ESSAYS IN OTOMANGUEAN CULTURE HISTORY

Edited by

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INTRODUCTION

The papers included in this volume are based on research in different fields of anthropology--linguistics, archeology, and ethnohistory--but they have a common goal: to contribute to the development of a unified model of prehistory for one of the least studied but most important sectors of Mesoamerica, the Otomanguean linguistic group and its related cultures and societies.[1] The choice of Otomanguean is not accidental. The Otomanguean linguistic family is one of the largest in Mesoamerica, with nine major branches composed of over twenty languages or closely related language complexes. Even after intense population reductions in the early Colonial period and four hundred years of cultural suppression, there are some one million speakers of Otomanguean languages in Mexico, and they are the numerically dominant population in many parts of the states of Mexico, Oaxaca, Puebla and Guerrero.

In preconquest times, the Otomanguean language family touched on both the northern and southern limits of Mesoamerica and occupied a large part of the intermediate zone. Geographically, Otomanguean occupied a central position among the major language families of prehispanic Mesoamerica (Mayan, Otomanguean, Totonacan, Mixe-Zoquean, Tarascan and Utoaztecan). With the exception of relatively restricted Tarascan and late arrival Utoaztecan, the Mesoamerican highlands north of the Isthmus of Tehuantepec were Otomanguean, and this appears to have been the case from the Archaic onward.

Otomanguean began to diversify very early; there are kinds of Otomanguean surviving today whose antecedents began distinct lines of development as early as 4400 B.C. The time depth of Otomanguean is probably greater than that of Indoeuropean. Thus, tracing the development of Otomanguean languages, cultures and societies is relevant to important periods in Mesoamerican history as well as to important regions.

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Of the major Mesoamerican language families, Mayan is per-
haps the best studied in terms of the integration of multi-
disciplinary information (cf. McQuown 1964, Vogt 1964, Kaufman
1964, 1969, Josserand 1975). Mixe-Zoquean has been associated
with the Olmecs (Campbell and Kaufman 1976, Kaufman 1976) and
related to the spread of widely distributed linguistic features
just as Olmec culture in general left its mark on diverse parts
of Mesoamerica. Other language families include some well-
studied languages (Utoaztecan's Nahuatl in particular) but
little has been done to try to relate the diversification of
the families to prehistory as known through archeology and
ethnohistory. In Tarascan and Totonacan, for instance, the
basic linguistic and archeological studies have not yet been
integrated.

The Otomanguean family seems ripe for study. Pioneering
works such as those of Longacre and Millon (1961), Jiménez-
Moreno (1962, 1966), Harvey (1963, 1964), Paddock (1966),
Casasa (1976, 1979) and Amador and Casasa (1979) have suggest-
ed the potential for interdisciplinary work. Recent linguistic
studies (especially Rensch 1973, 1976) have made possible a his-
torical perspective that was previously unattainable. Archeo-
logical and ethnohistorical research in the Otomanguean area
has increased significantly in recent years. It now seems pos-
sible to begin the formulation of an integrated theory of Oto-
manguean development, i.e., of the culture history of the geo-
graphical core of Mesoamerica. The papers presented here are a
first step towards the integration of the available data.

Otomanguean-speaking populations (Fig. 1) are characteris-
tically tropical highland groups. The Otopamean branch of the
family is for the most part located north of the Volcanic Axis
in the central Altiplano (Mesa Central). Otopamean's precon-
quest territory, bounded on the west by Tarascans and on the
east by Totonacs, included most of the central basin and range
systems, such as the fertile and then lacustrine valleys of
Mexico and Toluca. Population was denser in the southern val-
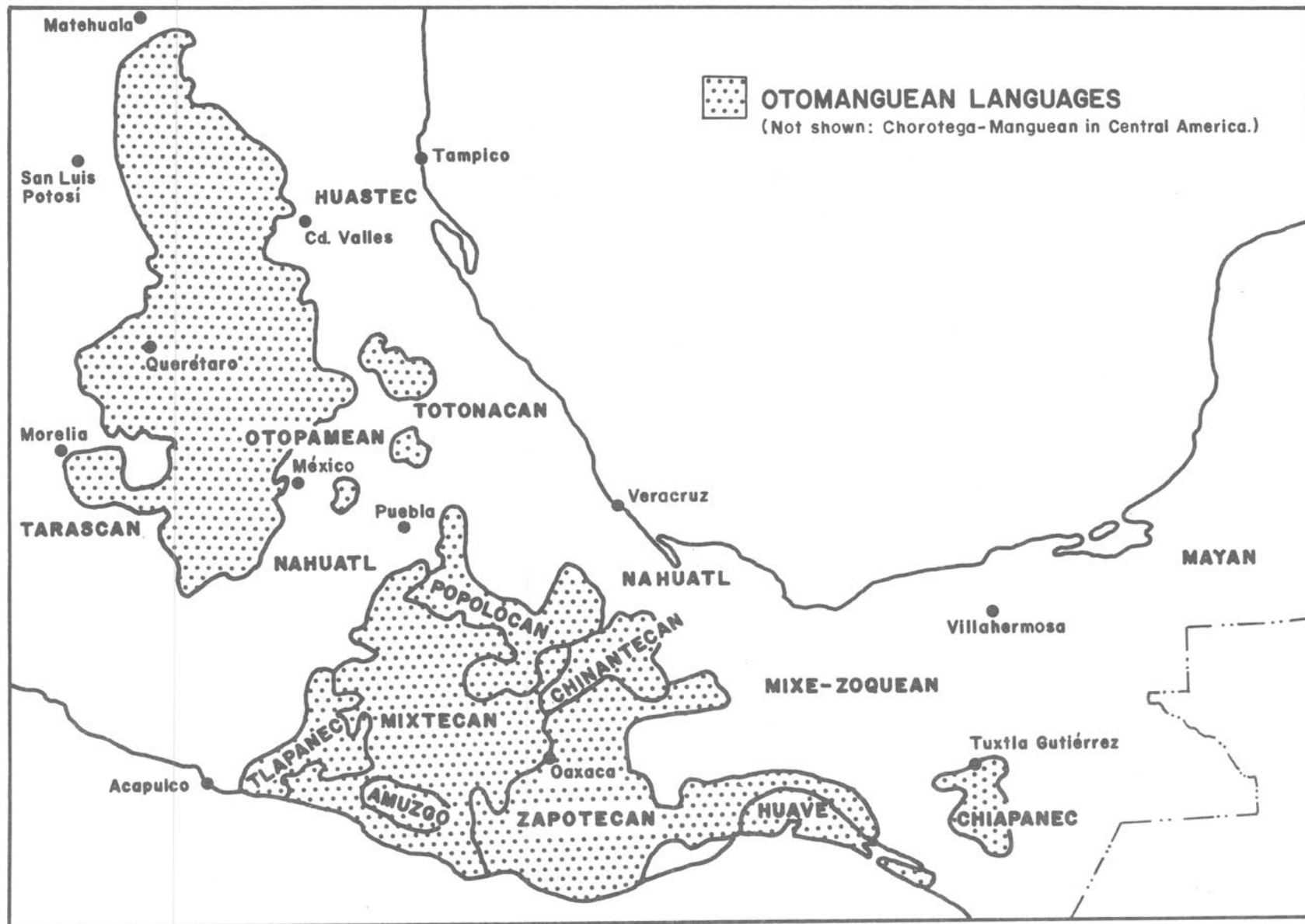
Fig. 1. Distribution of Otomanguean languages, circa A.D. 1500 (after Longacre 1967: Fig. 15).

leys and thinned to the north as the geography changed to a
drier, desert-like environment inhabited by Chichimecs and
Pames, both seminomadic Otopamean groups which occupied Meso-
america's variable northern frontier. These are areas with
summer rains and a winter dry season, drier to the east in the
rain-shadow of the Sierra Madre Oriental, wetter to the west
towards (Tarascan) Michoacán. Otomí and Mazahua probably oc-
cupied the larger basins (Mexico and Toluca). Along the
southern edge of the Altiplano, springs at sites like Malinalco
and Chalma (where Matlatzinca and Ocuiltec were spoken) were
important pilgrimage centers in prehispanic times. Vegetation
in the Mesa Central once consisted of grass-floored basins with
open woodland blending to thick mixed oak-pine forests on the
range slopes, and then to pine, fir and juniper in the higher
elevations up to the tree line. Today, much sparser vegetation
of scrub oak, cactus and the introduced pirul is more typical
(West 1964:371-2).

The same general vegetational situation pertains to the
somewhat lower step-terraces down from the Altiplano to the
southeast of the Valley of Mexico: the valleys of Puebla,
Tlaxcala and Tehuacán, as well as the valley of Morelos to the
south. At these lower elevations, the climate is warmer and
drier, with consequent changes in the vegetation; today, xero-
phytic scrub is characteristic of the lower valleys. To the
east of these valleys, as the elevation rises and then falls
again towards the Gulf Coastal Plain, cloud forest is found.
The area from the moist Gulf highlands into the Tehuacán Valley
and adjacent areas was Popolocan (Mazatec on the Gulf escarp-
ment, Popoloca in and around the Tehuacán Valley, Chocho and
Ixcatec in adjacent areas to the south); it still is to a cer-
tain extent, but Nahuatl displaced Popolocan in the valleys.
It has been suggested that the Puebla Basin might have been
Chiapanec-Mangue-speaking before Nahuatl intrusions (see
Lehmann 1920). The Puebla Basin and the Tehuacán graben formed
a major trade route from the Mesa Central to the Gulf Coastal
Plain, via the pass cut by the Río Papaloapan, or on to Oaxaca

via the Cañada; in any case, through areas occupied by Popolocan speakers.

The southern edge of the central Mexican Altiplano and the southwestern edges of the Tehuacán and Puebla area descend to the Río Balsas. The Balsas drains the southern slopes of the Volcanic Axis, the western side of the Mixteca Alta (part of the Mesa del Sur), and the northern slopes of the Sierra Madre del Sur in Guerrero, finally encountering the Pacific Ocean near Zihuatanejo. The Balsas Depression, through which the river flows, is an extremely deep trench, characteristically very hot and very dry, with narrow river valleys cutting the broken terrain. These valleys were perhaps once covered with a tropical deciduous forest, but after centuries of human intervention are now mainly characterized by thorny shrubs and cacti (Miranda 1947, Wagner 1964, West 1964:381). Tlapanec probably occupied the Balsas Depression eastward from about where the valley floor rises to 2000 feet to the upper drainages where Mixtecan and Amuzgo are located.

At the eastern extreme of the upper drainage of the Balsas is the Mixteca Baja. The northern Mixteca Baja, at the northern end of the upper Balsas drainage, includes the Ñuiñé archeological region near the border with Popolocan. The central Mixteca Baja, to the south, is hilly, relatively lower (with valley floors dropping to below 4000 feet), and very dry. Vegetation is sparse, and there are seasonal problems with water supplies. Nonetheless, many valleys are irrigated (e.g., the valley of Tonalá). The southern Mixteca Baja rises through the long Juxtlahuaca Valley to heavily forested elevations including some cloud forest, near Trique (Mixtecan) country around Copala (just west of the summit of the Sierra Madre del Sur). It appears likely that the entire upper Balsas drainage, from the southern slopes of Morelos and southern Puebla, to the central and southern Mixteca Baja, down the Balsas halfway through the state of Guerrero, has been Otomanguean for well over a thousand years.

Low coastal ranges separate the southern limit of the Balsas drainage from the Pacific coast, along the Costa Chica from Guerrero to Oaxaca. Vegetation on these sandy soils--old dunes--includes palms as well as deciduous forest. Inland from the coasts of Oaxaca and Guerrero, near their common border, but well below the mountain massif to the north (the Mixteca Alta), several villages house the Amuzgo (a single-member branch of Otomanguean). Other inland ranges to the east comprise the Mixteca de la Costa.

Along the coastal ranges of low hills, from near Acapulco to the Isthmus of Tehuantepec, there is a chain of distinct linguistic groups. With the exception of Pochutec (a close relative of Nahuatl formerly spoken in Pochutla, Oaxaca) and Chontal of Oaxaca (a possibly Hokan language east of Pochutec) these languages are Otomanguean: Mixtec from Ayutla de los Bravos, Guerrero, to Tututepec, Oaxaca; Chatino east to Pochutla; Chontal of Oaxaca, and still further east, Isthmus Zapotec and Huave, in the Isthmus of Tehuantepec. There is some reason to believe that the Otomanguean groups in the tropical lowlands along the coast are relatively recent in this area, although certainly prehispanic.

North of the coastal ranges in the state of Oaxaca rises the Mesa del Sur (Sierra Madre Occidental), an old formation with gold and other mineral deposits. The western half of these highlands is referred to as the Mixteca Alta, and is one of the major areas of Mixtec speech. The terrain is very broken, but there are several large valleys (e.g., the valleys of Nochixtlán, Coixtlahuaca, Tamazulapan and Achiutla); their floors lie at elevations over 7000 feet. Throughout the Mixteca Alta there is extensive evidence of old terraces on the valley slopes, and irrigation of valley floors is common. The Mixteca Alta is drained to the south by the Río Verde system (emptying into the Pacific near Tututepec); on its northern fringe drainage is to the Gulf of Mexico via the Cañada and the Río Papaloapan. Cuicatec, a Mixtecan language, is spoken in part of the southern Cañada.

To the east of the Mixteca Alta, still within the Mesa del Sur, the Zapotecan highlands include the Valley of Oaxaca and a number of smaller valleys. The highlands can be divided into three major parts. The Sierra de Juárez lies north of the Valley of Oaxaca, towards the Gulf escarpment; the Zapotecan-Chinantecan border is in these mountains. The southern ranges, south of the Valley of Oaxaca, drain to the Pacific; the southwestern sector of these highlands is occupied by Chatino, the southeastern sector by Chontal of Oaxaca (not an Otomanguean language). To the northeast of the Valley of Oaxaca lie the Mixe highlands (also not Otomanguean), bordering on the Isthmus of Tehuantepec and the Gulf lowlands.

The Mesa del Sur has been profoundly affected by human intervention and bears the scars of long occupation. The vegetation in these highlands was once mixed oak-pine forests, rising to cloud forest above 10,000 feet. Tens of centuries of exploitation have reduced this vegetation to scattered remains. Much of the Mixteca Alta resembles bare moonscapes, and low fan palm is the dominant vegetation in many areas. Xerophytic plants, including many cacti, cover the hillsides, although irrigated valley floors are still very productive.

Chinantecan languages are spoken north of the Zapotecan highlands, along the Gulf escarpment and down towards the Gulf Coastal Plain. This region is in part rain and cloud forest, in lush contrast to the drier lands to the south but similar to the Mazatec highlands to the northwest of Chinantecan.

The Isthmus of Tehuantepec (where Isthmus Zapotec and Huave are spoken) forms the effective southern boundary of Otomanguean distribution as well as the effective geographical border with Central America. Chiapanec-Mangue, a now-extinct branch of Otomanguean, was located beyond the Isthmus in historic times. Chiapanec was spoken in the Grijalva Valley of central Chiapas, Mangue along the Pacific coast of Costa Rica. This distribution probably represents a late (Postclassic?) migration. Vegetation in these zones is roughly similar to that of the Balsas Depression.

In sum, Otomanguean-speaking populations are now and apparently have been in the past characteristically tropical highland groups (see the natural areas depicted in West 1964: Fig. 1). They have occupied most of the tropical highlands from the central parts of the Mesa Central to the Isthmus of Tehuantepec for many centuries if not millenia. Otomanguean populations in the tropical lowlands, with the exception of those in the Balsas Depression, can be accounted for as relatively recent expansions: Otomies in the Huasteca, Chinantecs in Veracruz, Mixtecs on the Pacific coast, Mangues in Costa Rica.

Because of the particular research interests of the authors of the essays included in this volume, there is a certain focus on the southern parts of the Otomanguean area (excluding the Chiapanec-Mangue areas), particularly on Oaxaca and its immediate neighbors. We have made little use of the available ethnographic material on Otomangueans, but have limited ourselves to linguistic, archeological and ethnohistorical data.

Our immediate goal is to point out areas of interest, generate hypotheses that can be tested in further research, and propose an overview that stimulates comparative and multidisciplinary research in the Otomanguean area. Our proposals are based on an interdisciplinary approach which we believe is essential to the scholarly attack on a field so large and complex. In general terms, we have begun with independent evaluations of single lines of evidence--archeological, linguistic or ethnohistorical. Each line of evidence independently suggests a historical interpretation of the evidence. Archeology documents a process of cultural development beginning in the Archaic and terminating, for our purposes, with European intervention. Linguistics demonstrates that the various Otomanguean languages spring from a common ancestor, and suggests the general lines of diversification which led to the attested situation. Ethnohistory adds traditional history and documentary information on

the latter stages of Otomanguean development. Each line of evidence may be independently studied in order to generate hypotheses about particular aspects of the prehistory. But this independent evaluation is only the first step. Basic to our views on the study of Mesoamerican prehistory is the idea that these lines of evidence are independent only in the limited sense of methods of data collection and techniques of analysis. They are by no means independent in their origin, since each line reflects the same history. Since the different lines of evidence derive from a single, if complex, phenomenon, the culture history of the Otomanguean peoples, and since this common origin is the subject of our ultimate interest, the integration of the evidence is a logical next step. The essays presented here report a first attempt at such integration, and we hope they will lead to more research on particular aspects of Otomanguean culture history. This in turn should generate more sophisticated hypotheses and ultimately lead to an integrated, coherent theory of Otomanguean development. Such a theory should then be reworked with material from other cultures to formulate an integrated theory of Mesoamerica in general; it is obvious to us that Mesoamerica must be studied as a whole, since it has developed as a whole.

The general outline of our historical model for the Otomanguean area is the following. We believe there is an intimate relationship between the cultural tradition that MacNeish (1967) has called the "Tehuacan tradition" and the Otomanguean family of languages in its earlier stages, i.e., that the bearers of this tradition were speakers of proto-Otomanguean at least in part, and vice versa. The development of agricultural technology within this tradition (although not only within this tradition) made possible the expansion of Otomanguean-speaking populations and the establishment of Otomanguean presence in large parts of central Mesoamerica, possibly displacing or replacing previous non-Otomanguean groups. Regionalization followed, as the Otomanguean populations achieved relative independence from one

another, and this formation of regional subdivisions is re-
flected both in the archeological record and in the develop-
ment of the major branches of the Otomanguean family as at-
tested in the linguistic evidence.

In Classic times, the formation of political and economic
spheres of influence contributed to further regional differences
while at the same time forming the basis of interregional inter-
action that diffused cultural and linguistic elements. Disrup-
tions caused by the intervention of other (mainly Nahuatl-speak-
ing) groups fragmented these regions again in Postclassic times,
and this continued after the Spanish conquest. A general pic-
ture of the correlation between the archeological and linguis-
tic development of the Otomanguean area is presented in Figure 2.

The first paper in this collection, an overview of the lin-
guistic evidence (Hopkins), presents the basic language data
which have to be understood in the light of the archeological
and other evidence. The Otomanguean language family derives
from a single language spoken before 4500 B.C.; the vocabulary
of this language reflects a culture similar to that attested
for this period in the Tehuacán Valley, and linguistic recon-
struction can be brought to bear on various aspects of the cul-
ture. Cultural analysis of reconstructable vocabulary should
lead to specific testable hypotheses concerning the association
between proto-Otomanguean and the population reflected in the
Tehuacán tradition in time and space. Proto-Otomanguean devel-
oped into nine branches, which may be tentatively related to
geographical and archeological areas. The linguistic evidence
also suggests early relationships between certain of these
branches, indicating spheres of mutual influence that reflect
important networks in Otomanguean prehistory. There is, for
instance, evidence of an early interaction sphere which inte-
grated the Puebla and Tehuacán valleys with the central Mexican
highlands, the Gulf escarpment, and the Balsas Depression, as
opposed to the more southerly highlands of Oaxaca.

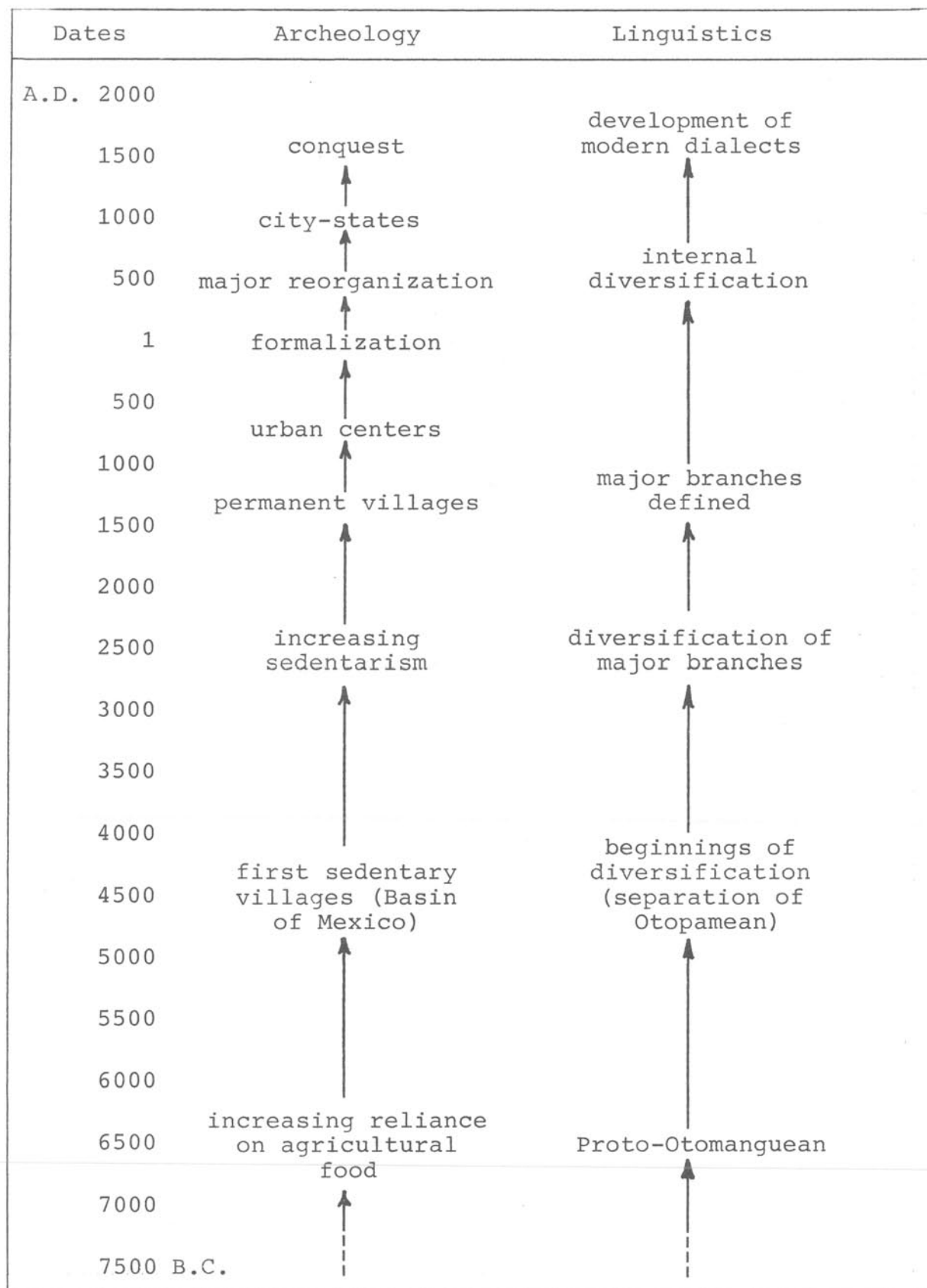| Dates	Archeology	Linguistics
A.D. 2000		
		development of
1500	conquest	modern dialects
	↑	↑
1000	city-states	
	↑	internal
500	major reorganization	diversification
	↑	↑
1	formalization	
	↑	
500		
	urban centers	
1000	↑	major branches
	permanent villages	defined
1500		↑
2000	↑	
	increasing	diversification of
2500	sedentarism	major branches
3000	↑	↑
3500		
4000		beginnings of
	first sedentary	diversification
4500	villages (Basin	(separation of
	of Mexico)	Otopamean)
5000	↑	↑
5500		
6000		
	increasing reliance	
6500	on agricultural	Proto-Otomanguean
	food	↑
7000	↑	
7500 B.C.		

Fig. 2. Correlation of archeological and linguistic developments in the Otomanguean area.

Within the nine branches, further linguistic diversifica-
tion created the languages and groups of languages that corre-
spond to regionalization throughout the Preclassic and Classic,
and which were further fragmented in the Postclassic and Histor-
ical periods into the modern languages and dialects. At each
stage of development, suggestions are made about the correlation
of the linguistic and sociolinguistic situation with that de-
rived from the archeological record.

The second paper in this collection, an archeological over-
view of the Otomanguean area (Winter, Gaxiola and Hernández),
comments on the linguistically-generated hypotheses of the first
paper and adds further information on relevant aspects of the
prehistory of Mesoamerica, especially on the cultural develop-
ment of the areas inhabited by speakers of Otomanguean lan-
guages. The discussion is organized with reference to the ar-
cheological sequence as well as to the linguistic diversifica-
tion model presented in the first paper. In general terms, the
prehispanic era can be divided into four stages: hunter-
gatherers and early agriculturalists; villages; urban centers,
and city-states. The salient features of each stage are de-
scribed and related to the stages of development of the Oto-
manguean language family. Archeological data are discussed
from the point of view of whether they support the hypotheses
based on linguistic evidence, weaken the hypotheses, or lead to
new hypotheses. Some areas are redefined, as artifact distri-
butions lead to the definition of more precise areas than those
proposed on the basis of language distributions (see also
Byland's paper). Future studies may force changes in the
model, as there are large gaps in both linguistic and archeo-
logical knowledge, but in general the archeological overview is
consistent with that proposed by linguistics. This article
closes with comments on other language families and their pos-
sible locations in early prehistoric times, placing major groups
in the Mesa del Sur (Otomanguean), Chiapas and Central America
(Mayan) and the intermediate and adjacent lowlands (Mixe-Zoque).

The third paper in this volume (Byland) reports some of
the results of an archeological survey project in the Tamazula-
pan Valley of Oaxaca, one of the large valley systems in the
northern part of the Mixteca Alta. Ethnohistorical sources in-
dicate this valley was bilingual in late prehispanic times,
having speakers of Mixtec as well as Chocho, with evidence of
Chocho conquest of at least part of the area. Cultural features
of this region were in general those of the rest of the Mixteca
Alta. Byland suggests that within this culturally similar area,
evidence of an ethnic boundary (Chocho versus Mixtec) could be
found in material culture remains (specifically, in goods re-
distributed through different networks). This boundary could
be expected to fall between the Coixtlahuaca (Chocho) component
and the neighboring Teposcolula (Mixtec) component. According
to data collected during Byland's recent survey of the Tamazu-
lapan Valley, located between Coixtlahuaca and Teposcolula, a
Postclassic domestic ware showed wide variation in design
motifs and decorative modes. The distribution of the variants
of this ware, thought to have been manufactured in a few loca-
tions and redistributed, might reflect economic and political
boundaries. This hypothesis was supported by the results of
the survey project, which did in fact note a boundary between
two redistributional networks; this boundary is consistent with
that predicted on the basis of the ethnohistorical evidence.
But while the ethnohistorical sources speak only of major towns,
the archeological evidence covers the intervening landscape,
and thus achieves a more precise determination of the ethnic
boundary, as well as confirming its presence. In this study,
the linguistic characterization of towns in ethnohistorical
sources implied ethnic boundaries, which were confirmed and
made more precise by archeological research. This suggests
that similar archeological boundaries represent similar socio-
cultural ones, and we need not be limited to ethnohistorical
sources for information on ethnic frontiers.

The final paper in this collection (Josserand, Jansen and Romero) combines ethnohistorical and linguistic research, and examines the evidence of 16th and 17th Century Mixtec dialects or languages in Colonial documents written in the native language. The study of the diverse varieties of Mixtec that presently occur (see Bradley and Josserand 1978) is sufficiently advanced so that written evidence from the early Colonial period can be evaluated in the light of the modern varieties of Mixtec and their antecedents. An important 16th Century source (de los Reyes 1593) can be interpreted to imply that a standard variety of Mixtec, based on the dialect of Teposcolula, was widely spoken in the Mixtec region. The language politics of the early missionaries, if carried out, could have resulted in its imposition as a written medium over the entire Mixtec area in the early Colonial period. Thus it has been supposed that centrally-trained scribes were responsible for the production of documents in all areas, and that little evidence of local varieties of Mixtec would be found in Colonial documents. It is obvious from this study that such was not the case, as characteristics of local Mixtec appear in the written materials from different areas. In terms of historical linguistics, this is an important discovery, since it means that earlier versions of modern languages and dialects are available for study in written materials and need not be entirely hypothetical reconstructions. It is also important for historical interpretations of the area, since it means that central control was not as all-encompassing as previously suspected. It is important to note that the documents on which this study was based have only recently been discovered in local archives, and that there appears to be an immense amount of ethnohistorical information in these archives which has not been analyzed, and which will contribute greatly to the understanding of the early modern history of western Oaxaca. An index of the documents, prepared by Romero and limited to documents in Mixtec, is appended to

this volume. A second appendix discusses the prehispanic and posthispanic literary traditions of the Mixtec.

We would like to reiterate that we present these studies as exploratory and suggestive rather than as definitive. We continue to work along the lines presented here, seeking to improve the empirical base with studies which help to fill the gaps in knowledge, searching for a better fit between the evidence which derives from the interdisciplinary research and the research in the individual disciplines. We expect to expand and improve the models we have proposed, and we hope that the publication of these preliminary studies will open a dialogue with other archeologists, linguists, ethnohistorians and anthropologists which will bring about a better synthesis of the available data and the incorporation of data which we have not taken into account.

Finally, we note that these essays were all written circa 1978; at the request of the editors of this series, two have been revised to taken into account more recent literature (Winter et al., Byland). The remaining essays have not been revised, although recent work might affect some arguments.

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Notes

[1] The discussions which led to the papers presented in
this volume began in 1976 at the Mesa Redonda: La Familia Oto-
mangue, an interdisciplinary meeting sponsored by the Centro
Regional de Oaxaca (a regional center of the Instituto Nacional
de Antropología e Historia) and held at the Museo Regional de
Oaxaca. The Centro Regional de Oaxaca had previously carried
out archeological research in Otomanguean areas of Oaxaca (with
the participation of Winter, Gaxiola and Hernández, among other
colleagues at the Regional Center) as well as ethnohistorical
research (Romero and others, including Jansen, working through
the Center from a home base in Leiden). The Programa de Lin-
güística of the Centro de Investigaciones Superiores del INAH
in Mexico City (Josserand, Hopkins, and others) had been inves-
tigating Otomanguean languages since 1973 (cf. Hopkins and
Josserand 1979). The papers presented at the Mesa Redonda and
the ensuing conversations resulted in coordination of this re-
search, not only interdisciplinary but interinstitutional as
well.

A second conference organized by the Centro Regional de
Oaxaca, the Congreso de Evaluación de la Antropología en Oaxaca,
was held in 1977. At this conference Hopkins presented a report
on the linguistic prehistory of Oaxaca which was the direct an-
cestor of the expanded paper presented here. Calvin Rensch
(Summer Institute of Linguistics) presented an overview of lin-
guistic work on Oaxacan Otomanguean languages (Rensch 1979).
Jorge Suárez (Universidad Nacional Autónoma de México) reported
on a study of the varieties of Zapotecan. C. Henry Bradley
(Summer Institute of Linguistics) and Josserand presented an
overview of the Mixtec languages and their development (Bradley
and Josserand 1977). Winter and Hernández provided an overview
of Oaxaca and its archeological regions. Romero reported on
ethnohistorical research on the Colonial period in Oaxaca.

The intellectual interest provoked by these conferences in
Oaxaca led to the organization of a symposium which formed part

of the program of the annual meeting of the Society for American
Archeology in Tucson, Arizona, in May of 1978. The papers pre-
sented at the symposium, Interdisciplinary Studies in Otoman-
guean, were essentially the same as those which appear here, al-
though the papers have been revised in the light of further dis-
cussion among the authors.

It is obvious that the research presented in these papers
builds on previous studies by a number of scholars, and has been
supported and encouraged by still others. Besides the ultimate
debt we owe to proponents of the culture history approach to
regional studies, a more immediate debt is owed to Alfonso Caso,
Wigberto Jiménez-Moreno and John Paddock, whose studies have
guided us more than is indicated by bibliographic citations.
Our research has been facilitated by institutional support, and
in this area we express our appreciation and thanks to Manuel
Esparza, director of the Centro Regional de Oaxaca during the
period when the research was carried out and organizer of the
seminal conferences in Oaxaca; and to the late Angel Palerm,
director of the Centro de Investigaciones Superiores del INAH
during the formative years of the Otomanguean research project
of that institution. Maarten Jansen's participation in the
ethnohistorical research would not have been possible without
the support of his home institution, the University of Leiden.
Bruce Byland's research was supported by Pennsylvania State
University. We have benefitted from discussions with Ronald
Spores, Nancy Troike, Emily Rabin, Cecil Welte, Michael D. Lind
and many others.

The charts and maps were prepared by Cuauhtémoc Fernández
Ortiz, Angel Ramírez M., Carlos Ramírez M., Alvaro Galán H.,
and César Parres; we acknowledge the support of the Centro Re-
gional de Oaxaca and the Centro de Investigaciones y Estudios
Superiores en Antropología Social in the preparation of these
materials and the manuscript in general. Final typing was done
by Hopkins, who accepts full responsibility for inconsistencies
and spelling errors.

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OTOMANGUEAN LINGUISTIC PREHISTORY
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The term "linguistic prehistory" refers to the subdiscipline of linguistics which brings linguistic data to bear on questions of prehistory; the techniques involved form a useful complement to those of archeology, ethnohistory, ethnology and other disciplines concerned with the reconstruction of past events and relations.[1] The linguistic study of prehistory has its origins in the nineteenth century with the development by European scholars of the comparative method of historical linguistics. This "method", one of the significant scientific achievements of the past century, unravels historic and prehistoric relationships by means of the comparative study of the linguistic structures and vocabularies of related languages. The comparative method makes possible the determination of the genealogical relationship which exists between two or more languages which are developments from the same ancestral language--the proto-language of the group. Application of the method also allows the hypothetical reconstruction of the vocabulary of the proto-language, as well as the reconstruction of aspects of its phonological, grammatical and semantic structures. Such reconstructions in turn make possible the study of the development of the language family in terms of the changes which have taken place since the period in which the proto-language was spoken (the "common period" of the language family), that is, in terms of the innovations which have created the different languages and dialects which constitute the family.

The genealogical classification of a language family is based on the study of shared innovations which have affected sets of languages since the common period. Shared innovations, in contrast with shared retentions, indicate close relations between languages at some stage of their development, and re-

flect the social relations which pertained between the speakers of the languages at the time that the innovations took place. The sharing of innovations thus implies a period of shared history. This period may be that common period prior to the diversification of the languages, when the proto-language still existed. Or, it may be a period after diversification when there existed considerable bilingualism between the already diversified languages. Part of the task of comparative linguistics is to determine at what stage of diversification the innovations occurred, and to describe the details of the process. A genealogical classification, based on the history of shared innovations between two or more related languages, reflects the level and type of contact and shared history which have affected the development of a language family.

The distribution of the languages of a family can be interpreted in the light of their genealogical classification. Groups which have shared innovations must have been in intimate contact when the innovations occurred. Groups which do not share innovations may be assumed not to have been in intimate contact, but to have been separated by geographical or social barriers to common change. The patterns of distribution of innovations within a family can reflect population movements which led to geographical separation, continuous contact between groups which nevertheless underwent partially independent development, or some combination of the two situations. The interpretation of the distribution of the languages taken together with their classification generates hypotheses about the prehistoric social and geographical relations which existed within the territory occupied by the speakers of the proto-language and its descendants.

The comparative study of the vocabularies of related languages makes possible the reconstruction of some of the lexicon of the common ancestor. Each set of cognates within a language family reflects a lexical item which existed in an earlier period, either the common period of the family as a whole or the common period of some branch of the family. Since vo-

cabulary reflects the culture of the speakers of a language, the reconstruction of the vocabulary of a proto-language generates hypotheses about the culture of its speakers. If we can reconstruct for proto-Mayan, for example (see Kaufman 1964), domains of vocabulary which are associated with agriculture (terms for maize, beans, squash, chile and other cultigens; terms for agricultural technology and products derived from cultigens, etc.) we may be reasonably sure that agriculture formed part of the culture of the Mayans before the diversification of the language family, i.e., when proto-Mayan was still spoken. On the other hand, if this terminology could only be reconstructed at the level of branches of the family (that is, if cognates were found only within the same branch of the family and not between branches), and the terminology differed from branch to branch, we might suspect that agriculture was introduced after the beginnings of diversification, when various languages were already spoken by the descendants of the speakers of the proto-language, each language independently developing its own terminology.

Since we can identify, by means of the comparative method, vocabulary items which are native to the family and represent common heritage (the cognates), we can also identify non-native vocabulary, terminology which has been borrowed from languages of other families. The adoption of a loan implies an intimate contact between the borrowing and the loaning linguistic groups and the nature of the words loaned reflects the type of contact which existed. If the majority of the agricultural lexicon of the Xinca of Guatemala, for instance, are loans from Mayan languages, we may infer that the Xinca acquired agriculture from Mayan speakers, or through contact with Mayan speaking groups.

The number of cognates in a set of basic vocabulary items is the basis for glottochronological calculations which reflect the amount of time which has transpired since two languages began to diversify from their common ancestor. Glottochronology, a much criticized technique which nevertheless seems to be valid except in exceptional circumstances, complements the tech-

niques of the comparative method by adding a chronological dimension to the structure of a language family. Dating the common period of a group of related languages also dates the period of diversification which begins with the break-up of the proto-language. When applied to the data in conjunction with information on language distribution and classification, reconstructed vocabulary, loan words and so forth, glottochronology is one of the most useful instruments in the correlation of linguistic, archaeological and other information on the prehistory of a language family.

Within the scope of any language there exist minor variants or dialects. Dialectology, the study of dialects, provides information on the past social relations within a language area. On the basis of European studies, where the history of the linguistic groups is known, we know that the distribution of dialects and their characteristics reflects the history of social, political and economic relations between the groups. The same situation exists in the New World, where the study of indigenous dialects is still in its infancy but is already making contributions to the understanding of regional development of prehistoric cultures.

The study of American Indian groups is one of the most fertile fields for the application of the techniques of linguistic prehistory, utilizing not only the methods developed in the nineteenth century but those of more recent origin. In general, these techniques were developed in a cultural context in which the histories of the linguistic groups were known and the validity of the techniques could be tested against historical fact. The application of the same techniques in the New World, where their validity has not been independently tested against known history, is based on the universality of the major processes of linguistic change, which are not limited to one linguistic family or linguistic area but which are characteristic of language in general.

In spite of the increasing number of scholars interested in the field, research on Mesoamerican linguistic prehistory

is still in a relatively undeveloped state. The number of
languages is large, the number of linguists is small, and not
all linguists are interested in questions of prehistory. Only
in the last fifteen years have sufficient data on the Mayan
languages become available to form a solid foundation for the
historical interpretation of the development of the Mayan fam-
ily. Now, however, this important family is perhaps the best
understood of the language families in Mesoamerica (see the
some 2500 entries in Campbell, Ventur, Stewart and Gardner
1978). Preliminary studies exist for Mixe-Zoque which have
established its association with the Olmec culture of the Pre-
classic (Kaufman 1969, Campbell and Kaufman 1976). Relatively
little has been published on Utoaztecan, Totonacan, Tarascan
and other language families in Mesoamerica.

The situation in Otomanguean studies approximates that of
Mayan of about ten years ago. With the publication of Calvin
Rensch's comparative phonology (a 1966 thesis, published in
1976) we have the first detailed study of the family as a
whole, the foundation necessary for any further historical
study. There are grammars and dictionaries, both indispensa-
ble elements for comparative research, for at least one lan-
guage in each major branch (although there are no major modern
studies of Amuzgo, Chiapanec-Mangue, Tlapanec or Huave), and
more are being published every year (see Hopkins and Josserand
1979:69-146). Various glottochronological studies have been
published, although they have not been revised in the light of
Rensch's rules for the identification of cognates. The recon-
struction of the lexicon of proto-Otomanguean and that of its
various subgroups is in progress and is already sufficient for
some historical interpretation, but the emphasis is still on
reconstruction of items of linguistic interest rather than
those of greater cultural significance. The study of loan
words--both internal, within the family, and external, from
without the family--hardly exists, given the difficulty of
identifying loan words without knowing the details of the in-
ternal development of the languages. Dialect studies are only

beginning, although some projects have already yielded valuable insights into regional development (e.g., Gudschinsky 1958 on Mazatec, Suárez 1977a on Zapotec, Josserand and Bradley 1978 on Mixtec).

The Otomanguean Family of Languages
Classification and Origins

The Otomanguean family of languages is composed of nine linguistic groups whose linguistic kinship has been established beyond reasonable doubt. The early historical distribution of these languages spanned Mesoamerica, from the Otopamean groups of the northern frontier to the Mangue of Central America on Mesoamerica's southern extreme. From north to south (roughly) the linguistic groups which comprise the branches of the family are: Otopamean (Pame, Chichimeca-Jonaz, Otomí, Mazahua, Matlatzinca and Ocuiltec), Popolocan (Popoloca, Mazatec, Ixcatec and Chocho), Mixtecan (Mixtec, Cuicatec and Trique), Tlapanec, Amuzgo, Chinantec, Zapotecan (Zapotec, Chatino and Papabuco), Huave, Chiapanec-Mangue (Chiapanec, Mangue, and other synonyms of Mangue: Nagrandan, Diria, Orisi, Orotinya, Nicoya and Cholutec).

The distribution of these languages suggests the important role they and their ancestors must have played in the development of Mesoamerican civilizations. They occupy key areas for the domestication of plants, for the development of some of the most important Preclassic and Classic cultures, as well as important Postclassic cultures. The central position of Otomanguean in Mesoamerica is apparent, and it would have been difficult if not impossible for the characteristic elements of Mesoamerican cultures to have diffused throughout the culture area without the active participation of Otomangueans. If, as many believe, Utoaztecan groups are relatively late arrivals in the central and southern parts of Mesoamerica (see Kaufman 1976), then Otomangueans must have occupied the valleys of Puebla and Tehuacán before the Nahuas, and Otomangueans are

strong candidates for the basic population of Teotihuacán. Without reasonable doubt, Otomanguean speakers developed the prehistoric cultures of the valley of Oaxaca and the Mixteca Alta, as well as the Cañada and the valley of Tehuacán.

If available data are not misleading, the Otomanguean family began to diversify before any other Mesoamerican family of languages. Otomanguean diversification has such time depth that it is only in the last few years that the relationships of Tlapanec and Huave to the rest of the family have been recognized (see Swadesh 1960, Rensch 1973, Suárez 1977b), and it was only after more than fifty years of study that the relationship between Otopamean and the Oaxacan languages was firmly established (see Mason 1940).

Glottochronology fixes the beginnings of diversification at a minimum of 64 centuries before the present (64-66 minimum centuries; Swadesh 1967). That is, as far as we can tell from the languages which have survived into the present era, proto-Otomangue began to develop distinct varieties--the languages ancestral to the nine subgroups--around 4400 B.C. (in archaeological terms, in the Archaic). Compare this figure with that for the beginnings of diversification of Mayan, which is dated some 2000 years later. Linguistic diversification implies the separation of formerly unified populations, which begin to develop with relative independence, and whose cultural (linguistic) descendants survive into modern times. Generally, diversification implies population movements, as populations expand into territories vast enough for intimate contact between segments to be lost. On the other hand, the loss of intimate contact may not imply population movements, but the development of socio-political entities which impose barriers to communication and interaction. Both of these factors are apparent in the Otomanguean data.

The extreme chronological depth of the Otomanguean family is, paradoxically, an advantage in terms of the reconstruction of the lexicon of the proto-language and its cultural interpretation: such time depth makes reconstruction more difficult

but the terms reconstructed are those of a language spoken
at an early period. The reconstruction of proto-Otomanguean
vocabulary is the reconstruction of the lexicon of a Mesoamer-
ican people of around 4400 B.C. It is of great interest to
note that proto-Otomanguean reconstructions made by Rensch
(1966, 1976) include terms for maize, beans, squash, chile,
avocado, cotton, tobacco, cacao, and edible tuber (camote).
(Amador and Casasa 1979)

The combination of three types of information--distribu-
tion of the languages, reconstruction of the vocabulary of
proto-Otomanguean, and glottochronology--suggests a hypothes-
is relating to the location and archaeological associations
of the proto-Otomanguean population. This population must
have existed around 4400 B.C., must have utilized the plants
whose names can be reconstructed as part of their vocabulary
(as well as knowing of the animals whose names can be recon-
structed, etc.), and should have occupied an area which could
be a logical homeland for the family given the later distri-
bution of the branches of Otomanguean. We find evidence of
a population with the right characteristics in the archeo-
logical sequences of the valley of Tehuacán, Puebla (Byers
1967; MacNeish et al. 1967, 1970; Johnson 1972). The glotto-
chronological dates for the latest probable period for the
beginnings of Otomanguean diversification fall within the
Coxcatlán phase (5000-3400 B.C.) of the Tehuacán sequence
(Johnson and MacNeish 1972:40). In fact, the almost perfect
correlation which Amador and Casasa (1979) report between the
inventory of proto-Otomanguean plant and animal names and the
plant and animal remains discovered in the Coxcatlán phase of
Tehuacán is impressive. It is precisely in this phase that
the remains of utilized plants point to the development of
the basic dietary complex later characteristic of Mesoamerica
(Smith 1967).[2] This is the period in which the populations
which occupied the archeological sites were discovering and
improving a subsistence base that would have made possible a
considerable expansion of population. The hypothesis is,

then, the following: the proto-Otomanguean population occupied the sites in the valley of Tehuacán represented in the Coxcatlán phase of the sequence, and probably other sites outside the region of Tehuacán which took part in the same developments. It was this development of a new complex of plants as a subsistence base that made possible the population growth and expansion reflected in the diversification of the Otomanguean family into its nine major branches.

The following stages of diversification cannot be fully understood without further linguistic research, as well as further archeological research. We know that there are nine branches of the family--nine groups with more or less independent development--but the relationships between the nine branches are unclear, both in structural and in glotto-chronological terms. Nevertheless there is a certain correspondence between the distribution of the nine branches and distinct geographical or ecological zones. The Otopamean branch now occupies (and probably occupied in prehistoric times) certain zones of central Mexico: at present, parts of the Distrito Federal and the states of México and Hidalgo, with extensions into San Luís Potosí, Querétaro and Guanajuato. The Popolocan branch is centered around the presently Nahuatl- and Spanish-speaking areas of the valleys of Puebla and Tehuacán, with extensions to the south (Ixcatec and Chocho) and east (Mazatec). The Chinantecan branch occupies the eastern escarpment of the Sierra Madre de Oaxaca, with extensions down into the Gulf lowlands. The remainder of the highlands of Oaxaca, with the exception of the small enclave of Amuzgo, is divided between the Mixtecan branch from the valley of Oaxaca to the west, and the Zapotecan branch from the valley of Oaxaca to the east. Tlapanec occupies the eastern parts of the state of Guerrero, and Huave is located along the lagoons on the Pacific coast of the Isthmus of Tehuantepec. The Chiapanec-Mangue branch, now extinct, was found in the Grijalva valley in Chiapas (Chiapanec) and in parts of Central America (Mangue). These general patterns

of distribution are the result of the gradual expansion of
a population attested in the area of Tehuacán. Equipped
with a new agriculture, Otomangueans expanded into new terri-
tories, gradually losing contact with one another and evolv-
ing distinct languages and cultures as they adapted to their
new environments. With the establishment of the populations
in their new locations and the development of Mesoamerican
culture in general, new factors came into play--ethnic, polit-
ical, economic and social considerations which contributed to
the definition of the distinct branches of the family.

Shared Innovations in the Early Periods

Some studies of the relationships between the nine lin-
guistic subgroups have been made, and they lead us to believe
that there was early intimate contact between the distinct
regions in spite of their partially independent development.
Rensch (1973) has presented a study of the order and distri-
bution of the major innovations which have affected more than
one branch of the family since the common period. The pattern
evident in these data is one of continuous interaction between
Otomanguean groups, at least in the early periods of diversi-
fication. Rensch discusses eight stages of innovations, in-
volving fifteen changes (Fig. 1). The Otopamean branch ceased
to participate in common innovations after the third stage;
its later development was independent of other Otomanguean
groups. Amuzgo was independent after the fifth stage and Po-
polocan after the sixth. The other groups continued to par-
ticipate in a common network of relationship which produced a
distinct pattern of shared innovations between each pair of
branches. Nevertheless, the development of each branch was
unique. No two branches participated in exactly the same set
of innovations, but the overall pattern was one in which each
innovation tended to be shared by four or more branches.

This pattern of distribution of shared innovations is
similar to the patterns manifested among Mixtec languages
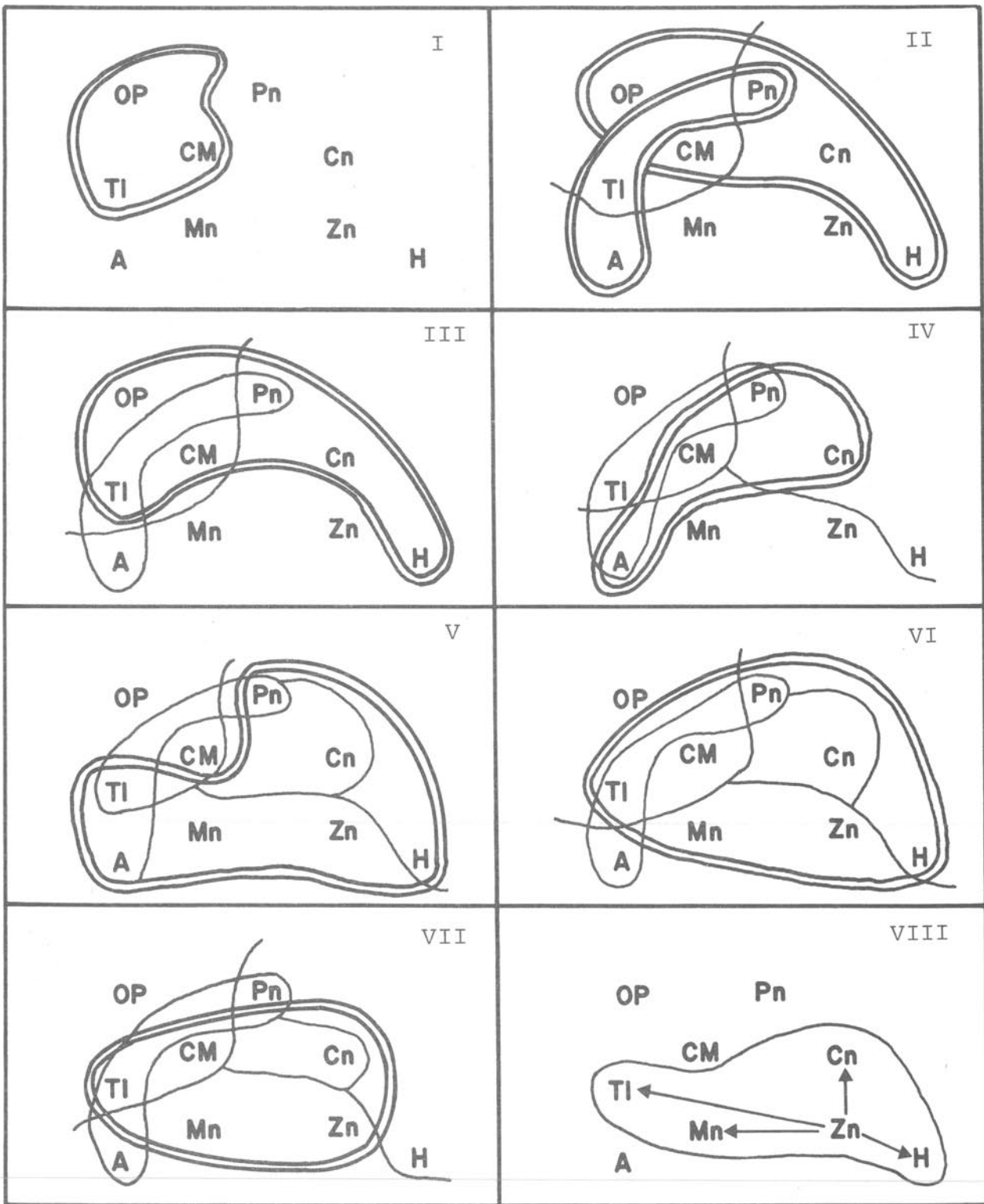
Fig. 1. Order and distribution of shared innovations, by stages (adapted from Rensch 1973). Double lines enclose the area affected by an innovation, single lines delimit areas already distinct. I, *p:*k^W contrast; II, vowel changes: creation of nasalized vowels; III, tone changes, and *hk → *h; IV, changes in clusters *YC, *nC, *hʔ; V, changes in *(n)Yt, *(n)Ys; VI, *ny → liquid, loss of *ʔ(irregular); VII, changes in *nt, *ns, and vowels; VIII, Changes possibly of Zn origin.

(Bradley and Josserand 1977, Josserand and Bradley 1978),
Zapotec languages (Suárez 1977a) and Mayan languages as well
(Josserand 1975), and it is probably typical of other Meso-
american language families. Such a pattern implies a network
of interaction that spans a large area, but not all of the
area at any given moment, and it indicates that none of the
groups within the area developed completely independently of
the rest. This is what we should expect in Mesoamerica,
where all groups have participated in a common areal develop-
ment, although there exists in each period a different set of
alliances and conflicts. No single group was preeminent,
rather, several centers alternated in dominance. These should
be centers whose innovations were frequently adopted by others.

Despite the difficulty of defining tight subgroups in such
a fluid situation, a quantification of the shared innovations
between each pair of branches gives some idea of the level of
their interaction. On the basis of the fifteen innovations
discussed by Rensch (1973) we can identify some sets of
branches which tend to share a greater part of their linguis-
tic development (Fig. 2). Of the nine branches, Popolocan and
Chinantecan share the greatest number of innovations (11 of
the 15). Popolocan and Amuzgo share nine of the fifteen inno-
vations, as do Chinantecan and Amuzgo. Chinantecan and
Chiapanec-Mangue share eight innovations; Chinantecan and Tla-
panec, seven. Popolocan and Chiapanec-Mangue share six inno-
vations. The remaining pairs of branches share five innova-
tions or less, and the only pairs of branches which do not
share innovations are Mixtecan-Amuzgo, Mixtecan-Otopamean and
Otopamean-Zapotecan.[3] Thus in terms of shared innovations--
that is, common linguistic developments--a tightly related
group is formed by Popolocan and Chinantecan, and this group
is closely tied to Amuzgo on the one hand and to Chiapanec-
Mangue and Tlapanec on the other. Outside this group, sharing
relatively few innovations with it or with each other are Oto-
pamean, Mixtecan, Zapotecan and Huave.

Number of innovations shared (=n)	Pairs of branches sharing n innovations
11	Pn-Cn
10	--
9	Pn-A, Cn-A
8	CM-Cn
7	Tl-Cn
6	Pn-CM
5	Pn-OP, Pn-Tl, Pn-H, A-CM, A-OP, OP-Cn, Zn-Tl, Cn-H
4	Mn-Cn, Mn-Tl, CM-Tl, Zn-Cn, Tl-H
3	Mn-CM, Mn-Zn, A-Tl, A-H, CM-Zn, CM-H, Zn-H
2	Mn-Pn, Mn-H, Pn-Zn, CM-OP, OP-Tl, OP-H
1	A-Zn
0	Mn-A, Mn-OP, OP-Zn

Fig. 2. Number of innovations shared between branches of the Otomanguean family, of 15 possible innovations (data from Rensch 1973). A, Amuzgo; CM, Chiapanec-Mangue; Cn, Chinantecan; H, Huave; Mn, Mixtecan; OP, Otopamean; Pn, Popolocan; Tl, Tlapanec; Zn, Zapotecan.

The innovations which are quantified here are those which
created the proto-languages of the branches of Otomanguean
(proto-Otopamean, proto-Popolocan, etc.); that is, these
should be relatively early innovations, which occurred before
the internal diversification of the branches. In the time
scale to be discussed in the following section, these innova-
tions should have begun by around 4400 B.C., and should have
run their course by around 1500 B.C., or by 500 B.C. at the
latest. They begin in the Archaic and continue to the begin-
ning of the Preclassic, and perhaps to the middle of the Pre-
classic.

The innovations shared across branches of Otomanguean are
most easily explained as happening before the internal diver-
sification of the various branches (for distributional reasons)
and before the various branch proto-languages had themselves
become very different from each other (for structural reasons).
In theory, it should be increasingly unlikely that diversify-
ing languages continue to share innovations as the time depth
of their divergence increases. Languages which are quite sim-
ilar to each other structurally can more easily accept struc-
tural innovations from one another. After a series of differ-
ent innovations have caused the systems to become more differ-
ent, the likelihood that they will continue to affect each
other's structures decreases. Thus we should expect that
while the sharing of the earliest innovations comes more or
less naturally, the sharing of later innovations requires
special circumstances. On distributional grounds, if all lan-
guages of a branch manifest the results of an innovation, it
is more easily explained as an innovation which occurred dur-
ing their common period (affecting a single speech community)
than as an innovation which occurred after diversification
(affecting various relatively independent speech communities).
Therefore it is assumed here that the shared innovations dis-
cussed by Rensch took place early (Archaic and early Preclas-
sic) rather than late, although it is possible that they
could be shown to extend to a somewhat later time.

Quantification of shared innovations indicates that Popo-
locan and Chinantecan, along with Amuzgo, form a tight group
which also often allies itself with Chiapanec-Mangue and Tlapa-
nec. In terms of the distribution of these innovations in
eight stages (Fig. 1), another pattern of shared changes can
be seen. The earliest stage (I) involves a single innovation,
and sets Otopamean-Chiapanec-Mangue-Tlapanec off against the
remaining groups. The next stage (II), involving two innova-
tions in the vowel systems, affects all groups but Mixtecan
and Zapotecan, but it affects Popolocan-Tlapanec-Amuzgo in a
different way than it affects Otopamean-Chiapanec-Mangue-
Chinantecan-Huave. The following stage (III) again involves
two innovations (tone changes and a consonant cluster reduc-
tion), and these innovations affect the same set of languages
except for Amuzgo. Note that Mixtecan and Zapotecan do not
participate in these changes of stages I-III, and after stage
III, Otopamean ceases to participate. The changes in conso-
nant clusters that characterize stage IV affect only Popolocan,
Chinantecan, Chiapanec-Mangue and Amuzgo. Not participating
in these innovations are Mixtecan and Zapotecan, Otopamean,
Tlapanec and Huave. Stage V includes Mixtecan and Zapotecan
in the shared innovations for the first time, and they continue
to participate throughout the remaining stages (VI-VIII). Af-
ter the fifth stage, Amuzgo ceases to participate. The last
four stages (V-VIII) always include in the innovating area
Mixtecan, Zapotecan, Chinantecan and Tlapanec, and sometimes
include Chiapanec-Mangue, Popolocan and Huave.

It is interesting to speculate on who were the innovators
within these clusters and who were the recipients of diffused
innovations. Detailed investigation of the structural motiva-
tions and structural effects of these changes could suggest
the logical possibilities.

The distributions of innovations throughout the eight
stages reflect the early separations of Otopamean from the
rest of the family and the independence of Mixtecan and Zapo-
tecan until a relatively late period. They also reflect the

eventual separation of Amuzgo from what we could call the core
area of early Otomanguean innovations. The cluster of Popolo-
can-Chinantecan-Chiapanec-Mangue interacts first with Otopame-
anand later, after the separation of Otopamean, with Mixtecan
and Zapotecan.

Glottochronology of the Family

A number of glottochronological figures are available for
Otomanguean, such as the figure already cited which places the
beginnings of Otomanguean diversification at around 4400 B.C.
In the interpretation of such dates, some cautions are in or-
der. First, differences in basic vocabulary are measured by
the number of cognates found in a standard vocabulary list.
Figures for the same two test lists may vary depending on the
standards used in identifying cognates (i. e., whether cog-
nates are identified by inspection and intuition, by prelimi-
nary rules for sound correspondences, or by a definitive
study of the diversification of the family). All of the fig-
ures cited here represent calculations made before the publi-
cation of Rensch's comparative phonology, and different inves-
tigators have used different rules for establishing cognates.
On the other hand, considerable experience has shown that pre-
liminary rules for identifying cognates have about the same
probability of counting non-cognates as cognates as they have
for counting cognates as non-cognates; there is a tendency
for the errors to cancel each other out.

Second, glottochronological time depth calculations refer
to the minimum amount of time necessary for the development of
the observed lexical differences. In cases of continued con-
tact we know that such figures tend to be conservative, as
contact retards the rate of independent change presupposed by
the theory. Thus 64 centuries is the minimum time necessary
for a group of languages diversifying from a common ancestor
to develop lexical differences at the level of those observed
for Otomanguean. Given the continuous interaction evident in
the pattern of shared innovations, the figure of 64 minimum

centuries (m.c.) for Otomanguean should be conservative. Diversification could have begun earlier, but at a slower than average rate due to continued contact. Even if some ten percent were added to the time depth of Otomanguean, the data for the beginning of diversification would still fall at the beginning of the Coxcatlán phase of Tehuacán (70.4 m.c.; 5000 B.C.).

The glottochronological comparison of any two languages from different branches of the family should yield figures in the same time range. This is not the case for the available calculations for Otomanguean; branch-wise comparisons yield figures which vary between 64 m.c. (4400 B.C.) and 29 m.c. (900 B.C.).[4] Published figures are (all from Swadesh 1967):

>64 m.c. (4400 B.C.), Mazatec-Trique (Popolocan-Mixtecan);
>Mazatec-Isthmus Zapotec (Popolocan-Zapotecan);
>
>54 m.c. (3400 B.C.), Tlapanec-Mangue (Tlapanec-Chiapanec-Mangue);
>
>50 m.c. (3000 B.C.), Chinantec-Ixtlán Zapotec (Zapotecan-Chinantecan); Huave-Mangue (Huave-Chiapanec-Mangue);
>
>49 m.c. (2900 B.C.), Ojitlán Chinantec-Trique (Mixtecan-Chinantecan); Mazahua-Ixcatec (Otopamean-Popolocan);
>
>45 m.c. (2500 B.C.), Trique-Amuzgo (Mixtecan-Amuzgo);
>
>44 m.c. (2400 B.C.), Tlapanec-Chiapanec (Tlapanec-Chiapanec-Mangue);
>
>41 m.c. (2100 B.C.), Huave-Isthmus Zapotec (Huave-Zapotecan);
>
>39 m.c. (1900 B.C.), Amuzgo-Cuicatec (Amuzgo-Mixtecan); San Miguel el Grande Mixtec-Ixcatec (Mixtecan-Popolocan);
>
>36 m.c. (1600 B.C.), San Miguel el Grande Mixtec-Ixtlán Zapotec (Mixtecan-Zapotecan);
>
>35-29 m.c. (1500-900 B.C.), Amuzgo-Mixtec (Amuzgo-Mixtecan).

These figures do not give a clear picture of branch-wise separations with strong subgrouping, but rather reflect the situation indicated by the patterns of shared innovations: an

extended network of continued interaction after the beginnings
of diversification. The diversification process is gradual
and we cannot be sure that all the branches were clearly dis-
tinct until around 1500 B.C. By this time, however, all the
branches were relatively independent and the first stage of
diversification had come to an end. In archeological terms,
Otomanguean diversification into nine branches occurred
throughout the Archaic, but by the beginnings of the Preclas-
sic the nine branches existed as relatively independent vari-
eties of speech, some already internally diversified.

The internal diversification of the branches continued
without pause (Fig. 3). The Otopamean branch shows internal
diversification at an early period (by 3500 B.C.). By about
1500 B.C., Mixtecan had separated into Trique versus Mixtec-
Cuicatec. The internal diversification of the Popolocan and
Zapotecan branches (Mazatec versus Popoloca-Chocho; Chatino
versus Zapotec), as well as the further diversification of
Mixtecan (Mixtec versus Cuicatec), took place by 500 B.C.
Later separation dates represent the formation of distinct
languages within each subgroup; one cluster of dates falls
between A.D. 400 and 700, another between A.D. 1000 and 1200.
These will be discussed later.

The periods of greatest activity in diversification can
be related to different periods of cultural development. The
diversification of Otomanguean in general, as well as that of
the Otopamean branch, is a product of the Archaic. The in-
ternal diversification of Mixtecan, Popolocan and Zapotecan
is a product of the Preclassic. The separations of Otomí and
Mazahua, of Ixcatec versus Popoloca-Chocho, the development
of the regional varieties of Mixtec, Chinantec, Chiapanec-
Mangue and Zapotec, are products of the Classic. Other sepa-
rations (Matlatzinca versus Ocuilt Popoloca versus Chocho,
the development of the varieties of Mazatec, etc.) are prod-
ucts of the Postclassic.

Linguistic diversification reflects the same cultural and
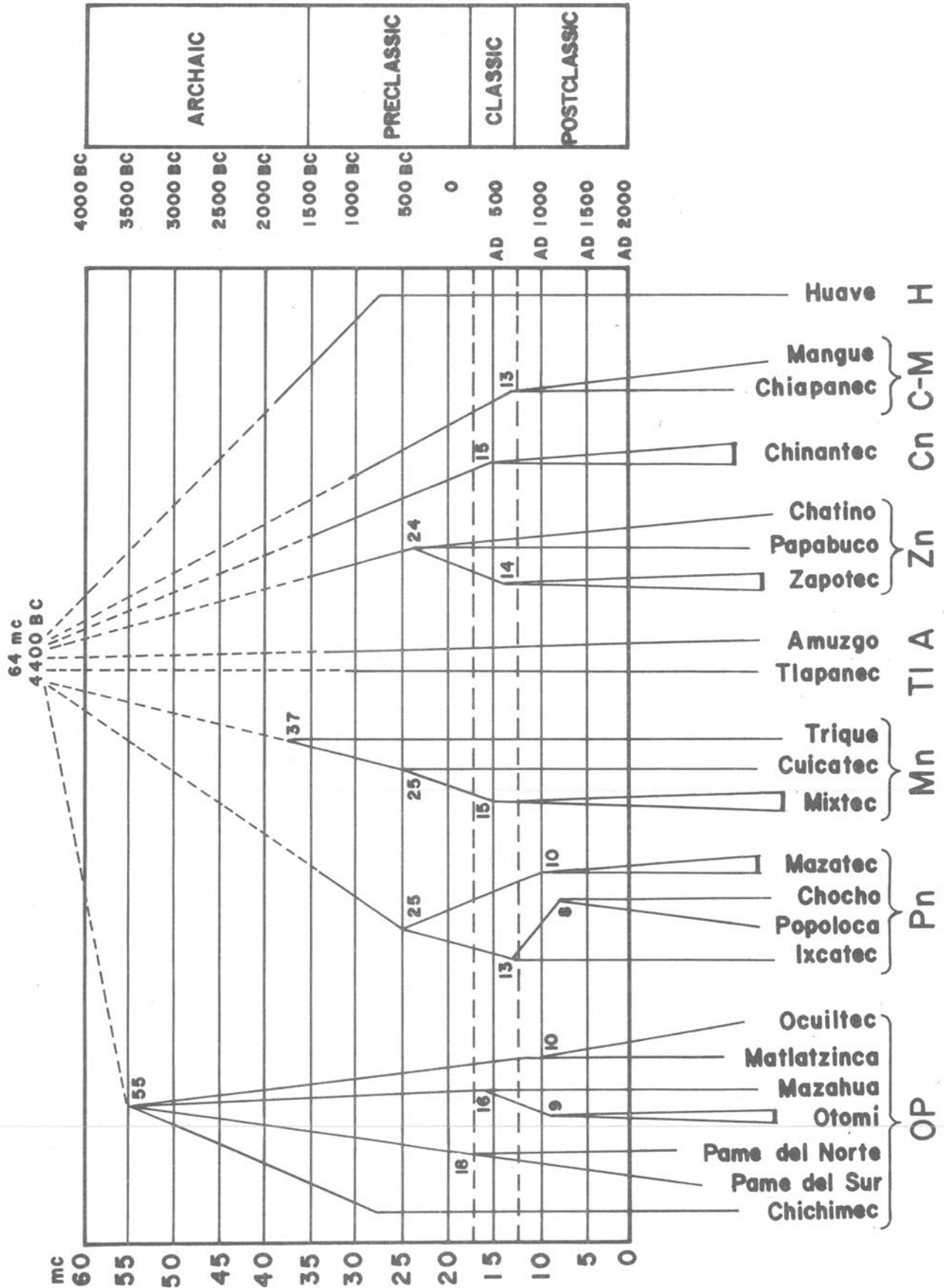social phenomena attested in the archeological record. We

Fig. 3. Glottochronology of the Otomanguean family

should therefore expect to find in the archeological record
from the Otomanguean area patterns similar to those revealed
by linguistic research. We would expect to find a period of
general homogeneity in an area that includes Tehuacán, up un-
til around 4400 B.C. The cultural patterns attested in Tehua-
cán should either be present at the same time or appear short-
ly thereafter in areas to the north, south and east, with some
regional differences. By the beginnings of the Preclassic we
would expect to find nine distinct areas corresponding to the
nine branches of Otomanguean. These might be (1) an area in-
cluding the Valley of Mexico and adjacent valley systems
(Otopamean); (2) an area including the Valley of Tehuacán and
extending east and south (Popolocan); (3) the Valley of Puebla
(Chiapanec-Mangue, for reasons to be discussed later); (4) the
Mixteca Alta and Baja (Mixtecan); (5) an area including the
Valley of Oaxaca and extending north, south and east (Zapote-
can); (6) the highlands north of Zapotecan and extending over
the Gulf escarpment (Chinantecan); (7) eastern Guerrero (Tla-
panec); (8) the Isthmus of Tehuantepec (Huave) and (9) south-
western Oaxaca (Amuzgo). Of these, the northernmost zone
(Otopamean) should be most distinct, in view of the relative
independence of the Otopamean branch. During the Preclassic
further regional differences, corresponding to the increasing
differences between branches of the family, should have devel-
oped. These regions should show increasing internal diversity
throughout the Preclassic, Classic and Postclassic.

External Contacts of the Family

As far as external contacts are concerned--contacts with
other language families--we have little data, but the data are
of some interest. These data are derived from studies of loan
words between Mesoamerican languages. In situations of culture
contact between groups of distinct speech, there is a clear
tendency for cultural influence to be reflected in vocabulary
loans from culturally superior (in some domain) to culturally
inferior groups.

Thus we find in the indigenous languages of Mexico many loan words from Spanish which reflect the cultural dominance of Spanish speakers over the past 400 years. We also find, however, many indigenous words loaned to Spanish, in cultural domains where the indigenous peoples offered special knowledge (above all, in the domains of plants and animals unknown by the early Spanish settlers. The nature of the culture contact can be inferred from the nature of these loan words. Spanish gives to the Indian languages the names of products derived from Spanish technology and the names of introduced plants and animals, as well as the terminology for the new religion and social order. The Indian languages, especially Nahuatl, give to Spanish the names of native plants and animals, as well as indigenous artifacts (comal, petate, metate, etc.). The same kind of cultural and linguistic interchange must have occurred between indigenous groups in the prehistoric era.

In 1976 the linguists Lyle Campbell and Terrence Kaufman published the results of a study of the Mixe-Zoque family of languages and its linguistic influence on other indigenous groups. They present a convincing case for the association of the Mixe-Zoque family with the Olmec culture of the Pre-classic. Part of their evidence is the existence of loan words from Mixe-Zoque to other languages, some of them clearly of early date. The evidence is clearest from the Mayan area, since the detailed work done on Mayan languages makes possible ready identification of non-native vocabulary, and the dating of the introduction of this vocabulary. The data indicate a clear Mixe-Zoque influence on Mayan in an early period in the diversification of Mayan, probably in the region of the eastern parts of Guatemala and the western parts of El Salvador, where there is archeological evidence of Olmec presence, and where it has been suggested part of the proto-Mayan population was located in an early period (Josserand 1975).

The data for Otomanguean are not yet definitive, given the difficulty of identifying loan words without having a com-

plete understanding of the phonological development of the
loaning and borrowing languages. Nevertheless, Campbell and
Kaufman present a list of possible Mixe-Zoque loans to Otoman-
guean. Of their sample of Otomanguean languages, Huave has
the greatest number of probable loans. This is in agreement
with Huave's geographical position on the Isthmus of Tehuan-
tepec, the route of Olmec contact with the Soconusco and Gua-
temala. Fourteen loans to Huave are cited: cacao, two terms
for zapote, tomato, tortilla, copal, to cut with an axe, sor-
cerer, paper, turkey, salt, straw mat, rabbit (as a calendric
term) and ant. The Otopamean and Mixtecan branches show seven
possible loans each, and the other branches three or less.
These possible loans are: to Cuicatec, camote; to Mixtec,
zapote, paper, wasp nest, fox, ant and coyote; to Otopamean
(the majority to Otomí and central Otopamean), measure, metal,
to cut with an axe, straw mat, pot, child, and (as calendric
terms) alligator and rabbit.

Since Campbell and Kaufman were concerned with Mixe-Zoque
influences, they have not investigated the possible loans from
Otomanguean to other languages, although they have in prepara-
tion a more general study of linguistic diffusion in Mesoameri-
ca. If our hypothesis about the association of Otomanguean
with the early agriculture of Tehuacán is correct, we would
expect to find loan words in the agricultural domain from Oto-
manguean to other groups. Detailed studies have not been made
that would make possible a definitive statement of such loans.
There does exist the possibility that terms for maize in many
languages are of Otomanguean origin: e.g. proto-Mixtecan *yam,
proto-Chiapanec-Mangue *-ma, and proto-Mayan *'e'm, 'maize';
as well as proto-Chiapanec-Mangue *wih', proto-Chinantecan
*wih(n), 'tortilla', and proto-Mixe-Zoque *way 'to grind
corn'. However, the phonological structures of Otomanguean
languages, with consonant alternations within a stem being a
common feature, make it risky to propose loans into and out
of the family on the basis of inspection rather than careful
comparative work.

Summary of Otomanguean Linguistic Prehistory

Putting together the linguistic information on the Oto-
manguean family and the archeological, ethnohistorical and
other evidence from the general Otomanguean area, we can pro-
pose a reasonably detailed model of the prehistory of the area
in which the linguistic diversification can be understood as
a result of the cultural and social development of the Oto-
manguean populations. Such a model will of necessity be in-
complete and inaccurate in many aspects given present limita-
tions in all sources of data. Nevertheless I believe it is
useful to attempt such syntheses, if only as a reminder that
since linguistic, archeological, and other evidences of pre-
history are reflections of the same phenomena, they should
lend themselves to integration, and this integration should
be more informative than any single line of evidence taken
by itself.

The geographical distributions of the linguistic groups
proposed below should be taken only as suggestions made in the
light of present-day knowledge of distributions and patterns
of diversification. Both geographical and social distance
are factors capable of bringing about the internal diversifi-
cation of a linguistic group. Thus the "separation" of groups
cited below can be interpreted as the migration or movement of
a segment of the population, creating geographical distance
which leads to diversification. Or such a separation can be
interpreted as the result of nucleation of various segments
of the population around different centers of influence, cre-
ating social distance between the groups which leads to their
diversification.

In the case of the earliest stages in the diversification
of the Otomanguean family, the separations may be taken as the
result of population movements out of a nuclear area including
Tehuacán, or as the result of the nucleation around different
centers of a population which already occupied the areas in
which the diversified groups are later attested. The separa-
tion of Otopamean from the rest of the family, for example,

may be due either to a movement of pre-Otopamean population
into central Mexico, or to a change in regional orientation
of a pre-Otopamean population which already inhabited the
northern zones (or, of course, to some combination of the two
factors). Hunting and gathering nomadic peoples whose social
groups utilize overlapping territories during their annual
cycles may be conservative with respect to diversification,
as there are no clear boundaries between groups to inhibit
the spread of innovations. What we see in the Archaic pat-
terns of diversification may not be the result of population
movements, but the result of a change to a sedentary way of
life and the consequent formation of barriers to the spread
of innovations. Choice between these alternatives can best
be made on the basis of archeological data which establish
the regional cultural associations of the populations which
existed in the different zones at different time periods.

In the absence of more complete archeological knowledge
two guidelines have been adopted in the construction of the
model to be presented. First, it is assumed that the separa-
tions of the Archaic and the Preclassic, periods characterized
by growth and expansion of population, are usually due to pop-
ulation movements and geographical separation. Second, the
separations of the Classic and Postclassic, when there is pre-
sumably a more-or-less evenly distributed population across
the Otomanguean area, are interpreted as a product of the so-
cio-political formations characteristic of these periods. A
definitive statement of early Otomanguean diversification must
await further archeological studies of cultural distributions
and alliances.

Archaic

The Archaic, from about 4400 B.C. on, is characterized by
the gradual expansion and diversification of a culture area
which includes Tehuacán. This process is related to the new
agricultural complex attested in the Coxcatlán phase of the
Tehuacán sequence, and should be marked in the **archeological**

record by the appearance of the agricultural technology exemplified by the Tehuacán sequence.

During the earlier parts of the Archaic there is a tight network of linguistic (and therefore probably other) relations between Popolocan, Chinantecan and Amuzgo, with secondary participation of Chiapanec-Mangue and Tlapanec. There should have been considerable interchange between the regions of Tehuacán (Popolocan), the Gulf escarpment (Chinantecan and Popolocan), Puebla (Chiapanec-Mangue) and the Oaxaca-Guerrero frontier (Tlapanec and Amuzgo). Note that the Puebla-Tehuacán-Gulf escarpment region is that part of the Otomanguean area that gives most direct access to the Gulf (via the Papaloapan) and this network of interaction may include non-Otomanguean cultures of the Gulf lowlands. If the hypothesis of spread of the agricultural complex from the Otomanguean highlands is correct, then the direction of influence may well have been from the highlands to the Gulf coast. It is of interest here that Wicke (1971) sees a strong highland influence in the Gulf lowlands and suggests that some "Olmec" art styles have their earlier representations in the region of Huamelulpan (western Mixteca Alta). However, I would differ from Wicke in suggesting not that the Olmecs are of highland origin, but that they received cultural influences from these highland Otomanguean groups before the Olmec florescence in the Preclassic.

During the Archaic the Otopamean groups, the northern branch of Otomanguean expansion, became independent of the remaining Otomangueans and began to diversify internally. The internal diversification of Otopamean may reflect expansion into distinct ecological or geographical zones. Chichimeca-Jonaz and Pame occupy the marginal agricultural zones on the northern frontiers of Mesoamerica; Otomí and Mazahua the more stable agricultural areas south of the frontier (including the valleys of Mexico, Hidalgo and Toluca). Matlatzinca and Ocuiltec occupy the southern parts of the valley of Toluca on the escarpments of the Río Balsas depression. The la-

custrine economy of the southern Altiplano valleys may have
been a strong factor in Otopamean independence and internal
diversification.

Note that Otopamean distribution includes the northern
side of the Balsas depression; Matlatzinca and Ocuiltec are
located at the southern edge of the Valley of Toluca where
tributaries of the Balsas rise and flow south through Morelos.
Before the arrival of Nahuatl, an Otomanguean continuum may
have existed from the Valley of Toluca through Morelos to the
Mixteca Baja, and up into Puebla and the Valley of Mexico.
This would constitute the Otopamean-Tlapanec-Chiapanec-Mangue
connection indicated by the first innovation, with Otopamean
north of the Balsas, Tlapanec to the south, and Chiapanec-
Mangue in the Valley of Puebla.

Mixtecan and Zapotecan were independent of the network
of shared innovations in its early phases, but began to par-
ticipate before the end of the Archaic. This linguistic inde-
pendence may not show strongly in the archaeological record
since at this point the cultures are newly diversified from a
common origin and independence is not long-lasting. Perhaps
Mixtecan and Zapotecan, having lost contact with other Otoman-
gueans through outmigrations, had by the late Archaic begun to
expand in population and territory, bringing them once more
into interaction with their likewise expanding relatives. It
is possible that the re-entry of Mixtecan and Zapotecan into
the network of shared innovations represents rising cultural
influence of these groups over adjacent Otomangueans.

After stage VI of the shared innovations, presumably to-
wards the end of the Archaic, Popolocan drops out of the net-
work. It is interesting to note that in the immediately fol-
lowing period, the Preclassic, there is further activity in
the region of the Cañada and the Gulf escarpment, with the
separation of Mazatec from the remaining Popolocan, and of
Cuicatec from the remaining Mixtecan. This suggests a reori-
entation of relationships in the areas adjacent to the Gulf
coast.

About the same time as the end of Popolocan involvement
in the network of shared innovations, Amuzgo lost its close
connection with Popolocan, Chinantecan, Chiapanec-Mangue and
Tlapanec. This was when Mixtecan and Zapotecan entered the
network, and a realignment of relationships was taking place.
It may have been then that Mixtecan intervened between Amuzgo
and Popolocan, perhaps by expanding into the Mixteca Baja.

Preclassic

This period begins with the nine branches of Otomanguean
already distinct and Otopamean already diversified. Some of
the separations which occur during the Preclassic can perhaps
best be explained by migrations. The separations of Trique
from the rest of Mixtecan and of Chatino from the rest of
Zapotecan indicate movement towards the Pacific coast and the
adjacent highlands.

Probably without migration, Mazatec separated from the
remaining Popolocan (Popoloca-Chocho-Ixcatec) and Cuicatec
separated from the remaining Mixtecan (Mixtec proper). As
these two developments are roughly contemporaneous and occur
in the same geographical area (the Cañada and the highlands
between it and the Gulf coast) we may suppose that they have
a common origin, perhaps a changing relationship with the
Gulf coast, where Olmec culture was beginning to exert its
influence.

Since the Preclassic is the period of Olmec presence in
large parts of Mesoamerica, it is tempting to relate Otoman-
guean diversification to the rise of Olmec influence in the
highlands. Unfortunately, there is little known evidence in
the linguistic record to reflect this influence, except for
a few Mixe-Zoque loan words into the Otomanguean languages.
At any rate, the Olmec presence is attested archeologically
in almost all of the area ascribed to Otomangueans during the
Preclassic. In this respect it would be interesting to be
able to compare relative Olmec influence (linguistic and non-
linguistic) on the diverging groups. Within Mixtecan, for

instance, comparison could be made between the Cañada (Cuica-
tec), the Mixteca Alta (Mixtec proper) and areas nearer the
Pacific (Trique). It might be the case that Cuicatec shows
heavy Olmec (Mixe-Zoque) influence due to its proximity to
the Gulf Coast, Mixtec less influence, and Trique none at all.
Similar comparisons could be made between Mazatec and other
Popolocan, and between Zapotec and Chatino.

Classic

The internal diversification of the branches of Otoman-
guean which characterized the Classic was probably related to
the formation of socio-political entities rather than to popu-
lation movements. There are few instances in the linguistic
data which necessitate the postulation of population movements
after the Preclassic, with the notable exception of Chiapanec-
Mangue.

In the northern Otomanguean zone (Otopamean), Mazahua and
Otomí become distinct from one another. In the Tehuacán-Caña-
da area, Ixcatec becomes distinct from Popoloca-Chocho, reflec-
ting continued fragmentation in this area. Chiapanec and Man-
gue separate towards the end of the Classic. The hypothesis
proposed here is that pre-Chiapanec-Mangue occupied the valley
of Puebla, but with increasing pressure from central Mexico
at the end of the Classic the Chiapanec-Mangue population
moved in a southward migration to Chiapas and Central America.
Any remnant Chiapanec-Mangue population which stayed behind
in the Puebla area was later absorbed or eliminated by in-
trusive Nahuatl speakers.

Mixtec, Zapotec and Chinantec all underwent internal di-
versification during the Classic, probably reflecting the
growth of political entities internal and external to their
regions. One aspect of the Classic is the relationship of
the Mixteca Baja's Ñuiñe culture with Teotihuacán, while the
Mixteca Alta related to Monte Albán (Paddock 1966, 1978). As-
suming that both these areas were at least partially Mixtec,
such differential spheres of influence should be reflected in

dialect (or language) differences within Mixtec. Detailed information on Mixtec dialects is now becoming available and there are isoglosses which divide Mixtec along the Baja-Alta frontier (Bradley and Josserand 1977, Josserand and Bradley 1978). Whether or not these are Classic period developments remains to be seen.

Postclassic

Developments during the Postclassic reflect, above all, the increasing dominance of the Nahuatl-speaking groups of central Mexico. In the northern Otomanguean area, Otomí developed its internal varieties, and Matlatzinca and Ocuiltec split. Further south, Popoloca and Chocho (the latter intrusive into the northern Mixteca Alta) became distinct. Mazatec diversified internally. These are all areas of considerable Nahuatl influence.

Gudschinsky (1958) has traced the development of Mazatec during the Postclassic in a study which constitutes a model for the correlation of linguistic, ethnohistorical and archeological information (Fig. 4). With a firm foundation in a detailed study of the linguistic development of the varieties of Mazatec, Gudschinsky identified the unique and shared innovations which characterized the process of diversification: Mazatec was relatively uniform until the end of the ninth century (A.D.), with only minor phonological and lexical differences between a central and a peripheral area. However, the existence of a Lowland Mazatec political entity (A.D. 890-1170) produced a distinct Lowland Mazatec dialect (Fig. 5a). The "Lowland Mazatec Nation" is known from ethnohistorical sources to have included what is now Jalapa de Díaz, San Pedro Ixcatlán, San Miguel Soyaltepec and San Bartolomé Ayautla. But since these share the defining Lowland Mazatec innovations with San Miguel Huautla and Mazatlán de Flores, these latter areas can be inferred to have also formed part of the political alliance. In the following period (A.D. 1170-1300; Fig. 5a), two innovations split Lowland Mazatec into three dialect
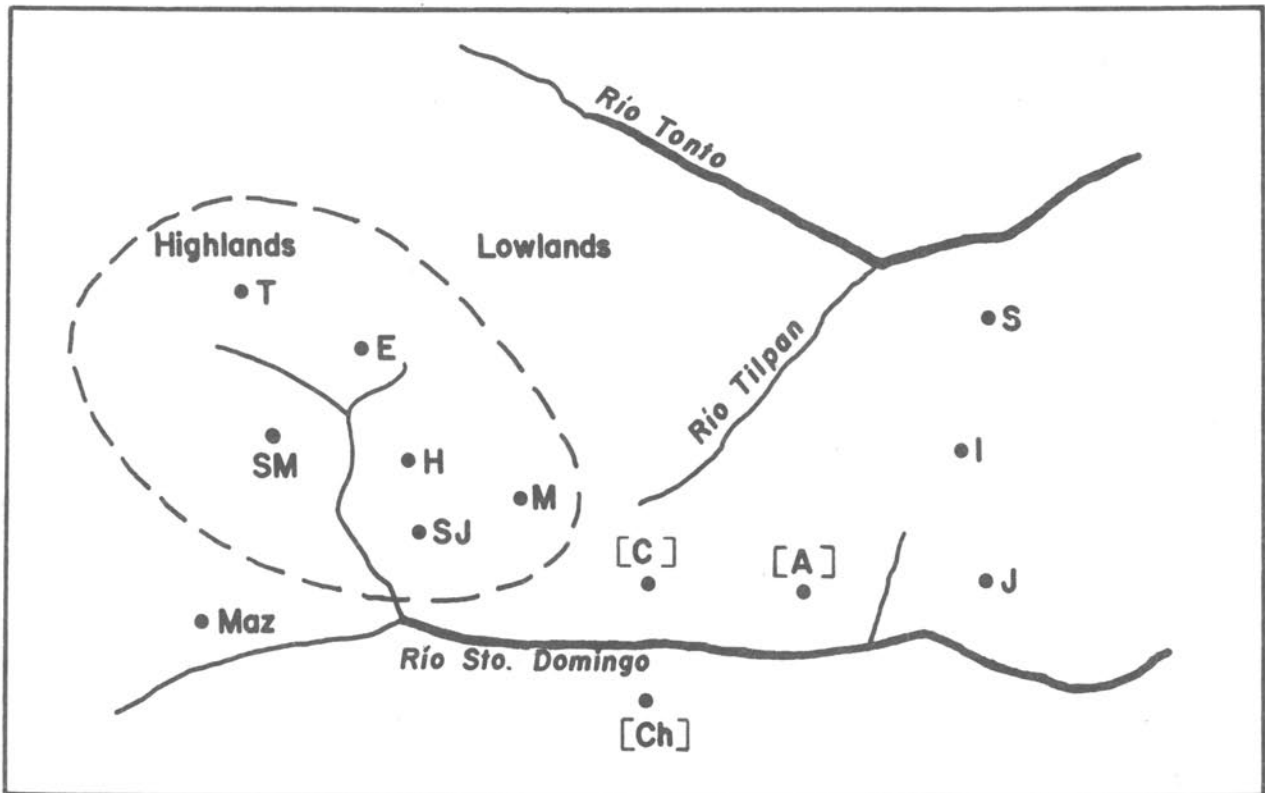
T	San Jerónimo Teocatl	Maz	Mazatlán de Flores
E	San Antonio Eloxochitlán	J	Jalapa de Diaz
SM	San Mateo Huautla	I	San Pedro Ixcatlán
H	Huautla de Jiménez	S	San Miguel Soyaltepec
SJ	Santa María Jiotes	[A]	San Bartolomé Ayautla
M	San Miguel Huautla	[Ch]	Chiquihuitlán de Benito Juárez

[C] San Juan Coatzospan (Mixtec)

Fig. 4. The Mazatec-speaking area of northern Oaxaca, Mexico, (redrawn from Gudschinsky 1958).
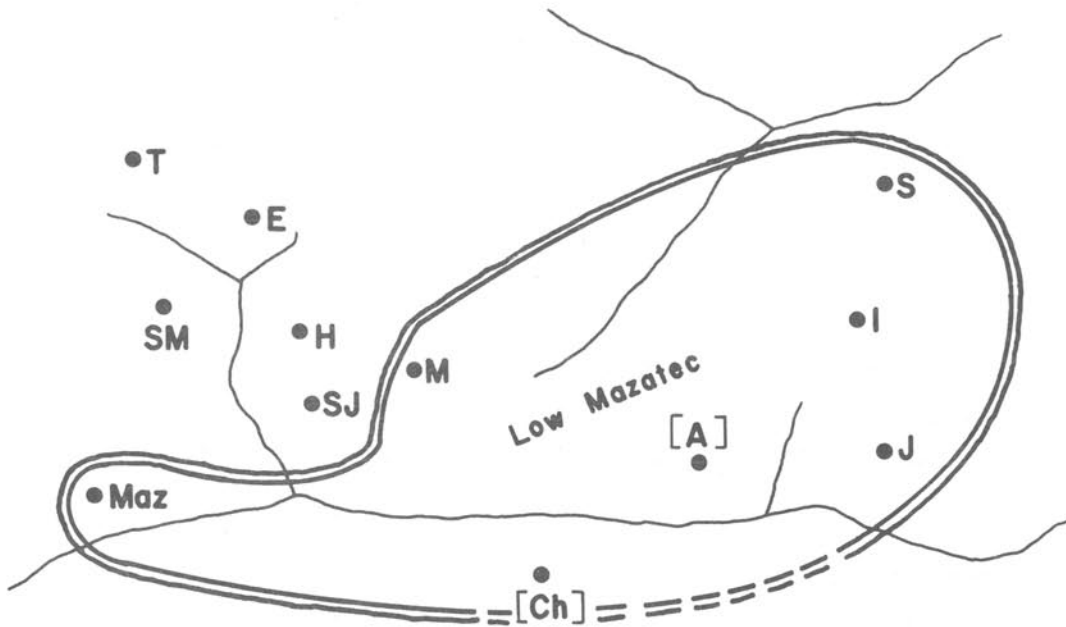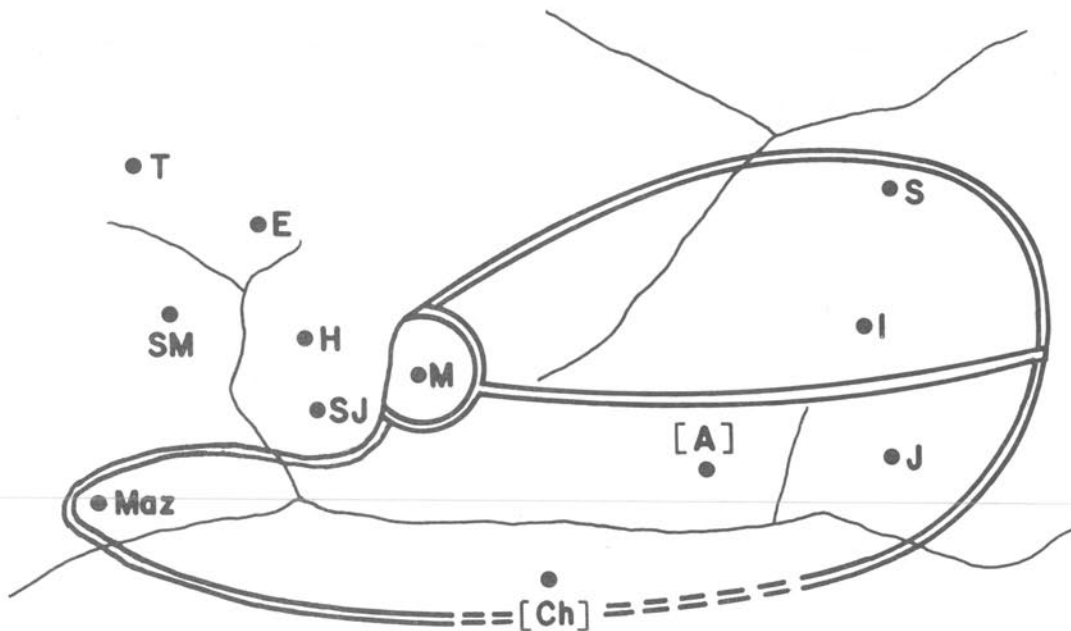
Fig. 5a. Early stages in Mazatec dialect development (adapted from Gudschinsky 1958).
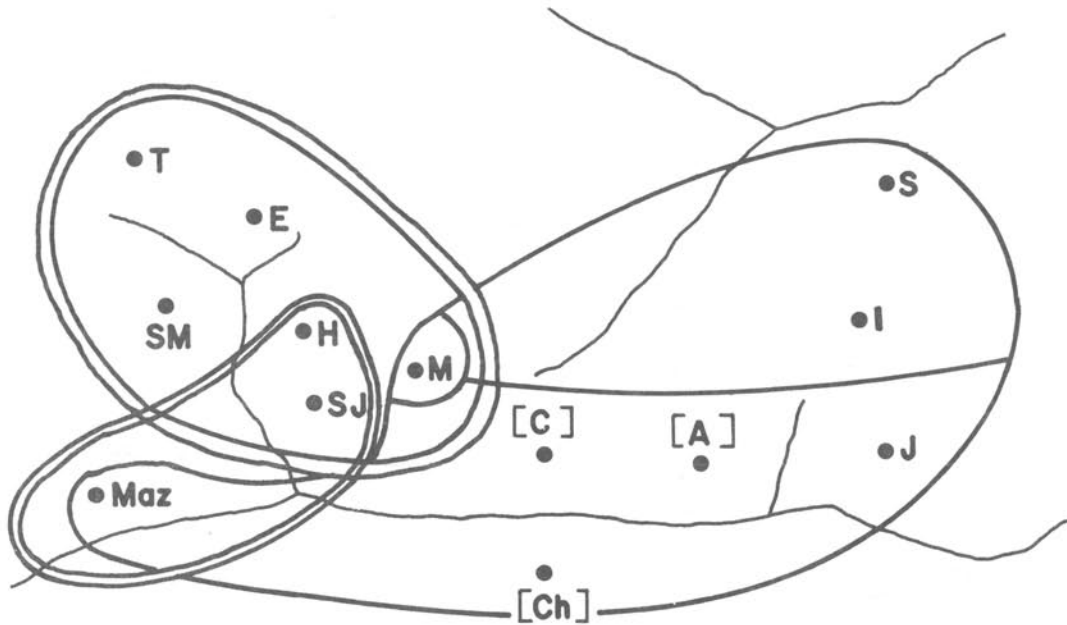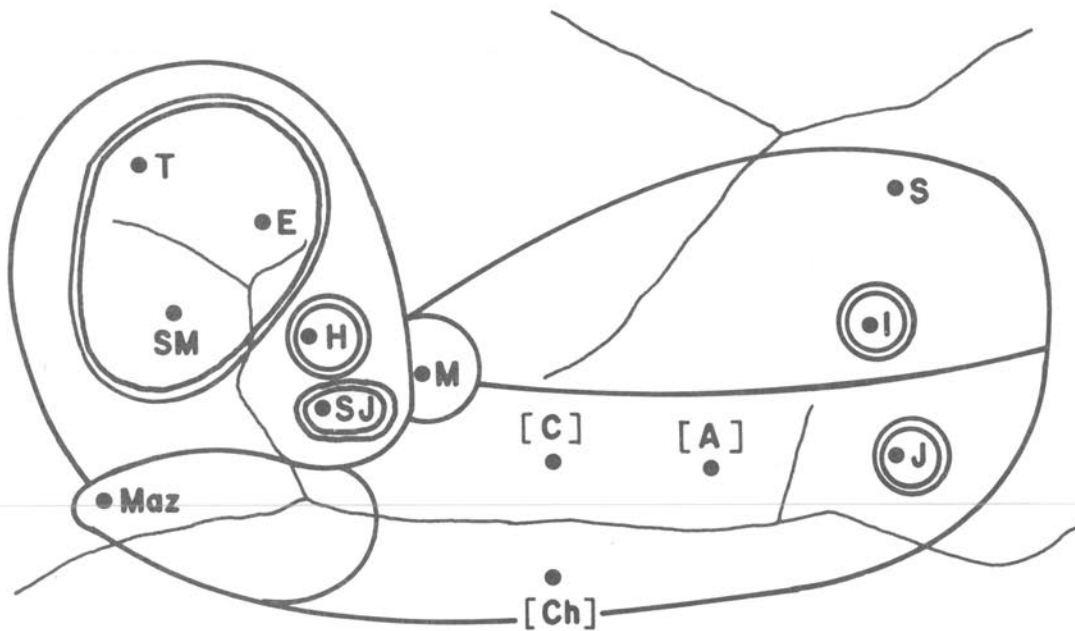
Fig. 5b. Late stages in Mazatec dialect development (adapted from Gudschinsky 1958).

areas; San Miguel Huautla is excluded from both innovations. This period apparently corresponded to a time of foreign domination by an unidentified group. The dialect developments include first a distinction between San Miguel Huautla and the remaining Lowland varieties, and then a distinction between Southern Valley (Jalapa and Mazatlán) and Northern Valley (Soyaltepec and Ixcatlán) dialects. Thus the foreign domination had apparently broken up the network of close internal relationships within the Lowland Mazatec Nation.

In the following period (A.D. 1300-1456), when the Highland Mazatec dialects developed, there existed both a Highland and a Lowland Mazatec political entity. In the same period a Mixtec village was established in the Southern Valley region. San Miguel Huautla and Mazatlán share innovations with the Highland group (Fig. 5b), presumably because the Mixtec village (San Juan Coatzospan) separated them from the other Lowland dialects. However, San Miguel Huautla shares innovations with Huautla de Jiménez, Santa María Jiotes, San Mateo Huautla, San Antonio Eloxochitlán and San Jerónimo Teocatl, while Mazatlán shares a later version of the innovation, and only with the first two of these. The Highland alliance is known from ethnohistorical sources to have included Mazatlán, but no mention is made of San Miguel Huautla. Since this latter dialect shares innovations with Highland Mazatec, it can be inferred to have formed part of the alliance as well. In the next period, which begins with the imposition of Aztec rule in A.D. 1456, the Western Highland dialects separated from the remainder of Highland Mazatec (Fig. 5b) and San Pedro Ixcatlán becomes distinct from Soyaltepec, bringing about the final set of dialect distinctions. The last period is one of individual developments in the various dialects, and probably corresponds to the end of Aztec rule and the beginning of Spanish domination.

Studies similar to that of Gudschinsky for Mazatec will be possible on completion of current research by various scholars on Mixtec, on Zapotec, and on Otomí and Mazahua. It

should be noted that each piece of historical reconstruction contributes to each other piece. Gudschinsky's work on Mazatec reveals a special role played by the Mixtec village of San Juan Coatzospan, established in the pass to the Gulf well after A.D. 1170 but before A.D. 1456. This has implications for the relationship of San Juan Coatzospan Mixtec to other Mixtec varieties. Coatzospan Mixtec is clearly divergent in many respects from more southerly Mixtec. These dates for its establishment away from other Mixtec areas should date both the innovations peculiar to Coatzospan and some of the innovations which it does not share by virtue of its isolation. Thus each study has value beyond its immediate scope of interest. The prospect is exciting that in the not too distant future we will be able to interpret the Postclassic ethnohistorical sources as well as the relevant archeology in the light of the development of languages and dialects.

Notes

[1] An earlier version of this paper, "Prehistoria lingüística de Oaxaca", was presented at the Congreso de Evaluación de la Antropología en Oaxaca, Museo Regional de Oaxaca, Centro Regional de Oaxaca (INAH), Oaxaca, June 27, 1977. The present version contains some revisions in details but follows the same general line. J. Kathryn Josserand contributed substantially to both versions in both concept and content.

[2] Smith (1967:232) remarks: "Although as a group the plant materials from this horizon reflect marked dependence on wild plants for food, it is in these zones that the modern Mexican diet based on maize, squash, beans and chili pepper becomes discernable. Maize cobs appear for the first time... The cobs are small in size and few in proportion to other plant fragments. The squash remains are even fewer..."

[3] The relative independence of Mixtecan and Amuzgo means that the cultural reconstructions of Longacre and Millon (1961), based on Amuzgo and Mixtec, should approximate a proto-Otomanguean reconstruction. Their findings are supported by the reconstructions of lexical items presented by Rensch (1966) as analyzed by Amador and Casasa (1979).

[4] The lower figures may reflect relatively close contact or lexically conservative areas. All figures below 40 m.c. involve Mixtec (or its closest relative, Cuicatec) and neighboring languages: Amuzgo, Zapotec, Ixcatec. The next lowest figure is 41 m.c. for Isthmus Zapotec and Huave, the latter at present under strong influence from the former. The variation in the Amuzgo-Mixtec comparison (35-29 m.c.), taken by Swadesh from Arana (1960), results from comparison of various varieties of Mixtec to Amuzgo. It is notable that the lowest figures come not from the comparison of Amuzgo with neighboring dialects of Mixtec, but of Amuzgo and dialects of Mixtec at a

considerable distance. Thus the contact which may skew these figures is not necessarily recent and village-to-village, but can be considered to have been branch-to-branch at an earlier period. This hypothesis would be strengthened if current studies of Mixtec dialects show these particular Mixtec dialects (Cuilapan, Cuyamecalco, Huitepec) to be lexically conservative.

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ARCHEOLOGY OF THE OTOMANGUEAN AREA

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Introduction

This paper is concerned with possible archeological mani-
festations of the diversification of the Otomanguean language
family.[1] We consider the hypothesis that the diversification
of the Otomanguean languages and the emergence of distinct
language groups are related to changes in economic, social and
political patterns reflected in the archeological record.

Ethnographic data and information from the Colonial period
show that in Oaxaca certain ethnic-linguistic groups occupy
specific geographical areas. For example, the Cuicatecs are
distributed within the region known as the Cañada; the Mixtecs
in the three regions of the Mixteca Alta, the Mixteca Baja and
the Mixteca de la Costa; the Zapotecs in the Valley of Oaxaca
and mountains to the south, the Isthmus of Tehuantepec and the
Sierra Juárez. We also know that certain stylistic features of
Postclassic artifactual remains are characteristic of some of
these regions. For example, red-on-cream pottery is character-
istic of the Mixteca Alta while gray tripod bowls with interior-
ly stamped bases (fondos sellados) and effigy deer-foot
supports are characteristic of the Cañada up into the Tehuacán
Valley. Assuming that for the most part the different ethnic-
linguistic groups occupied the same regions in Postclassic
times, in the Colonial period, and today, it can be stated that
correlations exist between three variables--ethnic-linguistic
groups, geographical regions and archeological remains.

This is not to deny the validity of the anthropological
dictum that race, language and culture are independent varia-

bles. Differences in material remains do not necessarily imply differences in ethnic-linguistic groups, but the possibility exists and remains to be explored that regional differences in archeological remains may reflect or be attributable to differences between such groups.

The Tehuacán Valley: Center of Diversification?

The Tehuacán Valley has been emphasized in the discussion of diversification of the Otomanguean languages. Based on data from Tehuacán, initial diversification dated around 4400 B.C. has been interpreted as a "result of the development of a new agriculture based on maize, beans, squash and chile" and subsequent "population expansion into various zones where distinct processes of cultural development were carried out according to the ecological situation" (Hopkins 1977:12). This expansion would include the Central Mexican Altiplano, the Mixteca Alta, the Valley of Oaxaca and surrounding highlands and the Isthmus of Tehuantepec (Fig. 1). The emphasis on Tehuacán may be criticized since there is no archeological evidence that the Tehuacán Valley was a key area in the process of transformation from subsistence based on appropriation to subsistence based on production. The fact that the Tehuacán Valley is archeologically the best known and most intensively studied area in the southern highlands does not mean that it was the key area in the development of early agriculture, and, in fact, there is reason to think it was not.

During terminal Pleistocene and pre-agricultural times to approximately 6000 B.C., that is, prior to the diversification of the Otomanguean language family, hunter-gatherer groups were distributed from the central altiplano through the southern highlands to Chiapas and Central America. The subsistence pattern was directly linked to particular plant and animal species distributed in different ecological zones resulting in similar adaptation to diverse geographical regions (Flannery 1968). The paucity of archeological data makes it difficult to determine the degree of mobility of these groups
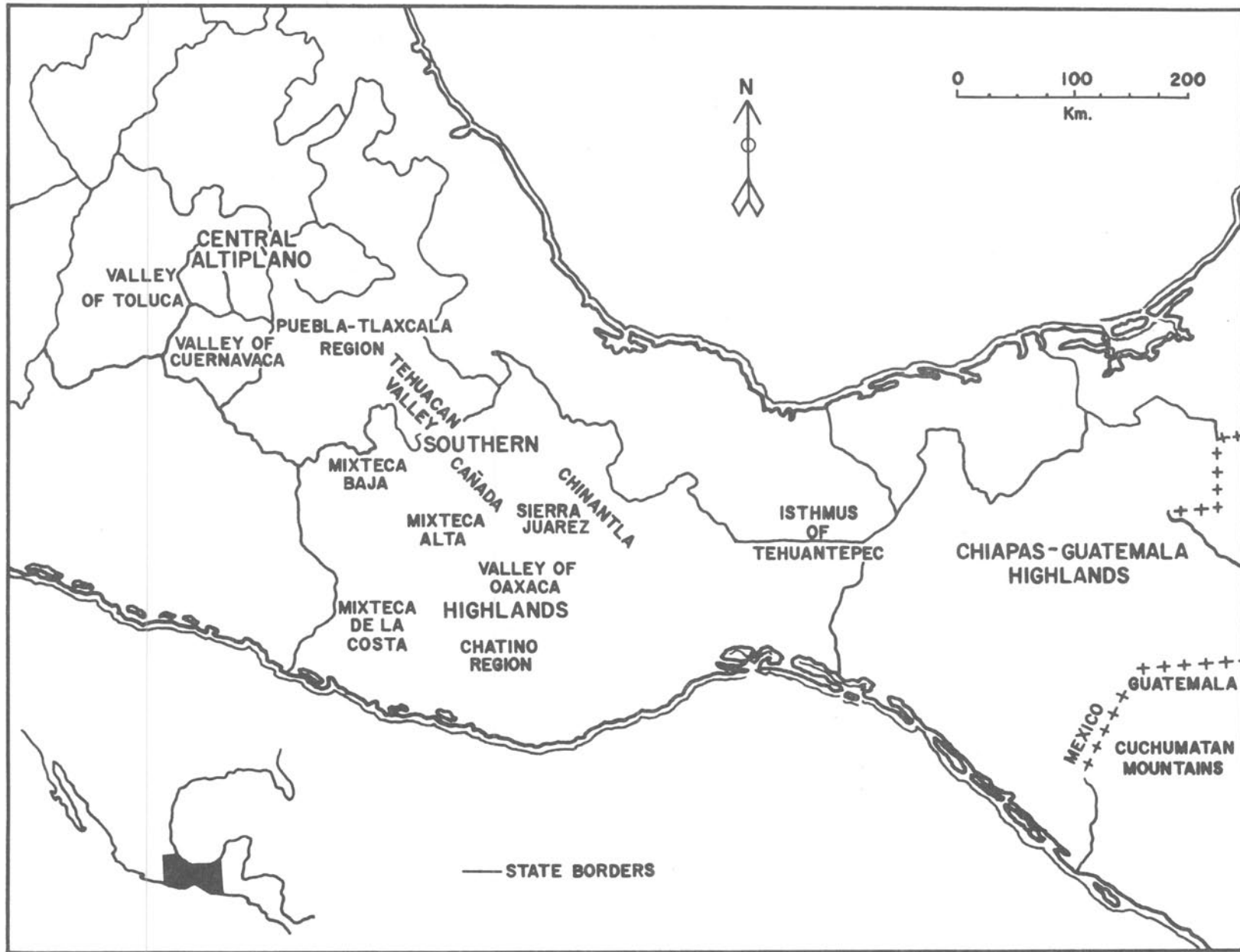
Fig. 1. Location of major geographical and cultural regions mentioned in the text.

or to determine which areas had high population concentrations.

Evidence for incipient agriculture comes from several regions. The temporal order in which cultigens appear in the archeological record differs in each local sequence, which implies multiple centers of domestication. The earliest evidence of domesticated pumpkin (Cucurbita pepo) comes from the Valley of Oaxaca and is dated at approximately 6500 B.C.; the earliest known domesticated beans (Phaseolus vulgaris) are from Ocampo, Tamaulipas, and date from approximately 4000 B.C. (Flannery 1973:288-9). Corn, various species of beans, and squash were already in the process of domestication when they were introduced into the Tehuacán Valley. Early plant specimens from the Tehuacán Valley exhibit morphological features acquired through processes of selection initiated outside the Tehuacán area (for maize, see Galinat 1977, for various species of beans, Kaplan 1967, and for squash, Cutler and Whitaker 1967).

Thus the Tehuacán Valley is not the only center of early agriculture nor was it necessarily more important than other centers. We cannot ascribe any special role to groups practicing early corn, bean and squash agriculture in Tehuacán, nor can we assume that population growth in the Tehuacán Valley led to the spread of agriculture into adjacent areas. In fact the opposite seems to have occurred since early domesticates were brought into the Tehuacán Valley. This does not invalidate the idea that Tehuacán was a center of diversification of Otomanguean. However, the presence of pre-agricultural and early agricultural populations in several regions of the southern highlands suggests that linguistic diversification was not from a single point.

This argument would cast doubt on Harvey's suggestion that the area around Santa María Ixcatlán in northeastern Oaxaca, a central point with respect to the geographical distribution of Otomanguean languages, was "the probable center of dispersal of the Otomanguean languages" (Harvey 1964:526).

Isolation as a Factor in Linguistic Diversification

Isolation is a key factor leading to linguistic diversification and the evolution and establishment of separate language groups. It is through isolation, either reduction in or loss of contact between groups, that each group may begin to develop its own separate linguistic patterns as well as its own ethnic identity. Several mechanisms may lead to isolation:

1. Loss of mobility so that groups have less contact, a phenomenon that may have occurred in Mesoamerica with the change from a nomadic to a sedentary way of life.

2. Population increase, including the establishment of new communities within a local area and/or migrations to other areas or regions, may lead to isolation between groups.

3. Isolation through social differences may occur; for example, members of certain social classes may be isolated from members of other communities or even from members of other classes within their own community.

4. Conflict leading to the severing of relations between groups, whether on a community, regional or interregional level, is another kind of isolation through social factors.

5. Another aspect of these processes of isolation would be the strengthening by a group of its linguistic distinctiveness as well as its customs and ethnic identity, whether consciously or unconsciously, as a means of defining and maintaining its cohesiveness. Community or local endogamy could play a role in the process.

Linguistic diversification and language separation are not the same as language change. Language change may be promoted by increased contact between groups rather than by isolation, and such change may be in the direction of greater similarity between languages rather than leading to separation or diversification.

The prehispanic occupation of the central and southern highlands of Mesoamerica can be divided into four main chronological-developmental stages: (1) hunter-gatherers and early

	VALLEY OF OAXACA	MIXTECA ALTA	CAÑADA	
A.D. 1500			Cuicatlán	Iglesia Vieja
1400	Monte Albán V			
1300		Natividad		
1200				
1100				
1000	Monte Albán IV			
900				?———?—
800				
700		Las Flores	III	Trujano
600	Monte Albán III B		Huamelulpan	
500				
400	Monte Albán III A			
300				
200	Monte Albán II	Late Ramos	II	Lomas
A.D. 100				
1				
100 B.C.		Ramos	I	Tecomax-tlahua
200	Monte Albán I			
300				Perdido
400				
500		Late Cruz		
600				
700	Rosario			
800	Guadalupe			
900				
1000	San José	Early Cruz		
1100				
1200				
1300	Tierras Largas		Dolores Ortiz	
1400				
1500	Matadamas Espiridión	Yuzanú		
2000		(site)		
2500				
3000	Preceramic			
3500				
4000	Sites:			
4500				
5000	Gheo Shih			
5500				
6000	Cueva Blanca			
6500				
7000	Guila Naquitz			
7500				
8000 B.C.				

Fig. 2. Chronological chart of selected

TEHUACAN VALLEY	TLAXCALA	BASIN OF MEXICO	CHIAPAS HIGHLANDS
Venta Salada	Tlaxcala	Chimalpa / Zocango	Tuxtla
	Texcalac	Mazapan	
		Xometla	
		Oxtotipac / Metepec	Maravillas
Palo Blanco	Tenanyecac	Xolalpan	Laguna
		Tlamimilolpa	Jiquipilas
		Miccaotli	Istmo
		Tzacualli	Horcones
	Tezoquiapan	Patlachique/Tezoyuca	Guanacaste
		Ticomán	Francesa
Santa María	Texoloc	Zacatenco	Escalera
	Tlatempa	Manantial	Dili
Ajalpan		Ixtapaluca — Ayotla	Cotorra
	Tzompantepec	Nevada	
Purron	---?----?--	Zohapilco	
Abejas			
Coxcatlán		Playa 2	Santa Marta Rock Shelter (site)
		Playa I	
El Riego			
Ajuereado			

regions of highland Mesoamerica.[2]

agriculturalists, (2) villages, (3) urban centers and (4) city-
states. We describe some of the salient features of each stage
and then focus on the divergences and separations of the Oto-
manguean groups as suggested by linguistic analysis.

Underlined statements about diversification which are used
as section headings are based on Hopkins (1977). Dates related
to Otomanguean separations are minimum estimates. Unless
otherwise noted, Hopkins (1977) is the source for all linguis-
tic dates cited in this paper. Figure 2 presents the chrono-
logical sequences for the major regions discussed in the text.
For descriptions of particular sites the reader should consult
articles referred to in the figure and general articles on
each region.

Stage of Preceramic Hunter-Gatherers and Early
Agriculturalists: 20,000-1350 B.C.[3]

This stage can be divided into an earlier period (from
approximately 20,000-5500 B.C.) of hunter-gatherers or pro-
duction based primarily on appropriation, and a later period
(from approximately 5500-1350 B.C.) during which agricultural
production became dominant, even though hunting and gathering
continued to be important. Glottochronological analysis indi-
cates that several changes occurred in Otomanguean languages
and their distribution during this stage.

Diversification of the Otomanguean languages had begun by 4400
B.C.

Three observations can be made here. First, the present-
day distribution of Otomanguean speakers in the central and
southern highlands, with the exception of Chiapanec and Mangue
speakers to the south, is roughly coterminous with what
MacNeish calls the Tehuacán tradition (1967a). We suggest
that the bearers of the Tehuacán tradition were speakers of
proto-Otomangue.

MacNeish dates the Tehuacán tradition between 5000-2300
B.C. and locates it in the highlands from Hidalgo and Queréta-

ro in the north to Oaxaca in the south. It is based in part on corn, bean and squash agriculture and has as diagnostic characteristics "true manos and metates, stone bowls, Coxcatlán, Tilapa, and Garyito points, crude and fine blades, gouges, and the use of pit houses" (1967a:243).

These dates, as well as some of the traits, may have to be modified. The millenium from 2300-1350 B.C., very poorly documented thus far in the highlands, may prove to be more like the preceramic than post-1350 B.C. village occupations. The use of pit houses is unconfirmed and terms like "true manos and metates", "stone bowls", "gouges" and "crude and fine" blades need clarification. Two-hand manos with elongated trough-shaped metates or boulder metates do not occur until 1350 B.C. A consistent blade industry does not appear, at least in Oaxaca, until around 1250 B.C. Nevertheless, the concept of the Tehuacán tradition is consistent with recent finds, including the preceramic occupations at Cueva Blanca, Guila Naquitz and Gheo Shih excavated near Mitla in the Valley of Oaxaca (Flannery 1970, Flannery et al. 1981), and preceramic levels at Texcal Cave, Puebla (García Moll 1977), and at Zohapilco in the Basin of Mexico (Niederberger 1976).

Even if many details of preceramic life in these areas remain to be documented, elements such as similar tool inventories including generalized flake tools for cutting and scraping and distinctive projectile point styles, and similar subsistence patterns including exploitation of game (deer, rabbit, turtle) and wild plants plus "an embryonic agriculture founded on corn, beans, and squash" (MacNeish et al. 1967:243) indicate that these groups participated in a common cultural tradition.

The Tehuacán tradition (Fig. 3) differs from three contemporaneous traditions to the north: the Cochise and Desert Culture traditions in the southwestern United States, the Abasolo tradition in Tamaulipas and Nuevo León and the Big Bend tradition in Texas (MacNeish et al. 1967:227-45). The Tehuacán tradition does not occur on the Pacific or Gulf

coasts of Mesoamerica nor does it extend south or east of the
Isthmus of Tehuantepec (MacNeish et al. 1967: Fig. 174). The
Santa Marta rock-shelter in central Chiapas (MacNeish and
Peterson 1962) and the Chantuto phase sites of the Soconusco
(Pacific coastal plain) of Chiapas (Voorhies 1976) did not
yield evidence of agricultural production and fall outside the
Tehuacán tradition. These sites are indicative of a lowland
and/or coastal adaptation different from the Tehuacán tradi-
tion of the highlands.

A second observation with respect to the diversification
of Otomanguean languages at 4400 B.C. is that this is roughly
the time period for which there is archeological evidence of a
shift from appropriation to production, or a greater reliance
on agriculture. The Tehuacán Valley evidence suggests an in-
crease from 5% reliance on agricultural food in the El Riego
phase (7200-5200 B.C.) to 14% in the Coxcatlán phase (5200-
3400 B.C.) (MacNeish 1967b: Table 38). This shift may have
been accompanied either by increased sedentarism or population
growth, or both, which in turn could have led to isolation of
certain groups with consequent language diversification.

Third, given linguistic diversification, one might pre-
dict that it would be accompanied by diversification in mate-
rial culture, perhaps as stylistic variation in artifacts used
by different groups of people. On the other hand, the archeo-
logical evidence suggests that plants were moved around from
region to region during the early stages of domestication, so
it is   likely that different types of tools and techniques
were also adopted over a wide area. Many of the stone tools
found in preceramic sites in highland Mesoamerica, such as
cutting, scraping and grinding implements, are generalized and
lack formal characteristics and variation. Projectile points
are an exception, and possible examples of early stylistic
variation of points found within the proposed Otomanguean
region do occur. One example is the complementary distribu-
tion of Coxcatlán and Pedernales (or Jícaras) points. Coxca-
tlán points are common in the Tehuacán Valley and the Valse-
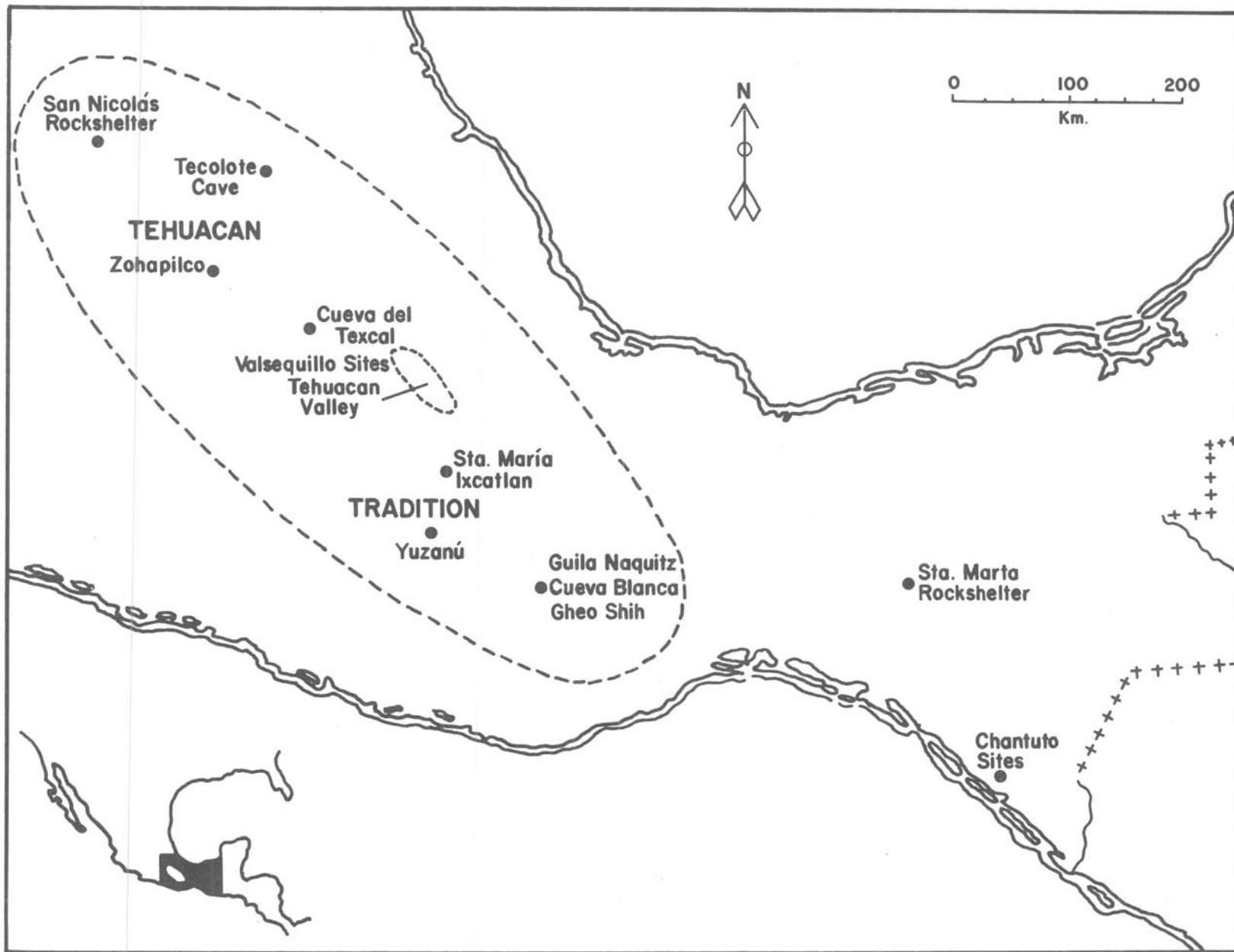quillo, Puebla, region (García Moll 1977: Lámina 7) and occur

Fig. 3. The Tehuacan tradition (after MacNeish 1967a:Fig. 175) with key sites indicated.

somewhat less frequently in the Basin of Mexico (Niederberger 1976:69). In contrast, only three examples have been found in the Valley of Oaxaca (two in Cueva Blanca and one surface find in San Felipe del Agua). Pedernales points were found in relatively high frequency at the open site of Gheo Shih near Mitla in the Valley of Oaxaca (Flannery 1970:23); only one fragmentary example is reported from the Tehuacán Valley (MacNeish et al. 1967:78 and Fig. 67) and two from Texcal Cave in the Valsequillo area (García Moll 1977:30). The temporal relation between these point types remains to be securely established. If both types date from the Coxcatlán phase, absence or scarcity of a type in a region is presumably due to non-temporal factors. Even if Pedernales points prove to be earlier, as suggested by Flannery, Marcus and Kowalewski (1981:59-60; but see MacNeish et al. 1967:65-66, 78), differential geographic distribution could indicate stylistic variation between groups in the Tehuacán Valley and the Valley of Oaxaca.

Internal diversification of the Otopamean branch begins around 3500 B.C.

Otopamean is the northernmost branch of the Otomanguean family and includes Pame, Chichimeca-Jonaz, Otomí, Mazahua, Matlatzinca and Ocuiltec. Although outside our main concern in this paper, Otopamean reflects early internal diversification which may have been due to isolation of groups as a result of increased sedentarism. Niederberger (1976) claims that there was a sedentary community at Zohapilco (Tlapacoya) in the Basin of Mexico during Playa 1 and 2 phases from 5500-3500 B.C. By extension this might suggest the presence of additional sedentary groups, probably of low population density, elsewhere in the Basin of Mexico and in nearby regions such as the Valley of Toluca, Valley of Cuernavaca, and in the Puebla-Tlaxcala area, which have abundant resources and land favorable for early cultivation. Isolation through sedentarism may have fostered linguistic separation and internal diversification within the Otopamean branch. According to

Niederberger early sedentarism at Zohapilco was based on col-
lection of wild resources supplemented by some cultivation.
Perhaps in this case neither cultivated plants nor migration
of human groups was the main factor involved in the linguistic
diversification.

During the period between 3000 and 1500 B.C., the eight remain-
ing branches of Otomanguean diversified.

The eight remaining branches are Popolocan, Mixtecan,
Amuzgo, Zapotecan, Chinantecan, Chiapanec-Mangue, Tlapanec
and Huave. Glottochronological dates for separation of dif-
ferent pairs of languages vary, but cluster around 1500 B.C.
or a couple of centuries earlier. Little can be said about
particular regions since the sequence of diversification for
every branch is not known.

The Tehuacán Valley is practically the only highland re-
gion for which even a small amount of archeological data is
reported for the period 3000-1500 B.C. Nevertheless, it can
be assumed that the general process of increasing sedentarism
occurred in other highland regions such as the Valley of Oaxa-
ca, the Cañada and the Mixteca Alta which have favorable envi-
ronmental conditions for early cultivation.

With respect to the generalization that nine branches of
Otomanguean were distinct by 1500 B.C., we postulate that di-
versification at this stage was due to isolation through popu-
lation growth and increased sedentarism. By the end of the
Abejas phase around 2300 B.C., the settlement pattern in the
Tehuacán Valley was characterized by a clustering of sites
into three or four groups suggesting a tendency toward terri-
torial definition. The focal point of this settlement type
was what MacNeish (1972:498-9) calls "central based band",
consisting of one relatively permanent settlement with tempo-
rary and seasonal sites within its territory. Population
growth during this period is related to an increase in food
production which now involves a 23% reliance on agriculture
and the introduction of new and more productive domesticates.

Increased sedentarism and population growth may have continued in subsequent phases as evidenced perhaps by the Purrón phase in the Valley of Tehuacán, the Espiridión phase in the Valley of Oaxaca, and the site of Yuzanú near Yanhuitlán in the Mixteca Alta, all of which are poorly documented. In any case, by 1500 B.C. various groups could have been isolated long enough for the nine branches of Otomanguean to have become distinct.

Mixtecan splits into Trique and Mixtec-Cuicatec at approximately 1500 B.C.

It is not clear whether this split occurred before or after sedentary villages became established in various highland regions.

Today Trique speakers form an isolate in the midst of Mixtec speakers, but their distribution in prehispanic times may have been different. The following possibilities might be investigated from an archeological standpoint:

1. Mixtecan speakers may have been located in the area from the Nochixtlán-Yanhuitlán Valley to the Cañada. The group which became Trique speakers migrated away from this parent group to an uninhabited region of the Mixteca Alta, but later became surrounded by Mixtec speakers.
2. At one time Trique was spoken over an extensive area of the southern Mixteca Alta, but Trique speakers were later surrounded by Mixtec speakers and left numerically reduced, perhaps due to conflict. (A similar fate may have befallen Chocho and Popoloca speakers with the Nahuatl expansion into the Tehuacán Valley in the Postclassic.)
3. Mixtecan may have been spoken throughout the Mixteca Baja, Alta, and Cañada regions, with the Trique split from Mixtec-Cuicatec at 1500 B.C. representing a linguistic separation of the Mixteca Baja from the Mixteca Alta-Cañada. Later Mixtec and/or Nahuatl expansion into the Mixteca Baja might have forced the Trique into their present area and left them a reduced and isolated group.

Stage of Agricultural Villages:
1350-600 B.C.

By 1300 B.C. permanent agricultural villages had been
established in various regions of the southern highlands, in-
cluding the Tehuacán Valley, the Mixteca Alta, the Cañada and
the Valley of Oaxaca (Fig. 4). (Villages were also present
on the Gulf Coast and on the Pacific Coast of Chiapas and
Guatemala.) A group of related traits that characterize the
early highland villages appears by 1300 B.C. in central Oaxaca
and southeastern Puebla. It includes rectangular wattle and
daub houses; bell-shaped subterranean storage pits; human
burials placed in spatial association with the houses; pottery
vessels of two basic forms--hemispherical bowls (sometimes
erroneously called tecomates) and narrow-mouthed jars with
high outflaring necks--and the use of red paint for their deco-
ration; realistic, finely made ceramic figurines; obsidian
flakes, and slab metates with two-hand manos. This complex
extendes into Tlaxcala and even further north. Similarities
in form, manufacture and decoration exist between early cera-
mics from Oaxaca (Tierras Largas and early Cruz phases), Tehua-
cán (Ajalpan phase), Puebla-Tlaxcala (Tzompantepec phase),
Chalcatzingo in Morelos, and the Basin of Mexico (Nevada com-
plex).

Available data show that interregional similarities are
much more striking than are differences, and there is tight
clustering between 1350-1300 B.C. of radiocarbon dates from
villages in several regions (Ajalpan in the Tehuacán Valley,
San José Mogote in the Valley of Oaxaca, Yucuita in the Nochix-
tlán Valley of the Mixteca Alta and Rancho Dolores Ortiz in
the Cañada). Thus it appears that the early village horizon
evolved over a wide area in the highlands.

What linguistic factors may have been involved in this
village stage? We have already noted that the linguists
place the separation of the nine branches of Otomanguean
around 1500 B.C. or slightly earlier than the first clear and
widespread appearance of permanent villages in the southern

highlands. If future archeological work reveals evidence of permanent villages in several regions prior to 1350 B.C., it will be possible to state with some confidence that the linguistic diversification correlates with the formation of villages, and in fact we would expect linguistic diversification and separation to occur in conjunction with the widespread appearance of villages.

Some regional differences in archeological remains from 1300 B.C. have been recognized, and others will become clear with more excavation. For example, villages in three regions of Oaxaca differ in the amount of obsidian obtained through exchange. Rancho Dolores Ortiz in the Cañada has 62% obsidian by piece among all chipped stone, Yucuita in the Mixteca Alta has 18% and Tierras Largas in the Valley of Oaxaca has 12% (Winter 1979). Shell ornaments are relatively common at Rancho Dolores Ortiz (Winter n.d.) and at the Valley of Oaxaca sites of San José Mogote and Tierras Largas (Pires-Ferreira 1975) but absent in our excavations at Yucuita. The same Valley of Oaxaca sites have yielded probable imported Pacific (?) coast pottery--tecomates with fine rocker and dentate stamped decoration--but such artifacts are again absent at Yucuita. Rancho Dolores Ortiz differs from sites in the Valley of Oaxaca and the Nochixtlán Valley in the use of stone house walls and the absence of subterranean storage pits.

The Valley of Oaxaca and the Nochixtlán Valley had relatively large populations at 1300 B.C., and are thus good candidates for areas where linguistic diversification had taken place before 1500 B.C., though village occupations at that time remain to be documented. The Valley of Oaxaca is especially well known archeologically through excavations at the sites of San José Mogote (Flannery 1976; Flannery et al. 1981), Tierras Largas (Winter 1972), and Tomaltepec (Whalen 1981), as well as the valley-wide survey which registered 23 early village sites (Kowalewski et al. 1982). San José Mogote appears to be unique among early Valley of Oaxaca communities;
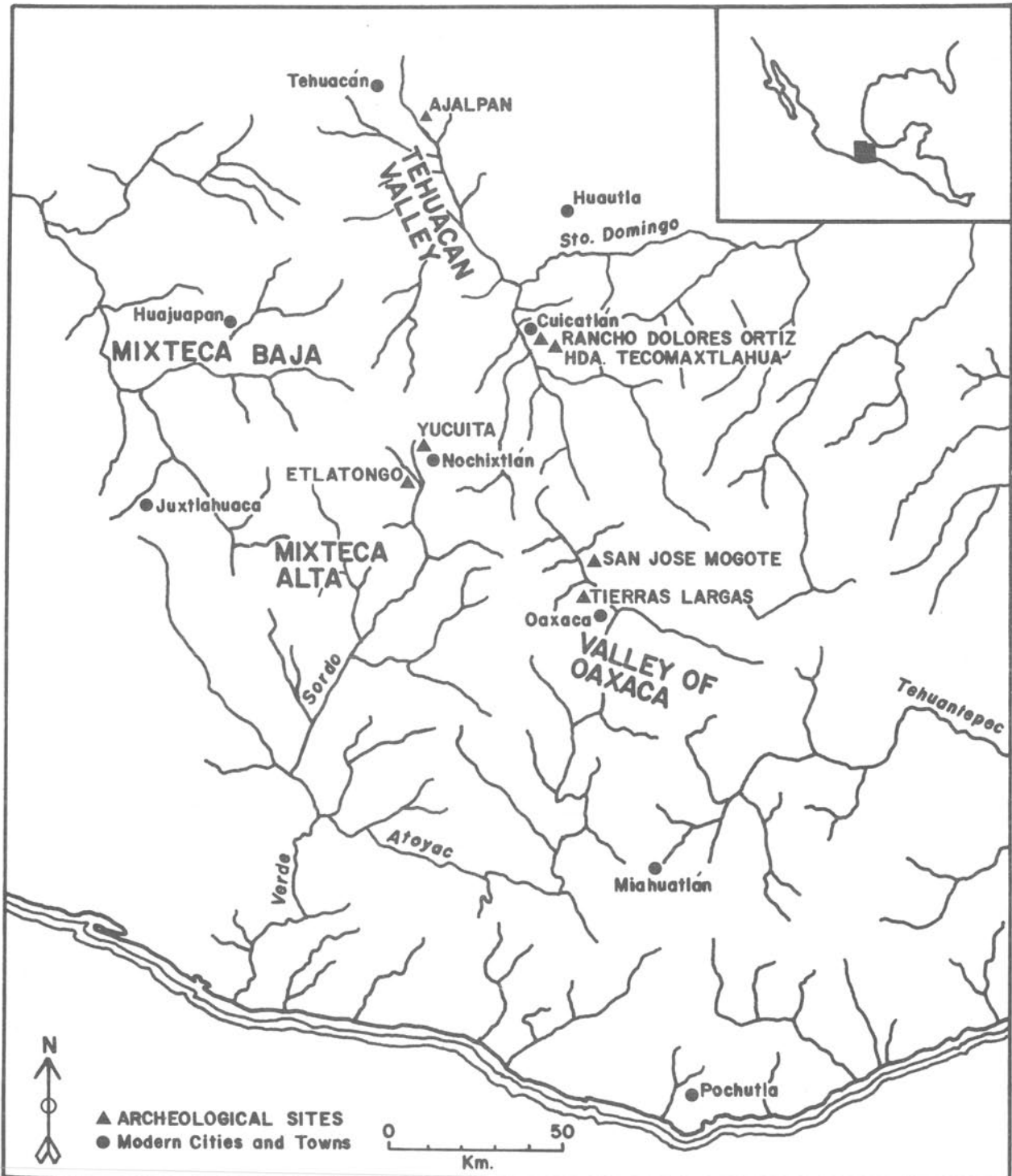
Fig. 4. Villages in four regions of the southern highlands at 1300 B.C.

it has yielded what Flannery considers to be the oldest cera-
mics found in the Valley of Oaxaca, dated before 1400 B.C.
(Flannery et al. 1981). The Tierras Largas phase occupation
at San José Mogote covered nearly eight hectares, in contrast
to the typical hamlet of 1-3 hectares, and the number of in-
habitants was accordingly large, perhaps 150 rather than 25-50
persons (Flannery et al. 1981). San José Mogote has also
yielded evidence of unusual constructions, unknown at other
Tierras Largas phase sites, which Flannery interprets as
"public" buildings (Flannery et al. 1981). These unique as-
pects plus its central location with respect to other Etla
Valley villages suggest that San José Mogote played a dominant
role in economic, political and religious activities among lo-
cal communities as early as 1300 B.C.

Yucuita may have played an analogous role in the Nochixt-
lán Valley, although fewer early villages are known within
the region. The 1300 B.C. occupation at Yucuita extends over
an area of some 20 to 30 hectares (Plunket and Uruñuela 1981),
but to date only common household remains have been excavated.

Stage of Urban Centers: 600 B.C.-A.D. 700

At approximately 600 B.C., the first urban center in
southern Mesoamerica was formed at Monte Albán in the center of
the Valley of Oaxaca. At the same time or shortly thereafter,
other centers were formed in the Mixteca Alta at Huamelulpan,
Monte Negro, Yucuita, Diquiyú and elsewhere. Social stratifi-
cation, large civic-ceremonial buildings, carved stones with
calendric and glyphic symbols and population concentrations of
previously unattained size (as many as several thousand people)
characterized these centers (Fig. 5).

Economic, social and political relations were dynamic and
open during the first few centuries of this stage. Monte Albán
functioned as the major pan-regional center in the southern
highlands, apparently attracting pilgrims, traders and politi-
cal leaders from as far away as what are now Puebla, Veracruz
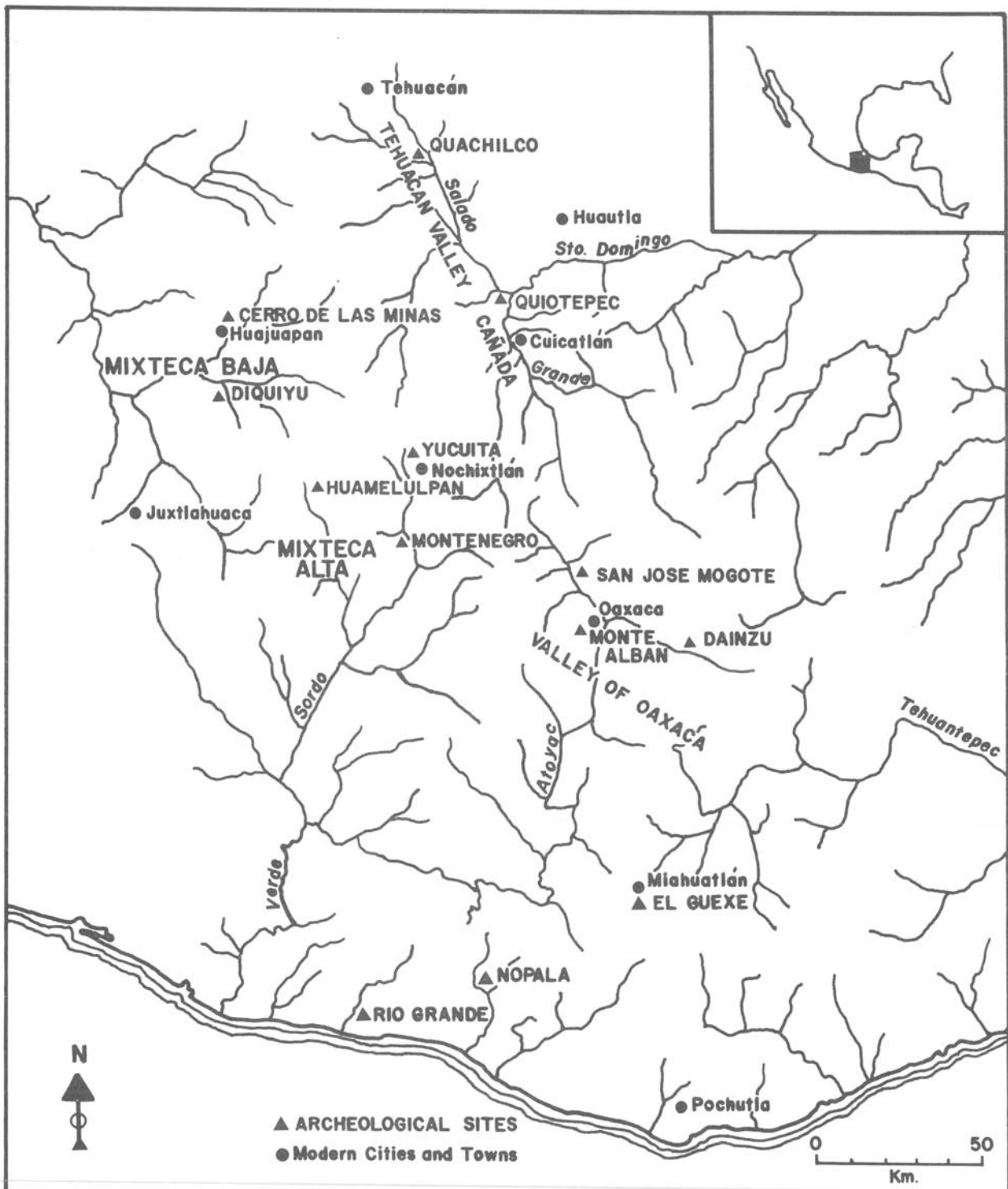and Chiapas.

Fig. 5. Urban centers and some contemporaneous sites in four regions of the southern highlands at approximately 200 B.C.

By at least A.D. 200 relations within and between centers were becoming formalized. Probably because of increased tribute demands imposed by high-status groups, distinct social classes began to form and hostilities and conflicts arose between communities. By late Monte Albán I times high status households were present in small Valley of Oaxaca communities. They may have organized manpower and production on the local level and served as a formal link to Monte Albán. At Yucuita in the Mixteca Alta distinctive pastes, vessel forms and decorative techniques appear and similarities with the Valley of Oaxaca ceramics diminish. In the Mixteca Alta possible evidence of hostilities includes presence of trophy skulls at Huamelulpan (Gaxiola 1978), construction of large walls around the heart of the city at Yucuita, and the founding of Monte Negro possibly as a mountaintop refuge south of the Nochixtlán Valley. Monte Albán lost its pan-regional role and there seems to have been fragmentation of relations on local, regional and interregional levels. Sometime around A.D. 700 a major reorganization of society occurred. Monte Albán and some of the centers in the Mixteca Alta were abandoned, and city-states were formed in new locations.

There are two periods of linguistic separation and diversification during the urban center stage, one at 600-400 B.C. which correlates with the time the centers were forming, and another at around A.D. 600 when the centers were collapsing and being abandoned.

With the appearance of urban centers, several languages which we associate with specific geographical regions became distinct for the first time. These include Zapotec, which is associated with the Valley of Oaxaca as well as the Sierra and the Isthmus; Cuicatec, associated with the Cañada; Mazatec, associated with the mountains northeast of Teotitlán de Flores Magón, and Mixtec, associated with the three regions of the Mixteca Alta, Baja and Costa.

The nine separate Otomangue branches that existed prior to the urban centers were general groupings, each presumably spoken over an area encompassing several geographical regions.

The emergence of specific languages which can be associated
with specific geographical regions implies the existence of
distinct ethnic groups. The identities of several of the
ethnic-linguistic groups recognized today in Oaxaca became
clear for the first time when urban centers emerged. A signi-
ficant line of future research will be to elucidate the role
of social stratification and inequalities between individuals,
communities and regions in the definition of ethnic-linguistic
groups.

Mixtec and Cuicatec split at approximately 500 B.C.

This separation means that for the first time a distinc-
tion can be made between Mixtec and Cuicatec speakers. These
languages are spoken today in two distinct geographical re-
gions, the Mixteca and the Cañada. Marked differences in the
archeological remains from these regions appear initially
around 600-200 B.C. and may reflect the linguistic separation
as well as the emergence of two ethnic groups, Mixtecs and
Cuicatecs. It is likely that both the linguistic separation
and the ethnic distinctions were brought about by the forma-
tion of early urban centers.

Prior to 600 B.C. the four contiguous regions of the
Cañada, the Valley of Oaxaca, the Mixteca Alta and the Tehua-
cán Valley were similar in terms of settlement types (mainly
hamlets or small villages of 1-3 hectares and in some cases a
larger, central village) and community organization (nuclear
family households largely self-sufficient in food production).
Similarities in pottery (pastes, forms, and firing processes,
and especially design elements, for example the double line
break on white slipped bowls or incised motifs on burnished
gray ware) and the occurrence of non-local materials such as
marine shell and obsidian attest to interregional exchange and
communication. Formation of the urban centers, however,
created inequalities and significant differences between the
regions.

The urban center stage is manifested in different ways from region to region. A single major center, Monte Albán, grew up in the Valley of Oaxaca, became the dominant community within the Valley and was influential in several other regions. In the Mixteca Alta, however, several centers arose--Huamelul- pan, Diquiyú, Monte Negro, Yucuita. They appear to have been independent from the Valley of Oaxaca, although both regions share certain iconographic elements. No single center was dominant within the Mixteca Alta, yet they were linked by traits such as large stone platforms with monolithic corners, inlaid teeth among high status males, and various pottery types.

The Cañada and the Tehuacán Valley reveal yet another pat- tern. Early urban centers are absent in the Cañada and perhaps also in Tehuacán. (Quiotepec in the Cañada is an urban center but at a later time. Quachilco in the Tehuacán Valley might qualify as an urban center depending on the definition. It lacks carved stone monuments and large stone buildings which are characteristic of centers in the Valley of Oaxaca and the Mixteca Alta, but it does have large structures made of adobe bricks.) We think that the Cañada and possibly the Tehuacán Valley became aligned with the Valley of Oaxaca during the period from 600-200 B.C. Sites in both the Cañada and Tehuacán commonly yield incised gray ware typical of the Valley of Oaxa- ca, and some sites in the Cañada have produced crema ware ves- sels which may have been imported from the Valley of Oaxaca. In contrast, the fine café wares typical of the Mixteca Alta are not common in the Cañada or Tehuacán.

Precisely what kind of relation existed between the Cañada and Monte Albán remains to be determined. Based on their recent survey and excavations, Spencer and Redmond argue that Monte Albán subjugated communities in the southern part of the Cañada during period Monte Albán I (Spencer and Redmond 1979; Spencer 1982). Groups from the Cañada may have supplied cot- ton, zapotes and other tropical fruits and fresh-water clam shells to the Valley of Oaxaca. They may also have assisted in moving goods through the Cañada in an exchange network in-

volving the importation of obsidian, rubber, feathers and
other products into the Valley of Oaxaca from the north via
the Río Salado and from the Gulf Coast via the Papaloapan and
Santo Domingo rivers.

The Popolocan branch diversifies at approximately 500 B.C., when Mazatec separates from Ixcatec-Popoloca-Chocho.

The geographical area occupied by the Popolocan branch
around 500 B.C. was presumably the Tehuacán Valley and the
mountains to the west and south where Chocho and Ixcatec are
now spoken. The separation of Mazatec may represent the ini-
tial colonization of what is today the Mazatec region in the
mountains above Teotitlán de Flores Magón, but this has yet
to be confirmed archeologically. The Mazatec separation may
also be linked indirectly to the formation of urban centers,
given that the creation of the centers meant differential par-
ticipation by groups in different regions in the activities
surrounding the centers. Whereas some groups may have parti-
cipated by providing food or other goods to the centers, per-
haps as tribute, others may have become marginated and general-
ly isolated from the events and changes brought on by the cen-
ters.

The Zapotecan family diversified at approximately 400 B.C., separating into Papabuco, Chatino and Zapotec.

The formation of urban centers may also have contributed
to this separation. Zapotec speakers in the Sierra Juárez,
in the Valley of Oaxaca and mountains to the south and in the
Isthmus region may have maintained relatively more contact
with one another during the time of Monte Alban's rise, while
Chatino and Papabuco speakers remained outside this interac-
tion sphere. Archeological sites in the Valley of Oaxaca south
to Miahuatlán and in the Isthmus yield similar incised gray
ware at 400 B.C., linking these regions stylistically to Monte
Albán itself. Whether related ceramics are found in what is
now the Chatino area remains to be determined.

Late Part of the Urban Center Stage

Separations in the Otomanguean family which occurred
around A.D. 500-700 may have been related to the conflicts
which prevailed toward the end of the urban center stage,
particularly in cases in which conflicts led to the isolation
of groups. Evidence for conflict is based on data from the
Mixteca Alta, where hilltop centers such as Yucuñudahui (Caso
1938) were established in defensible positions and where pro-
jectile points have been found in association with Las Flores
phase male burials (Deraga 1981). In the Valley of Oaxaca
prisoner scenes are shown on carved stones at Monte Albán
(Caso 1928), a hilltop rival to Monte Albán appears at Jalieza
in the Valle Grande (Blanton et al. 1979), and Monte Albán is
eventually abandoned. Teotihuacán's demise at this time may
have had an effect on groups in Puebla and Oaxaca.

The linguistic separations noted for this period include
the internal diversification of Chinantec, Mixtec and Zapotec
and the separation of Ixcatec from Popoloca-Chocho.

Internal diversification of Chinantec began around A.D. 500.

Very little is known archeologically about the region
occupied today by the Chinantecs. Known as the Chinantla, it
includes part of the Gulf Coast piedmont area and extends up
into the mountains of northern Oaxaca. Perhaps in the Late
Classic some towns were drawn toward the Gulf Coast with its
connection with Teotihuacán and others toward Monte Albán and
the Valley of Oaxaca, leading to political divisions and lin-
guistic separation within the region. This possibility could
be investigated archeologically.

Internal diversification of Mixtec began around A.D. 500.

Mixtec diversification may be related to the political
fragmentation evident in the Mixteca during the latter part of
the urban center stage. The best supporting evidence comes
from the Nochixtlán Valley which has been the scene of relati-
vely intensive archeological study (Caso 1938; Spores 1969,

1972, 1974 b; Lind 1977, 1979; Plunket and Uruñuela 1981; Winter 1981). From the Ramos to the Las Flores phase the major urban center shifted from Yucuita, a low hill in the center of the valley, to Yucuñudahui, located on a defensible mountaintop at the head of the valley. At the same time several other major centers were founded--some, such as Cerro Jasmín and Jaltepec, are on hilltops--and population increased by approximately 150 percent, as new agricultural lands were opened (Spores 1969). Political fragmentation, if not outright conflict, is suggested.

The major center of Cerro de las Minas in the Huajuapan Valley of the Mixteca Baja is also located on a hilltop in a defensible position, and the same pattern will probably show up in areas of the Mixteca which have yet to be surveyed.

The roles of Teotihuacán and Monte Albán with respect to different regions of the Mixteca may also be relevant. Some communities in the Mixteca Baja may have had relatively direct contact with Teotihuacán. The Mixteca Alta seems to have remained independent with occasional imported ceramic vessels appearing in the context of high-status households (Winter 1977).

In sum, the data attest to a period of conflict on a local level with relative autonomy and independence of larger geographical regions. This implies a greater degree of regional isolation than in earlier times which may have led to linguistic diversification. Another possible factor is isolation through social distinctions since at this time class differences are present and there was probably relatively little physical and social mobility among the less dominant classes (Winter 1974).

Internal diversification of Zapotec began around A.D. 600.

Precisely where or between what groups diversification occurred needs to be specified on the basis of linguistic data. At this time hilltop centers appear in the southern part of the Valley of Oaxaca, and they may have been competing with

Monte Albán for political control of the Valley and the economic support this implies. Salt production became important at Lambityeco in the Valley of Oaxaca, due to the severing of exchange relations between the Valley and the Isthmus, where salt had previously been obtained (Peterson 1976:142-6).

Monte Albán's demise around A.D. 600 probably meant the end of an integrating Zapotec center where people from the Valley of Oaxaca as well as from the Zapotec Sierra and the Isthmus met. Inhabitants of these three regions along with the southern Zapotec region south of Miahuatlán may have become relatively more isolated, independent and hostile toward one another with the end of Monte Albán.

Another factor of possible relevance is the role of the Chatino at this time. A distinctive style of carved monuments probably dating from A.D. 500-700 is known from the Chatino region (Jorrín 1974; monuments at Santos Reyes Nopala and the Río Grande stela in the Mexican National Museum of Anthropology are the best known). These monuments imply a cultural florescence in the Chatino region which may have been supported by economic and political organization strong enough to have weakened contacts and integration with Zapotec groups.

Ixcatec separated from Popoloca-Chocho around A.D. 700.

Hopkins (1977:25) has suggested that Popolocans dominated the northwestern part of the Cañada to the Cuicatec region. We suspect that they also occupied the Tehuacán Valley from what is now the city of Tehuacán south to Teotitlán de Flores Magón, and that they were displaced and/or absorbed by Nahuatl intrusion in Postclassic times. The Chocho now occupy a small area around Coixtlahuaca in the Mixteca Alta; in earlier times they may have occupied the area north and east of Coixtlahuaca towards the Tehuacán Valley. Ixcatec speakers are found today only in the town of Santa María Ixcatlán, though at one time they too may have occupied a larger area in the mountains between the Chocho region and the Cañada.

The reductions in size of the Chocho and Ixcatec territories may have been caused in Postclassic times by pressures

exerted by the Nahuatl expansion into the Tehuacán Valley and
the florescence and growth of the Cuicatecs in the Cañada.
The separation of Ixcatec from Popoloca-Chocho is not so easy
to explain due to a lack of data from the period around A.D.
500-700 from the area between Coixtlahuaca and Ixcatlán. It
is reasonable, though, to suggest that Late Classic conflict
occurred in this area and, together with possible pressures
from the north with the fall of Teotihuacán, may have fostered
this separation.

Stage of City-States: A.D. 700-1521

During Postclassic times a number of distinct ethnic-
linguistic groups occupied specific geographical regions with-
in the southern highlands. These groups were divided politi-
cally into autonomous cacicazgos governed by royal lineages.
Most cacicazgos had a single linguistic affiliation, except
in border areas where subject communities which spoke differ-
ent languages were controlled by the same center. Certain
mechanisms of ethnic integration were utilized by cacicazgos
of the same language group: in the ideological sphere, caci-
ques claimed common origin, and in the political sphere, mar-
riage alliances were contracted between governing families
who also tended to marry within the same class or social group.

For the latter half of this stage (approximately A.D.
1100-1521), culture areas corresponding to specific ethnic
groups can be defined archeologically. The following examples
are based primarilly on the distribution of material goods
(Fig. 6).

1. Regional variations occur in polychrome pottery and
in tripod gray ware bowls with effigy supports. Distinctive
varieties of polychrome occur in the Isthmus, in the Chinantla
and in the Mixteca Alta and the Valley of Oaxaca. Common
types of effigy supports are iguana heads in the Isthmus, deer
feet in the Cañada and eagle and serpent heads in the Mixteca
Alta and Valley of Oaxaca.

2. Red-on-cream ceramics are characteristic of the Mixteca Alta in this period (Spores 1972, Lind 1977), but also occur outside the region at the sites of Tepapayeca in the Valley of Atlixco, Puebla (Gaxiola et al. 1973), and Cerro Hidalgo at Teotitlán de Flores Magón in the Cañada (Hernández 1978). Within the Mixteca Alta, distribution of distinctive design elements correlates with subregions around Apoala, Coixtlahuaca, Nochixtlán and Tlaxiaco, probably reflecting political units.

3. The Cañada and the Tehuacán Valley comprise two distinct culture areas, one being the Cuicatec Cañada bounded on the north side by the Salado River and the other including the Mazatec Cañada plus the Tehuacán Valley. At least four ceramic types (Coxcatlán Brushed, Coxcatlán Red, Coxcatlán Orange and Teotitlán Incised) occur within the latter area but are absent in the Cuicatec Cañada. Stamped bottom bowls, however, are common to both culture areas.

Late Postclassic settlements in the Mazatec Cañada and Tehuacán Valley were dispersed, with sites located both on hill flanks and hilltops. In contrast, the Cuicatec Cañada reveals a relatively more nucleated pattern, with sites mainly located on hilltops and along ridges.

4. Stamped base vessels and a distinctive type of footed basalt metate are traits that link the Chinantla and the Cañada, although these geographically contiguous areas seem to be otherwise culturally distinct.

Internal Diversification of Mixtec

Although the internal diversification of Mixtec began around A.D. 500, additional changes certainly occurred during the city-state stage. Diversification could have taken place due to isolation through social differences. As Spores (1974a) has shown, mechanisms of class and social group endogamy functioned to maintain cohesiveness within the ruling class. For example, Mixtec caciques could become rulers only if they were able to trace their origin back to the sacred place of Apoala where supposedly all Mixtec dynasties origina-
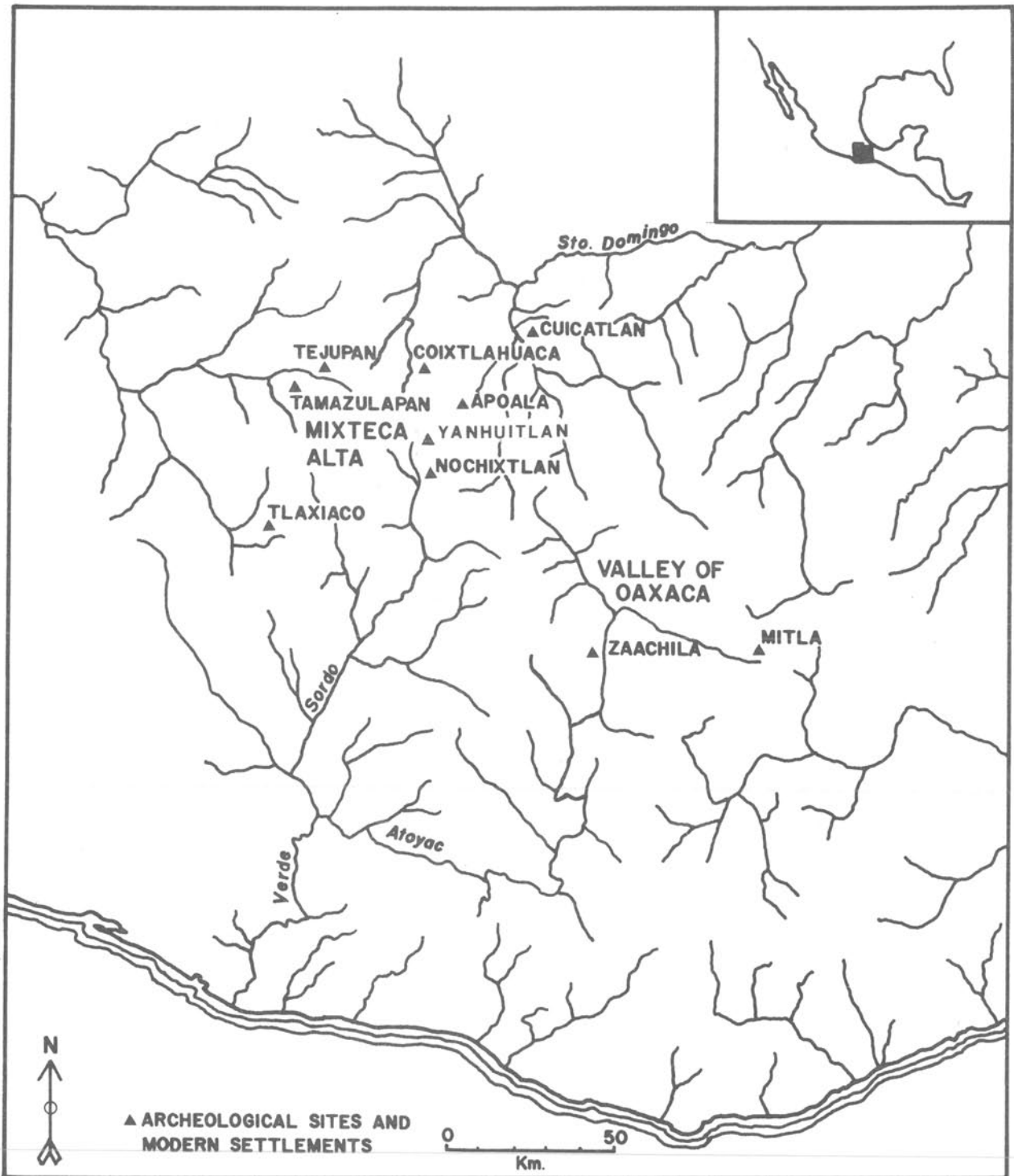
Fig. 6. Locations of late postclassic cacicazgos and archeo-
logical sites mentioned in the text.

ted. Furthermore, the ruling class was strictly endogamous, almost caste-like, and marriages were among ruling families from different cacicazgos. Ruling class men married only ruling class women for procreation of heirs and perpetuation of lineage (Spores 1967:153).

Presence of such mechanisms within the governing class implies strong separation and isolation between all classes. There was considerable social distance between the ruling and noble classes and the macehuales, terrazgueros and slaves. The latter groups also must have been strongly endogamous. Social isolation as well as probable lack of physical mobility among the lower classes who comprised the majority of society could have created linguistic diversification. We would predict dialect differentiation to have occurred roughly in correspondence with political divisions or cacicazgos of the Mixteca.

Internal Diversification of Zapotec

The probable relation between diversification of Zapotec beginning around A.D. 600 and the disintegration of political units centered at Monte Albán has already been mentioned. A process of dialect diversification probably continued for the next 1000 years or so. Whitecotton (1977:131) cites a glottochronological date of 6.5 minimum centuries or A.D. 1300 for separation between Mitla and Isthmus Zapotec. It may be suggested, then, that diversification of Zapotec as spoken in various regions--the Valley of Oaxaca, Sierra Juárez, Isthmus of Tehuantepec and southern mountains--was related to emergence of dominant centers in these regions which integrated smaller cacicazgos. In the Valley of Oaxaca, although relatively independent, cacicazgos tended toward a military alliance centered at Zaachila (Spores 1965). Another major and dominant center was located in Tehuantepec and functioned as focal point of a wide-ranging, commercial network notable for the large variety of products which moved through it (Spores 1965).

Separation of Chocho from Popoloca: A.D. 1200

Factors causing the Chocho-Popoloca linguistic separation at A.D. 1200 are unknown, and little is known about the social organization of these groups in Postclassic times. The Mixtec expansion into areas outside the Mixteca Alta such as the Valley of Oaxaca, the Cañada and the Isthmus of Tehuantepec, very likely included parts of the Chocho region. Mixtec outposts may have been established in the Chocho region to counteract pressure exerted from the north by Nahuatl-speaking groups.

Nahuatl groups apparently did subjugate Popoloca speakers, although this process remains to be carefully documented archeologically. Detailed archeological comparison of the Chocho and Popoloca areas with the Mixteca Alta and Valley of Oaxaca should reveal differing patterns with regard to cultural continuity and externally caused change.

Two branches of Otomanguean which we have not discussed are Amuzgo and Huave. Hopkins has pointed out (1977:26-7) that more linguistic analysis needs to be done before much can be said about the prehistory of these languages. He suggests that the geographical location of Amuzgo may be the result of an early migration. The relation between Huave and other members of the Otomanguean family remains to be clarified.

Conclusion

In this final section, a few comments on archeology and linguistics are added, particularly with respect to the Otomanguean area. One assumption here is that the linguists' glottochronological time corresponds to the archeologists' radiocarbon time. Even if this assumption were shown to be invalid, there would still exist a sequence of linguistic diversification and a sequence of archeological patterns which could be compared on a relative time scale.

The relative sequence of change and stages in the archeological record is repeated in most regions in southern Mesoamerica. The linguistic data, however, have received less atten-

tion, so that it is possible that with a larger sample of dia-
lects and more complex criteria of comparison the proposed
dates of separation and diversification would be modified.
Modifications could, of course, affect the correlations we
have proposed. Future studies in both linguistics and arche-
ology should help resolve questions or problems such as how
and why Otomanguean, excepting Otopamean, diversified into
eight branches at a time for which virtually no archeological
data are known.

A second assumption here has been that the linguistic
separations and diversifications occur simultaneously with
cultural changes, though in reality there may be some lag in
the linguistic manifestation of a given change. Studies using
historical data to evaluate the relations between change in
language and change in a group's material and non-material
culture would be helpful.

Much work needs to be done in terms of preliminary archeo-
logical reconnaissance in several areas of the southern Meso-
american highlands. On the basis of known sites and available
data, especially from the Valley of Oaxaca and Nochixtlán Val-
ley which have received considerable attention from archeolo-
gists in the past 15 years, many more specific and detailed
studies could be carried out which would aid in the definition
of prehispanic groups and in the characterization and measure-
ment of the interaction between them. Byland's work in the
Tamazulapan Valley of the Mixteca Alta (this volume) is illus-
trative. Similar studies are in progress on the incised gray
ceramics characteristic of the early occupation at Monte Albán.

A brief comment is in order on the possible relations be-
tween Otomanguean, Mayan and Mixe-Zoque in early times.
Kaufman (1976) locates proto-Mayan speakers specifically in
the Soloma area of the Cuchumatán mountains of Guatemala and
suggests that human dispersion and (Mayan) linguistic diversi-
fication began from there at approximately 2200 B.C. Generali-
zing from our conception of the wide area occupied, perhaps

intermittently, by proto-Otomanguean speakers, we suggest that proto-Mayan speakers may have occupied a wide area possibly extending from the Chiapas highlands through the Guatemalan highlands into Honduras. Parts of this area are within the area of occurrence of teosinte (Wilkes 1972), and may have been prime locations for gathering and perhaps early agriculture in pre-ceramic times. The Santa Marta Rockshelter in Chiapas (MacNeish and Peterson 1962) may be one of the sites occupied by proto-Mayan speakers.

The Isthmus of Tehuantepec is a natural break separating the Oaxaca-Puebla-Mexico highlands from the Chiapas-Guatemala highlands. The Isthmus region may be part of the area formerly occupied by yet a third early language group in Mesoamerica, proto-Mixe-Zoque. Kaufman writes that Mixe-Zoque diversification began around 1600 B.C., "probably by spreading north, east and south-east from a homeland in the middle of the Isthmus of Tehuantepec" (1976:106).

We disagree with the idea of diversification from a point, and also consider it unlikely that the middle of the Isthmus of Tehuantepec would have been a desirable or utilized habitat in early times. The Pacific coast of Chiapas-Guatemala and the Gulf Coast lowlands of Veracruz and Tabasco should perhaps be added to the Isthmus region forming a larger area possibly occupied in early times by proto-Mixe-Zoque speakers. The bearers of the Chantuto phase culture on the Chiapas coast (Voorhies 1976), dated at approximately 3000-2000 B.C., may have spoken proto-Mixe-Zoque. Later, agriculturally based sites or communities such as Laguna Zope near Juchitán, Oaxaca, and the Olmec center of San Lorenzo, Veracruz, which are the earliest known sites in the Isthmus area, would also have been occupied by proto-Mixe-Zoque speakers. In the case of San Lorenzo, at least, our suggestion is in accordance with Campbell and Kaufman's (1976) identification of Olmecs as Mixe-Zoque.

In sum, our hypothesis is that three major early language groups--Otomanguean, Mixe-Zoquean and Mayan--are associated

with three distinct geographical areas--the highlands north-
west of the Isthmus, the Isthmus plus Gulf and Pacific Coast
lowlands and the Chiapas-Guatemalan-Honduras highlands, res-
pectively. This implies an early highland-lowland dichotomy
as well as considerable interaction between highland and low-
land groups, given the hypothesized Z-shaped distribution of
Mixe-Zoque speakers, touching on both coasts.

Finally, whether or not one believes that potsherds talk--
some of us think that they talk but have a tendency to tell
lies--the possibility of linking archeological and linguistic
data is real. It not only constitutes a challenge for the
archeologist but certainly in the case of Oaxaca if not all
of southern Mesoamerica it widens the anthropological perspec-
tive of studies in prehistory.

Appendix

Included below is a list of some cultural features along with the approximate date of their initial appearance in archeological context as documented as of 1978 in sites in Oaxaca. Some of these items and dates may be helpful for linguistic reconstruction.

Cultural Item	Initial Appearance
Ceramics	1350 B.C. secure, possibly earlier
Bell-shaped pit	1350 B.C.
Wattle and daub house	1350 B.C.
Ceramic figurine	1350 B.C.
Obsidian blade (as opposed to chip or flake)	1250 B.C.
Comal and, by extension, tortilla	600 B.C.
Stela, carved stone monument	600 B.C.
Ceramic urn	600 B.C.

Notes

[1] The authors thank Cecil R. Welte for comments on an earlier version of this paper.

[2] Regional sequences are based on the following sources: for the Valley of Oaxaca, Flannery et al. 1981, Winter n.d.; for the Mixteca Alta, Spores 1972, Winter 1981; for the Cañada, Spencer 1982, Winter n.d.; for the Tehuacán Valley, MacNeish 1964; for Tlaxcala, García Cook 1974; for the Basin of Mexico, Millon 1973, Niederberger 1976, and for the Chiapas Highlands, Lee 1974, MacNeish and Peterson 1962.

[3] Human presence at Tlapacoya in the Basin of Mexico and at Caulapan in Puebla is dated at approximately 20,000 B.C. Earliest documented evidence in the Tehuacán Valley is approximately 10,000 B.C. and in the Valley of Oaxaca approximately 9,000 B.C. (Lorenzo 1975).

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BOUNDARY RECOGNITION IN THE MIXTECA ALTA, OAXACA, MEXICO

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Recognition of territoriality is a common characteristic of substantially ranked or stratified societies the world over (Fried 1967:175). When complex political entities co-exist in a limited geographical area it is reasonable to expect that they will share borders. The nature of borders between differing political entities is certainly quite variable and is not amenable to trivial definition. A border may affect social interaction, information exchange, or commodity movement in quite a variety of ways, as shown by Hodder (1977, 1979) for material goods in the Baringo area of modern Kenya and Plog (1980) for information and goods in the prehistoric American Southwest. The boundary between two entities, when measured for any particular interaction or group of interactions, may be clearly demarcated and rigidly defined, as when it lies between two competing polities, or when the boundary coincides with substantial geographic barriers. Conversely, a boundary may be diffuse and ill-defined, as when it lies between two cooperating, interactive peer polities with mutual economic or social goals.

A social scientist interested in political, economic, or social interactions of neighboring societies needs to be able to identify their borders. The accurate interpretation of differential processes of cultural development in adjoining regions is fundamentally dependent upon identification of the boundaries which exist between them. The internal composition of the neighboring entities cannot be accurately assessed unless their limits can be defined. Boundaries may be readily apparent physical barriers, but more often than not they are more permeable, less apparent impediments to interaction.

The recognition of a boundary zone should include a determination of both its geographical location and its strength as a barrier to interactions. Without establishing the location of a boundary, the internal composition and structure of each polity in a region cannot be accurately determined. Without defining the characteristics of the boundary, the nature of any interaction between adjacent polities cannot be fully understood. To the extent that these two ideals can be achieved, an investigator can effectively study the dynamics of cultural evolution within a region. Recognition of internal, autochthonous processes which promote either change or stability as well as external, interactive processes might then be possible.

Ultimately, adequate explanation of variation in evolutionary history can be achieved only when we develop the means to recognize the variability in the first place. We must be able to identify the human units of analysis (including, but not limited to, polities) and to do that we must be able to identify and characterize their edges.

This paper presents a summary of my efforts to date to discover the boundaries which existed in a small portion of the Mixteca Alta during Late Natividad times (ca. A.D. 1000-1520). The Tamazulapan Valley (Fig. 1) is a region of about 253 km^2 which has been the subject of some ethnohistoric research (Spores 1967, Gerhard 1972, Borah and Cook 1977) and some archeological research (Paddock 1953, Byland 1980). The objectives of these studies have included, in general terms, an improved understanding of the processes of culture change in Postclassic Mesoamerica and of the structure of the Postclassic Mixtec political, economic, and social systems, as well as the elucidation of the particular culture history of the Mixteca Alta.

This essay begins with a review of available ethnohistorical information about the distribution, size, and structure of the valley and its immediate vicinity. Information has been sought which would reveal the locations of borders within the study area so that the internal structure of any poli-
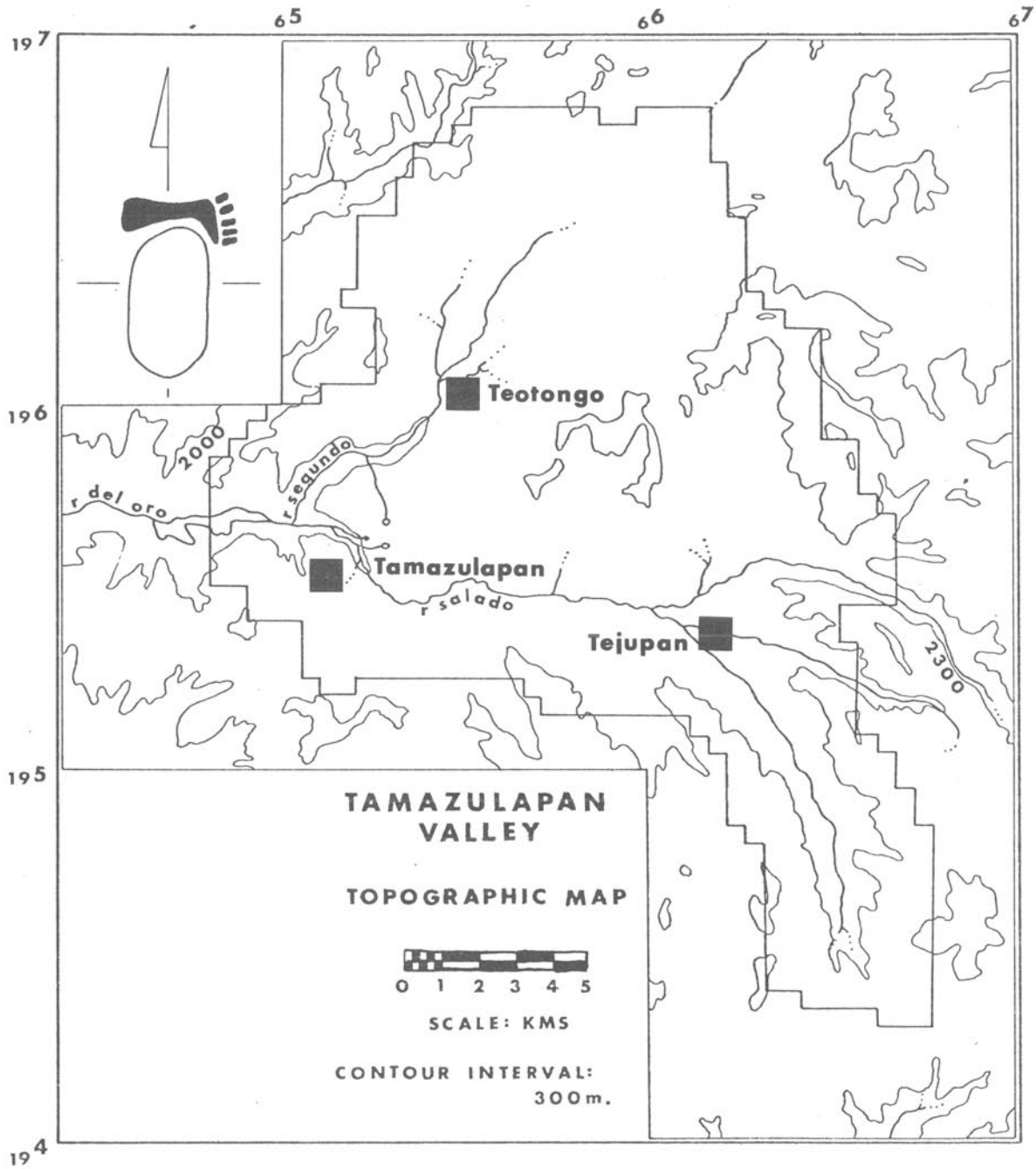
Fig. 1.   Tamazulapan Valley, Project Area

ties of the Late Natividad phase may be discovered. An attempt
has been made to expand this information through a stylistic
analysis of ceramic artifacts recovered during an archeological
survey, and a coordinated examination of contemporary ethnicity
and municipal identity.

The archeological analysis is based on artifacts recovered
during a comprehensive archeological survey of the Tamazulapan
Valley (Byland 1980). Of all the artifacts collected, a single
ware was selected for analysis: Yanhuitlán Fine Cream, first de-
fined by Spores in the Nochixtlán Valley (1972). This choice
was made for a number of reasons. First, the ware is a ubiqui-
tous type, found in abundance at all known Postclassic sites
in the Mixteca Alta. Second, the ware appears in a limited
number of vessel shapes and sizes, all associated with a single
functional context, which is serving and eating. Third, it ex-
hibits a wide degree of stylistic variability in its nonplastic,
painted decoration. Finally, it was collected as a ware without
regard to subdivisions imposed during the subsequent analysis.
Together these characteristics give this single ware a high po-
tential for yielding a great deal of unbiased information. By
examining stylistic variability within the universe of this ware
we can use relative abundance of different varieties of Yanhui-
tlán Fine Cream at each site as an unbiased measure of associa-
tion of the various sites.

Ethnohistorical Context

The existence of two principal Mixtec kingdoms or señoríos
within the study area was quickly established. The towns of
Tejupan and Tamazulapan (Fig. 1) were autonomous señoríos be-
fore their incorporation into the Aztec empire as tributaries
in the province of Coixtlahuaca (Dahlgren 1966, Spores 1969).
Coixtlahuaca was and is an important community, located across
the continental divide about 17 km east of Tejupan. Teposco-
lula, another important pre-Columbian community, is about 17
km to the south of Tejupan beyond another mountain range.

Tamazulapan and Tejupan share the same valley and are themselves about 11 km apart.

Identification of the pre-Columbian locations of Tamazulapan and Tejupan was also straightforward. The Relación geográfica of Tejupan (Paso y Troncoso 1905) included a map of the area around the congregated community established by the Spanish. The location of the old site of Tejupan is indicated to the east of the modern town by a hill sign and the Mixtec place glyph naming the hill. Detailed discussions of this map have been provided by Bailey (1972) and Byland (1978). Eulalia Guzmán was the first archeologist to visit this site and to identify it as the pueblo viejo or old city of Tejupan (1934:39).

During her early transit of the Mixteca Alta, Guzmán also visited and identified a site northeast of modern Tamazulapan as its pueblo viejo (1934:38). This site was briefly excavated in 1952 by members of the Mexico City College field trip in the Mixteca Alta directed by Ignacio Bernal (Paddock 1953). Bernal's work was concentrated at the nearby, and more architecturally impressive, site of Yatachio.

Both of these capital towns are listed by Antonio de los Reyes in his A.D. 1593 Arte en lengua mixteca with their Mixtec names (de los Reyes 1976:89). For "Tamatzulapa" de los Reyes gives the Mixtec Tequevui and for "Texupa" he gives Nuundaa. These are the terms used today by local residents to refer to the ruins visited by Guzmán. We can be sure that these sites were in fact the pre-Columbian seats of government.

The internal organization of the two towns is less clearly understood. From the Suma de visitas we learn that during the sixteenth century Tejupan had six barrios and that Tamazulapan had six sujetos (Paso y Troncoso 1905). The meaning of the words barrio and sujeto in terms of actual population distribution in Pre-Hispanic times is open to discussion but it is clear that these words are not used as synonyms (Spores 1967:90-104). I have argued elsewhere that barrio refers to relatively large sites near the com-

munity center and sujeto refers to relatively small sites
far from the community center (Byland 1980:170-171). The
use of these terms suggests substantially different popula-
tion distribution or settlement pattern within these two
communities.

Other significant information concerning the structure
of Tamazulapan and Tejupan has been drawn from linguistic
information found in de los Reyes' Arte (1976:iii). De los
Reyes states that in any discussion of the Mixtec language,
one should exclude from consideration "the Chocho language
that is spoken in the towns of Coixtlahuaca, Tejupan, and
Tamazulapan, and others in that area, in which there are also
many Mixtecs, and in some of the said towns there are more
Mixtecs than Chochones" (1976:iii, my translation). This
comment can be taken to indicate a degree of ethnic diversity
in the three towns mentioned as well as "others in that
area".

This information can be augmented by reference to the
Relación geográfica of Tejupan written in 1579 by Diego de
Avendaño and first published by Paso y Troncoso (1905).
Avendaño declares that in Tejupan "the Indians speak two
languages, Mixtec and Chocho. Mixtec is more generally
spoken" (Bailey 1972:470). The ethnic mix in Tejupan, then,
seems to be predominantly Mixtec. Avendaño also makes clear
that in at least one other community the Chocho ethnic and
linguistic group was dominant. He says that Tejupan "waged
war with a conquering Chocho ruler who subjugated them"
(Bailey 1972:470). I believe that this Chocho ruler was
based at Coixtlahuaca, as that town is the modern center of
the Chocho language (Parmenter 1982:6).

For Tamazulapan we have no clear indication of the ethnic
mix. Our field investigation has shown that the modern muni-
cipios north of Tamazulapan consider themselves to be Chocho
towns although few if any inhabitants still speak the lan-
guage. Citizens of Tamazulapan, when asked where the border
between Chocho and Mixtec territory was, say that it ran on
an east-west line right through the middle of the cathedral

on the town square, with Chochos to the north and Mixtecs to
the south. This may be a folkloric suggestion that the two
groups were equally mixed or had equal influence within the
community.

Unfortunately, nowhere in the documentary record is there
mention of the physical extent of the señoríos which we are
considering. Though barrios and sujetos are mentioned, little
information is given about the dispersion of these dependen-
cies. The physical structure of Mixtec señoríos is thus hinted
at in the documentary record but is largely undiscoverable
without additional sources of information.

Some of that additional information can be derived from
the current and colonial political affiliation of towns cur-
rently in the valley. The Tamazulapan Valley includes parts
of eight modern municipalities (Fig. 2). These include the
towns of Santiago Tejupan (STX), Tamazulapan del Progreso
(TAP), Santiago Teotongo (STT), Trinidad Vista Hermosa (TVH),
San Antonio Acutla (SAA), San Juan Teposcolula (SJT), San
Miguel Tulancingo (SMT), and San Pedro Nopala (SPN).

Borah and Cook note that Santiago Tejupan lies largely
within the same boundaries that it has had since before the
Spanish conquest (1977:69). Gerhard lists the towns of
Teotongo, Acutla, Tulancingo, and Nopala as dependencies of
Tamazulapan in 1548 (1972:289). He also mentions that San
Juan Teposcolula was a dependency of San Pedro y San Pablo
Teposcolula, located south of San Juan, at that same time.

Three regions of interaction are thus potentially defined
by combining the modern and ethnohistoric information. It
would appear that Tamazulapan dominated the drainage of the
Río Segundo, the northern and western parts of the valley.
Tejupan controlled the central and eastern parts of the
valley. Teposcolula had control of the area south of the
valley, perhaps including part of the Río Salado de Tejupan
headwaters.

These general guidelines do not allow for very distinct
boundaries to be drawn between these areas. Furthermore, they

Fig. 2. Modern Municipio Boundaries and Centers of Population

continue to gloss over the internal structure within the principal communities. Yet another line of evidence is called for.

The Archeological Analysis

We now turn to the archeological survey of the Tamazu- lapan Valley. The methods employed in this project are simi- lar to those of many other highland Mesoamerican surveys and are described in detail elsewhere (Byland 1980). During the survey about 230 pre-Columbian sites were identified and col- lections of artifacts were taken from each of them. Artifacts were collected from well defined areas within the sites so as to insure representation of the various portions of each site. The number of areas collected at each site depended on the size of the site and the density of artifacts on its surface. The artifacts selected for recovery were chosen for their ability to aid in determination of temporal association or functional variation. As such, rims, bases, handles, and decorated sherds are predominant in our collections. Undeco- rated body sherds and unformed lithics were also collected but in smaller quantity and probably in a less representative fashion.

Of all the artifacts collected, the most abundant single ware attributable to the Late Natividad phase was Yanhuitlán Fine Cream. This ware is well described in Spores' original study of the ceramics of the Mixteca Alta (1972:26-33). The two principal subdivisions of the ware defined by Spores are undecorated Yanhuitlán Fine Cream Bowls and decorated Yanhui- tlán Red-on-Cream Bowls. Adopting a more fine-grained ap- proach, I was able to distinguish twenty-three separate cate- gories of the ware based on vessel shape, location of decora- tion, and the style of the decoration (Byland 1980:203-243). Rather than study each of the twenty-three categories indi- vidually, I chose to group them by nonplastic decorative style and in the case of undecorated examples by paste composition. This grouping combines vessels of all shapes whether decorated internally, externally, or both. Decorative style is taken

here to refer to the technique of decoration and not to the variation in content of the decorations themselves. Variability of element or motif constitutes another class of information which can also be studied but which has not yet been considered. Style in this sense seemed to offer the most potential for yielding information on the differential distribution of nonfunctional characteristics of the ware and thus on political and economic constraints on redistribution of the ware (Plog 1980:112-126, Hodder 1977). It is my belief, based on limited ethnohistoric documentation and the distribution of several distinctive categories of Yanhuitlán Fine Cream and other wares, that there were a limited number of specialized ceramic manufacturing communities in the Mixteca Alta at the time of the Spanish conquest. Our expectation is that these communities served different client areas and that these areas corresponded to some degree to the señoríos in which the productive centers were located. This assertion requires further verification before it can be unequivocally accepted. Insofar as Yanhuitlán Fine Cream had a limited range of functions, the products of several sources of the ware can be distinguished principally by nonfunctional, or stylistic, characteristics. The lumping of twenty-three Yanhuitlán Fine Cream categories resulted in seven varieties: five based on variation in decorative technique and two categories of unpainted ware based on variation in paste texture.

To limit the number of empty or zero cells in the analysis I also collapsed the 210 sites which contained Yanhuitlán Fine Cream artifacts into eleven areas. This procedure served not only to eliminate the problem of few sherds from some varieties at some sites but also to promote analytic simplicity. The eleven areas were constructed so as to divide the survey area into a small number of units of approximately equal size. They were arranged so that between known capitals the areas would be about 4 km wide (Fig. 3).

In order to evaluate the potential for differential distribution of the seven Yanhuitlán Fine Cream varieties I employed two common statistical measures. I first constructed
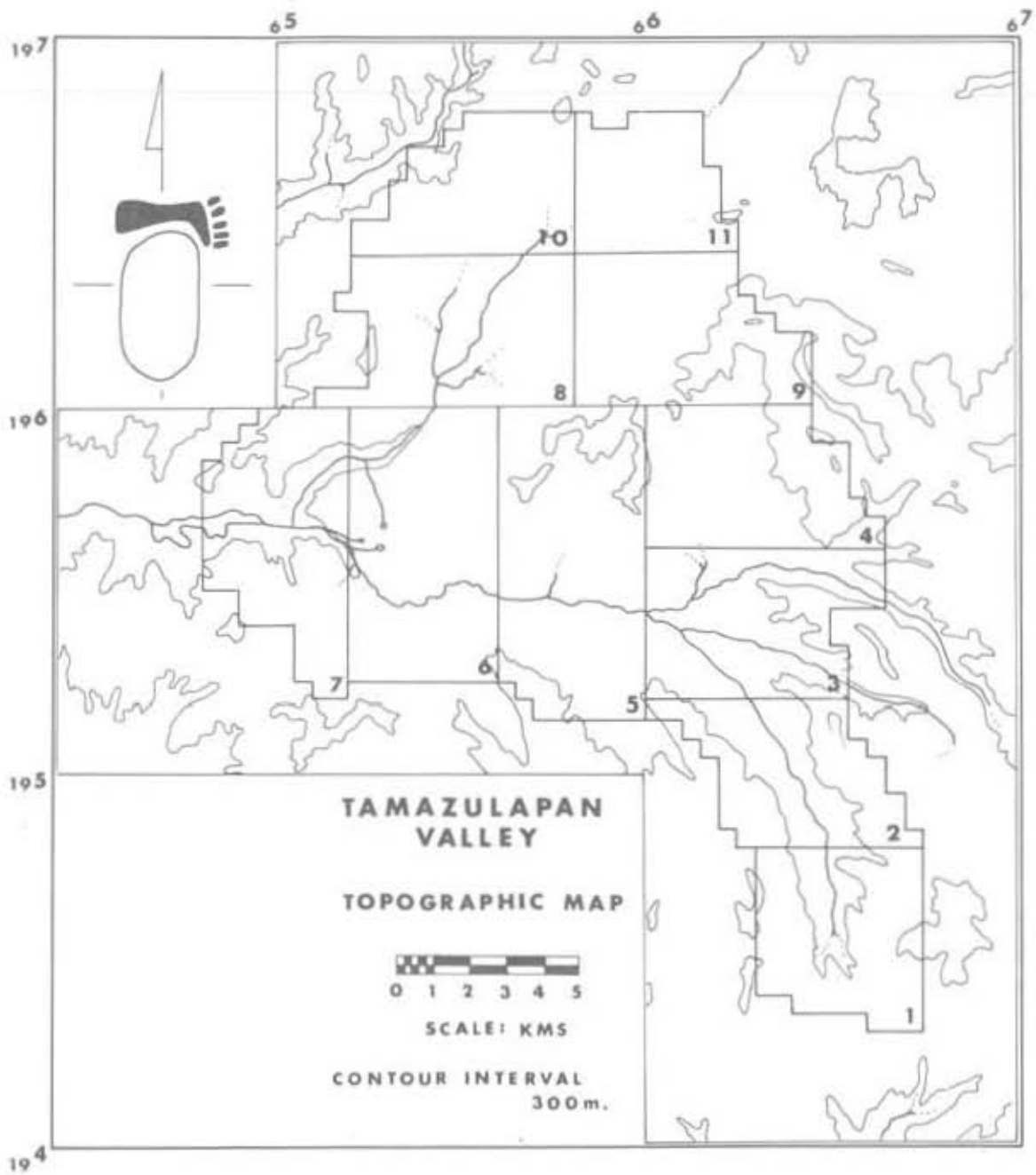
Fig. 3. Eleven Areas of Analysis

a seven by eleven table of frequency of occurrence of each
variety (Table 1). I noted in passing that the chi square
value of this table when tested for a model of complete in-
dependence of the variables is over 2,300 with 60 degrees of
freedom. To eliminate possible bias based on the presence of
the remaining zero cells in the table and on the low frequency
of Variety Four, I adopted a standard statistical response. I
both added a very small number to each cell and eliminated the
infrequent variety from the analysis. Under either or both of
these modifications the value of chi square remained extraordi-
narily high. The chi square value of the table is clearly
significant well beyond the p = .001 level. This determination
indicates that the observed distribution of Yanhuitlán Fine
Cream ceramics is definitely not a result of random processes.

The next step was to discover how the distribution devi-
ated from a uniform distribution. To do this I employed
another simple statistic, the standard score or Z-score. With-
in each variety the standard score is calculated by

$$z = \frac{X - \overline{X}}{s}$$

where X is an original quantity, $\overline{X}$ is the mean of the distri-
bution for the variety across the area, and s is the standard
deviation of the group of values. If the number of observed
occurrences in each cell for each variety were the same, the
standard score of each cell would be zero. Variation in the
value of the standard score is a measure of the deviation of
the table from uniformity. Conversion of the raw numbers in-
to standard scores allows each variety to be directly compared
without the bias introduced because some varieties are more
common than others. Within each variety, areas which have un-
expectedly frequent or infrequent occurrences will have higher
or lower standard scores, respectively, and the greater the
deviation, the higher or lower the score will be. The calcu-
lated value of the Z-score of each area for each variety is
printed below the number of artifacts in Table 1.

The results of this analysis led to the archeological
discovery of the zones within which boundaries between the

Table 1. Frequency of Occurrence of Each Variety by Area

Variety						Area					
	1	2	3	4	5	6	7	8	9	10	11
Type 1	150	169	412	223	300	406	178	190	197	291	151
	-1.01	-0.80	1.85	-0.21	0.63	1.18	-0.70	-0.57	-0.49	0.53	-0.97
Type 2	17	57	176	88	67	141	81	154	146	164	152
	-1.91	-1.11	1.25	-0.50	-0.91	0.56	-0.64	0.82	0.66	1.01	0.78
Type 3	2	3	15	25	13	32	24	58	59	104	80
	-1.13	-1.10	-0.72	-0.40	-0.78	-0.18	-0.43	0.64	0.67	2.09	1.33
Type 4	8	0	11	5	4	8	4	2	4	1	1
	1.11	-1.33	2.02	0.19	-0.11	1.11	-0.11	-0.70	-0.11	-1.02	-1.02
Type 5	0	3	3	7	30	16	6	15	39	8	9
	-1.07	-0.81	-0.81	-0.46	1.52	0.31	-0.55	0.23	2.31	-0.38	-0.29
Category 270	141	67	47	19	59	27	29	18	11	24	15
	2.76	0.71	0.15	-0.63	0.48	-0.40	-0.34	-0.65	-0.85	-0.47	-0.74
Category 271	280	34	8	9	15	2	5	2	0	4	2
	8.93	0.38	-0.90	-0.85	-0.55	-1.19	-1.05	-1.19	-1.29	-1.09	-1.19

polities are most likely to be found and to the formulation of hypotheses concerning the nature of interaction across those boundaries.

For ease in visualizing these results, the Z-scores have been translated into a series of maps in which the values of Z which are greater than one are dark, values between one and zero are somewhat lighter, values below zero but greater than negative one are lighter still, and values below negative one are blank. The rare Variety Four has been eliminated from the study because its quantities are so low as to be unreliable indicators of significant variation in standard score.

The object of this analysis is to develop a measure of the flow of information and/or material between the various areas. The relative abundance of these purely stylistically defined varieties is taken as a surrogate measure of economic and social interaction between the areas represented. In the case of the small señoríos known to have existed in the Mixteca Alta at this time it would appear that we may take economic and social interaction as an approximate measure of political interaction or affiliation (Spores 1972:51). Clearly, economic boundaries need not duplicate political ones (Barth 1969), but just as clearly, the daily life of pre-Hispanic Mixtecs would have involved closer contact with the members of their own polities and its allies than with competing señoríos. Such is the case today both within the Tamazulapan Valley and outside, in the wider scope of the Mixteca Alta (Warner 1976) and the Mixteca Baja (Romney and Romney 1966). Insofar as economic integration or social interaction and information exchange reflect political integration, it is reasonable to assume that boundaries defined on these bases reflect political boundaries (Hodder 1979). When evidence suggests that political explanations of boundaries are not appropriate then other explanations must be sought.

An examination of the underlying distribution of Late Natividad phase archeological sites is important for understanding the artifact distribution (Fig. 4). Remembering the distinction between Tejupan and its barrios and Tamazu-
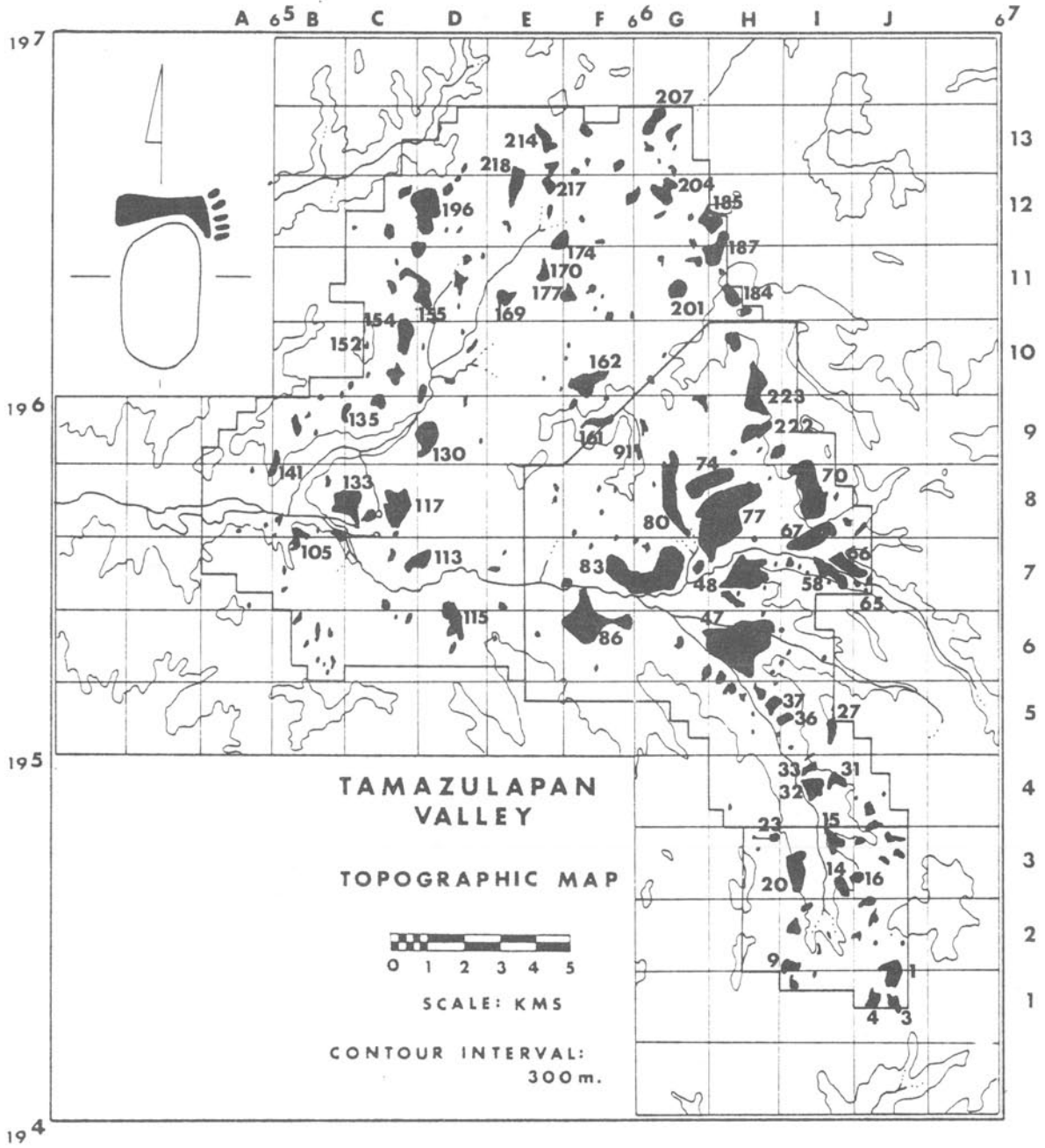
Fig. 4.   Late Natividad Site Distribution

lapan and its sujetos, we expect to be able to recognize distinctly different patterns of site dispersal in the areas controlled by Tejupan and Tamazulapan. In fact, sites near Tejupan seem to be larger and more densely packed than sites near Tamazulapan and elsewhere. Further mention of site distribution will be made later, but first let us examine the distribution of standard scores of Yanhuitlán Fine Cream ceramics.

Rather than examine the results of this analysis in the order of variety number it will be instructive to look at these results in such a way that interpretation of interaction, or the lack of it, can be built progressively.

Variety Five is composed of one category of shallow, subhemispherical bowls with roughly painted red lines parallel to the rim on the interior of the vessel. Z-scores of the distribution of this variety are plotted in Figure 5. This map shows positive values of Z in areas 5, 6, 8, and 9. For this variety it seems that the greatest interaction is found in the areas between Tamazulapan and Tejupan but with an emphasis on Tamazulapan. The only very low value of Z is found in area 1, the area nearest to Teposcolula.

Variety Three is defined as subhemispherical and vertical wall bowls, each with a well-burnished surface and with carefully painted designs composed of lines of uniform width. High values of Z, and hence the inference of greatest interaction, are found in the northernmost four areas, 8, 9, 10, and 11, with the highest values being in the two northernmost of these (Fig. 6). This area includes Teotongo and Acutla and is close to Tulancingo and Nopala, the four colonial sujetos of Tamazulapan. The variety is relatively unabundant in Tamazulapan itself, however, and similarly unabundant in Tejupan. This implies an area of close interaction in the northern part of the study area which is somehow separated from the main centers of Tamazulapan and Tejupan. High values of Variety Three overlap with those of Variety Five in areas 8 and 9. Very low values of Z are again found in the southernmost portion of the valley near Teposcolula, this time including both
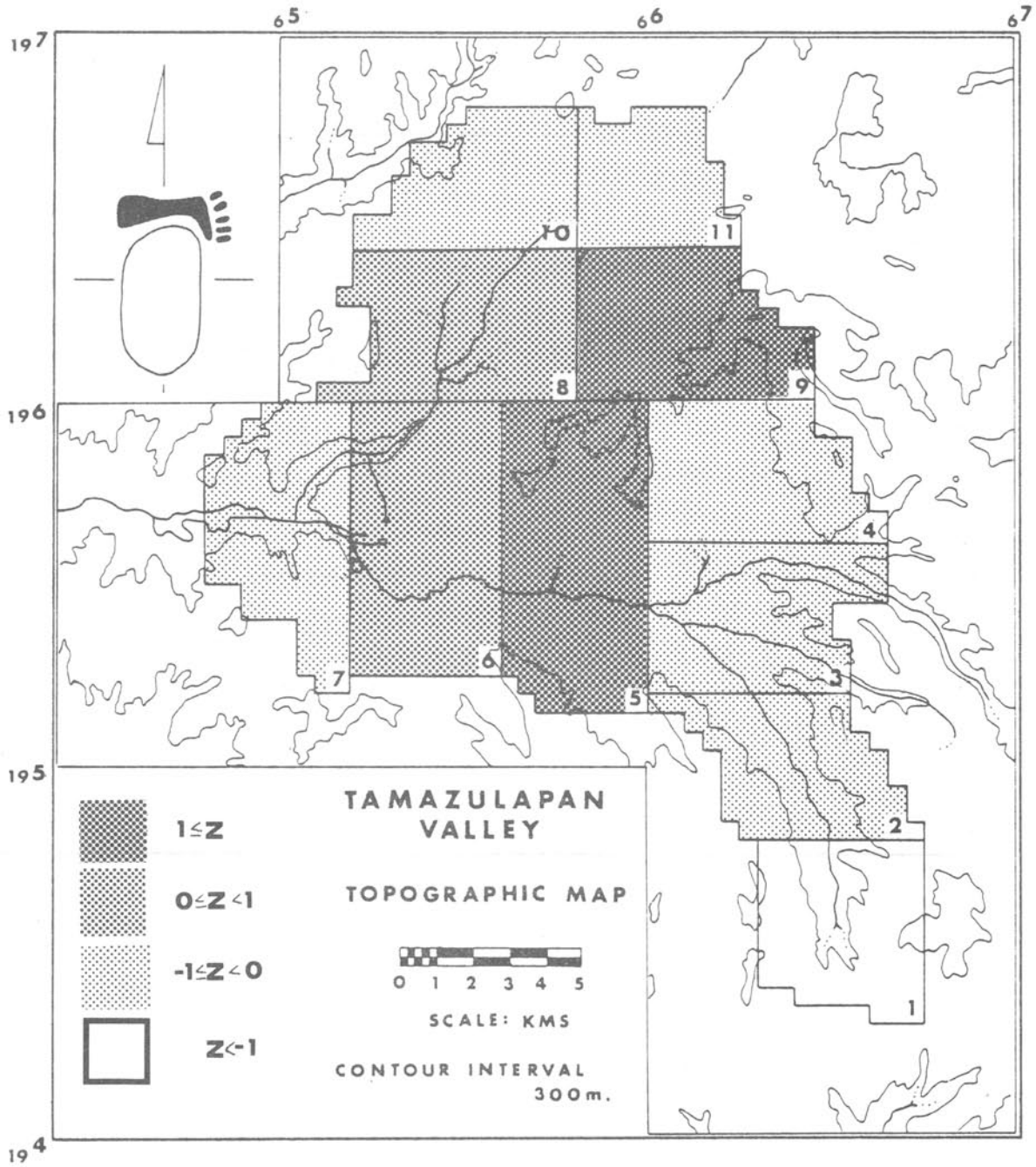
125

Fig. 5. Yanhuitlán Red-on-Cream Variety Five:
Z-Score Distribution

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areas 1 and 2. These areas are most distinctly divorced from the interaction indicated in the northern areas.

Variety Two is defined again by subhemispherical, out-leaned, and vertical wall bowls, this time with a burnished surface decorated with roughly painted designs composed of uneven lines of varying width. High values of Z for this variety are shown in Figure 7. These areas of relative over-abundance include the four northernmost areas and the two areas which include the sites of Tamazulapan and Tejupan, areas 6 and 3. The highest values are in areas 3 and 10. Area 3 includes Tejupan and area 10 includes the site of El Gentile in the municipality of Teotongo. This arrangement may be interpreted as reflecting a center of production or distribution in the north, perhaps associated with Teotongo, which is introducing its goods into the markets of Tamazula-pan and Tejupan. Once again, extremely low values of Z are found only in the southernmost areas of the region, the areas closest to Teposcolula.

Variety One, by far the most common variety, is defined by the same three vessel forms decorated with wide bands of designs painted with generally narrow lines of variable width. It has highest values of Z in areas 3 and 6, the areas en-compassing Tejupan and Tamazulapan, and high values in areas 5 and 10, or in the single area between Tamazulapan and Teju-pan and the single area encompassing the site of El Gentile (Fig. 8). Interestingly, this is the same area which had the highest value for Variety Two in that northern region. This arrangement might be interpreted as a sort of reciprocal ex-change between Tejupan and Tamazulapan with the area associa-ted with Teotongo, particularly with sites in area 10. It would appear that Teotongo and El Gentile were exporting ar-tifacts or information about how they should be decorated in a wide network to the south (Fig. 7) and that Tamazulapan and Tejupan were the donors in a smaller network to the north (Fig. 8). For Variety One the single area with a very low value of Z is again area 1. Note that for each of these three
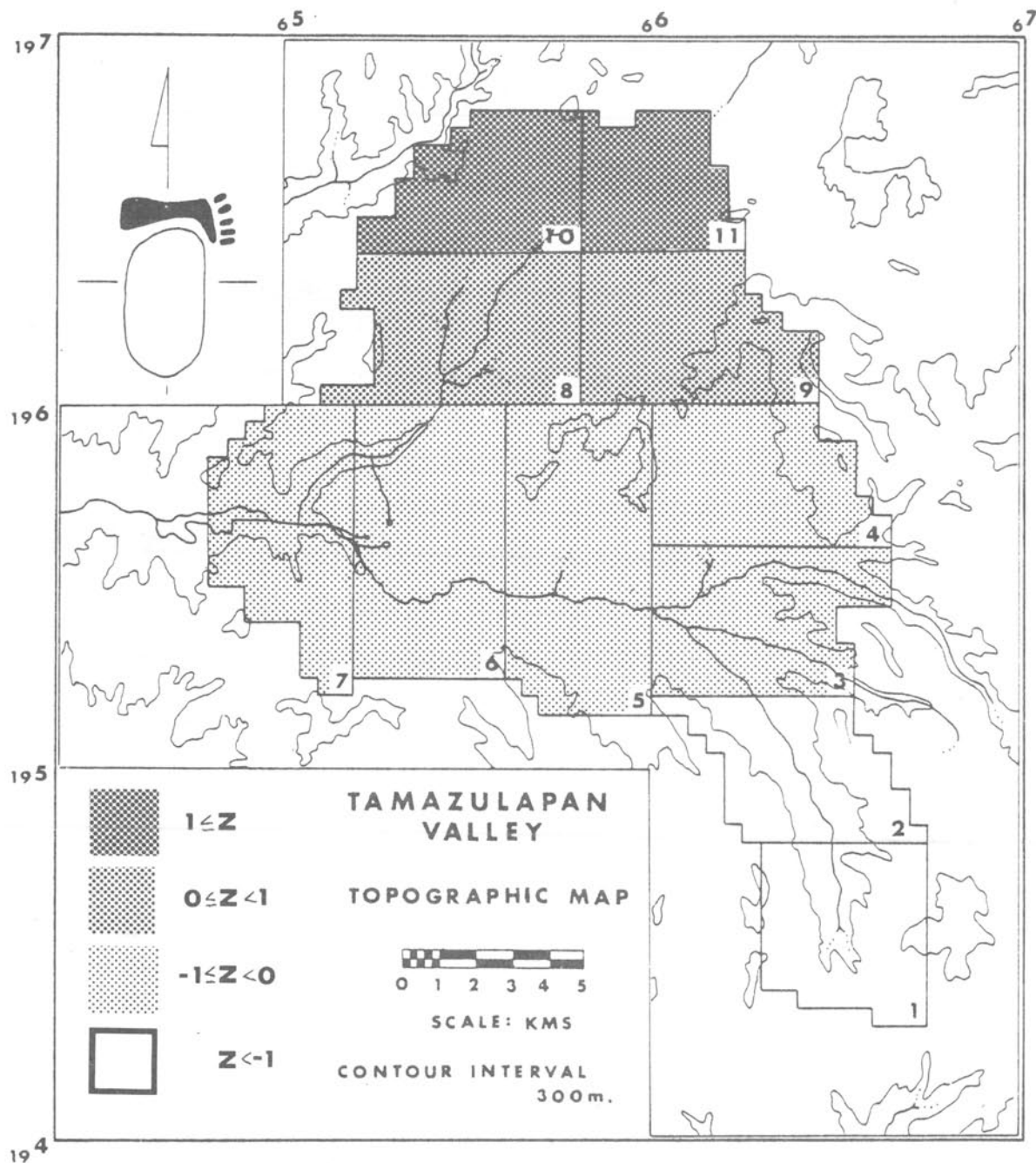
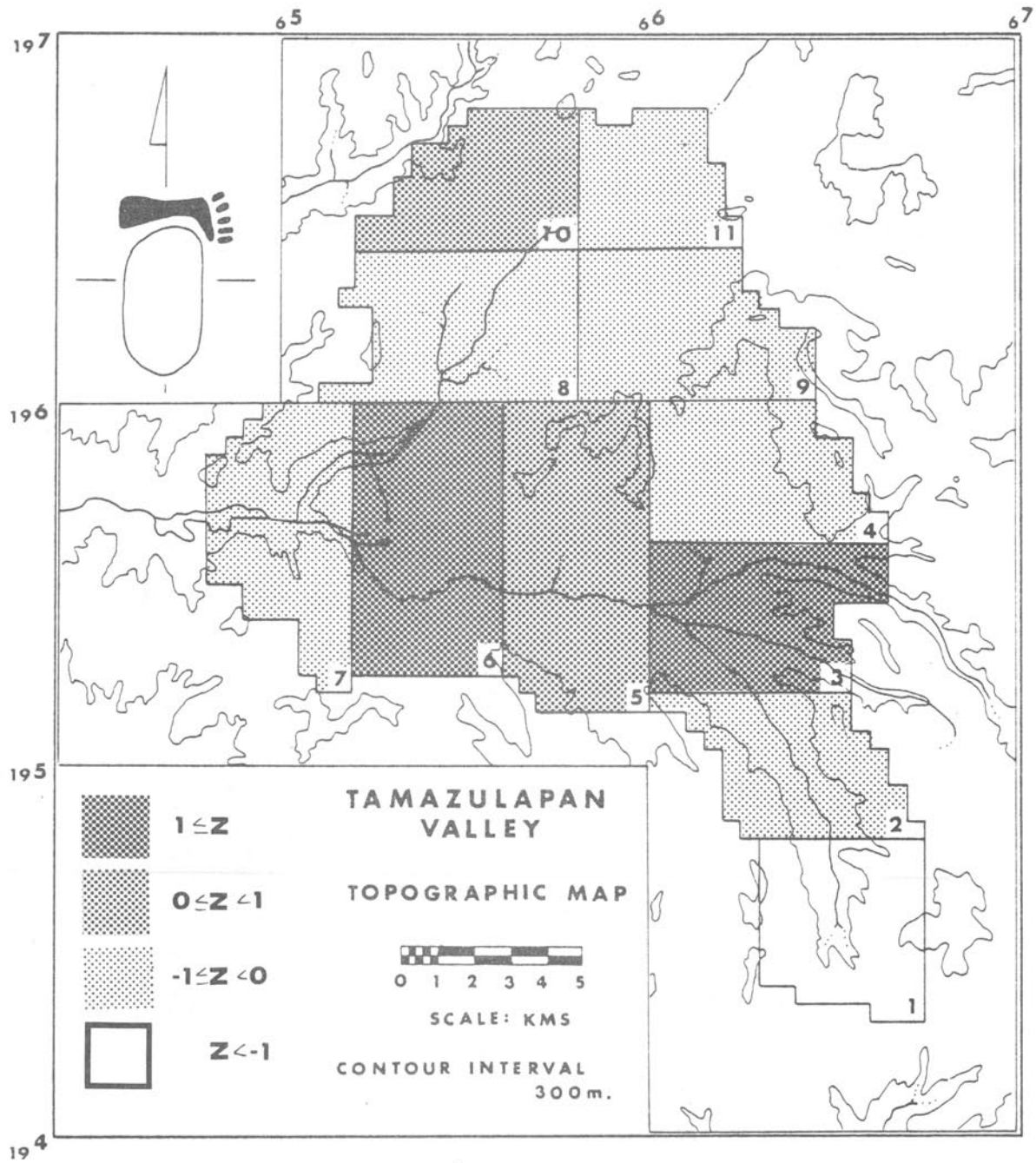Fig. 6. Yanhuitlán Red-on-Cream Variety Three:
Z-Score Distribution

Fig. 8. Yanhuitlán Red-on-Cream Variety One:
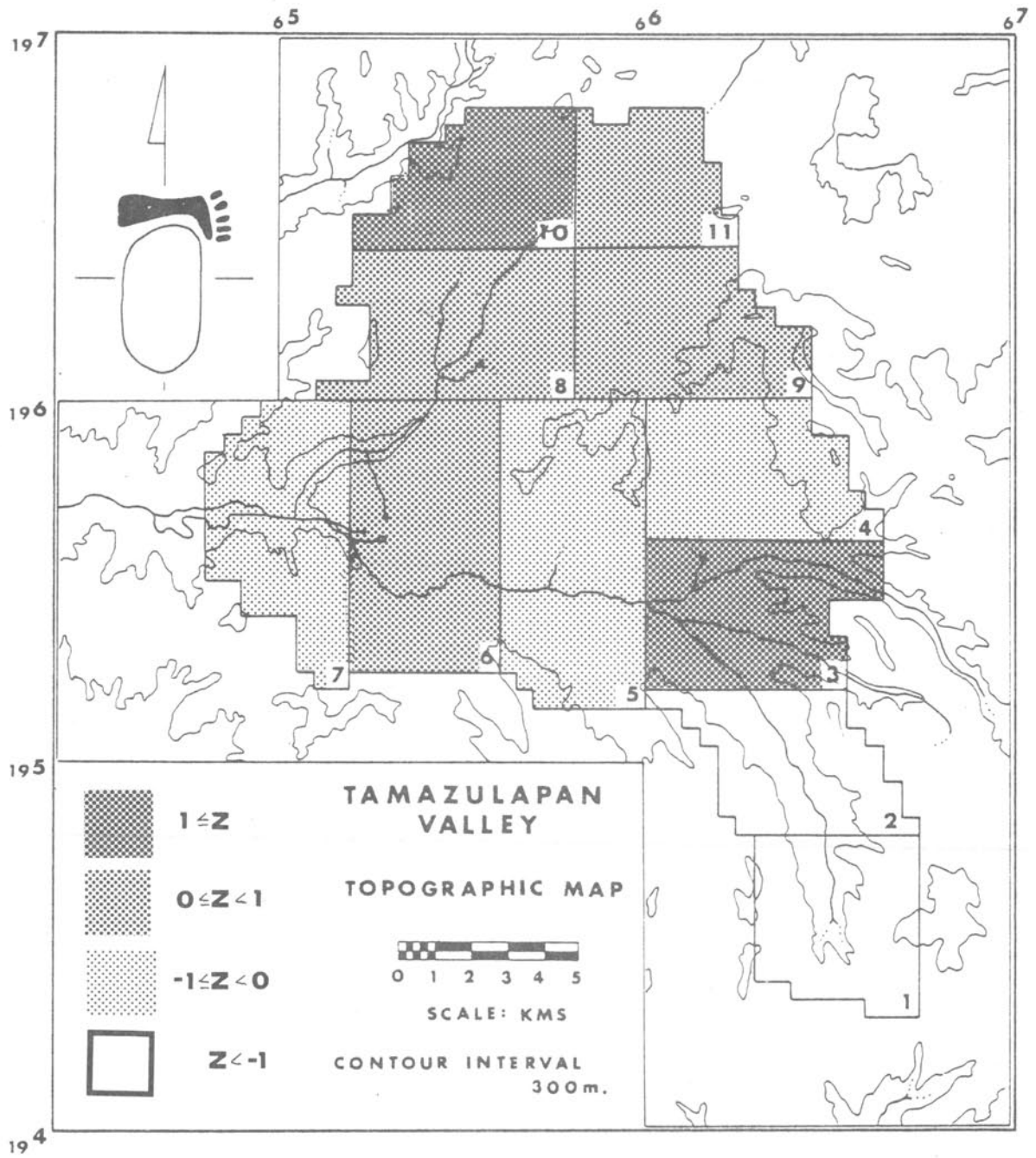Z-Score Distribution

Fig. 7.   Yanhuitlán Red-on-Cream Variety Two:
Z-Score Distribution

varieties the area with the lowest value of Z has been the area nearest Teposcolula.

Category 270, a single category defined by a sandy Yanhuitlán Fine Cream paste in any bowl form is an undecorated variety of the ware. It shows just the opposite sort of distribution (Fig. 9). This category contains, unfortunately, not only undecorated artifacts but also those sherds which have had their decoration completely eroded away. It is thus an ill-defined type and cannot be taken alone as sufficient evidence that the southern area had a distinctly different style than the rest of the valley. In spite of this, the variety does show good continuity, having a very high Z-score in area 1 and high values in areas 2, 3, and 5. This might, with due reservations, be interpreted as a type distributed from Teposcolula into Tejupan and to a lesser degree on into Tamazulapan and points north.

Category 271 is similar to category 270 except that its paste has a distinct silky, fine-grained texture. Though this type may require the same reservations as the previous ones it requires them to a lesser degree. Its high value of Z is found in area 1 with a much lower but still positive value in area 2 (Fig. 10). Very low values of Z are found in areas 6, 7, 8, 9, 10, and 11. The obvious interpretation of this distribution is again that it represents a type coming from the south with very little transgression into the more northerly areas.

Results

This analysis yields a suggestion of the most likely areas in which to look for boundaries between the señoríos operative in the area. Redistribution areas, or simply distribution, of the varieties of Yanhuitlán Fine Cream are taken as guides to levels of interaction rather than as definitive indications of political association. The combination of ethnohistoric information and the results of this archeological analysis may allow us to interpret these gra-
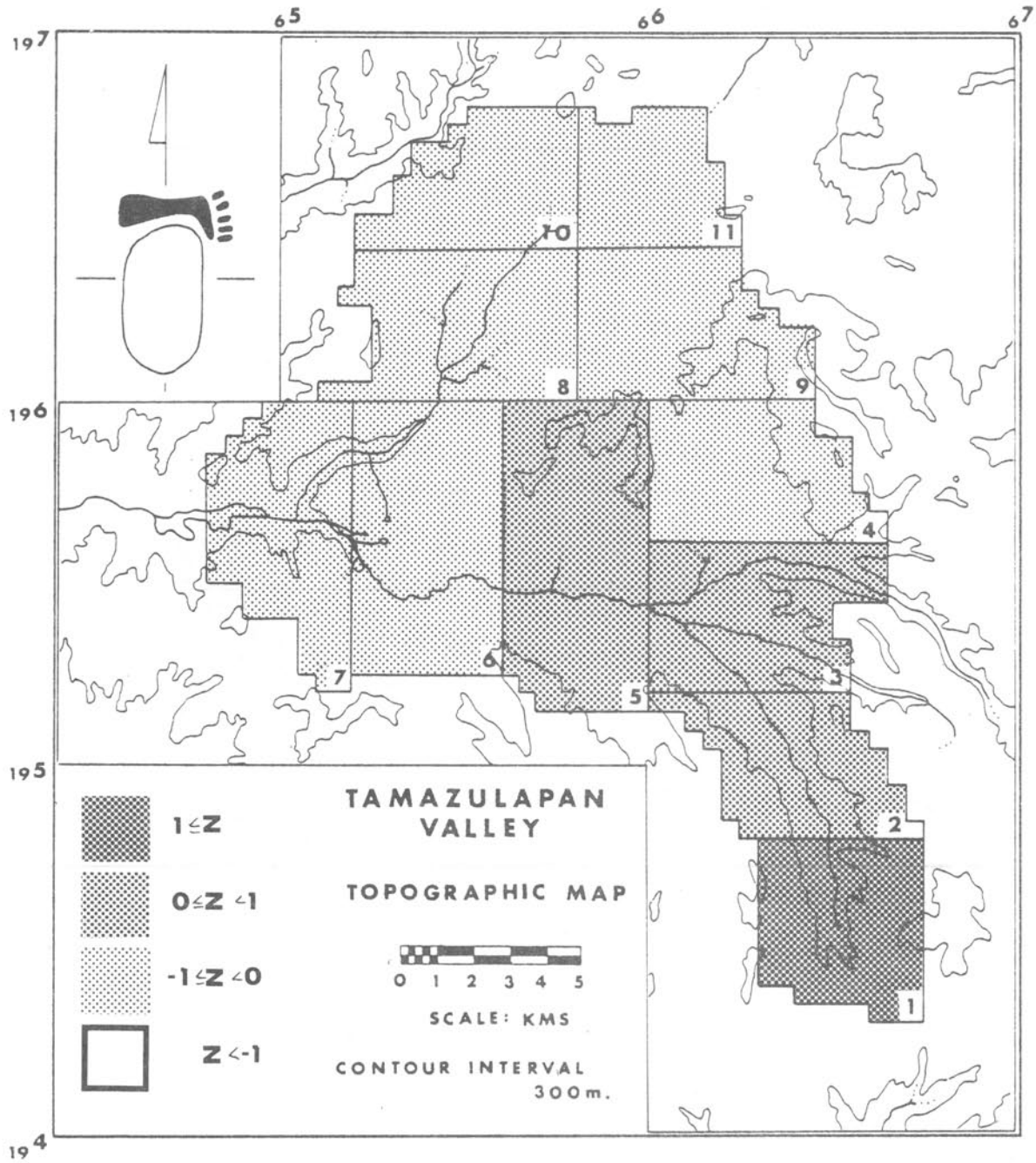
Fig. 9. Yanhuitlán Fine Cream Category 270:
Z-Score Distribution

dients in terms of human behavior. Figure 11 presents the
areas in which the actual boundaries should be found. Shading
indicates the likely boundary zones and dark lines represent
the current expectations for the final political divisions be-
tween the entities within the project area.

The boundary between the señoríos of Tejupan and Teposco-
lula should be found in area 2. This area is quite well de-
fined as the transition area between heavy representation of
undecorated and decorated Yanhuitlán Fine Cream varieties.
Because the northern part of area 2 is so near Tejupan itself,
the actual boundary probably lies in the southern part of the
area. The extraordinarily high value of Z for area 1 for Ca-
tegory 271 indicates that the interaction sphere of this area
at least was well defined and did not include Tejupan. The
projection of the actual boundary is the line dividing area 1
from area 2. This prediction is based on the Z-score mentioned
above and on the distribution of sites in the area. South of
that line sites are found both on the east and west side of
the river during the Late Natividad phase. North of the line
for three kilometers sites are mostly east of the stream.

The boundary between Tamazulapan and Tejupan is most
likely to be found in area 5. This prediction is based on
comparisons of the distributions of Variety Five and Category
270 and the distributions of Variety Two and Variety One.
These two pairings each indicate a transition zone in area 5.
The prediction of an actual boundary in this area is based on
a consideration of site distribution. The line is centered
in the western half of the area so as to avoid dividing the
site of Chocani, an important pre-Columbian site and a modern
village pertaining to Tejupan (Fig. 2). The decision also
serves to equally divide the territory between Chocani and
Las Pilas, another pre-Columbian site and modern village per-
taining to Tamazulapan (Fig. 2).

On the basis of this analysis a boundary must also be de-
fined between the northern area and the areas most clearly as-
sociated with Tamazulapan and Tejupan. This boundary is a
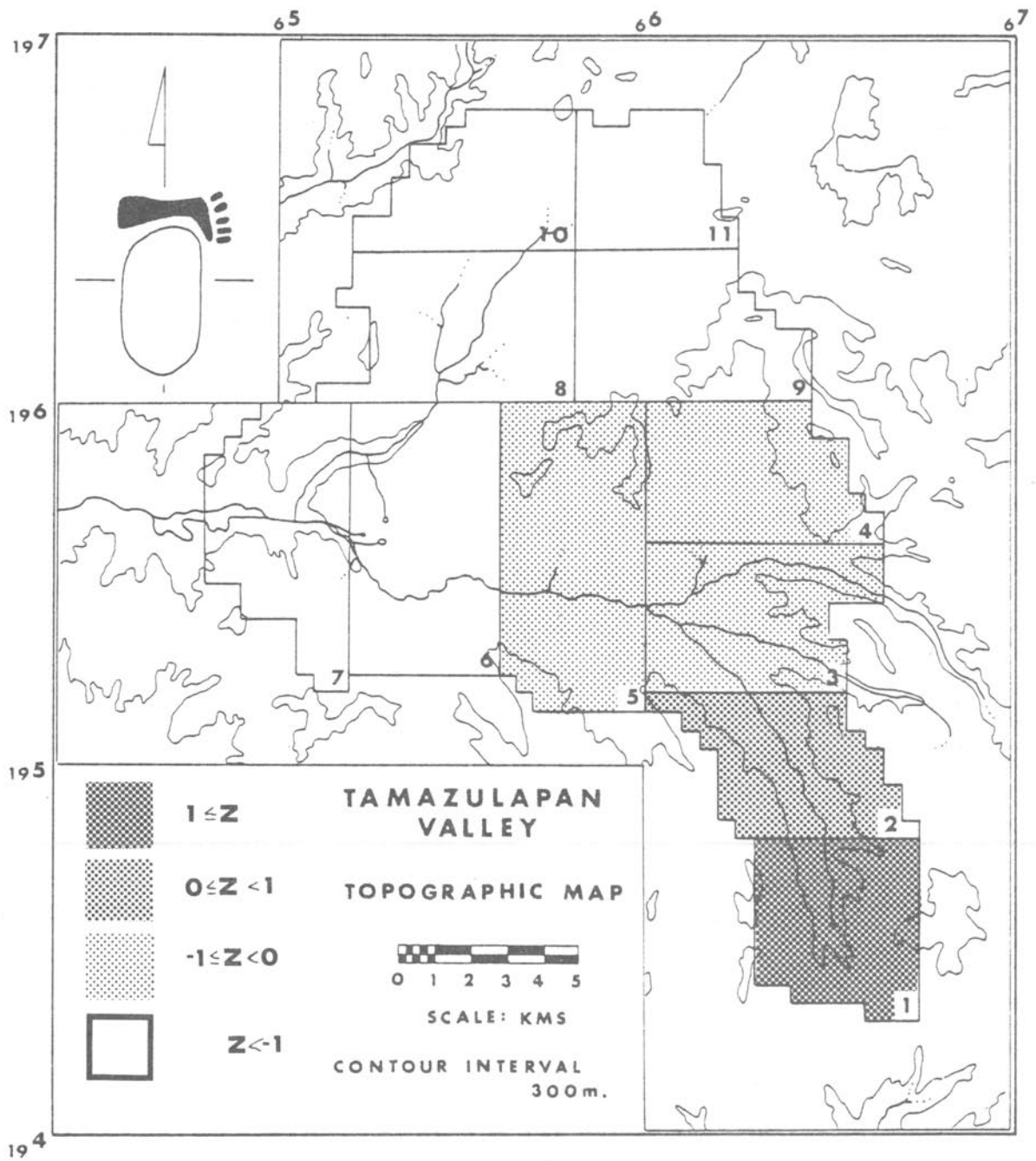complex one. It cannot be assumed to divide an independent

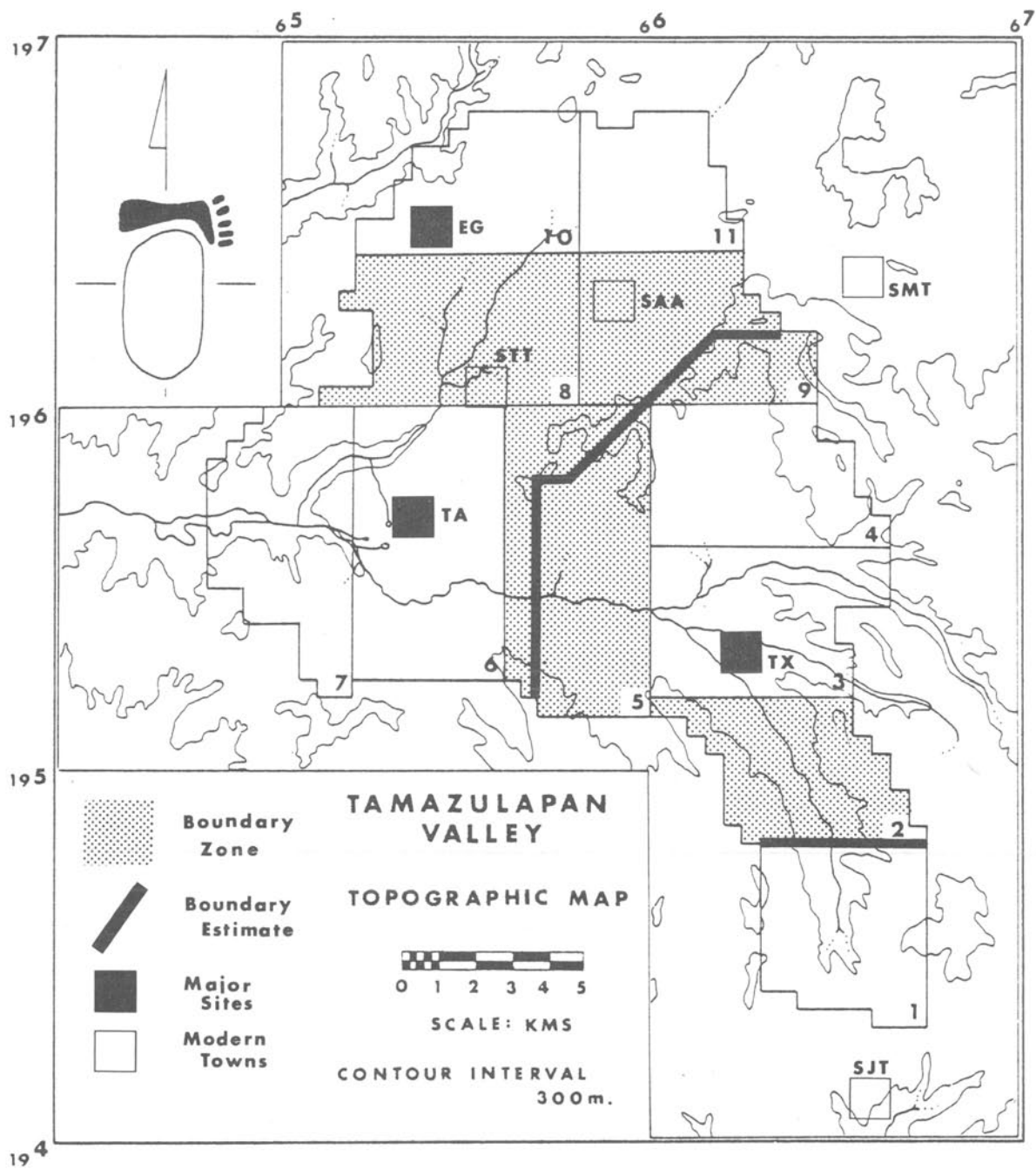Fig. 10.   Yanhuitlán Fine Cream Category 271:
Z-Score Distribution

Fig. 11. Boundary Estimates for Late Natividad

Teotongo from Tamazulapan and Tejupan. There is little evidence to suggest that Teotongo was an independent land-holding entity in Late Natividad times. It may indeed have been subject to Tamazulapan as in the early Colonial period, or parts of it may have been subject to Coixtlahuaca, the Chocho speaking center. It is clear though that this area did not belong to Tejupan.

We can infer, then, that the distributional boundary indicated in area 9 has political as well as economic or social significance. The proposed boundary is based on site distribution and on local geography. It is traced as it is in order to pass through the least inhabited part of the area and to connect with the division indicated in area 5. It is noteworthy that this positioning follows the top of the central valley uplift fairly closely. Thus, a political boundary coincides with a geological barrier.

The boundary zone between the northern area and Tamazulapan indicated in area 8 is perhaps a different sort of boundary. There exists in this part of the study area a linguistic and ethnic diversity beyond that of any other part of the area. The language spoken in and around Coixtlahuaca was Chocho rather than Mixtec. Coixtlahuaca is still known as a Chocho town as are Tulancingo, Acutla, Vista Hermosa, and Teotongo. These four towns are all in the northern part of the valley. Tamazulapan is today said to be right on the boundary between Chocho and Mixtec speaking areas. I suggest that the boundary zone indicated in area 8 is the archeological manifestation of this linguistic and ethnic gradient.

The stronger relationship of Tamazulapan than Tejupan to the northern region has been shown archeologically through the analysis of Yanhuitlán Fine Cream ceramics. The relationship of the northern areas to Coixtlahuaca cannot yet be archeologically demonstrated because Coixtlahuaca has not yet been surveyed. Indirectly, it can be argued that the presence of artifacts imported from Tehuacán and areas to the north and east in the Tamazulapan Valley indicates ties between those areas and Tamazulapan. Such connections may well have been

had boundaries with its contiguous neighbors. Archeological manifestations of limited distribution of several varieties of Yanhuitlán Fine Cream in areas between the center of Tejupan and the adjacent communities of Tamazulapan, Teposcolula and Tulancingo are interpreted as indicators of economically and politically significant boundaries.

With this reconstruction complete we can go on for the first time to comparison of two operative political units in the Mixteca Alta as complete regional entities. The population distribution of one señorío can be compared to that of the other. Environmental variability of each can be assessed and fundamental variation in human adaptation to that environmental base can be examined. The differential history of one unit can be compared and contrasted to the other, not as one town to another but as one complete señorío to another.

Acknowledgements

effected through the interregional marketplace at Coixtla-
huaca. Two imported ceramic types, Coxcatlán Red-on-Orange
and Moral Brown-on-Orange (almost surely a variant of the
prior type), are of Tehuacán manufacture. Their distribu-
tion is almost exclusively in the northern areas and near
Tamazulapan. Cholula Incised, Miguelito Hard Gray Fondos
Sellados, and Teotitlán Incised are also probably imports
which would have come through the same market connection.
They are each found most commonly in the north and to a lesser
degree at Tamazulapan and Tejupan. Aztec Black-on-Red and
Black-on-Orange are also found mostly in the north and near
Tamazulapan.

Conclusions

This analysis has shown that through the reasoned combi-
nation of ethnohistoric and archeological approaches substan-
tial progress can be made in the quest for a means to discover
and characterize boundaries between neighboring political,
economic, and social entities. No strict formula has been
proposed for use in any context but in this case interpretable
results have been derived--results which seem consistent with
other lines of evidence. The interdisciplinary approach is
what has allowed this degree of success.

Both ethnohistoric and archeological evidence suggest a
relationship between the northern area and the Chocho ethnic
group. There is good evidence for a transition or gradient
between Chocho and Mixtec linguistic affiliations in this
area. Similarly, there is no solid evidence for the regional
autonomy of Teotongo or any other community in the northern
part of the Tamazulapan Valley. Therefore, the presence of
an archeologically recognizable transition zone in this area
is interpreted as a material correlate of a cultural reality,
the linguistic and ethnic gradient within the señorío of
Tamazulapan.

Ethnohistoric evidence strongly suggests that Tejupan was
politically independent for most of its history. It surely

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MIXTEC DIALECTOLOGY: INFERENCES FROM
LINGUISTICS AND ETHNOHISTORY

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This analysis of Colonial documents written in Mixtec investigates the antiquity of some of the dialectal differences and their registration in Colonial orthography. When we began this study we did not know to what extent Colonial Mixtec manuscripts existed, or whether all official documents were in Spanish even in the early periods. And if not Spanish, it was possible that a single dialect of Mixtec, such as that of Teposcolula, might have been imposed on all provincial courts and convents. From the linguistic point of view, we were interested to see if the dialect areas posited from linguistic data are perceptible in the 16th century documents. That is, with two complementary sets of data--modern word lists and early Colonial transcriptions of Mixtec, from roughly the same areas--would we find the expected agreements? Would there be dialect areas identifiable in the documentary sources that coincided with those postulated from modern spoken varieties of Mixtec? We found both texts in Mixtec and differences in the dialects they record.[1]

The Documents from the Archives

To date we have located more than 100 documents written in Mixtec, the majority from the Archivo del Juzgado de Teposcolula (AJT) or the Archivo General de la Nación (AGN) of Mexico

Spores, Ronald

    1967   <u>The Mixtec Kings and Their People</u>. University of
              Oklahoma Press, Norman.

    1969   "Settlement, farming technology, and environment in
              the Nochixtlan Valley, Oaxaca", <u>Science</u> 166:557-569.

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              Valley, Oaxaca</u>. Vanderbilt University Publications in
              Anthropology, 1. Nashville.

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    1976   "Survey of the market system in the Nochixtlan Valley
              and the Mixteca Alta", in S. Cook and M. Diskin, edi-
              tors, <u>Markets in Oaxaca</u>, University of Texas Press,
              Austin, pp. 107-131.

Domingo Tonalá, Santiago Apoala, Santiago Juxtlahuaca, Santiago Tilantongo, and Villa de Silacayoapan. Although we found Mixtec texts only in Tecomaxtlahuaca, Tilantongo and Yucunama, it is likely that more documents with Mixtec texts will be discovered in other towns as yet unvisited.

Initially, we considered the possibility that the documents we encountered written in Mixtec were only copies of the original documents, made by the scribes on the juzgados (courts) in which the different affairs were being treated. A meticulous analysis of these documents has convinced us that in the great majority of the cases we have in our hands the original texts of the wills, letters, deeds, and other legal papers. These same legal briefs, in some cases, indicate this:

> ...el señor Alcalde Mayor habiendo visto el testamento reducido a la idioma castellana dijo que acumulado con su original a estos autos...

> ...the Alcalde Mayor, having seen the will translated into Spanish, said that it be filed with its original for these proceedings...

> (AJT leg. 43, exp. 29)

We have analyzed the style of the letters and the paper on which these Mixtec texts were written, and find that the quality and style of the characters are very different from those of the public scribes of Teposcolula. The signatures of individuals who were deceased by the time of the juridical proceedings, when the documents were entered as evidence to the court of Teposcolula, further confirms the local origin of these documents. Also, the paper of the original Mixtec texts was often much smaller than that used by the public scribes of Teposcolula, Yanhuitlán, or Mexico, and often did not bear seals.

Thus we maintain that the documents were written in different parts of the Mixteca: in the regions of Teposcolula (San Pedro y San Pablo Teposcolula, Yucunama, Yolomecatl, etc.), Tlaxiaco (Tlazultepec, San Pedro Mártir Chocaltepec, etc.), Yanhuitlán (Santo Domingo Yanhuitlán, San Pedro Topiltepec, Santa María Magdalena Yucucata or Zahuatlán), Coixtla-

City; a few come from some of the local archives which Romero
and Jansen visited in the Mixteca Alta and Baja (Appendix III
presents a complete index of these documents). Eight of these
documents were written during the 16th century, 43 during the
17th century, and 53 during the 18th century. Upon analyzing
the content of these documents, we found that those from the
16th century are each of a different type: letter, deed, law-
suit, etc. From the 17th century, however, 65% of the docu-
ments are wills, 16% are deeds and bills of sale for land and
houses, and the remaining 19% include documents of diverse
types (letters, statements, probates, community accounts,
etc.). During the 18th century, the proportions are much the
same: 66% are wills, 15% are titles and bills of sale, and
19% various. The correspondence between these two centuries
suggests that we have obtained a representative sample of the
types of documents which existed in Mixtec during the early
Colonial period.

The texts found in the Archivo del Juzgado de Teposcolula
are the result of a systematic search carried out by Angeles
Romero and Ronald Spores (1976), covering the first 54 legajos
inventoried in this archive. There are still more documents
in Teposcolula not yet reviewed, and it is almost certain that
they contain many more Mixtec texts. Mary Elizabeth Smith has
given us a list of documents found by her in the Archivo Gene-
ral de la Nación in Mexico City. Certainly a systematic
search of this archive would bring to light more texts. There
are doubtless more Mixtec texts in other archives and libraries
both within and outside of Mexico; we have examined only the
library of the Sociedad Mexicana de Geografía y Estadística
and the historical archive of the library of the Museo Nacional
de Antropología.

Within the Mixtec area itself, we have visited to date the
following places: Chalcatongo de Hidalgo, Huajuapan de León,
Magdalena Jaltepec, San Jerónimo Sosola, San Juan Sosola, San
Martín Huamelulpan, San Miguel Tlacotepec, San Pedro Yucunama,
San Sebastián Tecomaxtlahuaca, Santa María Yolotepec, Santo

of the public scribes from the Alcaldías Mayores (district
courts). But on the other hand, they give us a greater as-
surance that the local scribes are likely to have registered
the local dialect, and they offer the possibility of knowing
what was written by the Indians themselves, and since these
legal documents were almost always written in the presence
of government officials and the various witnesses, we are
further assured that those present understood the dialect
being written.

Thus we believe that these Colonial documents are re-
liable samples of the dialect spoken at a given time in a
given place, and as such have much to offer to the linguistic
studies of Mixtec. Although much has been written about the
importance of the dialect of Teposcolula as a medium of com-
munication throughout the Mixteca, we do not find it reflected
in the documents from other dialect areas. Apparently the
Spanish administrators did not attempt to unify the Mixtec
language, and they did not impose the use of the Teposcolula
dialect for legal documents written in the Indian language;
this fact has allowed us to distinguish some of the dialect
differences which existed during the three centuries of the
Colonial period.

We have Mixtec texts from the Teposcolula area, where
the dialect studied by de los Reyes (1593) and Alvarado (1593)
was spoken. We also have texts in the Mixtec of the Tlaxiaco-
Achiutla-Chalcatongo area, and from the area of Yanhuitlán
(Zahuatlán, Yucuita, Sayultepec), from which Jaltepetongo dif-
fers somewhat. We also have texts from the regions of Tilan-
tongo, Cuilapan de Guerrero (Chapultepec, in the Valley of
Oaxaca), and the Mixteca Baja (Tecomaxtlahuaca, Tonalá, Hua-
juapan, and Acaquizapan). Although we have no texts from the
Mixteca de la Costa, we know both from Antonio de los Reyes
and from the glosses on a few pictographic manuscripts (the
Lienzo of Jicayán, the Codex Colombino-Becker) that this re-
gion also formed a separate linguistic entity. We emphasize
that neither the search for documents nor their analysis has

huaca, Achiutla, Tamazulapan, and in a few communities of the
Mixteca Baja (see Appendix III). We still have not made a re-
connaisance of the Mixteca de la Costa to locate documents in
the local archives of that area.

The majority of these Mixtec documents were written by
the scribes of the indigenous cabildos (town halls) of the
above-mentioned communities, men who surely belonged to the
group of the principales (elders):

> ...como están los testamentos en la lengua mixteca y
> trasuntarla en la lengua castellana con tres princi-
> pales de este pueblo de Yanhuitlán que han ejercido
> oficio de escribano en la republica que saben las dos
> letras mixteca y castellana y leen con claridad con
> uno y otro y ansi trasuntamos estos testamentos...

> ...since the wills are in the Mixtec language, and are
> translated into the Spanish language by three elders
> from this town of Yanhuitlán who have held the office
> of scribe in the country, who know both Mixtec and
> Spanish letters and read with clarity either one, in
> this manner we transcribe these wills...

> (AJT leg. 50, exp. 38, f. 5)

The documents dating from the second half of the 16th century
show that from this early period Indian scribes already ex-
isted in various indigenous communities of the Mixteca, lit-
erate in their own language, and that local literacy was
maintained during all of the Colonial period (see Appendix
II). During recent times, however, this practice has disap-
peared, so much so that the authorities of various of the com-
munities which we visited were surprised to know that it was
possible to write in Mixtec.

Not all the documents were written by the cabildo
scribes, however; some of the wills and letters were written
by caciques, some even by common folk. There also exist in-
quiries carried out in cases of murder, written by a govern-
ment official (two documents written in 1602 in Tamazulapan).
The fact that some of the documents were written by local In-
dian citizens can create some problems in their decipherment,
because most of the time their writing is less clear than that

various Mixtec dialects, principally Teposcolula and Yanhuitlán but also commenting on Tlaxiaco-Achiutla, Coixtlahuaca, Cuilapan, Tejupa, Tilantongo, Mitlatongo, Tamazulapan, Jaltepec, Nochixtlán and the Mixteca Baja. This prologue is of fundamental importance for the dialectology of Mixtec, because it presents a discussion of the different pronunciations and idiomatic variants in the diverse regions of the Mixteca. Certain of the correspondences noted by de los Reyes were treated by Bradley and Josserand (1978): the dz of Teposcolula corresponds to s in Tlaxiaco (proto-Mixtec *s); the s of Teposcolula corresponds to the ch of the Coast and to the j of Tlaxiaco (proto-Mixtec *x).

De los Reyes is very insightful in his comments and presents with clarity some of the key differences found in the Mixteca Alta. It is surprising that he treats them so lightly, for they are of great importance for distinguishing varieties of Mixtec and must have impaired communication. De los Reyes' own attitudes towards the language situation influenced his presentation of the Teposcolula dialect. Besides his more technical discussion, his interests as a missionary are clear from his remarks; he was concerned with finding (or creating) a standard language which could be used for preaching throughout the Mixteca Alta. It is true that he had a vested interest in the Teposcolula dialect, and with good reason. The aim of his Arte and the complementary Vocabvlario en lengva misteca published by Alvarado in the same year (1593) was to provide the Dominicans with the necessary materials for preaching the Gospel in the language of the region, and it is significant that for this purpose they chose the dialect of Teposcolula: "...la /lengua/ de Tepuzculula es mas universal y clara, y que mejor se entiende en toda la Mixteca" ("...the language of Teposcolula is more widespread and clearer, and the best understood in all the Mixtec region")(de los Reyes 1593:iii). Furthermore, de los Reyes appears to believe that this dialect represented the most original and authentic form of the Mixtec language:

been completed, and therefore the conclusions offered here are only preliminary.

In Appendix I we present examples of some of the most obvious and diagnostic differences between the varieties of Mixtec recorded in 16th century documents from ten towns.

The Linguistic Background for the Analysis

When trying to analyze the linguistic features that might be recorded in these early Mixtec documents, it should be remembered that 16th century Spanish had sounds other than those common in New World Spanish today. Orthographic practices then current may obscure our understanding of the Mixtec forms, but close attention to internal characteristics of the dialects represented and an understanding of Colonial Spanish phonology will almost always render the Mixtec transcriptions intelligible. Although they must be read with care, the 16th century Dominican linguists, Fray Francisco de Alvarado and Fray Antonio de los Reyes, have much of interest to say concerning the language and social groupings of the Mixteca. De los Reyes gives some beguiling and very accurate phonetic descriptions; for example, when explaining the two-letter sequence dz, he says (de los Reyes 1593:2) "En la pronunciación de la dz herimos blandamente en la d, y mas rezio en la z..." ("In the pronunciation of the dz, we strike softly on the d, and more strongly on the z..."). If we remember that in 16th century Spanish the z was pronounced as Ө (theta, voiceless interdental fricative), then this statement is easily understandable as an attempt to describe the pronunciation of a fricative đ, essentially a voiced Ө. Again, in explaining the pronunciation of the sequence vu, de los Reyes (1593:3) says they should be spoken "hiriendo con ambas vu de suerte que sola vna se entienda clara y distintamente" ("striking both the letters vu so that only one is heard clearly and distinctly"); the sound thus described is a single sound, the semivowel w.

The eight pages of de los Reyes' prologue to his 1593 Arte en Lengva Mixteca are filled with interesting information about

dando el primer lugar a lo mas perfecto, como lo es esta
lengua en la pronunciacion, y que ella mejor que otra de
la Mixteca se puede escribir mas cumplidamente con todas
las letras.

It would appear that the rest of the languages here men-
tioned are <u>daughters of that of Teposcolula</u>, and are de-
rived from it, giving first place to the most perfect, as
that language is in its pronunciation, and it is also the
best language among all the rest of the Mixteca for
writing most correctly, with all of the letters.

(de los Reyes 1593:v)

The sense that should be understood here is that from the
Teposcolula dialect the forms of words in other dialects could
be predicted, thus the practical value of Teposcolula Mixtec
for written intelligibility was greatly enhanced. This fact,
which we do not dispute, is probably a result of Teposcolula
being in the center of innovations for almost all of the pho-
nological changes which have affected Mixtec speech communi-
ties, both a result and a contributing factor to its continu-
ous importance in prehistoric times. This does not mean, how-
ever, that it was the oldest variety, or the "purest" in any
linguistic sense (it certainly was not the most conservative).
If it was used as a <u>lingua franca</u> throughout the area, or at
least in most of the Mixteca Alta and Baja, it was as a sort
of "standard" or second, more refined language for the more
cosmopolitan segments of the population. It is not clear from
de los Reyes' assertions about the widespread intelligibility
of Teposcolula Mixtec whether he includes all classes of people
or only the upper classes and merchants, nor what geographic
extent that intelligibility might have, although he does men-
tion specific towns to which his statements apply.

Establishing dialect areas and talking about mutual intel-
ligibility or lack of it, although both depend on rigorous and
ample data bases, still represent subjective assessments of
real-world phenomena. The boundaries between varieties of Mix-
tec which we have drawn from linguistic data certainly reflect
real differences between types of speech, but the question re-
mains, what do these differences mean to the speakers them-
selves? The same is true for the results of intelligibility

Pero hablando sin agravio delos de mas pueblos de la
Mixteca que merecen mucha loa y tiene otras cosas par-
ticulares que notar en ellos, de el de Tepuzculula po-
demos dezir que es el que mas ha conseruado la entereza
de la lengua y que con menos mezcla de otras se halla
el dia de oy...

But speaking without prejudice towards the rest of the
towns in the Mixteca, which merit much praise and have
other noteworthy features, it is in Teposcolula that we
can say that the integrity of the language has been most
preserved, and today has less mixture from other langua-
ges...

<div style="text-align: right">(de los Reyes 1593:iii)</div>

At the end of his prologue, Fray Antonio explicitly observes:

Enfin aunque son muchas las diferencias desta lengua Mix-
teca como esta dicho, y que en vn mesmo pueblo se suelen
hallar barrios que tienen diuersos vocablos, y distintos
modos de hablar, es consuelo muy grande saber, que el que
entendiere bien la lengua de Tepuzculula, la puede hablar
en todas las partes dichas de la Mixteca, con seguridad
de que sera entendido de los naturales. Y ya que no sea
en tanto grado la de Yanguitlán, por las particularidades,
que tiene, no dexara de entenderse entre los principales,
y gente que cursa los caminos, y pueblos, con sus tratos,
y mercaderias, y la gente plebeya sacara vnas razones que
otras.

Finally, although there are many differences in the way
this Mixtec language is spoken, and in a single town it
is possible to find neighborhoods which have different
words and distinct manners of speaking, it is a great
comfort to know that he who understands the language of
Teposcolula well can speak it in all the mentioned parts
of the Mixteca, with the security of being understood
by the Indians. And although the same does not hold to
such an extent for the language of Yanhuitlán, because
of the peculiarities it has, it can still be understood
among the elders and the people who travel the roads and
towns with their trades and merchandises, and even the
common people can catch a word or two.

<div style="text-align: right">(de los Reyes 1593:viii)</div>

These texts may be interpreted as indicating that the dialect
of Teposcolula functioned as a lingua franca in at least part
of the Mixtec region; de los Reyes states that it was the var-
iety most widely understood, and that the other varieties were
derived from it:

...parecen los de mas lenguas de que aqui se haze mencion,
hijas de la de Tepuzculula, y que se deriuaron de ella,

areas. Furthermore, we have been reconstructing the linguistic development of these dialects from a common period--proto-Mixtec--and it is difficult to deal with many finely distinguished varieties in such a reconstruction. We have presented our analysis of the development of twenty representative varieties (Bradley and Josserand 1978); for purposes of this comparison with documentary sources we have chosen eleven of these varieties plus data for Teposcolula from the Colonial sources (de los Reyes and Alvarado). These towns are: Cuilapan de Guerrero, San Bartolo Soyaltepec, San Juan Mixtepec, San Miguel Achiutla, San Miguel el Grande, San Pedro Jicayán, San Pedro Tututepec, Santa María Peñoles, Santiago Apoala, Santiago Tilantongo, and Silacayoapan. Map 1 shows these and other Mixtec towns divided into dialect areas on the basis of Bradley and Josserand's linguistic study (1978).

Dialect Areas

The general picture from the linguistic data is of dialect areas which correspond roughly to valley and river systems, such as the Nochixtlán Valley, or the Achiutla-Tlaxiaco systems, or the Juxtlahuaca-Mixtepec area which drains to the Río Balsas, or the upper Balsas drainage around Acatlán, Puebla. For purposes of the present analysis we have chosen five large dialect areas (Map 1), all internally diversified, which can be established by a restricted but diagnostic number of linguistic features:

I. The Central and Eastern Mixteca Alta includes the broken highlands west of the Valley of Oaxaca and probably also all of the larger structural basins in this high mountain area: Teposcolula, Tamazulapan, Coixtlahuaca and the Valley of Nochixtlán.

The Nochixtlán Valley is clearly a key area for understanding the dynamics of the prehistoric Mixtecs; it is the largest valley in the entire Mixtec region, and as a dialect area it is paradoxically sometimes the most homogeneous (because it is a bounded, well-integrated area) and sometimes the

testing; an excellent modern survey has been carried out in the Mixteca on comprehension of neighboring varieties of speech, with the aim of establishing which dialects reach the greatest number of speakers for planning literacy materials (see Egland 1978). But it is the analyst of these data who decides at what level of mutual intelligibility communication is seriously impaired, when we are dealing with the same language, and when lack of comprehension indicates different languages. These arbitrary divisions should be recognized as such, but they are based on experience and realistic expectations; generally after three or four independent sound changes, intelligibility is impaired. Also, there is a difference between types of sound changes (or other linguistic innovations): an innovation which changes the phonological system is much more devastating to intelligibility than a change which affects the content but not the structure. In Mixtec, the change of *s̱ to ḏ is of minor importance for comprehension, whereas the two changes *x̱ becomes č̆ (in the Mixteca Baja), and *ṯ becomes č̆ (in most of the Mixteca Alta), create the same units but in different structures, and are thus likely to mark more permanent disruptions in communication.

Mutual intelligibility depends, above all, on motivation and the attitudes of the speakers, rather than on any objectively definable linguistic criteria. But the fact that the results of two methods of establishing dialect and language boundaries--linguistic isoglosses and intelligibility testing-- usually produce congruent or parallel divisions, even though their bases for establishing dialect areas are different, gives us more confidence that these divisions accurately reflect the linguistic reality. To date, the intelligibility studies (Casad 1974; Egland 1978) have made finer cuts in subgroupings than we have proposed on the basis of other linguistic data. Although it is certainly possible to further subdivide the areas on the basis of linguistic features, we have not done so here. We have been more interested in the larger groupings as evidence of diffusion spheres and related dialect
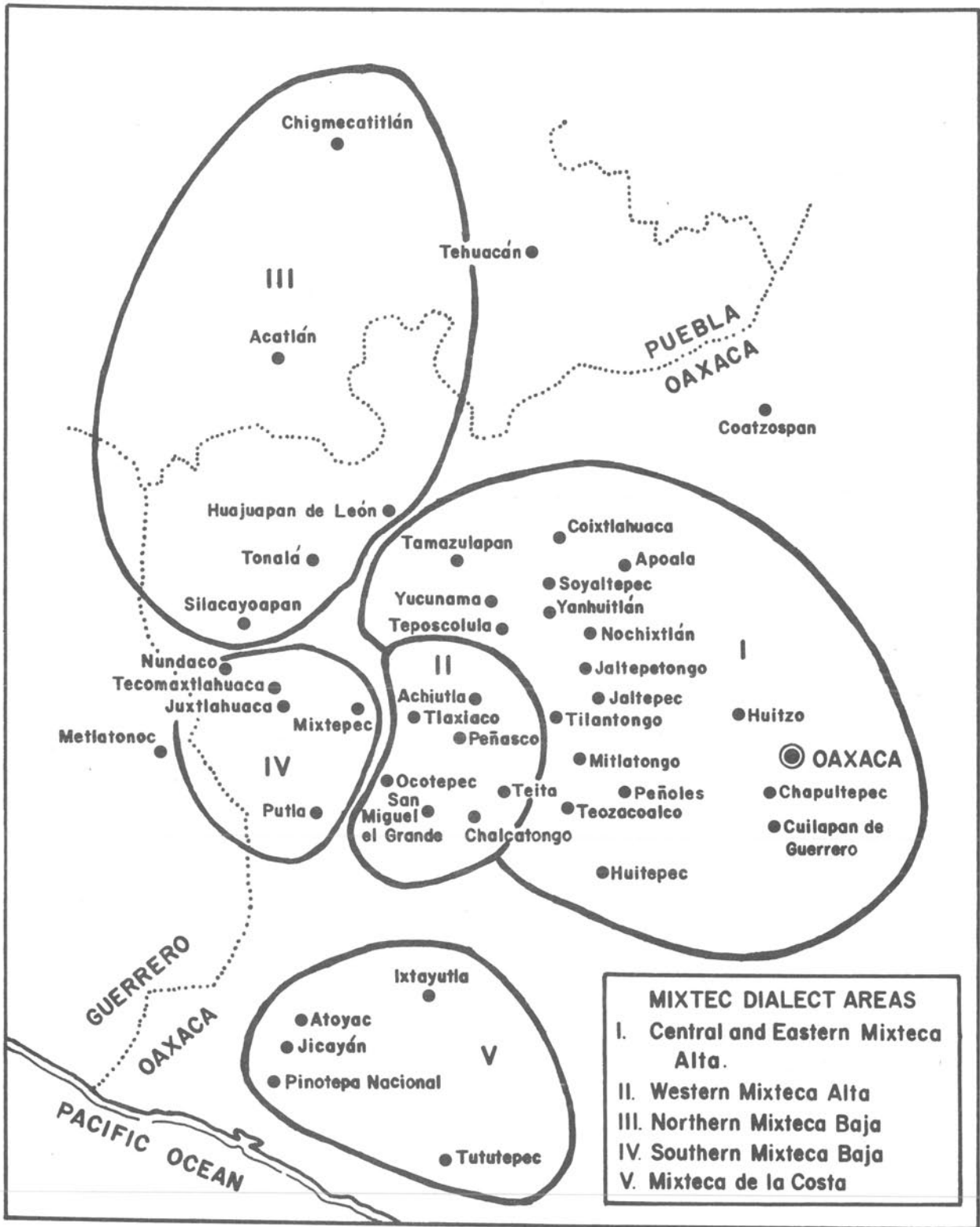
Map 1.   Mixtec dialect areas.

most diverse (because of the greater time-depth of the settle-
ments in the valley) of all the regions we will here discuss.
Its influence extends into the adjacent parts of the mountain-
ous areas to the south and east towards Tilantongo, Mitlatongo,
Peñoles and the Valley of Oaxaca. Groups controlling the No-
chixtlán Valley must certainly have been important in the rest
of the Mixteca. Although numerous towns with Mixtec speakers
remain in the valley, the largest and most important towns
(both pre- and post-Conquest) are now wholly Spanish-speaking.

The two centers treated here are Yanhuitlán and Teposco-
lula, both seats of large and important Dominican convents
established early in the 16th century. Linguistic data for
Teposcolula are taken from Alvarado and de los Reyes. For
the Yanhuitlán area, which forms the northwestern arm of the
Nochixtlán valley, linguistic data come from the modern vil-
lage of San Bartolo Soyaltepec. Other towns from the linguis-
tic sample which frequently follow the same linguistic pattern
exhibited by Yanhuitlán and Teposcolula include Tilantongo and
Peñoles in the eastern Mixteca Alta, and Cuilapan de Guerrero
in the Valley of Oaxaca. Coatzospan, to the northeast, and
Silacayoapan, to the west, show some similarities to the No-
chixtlán area, but probably belong to distinct dialect groups;
other changes, not discussed here, serve to differentiate these
latter areas.

II. The Western Mixteca Alta, which lies south and west
of the Yanhuitlán-Nochixtlán valley system, centers around
Tlaxiaco and Achiutla and terminates in the south in a high
mountain massif called Yucuyacua, "Crooked Mountain", near
Chalcatongo and San Miguel el Grande. This is a very broken,
mountainous area over 7000 feet in altitude, and is character-
ized by many small, long valleys, separated by knife-edged
ridges, all draining to the Pacific. The ridges are the geo-
graphic barriers to communication, and the linguistic dialect
boundaries coincide with the ridges and group into larger
units parallel to the hydraulic systems. The Western Mixteca
Alta dialect area is represented in the linguistic data by San
Miguel Achiutla and San Miguel el Grande.

Linguistic Diagnostics

Among the linguistic diagnostics which define and char-
acterize these five dialect regions are five of the more wide-
spread changes (Map 2) of the set of sixteen phonological in-
novations which Bradley and Josserand (1978) have reconstructed
to account for the development of the modern varieties of Mix-
tec from proto-Mixtec. These changes, in their probable order
of occurrence, are:

1. Proto-Mixtec *t becomes tn before nasalized vowels.
The development of this conditioned variant of t is character-
istic of 16th century Teposcolula and of Soyaltepec (Yanhui-
tlán), Achiutla, San Miguel el Grande, Tilantongo, Peñoles,
and Cuilapan; that is, almost all of the Mixteca Alta, both
Central-Eastern and Western dialect areas. This innovation
did not reach Apoala, Silacayoapan, Mixtepec, nor any of the
coastal towns. It does occur in the Tonalá-Acatlán areas of
the upper Balsas drainage, however, and probably represents
colonization of that area from the Nochixtlán Valley, presum-
ably the innovating center for this change. This is an early
phonological change which essentially defines the central
region and distinguishes it from the peripheries. It indi-
cates that by this time there was a separate population in the
Mixtepec-Juxtlahuaca area of the Mixteca Baja, which did not
participate in the innovation. It is probable that all areas
of the Mixteca Alta were populated when the change occurred,
but they were not very distinct linguistically from the No-
chixtlán area.

This change can be identified in the documentary sources
through inspection of the data presented in sets 36, 37, 39
and 40 of Appendix I. As expected, the innovation occurs in
the Mixteca Alta towns. Its appearance in Jicayán, however,
seems anomalous when compared to modern coastal dialects, and
the same is true for its occurrence in Tonalá and Nundaco in
the Mixteca Baja.

2. Proto-Mixtec *s becomes đ (a voiceless fricative be-
comes fronted and voiced; often written as dz in Colonial

III.   The <u>Northern Mixteca Baja</u>, or the upper Balsas
drainage, includes Acatlán, Huajuapan de León, Tonalá, and
Silacayoapan, from north to south. This very large area is
inadequately represented in the linguistic data, since we have
included only one town, Silacayoapan, in this analysis. Sev-
eral subdivisions of this area appear when more towns are in-
cluded and the analysis is refined (Josserand, in preparation).
The towns near Acatlán on the Río Mixteco in southern Puebla
form such a sub-group, distinct from the northernmost town of
Chigmecatitlán. The towns between Huajuapan de León and Sila-
cayoapan are linguistically quite diverse, and also reveal
many small sub-groupings.

IV.   The <u>Southern Mixteca Baja</u> includes the area around
San Juan Mixtepec and Santiago Juxtlahuaca. Like the Northern
Baja, this region drains into the Balsas, but via a distinct
system. These two dialect areas of the Mixteca Baja are but
two of the several suspected dialect groupings in the Mixteca
Baja and western Mixtec area, which extends into the Guerrero
highlands adjacent to Oaxaca, with a high mountain refuge
around Metlatonoc. This is an important area which spawned
several out-migrations towards the Pacific Coast, and it dif-
fers markedly from the Mixteca Alta dialect areas. In general,
the Northern Mixteca Baja dialects relate more closely to the
Central and Eastern Mixteca Alta region, while the Southern
Mixteca Baja more closely connects with the Western Mixteca
Alta area.

V.   The <u>Mixteca de la Costa</u>, occupying the small coastal
plain of Oaxaca traditionally called the Costa Chica, is the
last dialect area included in this analysis. Linguistically
it is represented by San Pedro Tututepec and San Pedro Jica-
yán; the documentary source is the <u>Lienzo de Jicayán</u>, from the
west coast. This dialect group is both recent and relatively
homogeneous, formed by two major population movements which
probably originated in the region of San Juan Mixtepec, reach-
ing the coast by A.D. 900-1000. There are differences between
western and eastern coast dialects, but they are nonetheless
quite similar.
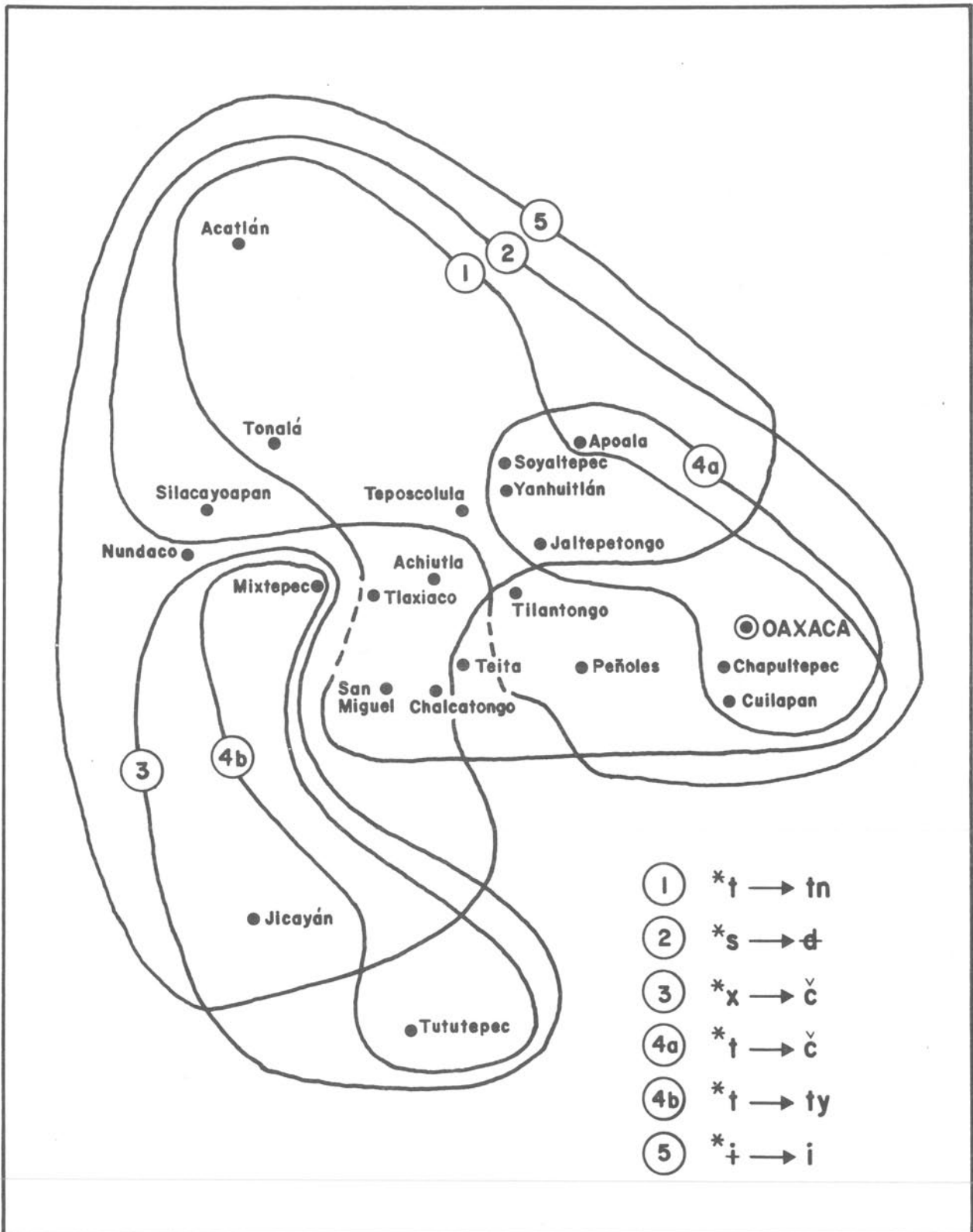
Map 2. Distribution of phonological innovations.

sources). This represents a change in the pronunciation of
words with the s̲ sound, and is an innovation in the speech
habits of the Nochixtlán-Teposcolula Mixtecs, which spread as
their cultural influence expanded into adjacent areas of the
Mixteca Alta (to towns like Tilantongo and Peñoles), and ulti-
mately into the Valley of Oaxaca (Cuilapan), west into the
upper Balsas drainage (Silacayoapan), and north (Apoala).

The documentary forms showing this change can be seen in
sets 1-6, 18, 25 and 41 of Appendix I, where all the sources
except those from Chalcatongo, Nundaco and Jicayán show the
innovation.

3. Proto-Mixtec *x̲ becomes č (a voiceless fricative
fronts and becomes an affricate; usually written ch̲). This
pronunciation change, characteristic of the speech of San Juan
Mixtepec and of the coastal populations which emigrated from
that area, defines the variants of the lower Mixteca Baja and
the Costa Chica. It is one of the changes which causes most
difficulty in intelligibility with other dialects because
other areas developed the same sound, č, but from a different
source (see below). This means that the same element partici-
pates in different structures; homonyms were created that did
not previously exist, and a stronger barrier to communication
between the areas now emphasized the independence of the Mix-
tepec-Juxtlahuaca area.

In the documentary sources only Jicayán shows the innova-
tion, as expected, since there were no documents from other
coastal towns or from San Juan Mixtepec. Sets 21 and 34 of
Appendix I give the data corresponding to this change.

4. Proto-Mixtec *t̲ becomes č (palatalized and affricated)
or ty̲ (palatalized only) before front vowels. These two paral-
lel innovations took place in different (complementary?) re-
gions of the Mixteca.

The development of the affricate č before the front vowel
i̲ is common to all of the Mixteca except for the coastal towns,
but the development of this same č sound before the front vow-
el e̲ has a much more restricted distribution, as shown by line

tongo and Teposcolula, where e regularly appears instead of *ɨ.
Sets 7, 8 and 41-44 in Appendix I show the documentary data for
this innovation.

Several towns show mixed reflexes, between i and ɨ (San
Miguel el Grande, Cuilapan), and others between i and e (Tona-
lá, Nundaco, Teita). Chalcatongo shows only i in the documen-
tary sample, but both i and ɨ in the modern data. Tilantongo
shows e in the documents cited here, but ɨ is regularly report-
ed in modern linguistic materials. Since ɨ was not a vowel
found in Spanish, it is possible that in the 16th century
sources it was spelled with e, the closest Spanish vowel
sound; the appearance of e where ɨ is expected in the Tilan-
tongo document might also be attributed to the spelling con-
ventions of a central area Mixtec scribe, whose dialect would
be expected to have e.

The mixed reflexes which correspond to this sound change
present a complex pattern, perhaps reflecting a change still
in process during the 16th century. It appears from internal
linguistic evidence to be a relatively late phonological de-
velopment, and its presence may reflect the impact of a foreign
language with a 4 or 5 vowel system, such as Nahuatl, whose
speakers were making incursions into Mixtec territory before
the Spanish Conquest. More important than who participated
in this innovation, from our point of view, is who resisted
it--the conservative areas of the Mixteca Alta (Tilantongo,
Teita, Peñoles) and the east coast (Tututepec). Although
shared retentions are not good evidence for sub-grouping, and
we do not suggest grouping the east coast with the Peñoles
area, this change does serve to distinguish the east coast
from the Mixtepec area, and the retention of the old six-vowel
system coincides generally with the Señorío of Tututepec, well
known in late Postclassic Mixtec history.

4a in Map 2. It is the defining characteristic for a sub-area
of the Mixteca Alta which includes the towns of Apoala, Soyal-
tepec and Cuilapan; the documentary sources for Yanhuitlán,
Jaltepetongo and Chapultepec also show the change (see sets
12, 13 and 14 in Appendix I; note that there were no examples
of *t̲ before i̲ in the sample set of words from the documentary
sources). This change, *t̲ becomes č̲, is structurally important
within Mixtec as a whole, for it is responsible for the crea-
tion of the č̲ sound in most of the Mixteca, but from a differ-
ent original sound than the č̲ of the Coast and Mixtepec (see
change 3).

The alternant form of this innovation, 4b, accounts for
the development of a palatalized alveolar stop t̲y̲. This par-
ticular presentation of the change is limited to San Juan Mix-
tepec and the second wave of emigrants to leave that area for
the Coast. It is not characteristic of the first emigrating
populations, already settled on the west coast by this time.
Thus Mixtepec and San Pedro Tututepec (and other towns of the
eastern coast) share this change, but San Pedro Jicayán and
other west coast towns do not. Since the documentary sources
for Appendix I include only Jicayán from this area, the t̲y̲
does not occur in the sample, but its absence can be confirmed
through an inspection of sets 12 and 13.

5. Proto-Mixtec *ɨ̲ becomes i̲. This change merges two
vowels into one and is therefore very important structurally
because it reduces the vowel inventory. It is common to most
of the Mixtec region except for the eastern Mixteca Alta and
the east coast, where the original ɨ̲ is retained. There is
a contrast between the data from the linguistic study and
that from the documentary sources, however. In the documen-
tary sources this innovation seems to have a different form;
most of the 16th century developments are e̲ rather than the
ɨ̲ found in Bradley and Josserand's (1978) sample. Further in-
vestigation reveals a sub-area, again in the Mixteca Alta, in-
cluding the towns of Apoala, Soyaltepec, Yanhuitlán, Jaltepe-

16th century. Linguistic data enabled the delineation of
large dialect areas, which we hypothesized would be character-
ized by specific orthographic conventions, or at least that
the sounds would be distinguished adequately. The documentary
sources do confirm the hypothesis. With this preliminary
study as a foundation, we believe that a more careful inspec-
tion of early documentary sources will yield more evidence
for reconstructing the dialect situation during early Colonial
times.

Aside from the importance of these documents for the lin-
guistic analysis of Mixtec dialects, we do not wish to omit
mention of the enormous value of the data contained in these
documents, written by the Mixtecs themselves. These early
Colonial Mixtec sources are particularly intriguing with re-
spect to our understanding of the system of land tenure in
the Mixteca, and for studies of social stratification and the
lines of succession and inheritance among the noble classes.

The great number of documents located so far could be more
than duplicated by an exhaustive investigation in the Teposco-
lula archive, in the Archivo General de la Nación, and in the
many municipal and parochial archives. We believe that the
custom of writing in Mixtec was very widely diffused in the
Mixteca during all of the Colonial period (see Appendix II).
This custom may have been determined at least in part by two
circumstances: the political stance adopted by the authorities
of New Spain with respect to the use of the Indian languages,
and the socio-economic situation of the Mixteca itself.

Despite repeated orders sent forth by the Spanish crown,
trying to establish the Spanish language as the official lan-
guage in all its empire and suggesting the manner in which
these orders could be carried out, this policy never had much
success. This was due in part to the difficulties of communi-
cation and to the isolation of many of the Indian regions.
One might suspect that the authorities of New Spain never took
the necessary measures to implement the royal decrees because
it was in their interests to maintain a society of privileged
and non-privileged, in which the use of an Indian language was

Conclusions

Appendix I presents a list of 44 words found in the ethno-historical sources which appeared to be of interest linguistically; that is, they varied in their transcriptions from document to document. These examples demonstrate the problems of Spanish orthography as well as Mixtec intelligibility. Sets 7, 8 and 36 show the various orthographic conventions for transcribing the wi sounds: vui, hui, vj and vi are all used for the same sequence. Set 9 shows the various spellings of ku: qh, cu, c, qu; the letter q alone had the syllable value ku at times. Other sets reveal sound correspondences between dialects rather than variant spellings of the same sounds: examples 1-6, 18, 25 and 41 all show the distinction between dialects with $\underline{d}$ versus dialects with $\underline{s}$ (Tlaxiaco, Nundaco and Jicayán). Sets 12-17, and possibly 19, 20, 24 and 36, show correspondences between $\underline{t}$ and $\underline{\check{c}}$, or $\underline{^{n}d}$ and $\underline{^{n}\check{c}}$ (or $\underline{^{n}\check{j}}$), which do not enter into the present analysis, but are very important dialect differences nonetheless. The correspondence between $\underline{x}$, $\underline{\check{s}}$ and $\underline{\check{c}}$ appears in sets 15, 21 and 32-35 (Tlaxiaco and Teita should have $\underline{x}$, and the Coast should have $\underline{\check{c}}$; where there are data, this hypothesis is confirmed). The expected contrast between $\underline{t}$ and $\underline{tn}$ is unfortunately lacking, probably due to the sample, which does not include enough towns outside the central area. San Pedro Jicayán, which should not show $\underline{tn}$, does so in set 39 (and elsewhere lacks corresponding data). Whether this abnormality should be attributed to a scribal error (hyper-correction), or a transitory imposition of Teposcolula influence on the Coast, is impossible to tell from this limited data. The lack of documents from San Juan Mixtepec and the coastal areas makes it impossible to test for the last two changes selected for dialect definition, the $\underline{t}$ to $\underline{ty}$ correspondence and the merger of $\underline{i}$ with $\underline{i}$.

In conclusion, we have found a satisfactory overall congruence between the linguistic expectations and the ethnohistorical indications of Mixtec dialect differences during the

of linguistic with archeological data as well as ethnohistor-
ical information can and should form the basis for greater un-
derstanding of the social and cultural development of the Mix-
tec as well as other Mesoamerican peoples.

one more trait which marked an individual as Indian and thus subject to tribute-giving. That is, the use of an Indian language in the society of New Spain was one more mark of an inferior status (Heath 1972).

The type of economy which developed in the Mixteca during the Colonial period, dominated by the interests of the merchants who united the region with the Puebla area, tended to perpetuate the indigenous community. The Spaniards obtained important raw materials from the Indian communities (silk, grains, tallow, skins, etc.) and had no need to transform the Indians into salaried workers, which would have functioned as a disintegrating factor for the Indian community and consequently would have favored loss of the native language. On the other hand, the maintenance of their native tongue functioned during the Colonial period as a factor which permitted the identification of the Mixtecs as an ethnic group distinct from other indigenous populations.

The Mixteca had been unified as a political entity during the reign of 8 Deer "Tiger Claw," whose life marked, for the Mixtecs themselves, the beginning of the florescent Mixtec culture of the Postclassic period. After this king's violent death the entire Mixteca was never unified under a single central government, but it did persevere as a cultural entity, with a common ideology: the myth of the common origin of the Mixtec kings in Apoala clearly functioned as a unifying concept. The ruling class was united by ties of kinship, and spoke a language which despite dialect differences was at least partially intelligible in all of the area. Social changes related to the Conquest, and later to the Independence movement, began the decline and disintegration of the Mixtec region as a political and cultural unity, and doubtless these changes have also influenced the linguistic diversification.

Although archeological investigations do not lend themselves to letter-correspondences for linguistic analysis, we believe that they offer other valuable information for understanding the dynamics of these populations. The combination

APPENDIX I

PROTO-MIXTEC RECONSTRUCTIONS AND FORMS
ATTESTED IN 16TH AND 17TH CENTURY DOCUMENTS

Introduction

The forms listed below include a hypothetical proto-
Mixtec reconstruction (based on Bradley and Josserand 1978)
as well as data from Colonial documentary sources. The
sources for this selection of attested forms are as follows:
for Teposcolula, data are taken from Alvarado's Vocabulario
(1593); for Yanhuitlán, data are from a document pertaining
to Yucucata, found in the Archivo del Juzgado de Teposcolula
(leg. 37, exp. 6, f. 10-14v), dated 1625. For Chapultepec,
in the Valley of Oaxaca, data are from a document in the Ar-
chivo General de la Nación (Tierras, vol. 236, exp. 6, f. 2-7),
bearing the dates 1523 and 1692. For Jaltepetongo, the docu-
mentary source is again from the AGN (Tierras, vol. 986, exp.
1), dated 1699/1733 and 1741/1761. Data for Tilantongo were
taken from a book in Mixtec dated 1682 and found in the local
Archivo Parroquial. The document for Teita is dated 1580 and
was found in the AGN (Tierras, vol. 44, exp. 1, f. 195); that
for Chalcatongo, dated 1636, was also found in the AGN (Tierras,
vol. 637, exp. 1, f. 270-271), as was one for Tonalá, dated
1643 (AGN, Tierras, vol. 245, exp. 2). The data for Nundaco,
in the Mixteca Baja, are from a manuscript written in Mixtec
found in the Tecomaxtlahuaca Archivo Municipal and dated 1667.
The sparse data for Jicayán, from the coastal region, are
taken from the Lienzo de Jicayán, an annotated map dating from
the mid-16th to mid-17th century (see Smith 1973:122-147).

	6 llano plain	7 gente people	8 día day	9 cuatro four
PMix	*yoso	*yą yɨwɨ	*kɨwɨ	*kowɨ
Tep	yodzo	ñayevui	quevui	qhmi
Yan	--	ñayehui	quehui	qhmi
Chap	--	--	quihui	cumi
Jal	--	--	quehui	qhmi
Til	yodo	ñayehui	quehui	qhmi
Tei	--	--	qhvj	--
Chal	--	ñayehui	quihui	qhmi
Ton	--	ñayihui	quihui	q (?)
Nun	--	ñayihui	quihui	qūmi
Jic	yoço	--	quivi	--

Glosses	1 padre father	2 hijo son	3 y and	4 dar to present	5 hacer to do
Proto-Mixtec ca. A.D. 500	*sutu	*se?ye	*sawa (=half)	*soko	*kisa
Teposcolula 1593	dzutu	dzaya	dzahua	dzoco	quidza
Yanhuitlán (Yucucata) 1625	dzutu	dzaya	dzahua	--	--
Chapultepec 1523/1692	--	dzaya	dzahua	--	quidza
Jaltepetongo 1699/1733 1741/1761	--	dzaya	dzahua	--	quida
Tilantongo 1682	--	daya	dahua	--	--
Teita 1580	dzutu	dzaya	dzahua	dzoco	--
Chalcatongo 1636	çutu	çaya	çahua	çoco	--
Tonalá 1643	--	dzaya	--	dzoco	quisa/ quidza
Nundaco 1667	--	--	çahua	çoco	quisa
Jicayán mid-XVI- mid-XVII	--	--	--	--	--

	15 verdad truth	16 flor flower	17 llevar to carry	18 palabra word, voice
PMix	*^{n}dixa	*ita	*^{n}deka	*^{n}dusu
Tep	ndisa	ita	ndaca	ndudza
Yan	--	icha	--	dudzu
Chap	--	ita	nchaca	--
Jal	njisa	--	--	--
Til	--	--	--	--
Tei	--	ita	--	ndudzu
Chal	ndihe	--	--	--
Ton	disa	ita	--	--
Nun	--	--	--	nduçu
Jic	--	ita	--	--

	10 hermano brother	11 alguien person	12 asiento seat	13 él he	14 río river
PMix	*yani	*yaʔą	*teyu	*te	*yute
Tep	ñani	ñaha	tayu	ta	yuta
Yan	ñani	ñaha	chayu	cha	--
Chap	--	ñaha	chayu	cha	yucha
Jal	ñani	ñaha	chayu	cha	yucha
Til	--	ñaha	--	--	--
Tei	--	--	teyu/ tayu	--	--
Chal	--	ñaha	tayu	--	--
Ton	ñani	ñaha	tayu	--	--
Nun	ñani	ñaha	tayu	--	yuta
Jic	--	--	--	--	yuta

	23 enfermo sick	24 hombre man	25 mojonera landmark	26 cinco five
PMix	*mai	*teye	*seyɰ	*ợˀợ
Tep	may	tay	dzañu	hoho
Yan	may	--	--	hoho
Chap	may	chee	dzaño	--
Jal	may	--	dzañu 1733 dañu 1761	--
Til	may	tay	--	--
Tei	maa/ may	--	dzeñu	--
Chal	maa	--	--	--
Ton	mey	--	--	--
Nun	mey	--	--	hoho
Jic	--	--	xaño	--

	19 mano/ tributo hand/ tribute	20 yo I	21 jícara/ melón gourd/ melon	22 casa house
PMix	*^{n}daʔa	*^{n}duʔu/ *yuʔu	*yaxɨ/ *yɨkɨ	*weʔye
Tep	ndaha	nduhu	yasi/ yeq	huahi/ quahi
Yan	chaa	nchuhu	--	huahy/ cuahi
Chap	--	yuhu	--	huehe
Jal	--	njuhu	--	--
Til	--	--	--	--
Tei	--	chuhu	yiqh	--
Chal	--	nduhu	yahi	huey
Ton	daha	yuhu	--	huehi/ cuey
Nun	--	yuhu	--	huey/ cuey
Jic	--	--	yachi	--

	31 en on	32 mando I command	33 que what	34 pie foot
PMix	*noo	*taxi/ *toni	*si?i/ *sini	*xe?e
Tep	nuu	yotasi tnunindi	sihi/ sini	saha
Yan	--	yotasi tnuni chu	sihi	saha
Chap	noo	--	sihi	saha
Jal	nuu	--	sihi	saha
Til	--	yotasi tnuni(ndi)	sihi/ sini	saha
Tei	--	tahi tnunindi	--	jhe
Chal	noo	yotaji tnonindi	hiy/ hini	jhaa
Ton	noo	yotasi tnoniyu	sihi	saha
Nun	nuu	yotasi tnoni yu	sihi/ sini	saha
Jic	--	--	--	chaā

	27 tres three	28 carne flesh	29 tierra/ dios earth/ god	30 ciudad city
PMix	*oni	*koyǫ	*yuʔɰ	*yoǫ
Tep	uni	coño	ñuhu	ñuu
Yan	uni	coño	--	ñuu
Chap	oni	--	ñoho	ñoo
Jal	--	--	ñuhu	ñuu
Til	--	coño	ñuu	--
Tei	--	--	--	--
Chal	uni	--	--	ñuu
Ton	uni	qhoño	ñoho	ñoo
Nun	honi	--	--	ñuu
Jic	uni	--	ñuhu	ño

	39 árbol tree	40 asunto work/ task	41 señora woman	42 y and
PMix	*yutu̧	*tiyo̧	*sɨ?ɨ	*ⁿdɨ?ɨ
Tep	yutnu	tniño	dzehe	dehe
Yan	--	tniño	dzehe	dehe
Chap	yutna	--	--	--
Jal	--	tniño	--	--
Til	--	tniño	--	nd̲ehe
Tei	--	tniño	--	--
Chal	tno	tniño	ziy	--
Ton	--	--	dzehi	dihi
Nun	--	--	--	ndihi
Jic	yutnu	--	--	--

	35 nuestro señor our lord	36 hoy today	37 juntar to join	38 milpa field
PMix	*xi to?o ^{n}do	*wita̧/ *witɨ	*ta?a̧	*ito
Tep	stohondo	huitna	tnaha	itu
Yan	--	huitna	tnaha	ytu
Chap	stohondi	huicha	tnaha	itno (?)
Jal	estoho (yu)	huitna	tnaha	ytu/ ytnu
Til	stohondo	huitna	--	--
Tei	--	vitna	--	ītu/ ītnu
Chal	hitohoyo	huitna	--	itu
Ton	stohoyo	huitni	tnaha	ītu
Nun	stohoyo	huitni	--	itu
Jic	--	--	--	--

APPENDIX II

THE MIXTEC LITERARY TRADITION

The tradition of writing in the Mixtec area dates from
the beginnings of our era, as is demonstrated by the hiero-
glyphs found at the sites of Diquiyú, Huamelulpan and Yucu-
ita, all contemporary with late Monte Albán I (300-1 B.C.).
These hieroglyphs are in great part calendric in nature, and
are generally similar to the Monte Albán (Zapotec) tradition.
During the Classic period there was a markedly distinct style
developed in the Mixteca Baja, called Ñuiñé (Paddock 1966:
176-200, Moser 1977). The known inscriptions comprise very
short units, hardly what one would call "texts," but the
presence of authentic texts in this type of glyphs at Monte
Albán clearly indicates the possibilities of this style of
writing. For reasons still not well understood, the system
of abstract glyphs fell into disuse and was replaced by a
pictographic system which presented the desired information
by means of images. An early example of this new tradition
is the Noriega Stela (Monte Albán IIIb-IV), and the culmina-
tion of the tradition is undoubtedly seen in the late Post-
classic Mixtec codices.

Mixtec writing on the eve of the Conquest was fundamen-
tally pictographic. The pictorial manuscripts, or codices,
of this period, of which only a few examples remain, consist
of long narrations presented in the form of painted images
and signs, structured and drawn according to their own well-
developed system of pictographic conventions. It is inter-
esting to note that various elements within the pictographs
function as phonetic indicators on rebus sysmbols for place
and personal names, etc. Thus a hairless chin on a bird's
head serves as an indicator that the bird's head is to be
read "bird" rather than "eagle" or "quetzal" or some other
related word, because "bird" and "chin" are homonyms in Mix-
tec, both having the form dzaa (ɖaa, phonetically); an ex-
ample is the case of the hieroglyph for Tututepec, on the
coast of Oaxaca (Smith 1973:67). Again, a water jug (yoo in
Mixtec) drawn inside the moon (also yoo in Mixtec) serves to
reinforce the phonetic value of the drawing of the moon. Fur-
termore, certain pictographic conventions were related to
specific idioms in the Mixtec language. For example, the way
of indicating a conquest was by painting the place sign with
an arrow stuck through it; this corresponds directly to the
Mixtec phrase for conquest, chichi nduvua ñuhu ñaha (čiči ⁿdu-
ba ñuʔu ñaʔa) "to put an arrow in foreign land" or "to
conquer" (Smith 1973:33).

But taken as a whole, this system of writing did not per-
mit the formalized registration of oral texts. Detailed ex-
planation of the scenes depends on an iconological analysis
and on systematic comparisons with information found in occa-
sional glosses and in the Spanish chronicles, as well as mod-

	43 uno one	44 todo all
PMix	*ɨɨ	*^{n}dɨʔɨ
Tep	ee	--
Yan	ee	--
Chap	--	ndihi
Jal	--	ndehe
Til	ee	--
Tei	--	ndihe
Chal	ee	--
Ton	yy	--
Nun	ee	--
Jic	--	--

ing of the vowel (e.g., ñuhu "earth" or "god" rather than ñuu
"city"). But this convention was seldom used for other occur-
rences of the glottal stop, such as between unlike vowels, or
preceding consonants. Also, in Mixtec there is a contrast be-
tween oral and nasalized vowels which was not indicated in the
early transcriptions of Mixtec, although this phenomenon is
mentioned by Alvarado (see below). Again, Mixtec is tonal,
and although both de los Reyes and Alvarado mention this,
there is no notation of the tones given in any of the early
texts.

Beginning in the 16th century we note the coexistence of
manuscripts with Spanish letters alongside the pictographic
texts. Various codices painted during the Colonial period,
but still in the indigenous tradition, carry glosses in
Spanish, Nahuatl or Mixtec (Codex Egerton, Codex Muro, the
Teozacoalco Map, etc.). It should be pointed out that in some
cases the glosses have no direct relation with the pictorial
content, but rather refer to the Colonial period names for
boundaries, like a "word-map" written on an old document to
give more authenticity to certain claims in lawsuits over
lands. This is the case of the Codex Colombino-Becker (Smith
1966), the Codex of Yucunama, and others (Smith 1963, 1966,
and 1973:126, 137).

An extremely interesting Mixtec document has disappeared;
once in the possession of a vicar of the Dominican convent at
Cuilapan (around A.D. 1600), it was described as

> un libro de mano, que él había compuesto y escrito con
> sus figuras, como los Indios de aquel reino mixteco las
> tenían en sus libros o pergaminos arrollados, con la de-
> claración de lo que significaban las figuras, en que con-
> taban su origen, la creación del mundo y diluvio general...

> a handbook, which he had made and written with figures,
> like the Indians of that Mixtec kingdom had in their
> books or rolled parchments, with an indication of what
> the figures meant, which recounted their origin, the
> creation of the world, and the great flood...
> (García 1729:327)

Gregorio García gives a summary of this book, which demon-
strates that it was based on a Mixtec text whose content had
important elements in common with the Codex Vindobonensis
(Jansen 1976). Burgoa (1934a:288-289) mentions a similar
book (perhaps the same one):

> Hallose algunos años después (Yanhuitlán), después de
> bautizados y que habían aprendido algunos a escribir,
> un libro de mano, escrito en buen papel, con historias
> en su lengua como las del Génesis, empezando por la
> creación del mundo y vidas de sus mayores como la de
> los patriarcas y el diluvio, interpuestas las figuras
> como las de nuestra Biblia... Y este libro fue tan se-
> creto su autor que no se pudo descubrir ni rastrear, di-
> ciendo el que lo tenía que lo había heredado. Y lo
> peor fue que, guardado en la caja del depósito, debajo
> de dos llaves, se desapareció como si fuera de humo:
> en fin prenda de Satanás.

ern ethnographic material. At the same time, there is no doubt that long oral narrations existed to accompany the books, and we think it likely that such narrations were part of an oral literary tradition equivalent to that demonstrated by the artistic quality of the paintings. The 17th century Dominican historian Francisco de Burgoa speaks of "las memorias y cantos de sus historias y guerras, que es lo que más claudicaron y como ciegos se precipitaron en mayores delirios y errores" ("the remembrances and songs of their histories and wars is what most hobbled them, and like blind men they threw themselves into greater delusion and errors") (Burgoa 1934b:417). Elsewhere Burgoa (1934b:210) informs us that

> para esto a los hijos de los señores, y a los que esco-
> gían para su sacerdocio enseñaban e instruían desde su
> niñez, haciéndoles decorar aquellos carácteres y tomar
> de memoria las historias. Y de estos mismos instrumentos
> he tenido en mis manos y oídolos explicar a algunos viejos
> con bastante admiración...

> For this reason they taught and instructed the sons of
> the lords, and those chosen for their priesthood, from
> their childhood, making them draw those characters and
> memorize the histories. And of these same instruments,
> I have held them in my hands and heard them explained
> by certain old men, with great admiration...

It is possible that the two groups mentioned here reflect a division of work between the historical chroniclers ("the sons of the lords") and the painters of the religious codices ("those chosen for their priesthood"); on the other hand, it may be that the same training was given to the two groups.

The codices presently known as Mixtec are historical in content, although their protagonists, the Mixtec kings, are superhuman in character, and reference is made to religious knowledge and rituals. Given their style and content, it is possible to indicate the areas of provenience of certain of these manuscripts. The Codex Bodley is associated with the Tilantongo-Achiutla-Tlaxiaco area, the Codex Selden with Jaltepec in the Valley of Nochixtlán (Smith 1974), the Nuttall Codex (anverse) and the Vindobonensis (anverse) with the area of Apoala, and the Codex Egerton with the Mixteca Baja (Huajuapan and Acatlán). Because of the pictographic nature of the codices, it is to be expected that the data they offer for dialect studies is somewhat limited, and it will require great effort and more knowledge than we now possess to extract relevant information.

The Period of Contact

After the Conquest, the introduction of the Spanish alphabet made possible a phonetic transcription of Mixtec texts, although the orthography was somewhat deficient. This is particularly notable in the case of the glottal stop (ʔ), a common feature of all Mixtec languages and dialects. The Spanish h was sometimes used between identical vowels to indicate a reenunciation of the second vowel rather than a simple lengthen-