ARTICLES

TEPIMANS, YUMANS, AND OTHER HOHOKAM

David Leedom Shaul and Jane H. Hill

The Proto-Tepiman speech community—that is, the community that spoke the language ancestral to all the contemporary Tepiman languages—can be located at the northern end of the present-day Tepiman range, perhaps as far north and west as the Gila-Colorado confluence, and probably within the Hohokam region, during the Hohokam time period in the first millennium A.D. Evidence for the northern location of Proto-Tepiman includes, first, attestation of language contact with Proto-River Yuman, including data from phonology, syntax, and lexicon. This evidence suggests that the Hohokam were a multi-ethnic community; we present evidence that by the fourteenth century this multi-ethnic system probably included speakers of Zuni. Second, the greatest internal diversity in Tepiman is among the northernmost varieties. Third, we can reconstruct a word meaning "saguaro cactus," a plant not found south of Ciudad Obregón, Sonora, for Proto-Tepiman. While the linguistic evidence strongly suggests the involvement of the Proto-Tepiman speech community in the Hohokam system, the evidence provided by contemporary Upper Piman languages (Akimel O'odham [Pima] and Tohono O'odham [Papago]) neither confirms nor excludes the involvement of speakers of these languages in the core Hohokam complex in the late prehistoric period.

La comunidad de habla prototepimana—es decir, la comunidad de hablantes del idioma antecesor a los idiomas contemporáneos tepimanos—puede ubicarse en el extremo norte de la distribución actual de estos idiomas, y probablemente dentro de la región donde se encuentra evidencia de habitación hohokam, durante la época asignada a esta manifestación arqueológica. Evidencia de la ubicación propuesta incluye el contacto lingüístico entre prototepimanas y protoyumanos ribereños. Tal evidencia sugiere que los hohokam fueron una manifestación multiétnica. Argumentamos que esta comunidad multiétnica incluyó no solamente tepimanos y yumanos, sino también hablantes del zuni en el siglo XIV. Además presentamos evidencia de una diversidad lingüística más compleja en los idiomas tepimanos norteños que en los sureños, y la reconstrucción en el prototepimano de una palabra que se refiere al cacto gigante "Saguaro," el cual no se encuentra más al sur de Ciudad Obregón, Sonora. Mientras que la evidencia sugiere una participación de hablantes del prototepimano en el sistema hohokam, los datos sobre los idiomas contemporáneos de la Pimería Alta (ákimel ó'odham [pima] y tóhono ó'odham [pápago]) ni niegan ni apoyan la posibilidad de que hablantes de estos idiomas participaran en el complejo nuclear hohokam durante los últimos días de la prehistoria.

"Hohokam" (from O'odham[1] *huhugkam* 'those who have finished') labels an archaeological culture of southern Arizona that endured between A.D. 200–400 and about A.D. 1450. The geographical distribution of the Hohokam is shown on the map in Figure 1: along the lower Verde and Agua Fria Rivers, in the Tonto Basin in the Cherry Creek drainage, in the Phoenix Basin along the Gila and Salt Rivers, along the lower San Pedro near its confluence with the Gila, in the Tucson Basin, and to the west in the drainage basins defined by the Santa Rosa and Vamori washes on the current Tohono O'odham Reservation in a region often known as the Papaguería. Artifacts of probable Hohokam origin are found in a more extended area, turning up sporadically to the north and east in sites associated with the other major southwestern archaeological cultures of this period, the Anasazi and Mogollon (Crown 1991; Doelle and Wallace 1991; Wilcox 1991).

A question of great interest, not only to archaeologists but also to the contemporary indigenous peoples in the region, is whether any of these peoples should be considered direct descendants of the Hohokam. The question arises because of the

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American Antiquity, 63(3), 1998, pp. 375–396.

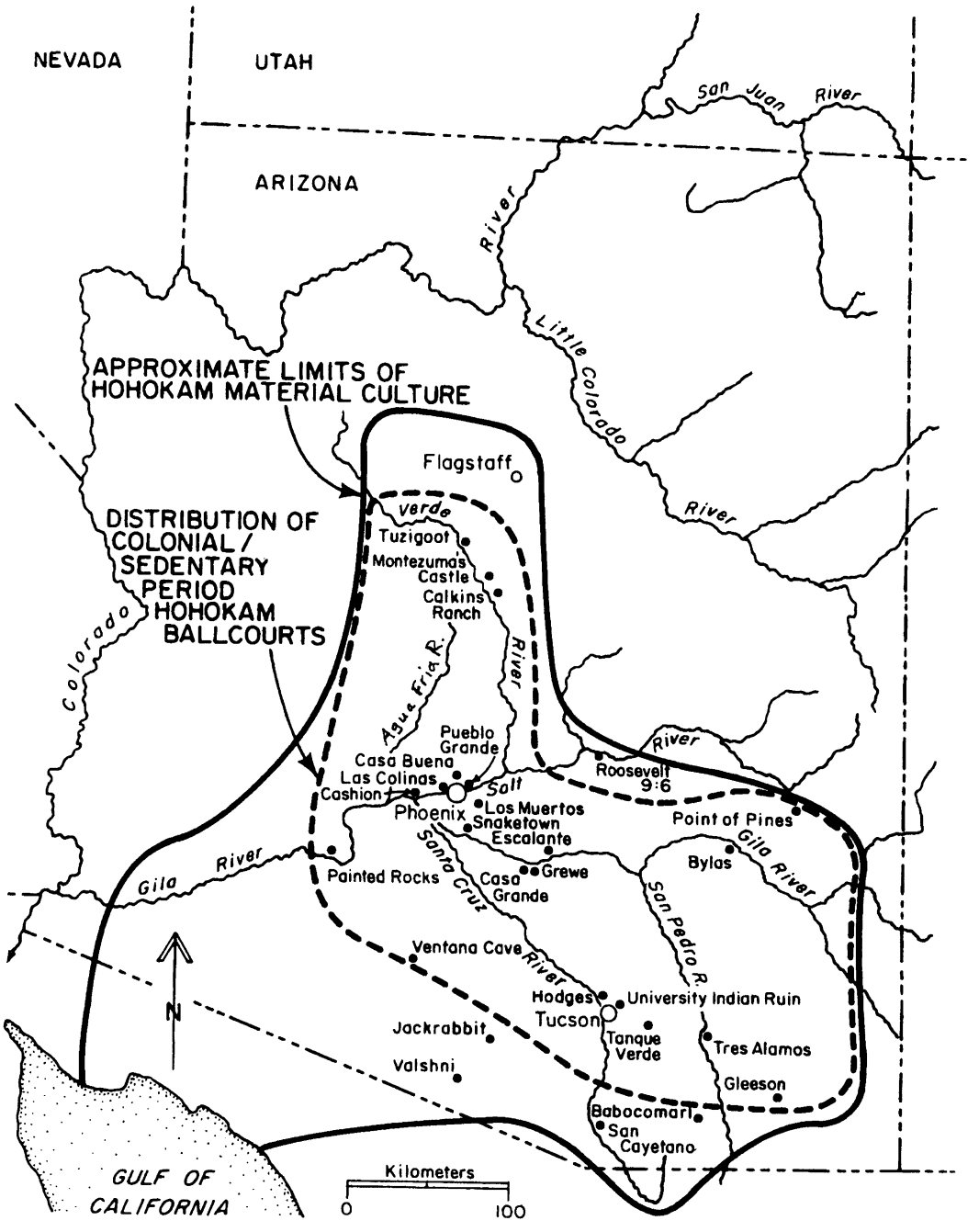

Figure 1. Geographical distribution of the Hohokam. (Reprinted by permission from *Chaco and Hohokam: Prehistoric Regional Systems in the American Southwest*, edited by Patricia L. Crown and W. James Judge. ©1991 School of American Research, Santa Fe)

possibility of ethnic discontinuities accompanying the "reorganization" (Crown and Judge 1991; Masse 1991) of the Hohokam in the twelfth and thirteenth centuries and the apparent "collapse" in the latter half of the fourteenth century (Gregory 1991; Masse 1991). At the time of Spanish entry into the region (from the Coronado expedition in 1540 to the Jesuit *entradas* in 1690 and after), the Hohokam platform mounds and great houses lay in ruins, and the people of the region lived in

small, relatively egalitarian communities, with some groups making seasonal moves relating to the availability of water.

Contemporary indigenous communities in the Hohokam region include speakers of languages from three distinct stocks: Yuman, Tepiman (Uto-Aztecan), and Apachean. The Apacheans arrived in the region relatively late, and we will not discuss them further.[2] Yuman and Tepiman are quite unrelated in phylogenetic-linguistic terms, except perhaps at an extremely remote level of time. Yuman languages probably represent one branch of a larger linguistic group often known as Hokan, with member languages found primarily in western Mexico, Baja California, and California. The Yuman languages spoken today in the old Hohokam region include Maricopa, along the lower Gila, and Yavapai, in the upland regions of the Verde River system.

The Tepiman languages are a branch of Southern Uto-Aztecan, one of the two subgroups of the great Uto-Aztecan family of languages that extends from Shoshone in Idaho to the Aztecan Pipil in Nicaragua. Along the Gila in the Phoenix Basin, on the San Pedro, in the Tucson Basin, and in the Papaguería to the west live speakers of Upper Piman varieties of Tepiman, including the several dialects of Akimel O'odham (Pima) and Tohono O'odham (Papago). Zuni, a language isolate (that is, it has no known phylogenetic relatives) now spoken only at Zuni Pueblo on the New Mexico-Arizona border, lies outside the Hohokam area as indicated by archaeological evidence. However, we will suggest that Zuni speakers may have been part of the Hohokam system during the Classic period in the fourteenth century.

Most cultural historians have assumed that Tepimans played some role in the Hohokam complex (e.g., Gumerman and Haury 1979:90; Haury 1976:357; Reid and Whittlesey 1997:75). The reason for this is the geographical distribution of the Tepiman languages, extending during the historic period from the Phoenix Basin, southward through Arizona between the Colorado and the San Pedro, through parts of the Mexican state of Sonora, to a southernmost outpost in southern Durango and the extreme northern corner of Jalisco among the southern Tepehuan. This "Tepiman corridor," shown as the shaded area on the map in Figure 2, has often been presumed to be the route along which Mesoamerican influence, artifacts, and possibly even personnel, came to the Hohokam region (Wilcox 1986). Several different scenarios for the relationship between Tepiman and Hohokam have been proposed. The first three are considered by Hale and Harris (1979), but a fourth has also been entertained (e.g., Haury 1976). These are:

1. Some Tepimans participated in the Hohokam tradition, and some did not.

2. The Tepimans are the Hohokam, but a southward expansion at a relatively late date separated southern groups from the Hohokam tradition.

3. Pimans now in the Hohokam culture area are recent arrivals who replaced the Hohokam.

4. The Upper Pimans are the Hohokam, the northernmost vanguard of an expansion of Tepimans from a point of origin to the south within Mesoamerica.

The purpose of this essay is to explore these hypotheses through a systematic presentation of the historical linguistic evidence. The data we present here support the first two hypotheses and are at least consistent with the third but do not support the fourth. We will argue that the proto-Tepiman speech community—that is, the community that spoke the language that is ancestral to all the contemporary Tepiman languages—can be located at the northern end of the present-day Tepiman range, probably within the Hohokam region, during the appropriate time period. Our evidence suggests that the Hohokam were a multi-ethnic complex, including at least speakers of Proto-River Yuman and Proto-Tepiman, and probably speakers of Zuni. The contemporary Akimel O'odham and Tohono O'odham, and the contemporary Maricopa, are descended from the proto-Tepimans and proto-River Yumans, respectively. However, the precise role of the immediate prehistoric speakers of these languages in the core Hohokam system is not made clear by the linguistic evidence. They may have participated directly or indirectly in the system and have a continuous occupation in the region, or they may have lived on its margins and moved into the region during the end of the Classic period or even later. The several hundred years intervening between the beginning of the Hohokam "collapse" in the late fourteenth century and the arrival of the Spanish in the sixteenth century leave ample time for a substantial reshuffling of linguistic communities.

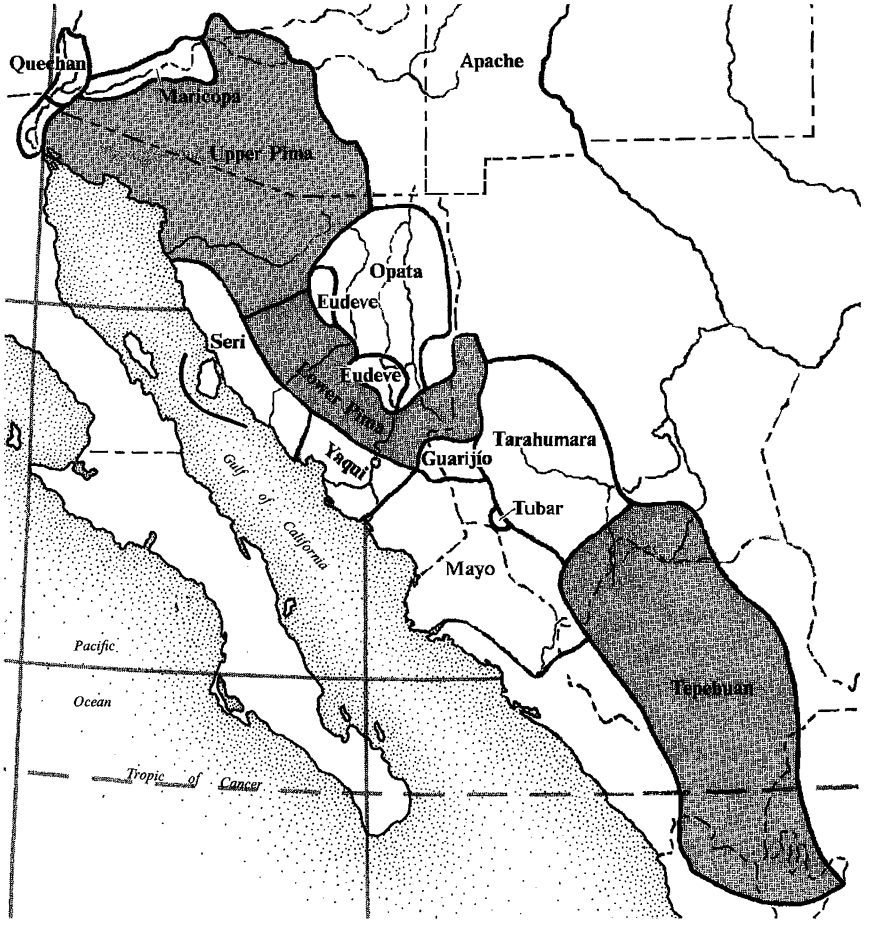

Figure 2. The Tepiman Corridor (after Ortiz 1983:ix).

Tepiman Languages

Tepiman constitutes a distinctive subgroup within the southern branch of the Uto-Aztecan stock (Bascom 1965). The distribution of the languages is shown in Figure 2; Tepiman languages are shaded.

Starting in the north, the Tepiman languages include the following branches: (1) Upper Piman includes Akimel O'odham and Tohono O'odham, formerly known as "Pima" and "Papago," respectively (Hale 1965; Russell 1908; Saxton 1982; Zepeda 1983). (2) Altar Piman, the language of the Altar and Concepción River valleys in Sonora in the Colonial period (Moyano ca. 1780; Shaul 1993). (3) Ati Piman, recorded historically at Ati on the Altar River but probably originating on the coast of the Gulf of California (Pfefferkorn 1989). (4) Lower Piman, including Nevome (the earliest recorded Tepiman language), centered around the town of Onavas, Sonora (Pennington 1979; Shaul 1986; Smith 1970 [1865]), and modern Onavas Piman, which is probably not directly descended from Nevome (Cornell 1971). (5) Mountain Pima or Oob No'ok, including at least two dialects, one in Yepachic, Chihuahua (Shaul 1994), and one from Maycoba and Yecora, Sonora (Escalante H. and Estrada Fernández 1993; Estrada Fernández 1992, 1994).[3] (6) Tepehuan has five varieties: Northern Tepehuan (Bascom 1982); Tepeguana, the colonial antecedent of Northern Tepehuan (Rinaldini 1743); Southeastern Tepehuan (Willett 1991); Tepecano (Mason 1916); and Southwestern Tepehuan (Moctezuma Zamarrón 1992). Tepecano and Southeastern Tepehuan are very closely related, while Southwestern Tepehuan is clearly most closely related to Southeastern Tepehuan (Thomas Willett, personal communication 1997).

Table 1. Cognate Densities for Tepiman and Selected Other Uto-Aztecan Languages.

	Tohono O'odham	Nevome	Tepecano	Hopi	Opata	Yaqui
Tohono O'odham		85	76	32	40	45
Nevome	85		78	33	44	47
Northern Tepehuan	79	79	87	33	40	49
Southeastern Tepehuan	73	75	89	30	39	49

Note: Cognate densities from Miller 1984 and Cortina-Borja and Valiñas C. 1989.

Tepecano, once spoken in the northern part of the state of Jalisco, is the southernmost language in the Tepiman group.

High densities of cognate vocabulary between even the most geographically remote languages suggest a shallow genealogy for the Tepiman languages. Comparisons among the languages based on a 100-word lexicostatistic test list yield the cognate densities shown in Table 1. Comparisons with neighboring languages outside the Tepiman group (Hopi, a Northern Uto-Aztecan language spoken in northeastern Arizona; Opata, a southern Uto-Aztecan language spoken in Sonora, now extinct; and Yaqui, spoken along the lower Yaqui River in Southern Sonora[4]) are given to suggest the position of Tepiman as a distinctive group within Uto-Aztecan.

Glottochronologists have argued that cognacy between two languages of 80.5 percent (strictly speaking, cognacy within a range between 86.4 and 74.4 percent) in basic vocabulary represents a split date of 10 glottochronological centuries or 1,000 years before the date of the lexical lists compared. Each square of this number represents an additional thousand years (Swadesh 1959). Glottochronological dates should, of course, be used only with great caution, but the fact that the lowest percentage of shared cognacy within Tepiman (between Southeastern Tepehuan and Tohono O'odham) is 73 percent is consistent with a hypothesis that the proto-Tepiman speech community existed sometime during the first millennium A.D., well within the Hohokam period.[5]

The Northern Location of Proto-Tepiman

We argue that the Proto-Tepiman speech community was located well in the north of the present Tepiman range, almost certainly extending as far north as the Gila and as far west as the Colorado River. We advance the following lines of argument for this conclusion. First, we present evidence for contact between Proto-Tepiman and Proto-River Yuman. This expands on the evidence presented by Shaul and Andresen (1989) for contact between Upper Piman and Yuman languages. The River Yuman languages include Yuma, Maricopa, and Mojave, and were spoken in the historic period along the Colorado River from roughly Las Vegas, Nevada, south to the U.S.-Mexico border, with Maricopa spoken along the lower Gila River. Second, we show that the center of maximum diversity in Tepiman lies in the northern end of the present-day range of the languages. Finally, we advance a biogeographic argument placing Proto-Tepiman within the area where saguaros (*Carnegiea gigantea*) are found, that is, in the northwestern half of the present-day Tepiman range.

Early Contact between Proto-Tepiman and Proto-River Yuman

Evidence for contact between Proto-Tepiman and Proto-River Yuman includes data from phonology, lexicon, and the morphosyntactic systems of the languages.

Shared Innovation of an Unusual Sound Change

A major sound change, the "hardening" of the system of glides to produce a new series of stops, divides Tepiman from other Uto-Aztecan languages (with minor exceptions discussed below). A virtually identical sound change appears in River Yuman. In Tepiman, the Proto-Uto-Aztecan (PUA) glides **y and **w, and the PUA labiovelar **k^w 'hardened.'[6] PUA **y became Proto-Tepiman (PT) *d. PUA **w became PT *g. PUA **k^w became PT *b. This resulted in a distinctive array of "voiced" stops, *b, *d, *g, in all the Tepiman languages, contrasting with a "voiceless" series, inherited unchanged from PUA as *p, *t, *k. Comparative linguistic method argues that it is more parsimonious in such a case to assume that the change took place before the breakup of Proto-Tepiman into its present daughter languages rather

Table 2. Representative Etymologies for PUA **y > PT *d.

PUA **yɨ'ɨ 'mother' > Proto-Tepiman *dɨ'ɨ
- Tohono O'odham *je'e*[a]
- Oob No'ok *de'e*
- Northern Tepehuan *dɨɨ*
- Opatan *de-
  - Opata *de-gwai*
  - Eudeve *de*
  - Compare Tarahumara *'iyé*, Guarijio *ye'yé*, Mayo *iye*

PUA* *yaka 'nose' >Proto-Tepiman *daka
- Tohono O'odham *da:k*
- Oob No'ok *daaka*
- Northern Tepehuan *daka*
- Opatan *daka
  - Opata *daka*
  - Eudeve *dakát*
  - Compare Tarahumara *'a'ká*, Guarajio *yahká*, Mayo *yékka*, Yaqui *yeka*

PUA **yena 'smoke tobacco' > Proto-Tepiman *deenei
- Tohono O'odham *je:*
- Oob No'ok *deenim*
- Northern Tepehuan *denei*
- Opatan *deen-
  - Eudeve *deinan* 'chupar tabaco'
  - Compare Mayo *yénna*, Yaqui *yena*

[a]The palatalization of *d to /ǰ/ in Upper Piman took place very late, probably not before the end of the eighteenth century. Note that the Eudeve examples are given in the Colonial-period orthography of Anonymous (1981), which is based on Spanish.

than to assume that the change arose independently in every single daughter language.

Consonantal hardenings very similar to those in Tepiman in all but fine phonetic detail occurred in the River Yuman languages, Yuma, Maricopa, and Mojave. This subfamily of languages is distinguished from the other Yuman languages by a change of Proto-Yuman **y to River Yuman *ð[7] and by a change of Proto-Yuman **w to River Yuman *v. Again, the most parsimonious approach is to reconstruct this hardening as taking place in Proto-River Yuman, before the breakup of this community into the three daughter groups.

While consonantal hardenings (fortitions) are in general less likely than consonantal "softenings" (lenitions) in sound change, the Yuman and Tepiman systems of consonant hardening share a particularly unusual change, of a glide **y to a dental obstruent, Tepiman *d and River Yuman *ð. Pulleyblank (1989:388) pointed out that while in theory such a change should be widely attested, in fact the palatal glide /y/ is usually quite stable in

Table 3. Representative Etymologies for Proto-Yuman **y > Proto-River Yuman *ð.

Proto-Yuman **yu: 'to be' > River Yuman *ðu
- Mojave *iðu:*
- Yuma *aðu:*
- Maricopa *ðu:*
- Compare Diegueño *yu:*, Hualapai *yu*

Proto-Yuman **yiw 'to come' >River Yuman *ði
- Mojave *iði:*
- Yuma *aði*
- Compare Hualapai *yu:*, Diegueño *yiw*

Proto-Yuman **yak 'to lie (position, not speech act)' > River Yuman *ðik
- Mojave *iði:k*
- Yuma *aðik*
- Compare Paipai *yak*, Diegueño *yaq*

Proto-Yuman **yaw 'be located in, stay (plural)' > River Yuman *ðaw
- Mojave *iðaw* 'be inside (plural)'
- Yuma *aðaw* 'be located (plural), live'
- Compare Cocopah *ya:w* 'sit, lie, stand pl., be located pl.', Kiliwa *yaw* 'stand'

Note: Forms from Langdon 1978:103–104.

the languages of the world. That this sound change is unusual is important, because it constitutes an argument against the likelihood of the hardening having originated independently in Proto-Tepiman and in Proto-River Yuman as a result of a very common universal process. Instead, it is more parsimonious to argue that it occurred first in one of the proto-languages and diffused as a system into the other. Such a diffusion is likely to occur only in a speech community in which many members were bilingual in Proto-Tepiman and Proto-River Yuman. Such multilingualism is well known from elsewhere in the Southwest (cf. Kroskrity 1993; Leap 1993).

Examples of the hardening of PUA **y to PT *d are shown in Table 2.

Proto-Yuman *y became *ð in root-initial position in River Yuman, but in no other Yuman language (Langdon 1975, 1978). Examples are shown in Table 3.

These data suggest that at the time period of interest, probably early in the first millennium A.D., River Yuman and Proto-Tepiman formed an areal speech community that included many bilinguals.[8]

Elements of the hardening change do occur sporadically in other Uto-Aztecan languages, all arguably in contact with Tepiman and/or River Yuman at the appropriate period. Regular hardening of PUA **y to /d/ and PUA **w to /g/ occurs

in Opata (Shaul 1989) and Eudeve (Anonymous 1981; Lionnet 1986), northern Taracahitan "Opatan" languages that were in contact with Tepiman at an early date (see Figure 2). Hardening does not occur in Tarahumara, Guarijio, or in Cahitan (Yaqui and Mayo), the more southerly members of the Taracahitan group.[9] In addition, similar hardenings are found in Numic languages, but these are sporadic at best, suggesting that if this hardening was due to contact with the Yuman-Tepiman system, this was neither long-lasting nor intense.[10] But if some speakers of Numic languages were affected by the pronunciation patterns of this group, its influence must have extended at least as far north and west as southeastern Nevada and adjacent California, a likely location for a proto-Numic speech community. Since Opata and Eudeve speakers exhibit patterns of speech that may trace to the influence of this group, the southeastern limits of this influence perhaps reached into northern Sonora as far east as the Sierra Madre Occidental. Thus the linguistic area within which this unusual change either diffused (the more likely account, based on parsimony) or reoccurred several times independently (the less likely account) must have included the core Hohokam area, and the relatively complex Hohokam society is a very likely candidate for a center of spread of a prestigious pattern of pronunciation. The areal pattern of consonantal hardening, which includes the unusual innovation of PUA **y to PT *d, is more general—that is, it affects more consonants, at more positions in the word, in Tepiman than in River Yuman, where the pattern is in turn more general than that of Opatan, with Numic exhibiting only minimal attestations. This is consistent with the change being oldest in Proto-Tepiman. But priority in the sound change is secondary to the most important lesson to be drawn from this evidence: that River Yuman and Tepiman were probably in close contact before the breakup of either proto-language community. Therefore the proto-Tepiman group must have ranged as far west and north as the Colorado-Gila confluence at an early date, consistent with the participation of Proto-Tepimans in the formation of the Hohokam complex.

A Yuman Loan Word in Proto-Tepiman. The Proto-Tepiman word for 'water,' **suu-dagi*, has reflexes in all the Tepiman languages, cf. Northern Tepehuan *suudági*, Southern Tepehuan *suuda'i*, Akimel and Tohono O'odham *su:dagi*, Mountain Pima *šu:deg*. The suffix **-dagi* is a noun formative found throughout Tepiman; the root is **suu-*. Elsewhere in Uto-Aztecan the root for 'water' is some reflex of PUA **pa-*. Tepiman languages retain this as **va-/wa-* only in combining forms (e.g., Tohono O'odham *wa:k* 'reedy place,' *wakon* 'to wash'). Why does Tepiman, alone of all the Uto-Aztecan subgroups, have a distinctive word meaning 'water?' We suggest that the innovative Tepiman independent noun **suu-dagi* is almost certainly a borrowing of the Yuman word for 'blue, green,' attesting again to the existence of the Tepiman-Yuman bilingual speech community suggested above. The Yuman cognates are shown in Table 4.

Table 4. Yuman 'Blue, Green'.

Proto-Yuman **xpsiw 'blue, green'
Diegueño *hepeshiw*
Havasupai *vasú:w*
Hualapai *vasú:'*
Yavapai *havsúwi*
Mojave *havasú:*
Yuma *xava:šú*
Maricopa *hvshuu*

The Proto-River Yuman word, the ancestor of the Mojave, Yuma, and Maricopa etyma, would have been something like **hava:sú.* To a Tepiman, this form could be parsed as having the following components: First, the initial element could be interpreted as the third person plural possessive prefix **ha-* 'their.' 'Water' is possessible in Tepiman languages; a poignant example was encountered during Hill and Zepeda's dialectological survey of Tohono O'odham. Zepeda was trying without success to elicit the word for 'river' (*'akimel*) from an elderly woman in Florence, Arizona, using a colored photograph of the Salt River. Finally, Zepeda gestured north toward the dry bed of the Gila, visible from the house. The old woman said, *Ah! milgán ha-ṣu:dagi!* 'Oh! The white people's water!' (literally, 'white people their-water').[11] Given this interpretation of the initial syllable as a possessive prefix, the remainder of the word could be analyzed as containing the Tepiman 'water' formative, **va-*, plus an element *sú:-* (which may have been pronounced as [su:] in Proto-Tepiman, which we believe lacked the retroflex sound [ṣ]). The latter is the stressed element in the Yuman forms and so is salient even for

people with poor understanding of the language. Of course full bilinguals would have known that the meaning of the total form was 'blue, green.' There is evidence that poetic language in Uto-Aztecan has included "ceremonial couplets" from the very earliest period. The most famous of these is Nahuatl *altepe:tl* 'city state,' from *atl-tepe:tl* 'the water, the mountain.' For instance, Hill (1985) has suggested that a word that designates important divinities and ceremonial officials in a number of Uto-Aztecan languages (e.g., Nahuatl *te:kwtli* [*tecuhtli* or *teuctli* in the Classical orthography] 'lord,' Shoshone *tekwani* 'chief') may be reconstructible in Proto-Utoaztecan as a couplet ***ta-ku.* These are the two PUA roots for 'fire,' and the couplet may be translatable as something like 'the wild fire, the domestic fire.' Tepiman speakers could thus interpret River Yuman **(ha)va-:sú* to mean something like 'their-water-green/blue'; in ritual language, an excellent ceremonial couplet way of saying 'their water.' In ordinary speech the element interpreted as the Tepiman-incorporated stem, **va-*, for wet things and actions could be dropped, leaving the stressed element *sú:*. The addition of the Tepiman noun formative **-dagi,* used very generally to derive nouns from abstract qualities, yields **su:-dagi,* the Proto-Tepiman form. There is, of course, a well-known pattern worldwide of speaking of sacred materials and entities in obscure and esoteric language. For instance, English "high language" contains a ritual expression for water as 'the elixir of life.'[12] Proto-Tepimans may have considered water to be so sacred that they preferred to avoid their "real" word, **vá:* and used the Yuman word instead in a euphemism meaning 'the blue/green-ness.' Another possibility is that the Proto-Tepimans considered that water had Yuman-speaking owners and thought of it as an elite good best spoken of in the elite language, parallel to the English "chair" borrowed from French, the language of the conquerors, in order to distinguish this more lordly piece of furniture from the humble "stool," referred to by an ancestral Germanic etymon.

In this case, the borrowing was clearly from Yuman into Tepiman. It is found in all the Tepiman languages, so it must have entered the language at the Proto-Tepiman period. This again supports our argument locating the Proto-Tepiman community far in the north.

The inquisitive reader might ask why, if there was a sizable community of Tepiman-River Yuman bilinguals, we can find only one loan word attesting to this bilingualism. While we do expect that other loan words of this antiquity will eventually turn up, the general pattern in the Southwest is that lexical borrowing is quite restricted. For instance, Kroskrity (1993) has emphasized the very limited amount of lexical borrowing between Tewa and Hopi and Tewa and Navajo, and has argued that, at least for the pueblos, purist language ideologies discouraged lexical "mixing."[13] If this pattern is ancient in the region, then the fact that only a single loan word is currently attested from the proto-language period does not constitute an argument against our hypothesis. As for loans from Tepiman or other Uto-Aztecan languages into Yuman, our lexical resources are currently inadequate to identify these.

Morphosyntactic Borrowings: The Tepiman and Yuman Systems of Clause Joining. The Tepiman languages exhibit a system of clause-initial particles that connect sentences in discourse. The Yuman languages have a system of clause-final particles with very similar functions, which are quite similar in phonological shape to the Tepiman set. We believe that these similarities are the result of linguistic convergence, which occurs when bilinguals notice grammatical tactics that are similar between the two languages, and then generalize a single pattern for both. This kind of syntactic convergence is widely attested; a paradigm case involves the Indo-Iranian language Marathi and the Dravidian language Kannada (Gumperz and Wilson 1971). One of the hallmarks of this syntactic convergence is that each variety tends to keep vocabulary items distinct, with little lexical borrowing. Thus grammatical convergence with very limited lexical borrowing between Yuman and Tepiman is not a unique situation.

The major clause-initiating particles of Tepiman are **ku/ko-, *ma-, *na-,* and **tV* (where V is "some vowel"); *ti, ta, to* all appear in Tepiman languages. These particles mean 'which,' 'and then,' 'already,' 'if,' 'because,' 'so that,' etc. The Yuman languages have similar particles that come at the end of a clause. They are very similar in shape to the Tepiman set, being **-k, *-m,* and **-č.*

In both Yuman and Tepiman, the word order is: Subject + Object + Verb (SOV). If two clauses

have the same subject, the second mention of the subject is left out: for example, *John went home and took a shower,* instead of *John went home and John took a shower.* Let us now imagine a stage at which bilinguals in Yuman and Tepiman notice the following clause-joining pattern, where the second subject is left out: SOV_OV. The blank is the site where a "same-subject" marker is placed. In Cocopa and Diegueño this marker is *č,* similar to the Tepiman same-subject marker *tV.* Same-subject joinings are the most common type in discourse.

At the same time that bilinguals noticed the striking similarity in same-subject-marking order and phonological form, they would notice that two other clause-joining markers were similar: Tepiman **-ku/-ko, *-ma, *-na* and Yuman **-k, *-m.* They could then recruit these markers to the pattern that had already been generalized: SOV_OV. The two languages in the bilingual repertoire now share a system of clause-joining, where "same-subject" marking is distinguished from "different-subject" marking, yielding so-called "switch-reference."

In summary, some such process is a likely reconstruction of the source of the similarities between Yuman and Tepiman observed today. In both groups phonologically similar elements appear as links between chained, coordinated, and subordinated clauses. In both groups two of the elements contrast in a switch-reference system. The most important difference in the two systems is that in contemporary River Yuman the *k/m/č* elements are usually clause-final (usually attached to the end of the verb), while in Tepiman they are clause initial. However, even this distinction is not fixed. Gordon (1987:50) points out a tendency in Maricopa for verb-final suffixes to change their affiliation and attach to the following word, in the second clause, rather than to the end of the verb in the first clause—that is, to approximate the Tepiman pattern. Hale (1983) argues that clause-initial position for the Tepiman forms may be an innovation; he believes that they originated as verb-final markers, comparable to subordination markers in Takic, Hopi, and Numic, and exactly as in Yuman. These were reanalyzed as initial in the following clause. So the positionality of these clause-joining elements is unstable in both groups and is not functionally a fundamental question.

No other Uto-Aztecan languages outside Tepiman exhibit such a system. This suggests that Yuman is the original source of the behavior of the Tepiman clause-joining markers and supports our argument that the Proto-Tepiman community was located in contact with Proto-River Yuman as far north and west as the Gila-Colorado confluence. The presence in Tepiman and River Yuman of two types of "structural" (as opposed to lexical) convergence—the hardening of original glides to obstruents in the phonology of both languages, and the convergence in the clause-joining system, is consistent with the presence of a population of speakers who were bilingual in Proto-Tepiman and Proto-River Yuman (Thomason and Kaufman 1988).

The Northern Center of Maximum Diversity in Tepiman

Culture-area studies dating from the work of Sapir (Mandelbaum 1949) have generally held that the zone of origin of a system of cultural variation is likely to be at or near the place where the greatest contemporary diversity can be identified. The reasoning is, first, that it is in this zone that diversity has had the longest time to develop. The second argument is the uniformitarian proposal that the conditions that caused diversity and the consequent radiation of a system of cultural diversity are likely to have been in the same place in the past as they are today. We will advance here two sets of arguments that the center of maximum diversity in the Tepiman languages lies in the north. The first argument is based on the extreme divergence of Ati Piman. The second employs several lines of dialectological evidence, which show that, while the Tepiman languages exhibit complex intersections of isoglosses, which vary depending on which variable is selected, the southern or Tepehuan languages tend to group together as relatively similar, while the northern languages are highly variable and more differentiated.

Ati Piman. We possess only the most minimal attestation of Ati Piman, in the form of materials given by Father Ignaz Pfefferkorn, who served as a Jesuit missionary at Ati (modern Atíl), on the middle Altar River in Sonora, for five years beginning in 1756 (Pfefferkorn 1989). According to Mills (1932, 1936, cited in Fontana 1989), the Pimans at Ati had come from the west, probably from the

Table 5. Vowel Deletion and Determiner Loss in Tepiman.

Invariable	Variable	Rare
	1. Final Vowel Deletion	
	Northern	
Upper Piman, Maycoba, Yecora Altar Ati	Onavas	Yepachic, Nevome
	Southern	
Southeastern Tepehuan, Tepecano	Northern Tepehuan	
	2. Determiner Distinguished from Demonstrative	
	Northern	
Upper Piman Altar (Moyano sermons) Ati Onavas	Yepachic	Nevome Altar (other)
	Southern	
Northern Tepehuan Southeastern Tepehuan, Tepecano		

coast of the Gulf of California. Although Pfefferkorn's materials are scant, they are completely interpretable from our present knowledge of Piman dialects, and they show that the variety of Piman spoken at Ati was strikingly divergent on a number of important points. The materials below are discussed in detail in Shaul (1996).

With one exception, the phonemes of Ati were like those of the other northern Tepiman varieties, including those attested at the same period—Altar Piman, Nevome—as well as Onavas Piman and Oob No'ok (Mountain Pima). Ati morphology, however, is quite divergent. First, throughout Tepiman the independent subject pronouns are *(a)ni* 'I,' *(a)pi* 'you, singular'; *ø/heg* 'he, she, it'; *(a)ti* 'we,' *(a)mi* 'you, plural'; *ø/hegam* 'they.' In Ati, we find *ani* 'I,' *api* 'you, singular,' but the remaining pronouns are unique: *serei* 'he, she, it,' *niape* 'we,' *pinape* 'you, plural,' *seserei* 'they.' Ati pronouns also have case markers not found in any other Tepiman variety: objective *-(u)m* in the singular, *-ua* in the plural, and a possessive in *-i.*

Second, throughout Tepiman nouns form plurals by reduplication. In Ati, plurals form by suffixing *-buri* (after vowels), *-uri* (after consonants). Thus Father Pfefferkorn gives *ipudak-uri* 'hearts,' *vainomik-uri* 'skins,' *hottai-buri* 'stones,' *qui-buri* 'houses.' Contrast Tohono O'odham *hohodai* 'stones' and *ki:k* 'houses.' This plural marker is attested also in the place name *Quiburi* 'houses,' the name of a large settlement of the Sobaipuri, a now-extinct Piman-speaking group who lived along the San Pedro River in Arizona at the time of the entradas. Note that this ethnic designation also attests the *-buri* plural, here perhaps suffixed to the element *obai* 'person.' Thus Ati-like morphology must once have been very widespread.

Third, Ati, uniquely among the Tepiman languages, forms imperatives by truncation (leaving off the final syllable of the verb). Normally, truncation distinguishes perfectives (such as English *saw*) from imperfectives (such as English *seeing*). In Ati, perfective stems were formed by reduplication. Contrast Ati *mumuhat* 'killed' (vs. *muhat* 'killing'), *nunui-t* 'saw' (vs. *nuit* 'seeing'), with Tohono O'odham *mua* 'killed' (vs. *mu'a* 'killing'), *ñei* 'saw' (vs. *ñeid* 'seeing'). In other Tepiman languages, imperatives are formed by the addition of

Table 6. Tepiman Negatives.

	P- forms	Pima	M- forms
Northern	Upper Piman: *pi* (*pi'a* 'no') Altar: *pi, pia* Ati: *pia*	Nevome: *pima* (*pi as* 'cessative' only)	Onavas (modern): *-him* Maycoba: *im* Yepachic: *im*
Southern			Northern Tepehuan: *mai* Southeastern Tepehuan: *cham* Tepecano: *iam*

Table 7. Tepiman Numerals.

	Tohono O'odham	Altar	Onavas	Onavas (J)[a]	Ati	Nevome	Maycoba	Yepachic	Northern Tepehuan	Southeastern Tepehuan	Tepecano
'1'	*hemako*	*humai*	*hüima*	*mado*	*mato/humaco*	*maddo (inan.)* *maco (anim.)*	*hemak*	*hemako*	*imóko*	*mad*	*hõmad/himati*
'2'	*go:k*	*goc*	*go:k*	*gok*	*kok*	*goc*	*go:k*	*goóka*	*goóka*	*gok*	*go:k*
'3'	*waik*	*vaic*	*vaik*	*vaik*	*weik*	*vaiko*	*vaik*	*vaika*	*vatka*	*vaik*	*vaik*
'4'	*gi:k*	*guicu*	*gui'ik*[b]	*gik*	*kik*	*guico/macoba*	*maakav*	*maákova*	*maakóva*	*makov*	*makov*
'5'	*hetasp*	*hutasp*	*heta'asp*	*héta'asp*	*hamacu (cf. '4')*	*utaspo*	*ma'vées*	*ma'vɨ̈si*	*taáma*	*hiščamam*	*ictuma:m*
'6'	*cu:dp*	*tutp*	*tu:tp*	*tu:tp*	*rassiri*	*tutpo*	*vusin*	*vusan*	—	—	*civhómad*
'9'	*humukt*[c]	*tum bustamam*	—	*túmvestmá:m*	*schabac*	*tumbustamama*	*nuéw*	—	*tuvustyáma*	—	—
'10'	*westma:m*	*bustamam*	*wiiiis(t)maam*	*véstmá:m*	*bustamama*	*bustamama*	*a'ipidvees*	*a'ipidve'es*	*baivustyáma*	*mambiš*	*mamvóc*

[a] These attestations are from John Robert Cornell's 1971 field notes.
[b] Estrada (1994) notes that this rearticulation of the vowel, seen in *gui'ik* 'four' and *heta'asp* 'five' in Onavas Pima is present also in the Oob No'ok of Yecora, Sonora, but is not attested in Maycoba or Yepachic.
[c] Note the possible source of this word in Yuman '9': Maricopa *ñemxamúk*, Yuma *xamxamók*, Cocopa *xamxamúk*, Diegueño *xámxamók*.

a suffix *-ni* (singular), *-vora* (plural), or by preposing a particle *ga* or *gu.* In Ati, imperatives are formed by truncation.

In summary, in the rather shallow phylogenetic system of Tepiman, Ati stands out as being especially divergent. Its northern location is secure, especially since the unusual plural *-buri* is attested as far north as the middle San Pedro River. If we were to develop a family tree for Tepiman, the first branch would be between Ati and all the other Tepiman languages.

Dialectological Evidence. The Tepiman dialect chain was probably once continually distributed from the Gila River to the northern mountains of Jalisco. However, our earliest Tepiman materials come from a period after this continuum had already been substantially disturbed, from linguistic work by missionaries in communities that probably originated as "congregations" or "reductions" of speakers from more than one dialect or even language. While it is thus impossible to reconstruct with much accuracy the isogloss system of the prehistoric dialect chain, such evidence as we found suggests that the northern languages are more different from each other than are the languages of the southern section of the Tepiman continuum. The northern languages include Upper Piman, Altar Piman, Nevome, Ati Piman, Lower Piman, and Oob No'ok (Mountain Pima). For the last we distinguish data from Maycoba (Sonora), Yecora (Sonora), and Yepachic (Chihuahua). The southern languages include the Tepehuan group (see Figure 2 for locations of the languages). We give below the distribution of a number of significant variables.

The first two variables are summarized in Table 5. The first variable is the deletion of word-final vowels, an innovation. For instance, Proto-Tepiman **pa-ka* 'reedy place' is retained in Nevome *vaca* /waka/, but appears in Tohono O'odham as *wa:k.* The three possibilities are invariable deletion, variable deletion, and near-absence of deletion. All three patterns are found in the northern languages, while in the southern languages deletion is invariable in the Southern Tepehuan varieties and variable in Northern Tepehuan.[14]

The second variable is the manifestation of the determiner. Most Tepiman languages distinguish a determiner (Zepeda 1983), something like English "the," from a demonstrative resembling English

Table 8. Tepiman Tense Markers.

	Tohono O'odham	Nevome	Onavas	Oob No'ok	Northern Tepehuan	Tepeguana	Southeastern Tepehuan	Tepecano
Past	*-ahim*	*-cada, -tada*	*-tad(a)*	*-tada*	*-tadai*	*-tade*	*-k*	*-kar, -dar*
Future	*-d*	*-mucu*	*-ia*	*-(i)a*	*-mu*	*-ague, -amocue*	*-'*	*-ka, -da*
Irrealis		*-na*	*-na*	*-na*	*-na, -ña*	*-ana*		
'was to'		*-macada*			*-muda, -mudyi*			
Potential		*-di*	*-di*	*-gi*			*-da*	*-ig*

Note: Table reproduced from Shaul 1994. Data are from Bascom 1982:364f (Northern Tepehuan); Mason 1916:367f (Tepecano); Rinaldini 1743:A18f (Tepeguana); Shaul 1986:33 (Nevome); Willett 1991:67f, 101f, 166f (Southeastern Tepehuan); Zepeda 1983:59f, 71f (Tohono O'odham); and Shaul's field notes on Oob No'ok (Mountain Pima). "Past" refers to past continuative.

"that." The determiner is required with noun phrases that are not otherwise specified (by possessives, numerals, or demonstratives).[15] The determiner is either invariably retained, retained only variably, or lost. Again, the northern languages exhibit all three patterns, while the southern languages exhibit only retention. The loss of the determiner in Nevome and Onavas and among some speakers of Altar should probably be considered an innovation.

The third variable is the form used for the negative, with variation shown in Table 6. Three major types of negatives appear in Tepiman: negatives including the element *pi,* negatives formed around the nasal element *-im, -am,* and an apparently intermediate form, *pima,* seen in Nevome, that seems to combine the two. All three types are attested in northern languages, while only the nasal type is found in the south.[16]

The numerals constitute an interesting lexical set that displays the same pattern of variation. The numerals are given in Table 7. For the number 'one,' Tohono O'odham, Oob No'ok, and Northern Tepehuan group together with a form that can be reconstructed as **hemako:*. A second etymon, reconstructible as **mado:*, appears in the southern languages. However, Onavas, Nevome, and Ati, all in the north, exhibit both types.

The words for 'four' and 'five' again show this pattern. While **gi:'ike* 'four' is dominant in the northern languages, with **maakova* 'four' in the south, three northern languages are aberrant: Nevome shows both forms, Ati seems to have mixed up 'four' and 'five' (we cannot, of course, fully trust Pfefferkorn 1989 on this point), and Oob No'ok groups with Tepehuan. In the case of 'five,' the northern languages show two etyma, **hetaspe* and **maveesi* (the latter meaning 'the whole hand'), while the southern languages all share a single etymon, something like **ta:ma(m),* probably related to the **tamama* component of the words for 'ten' (which comes from 'our hand' compounded with **ve:si* 'all'). For the number 'nine,' Tohono O'odham exhibits a Yuman loan word; this is probably part of a relatively recent series of loans from Yuman documented by Shaul and Andresen (1989). The distribution of 'ten' is very complicated, with Oob No'ok showing its own peculiar reflex, and Northern Tepehuan grouping with the Piman languages.

Finally, the tense markers exhibit a similar pattern. The Tepiman tense markers are seen in Table 8. The varieties from Nevome south conserve a common set of tense-aspect suffixes, which are totally lacking in Upper Piman (exemplified in the table by Tohono O'odham). The loss of the system in Upper Piman means that the northern languages exhibit both innovative and conservative versions of the tense-aspect system, while the southern languages have only the conservative one.

In summary, such dialectological evidence as we can reconstruct supports the claim that the northern end of the Tepiman continuum exhibits greater diversity than the southern end.[17] This is additional evidence for a northern origin for the family.

The Biogeographic Evidence. Biogeographic evidence has traditionally been important in attempting to identify the likely location of ancient speech communities. For Uto-Aztecan the definitive discussion of this evidence is Fowler (1983). Fowler points out that the most significant etymon for biogeographic argumentation about the location of Proto-Tepiman is the word **ha:sani,* glossed by Bascom (1965) as 'tall cactus species.' Since the word means 'saguaro (*Carnegiea gigantea*)' in

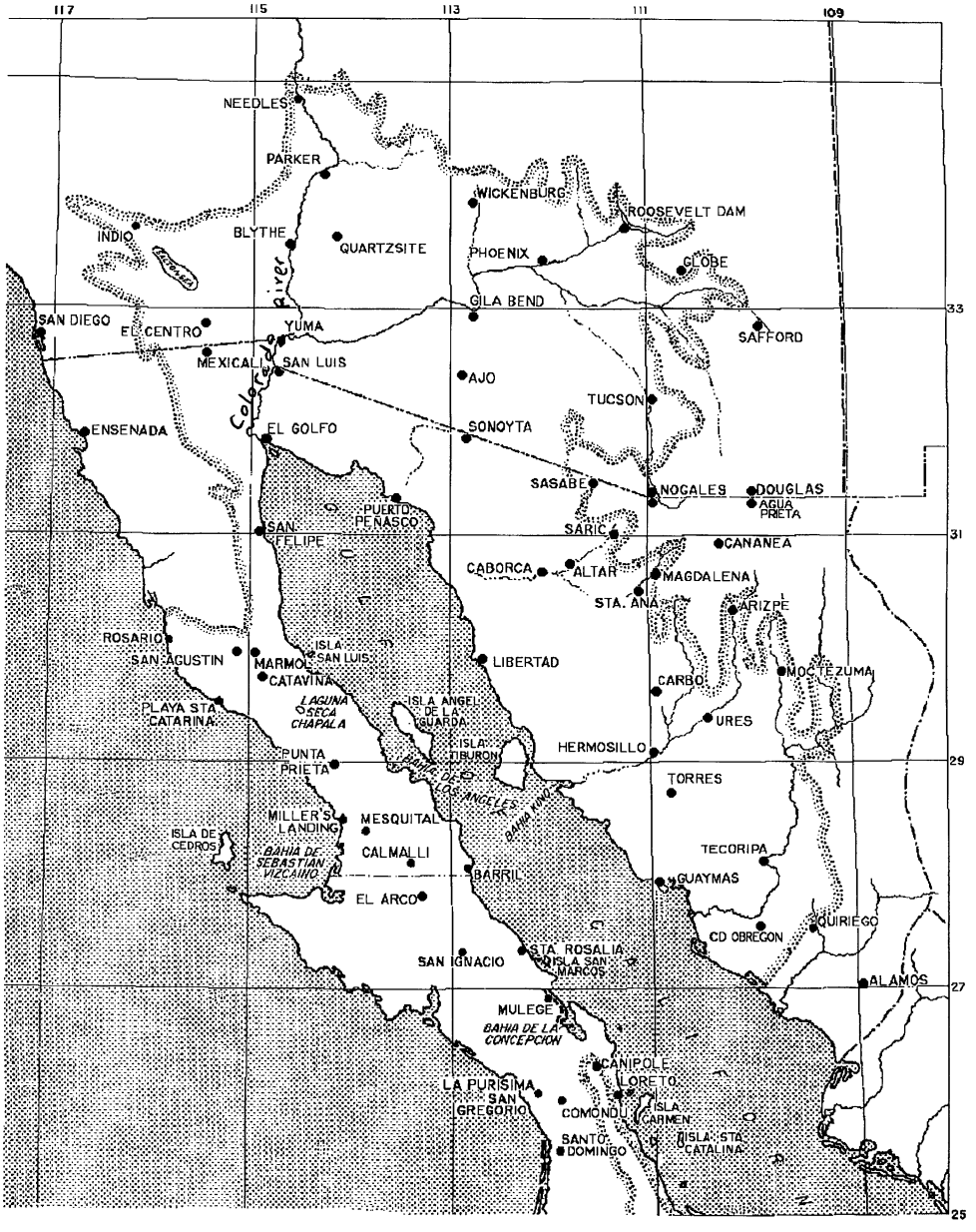

Figure 3. The Sonoran Desert (after Shreve and Wiggins 1964). Saguaros are found inside the boundaries of the Sonoran Desert north of Ciudad Obregón and east of the Colorado River, up to about 600 m.

Akimel O'odham and Tohono O'odham, Fowler concludes that the referent is this cactus. Therefore, she suggests, the Proto-Tepiman homeland must fall within the range of this plant. Saguaros are found in a restricted range: east of the Colorado River, south and west of the Mogollon Rim, and in the foothills of the Sierra Madre Occidental up to about 600 m as far south as Ciudad Obregón, Sonora (see Figure 3; other than the above restrictions, saguaros are found throughout the area defined there as "Sonoran Desert"). This area does not include Onavas, the region inhabited by speakers of present-day Oob No'ok, or the area where Tepehuan languages are spoken. Again, the region of Tepiman origin must lie in the north.

While we believe that Fowler's conclusion was correct, she does not give the necessary argumentation for it. Instead, Bascom's (1965) caution in

glossing **ha:sani* only as 'tall cactus,' a translation that does not permit her conclusion, was appropriate given his evidence. We present here additional argumentation required in support of Fowler's view.

Several different genera of giant cactus are found within the Tepiman range. The most important species that yield edible fruit are the saguaro, with the range described above, and the organ pipe (*Stenocereus thurberi*), ranging from the low deserts of southwestern Arizona south into northwestern Mexico. Bascom's etymology depends on the fact that Northern Tepehuan exhibits a reflex of **ha:sani.* However, in that language, spoken where saguaros do not grow, the referent is almost certainly the organ pipe or cardón. In Mexican Spanish the gloss "pitahaya," given by Bascom, can refer to the fruits of both the organ pipe and the saguaro (Schoenhals 1988). Two conclusions are possible. One is that the Northern Tepehuan shifted the meaning of a word that had originally meant 'saguaro' to 'organ pipe.' The other is that the word meant 'organ pipe' in Proto-Tepiman, and came to mean 'saguaro' only in the extreme north, outside the range of the organ pipe. The Nevome and contemporary Lowland Pima Bajo data permit us to resolve this problem. Pennington (1979) attests no reflex of **ha:sani* in Nevome; not surprisingly, since Onavas is outside saguaro range. Instead, he gives two other Nevome words for giant cactus. These are *tupoki* 'cardón' (probably *Pachycereus pecten-aboriginum—tepok* in contemporary Lowland Pima Bajo [Amadeo Rea, personal communication 1996), and *tutusi* 'pitahaya.' This latter form is obviously a cognate of Tohono O'odham *cucuis* 'organ pipe'; Amadeo Rea (personal communication 1996) reports that this cactus is *tutus* in contemporary Lowland Pima Bajo. The loss of **ha:sani,* with the retention of two other terms for tall cacti, in Nevome suggests that the **ha:sani* is indeed the saguaro, the major economically important species of giant cactus that does not grow at Onavas. The Nevome evidence argues that Northern Tepehuan simply collapsed the distinction between *tutus* and *ha:sani,* using only the latter term to refer to the giant cactus that bears edible fruit. Amadeo Rea (personal communication 1996) reports a similar nomenclatural transposition among some Gila River Pima. These speakers use the etymon *cucuis,* which refers to the organ pipe, *Stenocereus thurberi,* in Tohono O'odham and Pima Bajo, for a specimen of the senita cactus, *Lophocereus schottii.* The latter is known as *ce:m* in Tohono O'odham and *teem* or *teemis* in Pima Bajo. The Gila River Pima live outside the range of the senita and know only a single example, planted and carefully tended at Sacaton, Arizona. Rea's example illustrates precisely the sort of switch that must have taken place in Tepehuan. Thus Fowler's argument goes through after all, putting the Proto-Tepiman homeland necessarily in the north, within the range of distribution of saguaros.

Hohokam as a Multi-Ethnic Formation

The evidence we have presented thus far supports the first two hypotheses about Tepiman-Hohokam relationships proposed by Hale and Harris (1979). First, the Proto-Tepiman speech community was one component of the Hohokam cultural system. This is supported by our extensive evidence for contact between Proto-Tepiman and Yuman, mainly the River Yuman subgroup. The most probable geographical zone for Tepiman-Yuman contact lies within the area inhabited by the Hohokam. This contact occurred before the breakup of Proto-Tepiman or Proto-River Yuman, and thus falls within the appropriate time period in the first millennium A.D. Thus Hohokam society was almost certainly a multi-ethnic system, perhaps similar to the present-day Puebloan complex on the upper Rio Grande. Second, the present-day Tepiman Corridor represents a dominant direction of expansion of speakers of these languages from north to south rather than vice versa. This hypothesis is strongly supported by our data, with multiple lines of evidence converging on the conclusion that the Proto-Tepiman community was located at the northern end of the Tepiman corridor. Some Tepimans must have been involved in practices, perhaps trade, that sustained their radiation southward toward Mesoamerica and out to the coast of the Gulf of California.[18]

We have not ruled out the possibility that the Proto-Tepiman community represents a group migration from Mesoamerica that occurred at the beginning of the development of the Hohokam regional system. We consider this to be unlikely, since other evidence suggests that the Tepiman languages have been at the extreme northern end of the Southern Uto-Aztecan continuum since a

very early period. Hill (1997) reconstructs a system of eight cognate words involving maize cultivation for Proto-Southern Uto-Aztecan. While six of the items are found in Tepiman, three do not refer specifically to maize, in contrast to meanings in other groups. That is, Tepiman is relatively marginal in this system of vocabulary, suggesting a northerly location at the time of the northward spread of maize agriculture during the second millennium B.C., well before any archaeological materials that are considered "Hohokam" appear.

In addition to Tepimans and River Yumans, the historical-linguistic evidence suggests that a third ethnic component, Zuni, may have been part of the Hohokam system. During the Classic period, beginning in the thirteenth century, archaeologists note a substantial increase in evidence for hierarchy in Hohokam communities. Especially, platform mounds became fortified sites for elite residences (cf. Doyel 1991). We suggest that a Zuni element in the Hohokam system may date from this period. Our linguistic evidence for a Zuni presence in the Classic Hohokam is small but tantalizing: the presence of several loan words between Tepiman and Zuni. This linguistic evidence is consistent with the distribution of the Fourmile Polychrome ceramic horizon noted by Adams (1991), as well as with the distribution of Salado materials from the Salt River as far east as Acoma in the fourteenth century (Adams 1991). Furthermore, the content of these loan words is consistent with an association with the kachina cult that Adams argues appeared and diffused in this period.

First is a Zuni loan word into Upper Piman that appears in Tohono O'odham as *siwañ,* a term Underhill (1939) noted as the term for a rain shaman among the Tohono O'odham (Teague 1993). The ruins of the Hohokam great houses in Arizona are known among the contemporary O'odham as *siwañ wa'aki. Siwañ* is often translated as 'chief'; *wa'aki* is usually translated by O'odham as 'rain house,' and can refer either to a Hohokam great-house ruin or to the round, semi-subterranean structure used for community ritual in a number of contemporary O'odham communities. There are several different characters with the title *siwañ* in Piman legends (Bahr et al. 1994). Some Tohono O'odham stories include a specific character with this word as a personal name. *Siwañ* was a great man who lived better than ordinary people in his palatial house (cf. Saxton and Saxton 1973:74–78, 150–157, 163–168). This word is almost certainly a loan from Zuni *šiwani* 'rain priest' (Newman 1958:39), 'rain cloud' (Bunzel 1935:393). The same word is also found in Keresan as *šĺ:wana* 'rain deity, kachina' (Lange 1959; White 1942) . The direction of the loan between Zuni and Keresan, which are unrelated languages, cannot be determined. The contemporary O'odham pronunciation, with final palatal *ñ* reflecting a final **i,* is precisely what would be predicted if the form is a loan from Zuni; if the source were Keresan we would expect **siwan,* not *siwañ.*

The second loan word is a Tohono O'odham kin term, *kihe:* or *kiha:,* often translated as 'brother-in-law' or 'sister-in-law,' or as 'some kind of brother.' This form is almost certainly related to Zuni *kihe* 'ceremonial brother' (Newman 1958:25). In this case, the word probably originated as a loan from Tepiman into Zuni, since Newman (1958) gives only two Zuni words that begin with *ki.* The other is *kiwihts* 'kiva,' an etymon seen today in Hopi *kiva.* ***ki:* is a good proto-Uto-Aztecan reconstruction for 'house,' and *kihe* may have the same source, and mean something like 'housemate.' A third loan word is Zuni *kok:o* 'good kachina.' Tohono O'odham has *kok'oi* 'ghost, spirit of the dead' (Saxton et al. 1983:33); this is a good O'odham reflex of Uto-Aztecan ***koi* 'die' (Miller 1967:29). Hopi has apparently borrowed the Zuni word and uses it in a number of names of specific kachinas and in terms having to do with the Fire Clan (Kenneth C. Hill, personal communication 1995). The Hopi form is *koko-,* as in *Kokosori* 'a kachina,' or *kooko-,* as in *Kookopölö* 'a kachina with a hunchback or English 'Kokopelli.'[19] These forms can be identified as loans from Zuni into Hopi rather than direct descendants from PUA ***koi* 'die,' since the Hopi vowel is wrong; the regular reflex of PUA **o in Hopi is /ö/. However, the Tepiman vowel is regular; thus the direction of the loan is likely to be Tepiman > Zuni > Hopi.[20]

Finally, two additional probable loan words are found in the context of the Zuni Shuma'kwe Society ceremonialism. Stevenson (1904:545) states that the language of the songs used by the Shuma'kwe, a society devoted to the cure of con-

vulsion, was Pima. The songs were said to have been learned from the Pima during the earliest period of Zuni history (Stevenson 1904:29). A component of Shuma'kwe curing is the untwisting of a four-sided plaque made from yucca leaves (Parsons 1939:364). The Zuni term for *Yucca baccata,* 'banana yucca,' is *ho:-ts'ana* (Newman 1958); for *Y. whipplei* 'Spanish bayonet,' *ho:-k'apa.* The two forms share the root *ho:-*. The O'odham name for *Y. baccata* is *howi* (Saxton et al. 1983), whose final element, *-wi,* is an increment that appears on many O'odham nouns for plants and animals. The Zuni root *ho:-* 'yucca,' given its connection with ceremonialism otherwise linked to Piman, is probably a loan from that language.

Yet another probable Piman loan word is found in the name of the Shuma'kwe society itself. The head of the society must be a member of the Roadrunner Clan. The primary symbolism of the roadrunner in Puebloan cultures is 'war' (Tyler 1979). The Piman root *sema-* means 'bold, mean.' We suggest that the first element in Shuma'kwe (the element *-'kwe* is the collective suffix) is a loan from Piman meaning something like 'warrior, bold person.'

These loan elements suggest contact involving ceremonialism between Zuni and Upper Piman. While our lexical resources for the southern languages are relatively impoverished compared to Upper Piman, so that we cannot make a definitive conclusion on this point, we note that the *siwañ* and *howi* words are attested only in Upper Piman, so this exchange may have taken place in the north after the breakup of Tepiman.

Modern O'odham Dialects

The Hohokam collapse, complete by around 1450, may have broken off support for the long-distance relationships that connected communities in the Tepiman corridor, precipitating the final breakup of the dialect continuum. Elite collapse opened the way for a reshuffling of those Tepiman groups that were in the core Hohokam area and on its fringes, an issue to which we now turn.

It is important to understand that the divergence of the Upper Piman languages from the other northern Tepiman languages (Lower Piman, Mountain Pima) may be quite recent. (The divergence of Ati Piman is probably much older, as noted above.) Upper Piman is differentiated from other Piman languages by several very recent sound changes. These include the following: (1) retroflexion of *s to *ṣ* before all vowels except *i*; (2) hardening of *r to retroflex *ḍ*; and (3) palatalization of coronal consonants *t and *d to *c* [č] and *j* [ǰ] respectively before high vowels (*i, e, u*), a very recent change occurring after the 1740s (Shaul 1996).[21] The spread of these three sound changes throughout Upper Piman, but not into other languages, suggests that in the early historic period these dialects constituted a relatively bounded community.

Upper Piman is internally differentiated dialectologically. The extreme disruption of the region in the last few hundred years makes it impossible to definitively reconstruct the precontact situation, but some broad outlines pertinent to the early historic period are apparent. First, while Akimel O'odham or Pima is distinct from the two major dialect systems within Tohono O'odham, 'peripheral' and 'central,' all varieties are completely mutually intelligible with one another, and the differences are slight, comparable to those among, for instance, the different dialects of American English.

In addition to distinctive lexical items, Akimel O'odham is differentiated from Tohono O'odham by several sound changes. Internal dialect differentiation within Akimel O'odham is not well documented, but this variety seems to have been spoken from Queen's Creek west to near Gila Bend, and south to Kohadk and Angam on the present-day Tohono O'odham Reservation. Varieties that should probably be assigned to Akimel O'odham (although speakers consider themselves citizens of the Tohono O'odham nation) include Saxton et al.'s (1983) "Huhhu'ula" and "Kohathk" dialects. In this we follow Bahr (1971), who suggests that "there are hints that an historically significant distinction consists of 'Pimas plus some northern dialect groups of Papago' versus 'southern dialect groups of Papago.'"

Within Tohono O'odham proper (in the linguistic sense), Hill and Zepeda in recent fieldwork have confirmed the presence of four major dialects. In the southern part of the Tohono O'odham Reservation, along the Mexican border from the Baboquivari Range in an arc continuing to Pisinmo'o, are found speakers of what is often called "Kokolo:di," from Spanish *tecolote* 'owl,'

the name of a village in the region. In the extreme south and west is a second dialect. Saxton et al. (1983) record the name "Huhuwosh" for this variety. Finally, from the village of Ge Wo'o north to Wahia Cin is a third variety. While it is not clear that these dialects share a single common ancestor in contradistinction to the fourth, "central," dialect, Hill and Zepeda refer to them informally as the "peripheral" dialects.

The modern dialect of Tohono O'odham that is most innovative, compared to Proto-Tepiman, is Aji/Totoguañ, which Hill and Zepeda call "central." This dialect complex (which displays a small amount of internal differentiation) occupies most of the traditional Papaguería, the area, in addition to the extreme north, where evidence for a Hohokam presence is found on the Tohono O'odham Reservation. Hill and Zepeda identify dialect differences according to the reflex of significant sociolinguistic variables: loci of linguistic structure where speakers regularly differ from one another.[22] In the case of Tohono O'odham, the variables of interest are those where we know the reflex in Proto-Tepiman, so that we can tell whether a contemporary dialect has innovated or is conservative. Of 23 sociolinguistic variables where we know the Proto-Tepiman reflex, Aji-Totoguañ has innovated in 14. This substantial cluster of innovations is consistent with a fairly rapid separation of Aji/Totoguañ people from other Tohono O'odham speakers in recent times. A scenario consistent with this linguistic picture is that speakers of Aji-Totoguañ spread into abandoned Hohokam regions in the late prehistoric period. This is also consistent with Aji-Totoguañ oral tradition that they represent a later emergence from underground, which resulted in their displacing autochthonous peoples—the Hohokam—in their region.[23]

Aji-Totoguañ exhibits the most conservative (that is, most "Pimanized") treatments of Spanish loan words of all the Tohono O'odham dialects. For instance, Aji has a form with stress on the first syllable (the normal O'odham stress pattern) *siminjul* 'graveyard,' from Spanish *cementerio,* while Kokolo:di, the southern dialect, has *siminji:ro,* with stress in the Spanish position. The Aji pattern is consistent with an early exposure to Spanish relative to other dialect groups. The more hispanicized phonology found in other dialect groups suggests contact with large groups of speakers of Spanish, perhaps in the late nineteenth and early twentieth centuries, while the Aji-Totoguañ forms suggest sporadic contact with small numbers of Spanish speakers, which we would expect to have been the scenario in the seventeenth and eighteenth centuries (and which was followed in the Aji-Totoguañ area by 100 years of relative isolation as the Spanish pulled out of their area in the face of Apache pressure [Hill 1994]). This is consistent with our proposal that Aji-Totoguañ speakers lived somewhere in their current range at the time of the earliest entradas in 1690.

The Kokolo:di dialect is generally more conservative than Aji. Where it innovates, these innovations are sometimes shared with Piman languages farther south. The general picture is of a more conservative zone to the west and south and an innovating zone in the central and eastern part of the reservation.

Kokolo:di speakers claim to have moved into the foothills of the Baboquivari range in the southeastern corner of the reservation in very recent times. Communities in that region include a mixture of Kokolo:di and Totoguañ speakers. However the ethnohistorical attestations of local speech (e.g., Baboquivari, the sacred mountain southwest of Tucson) are more consistent with modern Kokolo:di pronunciation [vavəgiwəri^{h}k] than with Totoguañ pronunciation [wawəgiwurk].

In summary, the dialectology of Tohono O'odham suggests that Aji/Totoguañ should be recognized as a relatively distinctive and innovative dialect.[24] The distinctiveness of the dialect may be related to the fact that its speakers, along with the Kohadk and Huhu'ula, occupy that area in the Tohono O'odham region that exhibits Hohokam archaeological remains (see Figure 4). Either the Aji/Totoguañ constitute that element of the Tohono O'odham who were involved directly in the Hohokam complex, and were thereby distinguished from their "peripheral dialect" neighbors, or else they may constitute a group that moved into a geographical area left empty, or poorly defended, by Hohokam abandonment, thereby separating rather suddenly from the peripheral dialects. Our data on dialect differentiation cannot definitively distinguish these two scenarios. However, Aji-Totoguañ oral tradition supports the latter scenario and is thus consistent with the hypothesis that not

all Upper Piman groups now located in the Hohokam region lived there in prehistoric times.

Conclusion

Evidence from historical linguistics suggests that the Tepiman subgroup of the Uto-Aztecan languages originated in the northern end of its current range. Speakers of Proto-Tepiman and speakers of Proto-River Yuman were probably in a sufficiently intense contact with one another for a substantial population of bilinguals to exist, among whom convergences developed in the sound system, the morpho-syntactic system, and to a limited degree in the lexicon of the two languages. The most likely context for that development was during the emergence of the Hohokam system, in the drainage of the middle and lower Gila River. Thus from the beginning Hohokam were probably a multi-ethnic complex, comparable perhaps to the historic Puebloan complex on the Upper Rio Grande. Additional evidence makes it very unlikely that the Tepimans originated in the southern end of their historic range. Differentiation among the daughter Tepiman languages is much greater in the northern end of their range than at the southern end among speakers of Tepehuan languages. This suggests a differentiation in situ in the north, with a relatively late movement south to the northern boundaries of Mesoamerica. Finally, Proto-Tepiman was spoken within the range of the saguaro cactus (*Carnegiea gigantea*) (Proto-Tepiman **ha:sani*), again placing the language in the northern end of the present-day Tepiman range. All of these lines of evidence suggest that speakers of Proto-Tepiman were part of the Hohokam complex, probably along with speakers of Proto-River Yuman. Loan word evidence suggests that by the fourteenth century, speakers of Zuni were part of this system as well. However, we cannot make the same argument for speakers of the modern Upper Piman languages, Tohono O'odham and Akimel O'odham. This is a very recent dialect system. The system of linguistic variation within Upper Piman does not permit us to distinguish between a scenario that sees these people (or some of them) as the contemporary descendants of participants in the core Hohokam complex or one in which they entered the core Hohokam area at the time of, or after, the Hohokam collapse.

Acknowledgments. Versions of this paper were presented at the University of Arizona Department of Anthropology Colloquium, April 1993, at the Desert Archaeology Brown Bag Lunch, Tucson, Arizona, October 1993, and at the Friends of Uto-Aztecan Conference, Reno, Nevada, August 10, 1994. We thank our colleagues for suggestions and comments, especially William Doelle, Catherine S. Fowler, Kenneth C. Hill, Margaret Langdon, Jonathan Mabry, Mike Nichols, and Amadeo Rea. We also thank the editor and the anonymous referees of *American Antiquity.* All errors, of course, are our responsibility.

This paper represents a thorough collaboration, in which we have challenged and refined analyses that we initially arrived at independently. The evidence for the loan word for 'water' and the discussion of the morphosyntactic contact primarily come from Shaul, as does the bulk of the comparative Tepiman material. Hill identified the system of sound changes shared by Tepiman and Yuman and contributed the dialectological materials as well as undertaking much of the actual drafting of the paper.

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Notes

1. We use "O'odham" for the several varieties of Upper Piman, languages often referred to in the literature as "Pima" and "Papago." Speakers prefer "Akimel O'odham" (River People) and "Tohono O'odham" (Desert People), respectively, for these very closely related varieties. The dialect system does not precisely correspond to tribal membership; a number of "Tohono O'odham" in the northern part of their reservation speak dialects that are more closely affiliated with the Akimel O'odham varieties of the Gila River drainage than with the more southerly dialects that make up Tohono O'odham.

2. While the arrival of Apachean speakers in the Southwest has often been suggested as a possible reason for the shrinking of the Anasazi domain, as far as we know no one has suggested that the Apacheans played any role in the reorganization and collapse of the Hohokam. Most scholars attribute this to a combination of drought and flood (cf. sources in Crown and Judge 1991 and Nials et al. 1989); Doelle and Wallace (1991) emphasize that in the Tucson Basin decline of complexity of the system was much more gradual than in the Phoenix Basin.

3. Mountain Pima is known in the Mexican literature as "Pima Bajo," a term also used for Nevome and Onavas Pima (cf. Estrada Fernández 1994). Since the two complexes show no evidence of a single common origin vis-à-vis other Tepiman varieties, the term "Pima Bajo" or "Lower Piman" perhaps should be reserved for Nevome and Onavas Pima, with "Mountain Pima" being used as here. The Mountain Pima themselves prefer the term "O:b No'ok" for their language and we will use it below.

4. Yaqui is now also spoken in communities in Arizona, but this is not pertinent to our discussion.

5. It may be helpful to compare the lowest shared cognate density in Tepiman, of 73 percent, with cognate densities between some well-known pairs of languages. Spanish and Portuguese have 90 percent cognacy, suggesting in glottochronological terms a split within the last millennium. English and German exhibit 60 percent cognacy; the split between these must be at least 2,000 years old. English and French exhibit 27 percent cognacy, suggesting a division date closer to 3,000 years ago. Thus the Tepiman languages are much more closely related than English and German, but not quite as closely related as Spanish and Portuguese.

6. By convention, sounds in the protolanguage at the level of Uto-Aztecan itself are prefixed with two asterisks. Sounds in Proto-Tepiman are prefixed with a single asterisk. The term "hardening" (or "strengthening" or "fortition") expresses the fact that a sound change results in greater contact between the articulators. The opposite change is "softening" (or "lenition"), in which there is a lesser approximation of the articulators.

7. The phonetic symbol [ð] represents a sound pronounced like *th* in English "these," "those," "mother."

8. There is less lexicostatistical work on the Yuman languages than on Tepiman. Hinton (1991) cites estimates of the date of the breakup of the proto-Yuman speech community, probably located in southern California, that range from 4800 to 2300 B.P. Hill (1997) believes that a likely date for this breakup is similar to the date for the breakup of the Takic languages, which she now estimates based on a variety of external indicators at 3000 B.P. Thus a date for the proto-River Yuman community at about 2000–1500 B.P., contemporaneous with Proto-Tepiman, is by no means unrealistic.

9. Yaqui /w/ is sporadically pronounced today as [g] before /o/ in a few words (Martínez Fabián 1997), but it is unlikely that this variation is related to the older system.

10. For instance, the hardening of Proto-Numic *w to [gw] is found in a few words in Comanche, which also exhibits a hardening of Proto-Numic *y to [d] (Nichols 1973). The most suggestive set of hardenings in Numic are found in a single dialect, Southern Nevada Northern Paiute (Nichols 1973), spoken today south of Reno at Walker Lake and Yerington. In this dialect, Proto-Numic *y and *w become [d:] and [g:w] respectively in certain very restricted intervocalic environments (where the hardened glide is preceded by final features of series 2 and 3; the "final features" of Numic are probably reflexes of consonants that have disappeared in all the daughter languages and are evidenced only in changes in remaining consonants, including nasalization and lenition (spirantization) as well as hardening). It is, of course, the very rare hardening of **y that is of relevance here.

11. Another possibility is that the first syllable was simply understood as the River Yuman word for 'water,' **ahá-*.

12. "Elixir" is a term from alchemy, referring to a substance that can transmute metals. The word came into Old French from Arabic, but can ultimately be traced to the Greek word for a medicinal powder containing the root *xeros* 'dry.' Such complex areal histories are often attested for "high language" vocabulary.

13. Dozier (1956) is a well-known discussion of this kind of purism in Rio Grande Tewa.

14. Estrada Fernández (1994) gives details of variation in treatment of the final vowels for the three Oob No'ok communities. Her work shows that deletion and devoicing of the final vowels is found even in Yepachic and in modern Onavas Pima, but at lower frequencies than in Maycoba and Yecora, and certainly at much lower frequencies than in Upper Piman where the deletion is almost categorical.

15. In Tohono O'odham, the determiner does not occur when the noun is in sentence-initial position.

16. The form attested in Onavas Pima and Nevome is probably the source of the Spanish-language name of the language group, *pima.* The Indians themselves referred to members of

their own groups as **o'odhama* 'people,' except for the Mountain Pima, who use *'o:b* from **o'obai* (the term in Upper Piman means 'enemy, Apache').

17. We can also conclude from these data that the subgrouping of Upper Piman, including Akimel and Tohono O'odham and Nevome, and Lower Piman, including the remaining Piman languages, proposed in Bascom 1965, cannot be sustained. Nevome seems usually to go its own way, rather than grouping with Akimel and Tohono O'odham, and the three varieties of Oob No'ok and modern Onavas Pima also split unpredictably in different directions. Even "Tepehuan" is a bit dubious, since Northern Tepehuan clearly shares some local phenomena with neighboring Oob No'ok. Departing slightly from the main theme of this paper, we suggest that this and other evidence (found in Shaul 1996) suggest the following subgrouping for Tepiman: an early branching between Ati and the remaining languages, a second branching between a highly innovative component in Upper Piman, with sharp divergence in morphology, especially in verb derivation, and phonology, and a relatively conservative core group to the south that includes at least Mountain Pima and Northern Tepehuan, and, finally, a branch dividing this group from a southern extension consisting of Southeastern and Southwestern Tepehuan and Tepecano.

18. Wilcox (1986) suggests that Piman agricultural villages, constituting a chain of oases between the northern edge of Central Mexico and the Hohokam region, were a natural corridor for trade as well as other types of cultural diffusion. Doelle and Wallace (1991) suggest that Hohokam sites in the Papagueria were inhabited by Pimans who controlled the shell trade from the Gulf of California. Fowler (1983) suggests that the Tepiman corridor was split by a penetration to the coast of the Gulf by Cahitan speakers (Yaqui and Mayo in Figure 2). Shaul (1994) makes the opposite argument, that the Tepiman expansion resulted in the division between Cahitan and Opatan (Opata and Eudeve) languages, which historically formed a single Opatan-Cahitan group opposed to Tarahumara-Guarijío. Shaul suggests, however, that some Pimans "Opatanized," becoming the Eudeve, speakers of a "Piman reading" of an Opatan language.

19. A probable additional attestation of this widespread loan word is found in Yavapai *qaqáqə* 'little people,' spirit entities said by many Yavapais to be "the same as the kachinas of the Hopi" (Khera and Mariella 1983). Yavapai is a Yuman language of the Pai subfamily.

20. Teague 1993 presents other evidence for ancient Hopi-Zuni-Piman contact.

21. The earliest Spanish attestations do not show either the retroflexion in (1) or the palatalization in (3). For instance, Father Eusebio Kino's 1699 *carta de relación* gives *tuc son,* not *chuc xon* for 'Tucson,' and *sonoydag,* not *xonoydag,* for 'Sonoita.' He gives *ac tun,* not *acchun* for 'Ak Chin' (*'ak ceñ* in the dialect of the place, hence Kino's orthographic *u* indicates the central vowel), and *adid* for 'Ajij.' The palatalization is still infrequent in Akimel O'odham as late as Thomas Coulter's brief word list of 1835.

22. A useful example of such a sociolinguistic variable is the consonant /r/ prepausally or before a following consonant (as in "car" and "park," respectively) in English. As is well known, the dialects of modern English can be divided into "r-ful" and "r-less" (or "rhotic" and "non-rhotic") varieties; in the former, /r/ in this environment is pronounced, while in the latter, it is not.

23. The oral traditions of the O'odham peoples in Arizona contrast the *wuṣkam* 'emerger' people—their own ancestors—with the *huhugkam* 'finished' people, whom these *wuṣkam* conquered in a series of battles in ancient times (Bahr et al. 1994; Teague 1993). Note that Bahr (1971) states that the Aji have such a "Hohokam" creation myth, in contrast to myths collected from Kuk (in Kokolo:di territory), which are "Hohokam-less." However, Bahr et al. (1994) say that one version of an emergence myth involving the defeat of the Hohokam was collected from Juan Dolores, a native-speaker scholar of Tohono O'odham. On the evidence of his own transcription of his speech, Dolores was a speaker of the Kokolo:di dialect, so the Aji are not the only group who have this story.

24. It should not be thought of as "Standard Papago" as has often been the case in historical treatments (cf. Munro 1983). Contemporary Tohono O'odham do not consider any dialect to be better or more correct than any other.

Received July 17, 1997; accepted October 20, 1997; revised January 28, 1998.