ESSAYS IN OTOMANGUEAN CULTURE HISTORY

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Vanderbilt University
Publications in Anthropology
No. 31
Nashville, Tennessee
1984
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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.
Of the major Mesoamerican language families, Mayan is perhaps the best studied in terms of the integration of multidisciplinary 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 suggested the potential for interdisciplinary work. Recent linguistic studies (especially Rensch 1973, 1976) have made possible a historical perspective that was previously unattainable. Archeological and ethnohistorical research in the Otomanguean area has increased significantly in recent years. It now seems possible to begin the formulation of an integrated theory of Otomanguean development, i.e., of the culture history of the geographical core of Mesoamerica. The papers presented here are a first step towards the integration of the available data.

Otomanguean-speaking populations (Fig. 1) are characteristically 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 preconquest 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 Popoloca 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 Nuiñe archaeological region near the border with Popoloca. 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 Tonaláp). 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 Papalotlapan. 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 millennia. 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 reflected both in the archeological record and in the development of the major branches of the Otomanguean family as attested 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 interaction that diffused cultural and linguistic elements. Disruptions caused by the intervention of other (mainly Nahuatl-speaking) groups fragmented these regions again in Postclassic times, and this continued after the Spanish conquest. A general picture of the correlation between the archeological and linguistic development of the Otomanguean area is presented in Figure 2.

The first paper in this collection, an overview of the linguistic 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 reconstruction can be brought to bear on various aspects of the culture. 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 developed 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 integrated 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.
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<th>Linguistics</th>
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<tr>
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<td>conquest</td>
<td>development of modern dialects</td>
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<td>1500</td>
<td>city-states</td>
<td>internal diversification</td>
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<td>major reorganization</td>
<td>major branches defined</td>
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<td>1000</td>
<td>permanent villages</td>
<td>diversification of major branches</td>
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<td>1500</td>
<td>increasing sedentarism</td>
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<td>4000</td>
<td>first sedentary villages (Basin of Mexico)</td>
<td>beginnings of diversification (separation of Otopamean)</td>
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<td>increasing reliance on agricultural food</td>
<td>Proto-Otomanguean</td>
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Fig. 2. Correlation of archeological and linguistic developments in the Otomanguean area.
Within the nine branches, further linguistic diversification created the languages and groups of languages that correspond to regionalization throughout the Preclassic and Classic, and which were further fragmented in the Postclassic and Historical 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 derived from the archeological record.

The second paper in this collection, an archeological overview 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 development of the areas inhabited by speakers of Otomanguean languages. The discussion is organized with reference to the archeological sequence as well as to the linguistic diversification 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 described and related to the stages of development of the Otomanguean 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 distributions 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 archeological 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 possible 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 Tamazulapan Valley of Oaxaca, one of the large valley systems in the northern part of the Mixteca Alta. Ethnohistorical sources indicate 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 redistributed 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 Tamazulapan 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 locations 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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The discussions which led to the papers presented in this volume began in 1976 at the Mesa Redonda: La Familia Otomangue, 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 Línguística of the Centro de Investigaciones Superiores del INAH in Mexico City (Josserand, Hopkins, and others) had been investigating 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 research, 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 ancestor of the expanded paper presented here. Calvin Rensch (Summer Institute of Linguistics) presented an overview of linguistic 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 presented at the symposium, Interdisciplinary Studies in Otomanguean, were essentially the same as those which appear here, although the papers have been revised in the light of further discussion 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 Regional 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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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. 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-
fect 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-
cassuary 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 family. 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 Preclassic (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 indispensable elements for comparative research, for at least one language 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 reconstruction 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 internal development of the languages. Dialect studies are only
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, Ixca-tec and Chocho), Mixtecan (Mixtec, Cuicatec and Trique), Tlapa-nec, 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 Nahua, 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 Mesoamerican 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—distribution of the languages, reconstruction of the vocabulary of proto-Otomanguean, and glottochronology—suggests a hypothesis 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 reconstructed, etc.), and should have occupied an area which could be a logical homeland for the family given the later distribution of the branches of Otomanguean. We find evidence of a population with the right characteristics in the archaeological sequences of the valley of Tehuacán, Puebla (Byers 1967; MacNeish et al. 1967, 1970; Johnson 1972). The glottochronological 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). 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 Luis 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 territories, gradually losing contact with one another and evolving 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, political, 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 linguistic 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 distribution 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 diversification. Rensch discusses eight stages of innovations, involving 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 Popolocan after the sixth. The other groups continued to participate 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* contrast; II, vowel changes: creation of nasalized vowels; III, tone changes, and *hk > *h; IV, changes in clusters *YC, *nC, *h?; V, changes in *(n)Yt, *(n)Ys; VI, *ny > liquid, loss of *?(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 Mesoamerican 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 development, 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 linguistic 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 innovations, as do Chinantecan and Amuzgo. Chinantecan and Chiapanec-Mangue share eight innovations; Chinantecan and Tlapanec, seven. Popolocan and Chiapanec-Mangue share six innovations. The remaining pairs of branches share five innovations 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 Otopamean, Mixtecan, Zapotecan and Huave.
<table>
<thead>
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<th>Number of innovations shared (=n)</th>
<th>Pairs of branches sharing n innovations</th>
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<tr>
<td>11</td>
<td>Pn-Cn</td>
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<td>CM-Cn</td>
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<td>7</td>
<td>Tl-Cn</td>
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<td>6</td>
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<td>Mn-Pn, Mn-H, Pn-Zn, CM-OP, OP-Tl, OP-H</td>
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<td>1</td>
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<td>0</td>
<td>Mn-A, Mn-OP, OP-Zn</td>
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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 innovations 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 beginning of the Preclassic, and perhaps to the middle of the Preclassic.

The innovations shared across branches of Otomanguean are most easily explained as happening before the internal diversification 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 diversifying languages continue to share innovations as the time depth of their divergence increases. Languages which are quite similar to each other structurally can more easily accept structural innovations from one another. After a series of different innovations have caused the systems to become more different, 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 languages of a branch manifest the results of an innovation, it is more easily explained as an innovation which occurred during 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 discussed by Rensch took place early (Archaic and early Preclassic) 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 Popolocan and Chinantecan, along with Amuzgo, form a tight group which also often allies itself with Chiapanec-Mangue and Tlapancan. 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 innovations 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 reduction), 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 consonant 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). After 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 motivations 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 Zapotecan 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 Popolocan-Chinantecan-Chiapanec-Mangue interacts first with Otopamean and 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 order. 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 cognates are identified by inspection and intuition, by preliminary rules for sound correspondences, or by a definitive study of the diversification of the family). All of the figures cited here represent calculations made before the publication of Rensch's comparative phonology, and different investigators have used different rules for establishing cognates. On the other hand, considerable experience has shown that preliminary 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 contact 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.).

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 distinct 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 Preclassic the nine branches existed as relatively independent varieties 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-Chcho; 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 internal diversification of Mixtec, Popolocan and Zapotecan is a product of the Preclassic. The separations of Otomi and Mazahua, of Ixcatec versus Popoloca-Chcho, the development of the regional varieties of Mixtec, Chinantec, Chiapanec-Mangue and Zapotec, are products of the Classic. Other separations (Matlatzinca versus Ocuit, Popoloca versus Chocho, the development of the varieties of Mazatec, etc.) are products 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 until around 4400 B.C. The cultural patterns attested in Tehuacán should either be present at the same time or appear shortly 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 including 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 (Zapotecan); (6) the highlands north of Zapotecan and extending over the Gulf escarpment (Chinantecan); (7) eastern Guerrero (Tlapapanec); (8) the Isthmus of Tehuantepec (Huave) and (9) southwestern 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 developed. 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 Preclassic. 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 Otomanguean. 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 Tehuantepec, the route of Olmec contact with the Soconusco and Guatemala. Fourteen loans to Huave are cited: cacao, two terms for zapote, tomato, tortilla, copal, to cut with an axe, sorcerer, 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 preparation a more general study of linguistic diffusion in Mesoamerica. 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 Otomanguean 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 Otomanguean family and the archeological, ethnohistorical and other evidence from the general Otomanguean area, we can propose 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 Otomanguean populations. Such a model will of necessity be incomplete and inaccurate in many aspects given present limitations 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 prehistory 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 diversification 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, creating 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 separation 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 patterns 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 separations of the Archaic and the Preclassic, periods characterized by growth and expansion of population, are usually due to population movements and geographical separation. Second, the separations of the Classic and Postclassic, when there is presumably a more-or-less evenly distributed population across the Otomanguean area, are interpreted as a product of the socio-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 exem-
plified 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 par-
ticipation 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
(month 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 Pre-
classic.

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 expan-
sion into distinct ecological or geographical zones. Chichi-
meca-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 Tolu-
ca 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 participate before the end of the Archaic. This linguistic independence 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 Otomangueans 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 towards the end of the Archaic, Popolocan drops out of the network. It is interesting to note that in the immediately following 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 reorientation 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 Otomanguean 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 (Cuicatec), 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 Otomanguean which characterized the Classic was probably related to the formation of socio-political entities rather than to population 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-Chcho, reflecting continued fragmentation in this area. Chiapanec and Mangue 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 intrusive Nahuatl speakers.

Mixtec, Zapotec and Chinantec all underwent internal diversification 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 Nuiñe culture with Teotihuacán, while the Mixteca Alta related to Monte Albán (Paddock 1966, 1978). Assuming 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 archaeological 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
Fig. 4. The Mazatec-speaking area of northern Oaxaca, Mexico, (redrawn from Gudschinsky 1958).
I. Lowland Mazatec Nation, A.D. 890 - 1170.

II. Domination by a foreign group.

Fig. 5a. Early stages in Mazatec dialect development (adapted from Gudschinsky 1958).
III. Intrusion of San Juan Coatzospan [C]; Highland Mazatec Nation.

IV. From Aztec rule (A.D. 1456) to Spanish.

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 manifestations of the diversification of the Otomanguean language family. 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 characteristic of the Mixteca Alta while gray tripod bowls with interiorly 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
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Fig. 2. Chronological chart of selected
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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 Otomanguean 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 linguistic dates cited in this paper. Figure 2 presents the chronological 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.

This stage can be divided into an earlier period (from approximately 20,000-5500 B.C.) of hunter-gatherers or production 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 indicates 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 Querétar-
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 tradition 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 increase 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 predict that it would be accompanied by diversification in material culture, perhaps as stylistic variation in artifacts used by different groups of people. On the other hand, the archeological 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 distribution of Coxcatlán and Pedernales (or Jícaras) points. Coxcatlán points are common in the Tehuacán Valley and the Valsequillo, 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 collection 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 remaining branches of Otomanguean diversified.

The eight remaining branches are Popolocan, Mixtecan, Amuzgo, Zapotecan, Chinantecan, Chiapanec-Mangue, Tlapanec and Huave. Glottochronological dates for separation of different 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 Tehuacan Valley is practically the only highland region 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 Oaxaca, the Cañada and the Mixteca Alta which have favorable environmental conditions for early cultivation.

With respect to the generalization that nine branches of Otomanguean were distinct by 1500 B.C., we postulate that diversification at this stage was due to isolation through population growth and increased sedentarism. By the end of the Abejas phase around 2300 B.C., the settlement pattern in the Tehuacan Valley was characterized by a clustering of sites into three or four groups suggesting a tendency toward territorial 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 temporary 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 Puruñon phase in the Valley of Tehuacán, the Espiridión phase in the Valley of Oaxaca, and the site of Yuzán 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, including 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 decoration; realistic, finely made ceramic figurines; obsidian flakes, and slab metates with two-hand manos. This complex extends into Tlaxcala and even further north. Similarities in form, manufacture and decoration exist between early ceramics from Oaxaca (Tierras Largas and early Cruz phases), Tehuacán (Ajalpan phase), Puebla-Tlaxcala (Tzompantepec phase), Chalcatzingo in Morelos, and the Basin of Mexico (Nevada complex).

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 Nochixtlán 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 ceramics 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 inhabitants 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 aspects 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 local communities as early as 1300 B.C.

Yucuita may have played an analogous role in the Nochixtlán 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 stratification, 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 political 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 significant 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 distinction can be made between Mixtec and Cuicatec speakers. These languages are spoken today in two distinct geographical regions, 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 formation 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 Tehuacán 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—Huamelulpan, 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 pattern. 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 Oaxaca, and some sites in the Cañada have produced crema ware vessels 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 cotton, 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 initial 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 participation by groups in different regions in the activities surrounding the centers. Whereas some groups may have participated by providing food or other goods to the centers, perhaps as tribute, others may have become marginalized and generally isolated from the events and changes brought on by the centers.

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 Albán's rise, while Chatino and Papabuco speakers remained outside this interaction 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 projectile 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 linguistic 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 relatively intensive archeological study (Caso 1938; Spores 1969,
1972, 1974b; 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 within the southern highlands. These groups were divided politically into autonomous cacicazgos governed by royal lineages. Most cacicazgos had a single linguistic affiliation, except in border areas where subject communities which spoke different 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, caciques claimed common origin, and in the political sphere, marriage 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 primarily 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 archaeological 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 glotto-chronological 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 archaeologically. Detailed archaeological 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' glotto-chronological 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 dialects 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 archaeology 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 archeological reconnaissance in several areas of the southern Mesoamerican highlands. On the basis of known sites and available data, especially from the Valley of Oaxaca and Nochixtlán Valley which have received considerable attention from archeologists 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 measurement of the interaction between them. Byland's work in the Tamazulapan Valley of the Mixteca Alta (this volume) is illustrative. 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 between 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 diversification began from there at approximately 2200 B.C. Generalizing 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 northwest of the Isthmus, the Isthmus plus Gulf and Pacific Coast lowlands and the Chiapas-Guatemalan-Honduras highlands, respectively. This implies an early highland-lowland dichotomy as well as considerable interaction between highland and lowland 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 perspective of studies in prehistory.
Appendix

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

<table>
<thead>
<tr>
<th>Cultural Item</th>
<th>Initial Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceramics</td>
<td>1350 B.C. secure, possibly earlier</td>
</tr>
<tr>
<td>Bell-shaped pit</td>
<td>1350 B.C.</td>
</tr>
<tr>
<td>Wattle and daub house</td>
<td>1350 B.C.</td>
</tr>
<tr>
<td>Ceramic figurine</td>
<td>1350 B.C.</td>
</tr>
<tr>
<td>Obsidian blade (as opposed to chip or flake)</td>
<td>1250 B.C.</td>
</tr>
<tr>
<td>Comal and, by extension, tortilla</td>
<td>600 B.C.</td>
</tr>
<tr>
<td>Stela, carved stone monument</td>
<td>600 B.C.</td>
</tr>
<tr>
<td>Ceramic urn</td>
<td>600 B.C.</td>
</tr>
</tbody>
</table>
1 The authors thank Cecil R. Welte for comments on an earlier version of this paper.


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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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 km² 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 defined by Spores in the Nochixtlán Valley (1972). This choice was made for a number of reasons. First, the ware is a ubiquitous 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 exhibits 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 potential 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 Yanhuitlán Fine Cream at each site as an unbiased measure of association 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 before 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. Teposcolula, 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 Yatachío.

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-
community 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 population 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 municipios north of Tamazulapan consider themselves to be Chocho towns although few if any inhabitants still speak the language. 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 dependencies. 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 currently 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 Tamazulapan Valley. The methods employed in this project are similar 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 collections 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. Undecorated 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 Yanhuitlán Red-on-Cream Bowls. Adopting a more fine-grained approach, I was able to distinguish twenty-three separate categories of the ware based on vessel shape, location of decoration, and the style of the decoration (Byland 1980:203-243). Rather than study each of the twenty-three categories individually, 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 independence 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 extraordinarily 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 deviated from a uniform distribution. To do this I employed another simple statistic, the standard score or Z-score. Within each variety the standard score is calculated by

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

where $X$ is an original quantity, $\bar{X}$ is the mean of the distribution 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 into 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 unexpectedly 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 calculated 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

<table>
<thead>
<tr>
<th>Variety</th>
<th>Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
<th>Area 4</th>
<th>Area 5</th>
<th>Area 6</th>
<th>Area 7</th>
<th>Area 8</th>
<th>Area 9</th>
<th>Area 10</th>
<th>Area 11</th>
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<tbody>
<tr>
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<td>412</td>
<td>223</td>
<td>300</td>
<td>406</td>
<td>178</td>
<td>190</td>
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</table>
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 Tama-
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
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 Tamazulapan 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 encompassing Tejupan and Tamazulapan, and high values in areas 5 and 10, or in the single area between Tamazulapan and Tejupan 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 exchange between Tejupan and Tamazulapan with the area associated with Teotongo, particularly with sites in area 10. It would appear that Teotongo and El Gentile were exporting artifacts 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 between the entities within the project area.

The boundary between the señoríos of Tejupan and Teposcolula should be found in area 2. This area is quite well defined 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 Category 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 pertaining to Tamazulapan (Fig. 2).

On the basis of this analysis a boundary must also be defined between the northern area and the areas most clearly associated 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

The research herein described has been generously supported by the Wenner-Gren Foundation for Anthropological Research, grant number 3196, and by the Hill Fund of the Pennsylvania State University. Fieldwork was conducted under authority granted by the Consejo de Arqueología of the Instituto Nacional de Antropología e Historia of Mexico, oficio 401-34, and the Centro Regional de Oaxaca, INAH, oficio D-403-77/401. Eduardo Matos, Manuel Esparza, and Marcus Winter of these institutions were instrumental in making my work possible. Ronald Spores, William Sanders, and David Webster have all contributed greatly to the development of the ideas presented here since the original version of this paper was written in 1978. Finally, grateful acknowledgement must be made to the officials and citizens of the towns in which I worked and to the workers who helped realize the project. This essay is a substantially revised version of a paper presented to the symposium "Interdisciplinary Studies in Otomanguean", 43rd Annual Meeting of the Society for American Archaeology, Tucson, Arizona, 1978. The current version incorporates a portion of my dissertation (Byland 1980).
effected through the interregional marketplace at Coixtla-
huaca. Two imported ceramic types, Coxtlatlán 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 señorfo of
Tamazulapan.

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

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


Warner, John
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 Mártil Chocaltepec, etc.), Yanhuitlán (Santo Domingo Yanhuitlán, San Pedro Topiltzoltepec, 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, lawsuit, etc. From the 17th century, however, 65% of the documents 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 General 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 assurance 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 reliable 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 communication 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 Yahuatlán (Zahuatlán, Yucuita, Sayultepec), from which Jaltepetongo differs somewhat. We also have texts from the regions of Tilantongo, Cuilapan de Guerrero (Chapultepec, in the Valley of Oaxaca), and the Mixteca Baja (Tecomaxtlahuaca, Tonalá, Huajuapan, 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 region 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 re­connaisance 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 principales 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 así 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 existed in various indigenous communities of the Mixteca, literate 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 disappeared, so much so that the authorities of various of the communities 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 inquiries carried out in cases of murder, written by a government official (two documents written in 1602 in Tamazulapan). The fact that some of the documents were written by local Indian 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 ʃ in Tlaxiaco (proto-Mixtec *ʃ); 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 Vocabulario en lengua 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 Teposcolula 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 haremos 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 θ (theta, voiceless interdental fricative), then this statement is easily understandable as an attempt to describe the pronunciation of a fricative ɗ, essentially a voiced θ. 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 Lengua Mixteca are filled with interesting information about
It would appear that the rest of the languages here mentioned are daughters of that of Teposcolula, and are derived 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 phonological changes which have affected Mixtec speech communities, both a result and a contributing factor to its continuous importance in prehistoric times. This does not mean, however, 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 lingua franca 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 mention specific towns to which his statements apply.

Establishing dialect areas and talking about mutual intelligibility 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 Mixtec which we have drawn from linguistic data certainly reflect real differences between types of speech, but the question remains, what do these differences mean to the speakers themselves? 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 particulares que notar en ellos, de el de Tepozulula podemos dezir que es el que mas ha conservado 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 Tepozulula that we can say that the integrity of the language has been most preserved, and today has less mixture from other languages...

(de los Reyes 1593:iii)

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

Enfin aunque son muchas las diferencias desta lengua Mixteca 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 entiendra bien la lengua de Tepozulula, 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 Yanguitlan, 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 Tepozulula 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 Yanhuitlan, 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.

(de los Reyes 1593:viii)

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

...parecen los de mas lenguas de que aqui se hace mencion, hijas de la de Tepozulula, 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 *s to ñ is of minor importance for comprehension, whereas the two changes *x becomes č (in the Mixteca Baja), and *t becomes č (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-
chixtlan 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
Nochixtlan 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-
chixtlan 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-Nochixtlan valley system, centers around
Thlaxiaco 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 characterize these five dialect regions are five of the more widespread changes (Map 2) of the set of sixteen phonological innovations which Bradley and Josserand (1978) have reconstructed to account for the development of the modern varieties of Mixtec 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 characteristic of 16th century Teposcolula and of Soyaltepec (Yanhuitlán), 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, presumably 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 indicates 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 Nochixtlán 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 a (a voiceless fricative becomes fronted and voiced; often written as dz in Colonial
III. The Northern Mixteca Baja, 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. Several subdivisions of this area appear when more towns are included 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 Silacayoapan are linguistically quite diverse, and also reveal many small sub-groupings.

IV. The Southern Mixteca Baja 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 differs 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 Mixteca de la Costa, 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 Jicayán; the documentary source is the Lienzo de Jicayán, 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, reaching 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 _s_ 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 ultimately 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 *x becomes  _c_ (a voiceless fricative fronts and becomes an affricate; usually written _ch_). 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,  _c_, but from a different source (see below). This means that the same element participates 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 Mixtepec-Juxtlahuaca area.

In the documentary sources only Jicayán shows the innovation, 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 *t becomes  _c_ (palatalized and affricated) or _ty_ (palatalized only) before front vowels. These two parallel innovations took place in different (complementary?) regions of the Mixteca.

The development of the affricate  _c_ before the front vowel _i_ is common to all of the Mixteca except for the coastal towns, but the development of this same  _c_ sound before the front vowel _e_ has a much more restricted distribution, as shown by line
tongo and Teposcolula, where e regularly appears instead of *i. Sets 7, 8 and 41-44 in Appendix I show the documentary data for this innovation.

Several towns show mixed reflexes, between i and u (San Miguel el Grande, Cuilapan), and others between i and e (Tonalá, Nundaco, Teita). Chalcatongo shows only i in the documentary sample, but both i and u in the modern data. Tilantongo shows e in the documents cited here, but u is regularly reported in modern linguistic materials. Since u 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 u is expected in the Tilantongo document might also be attributed to the spelling conventions 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 development, 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, Soyaltepec 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 *t before i in the sample set of words from the documentary sources). This change, *t becomes c, is structurally important within Mixtec as a whole, for it is responsible for the creation of the c sound in most of the Mixteca, but from a different original sound than the c of the Coast and Mixtepec (see change 3).

The alternant form of this innovation, 4b, accounts for the development of a palatalized alveolar stop ty. This particular presentation of the change is limited to San Juan Mixtepec 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 ty does not occur in the sample, but its absence can be confirmed through an inspection of sets 12 and 13.

5. Proto-Mixtec *i becomes i. 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 i is retained. There is a contrast between the data from the linguistic study and that from the documentary sources, however. In the documentary sources this innovation seems to have a different form; most of the 16th century developments are e rather than the i found in Bradley and Josserand's (1978) sample. Further investigation reveals a sub-area, again in the Mixteca Alta, including the towns of Apoala, Soyaltepec, Yanhuitlán, Jaltepe-
16th century. Linguistic data enabled the delineation of large dialect areas, which we hypothesized would be characterized 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 inspection 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 linguistic 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 respect 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 Teposcolula 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 language 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 communication 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 ñ versus dialects with s (Tlaxiaco, Nundaco and Jicayán). Sets 12-17, and possibly 19, 20, 24 and 36, show correspondences between t and č, or ^d and ^c (or ^j), which do not enter into the present analysis, but are very important dialect differences nonetheless. The correspondence between x, č and č appears in sets 15, 21 and 32-35 (Tlaxiaco and Teita should have x, and the Coast should have č; where there are data, this hypothesis is confirmed). The expected contrast between t and 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 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 t to ty correspondence and the merger of ñ with 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 ethnohistorical information can and should form the basis for greater understanding of the social and cultural development of the Mixtec 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 Archivo General de la Nación (Tierras, vol. 236, exp. 6, f. 2-7), bearing the dates 1523 and 1692. For Jaltepetongo, the documentary 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).
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The tradition of writing in the Mixtec area dates from the beginnings of our era, as is demonstrated by the hieroglyphs found at the sites of Diquiyú, Huamelulpan and Yucuita, 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 culmination of the tradition is undoubtedly seen in the late Postclassic Mixtec codices.

Mixtec writing on the eve of the Conquest was fundamentally 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 interesting to note that various elements within the pictographs function as phonetic indicators on rebus symbols 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 Mixtec, both having the form dzaa (daa, phonetically); an example 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. Furthermore, 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 (čičí ndu-ba ñu?u ña?a) "to put an arrow in foreign land" or "to conquer" (Smith 1973:33).

But taken as a whole, this system of writing did not permit the formalized registration of oral texts. Detailed explanation of the scenes depends on an iconological analysis and on systematic comparisons with information found in occasional glosses and in the Spanish chronicles, as well as mod-
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| Nun  | ee    | --     |
| Jic  | --    | --     |
ing of the vowel (e.g., Ŧūhu "earth" or "god" rather than Ŧuu "city"). But this convention was seldom used for other occurrences of the glottal stop, such as between unlike vowels, or preceding consonants. Also, in Mixtec there is a contrast between 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 declaración de lo que significaban las figuras, en que contaban 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 demonstrates 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 secreto su autor que no se pudo descubrir ni rastrear, diciendo 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 them­
selves 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 escogían para su sacerdocio enseñaban e instruían desde su
niñez, haciéndoles decorar aquellos caracteres y tomar
de memoria las historias. Y de estos mismos instrumentos
he tenido en mis manos y oído 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 ex­
tract relevant information.

The Period of Contact

After the Conquest, the introduction of the Spanish alpha­
bet made possible a phonetic transcription of Mixtec texts, al­
though the orthography was somewhat deficient. This is par­
ticularly 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 re­
enunciation of the second vowel rather than a simple lengthen­