

COMPARATIVE RECONSTRUCTION OF INDIGENOUS LANGUAGES

ROBERT E. LONGACRE

0. For many years the accomplishment of Indo-European comparative reconstruction has stood in lonely splendor without a serious rival (in depth and scope) in other linguistic stocks. Current work in Latin America and the Caribbean is, however, now going forward at such a pace that in the near future it will no longer be possible to equate comparative linguistics with Indo-European studies. In Mesoamerica comparative reconstruction is reaching a very mature stage — especially in the Otomanguean and Mayan stocks and in the Mixe-Zoque family. Proto-Otomanguean, embracing some thirty languages grouped into seven component families, is currently on the drawing boards. Meanwhile, phonologies of component families have either been worked out as of several years ago or are currently being completed. Etymological dictionaries — sizeable bodies of cognate sets — will soon be available for component families and the stock as a whole. Current work in the Mayan stock is also very promising with a proven link of Mayan to one South American language. Mixe-Zoque is shaping up well. Good work has been done recently in Utoaztecan but we still lack an etymological dictionary of adequate size for that stock. Less advanced are available comparative studies in Totonac-Tepehua (not to mention the vexed question of 'Mexican Penutian': Mayan, Totonac-Tepehua, Mixe-Zoquean) and in Yuman (Hokan).

In South America and in the Caribbean, comparative projects are at early stages. Arawakan, Tupi-Guaraní, Chibchan, and Carib are scarcely begun. Nevertheless, in Quechua-Aymara and in Pano-Tacanan mature projects with sizeable ensembles of reconstructed forms will soon be forthcoming. A significant beginning has been made in Gê.

A sine qua non of careful comparative reconstruction is adequate synchronic data. It is probably no accident that comparative reconstruction is at an advanced stage in Mesoamerica, where investigators of the Summer Institute of Linguistics are currently working in approximately 100 languages and dialects, and where that organization began work in 1935. In as much as the same organization has been at work in Peru since 1946, Ecuador since 1953, Bolivia since 1955, Brazil since 1956, and Colombia since 1962 (with projected expansion into yet other countries), the descriptive data needed for sound comparative work on an extensive scale are either available already or will be available shortly.

This article does not pretend to be either exhaustive or encyclopedic. I have con-

centrated on reporting comparative projects that seemed to me to be genuinely significant. Articles which are essentially collations of word lists from two or more languages (or dialects) without application of the comparative method have usually not been mentioned. Such articles, if they contain reliable data, are sources for comparative projects but not themselves such projects. By the same token, the rather extensive literature of lexico-statistics (glottochronology) has been bypassed. Many such articles have been written without application of the comparative method or with a minimum use of that method. Such articles deal with resemblant forms rather than with cognates. Nor have I been concerned to report the varying linguistic classifications found in the literature. Greenberg's and McQuown's classifications have proved useful for providing frames of reference (and occasionally a convenient whipping-boy).

In that some of the most significant comparative work is still unpublished — some even in non-final form — this article cites a much higher proportion of unpublished works than is customary. My defense for this unorthodox procedure is that the sketch would have been most impoverished otherwise. Colleagues of the Summer Institute of Linguistics have been cooperative in providing unpublished materials and letting me quote from them — as have also María Teresa Fernández de Miranda, Terrence Kaufman, and José Rona (who lent me the unpublished Ferrario manuscript on Charruan). Naturally, the citation of so many unpublished works is inevitably accompanied by failure to cite other such works unknown to me.

Current progress in comparative reconstruction throughout Latin America and the Caribbean — along with the prospect of increased momentum in such studies during the immediate future — offers promise of payoff in the following domains: (1) Cultural analysis of reconstructed vocabularies and evidence of past cultural contacts; (2) evidence of past migrations and locations of original homelands of some language groups; (3) scope for application of dialect geography (e.g. Mixtec, Mazatec, Zapotec, Chinantec in Mexico); (4) fresh examination of substratum theory (e.g. Aymara substratum in Quechua); (5) study of late spread of certain languages as *linguae francae* (Quechua, Tupi-Guarani) vis-a-vis tribal languages on the one hand and Spanish or Portuguese on the other hand; (6) classification of languages and dialects.

The last point needs to be underscored. Consider, e.g. 'Macro-Otomanguean' as set up by Greenberg and predecessors. In this classification, the whole phylum has been divided into the following stocks: Otomanguean, Mixtecan, Chinantecan, Zapotecan. Within Otomanguean stock the following families have been posited: Otomian, Popolocan, Mazatecan, Trique, Chorotegan (Chiapanec-Manguean). The Mixtecan stock is said to contain the Mixteco family: Mixtec, Cuicatec, Amuzgo. Such a classification reflects intuitive groupings, guesses made before adequate descriptive data were available, and before serious comparative work was undertaken in various branches of the phylum. However, it is now evident (see section 6 below) that Popolocan contains Mazatecan (as its most divergent member), that Trique belongs

within Mixtecan, and that Amuzgo is not Mixtecan but a separate family in the stock or phylum. Furthermore, the very grouping 'Otomanguean' within 'Macro-Otomanguean' can no longer be justified. Popolocan within 'Otomanguean' shared important developments with Mixtecan which is not in this grouping. Although it is probable that Chorotegan shares developments with Mixtecan-Popolocan, there is no evidence as yet that Otomian is any nearer to these two families than, say, to Zapotecan or Chinantecan. The old Mixtecan-Zapotecan grouping may not be entirely irrelevant. In brief, it is best at present to posit an Otomanguean phylum or stock (discarding the term 'Macro-Otomanguean') with seven component families: Otomian (or better, 'Otopamean'), Popolocan, Mixtecan, Amuzgoan, Chorotegan (or better, 'Chiapanec-Manguean'), Zapotecan, Chinantecan. These are the main pieces. How they mutually relate will be decided when Proto-Otomanguean is published. It will then be possible to trace not only isoglosses as such but shared innovations versus shared retentions. In that shared innovations are crucial to genetic grouping (cf. 4.2 below) it should be possible to make some mature judgments regarding groupings within Otomanguean.

Special mention should be given to those obliged to work with often poorly recorded data of extinct languages in an effort to use such data for comparative reconstruction and language classification. María Teresa Fernández de Miranda and Roberto Weitlaner's comparative reconstruction of Proto-Chiapanec-Manguean (6.3) and Benigno Ferrario's treatment of the scanty data for Charruan (9) are exemplary in this regard.

1. Wonderly's reconstruction of Proto-Zoquean¹ was based on the comparison of Zoque (4 dialects), Tapachulteco, Sierra Popoluca, and Mixe. The Tapachulteco data, characterized by Wonderly as 'scanty and not too reliable', are all we can expect to have in that the language is either already extinct or very close to extinction. In an important little note Nordell² presented evidence to show that the Zoquean family does not consist of three branches, Zoque, Popoluca, and Mixe, but basically of two: Zoquean and Mixean. The 'Popolucan' dialects may be parcelled out on one side or the other. In this judgment Kaufman has now concurred and has placed Tapachulteco on the Mixean side as 'Chiapas Mixe'. Kaufman's unpublished study, *Mixe-Zoque diachronic studies*³ replaces all former work in its detail and scope.

Wonderly set up the phonemic system for Proto-Zoquean (Table 1):

¹ William L. Wonderly, 'Some Zoquean phonemic and morphophonemic correspondences', *IJAL* 15.1-11 (1949).

² Norman Nordell, 'On the status of Popoluca in Zoque-Mixe', *IJAL* 28.146-9 (1962).

³ Terrence Kaufman, unpublished manuscript.

*p	*t	*c	*k	*kʷ	*ʔ
	*s				*h
*m	*n			*ŋ	
*w	*y				
		*i	*ʌ	*u	
		*e		*o	
		*ā		*a	

Table 1

Of the phonemes in Table 1 (a) *kʷ is set up on the basis of the correspondence Zoque and Popoluca kʷ ~ Tapachulteco and Mixe p in but one set; (b) *ŋ is set up only in word final; (c) *ā is set up to account for Mixe-Zoque-Popoluca a ~ Tapachulteco e.

Kaufman does not reconstruct these three phonemes. In common with Wonderly, he finds the correspondence Zoque and Popoluca kʷ ~ Mixe p in but one set where he posits a Proto-Mixe-Zoque cluster *kw which went to common Mixe p. An allophone *[ŋ] of Proto-Mixe-Zoque *w is considered to have become phonemic in common Zoquean. Concerning Wonderly's posited *ā Kaufman suggests: 'more data on Tapachulteco would probably show the correspondence Tap./e/: other MZ /a/ to be the result of a secondary development in Tap. For instance, if we assume this correspondence to go with MZ *a, we can account for the Tap. forms by the following rules ...' (42).

One of the most marked features of Mixe-Zoque is its complicated morphophonemics: palatalization, metathesis, assimilation, loss or gain of laryngeal (ʔ or h); lengthening or shortening of vowel. One can proceed neither synchronically nor diachronically in this family without attending to such processes. Wonderly's article was significantly entitled 'Some Zoquean phonemic and morphophonemic correspondences'. Kaufman's careful consideration of the morphophonemics is matched by his care in reconstructing affixes both derivational and inflectional; and patterns of word, phrase, and clause structure. In one respect Kaufman was handicapped, however: no published modern description of Oaxaca Mixe was extant when he wrote. A major breakthrough has now been scored in understanding the grammar of Oaxaca Mixe. The clause system described for Tlahuiltontepec Mixe⁴ is in some ways strikingly different from that found in any previously described Mixe-Zoquean dialect. Thus, while Kaufman describes two sets of person markers for verbs, Tlahuiltontepec Mixe has eight partially similar but functionally distinct sets of such markers.

2.1. The comparative reconstruction of Proto-Mayan has been under way by McQuown for many years. His sketch of 1955⁵ (revised somewhat in 1956)⁶ outlines a phonemic

⁴ Shirley Lyon, 'Tlahuiltontepec Mixe clause structure' *IJAL* 33.25-33 (1967). A similar analysis is followed in unpublished materials of Searle Hoogshagen and John Crawford for two other Oaxaca Mixe dialects.

⁵ Norman McQuown, 'The indigenous languages of Latin America', *AmA* 57.501-70 (1955).

⁶ Norman A. McQuown, 'The classification of the Mayan languages', *IJAL* 22.191-5 (1956).

system for Proto-Mayan but cites data only from Mam and Huastec. Kaufman, with access to McQuown's data, has published recently⁷ an ensemble of 532 reconstructed forms classified according to semantic domains and accompanied by a chart of the phonemic system. Olson's article on the genetic relation of the Chipaya of Bolivia to Mayan contains a sketch of Proto-Mayan.⁸ None of these materials are adequate at present. Kaufman's sketch, the best of the three, needs to be amplified into an etymological dictionary; it cites no actual language forms but gives only reconstructions. Olson's sketch (to which I contributed) is based on a more meager file of reconstructions than is Kaufman's — although some sets have fuller representation and spread. Furthermore, in Olson's article, only those Proto-Mayan sets are given for which Chipaya cognates exist. Olson is able, however, to state in some detail reflexes of Proto-Mayan phonemes in the various Mayan languages. His description of Proto-Mayan reflexes is based on the total corpus of sets, published and unpublished, which Olson and I assembled.

McQuown's inventory of Proto-Mayan phonemes (1955 modified by 1956) follows in Table 2:

*p	*t	*c	*č	*č	*k	*ḳ	
*p'	*t'	*c'	*č'	*č̣	*k'	*ḳ'	*ʔ
		*s	*š		*x		*h
*m	*n				*ŋ		
*w			*y				
	*l						
	*r						
*i	*ī	*u					
*e	*a	*o					

Two tones 'and'; Clusters $C_1 C_2$ in which C_1 = any except bilabials, liquids and semivowels; and C_2 = semivowels *y and *w.

Table 2

Kaufman's inventory of phonemes is much the same as McQuown's except (1) that he does not reconstruct retroflexed *č̣ and *č̣'; (2) he does not reconstruct *r; and (3) he posits a threefold contrast among the bilabials: *p, *p', and *b.

Olson's inventory of phonemes includes *ɬ and *ɬ' as well as *ḳ and *ḳ' — all of which McQuown handles as clusters of *t, *t', *k, and *k' with *y. Likewise, Olson reconstructs *h^w and *x^w which McQuown handles as clusters of *h and *x plus *w. Olson also includes a full series of retroflexed affricates and sibilants (č̣, č̣', and ṣ̌). Olson, like McQuown, posits a simple two-way contrast of bilabials (*p versus *b)

⁷ Terrence S. Kaufman, 'Materiales lingüísticos para el estudio de las relaciones internas y externas de la familia de idiomas mayanos', Evon Z. Vogt and Alberto Ruz L., eds. *Desarrollo cultural de los Mayas* 31-136 (Mexico City, 1964).

⁸ Ronald D. Olson, 'Mayan affinities with Chipaya of Bolivia I: correspondences', *IJAL* 30.313-24 (1964) and 'Mayan affinities with Chipaya of Bolivia II: cognates', *IJAL* 31.29-38 (1965).

and of liquids (*l and *r). As in McQuown's 1955 sketch, he posits five vowels rather than six.

Olson summarizes as follows the sound correspondences on which the threefold distinction among the Proto-Mayan affricates (*c, *č, *ç) is based: '*c regularly has reflex c in most languages. ... In M this reflex occurs only root finally. Root initially the M reflexes are č in the environment of high vowels ... and t in the environment of low vowels ... Under obscure conditions, reflex s occurs in P and K ... as well as in C and Tz. Similarly obscure is t ... versus Ø in H.

*č has reflex c in A, Q, C, P, Pm, K, Ch, Chr, Chl, and Tz ... Root initially it has č before front vowels and ç elsewhere in I, Ag, Mm, and J ... Root finally, č occurs in Ag, Mm, and J, but c in I and M.

*ç has reflex č in A, Q, C, Pm, K, Ch, Chr, Chl, Tz, M, and H...; it has reflex č in I, Ag, Mm, and J before front vowels ... it has reflex ç in I, Ag, M, and J in other environments' (318).

In brief, *c is based on correspondence of c ~ c throughout the languages with occasional reflex s under conditions as yet not understood; while *ç has reflex č in languages which have no retroflexed affricate but is ç in languages having this phoneme (aside from fronting to č before front vowel). A further affricate *č is reconstructed on the basis of the correspondence c ~ ç (~ č), i.e. the phoneme *č merged with reflexes of *c in some languages and with those of *ç in others.

Olson's reconstruction of *r is based on the correspondence r(A, Q, C, P, Pm, K) ~ y (J, Ch, Chr, Chl, Tz, Mop, H), ~ (with weaker witness) č (I, M) ~ ç (Ag). In words where Olson and I reconstructed *r, Kaufman reconstructed *y — for which Olson posits uniform reflex y in all languages. However, Olson's reconstructions of *y are all contiguous to vowel *a. In that *r — which has wider distribution — also occurs contiguous to *a there is apparent contrast. Here, however, Kaufman reconstructs vowel *ě. Thus, where Olson posits *par or *pahar 'skunk' Kaufman posits *pahëy; and where Olson posits *raš 'green' Kaufman posits *yěš. A phonemic contrast must be posited here somewhere in the Proto-Mayan forms. Olson accounts for the contrast by positing *r (versus *y); Kaufman, by positing *ě (versus *a).

It is impossible at present to evaluate Kaufman's three-way contrast among bilabials. McQuown and Olson reconstruct only *p versus *b. The phoneme b, which is a reflex of the latter in contemporary Mayan languages, is usually accompanied by glottal friction or closure. In some languages it has a variety of allophones. Thus, in Tzotzil⁹ the phoneme varies from [b], to [ʔb], to [ʔm] to [ʔM]. In that Kaufman reconstructs *p' presumably he has found sets of correspondences which justify his assuming that b in contemporary Mayan has two different sources. The slender file of comparative Mayan sets which Olson and I assembled is not sufficient to check this out. All etymons in our present data are forms where Kaufman reconstructs either

⁹ Nadine Weathers, 'Tsotzil phonemes with special reference to allophones of B', *IJAL* 13.108-11 (1947).

*p or *b; we do not have sets containing the (relatively few) etymons for which Kaufman reconstructs *p'.

One of the most commendable features of Kaufman's work is his careful attention to the geographical distribution of cognates which do not occur in the entire family. He sets up the following subgroupings in Mayan: (1) Huastecan; (2) Yucatecan; (3) Cholan; (4) Tzeltalan; (5) Tojolabal; (6) Chuj; (7) Kanjobalan (includes Jacaltec); (8) Motocintleco (extinct); (9) Mamean (includes Aguacatec and Ixil); (10) Quichean (includes Kakchiquel, Tzutujil, and Achi); (11) Kekchian (includes Pocoman-Pocomchi).

Excluding Huastecan (which is geographically noncontiguous) Kaufman sets up (2)-(11) as a dialect chain along which certain cognates, not found in the whole family, occur in continuous areas. In this way he is able to group (2)-(5) as a lexical area distinguishable from (6)-(7); and from (8)-(11). Other cognates, which have less than family-wide distribution may reflect sporadic survival of competing Proto-Mayan forms. In the above dialect chain, (2), (4), and (7) are especially singled out as centers of lexical innovation.

Kaufman closes his article with a consideration of extra-Mayan contacts as reflected by the presence of 11 loans from Mixe-Zoque; one from Zapotec; and three from Utoaztecan.

2.2. By far the most interesting feature of Olson's paper is the evidence that it presents that the Uru-Chipaya of the Bolivian altiplano is related to Mayan.²² One hundred twenty-one cognate sets are presented in which reconstructed Proto-Mayan forms are given along with Chipaya forms and reconstructed Proto-Mayan-Chipaya forms. Both the present day phonemic system of Chipaya and the reconstructed Mayan-Chipaya system are quite similar to that posited for Proto-Mayan.

The phonemic system of Proto-Mayan-Chipaya follows (Table 3):

*p	*k	*t	*c	*č	*č'	*k	*k	*k	*k	*p?
*p'	*k'	*t'	*c'	*č'	*č'	*k'	*k'		*k'	
*v			*s	*š	*š'		*h ^w	*h	*x	*x ^w
*m		*n					*ŋ			
		*l								
		*r								
*w		*y								
*i	*Λ									
*e	*a	*o								

Table 3

It is interesting to note in Table 3 that three bilabials are reconstructed (cf. Kaufman's reconstruction of three bilabials in Proto-Mayan); a full set of retroflexed alveopalatals

²² Cf. Eric Hamp, 'On Maya-Chipayan', *IJAL* 33-74-76 (1967).

(cf. Olson's Proto-Mayan); *r versus *y (cf. Olson's Proto-Mayan); and six vowels (cf. Mc Quown 1956 and Kaufman). In the above *v deserves special comment. The reflexes in Chipaya are: zero in root-initial; w in root-final in certain special phonemic environments; elsewhere: l after high vowels and r after low vowels. The Proto-Mayan reflex is, according to Olson, *b. It would be interesting to see if Kaufman's reconstruction of *p versus *b corresponds in any sets with Olson's Proto-Mayan-Chipaya *p' versus *v.

The Mayan-Chipaya link undoubtedly will not stand as an isolated example of demonstrated linguistic relationship between Mesoamerica and South America. Indeed, the Mayan-Chipaya tie cannot in itself be evaluated without broader context. It has been assumed that Mayan, Mixe-Zoquean, and Totonacan are related.¹⁰ The day when Mayan and Mixe-Zoquean can be seriously compared should be near, in that both language families are subjects of serious comparative study. When etymological dictionaries of the two families are available, serious comparison of the two will be greatly facilitated.

Olson summarizes the problem of the relation of Uru-Chipaya to these three families as follows: 'At least four solutions are possible. These solutions imply varying estimates of the relative recency of migration to South America. In order of relative recency of migration these four possibilities are:

(1) Is Uru-Chipaya the farthest extension of the Mayan stock, the Tocharian of Mayan?

(2) Does Uru-Chipaya form a sub-grouping with either Mayan, Zoquean, or Totonacan as against the other two, or does Uru-Chipaya form a subgrouping with any two of the three as against the third?

(3) Are Uru-Chipaya, Mayan, Zoquean, and Totonacan all coordinate on the same horizon?

(4) Does Mayan-Zoquean-Totonacan form a grouping against Uru-Chipaya?' (29).

3. Evangelina Arana has reconstructed Proto-Totonacan-Tepehuan on the basis of three Totonac dialects and one Tepehua dialect.¹¹ She reconstructs the following phonemes (Table 4):

¹⁰ After this article went to the editor I received from Terrence Kaufman some mimeographed sheets which present the first solid evidence yet assembled to demonstrate the affinities of these three linguistic families. He has 131 cognate sets plus sixteen further sets that he regards as possible diffusions. Of the 131 sets, 51 are Mayan and Mixe-Zoquean; 31 are Mayan and Totonacan; 28 are Mayan, Mixe-Zoquean, and Totonacan; and 21 are Mixe-Zoquean and Totonacan. Cognates and reconstructed forms are not given. The catalogue consists rather of a set of English glosses with indications of presence of cognates in the two or three families involved in each set. In that Kaufmann is conservative in what he terms 'cognate' we may feel assured that published evidence regarding 'Macro-Mayan' is forthcoming.

¹¹ Evangelina Arana O., 'Reconstrucción del Prototonaco', Ignacio y Eusebio Davalos Hurtado Bernal, eds. *Huastecos, Totonacos y sus vecinos*, 123-30 (Mexico City, 1953).

*p	*t	*c	*č	*tl	*k	*ḳ	*ʔ
		*s	*š	*ḷ	*x		
*m	*n						
*w		*y					
		*l					
*i	*ị	*u	*ụ				
	*a	*ạ					

Table 4

Initially, certain clusters of spirant plus stop occurred: *sk, *šk, *st, *sḳ, *łk, *łt. Medially, syllable final consonants (*t, *k, *s, *n, *y) followed by the syllable initial consonants and consonant clusters constituted clusters of two or three members.

Proto-Totonacan-Tepehua was characterized by regular morphophonemic alternation among the members of the following sets of consonants: *k/*ḳ; *c/*č/*tl; *s/*š/*ḷ. Notice that these morphophonemic alternations involve contiguous pairs or triplets of consonants within the stop or spirant series.

While *ʔ is included in the stop series, Arana actually reconstructs glottalized vowels in preference to either a glottal stop or a series of glottalized consonants. The role of the Proto-Totonac-Tepehua laryngeal thus forms an interesting comparison and contrast with laryngeals in other reconstructed languages (cf. Proto-Mayan, Proto-Chipaya-Mayan, and Proto-Mixe-Zoque).

Phonological developments from Proto-Totonacan-Tepehua to the various daughter languages show a minimum of split and merger. Presumably the dialects involved have not diverged far from each other. The Totonac dialect of San Pedro Otlacotla seems to display evidence of borrowing from the adjacent Tepehua.

4.1. For Proto-Utoaztecan we have an early sketch of Whorf's (1935)¹³ and the recent work of the Voegelins and Hale (1962).¹⁴ These may be supplemented by an unpublished study of Burton Bascom on the Piman group.¹⁴

Whorf reconstructed the following phonological entities for Proto-Utoaztecan (Table 5):

*p	*t	*c	*ḳ	*k	*ḳw	*ʔ
*m	*n	*ṇs	[ñ]	*ŋ	*ŋw	
*v	*r	*s				
*w	*l	*y				
	*i			*u		
	*e	*a	*ạ	*o		

Table 5

¹³ Benjamin L. Whorf, 'The comparative linguistics of Uto-Aztecan', *AmA* 37.600-8 (1935).

¹⁴ C. F. and F. M. Voeglin, and Kenneth L. Hale, 'Typological and comparative grammar of Uto-Aztecan: I (phonology)', Indiana University publications in anthropology and linguistics memoir 17 of *IJAL* 28 (Jan., 1962).

¹⁴ Burton William Bascom Jr., 'Proto-Tepiman', unpublished manuscript, (University of Washington, 1965). I have had access only to an abstract prepared by Bascom.

The Proto-Utoaztecan phonemic inventory of the Voegelins and Hale is somewhat simpler (Table 6):

*p	*t	*c	*k	*k ^w	*ʔ
*m	*n		*ŋ		
		*s			*h
*w	*r	*y			
	*l				
*j	*ɹ	*u			
	*a	*o			

Table 6

Whorf's reconstruction of $k̄$ was based on the contrast of $k̄$ and k in Hopi. The Voegelins and Hale trace this development in Hopi to preceding high vowel versus preceding low vowel: 'Accordingly, we argue that UA * k descends as [Hopi] / k / when preceded by a high vowel and followed by * a , but as / q / when preceded by a low vowel and followed by * a . This argument can be extended — if restricted to examples descended from reconstructable forms — to account for the Hopi reflection of * k in all environments: UA * k >/ k / when contiguous to a high vowel; * k >/ q / when initial before a low vowel and when medial and flanked by low vowels, i.e. when not contiguous to a high vowel' (51).

Certain other features of Whorf's reconstruction possibly reflect Hopi bias: (1) * \bar{n} (a reconstruction of which Whorf himself is doubtful) is probably based on Proto-Utoaztecan * η > Hopi / η^v / after a high vowel. (2) * k^w is based on Hopi reflex of * w in a special morphophonemic environment discussed below. Whorf's * n_s and his * p versus * v also involve us in Hopi and Utoaztecan morphophonemics.

Whorf's six vowel system is awkward and off balance with respect to the occurrence of only one long vowel. The Proto-Utoaztecan vowel system of the Voegelins and Hale is more plausible.

Whorf, impressed by the p/v and w/η^w alternations in Hopi, tried to outline a theory to account for these and other alternations: (1) The stop-spirant alternation p/v reflects a stage in which spirant allophones occurred intervocalic and stop allophones elsewhere; (2) Some Utoaztecan stems which contain stops resistant to spirantization probably witness to a lost consonant which occurred in cluster before the nonspirantizing stop; (3) Other Utoaztecan stems, which contain non-spirantizing stops associated with a nasalizing influence, witness to medial clusters of nasal plus stop. Thus * w alternating with * η^w really was originally * w versus nw (or * mw ?). For the lost consonants of (2), Whorf suggested '* l , * r , possibly no more' (606).

Whorf seemed to believe that the canonical pattern * $CVCVC$ occurred as well as * $CVCV$ and that final consonants were nasals, * l , and * r . Occurrence of one of these syllable finals accounted for a further * $CVCCV$ pattern. While Whorf's choice of

*r and *l as syllable finals is probably a poor choice, his theory of a syllable final consonant (or consonants) is worth serious consideration.

The most regrettable feature of Whorf's study is its brevity. The article is especially deficient in having no catalogue of cognate sets appended to it. However, as an example of careful logic and good writing, the article is still quite relevant.

4.2. The study of the Voegelins and Hale takes account of the following languages in the U.S. and Mexico: Papago, Hopi, Huichol, Cora, Tarahumara, Zacapoaxtla Nahuat, Pochutla Nahuat, Nahuatl, Tübatulabal, Southern Paiute, Comanche, Mono, Bannock, Luiseño, Cahuilla, and Yaqui-Mayo. The varying quality of their sources causes them to treat some languages more fully than others. In their own words 'In our procedure, we have reconstructed where we had evidence to reconstruct, typologized whether or not reconstruction was possible, and quantified rather casually wherever quantification promised to be interpretable' (7). Phonemic systems are typologized, given numerical ratings, and compared with each other. Glottochronology — with a disavowal of interest in dates — is applied along with Grimes-Agard quantifying.¹⁵ Nevertheless, proto forms are reconstructed, phonological developments traced in various Utoaztecan languages, and various horizons carefully distinguished.

Besides Proto-Utoaztecan, the authors also reconstruct Proto-Aztec, Proto-Shoshonean, Proto-Sonoran. The evidence for Proto-Aztec is clear: loss of initial *p and of the laryngeals *h and *ʔ; *s and *c splitting to s, š and c, č; and *l remaining l (instead of at least some allophones becoming n or r). While the split of *s to s, š is shared by a secondary development in Luiseño and that of *c to c, č is shared by Southern Paiute, this does not greatly weaken the argument. Aztec stands out, at all events, as a well-defined group within Utoaztecan — as indeed no one is inclined to doubt.

Proto-Shoshonean (really beyond the scope of this paper) is not so well attested; it is united by shared phonological retentions rather than by shared innovations, while the morphophonemic innovations are not universally shared. The one exclusive universally shared phonological innovation in Shoshonean is medial *l > n.

Although the Voegelins and Hale reconstruct 'Proto-Sonoran', they are unable to cite one exclusive, universally shared innovation in support of the grouping. Thus, while *n and *ŋ merge into /n/ in all Sonoran, they also so merge in Aztec, and in the following Shoshonean languages: Shoshone, Comanche, Mono, and pre-Bannock; in brief this development is found in all branches of Utoaztecan. The merger of morphophonemic *Vⁿ and *V^u is found in all Sonoran and in Aztec. Complete merger of the morphophonemes *V^s, *Vⁿ, and *V^u is found in Taracahitan (Tarahumara, Yaqui-Mayo, and possibly a number of extinct languages). Other developments are given; none seem to point conclusively to the reality of the Sonoran

¹⁵ Joseph E. Grimes and Frederick B. Agard, 'Linguistic divergence in Romance', *Lg* 35.598-604 (1959).

grouping. On the other hand, merger of *Vⁿ and *V^u in Sonoran and Aztec cannot be cited in favor of the 'Aztecoidan' (Aztec, Cora-Huichol, and extinct languages) in that this development is found in Taracahitan and in Piman as well.

All in all the evidence suggests that the surviving 'Sonoran' languages might better be considered to constitute three branches of Utoaztecan: Taracahitan; Cora-Huichol; and Piman.¹⁶ The first has at least one solid, exclusive, and universally shared innovation to support it. It is no final objection that 'shared cognates are no more numerous between Tarahumara and Yaqui-Mayo than those between Papago and Yaqui-Mayo, for example' (130).¹⁷ It would be interesting to see whether Varohio (or Guarajio), still spoken by a few bilinguals, is also 'Taracahitan'. Regarding the closeness of Cora-Huichol no one is prepared to object but they scarcely share enough of the characteristic Aztec developments to be called 'Aztecoidan'. Finally, regarding the unity of Piman (Upper Piman, Lower Piman, Northern Tepehuan, Southern Tepehuan) there can be no doubt — as will be presented below.

The Voegelins and Hale treat Utoaztecan morphophonemics very thoroughly. They set up *V^s on a broader basis than did Whorf (and Sapir): '*V^s is written when a vowel preceding a stop may suspend the stopness of the stop, and when preceding a nasal may suspend the nasal articulation. ... In Sapir's terminology, V^s 'spirantizes'; but we use a more general term, since 'suspending' extends all the way from a replacement within the stop series (plosive stop by affricate stop) to a replacement of a consonant by zero. ...' (82). They set up *Vⁿ 'when a vowel precedes a consonant which is reflected either by a change of the consonant, or by addition of a nasal in consonant cluster with the unchanged consonant' (82). They wisely choose to write *V^u when there is enough data to show that neither of the above takes place.

One who has carefully read Whorf's sketch of Utoaztecan immediately begins to thumb through the Voegelins-Hale monograph to see if their sketch can be shown either to support or to disprove Whorf's theory that Utoaztecan stems, whose medial consonant neither spirantizes nor nasalizes, really contained medial consonant clusters. Does anything in the Voegelins-Hale description bear out this theory of 'lost' or 'ghost' consonants which occurred as first members of medial *CC clusters? Whorf speculated that the ghost consonants may have been *l and *r. Of this there is no hint in the data more recently presented. There is, however, some slight support that other consonants, possibly laryngeals, did occur as first members of medial clusters. The evidence must be sought in stems where the Voegelins and Hale mark the first vowel as *V^u — since here was where a 'lost' consonant would have prevented both spirantization and nasalization. It is intriguing to note that in Southern Paiute, -xC- clusters (C=stop) occur after *V^u, while in Comanche -hk- clusters also occur

¹⁶ Swadesh has analyzed the available scanty material on the extinct Tamaulipeco language in the south of the state of Tamaulipas. He concludes that Tamaulipeco was an independent division within Utoaztecan. 'El Tamaulipeco', *RMEA* 19:93-104 (1963).

¹⁷ Comparative linguistics, as developed on the terrain of Indo-European studies, has not considered percentages of shared cognates to be decisive of genetic grouping. On the contrary, the principle of shared innovations has been held to be the criterion. See Eric Hamp as quoted in 4.3.

after *V^u (85-6). Yaqui-Mayo have a gemination of medial consonants: 'Under certain morphophonemic conditions involving stress and length alternation, medial consonants are doubled (geminated)' (75). It is interesting to note that this gemination occurs only twice after *V^s, while after eleven examples of *V^s no gemination occurs. After *V^u the data are evenly divided: 5 examples of gemination versus 5 examples of single consonant. In brief, Yaqui-Mayo gemination is rare after *V^s but not uncommon after *V^u. It is possible, therefore, that this gemination has its origin in old laryngeal plus consonant clusters which are reflected as Yaqui-Mayo geminates. The Southern Paiute -xC- clusters and the Comanche -hk- cluster may be direct witness to the existence of such Proto-Utoaztecan clusters. That Proto-Utoaztecan syllables were closed with a laryngeal is not improbable in view of the occurrence of such syllables in some of the language: 'Some of these, as Comanche and Cora, permit a laryngeal consonant final, /h/ or /ʔ/ or both, but no other final consonant' (96). If Proto-Utoaztecan *cvʔ and/or *cvh syllables occurred, then canonical patterns *CVLCV and *CVLCVL (ʔ or h = L) also occurred. The *V^u posited by the Voegelins and Hale would be a first syllable vowel which occurred in either of these canonical patterns, while *V^s would be a vowel that occurred in the first syllable of *CVCV and *CVCVL. Possibly, *V^u was a first syllable vowel which occurred in *CVnCV and *CVnCVL — to reinstate bodily this part of Whorf's 1935 reconstruction. Further work on Utoaztecan morphophonemics is needed to test these hypotheses.¹⁸ The Voegelins and Hale assumed no consonant clusters and no final consonants in Utoaztecan. It may be somewhat whimsically asserted, however, that no reconstruction project of any scope and depth can be engaged in without encountering a laryngeal problem. Perhaps Utoaztecan is no exception?

The Voegelins and Hale give 171 cognate sets. This needs to be expanded with addition of further data. Ultimately we need an etymological dictionary of Utoaztecan, both for further work within the stock and comparison with other stocks.

4.3. Burton Bascom's recent study *Proto-Tepiman* reconstructs Piman or Piman-Tepehuan on the basis of Upper Piman, Lower Piman, Northern Tepehuan, and Southern Tepehuan. The terminology is misleading in that there apparently is no Piman versus Tepehuan division. Rather, according to Bascom 'There seems to be no clearcut grouping among the Tepiman languages'. Four unique universally shared innovations define 'Tepiman': **k>*b; **y>*d; **w>*g; and **c>*s (double asterisk for Proto-Utoaztecan; single asterisk for Proto-Tepiman). The first three innovations yield a new series of consonants in Proto-Tepiman. In no other subgrouping in Utoaztecan is Hamp's dictum regarding the crucial relevance of exclusive shared innovations so well exemplified: 'The only criterion for genetic proximity consists in the recognition of a decisive set, whether in number or in structural place-

¹⁸ Cf. e.g. Hansjakob Seiler, 'Accent and morphophonemics in Cahuilla and in Uto-Aztecan', *IJAL* 31.50-9 (1965).

ment, of shared structural innovations; and these must be innovations by addition or replacement, rather than by loss.¹⁹

A further interesting detail of Bascom's reconstruction is best stated in his own words: 'Probably the most satisfying result of our research was the ability to demonstrate the derivation of Northern Tepehuan tone from Proto-Tepiman stress. This development has resulted, at least in part, from the loss of laryngeals and the resultant vowel clusters with contrastive pitch patterns. In certain environments a Proto-TP contrast in syllable types, *CVV versus *CV?V, has merged into a single syllable in NT. The contrast between proto-syllables, however, has been maintained in NT by the contrasting tone patterns which they manifest, NT CVV-versus C?V respectively.'

Bascom's array of 473 Proto-Tepiman cognates might well form the nucleus for a Proto-Utoaztecan etymological dictionary.

5. Recently Alan Wares has made a good beginning towards the systemic comparison of the Yuman languages.²⁰ Wares characterizes his study as follows: 'The Yuman languages, with which this study deals, are spoken by some four to five thousand Indians living in the southwest United States and the northwest of Mexico ... The corpus of language data that forms the basis for this study covers material in Havasupai, Walapai, Yavapai, Mohave, Maricopa, Yuma, Cocopa, Diegueño, Tipai, Paipai, and Kiliwa ... On phonological and lexical grounds, four groups of languages are posited: (1) Northern Yuman (Havasupai, Walapai, Yuvapai, and also Paipai which, although spoken in Lower California near the southern limit of Yuman speech, exhibits features in common with the other languages in this group); (2) Central Yuman (Mohave, Maricopa, Yuma); (3) Delta-California (Cocopa, Diegueño, Tipai); and (4) Kiliwa ... Chapter XIII deals with a reconstruction of Proto-Yuman phonemes — chiefly consonant phonemes — on the basis of sets of correspondences found in this comparative vocabulary. No attempt has been made here to reconstruct entire forms. ... A comparative vocabulary of 501 cognate sets (some 3000 individual items) concludes the paper.'

While it is evident that the study here summarized is only a beginning, it appears nevertheless to be a good beginning. The size of the comparative vocabulary is gratifyingly large.

6. In published or unpublished form extensive, detailed reconstructions are now completed for all language families considered to belong to the Otomanguean stock of Mesoamerica. Furthermore, Calvin Rensch has now completed the reconstruction of Proto-Otomanguean itself. The publication of this study will give us one language stock of the western hemisphere in which systemic reconstruction has been carried out on a scale somewhat comparable to the scope and depth of Indo-

¹⁹ Eric P. Hamp, 'Protopopoloca internal relationships', *IJAL* 24.151 (1958).

²⁰ Alan Campbell Wares, 'A comparative study of Yuman consonantism', unpublished manuscript (University of Texas, 1965). I have had access to an abstract prepared by Wares. cf. also Mary R. Haas, 'Shasta and Proto-Hokan', *Lg* 39.40-59 (1963).

European studies — although with a fraction of the manpower involved in the latter.

Some thirty native languages of Middle America are probably included in Otomanguean. The central mass of Otomanguean languages is found in the Mexican state of Oaxaca, and in surrounding areas of Puebla, Veracruz and Guerrero. To the west within this general area are found the Mixtecan (Mixtec, Cuicatec, and Trique), Popolocan (Popoloc, Ixcatec, Choco, and Mazatec), and Amuzgoan (one language) branches. To the east within the central mass lie Chinantecan and Zapotec-Chatino. While Chinantecan and Zapotecan have been spoken of as each consisting of but one language they are in reality complexes of at least six or seven languages each.

The northern outliers of Otomanguean constitute the Otopamean branch (Otomi, Mazahua, Pame, Chichimeco-Jonaz, Matlatzinca, and Ocuilteco); these languages are found in the Mexican states of Hidalgo, México, Queretaro, Guanajato, and San Luis Potosí. Pame lies north of the cultural boundary of Mesoamerica as defined by Kirchhoff in 1943.²¹ Two extinct languages, Chiapanec and Manguean, which are southern outliers, constitute the Chiapanec-Manguean branch of Otomanguean. Chiapanec was spoken until fairly recently in and around the town of Chiapa de Corzo in Chiapas, Mexico. Mangue, which became extinct in the late nineteenth century was spoken along the Pacific coast of Central America in Honduras, Nicaragua, Costa Rica, and El Salvador with some extensions into the interior. Chiapanec and Mangue appear to have been very similar. Evidently they comprised a group which emigrated southward from the central mass of Otomanguean. The Chiapanecs stopped off in Chiapas while the Mangue continued to disperse further southward where they formed the southermost continuous extension of Mesoamerica as a cultural area.

Swadesh wrote a brief but suggestive sketch of Proto-Zapotecan in 1947.²² In 1950, Stanley Newman and Robert Weitlaner published two articles which pioneered in the reconstruction of Proto-Otomi and Proto-Otomi-Mazahua.²³ The first detailed full scale reconstruction of a branch of Otomanguean was my 1957 Proto-Mixtecan.²⁴ This was followed in 1959 by Sarah Gudschinsky's triple piece of reconstruction (Proto-Mazatec, Proto-Popolocan, and Proto-Popolocan-Mixtecan).²⁵ In 1961 María Teresa Fernández de Miranda and Robert Weitlaner published a monograph which reconstructed Proto-Chiapanec-Mangue on the basis of extant data from those two

²¹ Paul Kirchhoff, 'Mesoamerica', *Acta Americana* 1.92-107 (1943).

²² Morris Swadesh, 'The phonemic structure of Proto-Zapotec', *IJAL* 13.220-30 (1947).

²³ Stanley Newman and Robert Weitlaner, 'Central Otomian I: Proto-Otomi reconstructions' and 'Central Otomian II: primitive central Otomian reconstructions', *IJAL* 16.1-19 and 73-81 (1950).

²⁴ Robert E. Longacre, 'Proto-Mixtecan', *IJAL* part III (1957). For an alternative reconstruction of Proto-Mixtecan (based on a narrower empirical base) see Evangelina A. Osnaya, 'Relaciones internas del Mixteco-Triqué', *AnINA* 12.219-73 (1960).

²⁵ Sarah C. Gudschinsky, 'Proto-Popotecan' Indiana University publications in anthropology and linguistics memoir 15 of *IJAL* 25 (April, 1959). Paul Kirk, with access to an enlarged corpus of Mazatec dialect material, has recently completed a more definitive and detailed reconstruction of Proto-Mazatec (Proto-Mazatec Phonology, unpublished dissertation, University of Washington, 1966).

extinct languages, and tied them in convincingly to Proto-Mixtecan, Proto-Popolocan, and Proto-Popolocan-Mixtecan.²⁶ Rensch's as yet unpublished *Proto-Chinantec phonology* was completed in 1963.²⁷ Doris Bartholomew published a revision of the Newman-Weitlaner line-up of Proto-Otomian consonants (1960);²⁸ she has now completed *The reconstruction of Otopamean*.²⁹ Fernández de Miranda's reconstruction of Proto-Zapotecan is all but complete.^{29a} I have argued in several articles that Amuzgo, traditionally considered to Mixtecan, is in reality a separate branch of Otomanguean.³⁰

On the basis of Proto-Mixtecan, Proto-Popolocan, and Amuzgo (with a side-glance at Proto-Chiapanece-Mangue), I hazarded a preview of Otomanguean in 1964.³¹ The following consonants seemed indicated (Table 7):

*t	*tʷ	*k	*kʷ	*ʔ
*θ	*θʷ	*x	*xʷ	
*n			*[m]	
	*y		*w	

Table 7

In that Proto-Chiapanece-Mangue, Proto-Zapotecan, and Proto-Otopamean all contain *p, the absence of this phoneme in the above scheme, shows an evident bias towards Mixtecan-Popolocan-Amuzgoan. *[m] was an allophone of *n in that *m occurred preposed and postposed while *n occurred in roots.

For a vowel system I guessed six vowels, perhaps *i, *e, *i, *a, *o, *u.

Taking a clue from Gudschinsky it seemed to me very certain that Proto-Otomanguean had a system of postposed elements that reconstructed as follows (Table 8):

*-m	
*-xm	-*xV
-*xmʔ	-*xVʔ
-*ʔm	-*ʔ/V

Table 8

I considered that postposed elements contained either a syllabic *m or a repeat of the

²⁶ María Teresa Fernández de Miranda and Roberto J. Weitlaner, 'Sobre algunas relaciones de la familia Mangue', *AnL* 3:7.1-99.

²⁷ Calvin Ross Rensch, 'Proto-Chinantec phonology', unpublished thesis, (University of Pennsylvania, 1963).

²⁸ Doris Bartholomew, 'Some revisions of Proto-Otomi consonants', *IJAL* 26.317-29 (1960).

²⁹ Doris Bartholomew, 'The reconstruction of Otopamean (Mexico)', unpublished dissertation, (University of Chicago, 1965). I have had access only to an abstract prepared by Bartholomew.

^{29a} This is fortunate in view of the untimely death of our colleague. Plans have been initiated for posthumous publication of her work.

³⁰ 'On Linguistic Affinities of Amuzgo', *IJAL* 32.46-49 (1966); 'The Linguistic Affinities of Amuzgo', *Homenaje a Roberto Weitlaner* (Mexico City, 1967); 'Progress in Otomanguean reconstruction', *Proceedings of the Ninth International Congress of Linguists, Cambridge, Mass., 1962*, 1017-19 (The Hague, 1964).

³¹ Longacre, 'Progress in Otomanguean reconstruction', 1016-25.

stem vowel, and that the only other elements involved were laryngeals. I could not, however, fully account for the distribution and development of laryngeals even in Mixtecan.

Calvin Rensch's work in Otomanguean reconstruction indicates rather clearly that several cherished assumptions stated above are either doubtful or wrong. Rensch is challenging the palatal series of consonants, reducing the vowels to four, and reducing to a minimum the posited system of postposed elements. It is possible, however, that the four-level tone system which I reconstructed for Proto-Mixtecan, and Gudschinsky for Proto-Popolocan-Mixtecan, may be a rather primitive feature.

At all events, this is the worst of all times to speculate as to the details of Proto-Otomanguean. When Rensch's study appears — itself based on the work of many predecessors — it will merit careful scrutiny from all those familiar with given branches of Otomanguean. Out of the foment that is certain to ensue, an even better picture of Proto-Otomanguean will be obtained than can be hoped for from Rensch's initial treatment — as brilliant an accomplishment as that is.

Brief reports on the reconstruction of various branches of Otomanguean follow:

6.1. My Proto-Mixtecan reconstructions demonstrated that Trique belongs to Mixtecan properly conceived.³² Subsequent study has shown that Amuzgo does not belong to the Mixtecan family. There are 279 cognate sets with reconstructions of consonants, vowels, glottal stop, initial consonantal alternations, tone patterns, and postposed elements. Proto-Mixtecan consonants were (Table 9):

*t	*k	*k ^w	*ʔ
*θ	*x	*x ^w	
* ⁿ d	* ⁿ g	* ⁿ g ^w	
*n	*ñ	*m	
*l(?)	*y	*w	

Table 9

Of the above (Table 9) *ñ was eliminated in a joint paper with Mak.³³ While seven vowels were reconstructed, *ə was eliminated in a subsequent article of mine.³⁴ Four tones were reconstructed in fourteen tone couplets, eight of which occurred in basic forms and six only in tone sandhi variants. The highest tone level was apparently restricted to sandhi variants. Especially characteristic of Proto-Mixtecan is its prenasalized series.

The joint paper with Mak was a brief sketch of Proto-Mixtec based on a scattering of data collected from 28 points in the Mixtec-speaking regions of Oaxaca, Puebla,

³² Cf. the isoglosses considered in my article, 'Swadesh's Macro-Mixtecan hypothesis', *IJAL* 27.9-29 (1961).

³³ Cornelia Mak and Robert Longacre, 'Proto-Mixtec phonology', *IJAL* 26.23-40 (1960).

³⁴ Robert E. Longacre, 'Amplification of Gudschinsky's Proto-Popolocan-Mixtecan', *IJAL* 28.227-42, especially 231-4 (1962).

and Guerrero. Besides establishing that *ñ and the anomalous *tn cluster were both unnecessary in Proto-Mixtecan and Proto-Mixtec, this brief study (some 100 cognate sets) also revealed that Proto-Mixtecan *i and *e probably never completely merged in Proto-Mixtec *i but remained separate in a few environments. In brief, it showed the relevance of a mass of dialect material in one language to the reconstruction of a language family. The paper also revealed that Mixtec dialect geography will be an engrossing and rewarding study when it can be undertaken.

6.2. Gudschinsky's Proto-Popolocan followed an earlier sketch of Fernández de Miranda which brought together Popoloc, Chocho, and Ixcatec.³⁵ Gudschinsky first reconstructed Proto-Mazatec on the basis of four dialects and then went directly to the reconstruction of Proto-Popolocan (356 sets). In her own words, 'I have bypassed the fuller reconstruction of PP (Proto-Popoloc), however, and proceeded directly to PPn (Proto-Popolocan). It remains for others to fill in the detail of development in PP and its exact position within the family'³⁶(2).

Proto-Popolocan consonants are (Table 10):

*t	*tʷ	*k	*kʷ	*ʔ
*c	*ç			
*s	*š	*h	*hʷ	
*n	*ñ		*m	
*l(?)	*y		*w	

Table 10

Especially characteristic of Popolocan is its alveopalatal order, and the proliferation of sibilants and affricates. Five oral vowels are reconstructed, *i, *e, *a, *o, *u, as are their nasalized counterparts. While Proto-Mazatec tone is reconstructed in detail with four tones, Proto-Popolocan tone could not be reconstructed in detail because adequate synchronic sketches of present day tone systems were not available. Certain preposed and postposed elements were posited.

For 113 of Gudschinsky's Proto-Popolocan sets she was able to suggest etymologies with Proto-Mixtecan. I subsequently added some seventy further etymologies (1962).³⁷ Thus, we now can give Proto-Popolocan-Mixtecan etymologies for approximately half of the Proto-Popolocan reconstructions. In the same article in which I proposed these etymologies I suggested a few refinements in the comparative phonology of the two language families.

6.3. The Fernández-Weitlaner reconstruction of Chiapanec-Mangue was based on poorly phonemicized materials recorded by various people before these two languages

³⁵ María Teresa Fernández de Miranda, 'Reconstrucción del Protopopoloca', *RMEA* 12.61-93 (1951).

³⁶ Cf. fn. 25.

³⁷ 'Amplification of Gudschinsky's Proto-Popolocan-Mixtecan', 237-42.

became extinct.³⁸ They were able to compile some 286 Chiapanec-Mangue sets. For 64 of these sets they suggest etymologies with Proto-Mixtecan, for 75 sets, etymologies with Proto-Popolocan. My inspection of their materials convinces me that more such etymologies could be posited.

The consonants of Proto-Chiapanec-Mangue are (Table 11):

*p	*t	*k	
	*s	*h	*h ^w
*mb	*nd	*ng	
*m	*n(ñ?)		*M[h ^m]
*w	*y		
	*l/r		

Table 11

Chiapanec-Mangue, unlike Proto-Mixtecan and Proto-Popolocan, had a labial order. The absence of a labiovelar may, however, indicate some relation of Proto-Popolocan-Mixtecan *k^w to Proto-Chiapanec-Mangue *p and *mb. Like Proto-Mixtecan, Proto-Chiapanec-Mangue has a prenasalized series. Reflexes of *n and *ñ overlap as do those of *l and *r. Five vowels are reconstructed: *i, *e, *ī, *a, *u. Three further vowels are reconstructed in the comparison of Proto-Chiapanec-Mangue with Proto-Mixtecan and Proto-Popolocan. Possibly at least two of these vowels can be eliminated in similar fashion to my elimination of *o from Proto-Mixtecan and both *ē and *o from Proto-Popolocan-Mixtecan.³⁹ Postposed elements containing nasals and the laryngeal h (? was not recorded) are clearly witnessed to.

6.4. Fernández de Miranda's as yet unpublished reconstruction of Proto-Zapotecan (some 300 sets) gives the following system of consonants; all consonants not in italics have a fortis (or according to Swadesh, a geminated⁴⁰) counterpart (Table 12):

*p	*t	*tʲ	*k	*k ^w	*ʔ
*c					
	*s	*ʃ			
*m	*n				
	*l				
	*r				*R
*w	*y				

Table 12

³⁸ Cf. fn. 26.

³⁹ 'Amplification of Gudschinsky's Proto-Popolocan-Mixtecan', 231-2.

⁴⁰ 'The phonemic structure of Proto-Zapotec', 221.

Swadesh⁴¹ did not reconstruct *m for Proto-Zapotec. While Fernández de Miranda reconstructs *m it is a very rare phoneme and does not have a fortis (or geminated) counterpart. According to my tentative sketch of Proto-Otomanguean (based on Mixtecan, Popolocan, and Amuzgo), *[m] was an allophone of *n and was restricted to preposed and postposed elements. Possibly the scarcity of *m in Proto-Zapotec and the origin of the geminates are related. As I have already suggested: 'Preposed *m, however, could conceivably have coalesced with a following consonant to form a geminate which in time came to pattern as a fortis consonant. I suggest, therefore, that PZ fortis consonants hark back to Proto-Otomanguean *mC clusters while PZ lenis consonants hark back to consonants without the preposed *m.'⁴²

Proto-Zapotecan *R was apparently restricted to postposed elements. It is attested somewhat obliquely by divergent developments in a few Zapotecan languages. Apparently it had an uvular or velar quality. In other branches of Otomanguean a velar spirant is found in certain postposed elements.

The contrast of *p and *kʷ is noteworthy (only *kʷ in Proto-Mixtecan and Proto-Popolocan; only *p in Proto-Chiapanec-Mangue).

Of some relevance here is Chatino and the extinct Papabuco. Upson and I reconstruct the following consonants for Proto-Chatino⁴³ (Table 13):

*t	*tʷ	*k	*kʷ	*kʷ	*ʔ
*c	*ç				
*s	*ç				
*n	*nʷ				
*l	*lʷ				
*w	*y	*h	*hʷ	*hʷ	

Table 13

The extinct Papabuco is considered to be simply a further Chatino dialect. The Papabuco does display, however, rather divergent reflexes from those found in the other Chatino dialects. Fernández de Miranda has pointed out that some of the Papabuco reflexes agree with those posited for Proto-Zapotec. Thus, the commonest Papabuco reflex of Proto-Chatino *k is b which corresponds to *b (lenis p, or ungeminated p) in reconstructed Zapotec forms. Likewise, the commonest Papabuco reflex of Proto-Chatino *t is s — which often corresponds to Proto-Zapotec s. Fernández would, therefore, place Papabuco on the Zapotec, rather than the Chatino side of Zapotec-Chatino.

Two hundred fifty-one sets have been assembled for Proto-Chatino. Papabuco forms, painfully culled from Belmar (1901)⁴⁴ are found in only 84 of the sets.

⁴¹ 'The phonemic structure of Proto-Zapotec', 223.

⁴² Longacre, 'Progress in Otomanguean reconstruction', 1023.

⁴³ Bill Upson and Robert Longacre, 'Proto-Chatino phonology', *IJAL* 31.312-22 (1965).

⁴⁴ Francisco Belmar, *Breve reseña histórica y geográfica del estado de Oaxaca* (Oaxaca City, 1901).

6.5. Bartholomew's recently completed reconstruction of Proto-Otopamean was preceded by the Newman-Weitlaner Otomi-Mazahua reconstruction (1950)⁴⁵ and by Bartholomew's own revision of their consonantal reconstructions for Proto-Otomi-Mazahua.⁴⁶ She is able to reduce the consonant inventory from 20 to 16 by eliminating *č, *s, *ñ, *r. Her present reconstruction of Proto-Otopamean consonants is starkly simple⁴⁷(Table 14)

*p	*t	*c	*k	*ʔ
	*s			*h
*m	*n			

Table 14

Fortis and lenis forms of the above were environmentally conditioned: Lenis forms occurred intervocalic; fortis forms elsewhere. Nasal influence as well as weakening resulted from addition of an *m/nV- prefix. Clusters of laryngeals (*ʔ or *h) with the above occurred as well.

The vowel system is also the simplest reconstructed for any Otomanguean language yet: *i, *e, *a, *o, and their nasalized counterparts. Vowel clusters *ao, *oa, *ai, *ia, *io, *oi, *eo, and *oe occurred. Reconstruction of these clusters involving *i and *o presumably obviated the need for reconstructing *w, *y, *kʷ, and *hʷ.⁴⁸

Six tones are reconstructed: high, low, falling, and rising, plus two further contours falling plus low, and high plus falling.

Characteristic of Otopamean is the structure: prefix plus root syllable plus stem formative. The latter two are reconstructed in detail; the first only sketchily.

There are 700 cognate sets of which about half contain cognates from the two largest subgroups, Otomian and Pamean. Other languages cited are: Mazahua, Matlatzinca, Ocuilteco, and Chichimeco. A good amount of paradigmatic material is included in the sets. The tone correspondences are based on 147 sets.

Bartholomew's work is of special interest in that she follows the model of generative phonology.

6.6. Rensch's reconstruction of Proto-Chinantec is at once sufficiently important — and unavailable — to require fuller treatment than we have given any of the reconstructed languages above.⁴⁹ The reconstructions (773 sets) are based on material from 23 points in the Chinantec language complex. Synchronic descriptions of the present day Chinantec languages (Rensch nowhere attempts to distinguish language from dialect and would probably not be prepared to sustain the thesis that all 23 points on

⁴⁵ Cf. fn. 23.

⁴⁶ Cf. fn. 28.

⁴⁷ Cf. fn. 29.

⁴⁸ Cf. Longacre, 'Progress in Otomanguean reconstruction', 1023.

⁴⁹ Rensch's work was preceded by Roberto Weitlaner and Paul Smith, 'Detalles de la fonología del idioma Proto-Chinanteco', unpublished manuscript (Mexico City, 1957).

his map represent separate languages) is followed by a presentation of the phonemic system of Proto-Chinantec.

The consonants of Proto-Chinantec are (Table 15):

*p	*t	*k	*kʷ	*ʔ
*b	*z	*g	*gʷ	
	*s			
	*l			
*w	*r	*y		

Table 15

Clusters of consonants included *ʔ or *h plus *b, *z, *g, or *l.

Somewhat startling in Table 15 is the absence of nasals. Rensch explains this: 'The sets of correspondences that witness to *[b] reconstruct only with oral vowels. In all Chinantec languages nasals appear only before nasalized vowels and, therefore, sets of correspondences that witness to nasal proto-segments reconstruct only with nasalized vowels. It follows, then, that the sets of correspondences that witness to *[b] and *[m] are in complementary distribution and may be grouped together under the same symbol, say *b. The same may readily be done for sets witnessing *[g] and *[ŋ] in the same way. However, no *[d] and thus, no oral counterpart to *[n] is available. There are, however, three other correspondence sets which are reconstructed only before oral vowels, *gʷ, *z, and *l. Because of the supposed labiovelar articulation of *gʷ it would seem a poor choice, but either *[z] or *[l] could well be matched with *[n] as the oral allophone of the voiced stop in the dental-alveolar area. *[z] has been selected for reasons of clustering with *h and *ʔ which will be discussed in a subsequent section, but the choice is somewhat arbitrary. In summary, then, apart from *gʷ, three voiced stops are postulated for Proto-Chinantec *b, *z, and *g with allophones *[b], *[z], and *[g] respectively before oral vowels and allophones *[m], *[n], and *[ŋ] respectively before nasalized vowels. Phonetically, the oral allophones may have been prenasalized as they are to varying degrees in a number of the modern Chinantec languages' (32-3).

The Proto-Chinantec vowels are (Table 16):

*(i)	*i	*u
*(e)	*ʌ	*a

Table 16

Rensch comments: 'Clusters of vowels include *i plus each of the vowels shown outside the parentheses. The vowels *i and *e correspond to the clusters **ii and *iʌ respectively. ... However, since the evidence indicates that they were probably articulated as phonetic units and since the distribution of these correspondence sets is broader than

that of the other *iV clusters, these are treated as special members of the inventory of single vocalic elements' (24). In brief, the evidence points to a period (perhaps pre-Proto-Chinantec?) when a four vowel system was extant: (cf. Otopamean above, and Rensch's hypothesis of four vowels for Otomanguean and his desire to reduce Proto-Mixtecan vowels to four).

A consonant, a vowel, and a tone pattern were essential to a Proto-Chinantec syllable. In addition, the syllable could: (a) have ballistic articulation; (b) be lengthened; (c) be checked with *ʔ; (d) have a prepeak vowel *i; (e) be nasalized; and (f) be closed with *z. I have arranged these schematically as follows (Table 17):

		(/)			
		T			
C	(i)	V	(˘)	(ʔ)	(z)
		(N)			

Table 17

The diagram — in which optional elements are in parenthesis — implies that all possible combinations of optional elements with obligatory elements occur. More will be said about this later.

The ballistic articulation is described by Rensch as 'sharp, ballistic, fortisly articulated'; syllables without this feature are 'smooth, controlled, lenisly articulated'. The phonetic description is based, of course, on the phenomenon as observed in several Chinantec languages.

In that ballistic versus controlled articulation, length, and glottal closure are all independent variables, this yields eight syllable patterns: *CV, *C*V*, *CV, *C*V*, *CVʔ, *C*V*ʔ, *CV˘ʔ, *C*V*˘ʔ (103).

Apparently, prepeak *i may occur with any of the above also; although it is for example, very rare with *C*V*ʔ and *CV˘ʔ.

It is of special interest that nasalization and postposed *z appear to be independent variables — since postposed *z is also a source of nasalized vowels in some Chinantec languages. The phoneme *z, as was stated above, belongs to a series of three phonemes (*b, *z, *g) which have nasal allophones (*m, *n, *ŋ) before the phonemically nasalized Proto-Chinantec vowels. Furthermore *z had an allophone *y in cluster with *h or *ʔ before oral vowels. In the various languages the reflexes of postposed *z range from postposed i or y to n, to ŋ, to nasalization, to affecting of vowel quality in various ways.

Rensch reconstructs a system of three level tones (*1, *2, *3 from high to low) and four sequences: *32, *23, *21, and *131.⁵⁰ Tone reflexes are radically affected by occurrence of Proto-Chinantec ballistic versus controlled syllables. Further sets of correspondences not fitting in the above scheme are conscientiously listed.

⁵⁰ As this goes to press Rensch informs me that he now posits a Proto-Chinantec tone system with two register tones and the following tone sequences: high-low, low-high, and high-low-high.

Although the study is called *Proto-Chinantec phonology*, Rensch gives summary information regarding the Proto-Chinantec verb — even to the point of giving a Proto-Chinantec verb paradigm. Only those who have tried to rationalize the structural vagaries of the verb in any Chinantec language can appreciate Rensch's accomplishment.

Rensch's work is a model in respect to good craftsmanship, carefully reasoned logic, and scope of detail. We can only hope that it will be published soon.

6.7. Swadesh has repeatedly urged that Huave (an unclassified language of Mexico) be considered to be related to Otomanguean.⁵¹ Notwithstanding my initial skepticism, I now am inclined to believe that Swadesh may be correct. Swadesh's flat horizon approach to reconstruction — without taking account of particular developments in the several language families composing Otomanguean — vitiates many of his reconstructions. He sets up, among other features, more alveolar and alveopalatal sibilants and fricatives than the data warrant, and imposes his theory of geminates versus singles (Zapotec bias) on Otomanguean. I have taken his Huave-Otomanguean sets, restated some of them along the lines of the phonology more congenial to me, and added a few sets of my own. The results are not implausible. Possibly, as Swadesh suggests, Huave witnesses to original *p versus *k^w which have been merged into one phoneme or the other in some traditional Otomanguean languages (e.g. in Mixtecan, Popolocan, Amuzgoan, and Zapotecan).

6.8. Reconstructed vocabularies may be subjected to cultural analysis in an effort to reconstruct past cultural horizons. Some of the obvious dangers of this approach can be obviated by reconstructing cultural complexes rather than isolated items. Millon and I examined⁵² the vocabulary of reconstructed Proto-Mixtecan and noted six cultural complexes witnessed to by various reconstructed vocabulary items: (1) agricultural; (2) maize; (3) masa preparation; (4) palm; (5) maguey; (6) weaving. Comparing Amuzgo with the above, all complexes except (4) reconstructed. Recent archeological investigations square well with the linguistic reconstruction.⁵³

McQuown in three and a half pages⁵⁴ succinctly summarizes probable features of Proto-Mayan culture as reflected in reconstructable forms. The resulting picture is typically Mesoamerican. Noteworthy is the variety of cultivated plants: maize (with

⁵¹ 'The Oto-Manguean hypothesis and Macro-Mixtecan', *IJAL* 27.9-29 (January, 1961). 'Interim Notes on Oaxacan phonology', *SJA* 20.168-89 (Summer, 1964). 'Algunos problemas de la lingüística Otomangue', *Anales de antropología* 1.91-123 (1964).

⁵² René Millon and Robert E. Longacre, 'Proto-Mixtecan and Proto-Amuzgo-Mixtecan vocabularies: a preliminary cultural analysis', *AnL* 3:2.1-44 (1961).

⁵³ Richard Stockton MacNeish, 'First' and 'Second annual reports of the Tehuacan archeological-botanical project' (Andover, 1961) cf. MacNeish and Antoninette Nelken, 'Le Mexique et les débuts de l'agriculture au Nouveau Monde', *L'Anthropologie* 65:349-53 (1961).

⁵⁴ Norman McQuown, 'Los orígenes y la diferenciación de los Mayas según se infiere del estudio comparativo de las lenguas Mayanas', *Desarrollo cultural de los Mayas* 49-80, especially 77-80 (Mexico City, 1964).

terms for green ear, dry ear, and cob), squash, sweet potatoes, chile, avocado, maguey, cotton, and cacao. Other terms are suggestive of cooking, weaving, housmaking, and other techniques. Still others suggest nature deities (water, sun, wind), and religious ceremonies (incense, mask).

Without attempting reconstructions of linguistic forms as such, Howard Law had some success in obtaining a sketch of Proto-Yuman culture.⁵⁵ In that the Yuman languages have not diverged too radically from each other and most sound correspondences are quite regular, Law was able to proceed somewhat surely in identifying cognates. His attention to culture complexes (in which various items mutually reinforce each other as witnesses) helped him scale his results in terms of probability. The reconstructed horizon is more shallow than for Proto-Mixtecan or Proto-Mayan. Nevertheless, the cultural sketch reveals a culture still largely dependent on hunting but with developing agriculture. Again, the picture is a plausible one.

The reconstruction of Proto-Maya has advanced far enough to invite inquiry as to the homeland of the Mayas. A. R. Diebold, Jr. in an article concerned with the application of migration theory,⁵⁶ makes out a plausible argument that the homeland of the Mayas was the Central Guatemalan highlands. Migration theory, as thus exemplified, is based on comparative reconstruction. The latter gives a measure of the closeness of the linguistic relationships. This consideration, taken together with that of the distribution of present day languages, makes possible probability judgments as to original homeland of a language family and migrations from that homeland.

Comparative reconstruction within a family or stock may also yield evidence of past cultural contacts between population groups speaking diverse languages. This is possible in that careful application of the comparative method facilitates recognition of loanwords as opposed to inherited items. Kaufman's summary and analysis of Mixe-Zoque loans in Mayan (cf. 2.1) is suggestive of what can be done. The fact, moreover, that Mixe-Zoque seems to have had more cultural influence on early Mayan than either Zapotecan or Utoaztecan is in itself significant. On a lesser scale my tracing of a few Mixtec loans in Trique is of some interest.⁵⁷ In that the Mixtec loans are words referring to pathological states it is possible that the presence of these loans is another evidence of Mixtec cultural domination over the Triques. In this case we infer a situation involving Mixtec shamans and Trique clients.

Isoglosses within Mixtecan are traced in my 1961 article.⁵⁸ Shared innovations between Mixtec and Trique are relatively weak while those between Mixtec and Cuicatec, and between Cuicatec and Trique are relatively strong. There is some relevance to culture history and even migration theory here: ... 'Mixtec and Cuicatec

⁵⁵ Howard W. Law, 'A reconstructed proto-culture derived from some Yuman vocabularies', *AnL* 3:4.45-57 (1961).

⁵⁶ A. Richard Diebold, Jr., 'Determining the centers of disposal of language groups', *IJAL* 26.1-10 (1960).

⁵⁷ Longacre, 'Systemic comparison and reconstruction of Middle American Indian languages', to appear in McQuown, ed. *Handbook of Middle American Indians* 5.

⁵⁸ 'Swadesh's Macro-Mixtecan Hypothesis', 12-19.

have apparently been in unbroken contact since the common Proto-Mixtecan period. By contrast, Cuicatec-Triquet have not been in contact in historical times, while an argument can well be made in favor of the thesis that Mixtec-Triquet (now found in contact) were out of contact for a significant period of time. The paucity and weakness of shared Mixtec-Triquet innovations versus the comparative wealth and strength of Cuicatec-Triquet shared innovations seem to indicate that Cuicatec-Triquet, although now not in contact, were actually in longer early contact than were Mixtec-Triquet. Apparently Triquet moved off from Mixtec during the period of early dialect differentiation (but retained contact for some time with Cuicatec) only to be engulfed on all sides by Mixtec during the later period of Mixtec expansion' (12).

It is apparent that serious linguistic reconstruction has much to offer to the student of culture history. This is evident, e.g. in the recent symposium volume: *Desarrollo cultural de los Mayas*⁵⁹ — where articles of linguists McQuown and Kaufman make a crucial contribution.

In a classic article dealing with Mazatec dialect history,⁶⁰ Gudschinsky brings together insights of dialect geography with those of comparative reconstruction. Basing her arguments on exclusively shared phonological innovations she traces successive dialect splits and constructs a genealogical tree of the Mazatec dialects. She then considered 'word geography', i.e. lexical innovation versus retention. She then compares her results with what is known or conjectured regarding Mazatec history (480-1). Two periods of dialect development are distinguished before 'the period in which a lowland nation first flourished'. A third period is posited 'in which Low Mazatec developed its characteristic phonological and lexical features'; this period is probably that of the 'Lowland Mazatec Nation'. The fourth period — possibly a period of domination by some non-Mazatec people — saw the development of a 'Valley dialect', and subsequent split into 'Northern Valley' and 'Southern Valley' dialects. The fifth period (possibly 1300-1456) saw the development of a High Mazatec dialect in that both highland and lowland Mazatec kingdoms flourished at this time. One village, which had belonged to the Lowland kingdom and dialect in period three, now was absorbed into the highland kingdom with consequent dialect adjustments. The sixth and seventh periods (Aztec and Spanish domination) have seen further dialect developments.

7. The possible genetic affinity of the highland Andes languages, Quechua and Aymara, has been debated since 1888 when Steinthal affirmed that the two languages 'were genetically related and mutual exchange of loans was secondary'.⁶¹ This has been controverted by others, such as Mason, who, while admitting phonological and morphological parallelism of the two languages, denied genetic affinity. Mason held

⁵⁹ cf. fns. 7 and 54.

⁶⁰ Sarah C. Gudschinsky, 'Mazatec dialect history, a study in miniature', *Lg* 34.469-81 (1958).

⁶¹ Heymann Steinthal, 'Das verhältniss, das zwischen dem Keschua und Aymara besteht', 7 *Congreso Internacional de Americanistas*, 462-4 (Berlin, 1888).

that 'the lexical roots seem to have little in common, except a large number, perhaps as much as $\frac{1}{4}$ of the whole, obviously related and probably borrowed by one or the other language'.⁶² Both these contrary evaluations find present day adherents. What is needed is a careful assessment of the dialect situation in Quechua itself (with careful attention to the history of Quechua-Aymara contacts and present dialect geography) plus the culling out and evaluation of resemblant forms between the two languages.⁶³

7.1. Benigno Ferrario published a very important article concerning Quechua dialectology.⁶⁴ He argued that a basic division must be made between Quechua dialects that are in direct descent from Proto-Quechua and dialects that represent a late spread of Quechua, first as the language of the Inca empire, and secondly as a lingua franca for Spanish administrators and the missionary friars. Thus, he considers Ecuadorian, Colombian, and Argentine Quechua to be largely irrelevant to the reconstruction of Proto-Quechua. To distinguish the lingua franca of these areas from the most relevant dialects he terms the former 'Neo-Quechua' and the latter 'Runa-simi' (i.e. 'the people's language' in Quechua).

Within the dialects of 'Runa-simi' Ferrario recognized a further dichotomy: '... dialetti derivati dalla Proto Runa-simi, ossia: a) le parlate delle popolazioni che circondavano il luogo dove sorse, di poi, il Cuzco; b) quelle dei Chinchas (che già erano una nazione potente, a base federale, quando gli Inca ancora erano occupati a consolidare il loro piccolo Stato locale, nucleo del futuro impero) cioè le varietà di Ancash, di Huánuco, di Cajamarca ed altri luoghi' (136).

The dialect division posited by Ferrario within 'Runa-simi' was considered to be more relevant to phonology than to morphology. The salient phonological difference is that Cuzco type dialects (including those of Bolivia) have aspirated and glottalized series of stops as well as a simple series, while other dialects have only the latter.

Ferrario argued cogently that the aspirated and glottalized stops of Cuzco Quechua were due to Aymara substratum. He presented two maps. In the first, which represents the linguistic situation in the sixteenth century, the Aymara speaking region of Peru is shown to extend up to the 11° parallel south and to include a fingershaped strip of territory running up to the north of Lima; this region also includes most of Huancavelica, parts of Ayacucho, and Arequipa and extends about half way from Lake Titicaca to Cuzco. On the second map, reflecting the present linguistic situation, the former Aymara region of Peru is shown to be largely Quechua speaking, with Aymara

⁶² J. Alden Mason, 'The languages of South American Indians', ed. Julian H. Steward, *Handbook of South American Indians*, 6.157-317 (Washington, 1950).

⁶³ The Haquearu language of west central Peru (which Ferrario considered to be simply an Aymara dialect) should also be included in the sphere of investigation: cf. José M. Farfán, 'Diccionario conciso Castellano-Haquearu-Quechua', *Revista de Museo Nacional* 30.19-40 (1961).

⁶⁴ Benigno Ferrario, 'La dialettologia della Runa-Simi', *Orbis* 5.131-40 (1956). I am indebted to Miss Yolanda Lastra and Mr. Alfred Pietrzyk of the Center for Applied Linguistics (Washington, D.C.) for securing for me copies of this and other articles which were hard for me to obtain under field conditions.

confined to a narrow region north and west of Lake Titicaca (plus of course the Altiplano of Bolivia). Ferrario further argued that many of the placenames of Peru can be shown to be Aymara, while the Haquearu enclave in central Peru can be shown to be a remnant of the original Aymara-speaking population. Ferrario concludes: 'Il gruppo dei dialetti di tipo 'Cuzqueño' rappresenta, invece, una Runa-simi aymarizzata, e non solo foneticamente, ma altresì nel lessico, dovuto alla convivenza, sopra un medesimo territorio, di gente parlante Aymara e Runa-simi, già in epoca pre-incaica' (139-40).

It is probably somewhat inconsistent of Ferrario to draw such a sharp line between his Quechua or 'Neo-Quechua' (as a lingua franca) and dialects of 'Runa-simi' properly constituted. The data that he presents regarding displacement of Aymara by Quechua would indicate that many Quechua-speaking areas of southern Peru represent a recent spread of that language — even as the Quechua dialects of Ecuador, Colombia, and the Argentine. At any rate, Ferrario concludes that the dialects of greatest relevance to Proto-Quechua are the dialects now spoken in Ancash, Húanuco, and Junin.

The current studies of Gary Parker⁶⁵ seem to substantiate Ferrario's conclusion. Parker distinguishes Quechua A (including Cuzco, Ayacucho, Bolivia, and Ecuador-Ucayali) from Quechua B (Ancash, Húanuco, and Junin). While Ferrario had argued that all dialects of Quechua were quite similar morphologically, Parker contrasts the two major groups of Quechua dialects in respect to postpositions on nouns, person markers, and verb inflection. He also delineates certain isoglosses that separate the various dialects in each of the two large divisions. Phonologically, Ayacucho in Quechua A is more similar to Quechua B. While the Cuzco and Bolivian dialects have both aspirated and glottalized stops, and central Ecuador-Ucayali dialects have aspirated stops (and one phoneme which is a reflex of a former glottalized stop), Ayacucho has no trace of either aspirated or glottalized stop.

Parker, like Ferrario, considers the aspirated and glottalized stops of Quechua A to be by way of influence from Aymara: 'Aunque se ha presumido que éstas son originales del Quechua, el autor prefiere considerarlas como que fueron prestadas del Aymara, tanto sobre la base de la distribución geográfica como del relativamente bajo rendimiento funcional de estos componentes en el Quechua' (248). He points out the interesting fact that in Quechua no more than one laryngealized (aspirated or glottalized) consonant may occur per word. Possibly of greater relevance is the fact that the laryngealized stops are limited to roots in Quechua while they are also found in affixes in Aymara.

Parker reconstructs Proto-Quechua A, Proto-Quechua B, and Proto-Quechua. Since he groups Ayacucho in 'Quechua A' and does not reconstruct glottalized and aspirated stops in that dialect, the phoneme inventories of the three do not markedly differ.

⁶⁵ Gary Parker, 'La clasificación genética de los dialectos Quechuas', *Revista del Museo Nacional* 32.241-52 (1963).

The phonemes of PQA are as follows (Table 18):

*p	*t	*č	*k	*k̥
	*s	*š	*x	
*m	*n	*ñ		
	*l	*ly		
*w	*r	*y		
		*i	*u	
		*a		

Table 18

PQB differs only by virtue of the presence of a further affricate: c. Proto-Quechua is considered to have the phoneme inventory of PQB, plus the phoneme š based on the correspondence: PQA s ~ PQB x in some sets.

Parker considers that the 1560 lexicon of Domingo de Santo Tomás (the first printed work in Quechua) is an early dialect witness to Quechua A. He believes that this was a coastal dialect. Ferrario's description of the linguistic situation in the sixteenth century leaves no room for a 'coastal' dialect of Quechua; in southern Peru the Aymara-speaking strip separated the Quechua region from further languages spoken on the coast. The orthography of Santo Tomás gives no hint of aspirated or glottalized stops, nor of the contrast k:k̥. While Parker concludes that the dialect in question is obviously QA, (on the basis of morphology?) he admits that the accentual system is that of Quechua B. Presumably, this is a link in his argument for eliminating aspirated and glottalized stops from PQA. Ferrario and Rowe seem to locate Santo Tomás' Quechua dialect in Apurimac — where it would have been contiguous to Ayacucho. Presumably, both the dialect of Santo Tomás and Ayacucho — granting that both can be classified morphologically as Quechua A — are phonologically like Quechua B.

By contrast, the classic 'Inca' dialect ('court dialect' of Cuzco) which Rowe posits on basis of early 17th century documents⁶⁶ clearly had aspirated and glottalized stops. Ecuador-Ucayali dialects, some of which preserve aspirated stops and partial witness to existence of a glottalized series, presumably are developments from such Cuzco dialects on spread of the latter northwards.

7.2. The question of Quechua-Aymara genetic affinity is complicated by the undoubted prolonged historical contact of the two peoples and the presence of Aymara substratum in a large area of southern Peru.

In an unpublished study Carolyn Orr has assembled some 300 Proto-Quechua sets of which a bit under 50% can be shown to have resemblant forms in Aymara of Bolivia.⁶⁷ These tentative Quechua-Aymara cognate sets include some body parts

⁶⁶ John Rowe, 'Sound patterns in three Inca dialects', *IJAL* 16.137-48 (1950).

⁶⁷ Since submitting this article, Orr and I have further studied the Quechua-Aymara problem. Our joint paper, 'Proto-Quechumaran', is committed to the thesis that the two languages are genetically related. We now reconstruct glottalization and aspiration as Proto-Quechua features.

(*fist/joint, knee, finger/toenail, skin/hide/back, goiter/mumps/Adam's apple*), kinship terms (*father, man's brother, woman/wife, child/baby, sister/daughter-in-law, relative, brother/son-in-law*, and other items (*carry, put/give, be, want, cut, ripen, gather, walk*) that are usually less suspect of being loans from one language to the other. On the other hand, other items (*money, gold, write, two, three, and ten*) might well be loan-words from one of the languages into the other. Furthermore, Orr's sets do not include on the Quechua side, dialect witness from Ancash, Húanuco, and Junin — which according to Ferrario are less 'Aymarized' dialects of Quechua. If, on addition of material from these dialects, it is found that most of the presumed Proto-Quechua forms can be witnessed to in these crucial dialects, then a case can be made for the genetic affinity of Quechua-Aymara.⁶⁸ The case will rest heavily on the argument that a form disseminated homogeneously throughout Quechua dialects is not likely to be a loan from Aymara. Loans of this sort should tend to be statistically most frequent in dialects contiguous to Aymara (including Ucayali-Ecuador, if these are derived from Cuzco Quechua) and less frequent in other dialects (Ancash, Húanuco, Junin).

In brief, if — as generally admitted — the two languages are quite similar morphologically, and not so dissimilar phonologically (aside from extra series of aspirates and glottalized consonants in Aymara), and if cognate sets with plausible geographical spread can be assembled from vocabulary domains not highly suspect of containing loans, and if a viable phonology can be reconstructed based on systemic sound correspondences, then there would seem to be little point in continuing to doubt the genetic affinity of the two languages.

8. Olive Shell has made a good beginning at the reconstruction of Proto-Panoan,⁶⁹ while Mary Key has completed a sketch of Proto-Tacanan.⁷⁰ The two stocks have been assumed to be related (e.g. in Greenberg's Macro-Panoan).⁷¹ This relationship is confirmed by the present studies.

8.1. Olive Shell's unpublished study is based primarily on seven Pano languages for which extensive lexical materials as well as phonological and grammatical analyses exist: Cashinahua, Shipibo, Capanahua, Amahuaca, Marinahua, Cashibo, and Chacobo. The first six are spoken in Peru, the last in Bolivia. Shell describes her procedure as follows: '... the comparative method was applied to data from seven Pano languages in current investigations to obtain a tentative reconstructed primitive Pano. Reversing the process of reconstruction, rules of historical change were noted

⁶⁸ Since writing this, I have received from Helen Larsen (Summer Institute of Linguistics) a word list in the Quechua dialect of Ancash. Larsen has only recently begun her studies of Ancash Quechua and has incomplete lexical materials. Nevertheless, for almost one half of the Quechua-Aymara sets she readily found cognates in Ancash Quechua.

⁶⁹ Olive A. Shell, 'Pano reconstruction', unpublished monograph.

⁷⁰ Mary Ritchie Key, 'Comparative phonology of the Tacanan languages', unpublished dissertation (University of Texas, 1963).

⁷¹ Sol Tax, 'Aboriginal languages of Latin America', *CAnthr* 1.430-8 (1960) (reproduces Greenberg's classification of 1956).

which enabled the investigator to predict forms in the daughter languages. By applying these rules and making comparisons with further word lists found in the literature, the latter were evaluated, their symbolization interpreted, and the findings utilized in modifying the first construction' (1). Besides the seven control languages, Shell also had word lists from current investigations in the following Pano languages (all but the first are spoken in Brazil): Isconahua, Marobo, Yaminahua, Chaninahua, Mastanahua. Published word lists of varying quality (many nineteenth century) were available for: Atsahuaca, Yamiaka, Cakobo, Pakaguara, Karipuna, Culino, Mayoruna, Arazaire, Canawary, Poyanawa, Tutxiunaua, Pano, Wariapano, and Nokaman.

Although the published word lists of earlier investigators enter only indirectly into Shell's studies, they enable her to make a careful evaluation (6-39) of previous classifications. This admirably demonstrates the relevance of careful, detailed comparative reconstruction for the classification of languages. It is not necessary that the careful, detailed work embrace the entire family or stock but enough must be done — and done well — to provide a solid core around which other material can nucleate.

Even the mutual classification of the seven Panoan languages entering directly into Shell's study is of considerable interest. The grouping is done on the basis of shared phonological innovations with some attention to shared lexical innovations as well (131-6). On this basis (1) Shipibo-Conibo is first grouped with Capanahua, then (2) these, with (3) Chacobo. (4) This grouping is more or less coordinate with Amahuaca and Cashinahua-Marinahua. Finally, (5) Cashibo ties in on a still earlier horizon. By contrast McQuown⁷² groups as follows: (1) Shipibo and Conibo. (2) These, in turn, group with Cashibo (all sub-divisions of his QIA) (3) The preceding comprise a branch roughly coordinate with those branches represented by Capanahua (his Capanahuan is QIC) by Amahuaca (his Amahuacan is QID), and by Marinahua (in his Panoan QIF). Most distantly related of all is Chacobo (QIIIAa of Southwest Panoan QIII). Greenberg's classification — here, as in other places — is geographic rather than linguistic. Chacobo as 'South east Panoan' is separated from the other six languages which are classified as 'Central Panoan'. A glance at the striking difference in the classifications (e.g. Cashibo ties in on the earliest horizon in Shell's classification; Chacobo, in McQuown's) suffices to emphasize the difference between tentative classifications and those coming about as a by-product of the comparative method. Shell modestly entitles her reconstructions 'Reconstructed Panoan' instead of 'Proto-Panoan': 'The reconstruction is not claimed to be final. Further research in Bolivia and Brazil may provide data for a more primitive Pano than can be reconstructed from present data' (2). Needless to say, 'proto-languages' have been posited by other comparativists on a much more slender basis. Granting the inevitable subsequent revision of any pioneer piece of linguistic reconstruction, there is no reason why Shell's reconstructions should not be considered to be for all practical purposes 'Proto-Panoan'.

⁷² Norman McQuown, 'The indigenous languages of Latin America', *AmA* 57.501-70 (1955).

After a careful presentation of current phonemic systems in the seven languages, Shell presents the phonemes of 'Reconstructed Panoan' (Table 19):

*p	*t			*k	*kʷ	*ʔ	
	*c	*ç					
*b	*s	*š	*ʒ				
*m	*n						
	*r			*i	*ĩ	*i̇	*ĩ̇
*w	*y			*a	*o	*ȧ	*ȯ

Table 19

In a series of charts Shell presents the developments from Reconstructed Pano to each daughter language. There is a minimum of split and merger among the consonantal reflexes in the various languages. The nasals, however, condition nasalized reflexes of vowels in certain environments. The patterns of split and merger involving *b, *w, and *y vary in interesting fashion among the seven languages. Vowel reflexes are fairly consistent from language to language except for (1) loss of final vowels under certain conditions varying in degree and kind from language to language; (2) merging of oral and nasalized vowels in varying degree and under varying conditions; and (3) other miscellaneous developments too detailed to mention here. Development (2) is of special interest in that while it reflects a tendency to lose nasalized vowels, such vowels are developed in all the languages except Chacobo on loss of nasal consonants in third syllable (with nasalization of all second syllable vowels — although vowel nasalization is considered to be an allophone of nasal consonant in Capanahua).

Of the seven Pano languages under consideration, in two a two-way stress contrast is posited; in four a two-way tone contrast; and in one a complex stress-tone contrast. A two-way tone contrast is reconstructed. Shell comments: 'The RP high toneme was probably accompanied by strong stress, except when affected by over-all rhythm patterns' (116).

The Pano languages are very complex morphologically. Shell is able to reconstruct certain morphological features of RP. In current Pano languages there is a difference in the form of the noun when subject of a transitive verb and when either subject of an intransitive verb or object of a transitive — although this is expressed in different ways in the various languages. Shell reconstructs three-syllable forms for the nouns as subjects of transitive verbs versus two syllable forms either as subjects of intransitives or objects of transitives. In two-syllable Reconstructed Pano nouns, she posits a morpheme of high tone and nasalization on the last syllable of forms that were subjects of transitive verbs.

Shell lists 512 cognate sets. Forms from the seven languages on which the study is based are given when extant and available. At the bottom of each page additional cognates are given for languages other than the seven on which the reconstruction is primarily based. We thus have for Proto-Panoan an etymological dictionary of no

mean proportions. This should greatly facilitate further comparison of Panoan with Tacanan (see below) and with Macro-Guaycuruan — if Greenberg's Macro-Panoan grouping (Panoan-Tacanan with Macro-Guaycuruan) can be verified.

8.2. Mary Key's *Comparative phonology of the Tacanan languages* is based on three languages of Bolivia: Tacana, Cavineña, and Chama. For these three languages phonological, lexical, and (to some degree) grammatical materials are available, whether published or unpublished. Mary Key herself did some field work in the first two. These data are supplemented by Reyesano and Huarayo word lists recorded phonetically on short field trips. Reyesano may be the same language as that referred to as 'Maropa' by earlier investigators and still occurring as such in McQuown's and Greenberg's classifications: 'Both Armentia (1905) and Cardus (1886) identify the Maropa as the tribe which formed the mission of Reyes. If this is true, Maropa would be the dialect which is known today as Reyesano' (6). On the basis of phonological isoglosses Key feels that Reyesano is closer to Tacana, and Huarayo to Chama. She then posits that Chama-Huarayo, Cavineña, and Tacana-Reyesano, are more or less coordinate on the same horizon of reconstruction.

Current phonemic systems are duly presented, followed by the phonemic system of Proto-Tacanan (I have rearranged Key's chart and changed a few symbols in the interest of consistency with the format followed for the phonemes of Proto-Pano) (Table 20):

*p	*t			*k	*ʔ(?)
*b	*d				
	*c	*ç	*ç		
	*s	*š	*š	*x	
*m	*n				
	*r	*ř			
*w	*y				
		*i	*o		
		*e	*a		

Table 20

Aside from the inevitable 'obscure reflexes' and 'unexplained residues' which to varying degrees plague all comparativists, the reflexes of Proto-Tacanan phonemes are straightforward with a minimum of split and merger. One outstanding problem is Chama t: 'The status of Chama t is not satisfactorily explained. While it is a fairly common phoneme in the language it is found in only a few cognates. The limited material shows reflex t only occurring after the morpheme e — (which indicates an unidentified possessed form) in stem initial position. ... The conditioning factor cannot be e alone since s also occurs in that circumstance' (54). A further problem is posed by the systemic interchange of certain phonemes in Chama. The problem

affects not only Chama but the reconstruction of Proto-Tacanan: 'In almost all of the instances of specific fluctuations listed, corresponding problems are found in the comparative data. Either the sounds involved are proved reflexes of a sister language or remain as unexplained residues in one of the sister languages' (58). Key suggests dialect borrowing as at least a partial explanation of these 'fluctuations'. She adds a rather puzzling comment: 'Often the Panoan languages clarify the Chama problems better than do the Tacanan languages' (58).

Key's cognate sets, for which she gives Proto-Tacanan reconstructions, number about 200. Along with sets of this nature she presents many further sets with obviously resemblant forms among two or three of the languages, but for which she does not attempt specific reconstructions. The entire ensemble of sets are not numbered, but are arranged alphabetically according to English glosses. Forms answering to the glosses are added from various Panoan languages — whether or not the forms are cognate or even resemblant. No reconstructed Proto-Tacanan-Pano forms are given. On casual glance I would say that some 70 of the sets contain Pano forms that would seem to be very plausible cognates with the Tacanan languages.

8.3. Prospects seem bright for reconstruction of Proto-Tacanan-Pano in the near future. The extensive array of materials presented by both Shell and Key will greatly facilitate the task of bringing the two language groups together.

The reconstructed phonemic systems of the two language families are gratifyingly similar. Both have: four stops (*p, *t, *k, *ʔ), a voiced bilabial (Panoan *b; Tacanan *b), five affricates and sibilants (*c, *č, *s, *š, *ʃ), two nasals (*m, *n), one vibrant (*r), two semivowels (*w, *y) and four vowels (*i, *I, *a, *o in Panoan; *i, *o, *e, *a in Tacanan). In addition, Proto-Pano has the further stop *k^w and four nasalized vowels. Proto-Tacanan has a further voiced stop (*d), a further affricate (*č), a further vibrant (*ř), and a velar spirant (*x). This resemblance is all the more remarkable in that neither Shell nor Key had access to the materials or conclusions of the other while carrying out her reconstructions. In brief, the converging of the two reconstructions is dictated by the data. The phonemic systems of the two language families are similar, and this similarity is undoubtedly based on linguistic kinship.

9. Benigno Ferrario, in an as yet unpublished manuscript,⁷⁸ treated exhaustively the question of the genetic affinity of three extinct languages of Uruguay: Chana, Güenoa, and Charrúa. He believed these languages to have been related to the Matacan

⁷⁸ Benigno Ferrario, 'Las lenguas indígenas del Uruguay', unpublished manuscript, 160 handwritten pages.

Antonio Tovar has written two articles on Matacan, but I was not able to obtain access to them in the limited time available before submitting this paper: 'El grupo mataco y su relación con otras lenguas de America del Sur', Congreso Internacional de Americanistas *Actas y memorias* 2.439-52 (1964); 'Relación entre las lenguas del grupo mataco', *Homenaje a Fernando Márquez-Miranda*, 370-7 (Madrid-Sevilla, 1964).

languages of Paraguay and the Argentine (cf. Greenberg's Macro-Guaycuruan, which in turn belongs along with Panoan and Tacanan in his Macro-Panoan).⁷⁴

The extant data are pitifully restricted: 90 words and 26 expressions in Chana; 19 expressions in Güenoa; and 50 words in Charrua. For a fourth language Minuana (presumed to have been related) but one word (a place name) has survived. This small corpus Ferrario analyzed morpheme by morpheme in masterful fashion.

Ferrario had first to dispose of other suggestions regarding the affinities of the 'Charruan' family (listed as 'unclassified' under Macro-Guaycuruan by Greenberg). He does this incisively with cutting criticism of those who confuse social entities and linguistic families, of those who 'leaf through vocabularies' and latch on to superficial resemblances — comparing parts of words willy-nilly and discarding the rest without regard to the morphological structures involved; and of the cavalier handling of data and the semantic confusions found in some so-called 'comparative work'. Specifically he examines and rejects claims of affinity with Tupi-Guarani, Guaycuru, Kaingang (Gê), and Arawakan. These claims are not superficially dismissed; on the contrary, available evidence is painstakingly examined. The Tupi-Guarani claim is seen to be based on place names resultant on spread of Tupi-Guarani as a lingua franca. Assumed Charruan cognates with Guaycuru and Kaingang are laid in the balances and found wanting. Especially sharp is his criticism of Sixto Perea y Alonso's suggestion that Charruan is Arawakan.⁷⁵

Ferrario's positive argument for Matacan affinities cannot be based on systematic sound correspondences supported by an imposing array of cognate sets — the data are too fragmentary to permit this. He showed, however, that certain basic morphological features of Charruan — and certain specific morphemes — are very similar to those of such Matacan languages as Nocten, Vejoz, Choroti and Mataco. The resemblances are not superficial. Ferrario was especially interested in archaic and non-productive features rather than in features which may reflect recent analogical spread. Affixes such as first person singular, first person plural, second person common, and pluralizer are examined with care in Charruan and Matacan. Ferrario had the material well in hand. His methodology was sound and his arguments convincing.

10. Comparative Arawakan is scarcely begun as yet.⁷⁶ In the words of Douglas

⁷⁴ José Pedro Rona, *Nuevos Elementos acerca de la Lengua Charrúa*, (Montevideo, 1964). In this 28-page work, Rona first analyzes some proper names (found in the Jesuit mission records of the town of São Borja, Rio Grande de Sul, Brazil) for names of possible Charruan origin. The restricted nature of extant data on the Charruan languages necessitates efforts of this sort. The second section of the article presents comparative evidence that Charruan pertains to the Lule-Vilelan subdivision of Macro-Guaycuruan rather than to the Matacan sub-division.

⁷⁵ Sixto Perea y Alonso, *Filología comparada de las lenguas y dialectos Arawak 1* (Montevideo, 1942). Reproduces his earlier work 'Apuntes para la prehistoria indígena del Rio de la Plata y especialmente de la banda Oriental del Uruguay, como introducción a la filología comparada de la lengua y dialectos Arawak', *BFM* 1.217-45 (1937) cf. Olaf Blixen, *Acerca de la supuesta filiación Arawak de las lenguas indígenas del Uruguay* (Montevideo, 1958).

⁷⁶ After this article went to the editor the following monograph appeared: G. Kingsley Noble,

Taylor: 'No serious work on comparative Arawakan can be undertaken until we have adequate descriptions of some of the more typical Arawakan languages. Recent work on such languages as Amuesha, Campa, Tereno, etc. are little help, as these languages are very far indeed from the type represented by Arawak, Achagua, Goajiro, or the Rio Negro group. It seems to me that in order to make a beginning in any comparative work, one must have reasonably reliable descriptions of at least several languages showing a moderate amount of likely cognates. Outliers can be dealt with only at a later stage' (private correspondence).

Robert Shafer has assembled some 125 sets from some sixty Arawakan languages.⁷⁷ Certain languages enter, however, into only a few sets (e.g. Amuesha, which Greenberg considers to be 'unclassified' Arawakan, occurs in only two sets). The data are assembled from published sources which required some interpretation of the phonetically recorded data. Thus, Shafer felt it safe to consider that any given Arawakan language has but one set of stops whether voiced or voiceless. At any rate his sources did not record consistently any such differences if they were contrastive in the data. It now turns out that in at least one of the languages of his sources — Arawak proper — there is an opposition of aspirated and unaspirated consonants.⁷⁸ This opposition includes two of the stops (t versus t^h; k versus k^h;) and the lateral (l versus l^h). Thus, in the Arawak word for 'moon' where Shafer's source recorded katti, the tt was not an inconsistency of recording but a way of indicating the aspirated stop (kat^{hi}). Difficulties of this sort in his sources naturally limit the scope of Shafer's work.

Shafer reconstructed the following consonants (he does not reconstruct vowels): *h, *k, *t, *p, *n, *m, *t', *ś, *ts (doubtful), *d, *y, *w, *r. It is difficult to arrange these in any sort of orderly array. The phoneme *h is a major problem since Shafer's sources indicate a variety of reflexes: h, ø, k, s, z, and t. Maybe it was a fronted k which palatalized to č/c and thereby gave the latter three reflexes. By contrast, *k and *t have fairly consistent reflexes. Aspirated p occurs as a reflex of *p in some sets, while plain p occurs in others. Shafer believed these sets to be in complementary distribution, but the data are fragmentary. For phoneme *n, a puzzling reflex n^h occurs in several languages of one set. The occurrence of *d — one lone voiced stop

⁷⁷ 'Proto-Arawakan and its Descendants', *IJAL* (July, 1965) (Part II). As the author admits 'The sources of data have often been rather inexact transcriptions. Sometimes, they have represented compilations of several, often unobtainable primary sources' (113). In addition, the book tries to cover an immense area linguistically. Not only is Arawakan proper included, but Uru-Chipayan is assumed to be Arawakan (on the basis of some twenty sets) and included in the line-up along with Tupian and Chapacuran, for which data are given on the assumption that they are related to the Arawakan stock. A brief sketch of Goajiro is included as a control. Nevertheless, the overall result is almost as diffuse as Shafer's brief sketch described in this section. Noble, however, pays some attention to morphological features and to shared innovations — whether phonological, grammatical, or lexical. In this way he obtains a family tree for Arawakan and related languages. It needs to be emphasized, however, that without a detailed reconstruction of a proto-language shared innovations are not surely distinguished from shared retentions. Some use is made of glottochronology.

⁷⁸ Robert Shafer, 'Alguas equações fonéticas em Arawakan', *Anthropos* 54.542-62 (1959).

⁷⁹ H. C. van Renselaar and J. Voorhoeve, 'Rapport over een ethnologische studiereis door Mata', *Bijdr TLV* 3.328-61 — probably 1959).

— is difficult to systematize. In two-thirds of the languages cited initial *d gives zero; in others, d or t (h in Yukuna). While Shafer labeled *ts as doubtful, the data for the reconstruction of *t' are even scantier. The doubtful status of *ts is due, however, to the fact that in all but two of the thirteen sets where it is posited it occurred before vowel i (probably Proto-Arawakan *i). While Shafer reconstructs only *r, his sets may possibly indicate three phonemes, say, two varieties of r, and an l.

Douglas Taylor has compared (Surinam) Arawak with Island Carib (the language is Arawakan in spite of the name) as culled from historical sources and as now spoken by the 'Black Caribs' of Central America.⁷⁹ Taylor is encouraged by the comparative Arawak data to interpret his historical sources as indicating a contrast of aspirated and unaspirated consonants in the stops, nasals, and liquids. He symbolized the consonant systems of Dominican Island Carib (17th century) and Vincentian Island Carib (spoken until 1920) as follows (Table 21):

DIC:			VIC:		
m	n		m	n	
	n ^h			-(?)	
b			b	d	g
	t	k		c	
p ^h	t ^h	k ^h		t ^h	k ^h
	s	h	f	s	h
	r,l				r,l
	l ^h				

Table 21

In VIC, as in Arawak, the f phoneme is probably a development from earlier p^h. DIC, which has no f, has a p^h.

Although Taylor's study is on a narrow front, it may have significance for Arawakan in general. Shafer's n^h residue and apparent contrasts among reflexes of his r might be explained by some such scheme as the above. In current Arawak and in the 17th century DIC, there were three contrasting phonemes: r, l, l^h. Notice also Shafer's sets which witness to *[p^h] in possible contrast with *[p]. Furthermore, in that the contrast — if it existed — could have been fortis-lenis in Proto-Arawakan, Shafer's *h versus *k could be lenis versus fortis velar, while his *d may also have been a lenis alveolar. It is futile to speculate further. As reliable synchronic data become available, the serious reconstruction of Proto-Arawakan will become possible.

11. Irvine Davis' unpublished sketch of Proto-Gê⁸⁰ is brief but fulfills many of the

⁷⁹ Douglas Taylor, 'Surinam Arawak as compared with different dialects of Island Carib', *BjdrTLV* 3.362-73 (1959?) cf. earlier article 'Some problems of sound correspondence in Arawak', *IJAL* 24. 234-9 (1958).

⁸⁰ Irvine Davis, 'Comparative Jê phonology', unpublished manuscript, Brazilian branch of the Summer Institute of Linguistics (1964).

requisites of a good comparative study: (1) presentation of current phonological systems; (2) reconstruction of an earlier phonological system; (3) careful tracing out of reflexes in daughter languages; (4) attention to apparent irregularities of a quasi-systemic sort; (5) presentation of a significant number (112) of cognate sets, and English indexing of cognates.

Davis' Proto-Gê is based on: Apinaye, Canela, Suyá, Xavante, and Kaingang. While the choice of languages was partially dictated by availability of data, the languages chosen are nevertheless well representative of Gê. Thus: 'Apinaye in its relationship to Proto-Jê, is in most respects representative of the Northern Kayapó dialects. ... Most of the facts concerning Canela outlined in the paper are apparently also true of the other members of the Eastern Timbira subgroup. ... So far as it is known, Suyá constitutes in itself a subdivision of Jê lacking other members, while Xavante with its several dialects plus Xerente forms another distinct subgroup' (3).

Regarding Kaingang, Davis says 'For the purposes of phonological reconstruction Kaingang belongs more logically within the Jê family than as a separate family within the Macro-Jê stock. It is obviously more closely related to the traditional Jê languages than are other Macro-Jê languages such as Maxakalí, and in many respects it shows closer conformity to Proto-Jê phonology than does Xavante, an undisputed member of the Jê family' (2). With Kaingang Davis groups Xokleng as 'either a somewhat divergent Kaingang dialect or a separate but closely related language' (2). Ursula Weisemann unhesitatingly places Xokleng (which she spells Xokreng) as a fourth Kaingang dialect (along with Paraná, South Kaingang, and Saõ Paulo).⁸¹

Davis reconstructs Proto-Gê phonemes as follows (Table 22):

<i>Consonants</i>				<i>Oral Vowels</i>			<i>Nasal Vowels</i>		
*p	*t	*c	*k	*i	*i	*u	*i	*i	*u
*m	*n	*ñ	*ŋ	*e	*ə	*o	*e	*a	*o
*w	*r	*z		*ɛ	*a	*ɔ			

Table 22

The phonetics of the Gê languages is anything but straightforward. In current languages the phonemes symbolized as nasals 'vary from voiced stops or affricates to prenasalized or postnasalized stops, to nasal continuants depending on the environment and on the language' (4). Phonemes transcribed as w/v and y/z vary from non-syllabic vocoids to fricatives. In some languages vowel length, possibly even consonant length, are phonemic. Current phonemic systems are variations on Proto-Gê. Thus, Apinaye adds glottal stop to the consonants and a tenth oral vowel (and seventh nasal vowel). Canela (tentative phonemicization) adds two laryngeals, ʔ and h, and an aspirated velar k^h. The vowel system is identical with that of Proto-Gê. Suya (even more tentatively phonemicized) adds one laryngeal h, a spirant s, two

⁸¹ Ursula Weisemann, 'Notes on Proto-Kaingang: a study of four dialects', unpublished manuscript, Brazilian branch of the Summer Institute of Linguistics.

aspirants, t^h and k^h , and a further vowel (as in Apinayé). Xavante eliminates phonemes corresponding to $*n$ and $*z$, but adds one laryngeal, h . The glottal stop $ʔ$ occurs instead of the velar k . The system of oral vowels is identical to Proto-Gê, but one nasal vowel is eliminated.

Kaingang raises a few problems due to the uncertainty of phonemic analysis in present-day Kaingang dialects. Weisemann (in what appears to be an early paper) states that possibly some Kaingang dialects and Proto-Kaingang had a voiced obstruent series b, d, g . Since, however, Weisemann collaborated somewhat with Davis in his recent reconstruction, it appears that her more recent thinking would not lead to positing such a series. Davis indicates that, as in the traditional Gê languages, voiced obstruents are allophones of the nasals.⁸³ Even if the obstruents are phonemic in one or more current Kaingang dialects their sub-phonemic status seems probable in Proto-Kaingang. We may assume, then, that relative to Proto-Gê, Kaingang eliminates one stop $*c$, adds two laryngeals $ʔ$ and h , and two spirants f and $ʃ$. The system of oral vowels corresponds to that of Proto-Gê, while one nasal vowel has been eliminated.

Phonological developments — granting the above range of allophonic variation in certain phonemes — are, as a whole, consistent and straightforward. Conditioned sound changes and unexplained residues often involve vertical shunting within an order of consonants. Thus $*p$ is, on occasion, reflected as m or w in certain languages; $*m$, on occasion as p . Similarly $*t$ is, on occasion, reflected as n or r ; $*n$, on occasion, as t . By conditioned sound change $*c$ splits to c/y in Canela, and \tilde{n}/y in Kaingang. Less parallel is the velar order, but even here Kaingang has a few unexplained reflexes η of $*k$. While these are by no means the only conditioned sound changes and unexplained residues in the reflexes in current Gê languages, nevertheless the parallelism of the above is scarcely fortuitous. It is puzzling that the vertical shunting is neither wholly conditioned by sound change nor wholly irregular and sporadic. If the latter were the case, we could posit Proto-Gê consonantal alternation — possibly marking one or more grammatical categories. Some sort of morphophonemic alternation — partly phonologically conditioned — is nevertheless indicated.

12. Proto-Tupi-Guarani is, like Proto-Arawakan, more of a promise than a reality at present. We have, nevertheless, a phonological sketch by Hanke, Swadesh, and Rodrigues of the Mekens language along with (1) a sketch of the phonology of Tupinambá and Cocama; (2) a page of Proto-Tupi phonemes along with reflexes in thirteen languages; and (3) a Mekens word-list with a scattering of cognates from various other languages.⁸⁴

⁸³ Cf. Weisemann, *Notes on Proto-Kaingang* (2,3): 'According to the phonemic analysis now established for Paraná dialects as spoken at Rio dos Cobras however, $[b]$, $[d]$, and $[g]$ do not have phonemic status. They occur only contiguous to homorganic nasals. ...' It is possible that this analysis could also be established for some of the other dialects if sufficient data were available.

⁸⁴ Wanda Hanke, Morris Swadesh, and Aryón D. Rodrigues, 'Notas de fonología Mekens', *Miscellanea Paul Rivet octogenario dicata* (Mexico City, 1958).

Although they divided the Tupi stock into seven component families as did Rodrigues, 1958⁸⁴ (except that the Tupari family is rechristened Mekens), no attempt is made to distinguish Proto-Tupi as such from Proto-Mekens, nor to proceed step-wise by reconstruction of the phonologies of component families, then of the stock as a whole. The table of reflexes in thirteen languages tabulates reflexes of eight languages of Tupi-Guaraní proper, one of the Yuruna family, one of the Ariken family, two of the Mekens family, and one of the Monde family. Typologically Mekens is compared directly with Tupinamba and Cocama (both of Tupi-Guaraní proper) with the comment 'Podemos, pois, ter uma idéia geral de qualquier idioma tupí, examinando o Tupinamba é o Kokama. ...' (192).

The reconstructed consonants are plausibly similar to those found in Tupinambá, Cocama, or Mekens — except for two oddities *tʷ and *g (the latter is the only voiced obstruent posited and is very poorly attested). Six oral vowels are reconstructed as against four in Tupinamba and five in Mekens.

In a student paper at Indiana University⁸⁵ Loraine Bridgeman lines up comparative data in the following Tupí languages: Urubu, Kamayura, Assurini, Guajajara, and Satare (all Tupi-Guaraní proper). She suggests a few sound correspondences (each one attested in at least five sets involving four or five languages), but does not reconstruct forms. Some 75 sets are given with forms in five languages, some 48 sets with forms in four languages; and some 65 sets with forms in two or three languages.

In a four-page article Bernard Pottier⁸⁶ suggests a few sound correspondences in the following Tupi languages: Xeta, Chiriguano, Izozo, Guarayo, Siriono, Guayaki, Cocama, Emerillon, Oyampi, and Tembe (all Tupi-Guaraní proper). He proposes a division within Tupi-Guaraní (corresponding to the first of Rodrigues' seven main divisions of the Tupi stock) in which the 'South-West' group (Xeta, Guayaki, Chiriguano, Izozo, Guarayo, Siriono) is distinguished from the 'North and East' group (Tupi, Tembé, Oyampi, Emerillon, Cocama) on the basis of certain phonological isoglosses. In that Rodrigues' slightly different grouping within Tupi-Guaraní is based on lexical-statistics, while Pottier's is based on phonological isoglosses, the two articles form an interesting comparison.

13. Bruce Moore has compared two Chibchan languages, Colorado and Cayapa, spoken in the Ecuadorian coastal jungle.⁸⁷ Sound correspondences are carefully sorted out and classified according to Moore's stated purpose: 'The present study attempts to explain all the differences between 207 cognate pairs' (273). Although Moore never gives the phonemic system which he reconstructs for 'South Barbacoan Chibchan' —

⁸⁴ Aryón D. Rodrigues, 'Classification of Tupi-Guaraní', *IJAL* 24.231-4 (1958).

⁸⁵ Loraine I. Bridgeman, 'Preliminary notes on a comparative study of five Tupi-Guaraní languages' (1965).

⁸⁶ Bernard Pottier, 'Problemes de dialectologie dans le domaine du Tupi-Guaraní', *Orbis* 10:1.31-4 (1961).

⁸⁷ Bruce R. Moore, 'Correspondences in South Barbacoan Chibcha', Benjamin Elson, ed., *Studies in Ecuadorian Indian Languages I*: 270-89, (Norman, 1962).

nor a reconstructed form for each of his sets — the following phonemes occur in reconstructed forms scattered through the article (Table 23):

*p	*t	*tʷ	*k	*ʔ			
*b	*d	*dʷ					
*f	*s	*ʂ			*h		
	*c	*ç					
*m	*n	*ɲ					
	*l	*lʷ					
	*r					*i	*u
*w		*y			*e		*o
						*a	

Table 23

In addition, there occurs an *N which was a syllable final nasal element whose reflexes are vowel nasalization and nasal consonants. An *S is reconstructed to account for two irregular cognate pairs.

The only syllable final elements were *N and *h.

14. Comparative Carib is yet to be initiated. Desmond Derbyshire, however, has written briefly concerning three mutually intelligible dialects of Brazilian Carib: Hiskaryana, Katxhuyana, and Waiwai.⁸⁸ Internal reconstruction is employed within each dialect with attention to differences in phoneme inventories, restrictions in distribution of certain phonemes, and the distribution of allophones. On this basis the three dialects are reduced to the same inventory of phonemes. This yields a system considered to be that of the common stage lying back of the three dialects. The comparative method is not employed. Some lexical and grammatical comparisons are given — especially in respect to the structure of verbs.

Without engaging in comparative reconstructions, Jacob Loewen presents several isoglosses dividing the Choco languages of Panama and Colombia (in Greenberg's 'Northwestern Cariban').⁸⁹ It is, however, impossible to distinguish shared innovations from shared retentions without prior application of the comparative method. And, to refer again to Hamp's dictum (4.3), shared innovations are the sine qua non of genetic groupings.

⁸⁸ Desmond Derbyshire, 'Comparative notes on three Carib dialects', *Boletim do Museu Paraense Emílio Goeldi, nova série, Anthropologia* 14 (1961).

⁸⁹ Jacob A. Loewen, 'Chocó I: introduction and bibliography', *IJAL* 29.239-63 (1963).