中央研究院歷史語言研究所集刊

第六十五本　第一分

（抽印本）

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Reprinted from
The Bulletin of the Institute of History and Philology
Academia Sinica
Vol. 65, Part 1
Taipei, Taiwan, China
1 9 9 4

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第六十五本，第一分
出版日期：民國八十三年三月

Variable Finals in Proto-Sino-Tibetan*

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In many Tibeto-Burman languages we find that there are a number of forms that are clearly related though differ in one segment. In some cases these variations may be due to regular or common alternations, such as in Tibetan, where you have dental suffixes that can nominalize a verb (e.g. rkun-po 'thief', from rku 'steal'). In other cases we cannot find any morphological reason for the variation, even though the variation may involve the same segments, as in Tibetan bka, skad 'speech'. When we reconstruct the Proto-Tibeto-Burman provenience of these cognates, we sometimes have no way of knowing which form is older, so we must reconstruct two forms that are clearly related, that are what James A. Matisoff has dubbed 'allofams'. On the Chinese side of Sino-Tibetan we find similar alternations among cognate forms, as in 亡 *mjaŋ, 無 *mjag 'negative/not have'; 往 *gwjaŋ, 于 *gwjag 'go'.

This paper concentrates on variable finals, and argues that just as we find a certain amount of both rule-governed and non-rule governed variation in modern languages, in reconstructing Proto-Sino-Tibetan we should recognize the possibility of these types of variation. Second, the variation we find in PST and its immediate daughters is not as symmetrical and orderly as has been assumed. Third, the causes of the variation are complex and multifarious. Fourth, reconstructing a complex, typologically unlikely system to 'explain' the variation, such as the voiced stop finals

* An earlier version of this paper was presented at the 25th International Conference on Sino-Tibetan Languages and Linguistics, Oct. 14-18, 1992, U.C. Berkeley. I would like to thank all those who gave me comments on early drafts of this paper, especially William Baxter, W. South Coblin, James A. Matisoff, Tsu-lin Mei, Edwin G. Pulleyblank, Jackson T.-S. Sun, Pang-hsin Ting, and an anonymous reviewer.

reconstructed for Old Chinese, may also prevent us from attempting to find out the real causes of the variation. Fifth, the concept of word families is an important one, but we should not be unnecessarily constrained in our search for cognate sets by artifacts of our reconstructed system.

1. Variation in Sino-Tibetan

In working with Tibeto-Burman languages, we find that within each of the languages of the family there are a number of forms that are clearly related though differ in one segment, as in the following examples from Tibetan:

rku 'steal', rkun-po 'thief'

bka, skad 'speech'

nye 'near', nyen 'relative'

gči-ba, gčid 'to urinate', gčin 'urine'

ɦbye-ba (intr.), ɦbyed-pa (trans.) 'open, separate'

ɲi-ma, ɲin-mo 'day'

dro-ba 'to be hot', dron-mo 'hot', drod 'heat'.

ŋu-mo 'weep', ŋud-mo 'a sob'

In some cases these variations may be due to regular or common alternations, such as in Tibetan, where you have dental suffixes that can nominalize a verb, as in rkun-po 'thief', from rku 'steal', and ŋud-mo 'a sob' from ŋu-mo, 'weep', or they can have a causative function, as in ɦbye-ba (intr.), ɦbyed-pa (trans.) 'open, separate' (cf. Benedict 1972:100, 1991). In that case it will not affect our reconstruction of the Proto-Tibeto-Burman (PTB) form of, for example, 'steal', though if we find the same derivational process in other TB languages, then we might want to reconstruct that morpheme (and the morphological process) to the proto-language. In other cases we cannot find

any morphological reason for the variation, even though the variation may involve the same segments, as in Tibetan ɲi-ma, ɲin-mo 'sun'; ka, skad 'speech'; and Dulong mu?55 (< *muk; LaPolla 1987), ɯ31 mɯt55 'cloud'.

We find similar types of groupings on the Chinese side of Sino-Tibetan as well. These groups of related items are known as 'word families', following Karlgren's famous article (1933; see also Karlgren 1956). Karlgren, and later Wolfenden (1937), argued that in doing cross-language comparative work it is these word families that we should compare, not individual lexical items. Both Karlgren and Wolfenden felt that there were certain regularities to, or restrictions on, the type of variation within each word family, for example a restriction on the point of articulation of the finals such that all the variant forms of one word family would involve the same point of articulation. Wolfenden (1936, 1937) classified each of the forms he presented from Tibetan as to whether they were in the 'velar series', the 'dental series' or the 'labial series' of variation. He did not suggest a historical reason for this type of restriction on the variation.

Because of the recognition of these word families, in doing the comparative work necessary for reconstructing PTB we often need to recognize the same types of variation among languages or dialects in the family, as we often find forms that seem to be cognate in all but one segment, either the initial, the vowel or the final. If it is a case where the variation cannot be seen to be morphological, then we have to see if it is a matter of one language being aberrant, as in the case of some of the -k and -t finals of Maru and the -n ~ -ŋ variation due to the causative infix of Lepcha, [1] or of a large number of languages being split (possibly along

1 Maru has innovative -uk and -it appearing wherever the cognate forms in other languages would lead us to reconstruct *-uw and *-iy respectively (Burling 1966,

genetic lines) between having one form or the other, as in the case of 'dream', where all languages in Sino-Tibetan having cognate forms except for the Lolo-Burmese languages descend from *r-maŋ, with a velar nasal final, while the Lolo-Burmese forms descend from *r-mak, with a velar stop final. We might want to say in this case it is due to idiosyncratic phonetic change at the Proto-Lolo-Burmese level. The tendency in reconstruction work is still to attempt to reconstruct a single proto-form for the variant forms, though most cases are not as neatly distributed as the case of 'dream', and in these cases, when we reconstruct the PTB form we have no way of knowing which form is older, so we must reconstruct two or more alternate forms which represent the possible variations within the word family. Matisoff (1978:17ff) has dubbed these proto-variants 'allofams' (forms within the same word family, the term being based on analogy with 'allomorph' and 'allophone'), and he marks them with the symbol '⪤' (from > and <, as we do not know which way the relationship goes). Among the most common of the alternations we find is variation in the vowels of closed syllables (e.g. -i- ⪤ -u- ⪤ -a-), variation between pure vowel and dipthong (e.g. a ⪤ ay) (see for example Matisoff 1985), and also variation between stop and nasal final or stop and open final. [2] In this paper I will be concentrating on variable finals. Here are some examples from TB of the type of allofams I will be

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contra Wolfenden's (1939) view that the Maru -k is original). In Lepcha (Maniwaring 1876:93) causatives are formed by infixing -y- after the initial consonant (e.g. thór 'to escape', thyór 'to cause to escape'). If the final consonant of the simplex form is -ŋ, then the corresponding final in the causative form is -n (e.g. hróŋ 'to ascend', hryón 'to cause to ascend').

2 Shafer (1951:711) uses 'morphophonic' to refer to morphophonemic alternation of vowels, and 'morphosymphonic' for the morphophonemic alternation of consonants.

talking about: [3]

*ka ~ kat	'speech'	*m-si ~ m-sit	'comb'
*la ~ lap	'leaf'	*pa ~ pan	'palm'
*pyaw ~ pyam	'fly (v.)'	*ra ~ rat	'cut'
*k-lok ~ k-loŋ	'stone'	*yu(w) ~ yuk	'descend'
*ma ~ mat	'disappear'	*ya ~ yan	'night'
*du ~ dut ~ tu ~ tut	'join, tie, knot'		

On the Chinese side of Sino-Tibetan the question of word families is very much intertwined with the concept of rime categories (韻部 yūnbù). [4] From the study of the rhyming patterns and xié-shēng (諧聲) phenomena [5] of Old Chinese (OC), we are accustomed to thinking in terms of Chinese words belonging to certain rime categories, and these rime categories to belonging to certain groups of rime categories (類 lèi). The larger groupings are based on the observance that words belonging to a particular category sometimes rhyme with words in certain other rime categories, or the Chinese characters used to represent words belonging to a particular rime category will have the same phonetic components as words in certain other rime categories. We assume this happens because these particular rime categories have similar rimes. An example is the rime categories yū (魚), dūo (鐸), and

3 Most of the Tibeto-Burman reconstructions I will be discussing are from the work of Paul Benedict, especially Benedict 1972, and James A. Matisoff (e.g. 1978, 1985, 1989, 1992), though some are from Coblin 1986 or are reconstructions/ word families I have put together myself (see LaPolla 1987 and also the appendix to this article). As the works just mentioned cite many of the same examples, I will not mark the source of each individual example.

4 I will here use the spelling 'rime' to mean the part of the syllable excluding the initial consonant or cluster (itself simply called the 'initial'), and 'rhyme' for the usual sense of this word as the poetic use of assonance.

5 This is where two characters share the same phonetic component.

yāng (陽), which are all said by Li Fang-kuei (1980) to have the vowel *-a plus a velar final consonant: *-g, *-k, and *-ŋ, respectively. It is because of these 'contacts', as they are referred to, in rhyming or graphic components that Li (following Karlgren) reconstructs a final *-g for what is an open syllable in later Chinese (e.g. 魚 *ŋjag 'fish').[6] When we find words with the same vowel but different finals with the same point of articulation either rhyming with each other or sharing a phonetic component, we call this 'direct transfer' (對轉 dùi zhuǎn) or 'connected rhymes' (通韻 tōng yùn). We find examples of this kind of cross-rhyming in the Shi Jing (詩經) (from Wang 1980b): [7]

芼 *magw, 樂 *ŋrakw	(宵藥通韻)《周南：關雎》
敦 *tən, 遺 *rjəd, 摧 *sdəd	(文微通韻)《邶風：北門》
艾 *ŋadh, 難 *nan	(祭元通韻)《閔予小子之什：訪落》
來 *ləg, 贈 *dzəŋh	(之蒸通韻)《鄭風：女曰雞鳴》

It is not the case that the rhyming patterns always follow the tong yun patterns. In this case it is called 'combined rhymes' (合韻 hé yùn). [8] Here are a few examples (From Wang Li 1980b):

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6 The reconstructed forms for Old Chinese I will be using in the body of the paper are based on the system outlined in Li 1980, including forms adapted from other sources.

7 A number of the items mentioned below (e.g. 艾, 熾, 退, 賴) are considered ru sheng (入聲) rhymes by Wang Li, due to his hypothesis that OC ru sheng words could be divided into 'long ru' (長入) and 'short ru' (短入) tones, where the long ru became Middle Chinese qu sheng words, while the short ru remained ru sheng words, yet are considered qu sheng words in OC by Li Fang-kuei. As I am using Prof. Li's system in this paper, I have modified some of the examples taken from Wang Li's work to conform to Prof. Li's system.

8 The type of rhyme where the finals are the same but the vowels are different (known also as hé yùn or as 'side transfers' (pāng zhuǎn 旁轉)) are not relevant to the present discussion and so will not be discussed here.

業 *ŋjap　作 *tsak　（盍鐸合韻）《蕩之什：常武》
答 *təp　退 *thwədh　（緝微合韻）《節南山之什：雨無正》
躬 *kjəŋw　天 *thin　（中眞合韻）《文王之什：文王》[9]
林 *ljəm　冰 *pjəŋ　（侵蒸合韻）《生蕩之什：常武》
言 *ŋjan　行 graŋ　（元陽合韻）《蕩之什：常武》
人 *njin　訓 *xwjənh　刑 *giŋ　（眞文耕合韻）《清廟之什：烈文》
服 *bjək　熾 *thjəgh　急 *kjəp　國 *kwək
（國之緝合韻）《南有嘉魚之什：六月》
瞻 *tjam　相 *sjaŋ　臧 *tsaŋ　腸 *drjaŋ　狂 *gwjiaŋ
（談陽合韻）《蕩之什：桑矛》

We also find variation within these larger rime classes where a character will have two pronunciations differing only in the final consonant (e.g. 度 *dagh/dak, 殺 *sriadh/sriat, 告 *kəgwh/*kəkw, 莫 magh/mak (for lists of these characters see Downer 1959, Wang 1980a:213ff), or where two different characters will represent what seems to be the same word, though the reconstructed pronunciations for the two characters differ in the final consonant:

夜 *riagh　夕 *ɾjiak　'night' (cf. Mei 1979:120ff)
無 *mjag　亡 *mjaŋ　'no, not have'
于 *gwjag　往 *gwjaŋ　'go'
女 *nrjagx　孃 *nrjaŋ　'woman'

9 Wang Li (1980b:334) considers 躬 to be in the 侵 (*-əm) category, but Li Fang-kuei (1980:43) treats this word as being in the 中 category, and reconstructs it as *kjəŋw. As I am using Prof. Li's system in this paper, I have used his reconstruction here.

Following are some xie-sheng contacts involving different finals:

瞿 *kwjagh	矍 *kwjak	卒 *tsət	醉 *tsjədh
赭 *tjiagx	赤 *khrjak	弗 *pjət	費 *phjədh
逋 *pag	搏 *pak	必 *pjit	秘 *pjidh
借 *tsjiagh	昔 *sjiak	等 *təŋx/təgx	待 *dəgx
賴 *ladh	嬾 *lanx	能 *nəh	態 *hnəgh
由 *rəgw	迪 *diəkw	脈 *mrik	派 *phrigh

We can also compare forms from Proto-Tibeto-Burman with forms in Old Chinese, and we come up with some interesting variations.

PTB *la ~ lap, OC *rap (葉) 'leaf'.

PTB *ka ~ kat 'speech', OC *kal (歌) 'sing, song'.

PTB *ba, OC *bak (薄) 'thin'.

PTB *mra ~ *mraŋ, OC *mragx (馬) 'horse'.

PTB *graŋ ~ *grak, OC *gljaŋ (涼) 'cool, cold'.

PTB *kap, OC *gap ~ *kabh (吒) 'to cover, cover'.

PTB *san ~ *sat, OC *san (散) ~ *sat (撒) 'sow, pour out, disburse'.

PTB *ŋa ~ *ŋan, OC *ŋal (鵝) ~ *ŋran (雁) 'goose'.

PTB *tu ~ *tuŋ, OC *dugh (豆) ~ *təŋ (Cf. 登) 'bean'.

PTB *na ~ *naŋ, OC *njagx (汝) ~ *nəgx (乃) ~ *njəŋw (戎) '2sg pronoun'.

2. Problems of methodology

Since both sides of the family seem to exhibit the same pattern of variation, we should be able to reconstruct this pattern of variation to Proto-Sino-Tibetan, but there are two problems involved with this hypothesis. First, Wolfenden's 'rule' of Tibetan word families is the result of his chosing

some words over others that do not fit his pattern. I found a counter example after looking through a Tibetan dictionary for less than two minutes: sbu-gu 'hollow, cavity; the narrow interior of anything, a tube', sbugs 'hollow stalk, a tube; hole, excavation, interior space', ɦbugs-pa 'to hollow out, bore', sbun-gter 'meaningless, without substance, hollow, vain', sbub-khoŋ 'a hollow ball', sbub-mo 'hollow tube', sbur-ma 'chaff, husks'. Second, not all of the items that vary within one point of articulation in TB vary within the same point of articulation in OC. For example, Wolfenden gives Written Tibetan rmu-pa 'dullness, heaviness, fog', mun-ba 'obscurity, darkness, obscure, dark'; Kachin śa 'child', WT btsa-ba 'to bear children', tsha-bo, mtsan 'grandchild, nephew'; and WT rkun-ma 'thief', rku-ba 'steal' as all being in the dental series, while their Chinese cognates are all in the velar series: *mjugh (霧), *tsəgx(子), and *khugh(寇) respectively. We can also add OC *pjag/*pragx (扶 / 把), TB *pa ~ pan 'palm'. The opposite situation exists for OC *pjidh ~ *pjit (畀), TB *biy ~ biŋ 'give'. If we were to hold strictly to the 'same series consonant' rule, we would have to say that the forms in these word families are not cognate.

The problem of which forms to select exists for anyone attempting to identify word families, or even simple cognates. Each researcher has his or her own standards of rigorousness as to what constitutes an acceptable correspondence. Karlgren and Wolfenden limited their word families to only those forms whose finals had the same place of articulation, but as Pulleyblank (1972:11, 1973:120) has argued, 'One can easily find sets of words with the same initial consonant and closely similar meanings but quite different finals that are at least as plausible as the word families collected by Karlgren . . . ' Among the examples Pulleyblank gives are the following (1972:11-12, 1973:121):

尼 *njid 'near, close' 昵 *njit 'intimite, familiar; glue' 狃 *njəgwx 'be familiar with, treat with contempt' 粘 *njam 'to glue, stick to'.

累 *ljədx 'bind, wrap around' 繚 *liagw, 'bind round, wrap' 摎 *kiəgw, liəgw 'tie round, strangle' 綸 *ljən 'woof, twist a cord, cord'.

From Pulleyblank 1991:30 we can also add

呼 *xag, 喝 *xat 'shout'; 舉 *kjagx, 揭 *kjat 'lift'.

Wang Li (1980a, 1980b, 1982) accepted the concept of classes of rime categories, but unlike most scholars working on Old Chinese, did not follow Karlgren in reconstructing the finals *-b, *-d and *-g. [10] Possibly because of this he was not restricted in his search for cognate characters in Chinese (Wang 1982). He has 101 pairs of suggested cognates where the finals have different points of articulation (or would have in a system with *-g, *-d and *-b). Here are a few examples (converted to Li Fang-kuei's system of reconstruction): [11]

吾	*ŋag		言	*ŋjan	
我	*ŋarx		語	*ŋjagx	'language, speech'
卬	*ŋaŋ	'1sg pronoun'			
委	*ʔwjarx		于	*gwjag	
汙迂譹	*ʔwjag	'bent'	爰	*gwjan	(preposition)
喜	*hjəgx		弗	*pjət	
欣	*hjən	'happy, happiness'	不	*pjəg	'not, negative'

10 Wang Li was quite clear about his lack of appreciation for Karlgren's reconstruction of OC: 'In short, Karlgren's research on Middle Chinese phonology was fruitful (是有成績的), but his research on Old Chinese was not very fruitful (是没有多大成績的)' (1980a:68).

11 This is not to say that I accept Wang Li's system of reconstruction or the cognacy of all the sets he proposed in his 1982 book, but the cognacy of the items in each of the sets given here is difficult to deny on any grounds but the difference in final consonant.

急	*kjəp		架	*krarh	
亟	*kjək	'urgent, rushed'	格	*krak	'(clothes) rack'
額	*ŋrak		剔	*thik	
顏	*ŋran	'forehead'	剃	*thidh	'cut hair'
甲	*krap		恨	*gən	
介	*krat	'armor'	憾	*gəm	'regret'

It would be difficult, given the semantic correspondences (in most of the above examples, each of the characters is defined using the other from the pair), plus the fact that all other segments of the syllable match up exaclty, it would be unwise to throw out these correspondences simply because the finals do not have the same point of articulation. Doing so would also mean we would have to say the phonetic and semantic correspondences between these sets (and many others) are purely coincidental and not due to etymological relatedness.

In terms of xiesheng contacts, Mei & Gong (1992) discuss several examples that differ in rime class, such as 豆 *dugh : 短 *duanx : 登 *təŋ and 取 *tshugx : 最 *tsuats : 叢 *dzuŋ. Pulleyblank (1991:30) also gives the following forms (which are not only phonetically related, but most likely etymologically related as well): *khjagx/h (去) 'leave, go away from', *khjag (祛) 'dispel, exorcise', *khjat (竭) 'go away'. We can also add *khjap (怯) 'cowardly, afraid'. [12]

12 I have doubts about how the judgement of what is a phonetic in a particular character and what is not is made. For example, *?jəgh/?jək (意 / 憶) 'think, remember' has 音 (*?jəm) as part of the character. The Shuowen (說文解字) and Karlgren both treat this as a hui yi (會意) character, so *?jəm is not seen as a phonetic in this character, but generally in characters with the heart radical, the rest of the character is the phonetic, and *?jəm is phonetic in a large number of other characters (the Shuowen includes 暗瘖窨暗黯闇諳歆). Compare

We have at least three choices when faced with a situation such as we have in Sino-Tibetan. We can attempt to account for all possible variations (or most of them) by reconstructing a very complex proto-language using phonetic symbols (see for example Coblin 1986, where *-g is reconstructed to account for correspondences between OC *-g and TB *-k), we can use non-phonetic symbols to mark those alternate correspondences that are unresolvable (as for example when Austronesianists use *L to represent *l or *ɬ, or we can reconstruct a simple system and try to either explain the variations by some morphological or phonetic means or simply allow a certain amount of variation in our word families. This is a question of methodology. The first method is problematic because the resultant system is often typologically unrealistic (e.g. having three phonemically distinct *-r phonemes), while the second gives an incomplete and formulaic reconstruction. A cross between the two occurs in the case of the voiced finals of Old Chinese, as they are meant both to phonetically explain a particular correspondence, and to serve as symbols for unresolvable correspondences.[13] This gives us a system that not only does not satisfactorily account for the data, but also gives us a typologically very unlikely system with voiced final consonants and no open finals at all. [14] It is

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this with 短 *duanx, which the Shuowen says has the character 豆 *dugh as its phonetic, and 媼 *ʔəgwx which the Shuowen says has 塭 *ʔən as its phonetic. It seems then the decision as to whether *ʔjəm is or is not a phonetic in *ʔjəgh/ ʔjək is not due only to the difference in final, but involves some degree of arbitrariness.

13 Li Fang-kuei (1983:401) mentions that he used *-b, *-d, and *-g 'merely as an orthographic device without going into their phonetic details. There is no Chinese dialect or Sino-Tibetan dialect, so far as I know, in which there are two series of [final] stops' (see also Li 1980:33).

14 See Baxter 1992:332ff and Pulleyblank 1992:372-375 for further typological arguments against reconstructing a system with voiced stop finals for Old Chinese.

the third methodolgy I believe is the proper choice given the situation in Sino-Tibetan.

3. Possible explanations

The first thing I would like to suggest is that it is not necessary to assume that the rhyming or xiesheng contacts were anything less than true rhymes and accurate phonetic borrowings. To assume they were not (as is implied by the voiced stop final hypothesis) weakens the whole theoretical underpinings of the traditional methods of Chinese historical phonology. We must assume the creation of xiesheng characters and the use of rhymes was relatively strict. [15] That is, it is not necessary to say that when a yū bù (魚) word rhymed with a yáng bù (陽) word, that it was *-ag rhyming with *-aŋ. In these cases it was very likely *-a rhyming with *-a or *-aŋ with *-aŋ, with the difference due to variation of the final of that character/phonetic. If we accept variation in prefixes, initials, and vowels, then accepting variation of finals should not be very problematic.

Dong Tonghe (1981:268) argues that given the variation we find in the finals, 'we cannot say that the characters with stopped finals in Middle Chinese originally had no final consonant in OC, and so could rhyme and have xiesheng contact with non-stopped characters, as if we say this then the contacts between non-stopped rimes should be chaotic; they definitely would not be this clearly separated'. He suggests the only alternative is to follow Karlgren's lead and reconstruct *-g, *-d, and *-b.

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15 Cf. Duan Yucai's statement that 'characters with the same phonetic element must be of the same rhyme group' (同聲必同部) (《六書音韻表》, 蘇州保息局本, p. 22, cited at Wang Li 1980a:60).

The most cogent arguments presented in favor of the voiced final consonant hypothesis are those given in Ting 1979, 1987. In Ting 1979 Chinese loans to Tai are examined (citing Li 1945), and it is shown that of the 12 earth-branch (地支) callendrical signs, one, *mjədh (未), appears in Tai dialects with a -t final, and six of the seven other items reconstructed for OC with voiced stop finals (*-g or *-gw) appear with glide finals in the Tai dialects. The seventh, *ŋagx (午), appears with an -a final in all three dialects. Ting argues that the fact that in all three Tai dialects considered OC *-g, and *-gw have regular but different reflexes is evidence that these characters had different finals in OC. That is, if these characters had simple vowel rimes with open finals (e.g. *-ə), then it would be difficult to explain the appearance of off-glides in all the Tai dialects. Just as some of the off-glides in Modern Mandarin descend from OC voiceless stop finals, Ting argues these Tai off-glides descend from OC voiced stop finals. Ting explains the change of the *-d final of OC *mjədh to Tai -t and not to a glide by reference to the fact that the *-d final rimes (脂微祭) rhymed with rusheng rimes as late as the Nan-Bei-Chao period, while the *-g and *-gw rimes gradually stopped rhyming with rusheng rimes during the Han period. Ting also points out the possibility that the difference is related to the fact that *mjədh is the only qusheng word among all of the 12 callendrical signs.

Ting then (p. 731ff, citing Li 1976) gives a number of lexical items from Siamese that are suggested to be cognate to certain Chinese items, though here the correspondences are less regular, as there are sets of OC *-ag corresponding with Thai -ɔŋ, OC *-ag/-ug corresponding with Thai -(a)ak/-ɔŋ, OC əgw/agw corresponding with Thai -uak/-ok, OC *-ad/id corresponding with Thai -ɔt/-et, and OC *-ag corresponding with Thai -aa. Ting takes the former sets as evidence of stop finals in Chinese, and explains

the last set as due to the loss of *-g with compensatory lengthening of the vowel.

Next, Ting gives two sets of OC-Tibetan/Burmese correspondences. The first set shows some possible cognate sets where the OC form is reconstructed with a voiced stop final and the Tibetan/Burmese forms have voiceless stop finals. The second set shows possible cognates where the reconstructed OC form has a voiced stop final but the Tibetan/Burmese forms have open finals or glides. Ting argues that the sets where the Tibetan/Burmese forms have stop finals shows that at least some of the OC forms must have had consonant finals, and since the Chinese rime categories cannot be split up, then it must have been Tibetan and Burmese that have changed (p. 733).

In Ting 1987 further evidence is given to show that at least some characters had stop finals of some type. It is shown from an analysis of the cross-rhyming patterns of the different tones that there was a very strong connection between qu and rusheng in the Shijing, but that this connection weakened or changed gradually through the Western Han and Eastern Han periods to the point that in the Wei-Jin period rhyming patterns only those rimes reconstructed with dental finals showed cross-rhyming between the qu and rusheng words. There was in fact an increase in dental cross-rhymes as the velar cross-rhymes decreased (p. 62). Ting suggests that the reason why only the qusheng words, and not the ping and shang-sheng words, show this close connection with the rusheng words is that the pitch value of the qusheng must have been closer to that of the rusheng than were the other tones (p. 61, citing Dong 1954:189). The reason for the drop in velar contacts in later periods is suggested to be that *-g was lost earlier and faster than *-d (p. 63). No reason is given for the increase in dental qu-ru

cross-rhymes. In the Wei-Jin period not only do the ping and shang-sheng words not rhyme with rusheng words, they also do not rhyme with qusheng words. Ting's explanation for this is that something about the pitch value of the qusheng caused stop finals to be retained while they were lost from the ping and shang-sheng words.

This is very solid philological work, and there is no reason to doubt Ting's main conclusion that the relevant lexical items had consonant finals in Old Chinese. The question then is was it a voiced stop final or a voiceless one, and do all of those words in the traditional rime categories necessarily share this consonant? Ting's answer is that it was a voiced consonant and all the words in the category traditionally thought to not have a voiceless stop final shared the same voiced stop final. This is one possibility, but not the only one. We are now all in agreement that many variations in the initals of Middle Chinese are due to different prefixes in OC (see for example Pulleyblank 1962-62, 1972, 1973a; Bodman 1980, Benedict 1987, Mei 1989, Baxter 1992). In the same way much of the variation in the finals of Middle Chinese can be explained as due to qusheng (去聲 'departing tone') derivation (see Downer 1959, Pulleyblank 1962-62, 1972, 1973a,b, 1977-78, Mei 1980, Baxter 1992). Rather than assuming that since some words in a particular rime show contacts with rusheng words all words in the rime must have had stop finals, Pulleyblank (1977-78) and Baxter (1992) reconstruct consonant finals only for those items that actually show rusheng contacts, and reconstruct non-stop finals for those words which do not show rusheng contacts. Pulleyblank and Baxter both reconstruct voiceless (rather than voiced) stop finals in those words that show rusheng contacts, assuming that these finals were later lost due to the influence of an *-s suffix which later developed into the departing tone (and possibly a *-ʔ final that developed

into the rising tone). [16] All of the evidence presented by Ting is consonant with this hypothesis, and in fact more so than the voiced stop hypothesis, as the Thai and Tibeto-Burman evidence is of a voiceless stop, not a voiced one, and it explains why *ŋagx (午) (which does not have rusheng connections and so is reconstructed with an *-a final by Baxter) does not show evidence of a consonant final in the Tai dialects. The fact that Li's *-g and *-gw have different off-glide reflexes in the Tai dialects cannot be taken as evidence of voiced stop finals, as any system that differentiates these two rime categories (之 幽) can account for this, especially if yōu 幽 is reconstructed with an off-glide (e.g. əw). The open final hypothesis also explains the open *-a(a) finals in the Siamese, Tibetan, and Burmese words presented by Ting, as they are all items that do not show rusheng contacts (e.g. 五吾魚無死父余筮署稼), without having to assume the irregular loss of a voiced final in some but not other words. The rhyming patterns are also explained more satisfactorily than by making ad-hoc guesses about pitch contors, as suggested by Dong Tong-he.

What this hypothesis means is that the original tone categories of OC do not coincide completely with those of Middle Chinese. Whereas rusheng is considered a separate tone in Middle Chinese, the three 'tones' (*-Ø, *-ʔ, and *-s) of OC could appear on any type of syllable, including those with voiceless stop finals. According to Baxter (Baxter 1992:309), the *-s suffix ('post-final' in Baxter's book) then caused the loss of the voiceless stop finals in the following stages ('H' is the representation of the Middle Chinese departing tone in Baxter's system):

16 The idea of an *-s suffix to explain the origin of the departing tone goes back to Haudricourt 1954, and the idea of a glottal stop suffix to explain the origin of the rising tone goes back to Pulleyblank 1962 and Mei 1970.

*-ps	>	*-ts	>	*-js	>	-jH
*-ts	>	*-js	>	-jH		
*-ks	>	*-s	>	-H		
*-wks	>	*-ws	>	-wH		

Given the fact that 90% of all rusheng contacts with non-rusheng words involve qusheng words, this hypothesis explains quite a bit of the variation of finals within Old Chinese. Given this system the contacts would also not be 'chaotic', as feared by Dong Tonghe (see above). This analysis has other strong points as well. As Baxter points out (1992:336), Karlgren originally reconstructed voiced stops both to explain the rusheng contacts and the development of the qusheng, whereas in Li Fang-kuei's system the qusheng is separate from the voiced final, so 'it appears to be a coincidence that *-ad occurs only in qusheng, or that qusheng words often have clear and obvious rusheng connections, while words in other tones can usually be connected with rusheng only indirectly'. [17] It is also not a coincidence that we cannot find TB cognates for any of the OC *-dh and *-bh words that match exacty: as these words were created by a derivational process within Chinese, we would expect to find TB cognates only for the underived forms (i.e. *-t, *-p), not the derived forms. For example, we have TB *r-mok 'to wear on head', OC *məgwh (帽) 'hat'; TB *nup ≈ *nip 'enter, sink', OC *nəbh (內) 'inside'; TB *mu:k 'foggy, dark', OC *mjugh (霧) 'fog'. The *-s (written as *-h in Li Fang-kuei's system) of OC only occasionally matches up with cognates in TB languages, as in Written Tibetan rmugs [rmuks] 'thick fog',

17 See also Li Yifu 1984 for reasons why jì bù (祭部, Li's *-adh) and yuè bù (月部, Li's *-at) should be considered one rime. In Ting's study of the Wei-Jin period cross-rhyming patterns, the vast majority of contacts were between jì (祭部) and yuè (月部) (Ting 1987:62).

though the nominalizing *-s we find in TB is presumably cognate to the OC *-s. In terms of phonetic motivation for sound change, Baxter (1992:311) also mentions that the traditional view that *-b merged with *-d has no phonetic motivation (as *-p did not merge with *-t), whereas *-ps > *-ts can be explained as assimilation of the final to the suffix.

The qusheng (and possibly the shangsheng) derivation hypothesis assumed by Pulleyblank and Baxter explains quite a bit of the variation of finals in Chinese, but not all of it. One important reason for the reconstruction of a series of voiced stop finals is the supposed symetry of the contacts between different finals. But do we really find a symetrical system of variation? The evidence is that we do not. Out of the 99 tong yun rhymes marked in Wang Li's Shijing Yundu (1980b), 48 are *-Ø (Li's *-g) ~ *-k, and 15 are *-w (Li's *-gw) ~ *-k. Except for the well known shift of *-m, *-n to *-ŋ (8 and 6 tokens respectively), no other pattern shows such regulariity (i.e. all have four or less tokens). If we reconstruct the yōu (幽) and xiāo (宵) rimes as *-əw and *-aw respectively (rather than as Li's *-əgw, *-agw) and the jué (覺) and yào (藥) rimes as *-əuk and *-auk respectively (rather than as Li's *-əkw, *-akw), then the total number of tong yun rhymes where the difference is the presence or not of a final *-k is 63, or 62%. [18] This is quite significant, statistically, given the large number of tong yun possibilities. [19] In some cases this *-k may be a type of

18 Because Bodman, Coblin and others see *-gw etc. as a single final rather than seeing the *-w as part of the vocalism, they give the correspondence TB *-k,OC *-kw. Not seeing the *-w/-u- as a possible part of the vocalism causes them to miss seeing the variation between *-gw and *-kw and the variation of *-Ø and *-k as the same phenomenon.

19 It is interesting to note that of the 110 suggested word families Karlgren (1933: 98-100) lists that differ in having a final consonant or not (the latter including those ending in *-g, *-d, and *-b), 57 of them, more than half, involve a velar final (40 *-k, 17 *-ŋ).

derivational morpheme, as suggested by Puleyblank (1972:13, 1973:122) as an explanation for the correspondence between the pronouns *gwək (或) 'some one', *mak (莫) 'no one', *djəkw (孰) 'which one' and possibly *krak (各) 'each' and the forms *gwjəgx (有) 'there is', *mjag (無) 'there is not', *djəd (誰) 'who', and *kjagx (舉) 'all' respectively. Karlgren himself (1933: 37) mentions that in those cases where a TB form with an open final corresponds to a *-k or *-t final in OC (e.g. 'hundred'), 'these -k and -t must be an innovation, some kind of suffix in one or several Sinitic languages but not primary and common to them all.' He does not take the obvious step and use this to explain the same type of variation within Old Chinese. Examples involving variation of final *-t would include the forms from Pulleyblank (1991:30) given in section 2 above, and the different negative particles used in OC: *pjəg (不): *pjət (弗); *mjəg(毋) : *mjət (勿) (see Takashima 1988). Pulleyblank (1991) suggests that Sino-Tibetan had morphological *-n and *-t suffixes to explain the correspondences among these items and between certain other words in Chinese (such as *ŋjagx (語) ~ *ŋjan (言) 'language, speech') (cf. the *-n 'collective' suffix suggested by Benedict (1972:157ff)). If we accept the *-g final hypothesis, we have to say that the phonetic and semantic similarities of these two items (and dozens of pairs like them) are entirely coincidental, whereas if we take these *-g finals to actually be open finals, then it is a simple matter of *-t/*-n suffixation.

Some variation may also be due to a coalescence of two forms, as suggested for Tibetan by Walter Simon (1941, 1942, 1957). Simon's idea was that many of the finals in Tibetan, such as -g, -n, -l, -r, -s were from the coalescence of two syllables, the second of which originally also had lexical content, such as -s < sa/so 'place'. We find synchronic variation in Tibetan that points to this kind of development, such as da-ra ~ dar-ba 'type

of buttermilk', źa-la ~ źal 'clay', bu-ga ~ bug 'hole', lco-ga ~ lcog 'lark', nya-ga ~ nyag 'steelyard', yi-ge ~ yig 'letter', and tha-ga-pa ~ thag-pa 'to weave'. If Proto-Sino-Tibetan had a particle similar to Tibetan -ga, which Das (1902:203) says 'is sometimes used as an affixed particle of a word to complete it', then this would be at least one explanation for the large number of *-Ø ~ *-k variations. Aside from the possibility of coalescence resulting in *-k, and the examples of coalescence we are familiar with in Chinese (e.g. 諸 from 之於), coalescence might explain at least a few of the other odd finals in OC. For example, in one cognate set suggested by Wang Li (1982:435) with 何 *gar, 曷 (害) *gat, and 胡 *gag, all question particles, Wang includes 盍 *gap 'negative question ('why not') particle' which according to a commentator on the Guo Yu (國語) is from the coalescence of *gar and *pəg (何不). Changes in the pronunciation of characters caused by their use in connected speech is also suggested by Gong (Mei & Gong 1992:676) as a reason for some characters having unusual pronunciations.

Yet I am not suggesting that these are the only answers. There most probably are other explanations as well. Coblin (1976:52) mentions that in Tibetan 'each verb whose perfect, future and imperative forms end in root final -ŋ has final -n in its present root' (e.g. ɦphen, ɦphaŋ, ɦphaŋs, phoŋ/phaŋs 'throw, cast'). Modifying an idea from Shafer (1951:1028-9), he suggests that the present forms originally had a -d suffix (some forms show this suffix in older texts), and that the -n final was due to assimilation to this suffix. It may be that some such assimilatory process could explain some of the variations between homorganic stop and nasal final in Chinese as well. All these variations may be due to a combination of factors, some morphological, some phonetic. An example of the latter is the change of

some PST velar finals to OC dental finals after high front vowels. [20] One type of variation may even have multiple sources (e.g. Mei (1980:439) suggests that the qusheng *-s may have had more than one source). Future research would of course be needed to sort out which process determined which variations, and if possible, what motivated the different processes, as has been done in isolating and understanding qusheng derivation (see the references mentioned above, especially Mei 1980).

The system of finals I suggest for PST, and the regular correspondences between OC, PTB, and PST, then are as follows:

PST **-Ø	>	OC *-Ø	PTB *-Ø
PST **-p	>	OC *-p	PTB *-p
PST **-t	>	OC *-t	PTB *-t
PST **-k	>	OC *-k	PTB *-k
PST **-ŋ	>	OC *-ŋ	PTB *-ŋ
PST **-w	>	OC *-w	PTB *-w
PST **-y	>	OC *-y	PTB *-y
PST **-l	>	OC *-y/-Ø	PTB *-l
PST **-r	>	OC *-y/-n	PTB *-r
PST **-s	>	OC *-t	PTB *-s

This set is similar to that proposed in Baxter 1992. Below I compare the rimes proposed in Li 1980 with those in Baxter 1992, TB forms and my proposed ST forms.

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20 E.g. OC *tsit (節), PTB *tsik 'joint'; OC *srit (蝨), PTB *s-rik = *śrik 'louse'; OC *kit(結), PTB *kik 'tie'; OC *pjit (篳) PLB *pyik 'thicket'; OC *nin(年), PTB *niŋ 'year, harvest'; OC *sjin (薪), PTB *siŋ ~ *sik 'wood, tree'.

rime	Li	Baxter	TB	ST	# of sets in Appendix
之	-əg	-ɨ(/-ɨks)	-a	-ə(/-əks)	8
職	-ək	-ɨk	-ak	-ək	8
蒸	-əŋ	-ɨŋ	-aŋ	-əŋ	3
幽	-əgw	-u(/-uks)	-uw	-əw(/-əuks)	8
覺	-əkw	-uk	-uk	-əuk	7
中(冬)	-əŋw	-uŋ	-uŋ	-əuŋ	4
緝	-əp/-əbh	-[ɨ,u,i]p(s)	-ap/-up	-əp/-up [21]	7
侵	-əm	-ɨm	-am/-um	-əm/-um	8
微	-əd	-ɨj(/-ɨts)	-əy/ər/ey/iy	-əy/ər/ey/iy	11
文	-ən	-ɨn/-un	-ul/-un	-ul/un	6
物	-ət	-ɨt/-ut	-ay/-at	-ət	1
歌	-ar	-aj	-a/-ay/-al	-a/-ay/-al	17
月/祭	-at/-ad	-at(/-ats)	-at	-at	9/(1)
元	-an	-an	-an/-ar	-an/-ar	17
葉	-ap/-abh	-ap(/-aps)	-ap/-ep	-ap/-ep	6
談	-am	-am	-am	-am	3
魚	-ag	-a(/-aks)	-a	-a(/-aks)	30
鐸	-ak	-ak	-ak	-ak	6
陽	-aŋ	-aŋ	-aŋ	-aŋ	6
宵	-agw	-aw	-aw/-uw	-aw/-uw	7
脂	-il	-ij(/-its)	-iy	-iy(/-its)	9
眞	-in	-in	-in/-il	-in/-il	7

21 It may be that ST *-ip and *-im are reflected in OC *-əp and *-əm respectively, as suggested by Gong (1980:468), but I have not found any solid correspondences that would either support or disprove this suggestion.

佳(支)	-ig	-e(/eks)	-i	-i(/eks)	2
質	-it	-it	-it/-ik	-it/-ik	9
錫	-ik	-ek	-ik	-ik	2
耕	-iŋ	-eŋ	-iŋ	-iŋ	9
侯	-ug	-o(/-oks)	-uw	-uw(/-oks)	9
屋	-uk	-ok	-uk	-uk	5
東	-uŋ	-oŋ	-uŋ/-waŋ	-uŋ/-waŋ	3
					227

It can be seen from this comparison that a system such as Baxter's, without voiced stop finals, is closer to the independently reconstructed TB forms, and allows us to reconstruct a more phonetically and typologically plausable Sino-Tibetan system than one with voiced stop finals. [22]

4. Conclusions

There are several points I would like to make in this paper. First, just as we find a certain amount of both rule-governed and non-rule governed variation in modern languages, it is necessary to recognize the same types of variation in the proto-language we are attempting to reconstruct. Second, the variation we find in PST and its immediate daughters is not as symmetrical and orderly as has been assumed. Third, the causes of the variation are

22 It is not my intention to argue specifically for Baxter's system. It would also be possible to modify Li Fang-kuei's system by removing the voiced finals, much as suggestions have been made to modify it in other ways, such as recognizing the *-s suffix (Mei 1980) and having *r- for lái (來母) initials (Gong 1990). The good points of Baxter's theory are that it not only incorporates these ideas (both of which originated with Pulleyblank), but that it is a theory worked out character by character rather than by broad generalization.

complex and multifarious. Fourth, reconstructing a complex, typologically unlikely system based on broad generalizations such as the voiced stop final hypothesis not only is unsatisfactory from the typological point of view, but also effectively ends our search for the real causes of the variation. As mentioned earlier (footnote 13), Li Fang-kuei saw the stop final hypothesis as a stopgap measure, not the final solution. Especially given how little we really know about Sino-Tibetan lexical morphology, to limit the possibilities we are willing to consider would be very unwise. Fifth, the concept of word families is an important one, but we should not be unnecessarily constrained in our search for cognate sets by artifacts of our reconstructed system or methodology.

While recognizing the existence of variation, it is also important to emphasize that in terms of methodology we can only recognize variation within the context of regularity. We must first establish solid regular correspondences to establish what is regular, and to serve as the anchor that allows us to be able to talk about variation. For example, I can feel confident that OC *rap 'leaf' and TB *la 'leaf' are cognate (even if I did not know about the *la ~ *lap variation within TB) because the initial and the vowel correspond regularly (i.e. there are half a dozen or more parallel examples of each) and the meanings match exactly. We should not push etymologies or cognate sets where we have to explain variation of almost every segment in the forms, as for example when Benedict (1987:48) attempts to support a proposed shift in Chinese from *s-k- to *t- by comparing TB *mkha 'sky, heaven' with Chinese tian 天 'sky, heaven', which he reconstructs as *skhien/thien, giving PST *(-)ka(-n) 'with the PST " collective " plural *-n suffix (= " the heavens ") (reg. vowel shift before final dental.)' We then have variation of the prefix, the initial, the vowel,

and the final, all within the same set. Were each of these types of variation proposed on the basis of multiple examples of the same type of correspondence appearing in isolation (i.e. the other segments of the forms corresponding regularly), we might be able to accept the cognacy of the forms in such a set, but not only are we asked to accept this set without evidence of such regular correspondences, we are asked to accept this set as corroborating evidence for a proposed development within Chinese!

(Accepted for publication 6 May 1993)

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Appendix: List of suggested OC-PTB correspondences [23]

	Li	Baxter	PTB	GLOSS
魚部				
1. 魚	*ŋjag	*ŋ(r)ja	*ŋya	'fish'
2. 苦	*khagx	*kha?	*ka	'bitter'
3. 吾／卬	*ŋag/*ŋaŋ	*ŋa/*ŋaŋ	*ŋa ~ *ka	'lsg pronoun'
4. 五	*ŋagx	*ŋa?	*b/l-ha	'five'
5. 汝	*njagx	*nja?	*na (see below)	'2sg pronoun'
6. 狐	*gwag	*gwa	*gwa	'fox'
7. 罟	*kwag	*kwa	*gwan ~ *kwan	'net'
8. 斧	*pjagx	*p(r)ja?	*r-p-wa	'axe'
9. 父	*bjagx	*b(r)ja?	*pa (=pwa)	'father'
10. 笆	*prag	*pra	*g-p(w)a	'bamboo'
11. 豝	*prag	*pra	*p-wak	'pig'
12. 雨	*gwjagx	*w(r)ja?	*r-wa-ŋ	'rain'
13. 于	*gwjag	*w(r)ja	*s-wa (?)	'go'
14. 無	*mjag	*m(r)ja	*ma	'no, not'
15. 扶／把	*pjag/*pragx	*p(r)ja/*pra?	*pa-n	'palm'
16. 訝	*ŋragh	*ŋras	*ŋra	'meet, encounter'
17. 鼠／貉	*hrjagx/*g(1)ak	*h[r,l]ja?/*gak	*rwak	'rat, mouse'
18. 武	*mjagx	*Np(r)ja?	*d-mak	'soldier, war'
19. 馬	*mragx	*mra?	*mra-ŋ	'horse'
20. 簏	*kjagx	*k(r)ja?	*kak(PLB.JAM1972:30)	'basket'

[23] I have evaluated the cognate sets suggested by Benedict (1972, 1987), Bodman (1980), Coblin (1986), Gong (1980, 1990, 1991), Matisoff (1985, 1989, 1992, etc.), Yu Min (1989), and others, plus have put together some new sets. I have been very rigorous and conservative in evaluating the correspondences, including here only those forms for which I have solid PTB reconstructions and the correspondences of which seemed uncontroversial (e.g., I have generally followed the 'same series final' rule). I have excluded all those sets suggested by other authors where only a Written Tibetan form is available, though in a few cases I put likely cognates in parentheses after the regular correspondences. This does not mean these will not turn out to be valid cognate sets, just that at present we do not have enough comparative data available to reconstruct PTB forms; it is unwise to reconstruct a PTB form based entirely on a Written Tibetan form.

21. 膊	*phak	*phak	*pak(PLB, JAM 1972:40)	'dismantle'
22. 鞹	*khwak	*kwhak	*kwak	'skin'
23. 薄	*bak	*bak	*ba	'thin'
25. 戶	*gwagx	*g(w)a?	*gwa ≬ m-kha	'door'
26. 雒	*glak	*C-rak	*k-rak	'fowl, bird'
27. 補	*pagx	*pa?	*pa	'patch, mend' [24]
28. 渡	*dagh	*dak(s)	*da	'ford, cross(a river)'
29. 睹	*tagx	*ta?	*ta	'see'
30. 夜 / 夕	*riagh/*rjiak	*(l)jAks/*z(l)jAk	*s-la ≬ g-la	'moon'(see Mei 1979)
(惡	*?ak/?ag	*?ak/?aks	*WT ?ag	'bad, evil')
陽部				
1. 涼	*gljaŋ	*g-rjaŋ	*graŋ ≬ *grak	'cool, cold'
2. 望	*mjaŋh	*mjaŋs	*mraŋ	'look, see'
3. 岡	*kah	*kaŋ	*kaŋ (PLB)	'mountain top'
4. 孟	*mraŋh	*mraŋs	*maŋ	'big/older brother'
5. 量	*ljaŋ	*C-rjaŋ	*g-raŋ	'measure/count'[25]
6. 梗 / 硬	*kraŋx/ŋraŋh	*kraŋ?/ŋraŋs	*krak ≬ *kraŋ	'hard, solid, stiff'
歌部				
1. 歌	*kar	*kaj	*ka ~ kat	'speech'
2. 沙	*srar	*sCraj	*sa ≬ *tsa ≬ *say	'earth, sand'
3. 鵝	*ŋar	*ŋaj	*ŋa-n (see 雁)	'goose'

[24] The reconstruction of the TB form is based on WB pha, JP kă[31] pa[31], Zaiwa pho[51], Bijiang Nu pha[35], Mawo Qiang ʂpa, Tangut pa (based on the use of *pa (巴) in transliteration), Achang pho[55], and Langsu pho[31].

[25] The reconstruction of the TB form is based on WT graŋ, WB khraŋ, Geman Deng krung[55], Darang Deng xa[31] rueng[35], Menba dʂaŋ? and Lahu ɤɔ[33] (the etymology for this form is given as PLB *riy in Matisoff 1990, but the etymology suggested here (<*raŋ) better fits the usual Lahu pattern of *-aŋ >-ɔ). Bokar (Bo'erga) Luoba ruŋ 'to measure' may also fit here, though the usual Bokar reflex of PTB *-aŋ is -oŋ, as in jup-moŋ 'dream' (Jackson T-S. Sun, p.c.).

4. 蜾	*kwarx	*kwaj? ~ koj?	*kwa:y	'bee, wasp'
5. 移	*rar	*ljaj	*lay	'change'
6. 播	*parh	*pajs	*bwar	'spread, sow'
7. 皤	*bar	*baj	*pwa:r	'white'
8. 疲	*bjiar	*b(r)jaj	*bar	'tired'
9. 駕	*krarh	*krajs	*s-ga	'saddle, yoke horses'
10. 唾	*thuarh	*thojs	*m-twa ≬ s-twa	'spit, vomit, spittle'
11. 妥	*snarx	*hnaj?	*na-r	'rest, cease motion'
12. 何	*gar	*gaj	*ga-ŋ ≬ *ka	'what, which'
13. 鹺	*dzar	*dzaj	*tsa	'salt, salty,
14. 荷	*gar	*gaj	*s-gal ≬ gur	'carry on back'
15. 蝸	*kwrar	*kwraj ~ kroj	*kroy	'snail'
16. 簸	*parx/h	*paj?/s	*pway	'husks, shavings'
17. 我	*ŋarx	*ŋaj?	*ŋay	'lsg pronoun'

元部

1. 蒜	*suanh	*sons	*swa-n	'garlic'
2. 餐	*tshan	*tshan ~ *sran	*dza ≬ *dza	'food, eat'
3. 辮	*bianx	*ben?	*bat ≬ *ban	'braid'
4. 雁	*ŋranh	*ŋrans	*ŋa-n	'goose'
5. 炭	*thanh	*thans	*tal ≬ *dul	'dust, ashes, charcoal'
6. 員 / 圓	*gwjan	*wjɨn	*wal	'circle'
7. 連 / 聯	*ljan	*C-rjan	*ren	'connect'
8. 鮮	*sjan	*sjen	*sar	'fresh'
9. 乾	*kan	*kan	*kan	'dry'
10. 酸	*suan	*son	*swa:r	'sour'
11. 霰	*sianh	*skens	*ser	'sleet/hail'
12. 鐫 / 鑽	*tsjuan/*tsuan	*tsjon/*tson	*tswan	'pointed, to bore'
13. 燔 / 焚	*bjan/bjən	*bjan/bjun	*b(w)ar	'burn'

14. 斷	*duanx	*fiton?	*da:n	'cut'
15. 瓣	*brianh	*brens	*ba:r	'flower, petal'
16. 散	*sanx/h	*san?/s	*san (PLB, JAM1985#40)	'sow, disburse'
17. 犬	*khwianx	*kwhi/en?	*(s-)kwəy	'dog'
(翩	*phin/phjian	*phin	*pyam	'fly')
祭部				
1. 大 / 多	*dadh/tar	*lats/*taj [26]	*tay	'big'
2. 刺 / 列	*lat/ljat	*C-rat/C-rjat	*(g-)ra-t ≈ *(g-)rya-t	'cut, scrape'
3. 發	*pjat	*pjat	*-pat (PLB,JAM1972:35)	'send forth, vomit'
4. 殺	*sriat	*s(C)rjat	*sat	'kill'
5. 脫	*hluat	*hlot	*g-lwat 0 *s-lwat	'release, let loose'
6. 滅	*mjiat	*mjet	*s-mit	'destroy'
7. 八	*priat	*pret	*b-g-ryat	'eight'
8. 割	*kat	*kat	*(s-)kat	'cut'
9. 撒	*sat	*sat	*sat(PLB,JAM1985#40)	'pour out, disburse'
葉部				
1. 葉	*rap	*ljap	*la-p	'leaf'
2. 接	*tsjap	*tsjap	*tsyap	'connect'
3. 蓋	*gap ≈ *kabh	*gap ≈ *kaps	*kap	'to cover, cover' [27]
4. 蝶	*diap	*lep	*s-lep	'butterfly' [28]
5. 躡	*ljap	*C-rjap	*rap	'tread(upon), trample'
6. 疊	*diap	*[d,l]ep	*tap	'fold'

[26] Baxter suggests that it is the latter form, meaning 'much, many' (and 侈 *hljaj? 'great, large') that is cognate to TB *tay, not the former, as usually assumed.

[27] The reconstruction of the TB form is based on WT kha gtɕod 'a cover', sgab-pa 'to cover'; Dulong ta^{55} kop^{55} 'a cover', kap^{55} 'to put a cork in a bottle'; JP ma^{31} kap^{31}, Geman Deng ŋkhap, rGyarung ta pkap 'a cover'.

[28] The reconstruction of the TB form is based on WT phye-ma-leb, Lushai pheng-phe-hlep, WB lip-pra, Naxi phe^{33} le^{31} 'butterfly'.

談部

1. 彡	*sram	*sram	*sam ~ *tsam	'hair'
2. 嵌	*khram	*khram	*r-kam	'precipice'
3. 談	*dam	*lam	*g-dam	'talk'
(藍	*gram	*g-ram	WT rams	'indigo, blue')

宵部

1. 號	*gagwh	*gaws	*gaw/*kaw	'call, yell'
2. 燒	*hrjagw(-hŋrjagw?)	*hŋjew	*tsyow	'cook, burn'
3. 噭	*ŋagw	*ŋaw	*ŋuw	'cry'
4. 臊	*sagw	*saw	*sa:w	'fat'
5. 漂	*phjiagw	*phjew	*pyaw	'float'
6. 熬	*ŋagw	*ŋaw	*r-ŋaw	'fry, roast'
7. 梟	*kiagw	*kew	*ku	'owl'
(刀	*tagw	*taw	*s-ta	'knife')

之部

1. 來	*ləg	*C-rɨ(k)	*ra	'come'
2. 母	*məgx	*m(-r)o/i?	*ma	'mother'
3. 子	*tsjəgx	*tsjɨ?	*tsa	'child'
4. 耳	*njəgx	*njɨ?	*g/r-na	'ear'
5. 乃 / 戎	*nəgx/*njəŋw	*nɨ?/*njuŋ	*na-ɦ (cf. 仍 *njəŋ)	'2sg pronoun'
6. 牛	*ŋwjəg	*ŋwjɨ	*ŋwa ɦ	'cow'
7. 織	*tjək	*tiɨk	*tak ~ *trak	'weave'
8. 息	*sjək	*sjɨk	*sak	'breath'
9. 咳	*khəg	~~*khk~~ *khɨk	*ka:k	'cough'
10. 極	*gjək	*g(r)jɨk	*kak(PLB JAM 1972:31)	'limit, peak'
11. 蝠	*pjək	*pjɨk	*ba:k	'bat'
12. 寔	*djək	*Ljɨk	*dyak (PLB JAM 1972:30)	'really'

13. 翼	*rək	*ljɨk	*lak	'arm, wing'
14. 陟	*trjək	*trjɨk	*l-tak	'ascend'
15. 革 / 鞹	*krək ~ *kwhak	*krɨk ~ *kwhak	*kok ~ *r-kwak	'skin'
16. 右	*gwjəgx	*wjɨʔ(s)	*g-ya ~ gra	'right (side)'
(黑	*hmək	*hmɨk	*Tib smag	'black')
(友	*gwjəg	*wjɨʔ	*Tib grogs	'friend')
(植 / 直	*djək/drjək	*djɨk/drjɨk	*dzuk	'plant, erect')
(止	*krjəgx	*tjɨʔ	*kriy	'foot')
蒸部				
1. 夢	*mjəŋ	*mjɨŋ(s)	*smaŋ ~ *smak	'dream'
2. 蠅	*rəŋ	*jɨŋ	*b-/k-raŋ ~ yaŋ	'fly'
3. 蒸	*tjəŋ	*tjɨŋ	*taŋ	'firewood, pine, fir'
微部				
1. 衣	*jəd	*ʔjɨj	*g-wa-t	'clothing'
2. 飛	*pjəd	*pjɨj	*byer	'fly'
3. 類	*ljədh	*C-rjut/ps	*tɕrəy	'class'
4. 尾	*mijədx	*mjɨjʔ	*r-may ~ *mey	'tail'
5. 寐	*mjiədh	*mjits	*r-mwiy ~ *s-mwiy	'sleep, dream'
6. 火	*hmərx	*hmɨjʔ	*s-mey	'fire'
7. 微	*mjəd	*mjɨj	*mwəy	'small'
8. 紱 / 韍	*pjət	*pjut	*put ~ *pit	'knee, knee covers'
9. 開	*khəd	*khɨj	*ka	'open'
10. 唯	*gwjəd	*wjijʔ	*wəy(=wiy)	'copula'
11. 桑	*ljədx	*C-rjujʔ	*(s-)rwey	'cane, creeper'
12. 韋	*gwjəd	*wjɨj	*kwər	'skin, hide, leather'
(掘	*gwət	*gut	*r-ko-t	'dig')

幽部				
1. 目	*mjəkw	*m(r)juk	*mik/*myak	'eye'
2. 腹	*pjəkw	*p(r)juk	*puk	'belly'
3. 六	*ljəkw	*C-rjuk	*d-ruk	'six'
4. 毒	*dəkw	*duk	*duk/*tuk	'poison'
5. 九	*kjəgwx	*k(w)ju?	*d-guw/d-gaw	'nine'
6. 舅	*gjəgwx	*g(r)ju?	*kuw	'uncle'
7. 寶	*pəgwx	*pu?	*puw	'precious'
8. 菽	*hnjəkw(?)	*stjiwk	*s-nuk	'bean'
9. 鳩	*kjəgw	*k(r)ju	*kuw	'pigeon'
10. 牢	*g-ləgw	*C-ru	*kuok(PLB, JAM1973:31)	'pen, corral'
11. 夙	*sjəkw	*sjuk	*C-sok(PLB, JAM1972:55)	'morning, early'
12. 柔	*njəgw	*nju	*now	'soft'
13. 帽	*məgwh	*muks	*r-mok	'hat, wear on head'
14. 篤	*təkw	*tuk	*tu:k ~ *tow	'thick'

文部				
1. 銀	*ŋjiən	*ŋrjɨn	*ŋul	'silver'
2. 本	*pənx	*pɨn?	*pul	'root'
3. 糞	*pjənh	*pj[ɨ,u]ns	*pun	'dung, fertilizer' [29]
4. 鈍	*dənh	*duns	*dul	'dull'
5. 貧	*bjiən	*brjɨn	*bul	'poor'
6. 昏 / 悶	*hmən/mənh	*hmun/*mɨns	*s-mun ~ *r-mun	'dark, dull, stupid' [30]
(洗	*siənx	*sɨn?	*m-s(y)il	'wash')
(蠅	*pjən	*pjɨn	*byer	'fly')

[29] The reconstruction of the TB form is based on JP man[31] phun[33], Darang Deng tɯ[31] phɯ[35], Zaiwa phun[55], Langsu phun[35]. WT brun may also be related to this form.

[30] This set is tentative, as the PTB form is based on only WT mun-ba 'dark', rmun-po 'dull' heavy, stupid', WB hmun 'dim, dusky, blurred'. I could not find cognates in any other languages (in the materials I had available).

中部				
1. 中	*trjəŋw	*k-ljuŋ	*tsyu:ŋ=tu:ŋ	'middle'
2. 弓	*kjəŋw	*kwjɨŋ	*ku:ŋ	'bow'
3. 躬	*kjəŋw	*k(r)juŋ	*guŋ	'body'
4. 蟲	*drjəŋw	*lrjuŋ	*dyuŋ	'bug'
(宮	*kjəŋw [31]	*k(r)juŋ	*kyum	'house')
緝部				
1. 立	*gljəp	*C-rjɨup	*g-ryap	'stand'
2. 泣	*khljəp	*khrjɨp	*krap	'cry'
3. 汲	*kjəp	*g(r)jɨp	*ka:p	'draw water'
4. 捻	*niəp	*e̯np	*nyap	"pinch'
5. 習	*rjəp	*zlj[ɨ,u]p	*s-lap	'learn/teach'
6. 內 / 入	*nəbh/njəp	*nups/njup	*u̯np ≈ *nip	'enter/sink'
7. 十	*djəp	*gjip	*gip	'ten'
侵部				
1. 熊	*gwjəm	*wjum	*d-wam	'bear'
2. 含	*gəm	*g[o,u]m	*gam	'hold in mouth'
3. 飮	*?jəmx	*?(r)jum?	*am	'drink'
4. 荏	*njəmx	*njɨm?	*njam	'soft'
5. 燇	*rjəm	*zljum	*lum	'warm'
6. 三	*səm	*sum	*g-sum	'three'
7. 枕	*krjəmx	*Kjum?	*kum	'pillow'
8. 針	*krjəm	*kj[ɨ,i]m	*kap	'needle'
(林	*gljəm	*C-rjɨm	Lushai ram	'forest')

[31] Both 宮 and 躬 are in the 冬 rime category, which is often reconstructed with an -m final, which is then said to have changed to a velar nasal. If we accept this hypothesis, then the 'house' set is probably valid and the 'body' set is not, while if we do not accept it (i.e. assume 'body' was always a velar nasal in Chinese), then the 'body' set is valid and the 'house' set is not.

侯部				
1. 軀	*khjug	*kh(r)jo	*s-kuw=s-kəw	'body'
2. 口	*khugx	*kh(r)o?	*kuw (GB)	'mouth'
3. 乳	*njugx	*njo?	*nuw/*nəw (DL nuŋ^{55})	'breast, milk'
4. 谷	*kuk	*kok	*grok	'ravine'
5. 寇	*khugh	*khos	*r-kuw	'steal, thief'
6. 豆	*dugh	*dos	*tu-ŋ (Cf. xiesheng)	'bean'
7. 角	*kruk	*drok	*kruw	'horn'
8. 摳	*khug	*kho	*ku	'lift, raise'
9. 務	*mjugh	*m(r)jo(k)s	*mow	'effort, work'
10. 霧	*mjugh	*m(r)jo(k)s	*muw ~ *mu:k	'fog'
11. 局 / 曲	*gjuk/*khjuk	*ŋkh(r)jok/*kh(r)jok	*guk/*kuk	'bent'
12. 嗽	*suk	*sok	*su (w)	'cough'
13. 屬	*djuk	*djok	*dźuk (PLB)	'vulva' (see Mei 1979)
14. 樹	*djugh	*djos	*dzuk	'plant, erect'
東部				
1. 孔	*khuŋx	*kʰhoŋ?	*kuŋ	'hole'
2. 洞	*duŋh	*doŋs	*dwa:ŋ	'cave, pit, hole'
3. 巷	*gruŋh	*groŋs	*g-rwa-ŋ	'village/street'
脂部				
1. 二	*njidh	*njijs	*g-ni-s	'two'
2. 四	*sjidh	*s(p)jij/ts	*bliy	'four'
3. 死	*sjidx	*sjij?	*siy	'die'
4. 屎	*hrjidx	*xjij?	*kliy	'shit'
5. 細	*sidh	*si[j,t]s	*ts(y)iy ~ *ziy	'small, fine'
6. 妣	*pjidx	*pjij?	*piy	'grandmother'
7. 邇	*njidx	*njej?	*ney	'near'

8. 水	*hwrjidx	*h[l]juj?	*lwi(y)	'water'
9. 日	*njit	*njit	*niy(=nəy)	'sun, day'
10. 汁	*tshjit	*tshjit	*tsiy	'juice, paint'
11. 血	*hwit	*hwit	*s-hwiy(=s-sywəy)	'blood'
12. 畀	*pjidh	*pjits	*biy (DL biŋ)	'give'
13. 節	*tsit	*tsik	*tsik	'joint'
14. 蝨	*srit	*srit	*s-rik=*śrik	'louse'
15. 結	*kit	*kit/k	*kik	'tie'
16. 篳	*pjit	*pjit	*pyik(JAM1970:26)	'thicket'
17. 蛭	*tjit	*dujit	*m-li:t	'leech'
18. 一	*?jit	*?jit	*it	'one'
19. 米	*mid	*mij	*may ≈ *mey	'rice'
(脂	*tjid	*kjij	*tsil	'fat')
(切	*tshit	*tshit	*tsyat	'cut')
(堲	*tsjit	*tsjik	*WT rtsig-pa	'masonry, etc.')

眞部

1. 眠	*min	*min	*myel	'sleep'
2. 辛	*sjin	*sjin	*m-sin	'liver'
3. 矧	*snjinx	*hjin?	*r-nil ≈ *s-nil	'gums'
4. 年	*nin	*nin/ŋ	*niŋ	'year, harvest'
5. 薪	*sjin	*sjin/ŋ	*siŋ ≈ *sik	'wood, tree'
6. 民	*mjin	*mjin	*r-mi	'people, person'

耕部

1. 領	*ljingx	*C-reng?	*m-ling	'neck'
2. 生 / 腥	*sriŋ/siŋ	*srjeŋ	*śriŋ	'live, raw'
3. 名	*mjiŋ	*mjeŋ	*r-miŋ	'name'
4. 定	*diŋh	*deŋs	*diŋ	'certain'

5. 盈	*riŋ	*ljiŋ	*bliŋ	'full'
6. 平	*bjiŋ	*brjeŋ	*pleŋ	'flat'
7. 脛	*giŋ	*geŋ/kh-ljeŋ(?)	*r-k(y)aŋ	'leg/shank'
8. 赬	*hljiŋ	*hljeŋ	*kyaŋ	'red'
9. 狌	*sriŋ	*srjeŋ	*sre-ŋ	'weasel'
(清	*tshjiŋ	*tshjeŋ	*tsyaŋ ~ *syah	'clean, clear, pure')[32]
佳部				
1. 滴	*tik	*tek	*tki ~ *tsak	'drip, drop'
2. 隻	*tjik	*tjek	*g-tyik	'one'
3. 縊	*?igh	*?jeks	*?ik	'strangle'

[32] Benedict (1972:58) mentions that the TB forms might reflect an old *-ya- ~ *-i- alternation. If so, this would be a solid cognate set.