permit us to reach a precise definition of the characteristic traits of the ethnological method.

Ethnology is, from the point of view of its aim, a so-called historical science. As such, ethnology deals with three problems :

1. The statement of historical facts.
2. The determination of the chronological order of these facts.
3. The establishment of the causal connection between them.

The epistemological position and the aim of ethnology are thus identical with the position and aim of history in its narrower sense. However, the

¹ There are, unfortunately, ethnological publications which do not satisfy the conditions of induction. One such work is W. Koppers' *Die Frage eventueller alter Kulturbeziehungen zwischen dem südlichsten Südamerika und Südostaustralien*, Proc. of the 23d Internat. Congr. of Americanists, 1928, pp. 678-685.

In less than eight pages, this pamphlet contains most of the chief methodological errors which can be committed in comparing the cultures of two territorial entities. Treating three different tribes of Tierra del Fuego and several different tribes of southeast Australia as two entities, Koppers states the presence of about a dozen elements in the cultural inventories of both Southeastern Australians and Fuegians, and concludes that these elements belong to the same stratum. Even omitting doubts of an ethnographical sort, which concern the selection of traits and the establishment of such unnatural territorial entities, Koppers' reasoning is logically inadmissible. For the comparison of the distribution and of the inventories of territorial entities, a *tertium comparationis* is necessary. On the basis of the coexistence of a number of elements in the inventory of two tribes, we cannot conclude anything concerning their association in a trait complex. On the other hand, we cannot determine the similarity of two ethnic entities without having at least a third ethnic entity.

Koppers commits another equally serious error by introducing the so-called negative elements. He asserts that the similarity between his Australians and Fuegians is still greater because the inventories of both lack totemic and matriarchal institutions. This is an entirely inadmissible arbitrariness because, by continuing such a citation, we could progressively increase the similarity of these entities by stating that they both lack radio, strawberry sundae, toothbrush, etc. When we apply to the material of Koppers any simple measure of similarity such as Q_2 (Yule), we obtain the result 0/0.

difference between these two disciplines is distinctly evident when we direct our attention to the materials on the basis of which they achieve their results.

The first task of historical research is the statement of historical facts. The material from which an historian draws historical facts consists, above all, of written documents. These documents either contain the statement of historical facts or make possible their direct reconstruction. An ethnologist does not have any documents of this sort. His material consists almost exclusively of inventory data concerning the economic, social, and spiritual culture of ethnic groups. As a rule he possesses no direct statement of historical facts. To establish these facts, he is obliged to reconstruct them.²

This great difference between the materials of ethnology and of history in its narrower sense naturally determines the differences in method. It is not sufficient to state that, because ethnology is an historical science, it must therefore employ the "historical method." The so-called historical method is nothing more than the inductive method adapted to the special material and special purposes of history. The technique of this method must change with any change in material.

Thus ethnology must develop a special technique to suit its specific material. Without such a technique research work is entirely hopeless. Neither the "small" nor even the "large" Bernheim will be of any assistance here. The literature on ethnological method is already so vast that a discussion of the chief works alone would require a special dissertation. It is sufficient to say that even the most contrasting opinions concerning method are equally impotent in regard to the formulation of concrete instruction for research work. The result of this is the notorious lack of connection between the methodological foundation and the material, and between the material and the results.

In 1911 Czekanowski introduced to ethnology a quantitative method which he has further developed in his later, chiefly linguistical, works. The foundations of this method are as follows. In the ethnographical material, on the basis of which we must reconstruct the historical facts, we have to deal with two fundamental elements: the territorial entity and the cultural element. Neither of these elements, as such, is an historical fact. The territorial entity (tribe, linguistic group) is the subject and the object of historical facts, and the cultural elements are historically indifferent. We approach historical fact only when we introduce a third element which consists of a combination of the other two. This third element is the distribution of cultural elements

² By the statement that ethnological material consists chiefly of ethnographical data, we do not omit the fragmentary documents supplied by early travelers and missionaries. The value of these documents in relation to the tasks of ethnological research is very small. Although they give us the direct relation of some historical facts, they usually do not extend far into the past. They are chiefly valuable for their descriptions of the cultural inventory, and therefore do not differ fundamentally from usual ethnographical observations. Of even less value are the relations of historical facts obtained from mythological or traditional sources. Even dynastic tradition does not reach farther than a few generations into the past.

among territorial entities, and we determine the distribution of each element by marking its presence and absence among the territorial entities of some studied area. To know its distribution, we must have three conditions: (1) determined territorial entities, (2) knowledge of the presence, and (3) knowledge of the absence of the element among the territorial entities.³

The meaning of the distribution from the historical point of view is clear. It gives evidence of a process which has been accomplished in the territory. The reason for such a process can be only a human activity. A human activity which produces the territorial spread of a cultural element is an historical fact. Therefore the knowledge of the distribution has for the ethnologist the value of a document. It is the only kind of document at his disposal.

Consequently, it is necessary to organize ethnographical fieldwork and publications for the presentation of the knowledge of distribution. At the present time, only exceptional works are adequate in this respect. As long as most ethnographical publications continue to be prepared in the usual manner, any systematic comparative work will be impracticable. If we do not find concrete data about absence, we cannot know whether we are dealing with true absence or only with lack of observation. Therefore our huge ethnographical literature today has no important value from the historical point of view.⁴ Some order should be introduced into ethnographical fieldwork, and ethnographers should be made to realize that their observations are serviceable to an inductive science which supports its results on comparison. A comparison is impossible where different phenomena have been observed.^{5, 6}

Correctly presented ethnographical material has the form of a table. On one axis of this tabulation are listed the cultural elements, on the other the territorial entities. The contents of the table are marks (+ and —) indicating the presence and absence of particular elements in the inventory of particular

³ Maps on which only presences of elements are given cannot be considered as illustrations of distribution (W. Schmidt, Nordenskiöld). These maps lack two fundamental elements of the distribution: the concept of territorial entity and the knowledge of absence.

⁴ A. Howitt is considered to be a prominent authority on the culture of southern Australian tribes. To the kindness of Miss A. Frank I owe my knowledge of his presentation of material. A tabulation on the basis of Howitt's publications of the cultural inventory of 32 southern Australian tribes gives on the average only about 15 positive and negative instances for each tribe from a total of about 220 cultural elements observed and defined. Thus the cultural inventory of an average tribe in this group consists of 15 concrete facts and about 205 marks of interrogation. Such material of course cannot be used as a basis for any systematic research.

⁵ Two ethnographers, A. Métraux and G. Tessmann, have independently published data concerning the material culture of the same tribe, the Omagua. Métraux's inventory consists of 146 cultural elements, and Tessmann's of 96. Of a total of 238 elements, only 4 are common to both presentations. If we did not know that this material concerned the same tribe, we would think that we were dealing with two entirely different cultural entities.

⁶ Some consideration must be given to the so-called "negative elements," which are so frequently a source of confusion. Negative elements *per se* do not exist. There are only negative distributions, and we can operate with these only when we take cognizance of at least one positive instance.

territorial entities. In this way the tabulation gives us knowledge of the cultural inventory of territorial entities and the distribution of elements among these entities.

Next, this presentation of data must be arranged systematically. In the tabulation we are concerned with two systematic orders composed of a large number of elements. The first order is the relationship between the distributions of particular traits; the second is the relationship between the inventories of particular territorial entities. The definition of the degree of similarity between the distribution of particular elements will permit us to distinguish the groups of elements which are similarly distributed. The definition of the degree of similarity between particular territorial entities will permit us to distinguish the groups of entities which are similar in the totality of their cultural inventories.⁷

Now a purely technical question arises. How are we to reach this systematic order? It is clear that even a relatively small number of entities and elements will present to us such a tremendous number of possible combinations that the human mind will not comprehend this quantity, much less attain a grouping of the material. To reach this systematical grouping we must apply the quantitative method. Only the statistical or quantitative method is able to order such mass phenomena. Therefore the position of the quantitative method in ethnology becomes clear. When we wish to apply this method, we must have the material in the correct form; and when we have this correct form, we must apply the quantitative method because it is the only way in which the material may be ordered. This fact was recognized long ago by Tylor. The same point of view is represented in American ethnology by Kroeber, Driver, and Clements.

The ordering of a tabular presentation is, from the statistical point of view, a very simple problem because we have a number of formulae which make possible the definition of the degree of similarity between such phenomena. For practical reasons Czekanowski advises the use of Karl Pearson's coefficient of similarity, Q_6 .

$$Q_6 = \sin \left| \frac{\pi}{2} \right| \frac{ad - bc}{\sqrt{(a+c)(b+d)(a+b)(c+d)}}$$

In this formula, a is the number of instances in which both compared phenomena are present, b the number of instances in which the first phenomenon is present and the second is lacking, c the number of instances in which the

⁷ The quantitative expression of the cultural relationship between the inventories of territorial entities frequently receives the following criticism: the definition of such a relationship is inadmissible because particular elements of the cultural inventory have different "values." This criticism is irrational. The problem of value is a purely metaphysical one. We do not and never will have any criterion to determine the value of cultural elements. Therefore we have two possibilities: either to renounce the metaphysical and go ahead with systematic work, or to renounce systematic work completely.

second is present and the first lacking, and d the number of instances in which both are lacking.

For example, to define the degree of similarity between the distribution of houses on poles and walls of clay among seventeen Tupi tribes we count :

	Territorial Entities																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Houses on poles	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+
Walls of clay	-	+	+	+	+	-	+	-	-	-	-	-	+	-	-	-	-

$a = 1$ $b = 5$ thus $Q = \sin 90^\circ$. $\frac{5}{\sqrt{1980}} = \sin 90^\circ$. $0.113 = +0.18$
 $c = 1$ $d = 10$

Computing in this way the coefficients for every combination of our two systematic orders, we get two tables. One represents the coefficients of similarity between territorial entities, the other the coefficients of similarity between distributions of elements. By graphic presentation of these tables, we get diagrams which permit us to comprehend the grouping of territorial entities and the grouping of elements.

This is the end of the first stage of systematic work, resulting in the classification of the material and the segregation of its components. The groups of territorial entities correspond to cultural areas, and the groups of elements to cultural strata which owe their existence to certain historical facts.

After this classification of the distributed ethnographical data, we proceed to the definition of the cultural structure of particular territorial entities. Therefore we define the degree of similarity between particular territorial entities and particular strata in order to determine exactly the rôles which the particular strata play in the cultural structure of each territorial entity.

This is the solution of the first problem of the historical study : the reconstruction of historical facts. Now we proceed to the second stage of our research, i.e., to the chronologizing of strata. Here the statistical method no longer can be applied. The definition of the age of particular cultural strata demands the collaboration of auxiliary sciences such as archaeology, linguistics, and physical anthropology. The criteria of chronologizing these sciences can be adapted to ethnology by connecting the cultural strata with stratigraphically dated archaeological cultures, with linguistical complexes, or with anthropological types of population.

The final task of ethnological research, which is to establish the causal connection between determined historical facts, again requires the collaboration of auxiliary sciences. It is most important in this connection also to consider geographical factors and the nature of the elements themselves.

The most striking feature of Czekanowski's method is its logical simplicity, which raises us above the chaos of ethnographical data to a level on which we are able to operate with systematic entities. Its chief advantages are its intro-

duction of an objective technique of research and its method of tabular presentation of the source material.

This particular study would have been impossible without the type of ethnographical publication which has been created and fostered by Kroeber. These publications are relatively homogeneous in scope and interest, and therefore the results of particular members of the California group may be compared. In this respect California is today an exception.

LITERATURE

CLEMENTS, F. E.

1928. Quantitative Method in Ethnography. AA 30:295-310.

CZEKANOWSKI, J.

1909. Zur Differentialdiagnose der Neandertalgruppe. Korrespondenzblatt d. Deutschen Gesell. f. Anthro. Ethnol. u. Urg., XI Jahr, Nr. 6/7.

1911. Objective Kriterien in der Ethnologie. Korrespondenzblatt d. Deutschen Gesell. f. Anthro. Ethnol. u. Urg., 42:71-75.

1927. Z badań nad różniczkowaniem morfologicznem dialektów polskich. Prace polonistyczne. Warszawa.

1928. Wstęp do historii Słowian. K. S. Jakubowski. Lwów.

1929-31. Różnicowanie się dialektów prasłowiańskich w świetle kryterjum ilościowego. I Sjezd Słowanskych Filologu v Praze. Vol. 2, 1931.

DRIVER, H. E., and KROEBER, A. L.

1932. Quantitative Expression of Cultural Relationships. UC-PAAE 31:211-256.

KLIMEK, S., and MILKE, W.

1934. An Analysis of the Material Culture of the Tupi Peoples. AA 36:71-91.

III. MATERIAL

The material of this analysis consists of 411 elements of the economic, social, and spiritual culture of California Indians. The distributions of these elements have been determined among ninety territorial entities. It is thus the largest systematically presented material in existence.



Map. 1. Linguistic entities in California, according to Kroeber.

Unfortunately, there is considerable unevenness in the information. The material culture is quite uniformly represented, but our knowledge of the sociology and religion is very inadequate. We have, it is true, such excellent monographs as Kroeber's and Loeb's works on the Kuksu cult and Strong's

study of southern California social organization, but we do not have comparable data for the rest of California. The least known sector of California culture is doubtless its mythology and religious concepts. Here we are not able even to distinguish the fundamental ideas nor to define particular elements.

In this study, I take linguistic groups as territorial entities. These groups do not correspond to tribes in the political sense of the word. The tribe as a political unit appears only among the Mohave and Yuma, and the natural political and economic unit of the other peoples of California is the village community. It is impossible to obtain the cultural inventories of such communities, and therefore I take a linguistic or, better, a dialectic group as an equally natural entity. In this work, the term "tribe" will always refer to these linguistic groups. For practical reasons three exceptions to this rule have been made: (1) the northern and southern Diegueño are considered as one territorial entity; (2) the Nisenan and the Northwestern Maidu are divided into valley and hill subgroups; (3) the Achomawi and Atsugewi are considered as one entity (see map 1).

We are indebted to Kroeber for the determination of these linguistic groups and the mapping of their distribution in California. His nomenclature is adopted here with two alterations. First, in the Mattole group (1f), the Mattole proper (1f₂) and the Bear River Indians (1f₁) are distinguished on the basis of Nomland's researches. Second, in the Chemehuevi group (21e), I distinguish between Chemehuevi proper (21e) and Las Vegas (21e₁), accepting the results of Kelly's researches. Accordingly, the boundaries of these groups on the maps have been modified.

I am able to present more or less complete inventories for the following tribes:

	<i>Athabascan Family</i>		<i>Hokan Family</i>
1b	Tolowa	6a	Shasta
1c	Hupa	6e,f	Achomawi-Atsugewi
1f ₁	Bear River	8	Karok
1f ₂	Mattole	10a	Northern Pomo
1g	Nongatl	10b	Central Pomo
1i	Sinkyone	10c	Eastern (Clear Lake) Pomo
1j	Wailaki	10d	Southeastern (Lower Lake) Pomo
1k	Kato	10f	Southern Pomo
	<i>Algonkin Family</i>	11	Washo
2	Yurok	15a,b	Diegueño
3	Wiyot	15c	Kamia
	<i>Yukian Family</i>	15d	Yuma
4a	Yuki	15f	Mohave
4b	Huchnom		<i>Penutian Family</i>
4c	Coast Yuki	16a	Northern Wintun (Wintu)
4d	Wappo	16b	Nomlaki Wintun
	<i>Lutuamian Family</i>	16c	River Patwin
5	Modoc	16d	Hill Patwin
		17a	Northeastern Maidu

<i>Penutian Family—(Continued)</i>		<i>Shoshonean Family</i>	
17bh	Northwestern Maidu, hill	21a	Surprise Valley Paviotso
17bv	Northwestern Maidu, valley	21b	Eastern Mono (Owens Valley Paiute)
17ch	Nisenan, hill	21c	Western Mono
17cv	Nisenan, valley	21e	Chemehuevi
18a	Coast Miwok	21g	Tübatulabal
18b	Lake Miwok	21k	Serrano
18c	Plains Miwok	21m	Mainland Gabrielino
18d	Northern Miwok	21p	Luißeño
18e	Central Miwok	21q	Cupeño
18f	Southern Miwok	21r	Pass Cahuilla
20b ₁	Tachi Yokuts	21s	Mountain Cahuilla
20b ₂	Yaelmani Yokuts	21t	Desert Cahuilla
20c	Chuckchansi Yokuts		
20d	Choinimni Yokuts		
20e	Yaudanchi Yokuts		

The similarity of distribution of elements has been determined on the basis of these sixty tribes. There are also a number of territorial entities with very incomplete inventories. To show at least the approximate cultural connections of these tribes, they are grouped in seven entities, which are:

7	Yana-Yahi	14	Chumash
20a	Northern Yokuts	21f	Kawaiisu
19	Costanoan	21e ₁	Las Vegas Chemehuevi
13	Salinan		

In defining the degree of similarity of trait distributions and whole culture inventories, I omit these seven territorial entities. Their cultural structures can be determined after the more nearly complete material has been classified.

The following tribes are completely omitted because the data concerning them are too fragmentary for use:

<i>Athabaskan Family</i>		<i>Penutian Family</i>	
1a	Rogue River	20g	Buena Vista Yokuts
1d	Chilula		
1e	Whilkut		
1h	Lassik		
<i>Hokan Family</i>		<i>Shoshonean Family</i>	
6b	New River Shasta	21d	Koso-Panamint
6c	Konomihu	21h	Kitanemuk
6d	Okwanuchu	21i	Alliklik
9	Chimariko	21j	Vanyume
10e	Salt Pomo	21l	Fernandeño
10g	Southwestern Pomo	21n	Nicoleño
12	Esselen	21o	Juaneño

The approximate cultural positions of these tribes cannot be determined until the complete material has been analyzed.

The elements used in this analysis are listed below. To avoid misunderstanding, I incorporate references which define the captions in detail.

POTTERY

21. Nonpaddle method in pottery making. Gayton, 1929.
10. Paddle method in pottery making. Gifford, 1928.
2. Large bowl used in ferrying. Kroeber, Hdbk., 739.
3. Pointed parching tray. Kroeber, Hdbk., 738.
4. Oval plate. Kroeber, Hdbk., 738.
5. Quail spoon, rattling. Kroeber, Hdbk., 738.
6. Duck jar, asymmetrical. Kroeber, Hdbk., 738.
8. Spoon. Kroeber, Hdbk., 738.

BASKETRY

41. Diagonal twining. Mason, 1904.
52. Overlay twining. Mason, 1904.
45. Quill overlay in twined basketry. Kroeber, Hdbk., 331.
39. Lattice twining. Mason, 1904.
30. Coiling. Mason, 1904.
36. Single-rod coiling. Mason, 1904.
34. Two-rod and splint coiling. Mason, 1904.
40. More than 50 stitches an inch in coiled basketry. Kroeber, Hdbk., 247.
31. Wickerwork technique. Kroeber, Hdbk., 244.
29. *Epicampes* basketry. Merrill, 1923.
15. Small-element basket designs. Kroeber, Hdbk., 560.
26. Small light basket designs. Barrett, 1917.
35. Feather covering of baskets. Kroeber, Hdbk., 245.
37. Bead or haliotis ornament on baskets. Barrett, 1908.
33. Break in banded ornament. Kroeber, Hdbk., 246.
46. *Evernia* decoration. Merrill, 1923.
48. *Woodwardia* decoration. Merrill, 1923.
49. Band decoration. O'Neale, 1932.
50. Normal *Xerophyllum* decoration. Merrill, 1923.
60. *Alnus* decoration. Merrill, 1923.
54. *Adiantum* decoration. Merrill, 1923.
12. Diagonally twined woman's cap. Kroeber, Hdbk., 808, pl. 73.
22. Coiled basketry cap. Kroeber, Hdbk., 808, pl. 73.
47. Flat cap, overlay twined. O'Neale, 1932, pls. 19-33.
58. Large twined cap of tule. Kroeber, Hdbk., 808.
28. Triangular winnowing tray. Kroeber, Hdbk., pl. 50.
53. Sifter of close twining. Kroeber, Hdbk., 91.
38. Seed beater of basketry (wickerwork). Kroeber, Hdbk., pl. 29.
63. Seed beater of basketry. Kroeber, Hdbk., pl. 29.
23. Pitched water bottle, pointed bottom. Kroeber, Hdbk., 701.
16. Asphalted water basket, flat bottomed. Kroeber, Hdbk., 701.
14. Round-shouldered bottleneck basket. Kroeber, Hdbk., pl. 55e.
20. Bottleneck basket with sharp shoulder. Kroeber, Hdbk., pl. 50a.
19. Feather fringe at shoulder of bottleneck basket. Kroeber, Hdbk., pl. 50a.
51. Low cooking and food baskets. Kroeber, Hdbk., pl. 23.
42. Cylindrical dance basket. Kroeber, Hdbk., 56.
62. Carrying basket conical, twined. Kroeber, Hdbk., pls. 23, 24.
13. Coiled carrying basket, flat bottomed. Kroeber, Hdbk., pl. 54.
56. Back carrier of hide on frame. Kelly, 1932, 148.
59. Tule sacks, coarse. Kroeber, Hdbk., 331.
43. Rolled carrying case of twined stems. Kroeber, Hdbk., 94.
7. Carrying frame of sticks and cord. Kroeber, Hdbk., 738.
9. Twined bags of cord warps. Kroeber, Hdbk., 738.
1. Flat cradle of basketry, horizontal warps. Kroeber, Hdbk., 535, fig. 48g.
11. U-ladder cradle. Kroeber, Hdbk., 535, fig. 48a.
17. Tule cradle (vertical warps of tule, twine woven). Kroeber, Hdbk., pl. 40g.

BASKETRY—(Continued)

18. Y-frame cradle. Kroeber, Hdbk., 535, fig. 48d.
24. Kite-frame cradle. Kroeber, Hdbk., 535, fig. 48b, c.
25. Hooked ladder-frame cradle. Kroeber, Hdbk., 535, fig. 48c.
27. Flat cradle of basketry, vertical warps. Kroeber, Hdbk., 535, fig. 48f.
55. Sitting cradle of basketry, shallow type. Kroeber, Hdbk., 317, fig. 26.
44. Sitting cradle with "toe." Kroeber, Hdbk., pl. 35.
32. Sitting cradle, round type. Kroeber, Hdbk., pl. 35.
57. Board cradle. Spier, 1930, 57.

FOOD AND AGRICULTURE

100. Stone boiling in baskets.
92. Acorn bread dyed with red earth.
90. Dried salmon pulverized.
135. Flood agriculture. Kroeber, Hdbk., 735.
137. Planting stick. Kroeber, Hdbk., 736, pl. 67b.
138. Weed cutter. Kroeber, Hdbk., 736, pl. 67a.
139. Maize of several colors.
140. Beans.
141. Pumpkins.
136. Gourds grown.
113. Salt from grass.
95. Seaweed eaten for salt.

DRESS AND ORNAMENT

64. Eye shade.
72. Hair brush of porcupine tail.
132. Hair dye in mud plaster.
134. Men's hair in pencils. Kroeber, Hdbk., 729.
125. Headdress of human hair. Kroeber, Hdbk., 665.
109. Man's hair net, single. Steward, 1933, pl. 5.
76. Crocheted headnet, flowing (dance ornament only).
77. Open-mesh headnet, flowing.
103. Yellowhammer-quill headband, trimmed. Kroeber, Hdbk., 267, fig. 20.
124. Hainit headband. Kroeber, Hdbk., 665.

82. Woodpecker-scalp headbands of N. W. type. Kroeber, Hdbk., 56.
81. Sea-lion tooth headband.
89. Tarat woodpecker-scalp visor. Kroeber, 1929, 271.
- 78 Spliced eagle- or condor-feather head-dress. Kroeber, Hdbk., 56.
105. Feather forks and darts for head. Kroeber, Hdbk., 268, fig. 21.
115. Tall topknot of magpie tail feathers. Kroeber, Hdbk., 508, fig. 44.
110. Feather rope.
118. Eagle-down rope skirt. Kroeber, Hdbk., pl. 42.
126. Palut eagle-feather skirt. Kroeber, Hdbk., 665.
88. Blankets of warps of birdskin twisted with cord.
93. Tule legging.
73. Buckskin leggings, full length. Kelly, 1932.
68. Buckskin gown. Kelly, 1932, pl. 20a, b.
79. Painted double deerskin cape. Kroeber, Hdbk., 77, fig. 3.
104. One-piece moccasin. Kroeber, Hdbk., 805.
74. Two-piece moccasin. Kroeber, Hdbk., 805.
94. Tule moccasin.
144. High moccasin, hard soled. Kroeber, Hdbk., 805.
127. Fiber sandal. Kroeber, Hdbk., pl. 62.
130. Rawhide sandal. Forde, 1931, fig. 1.
102. Snowshoe. Kroeber, Hdbk., 807.
84. Women's chin tattoo, nearly solid. Kroeber, Hdbk., 77.
131. Nonritual face painting, across cheeks and under eyes. Kroeber, Hdbk., 730, fig. 60.
133. Mud plaster against lice. Kroeber, Hdbk., 729.
120. Haliotis pendants, thin circles with tabs.

SMOKING

122. Pipe of cane.
121. Pipe of clay.
119. Bone mouthpiece inserted in pipe.
99. Wooden pipe with bulb end. Kroeber, Hdbk., pl. 30.
85. Concave wood pipe with mortised steatite bowl.

80. Haliotis inlay in pipe of element 85 type.
 67. Wooden pipe stem.
 69. L-shaped pipe bowl of stone. Kroeber, Hdbk., 333, fig. 29.
 70. Disk pipe bowl of stone. Kroeber, Hdbk., 333, fig. 29.
 91. Tobacco planted. No special data about method of planting.
 117. Tobacco eaten with lime.

MUSICAL INSTRUMENTS

96. Footdrum.
 106. Bullroarer. Kroeber, Hdbk., pl. 44b, *e, f*.
 107. Cocoon rattle. Kroeber, Hdbk., 420, fig. 37.
 123. Gourd rattle. Forde, 1931, fig. 6.
 101. Splitstick rattle. Kroeber, Hdbk., pl. 67*d, e*.
 143. Flageolet. Forde, 1931, 31.

GAMES

66. Beaver-teeth dice.
 83. Dice of 4 mussel disks.
 108. Splitstick dice.
 114. Split acorn dice.
 128. Painted tablet dice. Kroeber, Hdbk., 741.
 87. Many-stick guessing game. Kroeber, Hdbk., 849.
 71. 4-stick guessing game. Kroeber, Hdbk., 849.
 142. Guessing-game objects hidden in sand-pile. Kroeber, Hdbk., 849.
 111. Hoop and pole game. Kroeber, Hdbk., 849.
 116. Block and pole game. Kroeber, Hdbk., 849.
 129. Cord-wrapped hoop in pole game.
 75. Double-ball played by men, with wrestling. Kroeber, Hdbk., 849.
 112. Women's lacrosse with hair ball and seed beater. Kroeber, Hdbk., 847.
 86. Salmon vertebrae ring-and-pin. Kroeber, Hdbk., 147, fig. 14.
 65. Ring-and-pin with single tule ball. Kroeber, Hdbk., 847.

MONEY

248. Dentalium money. Kroeber, Hdbk., 22.

246. Dentalium shells measured individually on finger creases. Kroeber, Hdbk., 23.
 247. Dentalium money strings measured on arm. Kroeber, Hdbk., 24, pl. 11.
 244. Triangular money box of horn.
 245. Cylindrical money box of horn with lid. Kroeber, Hdbk., pl. 15.
 249. Magnesite cylinder used as treasure.
 250. Shell-cylinder money or treasure.
 251. Clam-disk money, measured on hand.

TOOLS AND IMPLEMENTS

223. Jointed fire-drill. Kroeber, Hdbk., 332.
 177. Fire making with 2 stones. Kroeber, Hdbk., 249.
 180. Long wedge of elkhorn.
 196. Curved stone adze, mussel blades. Kroeber, Hdbk., pl. 19.
 169. Steatite bowl, small-mouthed.
 165. Steatite fry pan, trapezoidal, holed. Kroeber, Hdbk., 562.
 166. Wooden bowls with haliotis ornament. Kroeber, Hdbk., 560.
 183. Wooden meat platter.
 189. Ornamented elkhorn spoon. Kroeber, Hdbk., pl. 20.
 151. 3-stick food stirrer. Kroeber, Hdbk., 737.
 174. Looped-stick food stirrer. Kroeber, Hdbk., 446, fig. 28.
 215. Thumb guard of mussel for fiber drawing.
 212. Pear-shaped maul. Kroeber, Hdbk., pl. 19*d, e*.
 236. Pounding slab.
 168. Square-edged mortar.
 176. Wooden mortar, shallow type. Kroeber, Hdbk., pl. 45.
 153. Wooden mortar, deep.
 146. Wooden pestle, long. Kroeber, Hdbk., 737, pl. 67*a*.
 162. Bedrock mortar. Kroeber, Hdbk., pl. 45.
 179. Pestle with bulb end.
 213. Pestle ringed at base. Kroeber, Hdbk., pl. 16.
 240. Twined basket hopper. Kroeber, Hdbk., pl. 24*a*.
 157. Mortar hopper, coiled.

TOOLS AND IMPLEMENTS—(Continued)

161. Metate, slab type. Kroeber, Hdbk., pl. 66.
 154. Squared metate. Kroeber, Hdbk., pl. 66.
 149. Squared muller. Kroeber, Hdbk., pl. 66.
 227. Circular metate.
 225. Loop-handled muller.
 226. Two-horned muller. Kroeber, Hdbk., 324, fig. 27.

HUNTING AND FISHING

239. Deer-mask decoy. Kroeber, Hdbk., 342, fig. 31, pl. 8.
 231. Rabbit net (long stretched).
 156. Curved rabbit club. Kroeber, Hdbk., 632, fig. 55.
 178. Long quail trap of basketry. Like but longer than fish trap of basketry in Kroeber, Hdbk., pl. 33.
 172. Bird-snaring booth. Kroeber, Hdbk., 529, pl. 46.
 190. Sea-lion harpoon, line from shaft.
 228. Fish spear with prongs spread by ring.
 182. Lamprey hook or rake.
 167. Circular fishhook of haliotis. Kroeber, Hdbk., 564.
 188. Trapezoid bag net on A-frame. Kroeber, Hdbk., 85, pl. 6.
 193. Net shuttle of elkhorn.
 187. Fishing scaffold.
 191. Eel pot.
 148. Large fish scoop. Kroeber, Hdbk., pl. 59.
 230. Ring-pointed arrow for water skipping. Kroeber, Hdbk., 332.
 160. Cane arrow.
 155. Long self-bow.
 241. Sinew-backed bow.
 181. Bow broad, thin, short. Kroeber, Hdbk., pl. 18.
 242. Longitudinally grooved arrow polishers of sandstone, in pairs.
 185. Holed arrow straightener of elkhorn.
 175. Arrow straightener, rectangular, grooved, of steatite or clay.
 147. Ridged arrow straightener of stone or clay. Kroeber, Hdbk., pl. 49.
 229. Quiver of tule.

BOATS

235. Balsa (tule rush raft boat).
 192. Redwood dugout canoe. Kroeber, Hdbk., 82, pl. 13.
 219. Simple dugout boat. Kroeber, Hdbk., 329.
 164. Plank boat, planks lashed. Kroeber, Hdbk., 558.

STRUCTURES

214. Plank house. Described by Kroeber, Hdbk., 78-80; see also pls. 12, 13.
 201. 3-pitch roof.
 195. Roof plates.
 207. Stone platform outside.
 205. Circular entrance.
 206. Sliding door.
 202. Stone grips at door.
 194. Anteroom.
 184. 5-stone fireplace.
 203. Drying frame.
 197. Octagonal plank-lined pit.
 198. House names.
 208. Wooden stool, cylinder or mushroom shape.
 204. Broad ladder, notched.
 220. Tied-rung ladder.
 224. Holed ladder.
 233. Earth-covered building with 1 to 4 center posts. Kroeber, Hdbk., 175, 276, 290, 312, 317, 327, 340, 358, 365, 407, 447, 572, 654, 704, 721, 731, 809, 811, pl. 56.
 237. Earth-covered ceremonial house, "church house."
 232. Thatch covering of round or oval house frame of poles.
 163. Mat covering of round or oval house frame of poles.
 233. Conical or lean-to house of bark slabs.
 218. Square house of bark slabs. Kroeber, Hdbk., 312.
 217. House plan trapezoidal. Kroeber, Hdbk., fig. 25.
 158. Gabled house of brush or grass (exclusive of plank house). Kroeber, Hdbk., 521.
 171. Communal house, gabled, long. Kroeber, Hdbk., 521.

173. Houses in series with common shade. Kroeber, Hdbk., 521.
150. Front house-wall double, of brush, sand filled.
145. Shade roof only cult structure.
211. Plank sweat house. Kroeber, Hdbk., 80-82, pls. 12, 13, 14.
186. Plug exit door in plank sweat house.
199. Plank or slab floor in sweat house.
200. Cobble-lined exit pit from sweat house.
209. Wooden pillow in sweat house.
210. Cubical pit fireplace, stone lined, in sweat house.
221. Mat-covered small sweat house of Plains type.
222. Steaming in sweat house.
234. Earth-covered sweat house, primarily for sweating. Kroeber, Hdbk., pl. 56.
170. Granaries on posts. Kroeber, Hdbk., pl. 38.
159. Unroofed granary.
152. Low granary on ground.
243. Wells.
263. "Kohota" festival chief. Kroeber, Hdbk., 745, 746.
260. Tribe as political entity.
266. Private ownership of agricultural land.
430. Moieties.
286. Patrilinear totemic moieties without subdivisions, exogamic.
287. Land and water moieties.
278. Wildcat-coyote moieties.
279. Patrilocal lineages (clans) without clan totem.
257. Patrilinear totemic clans.
261. Women carry clan names.
256. Nonritual functioning of clan.
255. Clan tales of war and migration.
285. Personal names with totemic implication.
302. Names given according to house or marital status.
300. Named and ranked places in sweat house.
303. Employer's liability.
306. Damage compensation by social rank.
301. Debt slavery.
291. Levirate.
292. Sororate.
305. "Half" marriage. Kroeber, Hdbk., 29.
311. Negotiated marriage price.
312. Parents' marriage price determines weregild.
304. Fine for constructive adultery.
288. Parent-in-law avoidance.

WAR AND FIGHTING

318. War for taking slaves.
264. Only women captives enslaved, not violated, kept without definite status.
314. War dance of settlement.
254. Feathered staves in warfare. Forde, 1931, 265.
268. Cone-frustum war club. Kroeber, Hdbk., 844.
309. "Slave-killer" type stone club, edged. Kroeber, Hdbk., 50.
299. Rod-jacket armor, twined. Kroeber, Hdbk., pl. 18.
298. Elkskin armor.
267. Round hide shield.
262. Stick fight to settle disputes. Kroeber, Hdbk., 745.

SOCIAL INSTITUTIONS

307. Chieftainship replaced by wealth influence.
277. Assistant cult chief "paha." Kroeber, Hdbk., 687.

DEATH AND MOURNING

321. Cremation of dead.
322. Interment of dead.
315. Corpse taken through rear wall.
319. Widow's belt of hair.
317. Mourning necklace of pitch lumps.
310. Braided mourning necklace.
289. Widow pitches head.
253. Mourning singing begins before death.
258. Mourning anniversary for warriors.
259. Mimic battle in mourning anniversary for warriors.
269. Song cycles used in mourning.
271. Mourning anniversary: eagle-killing dance.

DEATH AND MOURNING—(Continued)

272. Mourning anniversary: fire dance (dancing fire out).
 273. Mourning anniversary: Yunish-mata-kish, mourning rite for toloache initiate.
 274. Mourning anniversary: Chuchamish, clothes burning.
 276. Mourning anniversary: Tuvish, clothes washing.
 282. Mourning anniversary: Images of death.
 (Particular elements of mourning anniversary are described by Kroeber, Hdbk., 668-688.)

SHAMANISM

293. Shaman sucks out disease object.
 313. Most shamans women.
 284. Grizzly bear shaman, transformed into bear.
 294. Grizzly bear shaman wears bearskin.
 290. Rattlesnake shaman. Definition of this element is not exact.
 295. Fetish sacks for shamans. Kroeber, Hdbk., 258.
 308. Liability of shaman declining case.
 316. Disease object kept in body of shaman.
 265. Shaman's dream of creation.

PUBERTY RITES, TOLOACHE USE AND INITIATION

332. Girls' rite with pit-roasting ceremonial.
 345. Girls' rite with drinking of tobacco.
 404. Girl dances during puberty rite.
 424. Fire ring in girls' rite.
 420. East significant in girls' rite.
 406. Haliotis looked into in girls' rite.
 399. Trench in girls' rite.
 347. Crescentic stone in girls' rite.
 416. Boys' puberty rite: whipping with bow string.
 417. Boys' puberty rite: vision seeking.
 418. Boys' puberty rite: fasting.
 419. Boys' puberty rite: running.
 340. Ant fortitude ordeal for boys. Kroeber, Hdbk., 672.
 339. Toloache initiation into a status. Kroeber, Hdbk., 668.

397. Taking toloache in groups without achieving status.

346. Toloache taken sporadically for luck.

KUKSU AND HESI COMPLEX

(The elements of this complex are defined and described by Kroeber, 1932, and Loeb, 1933.)

392. "Stabbing" as initiation.
 367. Obsidian initiation.
 360. Male initiation of Hesi type.
 352. Female initiation of Hesi type.
 369. Male initiation of Wai-saltu type.
 394. Male initiation of Kuku type.
 391. Female initiation of Kuku type.
 389. Male initiation of Bear type.
 388. Female initiation of Bear type.
 395. Male initiation of Ghost type.
 353. Fish representation.
 354. Grasshopper representation.
 355. Creeper representation.
 356. Goose representation.
 357. Turtle representation.
 359. Big-head representation.
 361. Coyote representation.
 362. Rabbit representation.
 363. Grizzly bear representation.
 364. Water-spirit, mud representation.
 365. Raccoon representation.
 366. Worm representation.
 370. Condor representation.
 371. Wai-saltu representation.
 372. Woman representation.
 375. Deer representation.
 425. Duck representation.
 368. Thunder-man representation in Kuku.
 380. Grizzly bear representation.
 382. Big-head impersonation in Kuku.
 387. Shalnis long-nose impersonation in Kuku.
 393. Moki impersonation.
 379. Ghosts (representing dead) impersonation.
 383. Ghosts (running spirits) impersonation.
 373. Kenu dance.
 376. Lole dance.
 377. Toto dance.
 378. Sacred dance: hawk-monster.

- 390. Acrobatic ceremony.
- 386. Fire-eating ceremony.
- 385. Thunder ceremony.
- 358. Waima, Wai-saltu ceremony.
- 374. Aki ceremony.
- 384. Women admitted to membership in Kuksu society.
- 381. Ritual clowns.

CHUNGICHNISH FORM OF TOLOACHE CULT

- 335. Sand painting altar. Kroeber, Hdbk., 663, fig. 56.
- 341. Chungichnish supreme deity.
- 336. Other named deities.
- 337. Grave trench.
- 338. Wanawut figure rite. Kroeber, Hdbk., 671.
- 343. Milky Way is spirit.
- 394. Double cult names. Kroeber, Hdbk., 667.

DIFFERENT CEREMONIES AND DANCES

- 334. "Morahash" whirling dance. Kroeber, Hdbk., 661.
- 398. "Pota" ceremony with images and enemy names. Kroeber, Hdbk., 451.
- 400. First acorn rite.
- 401. First salmon rite.
- 415. Ceremonial wealth display.
- 408. Salmon weir rite.
- 413. Complete localization of rites.
- 410. World-renewing rites: new fire.
- 409. World-renewing rites: taboo to see ritualist.
- 407. Dancing in boat. Kroeber, Hdbk., 61.
- 411. Deerskin dance. Kroeber, Hdbk., 57.
- 412. Jumping dance. Kroeber, Hdbk., 60.

DIFFERENT BELIEFS, CUSTOMS, AND ARTIFACTS

- 342. Origin myth of birth successions. Kroeber, Hdbk., 677.
- 331. Earth and sky as first deities.
- 330. Dying god concept (Quetzalcoatl).
- 333. Meteor cannibal spirit.
- 326. Myths of songs begin at sacred mountain. Kroeber, Hdbk., 754, 771.
- 327. Myth, song, and cult dreamed. Kroeber, Hdbk., 754.
- 328. Long song cycles. Kroeber, Hdbk., 771.
- 324. Religious dreaming connected with creation. Kroeber, Hdbk., 754.
- 323. Soul of untattooed enters rat hole.
- 329. Twins favored or signalized.
- 321. Berdache-making ritual.
- 281. Eagle or hawk rearing.
- 414. Sweat house fuel-gathering ritual.
- 348. "Paviut" wand, crystal topped.
- 349. "Spike" carved steatite artifact.
- 350. "Scoop" carved steatite artifact.
- 351. "Hook" carved steatite artifact.
- 275. Indefinite counting by fives only.
- 297. Octonary count with twigs in spaces between fingers. Kroeber, Hdbk., 878, 9.
- 280. 4-color direction symbolism.
- 270. 2-solstice calendar.

LITERATURE

- BARRETT, S. A.**
 1908. Pomo Indian Basketry. UC-PAAE 7:133-306.
 1917. Washo Indians. PMM-B 2:1-52.
- BARRETT, S. A., and GIFFORD, E. W.**
 1933. Miwok Material Culture. PMM-B 2:117-376.
- FORDE, C. D.**
 1931. Ethnography of the Yuma Indians. UC-PAAE 28:83-278.
- GAYTON, A. H.**
 1929. Yokuts and Western Mono Pottery Making. UC-PAAE 24:239-255.
- GIFFORD, E. W.**
 1928. Pottery Making in the Southwest. UC-PAAE 23:353-373.
- KELLY, I. T.**
 1932. Ethnography of the Surprise Valley Paiute. UC-PAAE 31:67-210.
- KROEBER, A. L.**
 1925. Handbook of the Indians of California. BAE-B 78.
 1929. The Valley Nisenan. UC-PAAE 24:253-290.
 1932. The Patwin and Their Neighbors. UC-PAAE 29:253-423.
- LOEB, E. M.**
 1932. The Western Kuksu Cult. UC-PAAE 33:1-137.
 1933. The Eastern Kuksu Cult. UC-PAAE 33:139-232.
- MASON, OTIS T.**
 1904. Aboriginal American Basketry. USNM-R 1902:171-548.
- MERRILL, R. E.**
 1923. Plants Used in Basketry by the California Indians. UC-PAAE 20:215-234.
- O'NEALE, LILA M.**
 1932. Yurok-Karok Basket Weavers. UC-PAAE 32:1-184.
- SPIER, LESLIE**
 1930. Klamath Ethnography. UC-PAAE 30:1-338.
- STEWART, JULIAN H.**
 1933. Ethnography of the Owens Valley Paiute. UC-PAAE 33:223-350.
- STRONG, W. D.**
 1929. Aboriginal Society in Southern California. UC-PAAE 26:1-358.

IV. RACIAL COMPOSITION

Before proceeding to the analysis of the ethnographical material, I will give some attention to the anthropological structure of California Indians. Knowledge of the racial composition of the aboriginal California population is derived chiefly from the materials of Boas and Gifford and from data used in my map of anthropological territories.⁸

All four cardinal components of the American population are found among the California peoples. These types are as follows:

Paleoamerican type (ψ): short, dumpy, with very long trunk, short extremities, dark hair and eyes, very long head, broad forehead, broad face, low orbits, and broad nose. This component is identical with the so-called "Lagoa Santa" race, and with the craniological type of San Joaquin described by Gifford.

Arctic type (η): short, dark, very long-headed, with broad forehead, long and large face, rather high orbits, and narrow nose. This type is the most numerous component of the Eskimo population.

Pacific type (ζ): tall, slender, dark, mesocephalic or subbrachycephalic, with long lower extremities and relatively short trunk, narrow forehead, narrow and long face, high orbits, and narrow nose. Gifford names this type on the basis of living material as "tall Indian type," and on the craniological material as "Buena Vista type." This race extends over great areas of America and northeastern Asia.

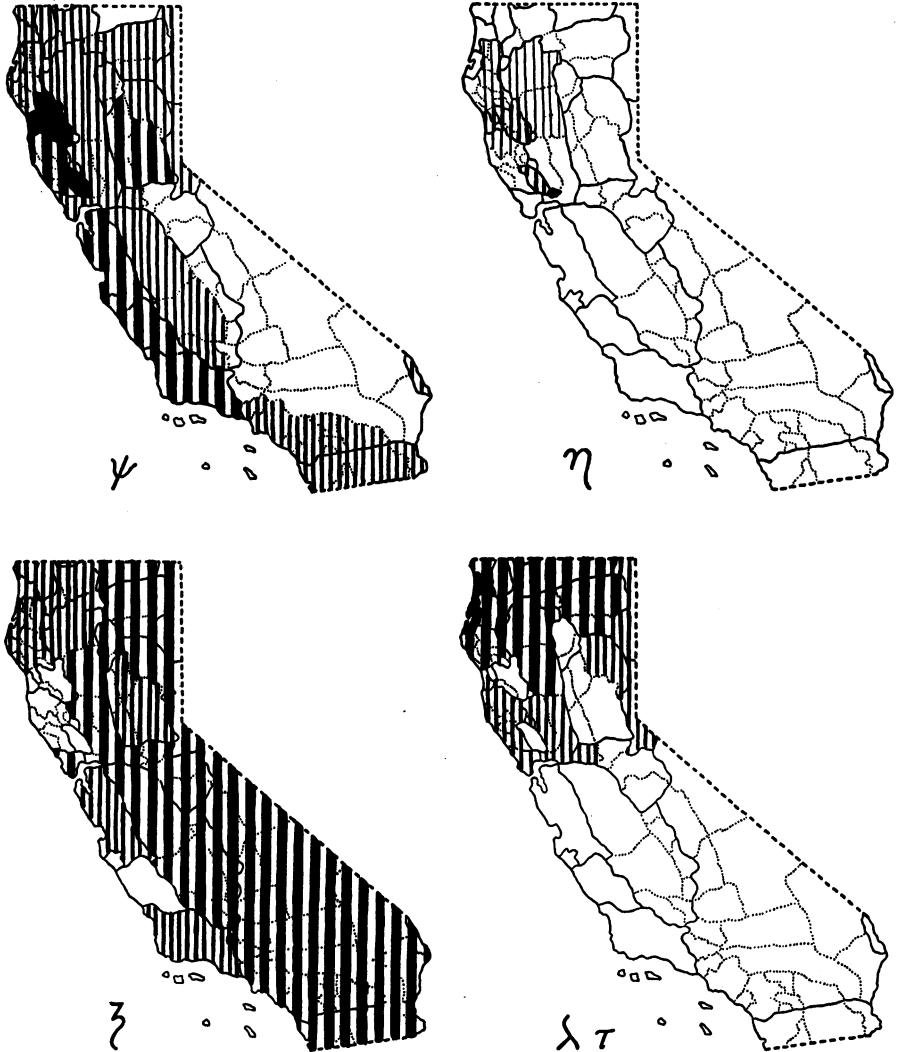
Brachycephalic Central Asiatic components are represented by two types: λ , short, dark, brachycephalic, with high skull, narrow forehead, broad face, low orbits, and broad nose; and τ , short, dark, brachycephalic or subbrachycephalic, with narrow forehead, broad and large face, high orbits, and rather broad nose.

All these elements are components of the yellow race. Each is represented in every Californian group and, therefore, the differences between the groups are not qualitative but quantitative. The intensity of these elements among particular Californian groups is represented cartographically by map 2.

We find the distribution of the Paleoamerican type to be very irregular. As the most important component, it appears among the coast tribes, the Yuki, Pomo, Costanoan, Salinan, and Chumash. On the other hand, there are many members of this type among the Nisenan and Northwestern Maidu. Its presence is less marked in northern California than in the San Joaquin valley, and on the southern California coast and the Colorado river. There is a small admixture of this type among Wintun, Miwok, and Shoshoneans.

The Arctic type is the least numerous component of the California population, appearing distinctly only among the Yuki tribes and two neighboring

⁸ This map is published in Klimek's volume of 1932. See Literature, below.



Map. 2. The distribution of racial components in California. Solid black, absolute majority; broad black stripes, relative majority; thin stripes, important minority (not below 20 per cent); thin lines, more than 5 per cent.

Athabascan groups, the Kato and Wailaki. We also observe a very small admixture of this element among Northern Wintun and Nomlaki.

The Pacific type extends over southeastern California, occurring principally in Penutian and Shoshonean territories.

Brachycephalic elements are represented chiefly in northern California among the Algonkin, Athabascan, northern Hohan, and Lutuamian groups.

There is also a rather strong admixture of these elements among Pomo and Wintun.

The Paleoamerican type is, then, the most important component of the Hokan groups. It is also dominant in the composition of the Yukians, who, however, are distinctly separated from other Californian groups by a relatively strong Arctic admixture.

The Pacific type is most important in the composition of the Penutian and Shoshonean groups. Central Asiatic elements are connected with Algonkin and Athabascan peoples. Among Lutuamians we find the Pacific and Central Asiatic types equally represented.

As the general conclusion of this anthropological survey, we notice striking quantitative differences in the racial composition of particular ethnic groups. Therefore we may expect analogous differences in the culture structure.

LITERATURE

BOAS, F.

1905. Anthropometry of Central California. AMNH-B 17:347-380.

GIFFORD, E. W.

1926. Californian Anthropometry. UC-PAAE 22:217-319.

KLIMEK, S.

1929. Kraniologische Beiträge zur Systematik der gelben Rasse. Verhandlungen d. Gesellschaft f. Phys. Anthrop.

1932. Terytorja antropologiczne. Lwów. Atlas.

V. ANALYSIS

TERRITORIAL ENTITIES

To reach general orientation, I first determine the relationship of territorial entities in order to distinguish the cultural provinces of California. The degree of similarity between particular entities I define only on the basis of their material culture. In this way the greatest possible uniformity may be obtained in the characterization of particular inventories.

The analysis is concerned with the following complexes: pottery, basketry and carrying implements, dress and ornaments, food and agriculture, smoking, hunting and fishing, tools and implements, structures, boats, and money. Using the 232 elements with complete distribution, I define the relationship of 60 complete territorial entities. The result of this analysis is represented in table 1 (facing this page) and diagram 1 (p. 35).

Considering the table, we notice first that the majority of the coefficients are positive and that the variability of their absolute values is very great. We observe negative coefficients only in the columns of the northwestern and southern California tribes.

Now it is easy to comprehend the grouping of tribes. The first group contains Mohave, Yuma, and Kamia, and the Chemehuevi are closely connected with it. Therefore it corresponds to the Colorado river cultural province.

The next group includes Diegueño, three Cahuilla tribes, Cupeño, Luiseño, Serrano, and Gabrielino. The center of this group, consisting of very high coefficients, contains only Cahuilla, Cupeño, Luiseño, and Serrano. On one wing of the center we find Diegueño, on the other, Gabrielino. This group as a whole represents the southern California province.

In the next group are all Yokuts tribes, which are closely connected among themselves, and three Shoshonean tribes—Tübatulabal, Western Mono, and Eastern Mono—which have an eccentric position. This group represents the territory of the characteristic Yokuts culture. Therefore we will define it as San Joaquin province.

This San Joaquin group is very closely connected with the next large assemblage, which contains all north central California tribes. Two subgroups may be distinguished. To the first belong Washo, Sierra Miwok, Plains Miwok, Nisenan, and Northwestern Maidu. In the second are Patwin, Nomlaki, Coast and Lake Miwok, all Pomo tribes, all Yuki tribes, and Kato. This division corresponds to the geographical grouping. The first subgroup contains tribes east of the Sacramento river, the second, tribes west of this river. As a totality, this large assemblage represents the north central California cultural province.

The next group is composed of Wailaki, Sinkyone, Nongatl, Mattole, Bear River, and Shasta, forming the northwestern province. These tribes are closely related to the next group, in which are found Tolowa, Hupa, Karok, Yurok, and Wiyot. This group corresponds to the northwest coast province which,

using the designation of Kroeber, is a "climax" of the larger northwestern area.

Besides these groups, we find five tribes each of which is either isolated or situated between two different groups. In the first category are the Modoc and Surprise Valley Paviotso. The Modoc are connected with the so-called "Plateau area," and these particular Paviotso represent Great Basin influ-

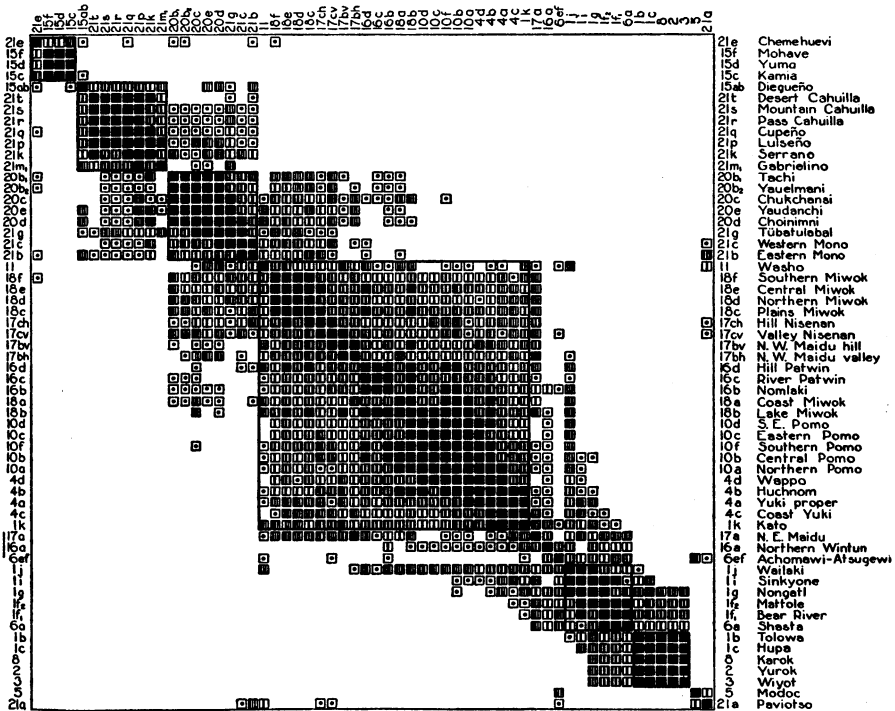


Diagram 1. Graphic representation of coefficients of similarity (Q_c) among sixty California tribes. Key: +1.00 to +0.90, black square; +0.89 to +0.80, square with three black stripes; +0.79 to +0.70, square with one black stripe; +0.69 to +0.60, square with three thin lines; +0.59 to +0.50, square with a point.

ences in California. Thus we have to deal with tribes foreign to the totality of Californian groups. Great Basin influences are marked among all the Paviotso group's neighbors—the Western Mono, Eastern Mono, Washo, Nisenan, and Achomawi-Atsugewi. Besides Modoc, only Achomawi-Atsugewi and Paviotso show the influence of the Plateau area.

Both the Northeastern Maidu and the Northern Wintun are intermediate between the central and the northwestern provinces. Moreover, the Northeastern Maidu are connected with the eastern part of the central province, and the Northern Wintun with its western part, in conformance with their geographical positions. The Achomawi-Atsugewi are closely affiliated with

tribes of the northwestern province, but their relations with Modoc and Paviotso detach them from the other tribes of that area.

Therefore the result of the quantitative analysis is entirely in agreement with Kroeber's synthesis of cultural relationships of Californian tribes. Our further task is to reply to the question: What is the reason for this grouping of tribes and this formation of cultural provinces in California? The answer is found in the analysis of the distribution of elements.

CULTURAL ELEMENTS

For purposes of distributional analysis, the entire body of material is divided into five sections. The first embraces elements of pottery, basketry, and carrying implements; the second, dress and ornaments, food and agriculture, smoking, musical instruments, and games; the third, fishing and hunting, boats, tools and implements, structures, and money; the fourth, war and fighting, social institutions, shamanism and knowledge; the fifth, cult and rites, mythology, and ceremonial paraphernalia.

Graphical representations analyzing the sections are presented (diagrams 2-6), together with tabulations (tables 2-6) showing the distribution of the particular elements in each section. These tables are of course arranged according to the order of territorial entities given in diagram 1.

Section 1

The analysis of the first section, represented in diagram 2 and table 2, enables us to distinguish a number of groups. The first group contains the following elements: duck jar, asymmetrical; quail spoon, rattling; carrying frame of sticks and cord; oval plate; large bowl used in ferrying; pointed parching tray; spoon of pottery; twined bags of cord warps. These elements are present in the inventory of the Mohave, Yuma, and Kamia, that is, in the Colorado river province. Thus they represent a stratum characteristic of the structure of the Colorado river province. This group is designated by the letter B.

The next group is composed of paddle method in pottery making; U-ladder cradle; round-shouldered bottleneck basket; coiled carrying basket, flat bottomed; coiled basketry cap, woman's. These elements are represented chiefly among south Californian Shoshoneans and Diegueño, that is, in the southern California province. Some of the elements are characteristic of the so-called "Mission basketry." This stratum is typical of the southern Californian province, and is designated by the letter C.

In the third group we find Y-frame cradle; tule cradle; bottleneck basket with sharp shoulder; feather fringe at shoulder of bottleneck basket; non-paddle method in pottery making. These elements are characteristic of the Yokuts and their neighbors. The element-group is designated as E.

The next group includes triangular winnowing tray; flat cradle of basketry, vertical warps; small light basket designs; hooked ladder-frame cradle. These

elements are represented chiefly among the Sierra and Plains Miwok and in the Washo inventory. This group is designated by the letter F.

The next group contains sitting cradle, round type; bead or haliotis ornament on baskets; more than 50 stitches an inch in coiling; lattice twining; wickerwork; seed beater of basketry (wickerwork); single-rod coiling; feather covering of baskets. This group of elements, represented chiefly among the Pomo, is designated as G.

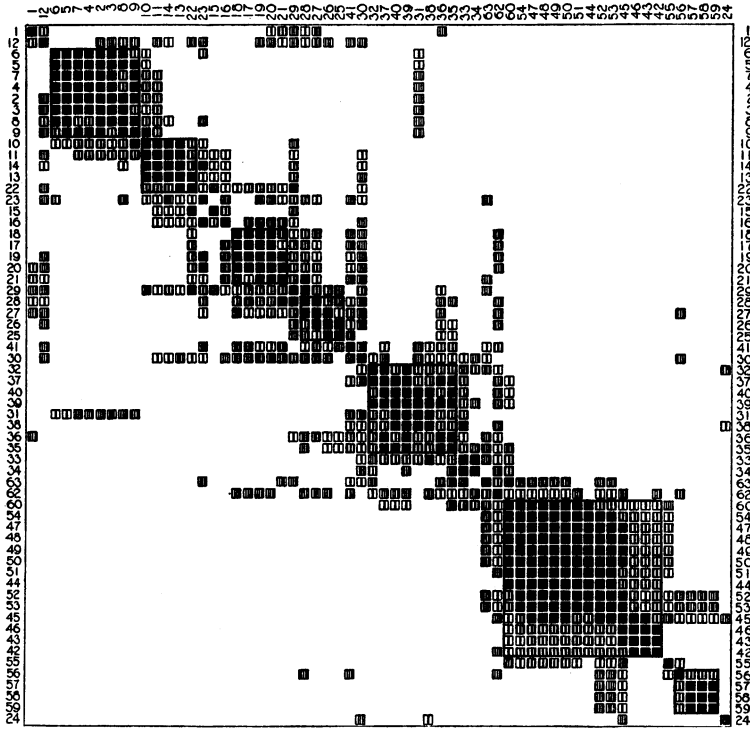


Diagram 2. Graphic representation of coefficients of similarity (Q_s) among the distributions of elements in the first section. Key: +1.0 to +0.80, black square; +0.79 to +0.60, square with three stripes; +0.59 to +0.40, square with one black stripe; +0.39 to +0.20, square with three thin lines.

Elements of the next group are *Alnus* decoration; *Adiantum* decoration; flat cap, overlay twined; *Woodwardia* decoration; band decoration; normal *Xerophyllum* decoration; low cooking and food baskets; sitting cradle with "toe"; overlay twining; sifter of close twining. This group is characteristic of northwestern California tribes, and is designated by the letter I.

In the last group we find back carrier of hide on frame; board cradle; large twined cap; tule sacks, coarse. These elements are represented almost exclusively in the Modoc inventory. Therefore it is this stratum which separates the Modoc from other California tribes. The group is designated as K.

Besides these groups, we find some elements which have isolated positions. Flat cradle of basketry with vertical warps is confined to the Eastern Mono. Diagonally twined woman's cap is rather broadly and irregularly distributed; it appears among the Western Mono and Chemehuevi and also among the Diegueño. The pitched water basket with pointed bottom is connected with group C, but has a far broader distribution than the elements of this southern Californian group. Small-element basket design and asphalted water basket, flat bottomed, are both present in the Gabrielino inventory and are united with a relatively high coefficient. For the present I will not define their structural character. *Epicampes* basketry has very irregular connections because of the territorial extension of this species of grass. Coiling, diagonal twining, seed beater of basketry, and carrying basket conical, twined, are very widely spread. We will determine the nature of these elements by including them in subsequent sections. Break in banded ornament and two-rod and splint coiling are closely related to group G. Their mutual affinity is rather doubtful because two-rod and splint coiling is present among Yana-Yahi, Salinan, and Chumash, tribes which are omitted in the distributional analysis. Sitting cradle of shallow type, which is limited to Achomawi-Atsugewi and Northern Wintun, is probably a local variation of sitting cradle with "toe" which belongs to group I. Kite-frame cradle, represented among Northeastern and Northwestern Maidu, is perhaps a local variation of the Y-frame cradle found in group F.

Section 2

The grouping of the second section of elements is represented by diagram 3.

The first group contains the following elements: man's hair in pencils, guessing-game objects hidden in sandpile; flageolet; flood agriculture; gourds grown; maize; beans; pumpkins; planting stick; weed cutter; mud plaster against lice; hair dye in mud plaster; rawhide sandal; nonritual face painting; cord-wrapped hoop in pole game; painted tablet dice. These elements are present in the inventories of the Mohave, Yuma, and Kamia, and most of them are found among the Chemehuevi. Thus this group is identical with group B of the first diagram.

The next group consists of pipe of cane; pipe of clay; gourd rattle; palut eagle-feather skirt; hainit headband; yucca-fiber sandal; headdress of human hair. These elements are represented in the southern California province and correspond to group C of the first diagram. Pipe of cane has a rather peripheral position in this group because its distribution is far greater than that of the other elements.

In the next group are two elements present only in the Gabrielino inventory: bone mouthpiece inserted in pipe; haliotis pendants, thin circles with tabs. The distribution of these elements is therefore identical with that of small-element basket designs in the first section. These three elements and asphalted water basket, flat bottomed, are designated by the letter D, and

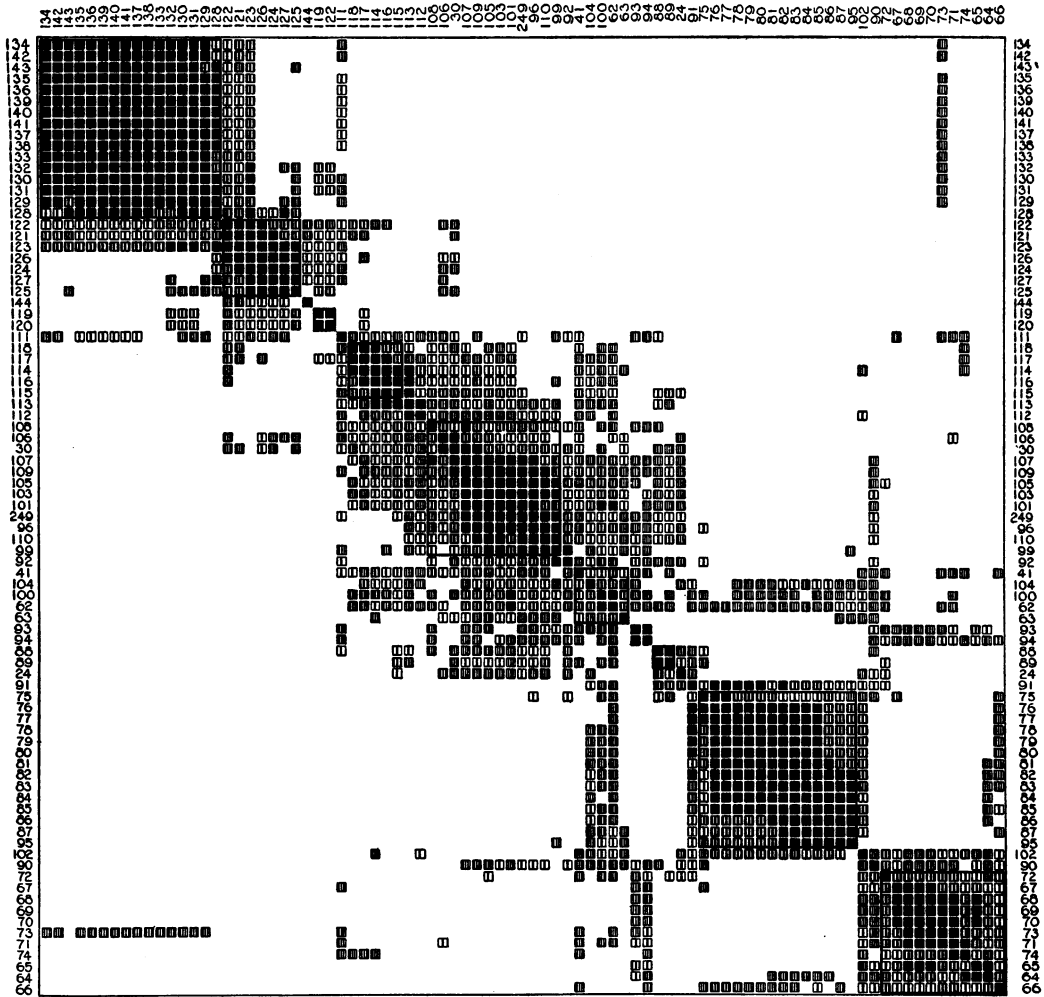


Diagram 3. Graphic representation of coefficients of similarity (Q_s) among the distributions of elements in the second section. Key: +1.0 to +0.80, black square; +0.79 to +0.60, square with three stripes; +0.59 to +0.40, square with one black stripe; +0.39 to +0.20, square with three thin lines.

represent the stratum which causes the relative separation of Gabrielino from the other tribes of the southern California province.

The next group contains elements characteristic of the San Joaquin province—eagle-down rope skirt; tobacco eaten with lime; split acorn dice; block and pole game; tall topknot of magpie tail feathers—and is identical with group E. Two other elements are connected with this group. The relation of the first, salt from grass, is very doubtful because its distribution is not completely known. The second, woman's lacrosse with hair ball and seed beater, belongs in group F which is characteristic of Sierra and Plains Miwok.

The next group is composed of splitstick dice; bullroarer; coiling; cocoon rattle; man's hair net, single; feather forks and darts for head; yellowhammer-quill headband, trimmed; splitstick rattle; magnesite cylinder used as treasure; footdrum; feather rope; wooden pipe with bulb end. This group does not appear in the preceding section, although it contains coiling which is isolated in the first diagram. The elements of this group are very widely spread. They belong in the inventories of all north central California tribes, and are found in the San Joaquin province, in southern California, and even among the tribes of the northwestern provinces. This complex is designated by the letter Z, and is distributionally distinguished as the Great Valley group.

It is very doubtful whether wooden pipe with bulb end belongs to group Z. The definition of this element is not very exact because the bulb-like shape of the Sierra Miwok pipe is distinctly different from that of the Pomo type. Therefore we omit this element in the synthetical presentation.

Acorn bread dyed with red earth is closely associated with some elements of the Great Valley group. It occurs among the Pomo and their neighbors, and may be identified with group G of the first section.

The next group of elements is even more widely distributed than the Great Valley group. It includes diagonal twining; one-piece moccasin; stone boiling in baskets; carrying basket conical; seed beater of basketry. These elements are present in all provinces of California except the Colorado river area. The group is designated as Y.

The distribution of tule leggings and tule moccasins, which are closely connected, is of an environmental kind. It is not unlikely that, with a more exact definition, it would be possible to distinguish forms characteristic of the Modoc from those which occur among the Lake Pomo. Meanwhile, this group lacks historical significance.

Next we have two elements, blanket of warps of birdskin twisted with cord, and Tarat woodpecker-scalp visor, which are present among the Patwin and some of the Maidu tribes. This group is typical of the lower Sacramento valley, and is designated by the letter L.

The next group contains double-ball played by men, with wrestling; crotched headnet, flowing; open-mesh headnet, flowing; spliced eagle- or condor-feather headdress; painted double deerskin cape; haliotis inlay in pipe; sea-lion tooth headband; woodpecker-scalp headbands of northwestern type; dice of 4 mussel disks; woman's chin tattoo, nearly solid; concave wood pipe with mortised steatite bowl; salmon vertebrae ring-and-pin; many-stick guessing game; seaweed eaten for salt. These elements, which are represented in northwestern California, correspond to group I of the first diagram.

Seaweed eaten for salt does not belong in this group because it is present in the inventory of almost every California coast tribe. Unfortunately, however, we are obliged to omit Costanoan, Salinan, and Chumash in the distributional

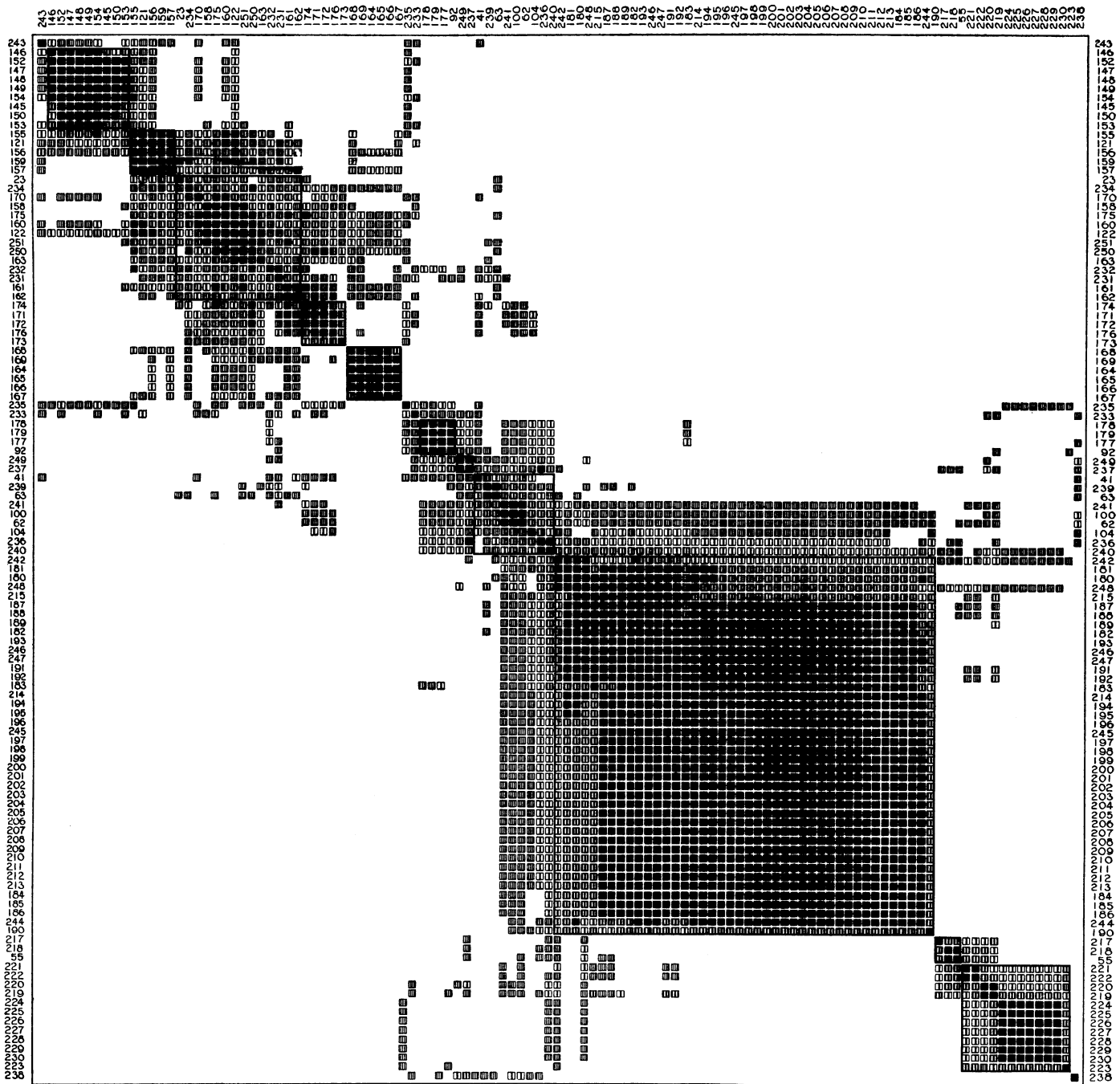


Diagram 4. Graphic representation of coefficients of similarity (Q_s) among the distributions of elements in the third section. Key: +1.0 to +0.80, black square; +0.79 to +0.60, square with three stripes; +0.59 to +0.40, square with one black stripe; +0.39 to +0.20, square with three thin lines.

analysis, and therefore this element must be connected with group I. It is, of course, omitted in the synthetical presentation.

The elements of the last group are hair brush of porcupine tail; wooden pipe stem; buckskin gown; L-shaped pipe bowl of stone; disk pipe bowl of stone; buckskin leggings, full length; 4-stick guessing game; 2-piece moccasin; ring-and-pin with single tule ball; eye shade; beaver-teeth dice. This group is identical with group K of the first section.

In addition, there are the following isolated elements: hoop and pole game, which is distributed over all California provinces except the northwest area; high moccasin, hard soled, which is limited to the mountain Cahuilla; kite-frame cradle, which even in this section maintains an isolated position; and tobacco planted, which has a very irregular distribution. Possibly tobacco planted is a misleading definition which does not permit distinctions to be made among traits of tobacco cultivation. The reasons for the isolation of snowshoe and dried salmon pulverized are, of course, environmental.

Section 3

To the third section, I add all elements of group Y; pipe of cane, pipe of clay, and asphalted water basket, flat bottomed, of group C; acorn bread dyed with red earth; and sitting cradle, shallow type.

The first group contains wooden pestle, long; low granary on ground; ridged arrow straightener of stone or clay; large fish scoop; squared muller; squared metate; shade roof only cult structure; front house-wall double, sand filled; wooden mortar, deep. These elements represent group B.

The next complex is large and has two distinguishable centers. The first is composed of long self-bow; pipe of clay; curved rabbit club; unroofed granary; mortar hopper, coiled. The distribution of this group is identical with that of group C.

The second center contains pitched water bottle, pointed bottom; earth-covered sweat house, primarily for sweating; granaries on posts; gabled house; arrow straightener, rectangular, grooved, of steatite or clay; cane arrow; pipe of cane; clam-disk money, measured on hand; shell-cylinder money or treasure; mat covering of round houses of poles; thatch covering of round houses of poles; rabbit net; metate, slab type; bedrock mortar. All these elements are found in the inventories of southern California tribes, but also are present in the San Joaquin and even in the central province. Some of them, such as pitched water bottle, pointed bottom, and pipe of cane, are finally represented in the inventory of the Paviotso. Also in the second center is thatch covering of round houses of poles, but the reason for its faint connection with the other elements is obviously environmental. It is omitted in the synthetical presentation.

The centers of this large complex are in close mutual connection. To express their relationship, the first center is designated as C_1 and the second as C_2 .

C₁ represents a stratum characteristic of the southern California province. The nature of C₂ is discussed below.

The next group consists of looped-stick food stirrer; communal house gabled, long; bird-snaring booth; wooden mortar, shallow type; houses in series with common shade. These elements represent group E.

The following elements are identical with group D: square-edged mortar; steatite bowl, small-mouthed; plank boat, planks lashed; steatite fry pan, trapezoidal, holed; wooden bowls with haliotis ornament; circular fishhook of haliotis.

Magnesite cylinders used as treasure and earth-covered ceremonial house, represent group Z.

The next group is identical with group G, and contains long quail trap of basketry; pestle with bulb end; fire making with quartz; acorn bread dyed with red earth.

In addition to its previously named elements, group Y contains deer-mask decoy; sinew-backed bow; pounding slab with loose hopper; and twined basketry hopper.

The next large group corresponds to group I, and is composed of longitudinally grooved arrow polishers of sandstone, in pairs; bow broad, thin, short; long wedge of elkhorn; dentalium money; thumb guard of mussel for fiber drawing; fishing scaffold; trapezoid bag net on A-frame; ornamented elkhorn spoon; lamprey hook or rake; net shuttle of elkhorn; dentalium money measured individually on finger creases; dentalium money strings measured on arm; eel pot; redwood dugout canoe; wooden meat platter; plank house; anteroom; roof plates; curved stone adze, mussel blade; cylindrical money box of horn with lid; octagonal plank-lined pit in plank house; house names; plank or slab floor in plank sweat house; cobble-lined exit pit from sweat house; 3-pitch roof; stone grips at door; drying frame in plank house; broad ladder, notched; circular entrance in plank house; sliding door; stone platform outside; wooden stool, cylinder or mushroom shape; wooden pillow in sweat house; cubical pit fireplace, stone-lined, in sweat house; plank sweat house; pear-shaped maul; pestle ringed near base; 5-stone fireplace in plank house; holed arrow straightener of elkhorn; plug exit door in sweat house; triangular money box of horn; sea-lion harpoon, line from shaft.

The elements of the next group—house plan trapezoidal; squared house of bark slabs; and sitting cradle, shallow type—are characteristic of Achomawi-Atsugewi and Northern Wintun. This group is designated by the letter M.

The last group, corresponding to group K, contains mat-covered small sweat house; steaming in sweat house; tied-rung ladder; simple dugout boat; holed ladder; loop-handled muller; two-horned muller; circular metate; fish spear with prongs spread by ring; quiver of tule; ring-pointed arrow for water skipping; jointed firedrill.

Besides these groups, there are four isolated elements: balsa, which has very

broad distribution and irregular connections doubtless resulting from the geographical situation; earth-covered building, which is distributed similarly to hoop and pole game; house of bark slabs, the distribution of which is determined by environment; and wells, which probably originated independently in two regions as remote as the Sacramento valley and southern California.

Section 4

To the fourth section, I add hoop and pole game and earth-covered building with 1 to 4 center posts. The grouping of elements is represented by diagram 5.

The following groups may be distinguished:

B: private ownership of agricultural land; shaman's dream of creation; mourning anniversary for warriors; mimic battle in mourning anniversary for warriors; large tribes; patrilineal totemic clans; women carry clan names; stick fight to settle disputes; Kohota; only women captives enslaved, not violated; kept without definite status; mourning singing begins before death; feathered staves in warfare; clan tales of war and migration; no ritual functions of clan. Closely connected with this group is round hide shield.

C₁: song cycles used in mourning; cone frustum war club; 2-solstice calendar; mourning anniversary; eagle-killing dance; fire dance; Yunish-matakish; Chuchamish; patrilineal lineages without clan totem; wildcat-coyote moieties; Paha.

D: indefinite counting by fives only; Tuvish.

C₂: moieties; images of dead in mourning anniversary; eagle or hawk rearing; grizzly bear shaman transformed into bear.

F: personal names with totemic implications; patrilineal totemic moieties without subdivisions, exogamic; land and water moieties.

Z: widow pitches head (or does not wash); parent-in-law avoidance.

Y: levirate; sororate; shaman sucks out disease object.

G: fetish sacks for shaman; grizzly bear shaman wears bearskin.

I: elkskin armor; rod-jacket armor, twined; named and ranked places in sweat house; corpse taken through rear wall; damage compensation by social rank; chieftainship replaced by wealth influence; debt slavery; names given according to house or marital status; employer's liability; fine for constructive adultery; "half" marriage; "slave-killer" type of stone club, edged; war dance of settlement; disease object kept in body of shaman; negotiated marriage price; parents' marriage price determines weregild; most shamans women; braided mourning necklace; liability of shaman declining case. Interment of dead is present in this group but occupies a somewhat separate position because it is also found among some Yokuts tribes. However, it must be admitted that burial among these remote tribes had an independent origin.

K: widow's belt of hair; war for taking slaves.

A separate complex is formed by hoop and pole game, cremation of dead, and earth-covered building with 1 to 4 center posts. The distributional trait

shared by these elements is absence in the northwestern provinces. For the purpose of orientation the group is designated as X. These elements are omitted in the synthetical presentation because their coefficients are relatively small.



Diagram 5. Graphic representation of coefficients of similarity (Q_c) among the distributions of elements in the fourth section. Key: +1.0 to +0.80, black square; +0.79 to +0.60, square with three stripes; +0.59 to +0.40, square with one black stripe; +0.39 to +0.20, square with three thin lines.

Certain isolated elements occur in this section. Mourning necklace of pitch lumps represents group M. Four-color direction symbolism is a local element of Diegueño culture. Rattlesnake shaman is isolated probably because it is not defined exactly. Octonary count with twigs is specific for the central Yuki.

Section 5

In the fifth section, which contains ritualistic and religious elements, the following groups are distinguished.

B: soul of untattooed enters rat hole; religious dreaming connected with



Diagram 6. Graphic representation of coefficients of similarity (Q_s) among the distributions of elements the fifth section. Key: +1.0 to +0.80, black square; +0.79 to +0.60, square with three stripes; +0.59 to +0.40, square with one black stripe; +0.39 to +0.20, square with three thin lines.

creation; berdache-making ritual; myths begin at sacred mountain; myth, song, and cult dreamed; twins favored or signalized; long song cycles.

C_1 : earth and sky as first deities; dying god concept; girls' rite with drinking of tobacco; meteor cannibal spirit; Morahash; sand painting altar; ant fortitude ordeal for boys; Milky Way is spirit; double cult names; other

named deities besides Chungichnish; grave trench; Wanawut; Paviut wand, crystal topped; toloache initiation into a status.

D: Chungichnish supreme deity; origin myth of birth succession; carved steatite artifacts in forms of "spike," "scoop," "hook."

E: taking toloache in groups without achieving status.

F: Pota; trench in girl's rite.

It is a rather difficult task to segregate the elements in each of the next two complexes, which concern the Kuksu and Hesi cults. First, two subgroups are found in the Kuksu complex. The first consists of ghost (representing dead) impersonation; sacred dances: hawk-monster; Toto; grizzly bear impersonation in Kuksu; Lole; ritual clowns; big-head impersonation in Kuksu. On the basis of similar distribution, this subgroup is identified with group Z, which contains magnesite cylinder as treasure, footdrum, and feather rope.

The elements of the second subgroup are male initiation of Ghost type; male initiation of Kuksu type; ghost (running spirits) impersonation; male initiation of bear type; women admitted to membership in Kuksu society; female initiation of Kuksu type; female initiation of bear type; Shalnis; thunder ceremony; fire-eating ceremony; acrobatic ceremony. They are present chiefly among the Pomo and therefore correspond to group G. Groups Z and G are very closely connected here because the elements of group Z in this section are absent among the Yokuts and Northern Wintun.

The Hesi complex is composed of four subgroups. The first contains male initiation of Wai-saltu type; Wai-saltu, rabbit, and Moki representations; male initiation of Hesi type; coyote, grizzly bear, water spirit-mud, condor, and woman representations. These elements correspond to group L. The elements of the second subgroup—Kenu; Aki; goose, turtle, deer, grasshopper, creeper, and duck representations—are present only on the eastern side of the Sacramento valley among Northwestern Maidu and Valley Nisenan. This group is designated as L₁. The other two subgroups are local in kind. L₂ consists of raccoon and worm representations, and L₃ contains fish representation and female initiation of Hesi type.

The group I elements in this section are haliotis looked into in girls' rite; salmon-weir rite; world-renewing rites; sight of ritualist is taboo; new fire; deerskin dance; jumping dance; complete localization of rites; sweat house fuel-gathering ritual; ceremonial wealth display; dancing in boat; first salmon ceremony; first acorn rite.

The following elements belong in group K: boys' puberty: whipping with bow string; vision seeking, fasting, running; east significant in girls' rite.

The isolated elements are of very different kinds. Four may be considered local variations: crescentic stone in girls' rite; obsidian initiation; thunderman impersonation in Kuksu; and fire ring in girls' rite. Girl dancing in girls' rite occurs only among the Yuki and their Athabascan neighbors. We find in our material no other element with a similar distribution.

LITERATURE

This list is limited to recent publications. An exhaustive presentation of Californian ethnographical literature is given in Kroeber, 1925 (see below).

BARRETT, S. A.

1917. The Washo Indians. PMM-B 2:117-376.

BEALS, R. L.

1932. The Comparative Ethnology of Northern Mexico before 1750. *Ibero-Americana* 2:93-225 (Univ. of Calif. Press).

1933. Ethnology of the Nisenan. UC-PAAE 31:335-414.

FAYE, P. L.

1923. Notes on the Southern Maidu. UC-PAAE 20:35-56.

FORDE, C. DARYLL

1931. Ethnography of the Yuma Indians. UC-PAAE 28:83-278.

GAYTON, A. H.

1929. Yokuts and Western Mono Pottery Making. UC-PAAE 24:239-255.

1930. Yokuts-Mono Chiefs and Shamans. UC-PAAE 24:361-420.

GIFFORD, E. W.

1926. Clear Lake Pomo Society. UC-PAAE 18:287-390.

1926. Miwok Cults. UC-PAAE 18:391-408.

1926. Miwok Lineages and the Political Unit in Aboriginal California. AA 28:389-401.

1928. Pottery Making in the Southwest. UC-PAAE 23:353-373.

1931. The Kamia. BAE-B 97.

1932. The Northfork Mono. UC-PAAE 31:15-65.

GODDARD, P. E.

1903. Life and Culture of the Hupa. UC-PAAE 1:1-88.

HOOPEE, L.

1920. The Cahuilla Indians. UC-PAAE 16:315-380.

KELLY, I.

1930. Yuki Basketry. UC-PAAE 24:421-444.

1932. Ethnography of the Surprise Valley Paiute. UC-PAAE 31:67-210.

KROEBER, A. L.

1925. Handbook of the Indians of California. BAE-B 78.

1929. The Valley Nisenan. UC-PAAE 24:253-290.

1932. The Patwin and their Neighbors. UC-PAAE 29:253-423.

LOEB, E. M.

1926. Pomo Folkways. UC-PAAE 19:149-405.

1932. The Western Kuksu Cult. UC-PAAE 33:1-137.

1932. The Eastern Kuksu Cult. UC-PAAE 33:139-232.

LOWIE, R. H.

1924. Notes on Shoshonean Ethnography. AMNH-AP 20 (pt. 3).

MASON, J. A.

1912. The Ethnology of the Salinan Indians. UC-PAAE 10:97-240.

MCKERN, W. C.

1922. Functional Families of the Patwin. UC-PAAE 13:235-258.

1923. Patwin Housse. UC-PAAE 20:159-174.

MERRILL, R. E.

1923. Plants used in Basketry by the California Indians. UC-PAAE 20:215-234.

OLSON, R. L.

1927. Adze, Canoe and House Types of the Northwest Coast. UW-PA 2:1-38.

1930. Chumash Prehistory. UC-PAAE 28:1-21.

SPIER, LESLIE

1923. Southern Diegueño Customs. UC-PAAE 20:297-358.

1930. Klamath Ethnography. UC-PAAE 30:1-388.

STEWARD, JULIAN H.

1933. Ethnography of the Owens Valley Paiute. UC-PAAE 33:233-350.

STRONG, W. D.

1929. Aboriginal Society in Southern California. UC-PAAE 26:1-358.

VI. SYNTHESIS

By applying the statistical method, it has been possible to classify the California ethnographical data and thus to establish groups of tribes which have similar inventories and groups of elements which have a similar distribution. The groups of tribes correspond to cultural provinces in California. The groups of elements represent cultural strata.

These strata will give us historical facts, and we can determine the nature of these facts by (1) establishing the connection of cultural strata to ethnic groups,⁹ and (2) considering the distribution of elements beyond California. The second condition is rather difficult to fulfill because the material concerning regions adjoining California is incomplete.

However, the first task is to define the relationship of cultural strata and particular territorial entities. Therefore I present the quantity of elements of each stratum in the inventory of each tribe. To preserve uniformity, the presentation is limited to the elements of material culture. This permits the inclusion of the seven incomplete entities—Yana-Yahi, Northern Yokuts, Costanoan, Salinan, Chumash, Kawaiisu, and Las Vegas—whose inventories are least defective in material culture.

On the basis of table 7, the degree of similarity between every tribe and stratum may be determined.

Knowledge of the cultural structure of each tribe explains the tribal groupings, and, consequently, defines the cultural provinces.

The separation of the Colorado river province is caused by stratum B, which is important in the structure of the area. This stratum is not so prominent in the cultural structure of the Chemehuevi as in those of the Mohave, Yuma, and Kamia. The Chemehuevi structure also has some connections with strata C₂, E, and Y, which are lacking in the structures of the Mohave, Yuma, and Kamia. This accounts for the aberrant cultural position of the Chemehuevi among the other tribes of the Colorado river province.

Stratum C₁ is the cause of the separation of the southern California province. The isolation of Gabrielino is caused by stratum D. Stratum E is characteristic of the San Joaquin province. The reason for the distinctness of the central area is the presence of stratum Z. The division of the central area into eastern and western subprovinces is a result of the distributions of strata F and G. F is characteristic of the eastern and G of the western division.

⁹ Even at the present time a superstition prevails among some ethnologists that the establishment of a relation between linguistic and ethnographical phenomena is inadmissible. This is, of course, entirely irrational. Both linguistic and cultural phenomena are products of social organizations. They owe their existence, their natures, and their distributions to definite human groups. Only in the fables of Andersen have cultural elements such as collars, pots, and baskets the ability to move by themselves and maintain independent existence. Of course we can connect some one ethnical group only with some particular cultural stratum, and not with the totality of the cultural inventory. That is why the structural analysis of a culture is of such importance to ethnological research. Without this analysis, it is impossible to comprehend the observed phenomena.

TABLE 7

COEFFICIENTS OF SIMILARITY (Q_s) BETWEEN TRIBES AND CULTURAL STRATA. MATERIAL CULTURE ONLY.
(Negative coefficients are in italics)

	21e ₁	21e	15f	15d	15c	15ab	21t	21s	21r	21q	21p	21k	21m	14	13	20a	20b ₁	20b ₂	20c	20e	20d	21f	21g	21c	211
B	.46	.58	.98	.95	.76	.05	.19	.24	.24	.25	.25	.27	.27	.27	.22	.26	.30	.30	.31	.31	.31	.26	.24	.29	.18
C ₁	.28	.10	.26	.18	.31	.81	.88	.89	.88	.86	.81	.67	.62	.36	.14	.08	.12	.10	.12	.13	.12	.29	.04	.02	.09
C ₂	.45	.41	.11	.04	.09	.61	.62	.63	.69	.78	.78	.81	.58	.52	.54	.58	.56	.57	.55	.72	.62	.58	.64	.53	.56
D	.15	.17	.16	.16	.14	.15	.13	.13	.13	.09	.03	.05	.68	.78	.12	.14	.16	.16	.16	.17	.16	.03	.02	.15	.14
E	.13	.15	.20	.20	.18	.18	.16	.16	.16	.17	.17	.10	.12	.17	.15	.49	.75	.64	.68	.66	.68	.27	.45	.43	.37
F	.02	.10	.11	.11	.10	.10	.09	.09	.09	.09	.09	.10	.11	.10	.07	.10	.11	.01	.01	.01	.01	.01	.02	.01	.28
Z	.01	.02	.18	.10	.08	.09	.05	.05	.05	.03	.03	.02	.05	.19	.48	.62	.46	.46	.45	.43	.45	.27	.32	.27	.32
L	.07	.07	.07	.07	.06	.06	.06	.03	.06	.06	.06	.06	.06	.06	.05	.06	.07	.07	.07	.07	.07	.07	.06	.07	.06
Y	.33	.30	.15	.14	.19	.06	.09	.12	.09	.12	.12	.14	.14	.15	.48	.58	.48	.48	.47	.46	.47	.53	.41	.43	.45
G	.17	.18	.10	.10	.16	.16	.14	.14	.14	.15	.15	.16	.17	.15	.03	.15	.18	.17	.18	.19	.18	.20	.17	.08	.16
J	.45	.42	.47	.47	.42	.43	.39	.38	.39	.40	.40	.42	.45	.43	.43	.41	.47	.46	.47	.49	.47	.41	.46	.44	.42
M	.08	.09	.09	.09	.08	.03	.07	.07	.07	.07	.07	.08	.08	.08	.08	.08	.09	.08	.09	.09	.09	.02	.08	.10	.08
K	.26	.28	.27	.28	.24	.25	.22	.22	.22	.29	.29	.17	.26	.25	.20	.17	.27	.27	.28	.28	.28	.22	.27	.20	.17

	19	11	18f	18e	18d	18c	17ch	17cv	17bv	17bh	16d	16c	16b	18a	18b	10d	10c	10f	10b	10a	4d	4b	4a	4c	1k
B	.19	.21	.29	.30	.29	.27	.25	.26	.27	.26	.26	.25	.23	.23	.27	.29	.29	.25	.29	.30	.26	.20	.21	.20	.24
C ₁	.04	.13	.16	.19	.18	.17	.16	.16	.17	.16	.16	.14	.04	.17	.18	.19	.18	.19	.19	.19	.16	.14	.14	.14	.15
C ₂	.38	.28	.30	.36	.31	.17	.28	.26	.09	.19	.01	.02	.05	.07	0	.01	.02	.09	.10	.10	.16	.14	.13	.14	.15
D	.08	.03	.15	.16	.15	.14	.09	.14	.14	.14	.14	.09	.12	.12	.14	.15	.15	.15	.15	.16	.14	.15	.11	.15	.13
E	.07	.06	.19	.24	.04	.06	.08	.07	.10	.09	.09	.01	.15	.15	.10	.19	.19	.19	.19	.19	.17	.15	.14	.15	.16
F	.49	.40	.35	.37	.52	.42	.04	.04	.10	.09	.09	.09	.08	.09	.10	.11	.11	.11	.11	.11	.10	.08	.08	.08	.09
Z	.61	.20	.75	.72	.75	.78	.76	.79	.72	.73	.80	.76	.76	.80	.72	.75	.72	.75	.72	.72	.73	.83	.86	.77	.83
L	.04	.05	.07	.07	.07	.06	.16	.36	.35	.15	.36	.37	.06	.06	.06	.07	.06	.07	.06	.07	.06	.06	.06	.06	.06
Y	.80	.88	.59	.55	.59	.62	.57	.55	.70	.72	.64	.48	.71	.61	.69	.66	.65	.66	.65	.64	.70	.72	.58	.55	.59
G	.09	.12	.01	.01	.01	.02	.15	.15	.02	.03	.18	.39	.06	.25	.65	.75	.72	.75	.72	.72	.67	.67	.20	.03	.05
J	.10	.28	.45	.43	.44	.42	.26	.30	.36	.36	.36	.31	.22	.27	.37	.37	.36	.36	.36	.30	.27	.20	.14	.01	.25
M	.49	.06	.10	.09	.10	.03	.07	.10	.08	.08	.08	.07	.07	.07	.10	.10	.08	.10	.08	.08	.10	.06	.08	.06	.07
K	.51	.04	.12	.27	.17	.24	.18	.24	.12	.11	.23	.29	.10	.21	.24	.12	.26	.26	.26	.27	.24	.20	.19	.20	.22

	17a	7	16a	6ef	lj	li	lg	lf ₂	lf ₁	6a	1b	1c	8	2	3	5	21a
B	.27	.24	.20	.22	.29	.30	.24	.21	.21	.23	.23	.44	.44	.45	.43	.31	.25
C ₁	.17	.16	.19	.20	.18	.19	.15	.20	.20	.21	.26	.29	.29	.29	.28	.20	.16
C ₂	.09	.15	.13	.12	.17	.19	.15	.19	.19	.20	.25	.22	.22	.22	.27	.12	.22
D	.14	.13	.14	.17	.15	.16	.13	.17	.17	.17	.22	.24	.24	.24	.24	.17	.09
E	.10	.16	.19	.21	.19	.20	.16	.21	.21	.22	.27	.30	.30	.30	.29	.21	.17
F	.10	.09	.11	.11	.11	.11	.09	.12	.12	.12	.15	.17	.17	.17	.17	.12	.21
Z	.71	.41	.24	.18	.63	.22	.14	.05	.11	.12	.18	.26	.26	.26	.25	.11	.12
L	.06	.17	.07	.07	.07	.07	.07	.06	.07	.07	.08	.10	.11	.11	.11	.10	.07
Y	.65	.68	.57	.53	.47	.55	.59	.53	.53	.59	.34	.30	.44	.44	.38	.47	.48
G	.16	.16	.09	.19	.01	.18	.14	.19	.19	.19	.24	.26	.25	.27	.29	.19	.15
J	.04	.08	.27	.10	.25	.56	.39	.68	.70	.61	.96	.99	.98	.99	.98	.24	.28
M	.08	.11	.30	.36	.10	.09	.07	.09	.09	.09	.07	.15	.13	.13	.13	.09	.07
K	.07	.03	.04	.25	.26	.27	.22	.22	.23	.03	.26	.26	.26	.41	.40	.93	.47

Stratum M is the cause of the isolation of the Achomawi-Atsugewi. The two northwestern provinces owe their individuality to stratum I, which is chiefly represented in the structure of the northwest coast province. The Modoc are isolated because stratum K is important in their cultural structure. The same stratum is present, though less prominent, in the structures of the Achomawi-Atsugewi and Surprise Valley Paviotso. The Paviotso are also connected with stratum C₂.

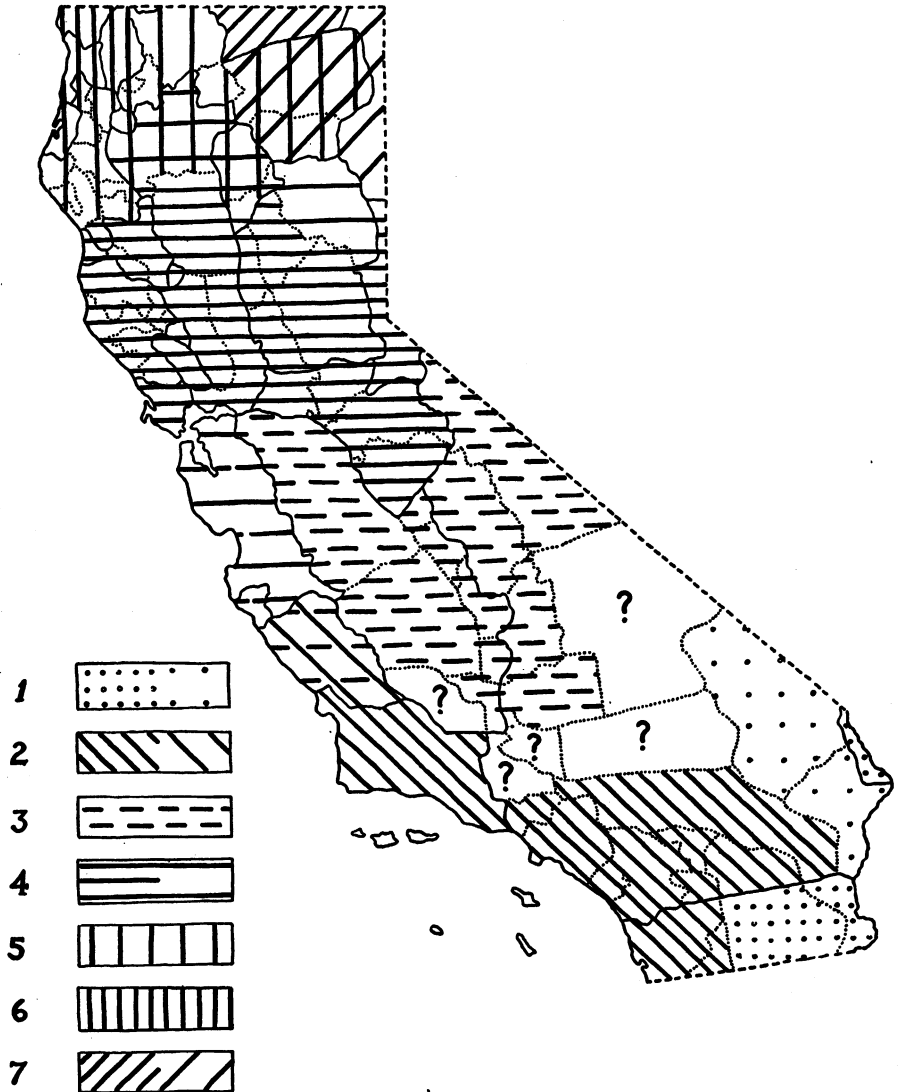
The isolation of the Northeastern Maidu and Northern Wintun is not caused by any specific stratum, but by the different relation of these tribes to strata which are also common to other tribes. The cultural structure of the Northeastern Maidu is very simple. It consists of strata Y and Z, slightly influenced by stratum C₂. The Northern Wintun structure is composed principally of stratum Y and affected by I, Z, and M.

Now I will try to determine the cultural structures of the tribes with incomplete inventories. The structure of the Las Vegas Paiute is similar to that of the Chemehuevi, but is less influenced by stratum B and has, in addition, some slight connections with strata F and Z. The structure of the Chumash resembles that of the Gabrielino. Both are strongly affected by stratum D, but stratum C₁ is less important in the Chumash than in the Gabrielino structure.

The Salinan have a rather isolated position. Their structure is almost equally determined by strata C₂, Z, and Y, and slightly influenced by strata C₁ and F. Thus the Salinan are intermediate between the southern and central provinces. The culture of the Northern Yokuts is identical with that of other Yokuts tribes. The Kawaiisu are culturally very like the Tübatulabal and hill Yokuts. The Costanoan also are isolated. Their cultural structure, defined chiefly by strata Y and Z, is also affected by C₁ and C₂ and, slightly, by G. Thus the Costanoans occupy a position intermediate between the west central and southern provinces. The Yana-Yahi structure is similar to that of the Northern Wintun.

Finally, I will attempt to define the general cultural structures of the tribes for which there are only fragmentary data. The Athabascan, Rogue River, Chilula, Whilkut, and Lassik tribes doubtless belong to the northwestern province. One expects stratum I to be stronger in the structures of the Rogue River and Chilula than in those of the Whilkut and Lassik. To the northwestern province, also, belong the Chimariko, New River Shasta, and Konomihu. It is possible that the Okwanuchu are culturally intermediate between Shasta and Achomawi-Atsugewi.

The Salt Pomo and the Southwestern Pomo are undoubtedly members of the west central province. The Esselen seem to be somewhat closer to the Costanoan than to the Salinan. In any event, their position is intermediate between the southern and central provinces. The Buena Vista Yokuts, like other Yokuts tribes, are a component of the San Joaquin group. But, one might expect them to be most strongly influenced by strata characteristic of the southern province. I cannot define exactly the cultural position of Koso-Panamint, Kitanemuk, Alliklik, and Vanyume because it is impossible to establish the limits of the influence of stratum B in the north, and the extension of stratum C among these tribes. The Koso-Panamint are, in all probability, a typical Great Basin tribe. The Kitanemuk and Alliklik may be connected with both Yokuts and Chumash. The Vanyume structure is entirely doubtful. The Fernandño and Nicoleño are certainly very similar to Chu-



Map. 3. Cultural provinces in California. 1, Colorado river; 2, Southern California; 3, San Joaquin; 4, Central; 5, Northwestern; 6, Northwest coast; 7, Northeastern.

mash and Gabrielino. The Juaneño are probably more closely affiliated with Luiseño than with Gabrielino.

Now I will try to define the relationships between particular strata and ethnic groups. As an introduction to this problem, I will first determine the connections between cultural provinces and linguistic families, applying the technique of the previous analyses and using the coefficient Q_6 . The results are presented in table 8.

The Hokan family is somewhat associated with two cultural provinces of entirely different structures. Its connection with the Colorado river province is through the Yuman-speaking peoples located there, and its relation to the central province is caused by the Pomo. The Shoshonean family is definitely affiliated with the southern province. The Penutians are connected by a relatively high coefficient with the central area, and by a smaller one with the San Joaquin province. The Yuki are related to the central province, but by a coefficient smaller than that of the Penutians. Athabascans are associated with the northwest, and Algonkins with the northwest coast area.

TABLE 8

COEFFICIENTS OF SIMILARITY (Q_c) BETWEEN LINGUISTIC FAMILIES AND CULTURAL PROVINCES
(Negative coefficients are in italics)

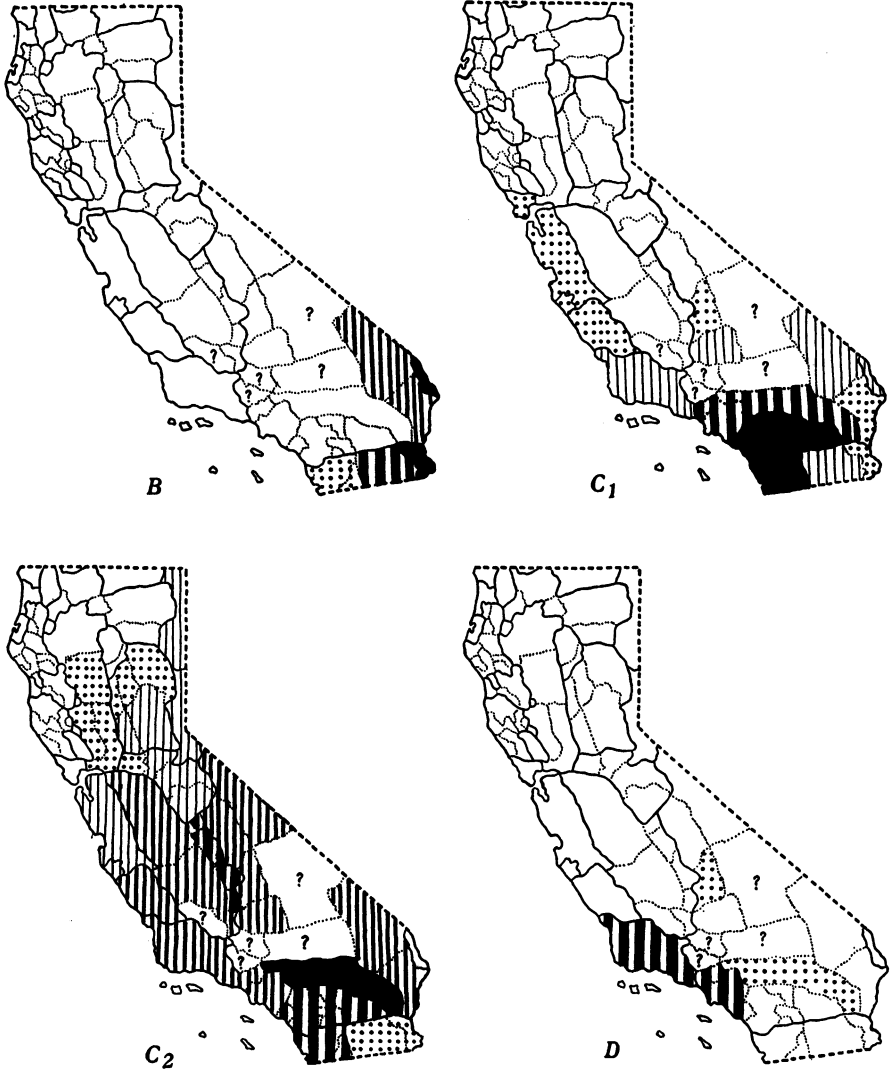
Linguistic families	Cultural provinces					
	Colorado r.	S. California	San Joaquin	Central	Northwestern	Northwest coast
Hokan.....	.54	.14	.34	.10	.07	.02
Shoshonean.....	.06	.89	.28	.64	.27	.24
Penuti.....	.30	.44	.40	.59	.37	.34
Yuki.....	.12	.18	.18	.48	.15	.14
Athabaskan.....	.18	.26	.26	.40	.88	.35
Algonkin.....	.08	.12	.12	.26	.10	.83

It is now clear that each of these cultural provinces has a definite connection with some particular linguistic group. These correlations would be higher, of course, if I dealt with the smaller division of the large linguistic families. Therefore strata which are decisive in determining the cultural structures of these provinces must also have their ethnical (tribal) affinities.

To define these affinities, the distribution of particular cultural strata must be considered more precisely. Therefore I represent cartographically the synthetical presentation of table 7. Stratum Y alone is omitted because it is almost universal.

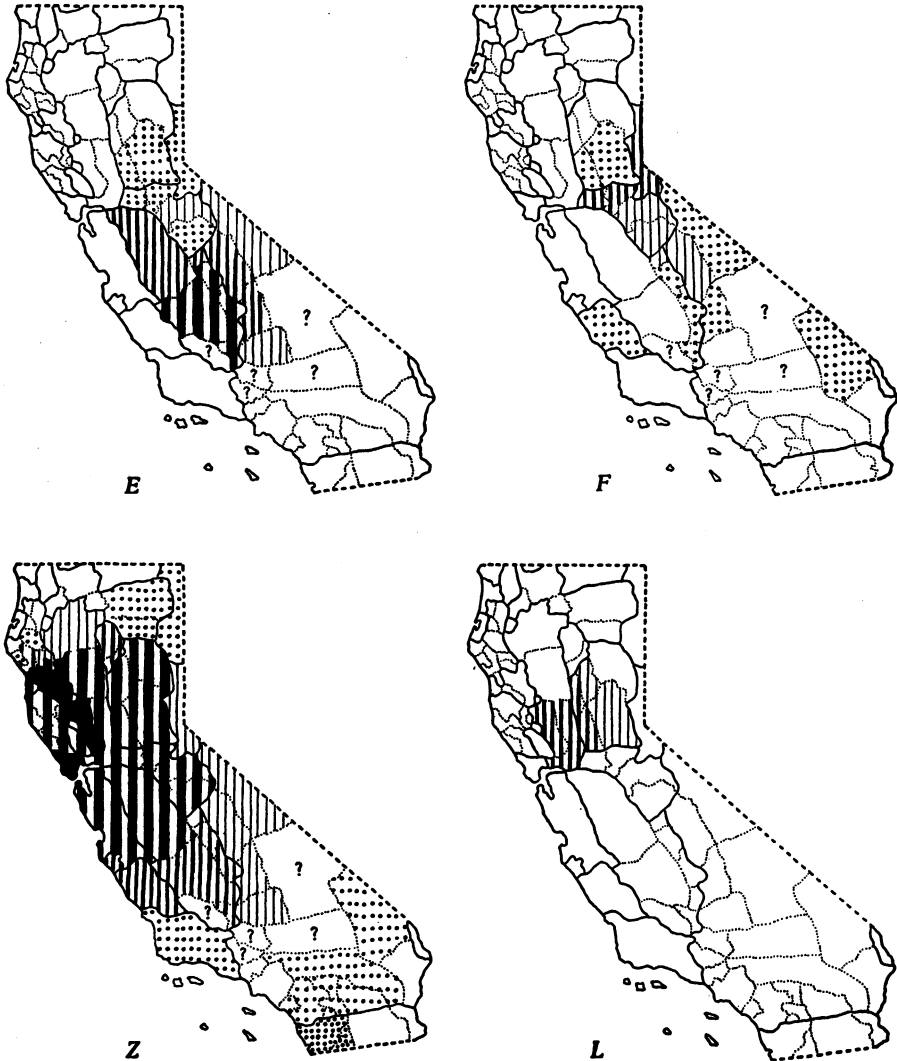
Stratum B occurs principally among Mohave, Yuma, and Kamia. With reduced intensity, it is present among Chemehuevi and Las Vegas and also in Diegueño territory. Considering the elements of this stratum with respect to their extra-California distribution, we find that most of them, including agriculture and connected elements, paddle method in pottery making, deep wooden mortar, rawhide sandal, face and body painting, clans, and tribal organization, are of Mexican origin.

Somewhat doubtful is the origin of the shield, which is represented in the Plains and in northwestern Mexico. In California it is present in the Colorado



Map. 4. The distribution of cultural strata in California. Key: +1.00 to +0.80, black; +0.79 to +0.60, heavy stripes; +0.59 to +0.40, thin stripes; +0.39 to +0.20, thin lines; +0.19 to +0.01, dots.

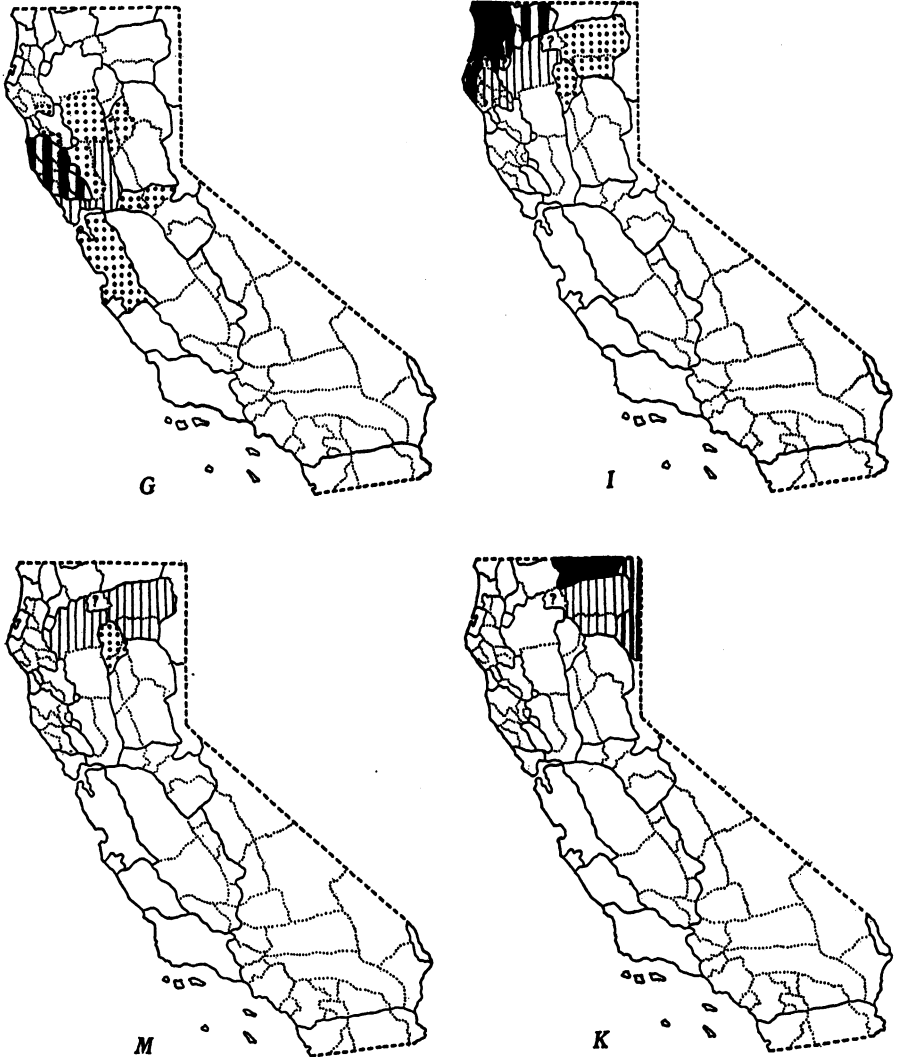
river province and in the inventory of the Modoc. It is certain that the Modoc shield is of Plains origin and therefore very modern. Possibly there are differences between the shield of the Modoc and that of the Yuman tribes, but we do not possess precise data with which to settle the question. However, the shield in the Colorado river province is more likely of Mexican than of Plains origin. Thus the definition of the ethnical nature of stratum B presents no difficulty. In California it is connected with the Yuman tribes which have been influ-



Map 5. The distribution of cultural strata in California. Key: +1.00 to +0.80, black; +0.79 to +0.60, heavy stripes; +0.59 to +0.40, thin stripes; +0.39 to +0.20, thin lines; +0.19 to +0.01, dots.

enced by Mexican culture. This influence reaches the Kamia and Diegueño. The Chemehuevi and Las Vegas members of the Shoshonean family, newcomers to the Colorado river, are influenced later by this stratum.

The ethnical nature of C_1 is clear. This stratum is centered among the southern Californian Shoshoneans, extends along the Pacific as far as Coast Miwok territory, and slightly affects the tribes of the Colorado river. It is therefore the characteristic component of the southern California province and is con-



Map. 6. The distribution of cultural strata in California. Key: +1.00 to +0.80, black; +0.79 to +0.60, heavy stripes; +0.59 to +0.40, thin stripes; +0.39 to +0.20, thin lines; +0.19 to +0.01, dots.

nected with the Shoshonean family, with which the province is associated. Many of the elements which make up this stratum, such as Quetzalcoatl, clans, gourd rattle, fiber sandal, and pottery, are of Mexican origin.

The ethnical nature of stratum C_2 presents a more difficult problem. Its distribution in California is very broad. It extends over the whole southeastern part of the State and as far north as the Sacramento valley, and it is represented in the structure of all Shoshonean tribes from the Cahuilla in

the extreme south to the Paviotso in the northeastern corner. The connections it has with other groups are very weak.

Clearly, this stratum is an important component in the structure of the southern and San Joaquin provinces. Its elements are of a very different origin. Some come from the Great Basin, including pitched water basket with pointed bottom, pipe of cane, cane arrow, and bedrock mortar, and others, such as gabled house, mat covering of houses, eagle rearing, and moieties, are obviously Mexican. Thus we can identify this stratum with the Shoshoneans. It is different from stratum C_1 because it has greater extension.

Group D is united with Chumash. In this group there are elements such as plank boat and circular fishhook of *haliotis* which resemble Oceanian forms. Others, such as basketry and ceremonial paraphernalia, are similar to elements of stratum C_1 .

The ethnical affiliations of strata E and F are easily distinguished. E is connected with Yokuts, F with Sierra Miwok. Some elements of these strata, including bottleneck basket, gabled house, pottery, toloache taking, moieties, and Pota, are typologically related to elements of strata C_1 and C_2 . Therefore they probably are products of Shoshonean influence. Others are connected with elements of stratum Z.

The determination of the linguistic connection of stratum Z is a somewhat complicated task. I call it the great valley stratum because it is an important structural component of the Penutian tribes, which extend over the territory of the two principal valleys of California. It also is a dominant factor in the cultural structures of the Pomo, Yuki, and Kato, but some of its elements are less developed among these tribes than among the Penutian groups. For example, there is only a minor form of parent-in-law avoidance and coiling is in balance with twining among the Pomo and Yuki.

More or less distinctive traces of the great valley stratum are found in the structure of almost all Californian tribes except those of the Colorado river and northwestern areas. Particular elements of this stratum have different origins. Coiling, bullroarer, and parent-in-law avoidance are spread widely over North America, but yellowhammer-quill headband, cocoon rattle, feather rope, and Kuksu are limited to California.

Considering in detail the distribution of strata Z elements, we may distinguish three subdivisions which follow the order of the diagram. Z_1 contains magnesite cylinder used as treasure; footdrum; feather rope; ghost impersonation; sacred dances: hawk-monster; Toto; grizzly bear impersonation in Kuksu. These elements are not distributed over all the central province. Z_2 consists of cocoon rattle; man's hair net; feather forks and darts for head; yellowhammer-quill headband, trimmed; splitstick rattle; widow pitches head; parent-in-law avoidance. These elements are present in the central area and the San Joaquin province. The elements of Z_3 , coiling and bullroarer, are found even in the southern province.

Nevertheless, in the California perspective stratum Z must be considered as a unit. It is the characteristic component in the structure of the central province and therefore is affiliated with the Penutian family, which is strongly connected with that province.

The ethnical association of stratum L is clear. It represents the Hesi cult, which is a characteristic feature of the lower Sacramento valley tribes, Patwin, Northwestern Maidu, and valley Nisenan. Kroeber's researches show that very probably the Patwin have played the principal part in the creation of this complex.

Stratum Y has a very broad extension which makes its ethnical association difficult to determine. The elements of this group are represented in the inventory of all California tribes except those of the Colorado river province. An equally broad distribution characterizes the elements of stratum X, which are hoop and pole game, earth-covered building, and cremation of dead. However, the coefficients between these elements and those of stratum Y are negative because the X elements are present in the Colorado river area and absent in the northwest. The negative extensions of these two strata show the cultural separation of the Colorado river and northwestern areas. In considering their positive extensions, X and Y must be treated as one entity.

Now the question arises concerning which California ethnic group first possessed these elements and brought about their later distribution among other tribes. The Algonkin, Athabascan, or Lutuami could not have played such a part. The Penutian and Shoshonean must be eliminated because the Shoshoneans in California show many Mexican influences, and the distribution of Penutian tribes is not so great as the extensions of strata Y and X. The connection of these strata with the Yuki is also impossible because of the limited range of Yukian territory.

There remain only the Hokans. These tribes, spread from the northern border to the extreme south of California, cover sufficient territory to be the representatives of the X and Y strata, and the formal consideration of the elements confirms this connection. Some of the elements are fundamental to economic existence, and must have been present in the oldest stratum of California population. Kroeber's researches suggest that the Hokan is the oldest linguistic family.

Elements of the X and Y strata are absent from the northwestern and Colorado river provinces because they have been lost in the course of cultural development. As a rule, when the X and Y elements are absent, they have been replaced by analogous elements belonging to other strata. Examples of this are the displacement of seed beater of basketry by agricultural implements; of sinew-backed bow by long self-bow; of carrying basket, conical, twined, by coiled carrying basket, flat bottomed; of stone boiling in baskets by pottery.

Finally, the elements which are really universal in California must be placed in the same category with strata X and Y. These elements are clamshell-

disk money; quiver of animal hide; girl fasts during puberty rite; girl uses head scratcher during puberty rite; semicouvade; arrow feathering triple radial; face tattoo by women.

The universal elements and groups X and Y form one cultural stratum which has, as its ethnical correspondent, the Hokan family in the period of its territorial community or contiguity of distribution. I do not suggest that these elements were present at this remote period only among Californian Hokan tribes. The sinew-backed bow, deer-mask decoy, one-piece moccasin, stone boiling in baskets, and many other elements doubtless were in the inventories of various non-Hokan groups before their immigration to California.

Stratum G obviously is connected with the Pomo. Two of its elements, Kuksu and coiled basketry, are typologically related to stratum Z, and another, grizzly bear shaman wears bearskin, to stratum C₂.

Stratum I, which is characteristic of the northwestern California area, is of course connected with the Algonkin and Athabaskan peoples. Its particular elements differ greatly in extra-California distribution. Plank house, dentalium money, and plutocratic organization of social life extend along the Pacific coast to Alaska, while deerskin dance and haliotis looked into in girls' rite are limited to particular tribes. I cannot distinguish these different strata in California. Stratum I represents in my material the total influence of the northern Pacific coast of America. If more data on the northwest coast tribes were available, it would be possible to define more exactly the strata connected with particular ethnic groups. Here I can only state the connection of stratum I with both Algonkin and Athabaskan.

The distribution of stratum M is peripheral to the northwestern stratum. Inspection of the M elements confirms this diagnosis. They are imitations of elements characteristic of stratum I: squared house of bark slabs instead of planks; sitting cradle, shallow, instead of with "toe." Thus stratum M is connected with tribes influenced by stratum I. These are the Northern Wintun, Yana-Yahi, and Achomawi-Atsugewi.

The ethnical correlative of stratum K is the Lutuami. The extra-California distribution of the K elements shows that we are again dealing with a complex which cannot be dismembered on the basis of Californian material alone. In stratum K, there are elements of the Plains culture (small sweat house with steaming), purely local variations (tule basketry), and even indirect influences from the northwest coast culture (slave trade). All these strata have been distinguished by Kroeber.¹⁰ From the Californian point of view, stratum K is the totality of Plateau and Plains influences which reached California through Modoc territory.

To recapitulate, each cultural stratum has a connection with a definite ethnic group. The knowledge of this connection will permit us to establish the historical nature of the strata.

¹⁰ Handbook, 334-335.

LITERATURE

KROEBER, A. L.

1920. California Culture Provinces. UC-PAAE 17:151-169.

1923. The History of Native Culture in California. UC-PAAE 20:125-142.

1925. Handbook of the Indians of California. BAE-B 78.

VII. HISTORICAL PERSPECTIVES

The definition of the ethnical nature of particular strata permits us to determine the nature of the historical facts which they represent.

Stratum B represents the Mexican influence on the branch of the Hokan stock which reached the Colorado river. Stratum C₁ corresponds to the specific development of the culture of the southern California Shoshoneans. Stratum C₂ represents the expansion of southern California Shoshoneans and the spread of their culture over foreign territories. Stratum D expresses the cultural differentiation of the Chumash and Gabrielino, a process which possibly began under Oceanian influence. Stratum E represents the cultural separation of the Yokuts and their neighbors as a result of the Shoshonean influence of strata C₁ and C₂. Stratum F embodies the same process of separation in Miwok history. Stratum Z is a reflection of Penutian expansion and the development of their culture before the period of their recent differentiation. Stratum L represents the growth of the Hesi cult and other characteristic traits of the lower Sacramento valley tribes. Strata X and Y and the universal elements correspond to the period of the cultural community of Hokan tribes.

I am not able to distinguish any stratum which is connected primarily with Yukians. There are sporadic elements limited to the Yuki, but they are few and too uncertain to be considered as a distinctive group. These elements are octonary count with twigs; obsidian initiation in Kuksu; break in banded ornament; and girl dances during puberty rite. The octonary count is a modification of the quaternary system, which we find elsewhere among the Salinan and Chumash. Obsidian initiation is at present a part of the Kuksu cult. Break in banded ornament is also represented among the Pomo. Girl dances during puberty rite is the only element that may be considered an old Yuki trait and, unfortunately, its definition is not exact.

On the other hand, undoubtedly Yuki culture once had a specific nature. The Yuki have preserved not only their linguistic peculiarity but even their racial composition, which is very different from that of other California groups.

These facts suggest that the Yuki reached their present territory a very long time ago, and have been culturally assimilated by the Hokans until now the special stratum of their ancient culture no longer can be distinguished. If this supposition is correct, it is possible to define more exactly the historical nature of the stratum X + Y + universal elements, and to establish the lower limit of the chronology. The stratum then represents the period in which both Hokan and Yuki were in California and possessed a similar culture, and the oldest historical phenomenon which may be reached on the basis of ethnographical material is the coexistence and cultural community of Hokan and Yuki.

Stratum G represents the development of a specific Pomo culture which resulted from the influence of strata Z and C₂.

Stratum I corresponds to Algonkin and Athabascan expansion which brought the elements of the northwestern culture into California.

Stratum M expresses the contact of Northern Wintun, Yana-Yahi, and Achomawi-Atsugewi with the northwestern culture. Stratum L represents the development of Lutuami culture as a result of Plateau and Plains influences.

These historical facts must now be chronologized. The most ancient one is, of course, the coexistence and cultural community of Hokan and Yuki. The next major event is the Penuti expansion. It is clear that the historical developments represented by strata E, F, G, and L must be later than that which corresponds to stratum Z. First, strata E, F, and L represent the process of cultural differentiation of the Penutian group, and second, many of their elements and those of stratum G are functionally analogous to elements of stratum Z.

Stratum Z also must be more ancient than strata B, C₁, C₂, and D because the elements of these strata represent direct or indirect Mexican influences. Moreover, Shoshonean expansion, if it had been earlier than Penutian, would have directly affected the Pomo, Yuki, and Kato, and elements of stratum C₂ would appear in their inventories. In each of these groups, stratum C₂ is absent and stratum Z is the most important component of the culture.

A striking proof that the Penutians were earlier in California than the Shoshoneans is found in the Diegueño cultural structure, in which stratum Z is more important than in the cultures of the Shoshonean tribes of the southern province.¹¹ It is certain that the Penutian expansion preceded the migration of Algonkins and Athabascans because the northwest coast culture is generally very young in America. Therefore it is probable that strata M and K, which are functionally related to the northwestern and Plains cultures, also are later than stratum Z.

The Shoshonean expansion is the next major event after the Penutian migration. Two different strata are connected with the Shoshoneans and, therefore, their chronological relationship must be defined. The elements of stratum C₁ have an exceedingly limited distribution. They are specific for the culture of southern California, and some are very specialized. For this reason alone one would expect stratum C₁ to be later than C₂. The extension of C₂ is very great, and it contains elements of Great Basin culture and some Mexican traits. Therefore it represents the cultural level of the Shoshoneans in the period of their expansion in California. It is true that Great Basin elements

¹¹ Dr. E. M. Loeb calls my attention to the presence of particular elements of the Ghost initiation as far south as the Yuman tribes of Lower California. This is the same sort of phenomenon as the marked occurrence of stratum Z among the Diegueño. The elements of Penutian expansion are better preserved among the geographically remote Hokan than among Shoshoneans.

could have reached California previously at a very ancient time, but in the present study these elements are closely associated with Mexican influences.

The next period marks the development of strata characteristic of particular recent groups. To it belong the final development of Pomo culture (G), the specialization of southern California culture (C_1), the cultural separation of Yokuts (E) and Miwok (F), and the hypothetical Oceanian influences (D). Stratum L is probably later than any of these. It is a special product of Patwin and valley Maidu.

It is difficult to determine the chronological relationship between the Shoshonean and the Athabascan-Algonkin expansions. The strata representing these two events are territorially mutually exclusive. Moreover, there are several stages in the development of the northwestern culture and, in kind, it is less an expansion than an infiltration. Unfortunately, I was not able to distinguish these particularities from the Californian point of view. I can only suppose that the northwestern expansion is later than the Shoshonean migration because the territorial extension of the northwestern stratum is more compact than that of the Shoshonean influences in California. This hypothesis can be verified only on the basis of a larger material.

The age of stratum M can be fixed with relative certainty. It is the result of northwestern influences and, therefore, must be later than the Athabascan-Algonkin expansion.

It is a more complicated problem to determine the chronological position of stratum K, which has some old elements of the Plateau area together with recent Plains influences. This stratum represents, from the Californian point of view, the development of Lutuamian culture. Considering its Plains and northwestern affiliations, we must define its age as later than the northwestern culture and probably contemporary with stratum M.

This determination of the historical nature and chronology of the cultural strata makes it possible to present the cultural history of California Indians in the form of a table (table 9, p. 64).

Now I will present in a general survey the cultural history of the California Indians, considering as far as possible the causal connections between particular events.

The most ancient period which can be reached with the assistance of the ethnographical material is that of the coexistence and cultural community of Hokan and Yuki in California. The Hokan family is certainly more ancient in California than the Yuki. The Yuki came here probably from the north, advancing along the coast. Their northern provenience is shown by the importance of the Arctic element in their racial composition. This Yuki migration took place at a very remote time. I am not able to find in the ethnographical material any stratum which might correspond to the ancient Yuki culture. Perhaps girl dancing in girl's puberty rite is one such element which has been preserved from this hypothetical stratum. We conclude that, after

reaching the Californian environment, the Yuki lost their ancient culture and were culturally assimilated by the Hokans.

In this early period the Hokan-Yuki culture was doubtless one of the most primitive in North America. The gathering of natural vegetable products,

TABLE 9
HISTORICAL SEQUENCE OF CALIFORNIA INDIANS

Strata		Periods
K	Plains influences in California. Development of the Modoc culture.	VI
M	Inland tribes of N. California influenced by the N. W. culture.	VI
I	N. California influenced by the N. W. culture. Athabascan and Algonkin migration	V
L	Development of Sacramento valley culture. Hesi cult.	IVc
D	Development of Chumash-Gabrielino culture. Oceanian influence (?).	IVc
G	Final formation of Pomo culture.	IVb
F	Development of Miwok culture.	IVb
E	Development of San Joaquin province.	IVb
B	Development of Colorado r. province.	IVa
C ₁	Development and spread of S. Californian culture.	IVa
C ₂	Southern California occupied by Shoshoneans. Spread of southwestern and Mexican influences over S. E. California.	III
Z	Penutian expansion and spread of their culture. Territorial disintegration of Hokan groups.	II
X+Y	The coexistence of Hokan and Yuki. The territorial continuity of Hokan groups in California and their cultural community. Yuki assimilated culturally by Hokan.	I

hunting, and fishing were the economic bases of life. The basketry was twined; coiling had not yet appeared. These old-timers lived in round or oval houses of poles which were covered with earth or bark slabs. They made fire with a simple firedrill. Clamshell disks were their ornaments or perhaps their money.

They observed girls' puberty, semicouvade, levirate, and sororate. Women were tattooed, especially on their chins.

Hokan tribes were acquainted with the hoop and pole game in its very primitive form, and they also burned the dead. These two elements are not found in the Yuki inventory and, unless they were once present and were later replaced by other elements, their absence may be considered a negative expression of the Yuki cultural individuality in this ancient period. The cultures of particular territorial entities already had been influenced by environment. The coast dweller used seaweed for salt, and the inhabitants of valleys and the lake area were acquainted with the balsa. However, in comparison with contemporary conditions, this culture had a rather undifferentiated and uniform structure.

Racial compositions were clearly distinguished in this early period. The most numerous component of the Hokan groups was the Paleoamerican element. Among the Yuki, the Arctic element had the most important place.

Deep modifications were produced in these ancient conditions by the Penutian expansion. This migration I consider to be the beginning of the second historical period in California. At present it is impossible to localize the start of this migration, that is, to discover the original territory of the Penuti. Sapir is inclined to think that these people came to California from the north because they have some linguistic connections with Chinook, etc. Kroeber surmises that their eastern provenience is more probable. My material gives only one positive indication in this regard. The original territory of Penutian expansion must have been where coiling, bullroarer, and parent-in-law avoidance occurred together, because these elements were brought into California by the Penuti. There are more distinct negative indications. The extension of stratum Z excludes the possibility of the northern provenience of Penuti. This stratum does not reach farther north than Achomawi-Atsugewi territory, and even there its intensity is very weak. The racial composition of the Penutian groups also must be considered. The most important component of their populations is the Pacific type, and the anthropological territory of this element extends to the east. In the northwestern part of North America brachycephalic elements predominate. This is another reason for localizing the start of Penutian expansion in the east.

Probably the Penuti reached California as an undifferentiated totality, or at least before they had acquired their present degree of differentiation. I am unable to determine what elements they brought to California, besides bullroarer, coiling, and parent-in-law avoidance, and what they produced in the first period of their Californian history. Obviously they already had a highly developed ceremonial life because we find among them the universality of cocoon rattle, splitstick rattle, yellowhammer headband, and feather rope. They also introduced the hair net, magnesite cylinders, and pitching the head in mourning.

However, it is uncertain whether the basic elements of the Kuksu cult were represented in the period of the Penutian cultural community, or whether they appeared after the separation of the Yokuts. In my opinion, it is probable that the Yokuts lost the ideas of the Kuksu cult after their cultural separation from the rest of the Penuti. This hypothesis is sustained by the possibility of the Kuksu cult, or traces of it, among the northern Yokuts (20a) and even farther south among the Costano and Salinan.¹² It is true that the southern Yokuts wholly lack Kuksu, but they preserve such typical elements of this ritual as the cocoon rattle and yellowhammer headband. As we know, the religious life of the Yokuts at present shows many connections with Shoshonean ritual. Thus it is probable that Shoshonean influence caused the disappearance of the ancient Kuksu elements among the southern Yokuts.

These elements also were lost by the Nomlaki and Northern Wintun. Otherwise it would be impossible to explain why Kuksu elements are represented in such remote places as Yuki and Sierra Miwok territories, and yet are absent in the immediate neighborhood of the cult center in the Sacramento valley. Moreover, the Nomlaki have preserved a great deal of Kuksu paraphernalia. Thus it is entirely possible that the fundamental ideas of the Kuksu cult were already represented in the period of Penutian cultural community.

The most important result of the Penuti expansion was the shattering of the ancient Hokan territory, which started the cultural differentiation of particular Hokan groups and the development of the strata characteristic of the Pomo and east Yuman divisions. Not much later the same process began among the Penuti.

One may suppose that the development of cultural differences among Penuti groups was paralleled by the growth of linguistic differences because the tribes which are related linguistically also have similar cultures. There are only four exceptions to this rule. The Northern Wintun and Northeastern Maidu are separated from their linguistic kinsmen, and the Coast and Lake Miwok are culturally connected with the Pomo. In the Northern Wintun and Northeastern Maidu, the irregularity is only partial because they have relatively strong connections with other Wintun or Maidu tribes. It is probable that the Lake and Coast Miwok either were separated from the other Miwok before the formation of stratum F, or lost the elements of this stratum while coexisting culturally with the Pomo, Wappo, and Patwin.

However, the final formation of the particular tribal cultures represented by strata B, D, E, F, G, and L came later. The development of these strata is connected with the elements of Shoshonean expansion, which opened the third period of Californian history. Kroeber considers the geographical situation and particularly the cultural structure of Californian Shoshoneans to be un-Californian.¹³ Neither Mexican nor Great Basin elements are characteristic of the typical Californian formation which is represented by the central

¹² Kroeber, *Handbook*, pl. 74. ¹³ *Handbook*, 574-75.

province. Probably the reason for this peculiar connection between Great Basin and Mexican traits is that the Shoshonean expansion was caused by some sort of tension on the peripheral zone of Mexican civilization. This impulse cannot be defined exactly. I note only an invasion of southern California which came doubtless from the large southwestern area. Linguistic data prove there was more than one stage of Shoshonean expansion. Kroeber believes there were at least three different migrations, corresponding to particular linguistic divisions. The ethnographical material does not permit the determination of these stages, probably because of their general cultural similarity.

There are no important anthropological differences between the Shoshoneans and the average Penuti group. The Pacific type is the most important component of certain Shoshonean tribes and, therefore, their expansion increased the quantity of the Pacific element in the territories which they occupied.

The Shoshoneans brought characteristic elements which included, in material culture, bottleneck baskets, metate and muller, and gabled house; in social culture, moieties; and in spiritual culture, mourning anniversary. These elements—which were adopted by the neighbors of the Shoshoneans and even spread over the Sacramento valley, probably via the Coast and Lake Miwok—underwent further development in the cultures of particular tribes. This growth of new cultural strata may be assigned to the period of cultural differentiation in California.

At this time the culture of the southern California province developed, extending along the Pacific coast to the Coast Miwok territory. Within the range of this stratum the specific Chumash-Gabrielino culture originated, which may have been stimulated by Oceanian influences and is, at any rate, the youngest stratum of the southern California area. In the same period the Yokuts and Miwok cultures developed, the culture of the Pomo attained its final growth, and stratum B, which is characteristic of the Colorado river province, reached its contemporary form. Stratum L of the lower Sacramento valley was formed after the development of Pomo, Yokuts, and Miwok cultures. At this time northwestern California was subject to at least the first wave of Athabascan expansion.

The Athabascan and Algonkin expansion produced a deep modification of the racial structure in northern California. The most important components of these populations are the brachycephalic central Asiatic element and, secondarily, the Pacific element. This kind of population overlaid a very ancient stratum in northern California, the chief component of which was the Paleo-american element.

The cultural stratification of northwestern California before the Athabascan-Algonkin expansion was also very ancient. In the whole territory between the coast and the Sacramento valley, and between the northern border of the state and the present Wailaki territory, there was no Penutian (Z)

influence. The immediate base of the northwestern stratum I was the old Hokan-Yuki stratum. It is not possible to define exactly the territorial distribution of Hokan and Yuki groups in northwestern California before the Athabaskan-Algonkin expansion. I can only suppose that the Kato and Wailaki, which are racially and culturally very similar to the Yuki, once were also Yuki kinsmen in language. In the north there were the Hokan groups of Karok, Chimariko, and Shasta. Thus it seems likely that before the Athabaskan-Algonkin expansion the Yuki territory was surrounded by Hokan tribes. However, this territory was larger at that time, and it is possible that prior to the Penuti expansion a direct connection existed between the Wappo and the main body of the Yuki.

The northwestern culture, represented in California by stratum I, is of maritime type, and extends in North America along the Pacific coast from Alaska to the northwestern corner of California. Going inland from the coast, this stratum becomes thinner and its influences are marked indirectly. Modifications of its elements occur to produce stratum M.

In a similar way the very heterogeneous complex denoted as stratum K has developed. It represents the crossroads of northwestern and Plains influences, and is clearly the youngest stratum of California culture.

This is the general cultural history of the California Indians, based on the quantitative analysis of ethnographical data with attention to linguistic and racial perspectives. The culture is formed of a number of strata, the origins of which are connected with processes of migration, differentiation, and contact. The source of each stratum is a definite ethnic group.

The next task is to enlarge the present perspective by extending the study over a larger territory. This would permit us to understand the processes which cannot be definitely determined from Californian data alone.

The culture of California is considered to be one of the most primitive in North America. Let us examine this characterization from the analyst's point of view. First, it is necessary to reduce the definition of California culture to the culture of the central area. Other provinces are directly or indirectly connected with extra-Californian culture areas. In the structure of the central province, the most important components are represented by very old strata, Z and X + Y. The influence of younger strata, which are associated with Shoshonean or Athabaskan-Algonkin expansions, is very faint. Therefore the primitiveness of the central Californian culture is explained by the age of its structural components. It is probable that the elements of strata Z and X + Y correspond, from the general North American point of view, to the most ancient cultural basis of this continent. Thus California may be considered as a peripheral zone which remained untouched by the more recent influences which formed the most typical features of the other cultural provinces of America.

LITERATURE

KROEBER, A. L.

1907. Shoshonean Dialects of California. UC-PAAE 4:65-166.

1925. Handbook of the Indians of California. BAE-B 78.

BIBLIOGRAPHICAL ABBREVIATIONS USED

AA	American Anthropologist
AMNH-AP	American Museum of Natural History—Anthropological Papers
AMNH-B	American Museum of Natural History—Bulletins
BAE-B	Bureau of American Ethnology—Bulletins
PMM-B	Public Museum (of the City) of Milwaukee—Bulletins
UC-PAAE	University of California Publications in American Archaeology and Ethnology
USNM-R	United States National Museum—Reports
UW-PA	University of Washington Publications in Anthropology