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PROTO-MIXTEC PHONOLOGY

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0. The tracing of a common source for some of the Oaxacan languages of Mexico has gone steadily forward in recent years. Robert Longacre¹ has reconstructed Proto-

¹ Robert Longacre, *Proto-Mixtecan*, IJAL, Volume 23, No 4 (October, 1957), Part III, Publication Five of the Indiana University Research Center in Anthropology, Folklore, and Linguistics (University of Pennsylvania dissertation submitted in February, 1955). This paper is one of the projected sequels to Longacre's monograph as anticipated by him (p. 153): 'Future research should include (a) reconstruction of PM, PC, and PT in their own right The above projects, once completed, should put the reconstruction of PMx on a somewhat more solid foundation than I have been able to provide for it in this study.' A second sequel to Longacre's monograph is a joint paper by him and Rene Millon, *A Cultural Analysis of the Proto-Mixtecan and Proto-Macro-Mixtecan Vocabularies* (to be published in Spanish in the *Memoria* volume of the Linguistic Section of the Mesa Redonda on Languages of Oaxaca, May, 1957). The latter study seeks to gain a rough outline of the culture of the speakers of Proto-Mixtec and Proto-Macro-Mixtecan. It involves reconstruction of Amuzgo along with the three languages included in Mixtecan proper (hence the term Proto-Macro-Mixtecan for the grouping including Amuzgo), and thus carries forward partially another projected sequel study of Longacre's (p. 153): 'Incorporation of Amuzgo into

Mixtecan, the structure underlying the present language family composed of Mixtec, Cuicatec, and Trique, and has suggested that Amuzgo split off from a common parent, Proto-Macro-Mixtecan, at possibly an earlier date. He and Evangelina Arana have independently reconstructed a few features of this broader framework inclusive of Amuzgo; the latter's sketch includes Amuzgo within Mixtecan proper and differs in some respects from Longacre's.² Meanwhile, Sarah Gudschinsky and Maria Teresa de Miranda have been working independently on Proto-Popolocan, a structure underlying Popoloc, Mazatec, Ixcatec, and Chocho. The former has just completed a study which not only reconstructs Proto-Popolocan but an earlier layer inclusive of both Mixtecan and Popolocan and termed by Gudschinsky Proto-Popotecan.³

In this paper we compare the modern Mixtec dialects, reconstructing their common source after the split-off from the sister languages, and comparing our reconstructions with those of Longacre for Proto-Mixtecan.⁴ Additional data not available to the PMx reconstructions with the revamping and adjustment that the adding of a further language inevitably brings.'

In this paper, Mak is responsible for the Mixtec data and for most of the suggested revisions in Longacre's framework. Longacre has written the bulk of Section 4.1 and 4.2, although, again, the germinal ideas of this section are largely Mak's. Longacre has also assisted materially in the phrasing and editing of the paper as a whole.

² Evangelina Arana: an unpublished Master's thesis, Mexico City, December, 1957.

³ Sarah Gudschinsky, *Proto-Popotecan*, a University of Pennsylvania dissertation, February, 1958. IUPAL Memoir 15 (1959).

⁴ In a few cases where the Mixtec evidence is not conclusive, we use reconstructions from Longacre's data; e.g., see 2, set 90, where PM *li is

Longacre at the time he wrote his monograph have brought to light a few reconstructions which amplify and modify his conclusions; see 4. In 3 we show the development of Proto-Mixtec from Proto-Mixtecan.⁵

The dialects will be cited by number in this paper as follows:

1. San Miguel el Grande, Oaxaca
2. San Esteban Atatláhuca, Oaxaca
3. Santiago Yosondua, Oaxaca
4. Santa Cruz Itundujia, Oaxaca
5. San Juan Tamazola, Oaxaca
6. San Mateo Santigui, Oaxaca
7. San Pedro Alto, Oaxaca
8. San Fernando Yucucundo, Oaxaca
9. Santo Tomás Ocotepec, Oaxaca
10. Jicaltepec, Oaxaca
11. Pinotepa de Don Luís, Oaxaca
12. Mechoacán, Oaxaca
13. Tlacamama, Oaxaca
14. Atoyac, Oaxaca
15. San Juan Mixtepec, Oaxaca
16. Juxtlahuaca, Oaxaca
17. Metlatonoc, Guerrero
18. Tonahuixtla, Puebla
19. Xayacatlán, Puebla
20. Chigmecatitlán, Puebla
21. Estetla, Oaxaca
22. Tilantongo, Oaxaca
23. Tidaa, Oaxaca
24. San Juan Diuxi, Oaxaca
25. Santiago Mitlatongo, Oaxaca
26. Nuxaa, Oaxaca
27. San Juan Coatzacoapan, Oaxaca
28. Cuyamecalco, Oaxaca

The dialects⁶ represent a fairly compre-

reconstructed on the basis of Longacre's evidence, whereas the proto-vowel is obscure in Mixtec.

⁵ The terms Proto-Mixtec and Proto-Mixtecan will be abbreviated to PM and PMx respectively throughout the paper.

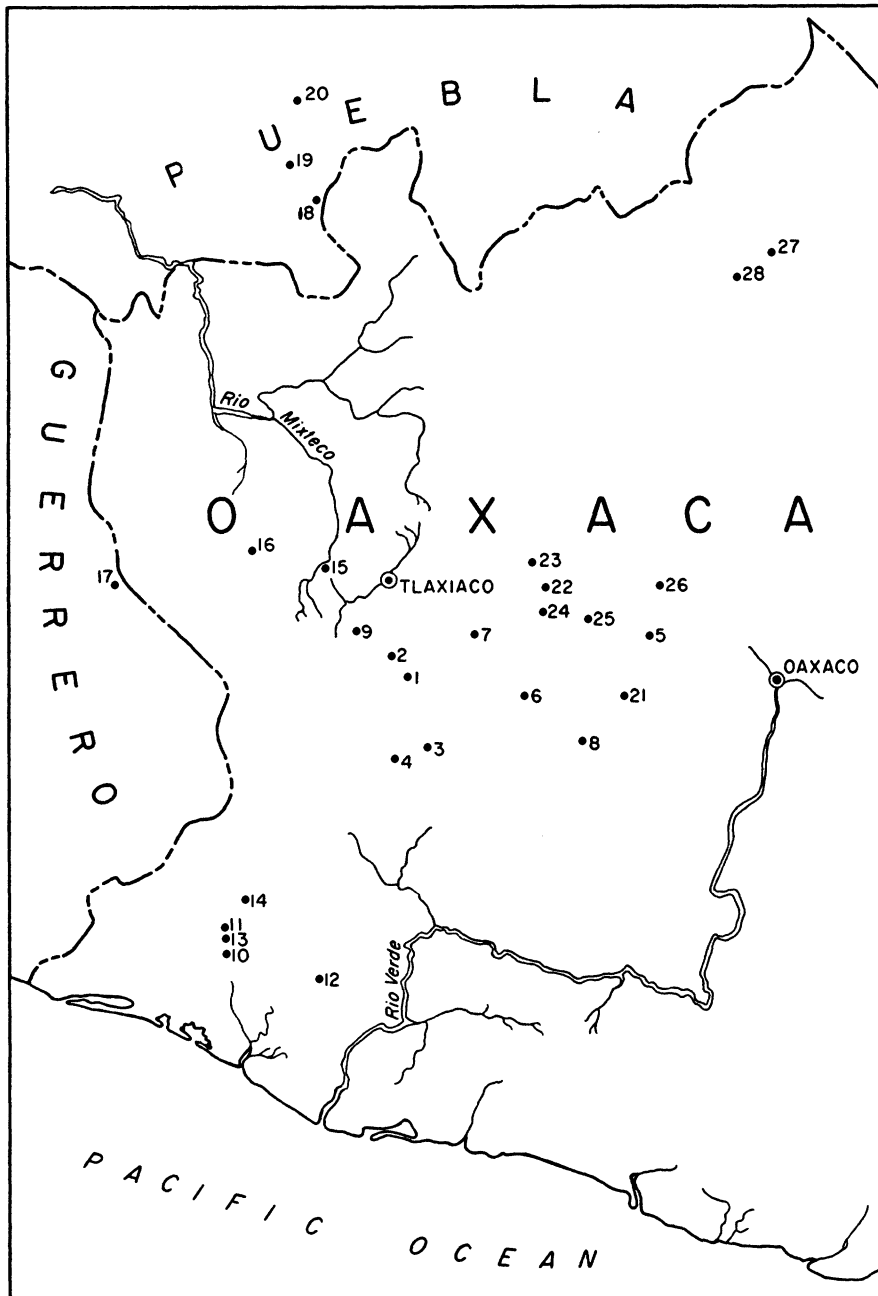
⁶ Longacre had data from only four Mixtec dialects when he wrote his monograph—those of San Miguel el Grande, San Esteban Atatláhuca, Jicaltepec, and Metlatonoc. Only dialects 1, 2 and 9 have been analyzed phonemically. The remainder are represented by more or less rough field notes gathered by the following persons: Evange-

lino Arana and her colleagues working under the auspices of The National Institute of Anthropology and History, Mexico City, for dialects 11 to 14, 16, 20, 27 and 28; also George Cowan for dialect 27; Anne Dyk for dialects 3 to 8, and 15; Melvin and Billie Jean Carson and Anne Dyk for dialect 18; Howard and Beatrice Klassen for dialect 10; Edward and Joyce Overholt for dialect 17; Anne Williams for dialect 19; John Daly and Robert Longacre for dialects 5 and 21 to 26. Ruth Mary Alexander gave invaluable help in the tedious work of lining up the sets of cognates. We greatly appreciate the generous cooperation of these members of the Summer Institute of Linguistics and the National Institute of Anthropology and History.

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1. The following phonemes are reconstructed for PM⁸: stops *t, *k, *k^w, *ʔ; nasalized stop *ⁿd; spirants *v, *θ, *y, *h; nasals *m *n, *ñ; lateral *l; vowels *i, *ī, *o,

⁸ For the PMx phonemes underlying PM, see 3.

*u, *a, and perhaps *e; see below. We have not attempted the reconstruction of PM tone⁹ for this paper, and have omitted the notation of tone in all citations.

⁹ For PMx tone, see Longacre, pp. 93-112.

PMx *ⁿg¹⁰ merged with PMx *k and *x, which became PM *k and *h respectively. Similarly PMx *ⁿg^w merged with PMx *k and *w, which became PM *k and *v respectively. Consequently only one PM nasalized stop, *ⁿd, remained rather than the series of three nasalized stops which characterized PMx. Modern y is an alveopalatal voiced spirant in most dialects, but frictionless in some; we have included PM *y in the PM spirant series, although Longacre listed PMx *y in the PMx semivowel (presumably frictionless) series. Similarly, PM *v was probably a voiced bilabial spirant, as it is in most modern dialects, although Longacre listed PMx *w in the PMx semivowel series. He has assumed here a development from PMx semivowel to Mixtec spirant (Longacre, p. 17), but says nothing specifically about PM in this respect.

Modern reflexes of PM phonemes include the following: PM *t has split into t, ty, č, š, s, and c in the dialects under various conditioning factors; PM *k, *k^w, and *ʔ have remained uniform with a few exceptions; PM *ⁿd gives ⁿd, ⁿj, ⁿdy, and nz; PM *vi gives u, and *va gives a, in some dialects in certain environments; PM *θ gives s, š, and d; PM *yo gives yo and o, *yu gives yu and [?]i, and *ya gives ya and ša; PM *h has split into h, č, š, s and ty; PM syllable initial *m gives m; PM *n gives n and ñ; PM *ñ gives ñ and n; *ña gives ɛ in a few dialects; PM *l regularly gives l. A few apparent exceptions to the above summary of Mixtec dialect developments have to do with the distribution of l in the dialects. For example, apparently PM *θ gives l in some instances in certain dialects. Again, in two instances PM *l apparently gives t. These developments are attributable, however, not to sound change as such, but to vestigial remains of a grammatical feature of PMx, viz., alternation of *θ with *l in the structure of the PMx noun (see Longacre, p. 55). The apparent development of *l to modern t is somewhat more

anomalous in that there is no evidence in PMx for alternation of PMx *l with PMx *t, although nouns with initial *t did enter into a different pattern of consonantal alternation.

Longacre reconstructed seven PMx vowels: *i, *e, *i, *o, *u, *a, and a vowel of uncertain quality which he symbolizes as *ɔ. PM had five vowels, or possibly six (*i, *i, *o, *u, *a, and possibly *e). PMx *ɔ became PM *o, *u, *i, and *a under various conditioning factors. Some of the modern dialects have merged i with i everywhere, and in other dialects *i has reflex i in certain environments. At one stage in the development of PM from PMx there may have been a complete merging of PMx *e with *i (see Longacre 2.2.3). If this occurred, it left a gap in the pattern of vowel contrasts in that there were at that time two back vowels and two central vowels but only one front vowel. Nevertheless this gap was soon filled by the reappearance of *e as phonemic by the split-off of an allophone of *i in a few restricted environments, and by merger of this allophone with certain allophones of *a as well as with e . . . e sequences developed from *a . . . i and *i . . . a in certain environments (see 4). It is, however, possible that *e never entirely merged with *i in PM but that the latter continued to contrast with the former in a few environments. Nevertheless, PM *e, if a phoneme, must have had a very restricted distribution until its distribution was augmented by merger of allophones of *a, *a . . . i, and *i . . . a as just indicated. In any event, this paper presents evidence to show that the merger of PMx *i and *e in PM is by no means certain and that Longacre's statements need to be revised at this point.

Modern dialects have developed nasalized vowels in syllables which formerly ended with *-m (see Longacre 2.2.4.3). A few exceptions where modern -m is retained will be noted later. Nasalized vowels are on the whole inconsistent from dialect to dialect. Longacre says (2.2.4.3), "The occurrence of

¹⁰ Modern ⁿg occurs in a few forms in certain dialects, but is not a reflex of PMx *ⁿg.

reflexes with nasal timbre is in many sets a sporadic, random phenomenon which has led me to posit some sort of postposed morpheme or morphophonemic alternation in PMx itself. By positing a final nasal suffixial or enclitic element occurring with some frequency in PMx, it is possible to explain these inconsistencies in terms of haphazard survival of reflexes of forms with the final nasal versus forms without it. . . . Furthermore, there occur resemblant morphemes, apparently from the same root, but one with nasalized and the other with non-nasalized vowel; these etymological doublets are good evidence for some sort of morphophonemic alternation, suffixation, enclisis, or the like in PMx." See 2, sets 6, 14, 15, 16, 30-35, 69, 71, 76.

2. Longacre has listed his array of cognates on the basis of the ultimate syllable of the PMx morpheme, for reasons given in his monograph (7.0.1). Most modern Mixtec morphemes are dissyllabic, with patterns CVCV, CV?CV, CVV and CV?V.¹¹ The latter two patterns as a rule were evolved from PMx monosyllabic morphemes. The PMx *CV forms, which were probably phonetically long, and PMx *CV?V, have become modern dissyllabic CVV and CV?V respectively, while some PMx *CV? forms have developed a reiterated vowel after the glottal stop, thus also giving modern CV?V. This results in modern phonemically dissyllabic morphemes, with each vowel taking its unit of level tone.¹² Therefore, both of the syllables of present-day CVV and CV?V morphemes hark back to Longacre's PMx ultimate syllables. Thus, the term ultimate syllable in this paper, as in Longacre's monograph, refers to the second syllable of PMx and PM patterns *CVCV and *CV?CV; to the entire modern CVV pattern; and usually to the entire modern CV?V pattern (with

some exceptions where the ultimate syllable was reduced to V after a glottal stop; see fn. 14 and Longacre 3.1.4.2 and 3.1.4.5). The term 'penultimate syllable' will refer to the first syllable of patterns CVCV and CV?CV.

In an effort to keep this paper brief, the list of cognates has been abbreviated. However, the cognate sets here included give a comprehensive picture of the broad outlines of phonological developments in the Mixtec dialects, but many details have had to be omitted. Only ultimate syllables are treated; for each of these we have used from 1 to 6 sets of cognates. In a few instances other sets would possibly reveal further phonological complications, and possibly some further reflexes, in some dialects; e.g., in dialects 10 and 13 we list a set which gives reflex ya < *ya, but omit a set (Longacre's set 191) which gives ña for these dialects, presumably by fusion of a proclitic *ni + *y > ñ.

The following reconstructed PM ultimate syllables and their modern reflexes¹³ are

¹³ The phonetic data were roughly phonemized: e.g., the phonetic transcriptions 'b', 'b̃', and 'w' are allophonic variations of 'v', the symbol used in this paper; phonetic sequences of CVh or CV? are transcribed simply as CV (the light aspiration before certain consonants word medially is a rather common non-phonemic feature of some of the dialects; see Longacre, 2.1.2.1.1); final voiceless vowels in dialect 20 are transcribed as voiced vowels; in a few dialects where geminate vowels were recorded within the syllable because of tone glides or phonetic lengthening, we record a short vowel; etc. The symbol 'N' refers to a unit phoneme in dialect 2, and we assume in the other dialects where it was recorded by our colleagues, consisting of voiceless alveolar nasal followed by voiced alveolar nasal, word initially, and velar spirant followed by alveolar nasal, word medially. The symbol 'c' is phonetically [ts]. The phoneme y varies from spirant to frictionless in a few dialects, but is always the latter in clusters. Modern phonemes p, g, and r (all rare) are not discussed in this paper. What we presume to be postposed pronoun enclitics are separated by hyphen; abbreviated preposed morphemes are separated by hyphen; other added morphemes are enclosed

¹¹ In this paper C is any consonant and V is any vowel.

¹² For a fuller discussion of the development of the modern Mixtec dissyllabic morpheme, see Longacre, 5.0.2 (pp. 75-76).

illustrated with some of Longacre's sets of cognates, amplified with cognates where available from the other modern dialects at our disposal. The sets are renumbered by us, and the number of his set follows in parentheses; the two numbers will appear in citing sets throughout the paper.

*ti

1. (16) tiči *avocado*, 1, 2, 9, 15, 17, 18; titi, 10, 13, 14; tityi, 12; čiči, 20.

2. (50) (koo) yučī *alligator*, 1, 2; ku-yoti, 10.

3. (58) tači *wind*, 1, 2, 9, 17, 18, 20, 22, 24, 5; tati, 10, 11, 13, 14; tatyī or tači, 15; tatyī, 12; taci, 21, 28; taši, 25; taci, 27.

PM *ti > ti in dialects 10, 11, 13, 14; či in 1, 2, 9, 17, 18, 20, 22, 24, 5; tyi in 12; tyi or či in 15; ši in 25; ci in 21, 28; cī in 27.

*tī

4. (71) hiti *intestines*, 1, 9; yitī, 2, 28; čitī, 10; sisi, 18, 19; siti, 17; šiti, 22-24, 26; ?ityī, 27; sityi, 16; čita, 11, čitī, 12; šici, 20; šitī, 5.

5. (197) kītī *to boil*, 1, 2, 15; kiti, 9.

6. (264) yučī *powder*, ŋitī, *sand*, 1; yučī, ŋitī, 2; yučī, ŋiti, 9; yuti, 10, 15, 17; yusi, 18; ŋutyi, 16; ŋitī, 11; (ŋii) yitī, 12; ŋuci, 14, 20; njuti, 13; ŋotyī, 27.

In sets 4 (71) and 5 (197), PM *tī > tī in dialect 1, except after hi- where *tī > ti; *tī > tī in 2, 12, 15, 5, 28; ti in 9, 10, 17, 22, 23, 24, 26; si in 18, 19; tyī in 27; tyi in 16; ta in 11; ci in 20. In set 6 (264), forms with u in the penultimate syllable have given ti, či, si, tyi and ci in the modern dialects as reflexes of PM *tī.

*to

7. (195) too *a span*, 1, 2, 10.

PM *to > too uniformly in all dialects cited, where it is a reflex of PMx monosyllable *to, but > to where it is a reflex of

in parentheses. In dialect 19, some nouns are presumed to be fused to a postposed pronoun, which reduces the final vowel of the noun; in these instances we assume vowels found in other dialects. We have of course been limited by the rough phonetic data, and in a few instances there may be inaccuracies in forms cited.

PMx *CVto, for which we have no set in Longacre's material. Note, however, the following from additional data: koto *to watch*, 1, 2, 9.

*tu

8. (194) čitu *full*, 1, 2, 9, 10, 18; nčitu, 15.

9. (234) yutu *tumpline*, 1, 2, 9.

PM *tu > tu uniformly in all dialects cited.

*ta

10. (107) yata *back*, 1, 2, 9, 18, 20, 28; čata, 10, 11, 12, 14; sata, 15, 16; yat-i, 19; kata, 13; ?ata, 27.

11. (108) yuča *river*, 1; yute, 2, 9, 19; yuta, 10, 11, 13, 14; yutya, 15, 16; ?itya, 17; yote, 18; dyute (kanu) 27; ⁿdute (kanu), 28.

12. (109) hiča *wide*, 1; hite, 2, 9.

13. (144) ⁿduča *water*, 1, 3; ⁿdute, 2, 5, 7, 8, 9, 21, 22, 24, 27; ⁿduta, 10, 11, 13; ⁿdutya, 12; dute, 25, 28; ntya, 15; tya (k^wii), 17; te (k^wii), 18, 19; tyi (k^wi), 16.

PM *ta when it follows *a in the penultimate syllable > ta in all dialects cited. PM *ta when it follows *u or *i in the penultimate syllable > ča in 1, 3; te in 2, 5, 7, 8, 9, 18, 19, 21, 22, 24, 25, 27, 28; ta in 10, 11, 13, 14; tya in 12, 15, 17; (yu)tya and tyi in 16.

*tum or *tom (the vowel is uncertain).¹⁴

14. (235) tų *black*, 1, 9, 10, 11, 13, 15-17, 21, 28; Nų, 2; tų, 12; tnu, 14, 20; (ña) tnu, 18, tnu, 22, 24; Nu, 5; nų, 25.

15. (110) yunu *tree*, 1; yuNu, 2, 3; fiųtu, 9; yutu, 4, 10, 12, 17; yutu, 11, 14, 15, 16; yutnu, 7, 18, 20; njutu, 13; fiuntu, 28.

PM *tum or *tom > tų in modern morpheme initial position and nu in modern ultimate syllables in dialect 1; Nu in 2, 3, 5;

¹⁴ Sets with reflexes of the suffixial *-m (see 2) are listed only for the syllables starting with t- and k-, i.e., *tVm and *kVm. *-m reflexes in syllables other than these are treated only incidentally, since they do not add anything significant. A few forms from *CVm + a postposed vowel → modern CŲŲ in most dialects but preserving -mV in some dialects, are discussed under 4.

tʉ in 4, 9, 10, 17, 21; tnu in 7, 20; tnuʉ in 22, 24; tʉʉ and (yu)tʉ in 11, 15, 16; tʉʉ and (yu)tʉ in 12; nʉi in 25; tnu and (yu)tʉ in 14; tʉʉ and (nju)tʉ in 13; (ña) tnuʉ and (yu)tnu in 18; tʉʉ and (ñun)tʉ in 28.

*tam

16. (150) tʉʉʉ *transpire*, stʉʉʉ *pester*, hatʉʉʉ (?ini) *be pleased with*, 1; stʉʉʉ, nuNʉʉʉ (?ini), 2; stʉʉʉ, hetʉʉʉ (?ini), 9; tʉʉʉ, tʉʉʉ (?ini), 10.

PM *tam > tʉ in dialects 1, 9, 10; tʉ after s- and Nʉ elsewhere in dialect 2.

*kī

17. (74) yikī *bone*, 1; yikī, 2, 4, 11, 12, 28; ?iki, 10, 13–15, 17–20; yiki, 9; sikī, 27.

18. (199) ʰdikī or likī *short*, 1; ʰdikī, 2; liki, 9; ʰdiki, 10.

19. (269) ʰdikī *horn*, 1, 2, 12, 27; ʰdiki, 9, 10, 13–15, 17; dikī, 11; nziki, 18; ʰdenke, 28.

PM *kī > kī in dialects 1, 2, 4, 11, 12, 27; ki in 9, 13–15, 17–20; ki and kī in 10; (yī)kī and (nden)ke in 28.

*ko

20. (201) koo *snake*, 1, 2, 5, 8–16, 18, 20, 21, 24, 25, 27; ko, 28.

21. (219) viko *cloud*, 1, 2, 9–15, 16, 18, 20–22, 27, 28.

22. (242) koʰo *owl*, 1, 2, 4, 9–15, 17, 18, 20.

PM *ko > *ko in all dialects cited. (See discussion of to versus too).

*ku

23. (236) ʰdaku *broom*, ʰduku *firewood*, 1, 4, 10–12; ʰdaku, 2, 9, 15, 18; daku, duku, 13; daku, ʰduku, 14; tnu-daku, 20.

24. (79) ?iku *yesterday*, 1–3, 5, 9–15, 17, 18, 20–22, 24, 25, 27.

25. (128) yuku *bush*, 1, 2, 9.

26. (214) kʷaku *will laugh*, haku *laughing*, 1, 9; kʷeku, heku, 2; kʷaku, čaku, 10; čaku, 14; vaku, šaku, 17.

27. (253) yaku *some*, 1; heku, 2; haku, 9.

PM *ku > ku in all dialects cited.

*ka

28. (122) ti-yaka or čaka *fish*, 1; čaka, 2, 21, 24, 25; tyaka, 9–14, 16, 5; tyaka or čaka, 15; si-yaka, 18; cyaka, 20; čyaka, 22; caka, 27; šaka, 28.

29. (129) hika *thorax*, 1, 2; yika, 9; ʰdika, 10; njika, 15; tika, 17; ?ika, 18; njike, 19; dika, 22.

PM *ka > ka in all dialects cited, except dialect 19, where *ka > ke for the one form we have.

*kīm

30. (76) yikī *squash*, 1, 2; yikī, 11, 21; ñikī, 9; ?ikī, 10, 14, 17; ?iki, 13; ?ikī, 18; yiʰi, 22, 25, 5; yiʰi, 24; šikī, 27; ?ikn, 20; ?itn,¹⁵ 19.

PM *kīm > kī in dialects 1, 2, 27; kī in 9, 10, 14, 17, 18; kī in 11, 21; ki in 13; ?i in 22, 25, 5; ?i in 24, kn in 20; tn (?) in 19.

*kum

31. (245) čuku *louse*, ti-yuku and čuku *fly*, 1; čuku, čuku, 2; tyuku, tyuku, 9; tyuku, tyuku (kʷi), 10, 13; tyuku, tyuku, 11, 12; tyuku *louse*, 15, 16, 22, 24; čuku *louse*, 21, 25; kyuku (should be tyuku?) *louse*, 5; tiku, tiku (kʷi), 14; cyuku, cyuku, 20; syuku *louse*, 18; cuku *fly*, 27.

32. (203) suku *neck*, 1, 2, 3, 4, 9, 12, 17; suku, 10, 11, 13–16; dukū, 18; dukū, 20; duk-i, 19; duku-ʰgo, 27.

33. (132) yuku *row*, 1, 2; ñuku, 9; yuku, 15; yuku, 18.

34. (3) či-suku *to wrap*, 1; ču-suku, 2; ti-suku, 10.

For set 31 (245), nasalized vs. non-nasalized pairs in the same dialect have come from *-m vs. absence of *-m. PM *kum > kū in all dialects except 11, 13–16, where we have only forms with ku.

*kam

35. (134) kaʃ *to dig, pierce*, 1, 2, 10, 14, 15; kaa, 13; kam, 20; kan, 28; kanu, 27; kaʃ (yavi), 16.

¹⁵ The form ?itn may have been erroneously recorded for ?ikn; the n is perhaps syllabic, or a vowel, i or ī, may have been omitted.

PM *kam > ka in dialects 1, 2, 10, 14, 15; ka in 13; kam¹⁶ in 20; kan in 28; kanu in 27; kaj in 16.

*k^wa

36. (127) lak^wa *pus*, 1, 2; ^wdak^wa, 9–11, 15, 18–20; dak^wa, 14, 17.

37. (142) yak^wa *crooked*, 1, 2, 10, 18; tyak^wa, 9.

PM *k^wa > k^wa in all dialects cited.

*ⁿdi

38. (89) ⁿdi[?]i *finished*, *all*, 1, 2; ⁿdi[?]i, 10, 13, 15; ⁿdyu[?]i, 27.

39. (90) ka[?]ⁿdi *explode*, 1, 2; ka[?]ⁿdi, 9, 10; ka[?]nzi, 18.

PM *ⁿdi > ⁿdi in dialects 1, 2; ⁿdi in 9, 10, 13, 15; nzi in 18; dyu([?]i) in 27.

*ⁿdo

40. (212) ⁿdoo *stay*, 1, 2, 5, 9, 10, 15, 18.

41. (251) ⁿdo[?]o *tenate (handleless palm leaf basket)*, 1, 2, 6, 9, 10, 15, 18.

PM *ⁿdo > ⁿdo in all dialects cited.

*ⁿda

42. (149) ⁿda[?]a *hand*, 1–3, 6, 9–12, 14, 15, 18, 20–27; da[?]a, 13, 17; ⁿdaa, 16; ⁿda[?]-i, 19; ⁿda[?]-ⁿgo, 28.

43. (145) ku-ⁿjaa *be seated*, 1; ko-ⁿdee, 2; ku-ⁿdee, 9; ku-ⁿda, 10; ⁿdyaa, 12; ⁿda-yu, 11, 13.

PM *ⁿda > da in old monosyllables of dialects 13, 17, and ⁿda in this situation in other dialects cited; in set 43 (145) *ⁿda > nja in dialect 1; ⁿde in 2, 9; ⁿdya in 12; ⁿda in 10, 11, 13, presumably after preceding *u.

*vi

44. (45) sau *rain*, 1, 2; savi, 9–13, 15–17; davi, 18, 5, 27; ⁿdavi, 14, 20, 28; dau, 21, 22, 24; lavi, 25.

45. (70) ča[?]u or ti-ya[?]u *lice eggs*, 1; ča[?]u, 2; tya[?]vi, 9–15; si-ya[?]vi, 18; cyavi, 20.

¹⁶This set is an important one because it apparently adds to the scanty evidence for *-m in PM; see 4.1. However, since morpheme final -m is elsewhere unattested in Mixtec dialect data, the data from dialect 20 should be rechecked.

PM *vi > u in dialects 1, 2, 21, 22, 24; vi in 9–18, 20, 25, 5, 27, 28.

*vi

46. (93) kivi *day*, 1, 2, 11, 12; kivi, 9, 10, 14, 17, 18, 20, 25; kii, 15; kii, 22; ⁿduu *day time, by day*, 1, 2, 9, 21, 24, 5; ⁿduvi, 10, 16, 20, 27; duvi, 28; [?]aⁿdivi *heaven, sky*, 1, 2, 7, 8, 12, 21, 5; haⁿdivi, 3; [?]aⁿdivi, 9, 10, 13, 15; [?]anzivi, 18, 20, 25; [?]adivi, 14; [?]anyivi, 16; ⁿdivi, 17; [?]aⁿdivi or [?]aⁿduu, 24; [?]aⁿdü, 22; viaⁿdivi, 27.

47. (101) ti[?]vi *to suck*, 1, 2; ti[?]vi, 9, 10, 15; si[?]vi, 18; tivü, 28; ci[?]vi, 20.

PM *vi > vi after i, and u after u in dialects 1, 2, 21, 5; vi after i, and u after u in dialect 9; vi after i, and u after u in 27; vi after i, and vi after u in 28; vi in 3, 7, 8, 11, 12; vi in 10, 13, 14, 16–18, 25; (ki)i, ([?]aⁿdi)vi, (ti[?])vi in 15; (ki)i and ([?]aⁿdi)u in 22; (ki)vü, (ⁿdu)vi, (ci[?])vi in 20; (ⁿdu)u, and ([?]aⁿdu)u or ([?]aⁿdi)vi in 24.

*va

48. (142) vaa *noisy*, 1, 2, 9.

49. (220) kava *to twist*, 1, 2, 9–14, 18; kava or kavi, 15.

50. (227) ⁿda[?]va *to be extinguished*, 1, 2, 9, 10, 17; da[?]va, 13; ⁿda[?]vi, 15.

51. (154) ⁿdava *jump*, 1, 2, 9, 10, 15.

52. (180) yu[?]a *thread*, 1, 14, 15, 18; yu[?]va, 2, 9, 10, 11, 12, 20; yu[?]ve, 4; yuva, 13.

PM *va > va in dialects 2, 9–13, 17, 20; a in (yu[?])a (after u[?]) and va in other citations in 1, 14, 18; ve in 4; va and vi in 15.

*θi

53. (5) viši *sweet*, 1, 9–15; viši or viši, 2; vidi, 18.

54. (51) šiü *aunt*, 1; šiši, 2, 9, 10, 15; [?]iši, 4; didi, 18.

PM *θi > ši in all dialects cited except 18, where *θi > di.

*θi

55. (82) ⁿdiši *roasting ear*, 1, 4; ⁿdiši, 2, 9–15; nzidi, 18, 20.

56. (83) ku-sii ([?]ini) *happy*, 1, 2; ku-sii

(?ini) 9, 15; sii, 10, 13, 14; sīi, 11, 12; ku-dii, 18.

These two sets are representative of a split under obscure conditions of *θi into šī¹⁷ and si (> ši and si in dialects where i merged with i), except dialects 18, 20 (and others not cited here), where *θ > d.

*θo

57. (206) ku-ⁿdiso *to take, to carry away*, 1; ko-ⁿdiso, 2; k^wiso, 9; ⁿdiso, 10, 15; viso, 17.

58. (247) yoso *grinding stone*, 1, 2, 9–15, 17; yodo, 8, 18, 20; šodo, 27.

PM *θo > so in dialects 1, 2, 9–15, 17; do in 8, 18, 20, 27.

*θu

59. (209) ?isu *deer*, 1–3, 9–15; ?idu, 18.

60. (248) kusu *to sleep*, 1, 2, 10, 13, 15, 16; kuṣu, 9; kudu, 14, 18, 20.

PM *θu > su in dialects 1–3, 10–16; su and ṣu in 9; du in 14, 18, 20.

*θa

61. (135) ti-saa *bird*, 1; saa, 2, 4, 9–15, 17; saa or ti-saa, 3; laa, 16, 18, 27, 28; či-daa, 5; ti-daa, 8; ci-daa, 20.

PM *θa > sa in dialects 1–4, 9–15, 17; da in 5, 8, 20. Reflex laa in dialects 16, 18, 27, 28 presumably reflects a Proto-Mixtec grammatical alternation *θ ~ *1; see 1.

*yo

62. (231) yo?o *rope*, 1, 2, 9, 10, 12, 13, 17, 18, 20.

63. (262) hio *clay griddle*, 1; hiyo, 2, 9; čiyo, 10–12, 14; čio, 15; šiyo, 17, 22; šio, 18, 21, 26; čyoo, 13; šoo, 20; ?io, 5; siyo, 24; ?iyo, 25.

PM *yo > yo in dialects 2, 9, 10–12, 14, 17, 22, 24, 25; yo in *CV?V forms and o in the ultimate syllable of CVCV forms in dialects 1, 15, 18, 21, 5, 26; (čyo)o in 13; (šo)o in 20.

¹⁷ But in dialect 2, *i gives reflex i contiguous to š; see also set 55 (82).

*yu

64. (230) ⁿdeyu *food*, 1, 2, 3, 9; ⁿdayu, 10; ⁿdya?i, 15.

65. (261) ⁿde?yu *mud*, 1, 2, 9, 18, 20; ⁿda?yu, 10, 11; dya?yu, 17; nya?yu, 12; da?yu, 13; ⁿdayu, 14; ⁿdya?i, 15.

66. (278) te?yu *to spoil*, 1, 2, 9; ta?yu, 10; tya?yu, 17.

PM *yu > yu in all dialects cited except 15, where *yu > ?i and i.

*ya

67. (189) yaa *tongue*, 1, 2, 4, 5, 9–12, 14–18, 20–26, 28; šaa, 27; ya-i, 19.

PM *ya > ya in all dialects cited except 27, where *ya > ša.

*hi

68. (1) tahi *to give, send*, 1, 2, 9; tači, 10; taši, 18.

69. (15) kahi *clear*, 1, 2, 9; kači, 10.

70. (8) ⁿdii *will return*, kii *will come*, vai or vahi *is coming*, 1; ⁿdihī, vehi, 2; ⁿdihī, vahi, 9; kiči, vači, 10; vači, 15; kihi, 21.

71. (86) ku-ⁿdihī *to dawn*, 1, 2, 9; ku-ⁿdiči, 10.

72. (52) ⁿdahi *to get wet*, 1, 2; ⁿdači, 15.

73. (54) kahi *to choose*, 1, 2, 9; kači, 10, 13, 15; na-kači, 12; na-kaši-yu, 20.

PM *hi > hi and i in dialect 1; hi in 2, 9, 21; či in 10, 12, 13, 15; ši in 18, 20. Set 71 (86) gives vowel nasalization as reflexes of PM *-m.

*ha

74. (139) haa *new*, 1; hee, 2, 9; čaa, 10–13, 15; šaa, 14, 17, 20; saa, 18; šee, 27; yee, 28.

75. (153) ke-ha?a *to begin*, 1; ke-hee, 2; ki-he?e, 9; ke-ča?a, 10; ki-ča?a, 11, 12, 14, 15; ki-sa?a, 18; ki-ča?-i, 13.

76. (85) yuḥa *dough*, 1; ṅuḥe, 2; ṅuḥa, 9; yuča, 11, 12; yuča, 10, 13, 14; yuša, 17; yusa, 18; yutya, 15; ṅuša, 20.

PM *ha > ha in dialect 1; he in 2, 9; ča in 10–13; ča and ša in 14; ča and tya in 15; ša in 17, 20; sa in 18; še in 27, ye in 28. Set 76 (85) gives vowel nasalization as reflexes of PM *-m.

***mi**

77. (20) *ñaʔmi tubular root*, 9, 15, 18; *yaʔmi*, 10, 17; *ñaʔmu* 1, 2.

PM ***mi** > *mi* in all dialects cited except 1 and 2, where ***mi** > *mu*.

***ma**

78. (157) *ñuʔma smoke*, 1, 2, 9, 12, 14–16, 18, 20; *yuʔma*, 10, 11, 13; *ʔuma*, 27; *ñumeʔ*, 28.

PM ***ma** > *ma* in all dialects cited except 28, where ***ma** > *me*.¹⁸

***ni**

79. (31) *ʔuni three*, 1–5, 8–11, 13–15, 17, 20–28; *ʔuñi*, 12, 16.

PM ***ni** > *ni* in all dialects cited, except 12, 16, where ***ni** > *ñi*.

***nu**

80. (223) *ʔinu tobacco*, 1, 2, 18, 20, 21; *šenu cigarette*, 9; *ʔinu, šanu*, 10; *šanu*, 14, 17; *čyanu*, 11; *ʔino*, 12; *sanu*, 13.

81. (255) *nuu for a short time*, 1, 2, 9, 10.

82. (167) *ñunu net bag*, 1, 2, 9, 15, 18; *yunu*, 10; *yoño*, 4; *yono*, 12.

83. (275) *kʷaʔnu will grow, haʔnu is growing, kaʔnu big*, 1, 9; *kʷaʔnu, heʔnu, kaʔnu*, 2; *kʷaʔnu, čaʔnu, kaʔnu*, 10; *kaʔnu*, 11–18, 20, 21; *kaʔno*, 27.

PM ***nu** > *nu* in all dialects cited, except ***nu** > *nu* and *no* in dialect 12; *no* in 27; *ño* in 4.

***na**

84. (165) *ti-ʔina or ʔina dog*, 1; *ʔina*, 2–4, 10–14, 24, 5; *tina*, 6, 8, 9, 15, 17, 21, 22, 27, 28; *čina*, 25; *tyina*, 16.

PM ***na** > *na* in all dialects cited.

***ñi**

85. (98) *nĩni¹⁹ ear of corn*, 1; *nĩni*, 2, 11, 12; *nĩni*, 9, 13; *nĩni*, 10, 14; *nĩi*, 17; *nii*, 18, 20; *nij*, 15.

¹⁸ Early PMx **-ʔmv* + **-m* > later PMx and perhaps PM **-ʔVm* > *-ʔ, V* as in Longacre's set (23): *šųʔu money*, 1–13, 9–15; *diʔu*, 18, 20; < ʔ followed by ultimate syllable **mim*; see Longacre 3.1.4.2 and 5.3.1.3; see also sets (22), (159), (160), and (161).

¹⁹ PM **i* > *i* after *ñ* and *y* in dialect 1; see also sets 86 (277) and 17 (74).

86. (277) *tiñi mouse*, 1; *Nĩni*, 2; *tiñi*, 9, 10; *tiñi*, 12, 21; *tuñu*, 11; *tij*, 17; *si-tñii*, 18; *cni*, 20; *ti-tiñi*, 24; *nĩni*, 25; *tiʔi*, 15; *štiñi*, 27.

PM ***ñi** > *ñi* in dialects 2, 12, 21, 25, 27; *ñi* in 1, 9, 10, 13, 14, 24; *ñi* and *ñu* in 11; *nj* and *ij* in 15, *nj* and *ij* in 17; *i* and *ni* in 18, 20.

***ñu**

87. (225) *kʷañu squirrel*, 1, 10–14; *kʷeñu*, 2; *škʷañu*, 9; *ʔdikʷañi*, 15.

88. (171) *ʔiñu thorn*, 1, 2, 9–15, 17–20.

PM ***ñu** > *ñu* in all dialects cited except dialect 15, where ***ñu** > *ñu* and *ñi*.

***ña**

89. (176) *hiʔña to bark (of a dog)*, 2; *hiʔa*, 1; *čiʔa*, 15.

PM ***ña** > *ña* in dialect 2; *a* in dialects 1, 15.

***li**

90. (19) *luli little*, 1, 2, 9; *luʔlu* or *luʔu* or *lušu*, 10; *lulu*, 3; *lule*, 7; *luʔlu*, 11, 12; *luʔu*, 13, 14; *luu*, 15; *čili*, *loʔo*, 17; *liʔli*, 21; *luši*, 25; *luʔndi*, 27; *lu (vaña)*, 28; *tii*, 18.

PM ***li** > *l-* with various vowel reflexes in most dialects cited. The irregularity of the vowel reflex witnesses, however, to the fact that other factors than sound change account for the variety of this set. The apparent reflexes *š* in dialect 25 and *ʔd* in dialect 27 are readily attributable to consonantal alternation in the PMx noun as described by Longacre and mentioned in section 1 of this paper. Whether this alternation was still an active feature of PM structure or whether such sets as this simply contain vestiges of formerly active patterns, it is difficult to say. At any rate, behind the variety of this set there probably lies on some horizon (whether PM or PMx) some such alternation as follows: **θ* ~ **ʔd* ~ **l*, with further admixture of a form in **t* from the 't' declension of nouns (see Longacre, pp. 55, 56), unless the form *tii* in dialect 18 is from a different root entirely.

***lu**

91. (272) *vilu cat*, 1–4, 6, 15, 17; *čilu*, 9; *čitu*, 18.

PM *lu > lu in all dialects cited except dialect 18, where *l apparently goes to t (but see above set).

3.1. The development in ultimate syllables of PM vowels and consonants from PMx is charted in two diachronic sound charts.²⁰ The reconstructed phonemes of PMx are arranged from left to right at the top of each chart. The PM phonemes appear in the right-hand column, arranged from top to bottom. In the blocks under the PMx phonemes are listed their PM reflexes opposite the PM phonemes; the environments in which they occurred are listed in parentheses before and after the reflexes. While Longacre listed *ñ as a PMx phoneme, it is not so listed here (see 4.3).

The vowel chart may be read as follows:²¹

PMx *i > PM *i except after *k^w when followed by *m, where *i was lost and the bilabial component of *k^w became *u.

PMx *e > PM *i in almost all instances, but possibly > PM *e in CV?V and CVV; see, however, discussion of this vowel in 2 and 4.

PMx *i > PM *i after *θ and *x^w when followed by *m. It became PM *a after *x when followed by *m. It was lost after *k^w, where the bilabial component of *k^w became *u. It remained *i in other environments.

PMx *o > PM *i after *t and *k when followed by *?. It became PM *o after other *k, and *u after other *t. It became PM *u or *o after *θ, *ⁿg, and *y; the conditioning factors are obscure. It became PM *o in *C_o and *C_o? forms (> PM *C_{oo} and *C_o?_o), but not in *C_{am} nor in PMx *w_o?. It became PM *u after any consonant when followed by *m. It became PM *a after *w or *ⁿg^w, except that PMx *-u?_w > PM *-u?_u.

²⁰ These charts are modelled after those of Henry Hoenigswald. Though the phonemes in the two charts are not starred, all of them are understood to be proto phonemes.

²¹ See Longacre 2.2, 3.2, and 4.3 for fuller details of the development of PM vowels from PMx.

PMx *o > PM *i after *ñ in set 85 (98). It became PM *u after any consonant when followed by *m. It became PM *u when preceded by PM *u or *a in the penultimate syllable. It remained *o in other environments.

PMx *u > PM *i after PM *yut- in set 6 (264), and after *t when followed by *m. It became PM *i after *t, *k, and *ñ. It remained *u in other environments.

PMx *a > PM *u after *n, *ñ, and *ñV? when followed by *m. It was lost where PMx *-uk^wa > PM *-uku, and after *-k^w when followed by *m, where the bilabial component of *k^w became *u. It remained *a in other environments.

The consonant chart may be read as follows:²²

PMx *t, *θ, *n, and *l remained unchanged in PM.

PMx *k > PM *k except before *i, where it became *h.

PMx *k^w > PM *k, except that it remained *k^w between a . . . a and in Ca?a.

PMx *x > PM *h.

PMx *x^w > PM *k^w in *CVk^wa. It became PM *h before *i, *i, and *e. It became *v in *Caa.

PMx *ⁿd > PM *t in *CVtV, and remained *ⁿd elsewhere.

PMx *ⁿg > PM *h before *a, and *k elsewhere.

PMx *ⁿg^w > PM *k before *am in PMx *? CVm, and *v after any vowel.

PMx *m > PM *m, except that PMx *?mVm became PM *?Vm.

PMx *y > PM *y, except that it perhaps became *ñ by PM times in some dialects in the environment of nasal consonants (see 4.3).

3.2. The PM ultimate syllables have been listed in 2 with their modern reflexes. We list them again here, showing their deriva-

²² The symbol * in this chart signifies space—roughly, word boundary. See Longacre 2.1.3, 3.1 and 4.2 for fuller details of the development of PM consonants from Pmx.

Diachronic Sound Chart of PMx-PM Vowels

PMx	i	e	i	o	o	o	u	a	PM
i		i	(θ) i (m) (x ^w) i (m)			(PM yut-) i (t) i (m)			i
		e in CVɔV, CVV							e (?)
			i	(t) i (?) (k) i (?)	(ñ) i	(t) i (k) i (ñ) i			i
				(C) o (ɰ?) (CVk) o	o				o
				(CVθ) o/u (CV ^{ng}) o/u (CVy) o/u					
				(C) u (m) (CVC) u (m) (CVt) u	(C) u (m) (PM a..) u (PM u..) u	(n) u (l) u (y) u	(n) u (m) (ñ) u (m) (ñV?) u (m)		u
			(x) a (m)	(w) a (ng ^w) a				a	a
(k ^w > ku) * (m)			(k ^w > ku) *	(-u ² wɔ > u ² u) *				(-uk ^{wa} > -uku) * (k ^w > ku) * (m)	*

Diachronic Sound Chart of PMx-PM Consonants

PMx	t	k	k ^w	θ	x	x ^w	n _d	ⁿ g	ⁿ g ^w	m	n	l	y	w	PM
	t						(CV)t(V)								t
		k	k					k	k (am in *CVm)						k
			(a) k ^w (a) k ^w (-a?a)			(V)k ^w (a)	n _d (V or V?V) (CV?) n _d								k ^w
				θ											n _d
		h (i)			h	h (i) h (i) h (e)		h (a)							θ
						(*)v(aa*)			(V)v					v	v
										m (except P _m V _m > ?V _m)			y		y
											n				m
											n				n
													ñ (in environ- ment of nasal con- sonants)		ñ
												l			l

tion from PMx syllables (for factors conditioning various splits and mergers, see preceding sections and accompanying charts).

PM *ti < PMx *ⁿdi (set 1), *te (set 2), *ⁿde (set 3).

PM *ti < PMx *ti (set 4), *tə (set 5), *tu (set 6).

PM *to < PMx *tə (set 7).

PM *tu < PMx *tə (set 8), *to (set 9).

PM *ta < PMx *ta (sets 10, 11, 12), *ⁿda (set 13).

PM *tum < PMx *tum or *tom (the vowel is uncertain) (set 14), *tam (set 15).

PM *tam < PMx *tam (set 16).

PM *ki < PMx *ki (set 17), *kə (set 18), *ku (set 19).

PM *ko < PMx *kə (set 20), *ⁿgə (set 21), *ko (set 22).

PM *ku < PMx *ko (set 23), *k^wi (set 24), *k^wa (set 25), *ⁿgə (set 26), *ⁿgo (set 27).

PM *ka < PMx *ka (set 28), *k^wa (set 29).

PM *kim < PMx *kim (set 30).

PM *kum < PMx *kom (set 31), *kəm (set 32), *k^wam (set 33), k^wim (set 34), *ⁿg^wam (Longacre's sets 155 and 80; cf. 4).

PM *kam < PMx *k^wam (set 35).

PM *k^wa < PMx *k^wa (set 36), *x^wa (set 37).

PM *ⁿdi < PMx *ⁿdi (sets 38, 39).

PM *ⁿdo < PMx *ⁿdə (set 40), *ⁿdo (set 41).

PM *ⁿda < PMx *ⁿda (sets 42, 43).

PM *vi < PMx *wi (set 44), *we (set 45).

PM *vī < PMx *ⁿg^wi (set 46), *wī (set 47).

PM *va < PMx *x^wa (set 48), *ⁿg^wə (set 49), *wə (set 50), *ⁿg^wa (set 51), *wa (set 52).

PM *θi < PMx *θi (set 53), *θe (set 54).

PM *θi < PMx *θi (sets 55, 56).

PM *θo < PMx *θə (set 57), *θo (set 58).

PM *θu < PMx *θə (set 59), *θo (set 60).

PM *θa < PMx *θa (set 61).

PM *yo < PMx *yə (set 62), *yo (set 63).

PM *yu < PMx *yə (set 64), *yo (set 65), *yu (set 66).

PM *ya < PMx *ya (set 67).

PM *hi < PMx *ki (set 68), *x^wi (set 69), *xi (set 70), *x^wi (set 71), *xe (set 72), *x^we (set 73).

PM *ha < PMx *xa (set 74), *ⁿga (set 75), *xi (set 76).

PM *mi < PMx *mi (set 77).

PM *ma < PMx *ma (set 78).

PM *ni < PMx *ni (set 79).

PM *nu < PMx *nə (set 80), *no (set 81), *na (set 82), *nu (set 83).

PM *na < PMx *na (set 84).

Longacre listed the following *n*V syllables as reflexes of PMx *ñ; see 4.3 for evidence that they are in all likelihood reflexes of PMx *y.

PM *ñi < PMx *ñi (set 85), *ñu (set 86).

PM *ñu < PMx *ñə (set 87), *ña (set 88).

PM *ña < PMx *ña (set 89).

PM *li < PMx *li (set 90).

PM *lu < PMx *lu (set 91).

4.1. Longacre reconstructed a PMx syllable *tnV;²³ it now appears that his *tnV was simply *tVm and that at a more recent date some of the Mixtec dialects developed syllable initial tn- as a metathesized reflex of *tVm. See Longacre's sets 22, 110, 111, 150, 161, 221, 235, 257, 267, 274 and 277, which have the following correspondences: PM *tVm > modern tnV ~ NV ~ tV ~ tV̄ ~ (in ultimate syllables in dialect 1) nV.

It is superfluous in these sets to reconstruct both *-m and *tn-. There is no contrast of oral vs. nasalized vowels after the posited *tn-. Furthermore, the distribution of reflexes of *-m, i.e. of nasalized vowels, is in complementary distribution with reflexes of the posited *tn- in ultimate syllables, as may be seen in the above set of correspon-

²³ Longacre's sets 150, 151, in which he reconstructed PMx *tn as a source of Trique r in ultimate syllables, need to be reinterpreted in the light of the data here presented. Probably Trique r here harks back ultimately to PMx *t, the regular reflex of which is ĉ in Trique. But there are many morphemes in which Trique ĉ and r are in free variation. The Trique forms in these sets are forms for which the variants -ĉ- no longer exist.

dences where tV may be considered to be a reflex of unmetathesized $*tVm$ and where the other reflexes listed may be considered to be reflexes of an earlier Mixtec dialect development in which $*tVm$ was metathesized to $*tnV$ with assimilation of $*m$ to $*n$ after $*t$. In originally monosyllabic forms, however, as in sets 16 and 14, metathesized $*tVm > *tnV$ continued to be a factor conditioning nasalization of the vowel of the syllable.

While it seems that there can be no question that metathesis of $*tVm$ to $*tnV$ is ultimately the source of such reflexes as tn and N in the Mixtec dialects, nevertheless a vexing consideration of the relative chronology of this sound change can scarcely be avoided. For while apparently PMx as such did not contain the $*tn$ that Longacre posited, nevertheless it is by no means impossible to argue that $*tn$ should be posited for PM. Two things must be kept in mind here: (1) Some dialects apparently bear witness to unmetathesized $*tVm$ as is seen in the pattern of complementary distribution noted above and in sporadic survivals of the $*-m$ itself when a final vowel was incremented to the form. (2) Nevertheless, the metathesis took place at an early enough period for $*tn-$ to undergo a variety of dialect developments ($> N, n,$ and t in certain dialects). It seems, therefore, that the metathesis took place neither at an early enough period to affect all the Mixtec dialects nor at a period recent enough to escape considerable further development. In a sense, whether or not one chooses to term this period of relatively early dialect differentiation 'Proto-Mixtec' amounts to a quibble. It is of course unnecessary to assume that 'Proto-Mixtec' was an absolutely homogeneous dialect; some amount of dialect variation is present on whatever horizon of reconstruction we reach. In this paper we do not project $*tn$ on the PM horizon but admit it as one of the early dialect developments.

The evidence for reconstructing $*-m$ for

PM as well as for PMx is twofold: (1) the need for positing some sort of final nasal which by metathesis gave $*tn-$ in early Mixtec dialect development; (2) the presence of intervocalic $-m-$ in certain dialects within sets having forms with nasalized vowels in other dialects. In these sets, which are given below, the $*m$ seems certainly to be the source of the nasalized vowels, but the question remains whether we should posit $*-m$ or $*-mV$, with accompanying questions of relative chronology. Longacre posited PMx $*-m$ as the source of nasalized vowels in the Mixtecan languages. He explained such forms as *kumi four* in the first set below as consisting of preservation of an originally final $*-m$ with addition of a final vowel at a rather early period in some dialects, by analogy with the words *two* and *three*. His data were limited, consisting only of the first two sets below. The second of these, the set for *onion*, was dismissed as being too irregular to be afforded much attention. However, further sets (see below) add data which make Longacre's explanation in regard to the first set appear to be ad hoc and inadequate, while the second set no longer appears to be recalcitrant and must now be taken seriously.

The crucial question becomes, then, whether a vowel has been added in the formation of such forms as *kumi four* in certain dialects, or whether $*-mV$ has been lost in the formation of such forms as *kuy four* in other dialects. If we assume the latter it then follows either that both $*-m$ and $*-mV$ existed in PM and were sources of nasalized vowels in certain dialects, or that $*-mV$ is to be posited everywhere, to the exclusion of $*-m$. If both $*-m$ and $*-mV$ existed, no particular difficulties ensue, except that we have no ready explanation for the loss of the second syllable in the forms in question. If we assume $*-mV$ everywhere, we have then to account for the presence of PM $*-mV$ vs. witness to final $*-m$ in Cuicatec, Trique, and Amuzgo. One hesitates to project back into PMx and PMMx a feature attested to

in Mixtec only, especially when there is an alternative explanation, viz. positing *-m with occasional addition of following vowel within Mixtec itself. We return then to the alternative that PM was characterized by forms ending in *-m and that a vowel was added to a few forms in certain dialects. This explanation at least has the virtue of not unleashing a chain reaction of required changes in our reconstructions all the way back to PMx and PMMx.²⁴ Addition of final vowel after *-m can be explained as fusion of some phrase-final or utterance-final particle such as has occurred in Trique and Mazatec; cf. Trique *čehe³ road* < *če³h + -a³* and *koho³ plant* < *ko³h + -a³* (Longacre, 5.1.1). Here again, considerations of relative chronology must be faced. It is possible that the addition of the fused particle came very early in the history of the Mixtec dialects. It does not seem to us, however, that this development is witnessed to by a sufficient number of the dialects to be termed 'Proto-Mixtec'.

(155) *kų* *four*, 1-4, 24; *kumi*, 9-17, 20, 21; *kimi*, 8; *kimi*, 27, 28; *kọ*, 22; *hų*, 25; *himi*, 5.

(80) *ndikī* *onion*, 1; *tī-kų*, 2; *ndi-kumi*, 10; *ti-kumi*, 9, 11, 14, 15, 17; *di-kumi*, 13; *si-kumi*, 18.

nuu *to be in a hurry*, 1, 2; *numi*, 9.

(246) *tų* *feather*, 1; *Nų*, 2; *tumi*, 9; *tnumi*, 21 (anomalous presence of both *tn-* and *-m-* in this form may reflect dialect mixture and contamination).

35. (134) *ką*, *to dig, pierce*, 1, 2, 10, 14, 15; *kaa*, 13; *kam* 20; *kan*, 28; *kanu*, 27; *kaj* (*yavi*) 16. (The phonetic data of dialects 20 and 28 should be rechecked. Final *-m*, if attested in even one Mixtec dialect, would constitute a datum of considerable importance.)

²⁴ It is, of course, possible that forms in *-mV characterized PMx and PM forms as well as forms in *-m. Nevertheless, it does not seem feasible to attribute any of the forms here under discussion to *-mV.

4.2. Longacre did not reconstruct a PM *e vowel, since in all of his sets PMx *e merged with PM *i. In modern Mixtec most e vowels are reflexes of *a (e.g. sets 11 (108) and 13 (144)). However, he was puzzled by some modern e vowels which did not seem to be reflexes of *a and which he could not tie into PM *i; these are often in morphemes of pattern Ce'e or Cee. This latter circumstance is of considerable importance. In the Mixtec sets given below there is clear dialect evidence that e . . . e in many modern Mixtec dialects harks back to several sources: (1) PM *a . . . i with intervening *y or *y; (2) PM *i . . . a with intervening *?; (3) PM *a . . . a with intervening *y. None of these environments are represented in any of Longacre's cognate sets. They are, rather, special environments in which Mixtec e . . . e has developed and which were not noticed by Longacre. Moreover, there are a few further sets which possibly give evidence that PMx *e did not entirely merge with *i in PM, but that in the environments CV?V and CVV this phoneme survived as such in PM. In presenting the sets below, the Cuicatec and Trique cognates are given wherever they have been identified, since these sets are supplementary to Longacre's data and give corroborating evidence for the vowel sequences constructed for PM by showing that such sequences characterized such environments at an earlier period.

From PM *Ca?yi and *Cayi: *kwe?e sickness*, 1, 9, 10, 15; *kwe?yi*, 2. *vee heavy*, 1, 9, 10, 15, 18; *veyi*, 2. *ku-ndee to win*, 1, 9; *ku-ndeyi*, 2. Here only Mixtec preserves evidence of the original intervening *y or *y. Trique affords corroborating evidence of the *a . . . i sequence posited for PM in that it seems necessary to construct such a cluster for PMx: Trique (g)a^{3?}i⁴⁵ *to be heavy*; and another Trique form in which the vowel sequence has been reduced to i . . . i, viz. ži^{3?}i⁶³ *sickness*. A further Mixtec form, ?u?u *to hurt, to be difficult*, may hark back to PM *wa?yim. These various Mixtec forms along

with the Trique cognates seem to hark back to a PMx verb form *waʔyi, *kaʔyi, *kʷaʔyi, with presence of *-m in at least a few forms, and with a similar form not occurring with medial glottal stop, viz. *wayi.²⁵

From PM *Ciʔa: ʔdeʔe *fruit*, 1, 2; ʔdiʔa, 9; ʔdiʔe, 17. ti-teʔe *cockroach*, 1, 2, 10; ti-tiʔa, 9. teʔe *hoof*, 1, 2; tiʔa, 9. For none of these sets have we close cognates in either Cuicatec or Trique. Nevertheless, the sets for *fruit* and *hoof* seem related to certain of Longacre's reconstructions which have PMx *a in the second syllable. The set for *fruit* is probably related to Longacre's set 183: ti-kaʔva *plum*, 1, ti-kava, 10; Trique ruʔgwiʔiʔ peach. This set reconstructs as *ʔwa with adaptation of some root of uncertain meaning to certain fruits introduced in comparatively recent times. It is possible that there was a similar PMx root that did not have *ʔwa but rather *ʔa, and which lies behind the Mixtec forms for *fruit*. Similarly, the set for *hoof* may be related to Longacre's sets 141 *foot* and 149 *hand*. The former set reconstructs as PMx *xaʔa ~ *kaʔa, the latter as PMx *taʔa ~ *daʔa. In neither of these sets do the PMx forms exhibit the *i...a sequence posited for PM. Nevertheless the PMx forms agree with the posited PM forms in having *a in the second vowel position, and the Mixtec dialect evidence that there was in PM a related form with *i...a sequence seems clear.

From PM *Caʔya: seʔe *offspring*, 1, 2, 4, 9, 10, 15, 17; deʔe, 18; daʔya, 21; daʔa, 23; laʔ (liʔi) *daughter*, laʔa (yi) *son*, 25; daʔya (yu) *son*, 5; da (diʔ) *daughter*, 22. The sequence *a...a seems clearly substantiated by the Mixtec dialect evidence. The forms with l- witness presumably to a remnant of a PMx *θ ~ *l grammatical alternation. The Cuicatec form dāiyā *offspring* seems clearly cognate with the Mixtec forms (early

Cuicatec *daya > daiya; see Longacre, p. 31, note 2).

From PM *Ceʔe and *Cee: ʔdeʔe *to look at*, 1, 2, 9, 10; ʔdiʔe, 21. keʔe *to touch*, 1, 2. (ñuʔu) teʔe *uninhabited land*, 1, 2. kʷee *slowly*, 1, 2, 9, 10, 15, 18; veʔe *house*, 1, 2, 9, 10, 15, 18, 21, 22, 24, 25; viʔi, 4, 5, 27. For several of these sets there appear to be cognates in other Mixtecan languages. The first set is probably cognate with Cuicatec and Trique forms listed as residual in Longacre's set 28: C ʔkūñi and T (giʔ)niʔiʔ *to see*. In that these forms reconstructed as a root with second syllable *-ni, they were listed there as a possible borrowing from Mixtec rather than as an inherited item. However, it now seems plausible to list these residual forms along with the Mixtec forms (ʔdeʔe, ʔdiʔe) as a set reconstructing with penultimate syllable *ʔde/ne, i.e. as a root with alternation of *d/n in PMx. This is not an ad hoc explanation resorted to in effort to create a new cognate set; rather it has been observed in several of Longacre's sets (see sets 89-92 with *ʔdi/ni). Longacre's statement regarding ultimate syllable reflexes of *e (3.2.1.2) needs therefore to be modified so as to include: PMx *e has reflex e in Mixtec in the restricted environment here described (but with a word of caution as to the phonemic status of this phone in PM itself); C reflex i after *n; T reflex i after *n. PMx *n conditioned, then, a peculiar C reflex i while elsewhere *e became C a or e. But this is consistent with the previously posited development of PMx *i which gives a peculiar C reflex o or u after *n but e or i elsewhere. Similarly, as PMx *e gives i only after *w and *n, so PMx *i gives a peculiar T reflex i only after *n. Therefore the new development here posited is in keeping with vowel developments previously posited in the Mixtecan languages and appears to be in every respect plausible. The Mixtec morpheme teʔe *uninhabited* in the third set above is probably cognate with Trique čeʔ *empty* (T č is a regular reflex of *t in ultimate syllables) with a slight diffi-

²⁵ See Longacre 5.6 for evidence that PMx was characterized by alternation of medial *-ʔC with *-C in at least some forms.

culty arising from witness to final *ʔ in the Mixtec form vs. lack of *ʔ in the T form (but see Longacre, 5.6). Finally, the Mixtec forms veʔe, viʔi *house* have been observed as similar to the Trique weʔe³ *house*, but Longacre has regarded this similarity as reflecting a Mixtec loan in Trique. Now, however, the Mixtec vowel reflex is no longer a problem in that these forms fulfill the specifications of the environment in which PMx *e went to PM *e and to e in most of the present dialects. It now therefore appears possible that the M and T words for *house* are cognate.

4.3. Longacre states that PMx *ñ is no doubt a development from pre-PMx *ny cluster (< *m + *y at an earlier stage). Its status in penultimate syllables, however, was not completely clear, but he hesitantly posited penultimate *ñ, with *ñ figuring prominently as an alternate of Paradigm A, 'θ' declension (see Longacre, 4.1.1.2 and 4.3.2.2).²⁶ There are nine occurrences of penultimate *ñ in his list of cognates. In six of these sets the ultimate syllable has an initial nasal consonant—n, m, or ñ—as follows: set 77 (20) ñaʔmi, yaʔmi, etc. *tubular root*; 78 (157) ñuʔma, yuʔma, etc. *smoke*; 82 (167) ñunu, yunu, etc. *net bag*; (275) ñaʔnu, etc. *aged*; (24) ñiani, yani, etc. *brother of a man*; (169) ñeñu, etc. *blackberries*. In set 76 (85) ñuḥe, yuḥa, etc. *dough*, the ultimate syllable has *m > Ṽ. In set (159) ñuʔu, etc. *land, soil*, Longacre reconstructs penultimate *ñam + ultimate *ʔma. The remaining set, 6 (264) ñiti, etc. *sand*, shows no nasal environment in most of the dialects, but we find the form ñii yiti in dialect 12, and deduce from it that in this set ñ is probably a fusion of *n + *y.

We conclude, on the basis of Longacre's sets and additional sets not in his data, that

²⁶ See also discussion of *ñ in Longacre 2.1.4.4, 2.2.4.3.1, 3.1.4.4, and particularly 4.2.4.3.

penultimate ñ in modern Mixtec is in almost every case a reflex of PMx *y before some kind of nasal, but in a few cases may be a fusion of nasal + *y, usually on the PM level, but perhaps rarely in PMx times. In the Paradigm A, 'θ' declension, it may well be that the *ñ alternate is simply *y > ñ in Mixtec only; the cognate languages do not show reflexes of the postulated *ñ alternate.

In some of the modern dialects, PM *y > ñ before ultimate syllables with initial nasal consonants, and/or before ultimate CṼ < PM *CVm. E.g., in dialect 1, PM *y > ñ in ñani *brother of a man*, ñuʔma *smoke* (before a syllable initial nasal consonant), but yuḥa *dough*, yunu *tree* (before *CVm). In dialect 2, PM *y > ñ in ñani *brother of a man*, ñuʔma *smoke* (before a syllable initial nasal consonant), ñuḥe *dough* (before *hVm), but yuNu *tree* (before other *CVm). In dialect 9, PM *y > ñ in ñani *brother of a man*, ñuʔma *smoke* (before a syllable initial nasal consonant), ñuḥa *dough*, ñutu *tree* (before any *CVm). In dialect 10, PM *y is retained: yani *brother of a man*, yuʔma *smoke*, yuḥa *dough*, yutu *tree*.

Regarding ñ in ultimate syllables, note that no modern yṼʔṼ forms occur, but only ñṼʔṼ. Both modern yVV and ñVV occur; for ñVV, Longacre's sets show reflexes of PMx *y + a nasal element in the other cognate languages. Further study may reveal that though some ñ in ultimate syllables are the result of the fusion of nasal + *y, some ñ in ultimate as well as in penultimate syllables are the result of the same regressive nasal influence as described above. See also Longacre's discussion on neutralization of nasal vowels (3.2.2.3); it is possible that when *m was preceded by *yV, the vowel did not develop a definite nasalization, as in other *CVm, but the nasal influence gave ñ < *y. Modern Mixtec yVV and yVʔV forms are those without PMx *m.