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THE SINO-TIBETAN TONOGENETIC LARYNGEAL RECONSTRUCTION THEORY

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1. Failure to establish a purely segmental C_i-derived tonogenetic reconstruction theory
2. The evidence of Chinese: Phonation types
3. The preliminaries: What is a reconstruction theory?
4. Evidence of tonal and non-tonal developments in different subgroups of Tibeto-Burman
5. The verbal alternation patterns of Kuki-Chin and Eastern Baric-II
6. Sample sets of reconstructed etyma for Tibeto-Burman tonal categories I, II, and III.

[SUMMARY]

Tibeto-Burman reconstructional theories explaining tonogenesis through the nature of the initial consonant of the syllable are unable to take into account the peculiar tonological developments in Kuki-Naga and Baric languages. The assumption of either a two tone or three tone system of the proto-language fails on similar grounds. The reconstructional difficulties encountered by such theories are briefly recapitulated. At the same time this raises the question of what entity a theory is like. The question is answered by applying a functional theory concept to historical linguistics. It is adopted from Sneed 1971 and Balzer/Sneed 1978, which represent the most sophisticated attempts to characterize the notion of theory in empirical science. The functional view guarantees a strict and complete division of reconstructional (marked by asterisk and italics) and comparative (italics only) entities within an historical theory. The evidence for establishing a Tibeto-Burman tonogenetic laryngeal reconstruction theory is divided into three sections: 1) the

external evidence in the form of Archaic Chinese phonation types (2.), 2) the evidence of tonal and non-tonal developments in the Kuki-Naga, Baric and Kachin subgroups of Tibeto-Burman (4.), and 3) the verbal alternation patterns of Kuki-Chin and two Eastern Baric languages (5.). The latter are historically explained by applying the laryngeal reconstruction system consisting of two laryngeals and five phonation types. Sample sets of reconstructed etyma for the major Tibeto-Burman tonal categories conclude the article.

[Abbreviations of Kuki-Naga and Baric languages]

Kuki-Naga languages:

Ag. Angami (Naga-I subgroup, Benedict's Southern Naga, Shafer's Eastern Branch)
An. Anal (Old Kuki)
Ao Ao (Naga-II subgroup, Benedict and Shafer's Northern Naga)
Ck. Chakhesang or Chokri (Naga-I)
Kh. Khezha (Naga-I)
Kom Kom (Old Kuki)
La. Lakher (a separate Kuki-Chin subgroup)
Lg. Lamgang (Old Kuki)
Li. Liangmei (Naga-III or Naga-Kuki transition group, Benedict's Western Kuki, Shafer's Western Branch)
Lo. Lotha (Naga-II)
Lu. Lushai (Central Kuki)
Mao Mao or Imemei or Sopvoma (Naga-I)
Mi. Mikir
Mn. Manipuri or Meithei
NR Northern Rengma or Ntenyi (Naga-I to Naga-II transition)
Ro. Rongmei (Naga-III)
Sa. Sangtam (Naga-II)
Se. Sema (Naga-I)
SR Southern Rengma (Naga-I)
Ta. Tangkhul (Naga-III, Shafer's Luhupa Branch)
Th. Thadou Kuki (Northern Kuki)
Ti. Tiddim Chin (Northern Kuki)
Yi. Yimchunger or Yachumi (Naga-II)
Ze. Zemei or Zeliang or Empeo (Naga-III)

Baric languages:
Bo. Boro (West Assam subgroup)
Ch. Chang (Eastern Naga subgroup, = Eastern Baric-I)
Ga. Garo (West Assam subgroup)
Km. Khiamngan (Eastern Naga subgroup, = Eastern Baric-I)
Ko. Konyak (Eastern Naga/Tamlu forms usually quoted)
Ko.(T) Tamlu and Tanhai dialects of Konyak
Ko.(W) Wakching and Wanching dialects of Konyak
No. Nocte or Namsangia (Arunachal subgroup, = Eastern Baric-II)
Ts. Tangsa or Moshang (Arunachal subgroup, Eastern Baric-II)

All other abbreviations are introduced in the text.

1. FAILURE TO ESTABLISH A PURELY SEGMENTAL C_i-DERIVED TONOGENETIC RECONSTRUCTION THEORY.

Much of the recent development in Sino-Tibetan (ST) approaches comparison with a scientific revolution: A wealth of descriptively adequate data in almost all subgroups of Tibeto-Burman (TB) has sprung forth within the last two decades. As seems fitting to its comparison with a scientific revolution, it is difficult, if not impossible, to combine the new linguistic material with the older ideas of ST (and in particular TB) comparative reconstruction mainly developed from unreliable, scattered, inadequate and unsystematic data records. From the present point of view, expositions of ST linguistic reconstruction theory such as Benedict 1972a (henceforth STC) and Shafer 1974 are the culminating points of a scholarly tradition that began in the first half of the 19th century. It would be a futile task to search in these works for the answers to such tantalizing problems as those which follow, and which will be the primary concern of this article:

a) Why do, within the Kuki-Naga (KN) subgroup of TB, and within tonal category (TC) II, a large number of languages such as Lushai, Mon, Lamgang, Tangkhul, Zemei, Angami, Chakhesang, Khezha, Mao, Northern Rengma, Lotha, Yimchunger etc. have a two-fold tonological distinction of (in terms of synchronously descriptive observation) open syllable nouns

such that 1) the majority of well established etyma exhibit tonological development different from closed syllable TC-II nouns and 2) only a minority of eight etyma agree in their tonological development with closed syllable TC-II nouns?

b) Why is a differentiation of tonological development similar to a) not observable for TC-I in any major TB subgroup (that is, Kuki-Naga, Lolo-Burmese, Baric, and Kachin (Jinghpaw), disregarding Tibetan and other Himalayish subgroups for the obvious reason of very scarce tonological developments)?

c) Why is the tonological development of TC-III in some KN languages identical with the tonological development of TC-I, in some other KN languages identical with the tonological development of TC-II?

d) Why does the verbal paradigm of Lushai and a fairly large number of Central and Northern Kuki languages have different tonological developments depending on the syntactic states of finiteness versus non-finiteness?

e) Why does a small number of Eastern Baric (EB) languages have, in comparative terms, the same tonological development as the Kuki languages in question d)?

f) Why, within the same TB subgroup, do we find evidence of languages having no tone system at all, languages with moderately tonological contrast, and languages with highly developed tonological contrast (an observation holding true for KN, the Baric and the Lolo-Burmese languages)?

g) What is the historical importance of the primary syllable division into glottalized versus non-glottalized syllables in Garo and Boro?

h) What is the historical importance of final glottal stop, which need not necessarily surface in the phonemic structure, in disparate languages of different TB subgroups such as Nocte, Tangsa, Mikir and Lotha Naga?

This list of problems can easily be multiplied when taking into account language-specific tonological developments that apparently do not follow the main line of development traceable through inter-language comparison. The best course to be taken in the ocean of tonological data is a very dangerous one: Our intuition ought to tell us what kind of explanatory

evidence should be considered of primary relevance for the establishment of a tonological or tonogenetic reconstruction theory and what data should be shifted to the non-primary concern of individual language development. But we can hardly have such intuitions because most of the languages under consideration have only been studied very inadequately, their tonological structure is very different from the better known Sinitic languages, and we still have no concrete ideas about the way a comparison based on neogrammarian Lautgesetz strictness between Sinitic on the one hand and TB on the other should be carried out. Yet, something like a main line of reconstructional analysis appears to result from observation of empirical phenomena which occur, sometimes in a very obvious form, sometimes in a disguised one, in TB languages which themselves may hardly be said to have anything in common except for their 'typical' TB vocabulary stock.

It is the aim of this essay to supply the primary material and discuss its value for this analytical main line which will subsequently lead us to the positing of a tonogenetic laryngeal reconstruction theory.

Before venturing on such an enterprise a few comments shall be made concerning recent attempts to account for the new data collections of TB languages in terms of reconstructional theories.

A very nebulous attempt to posit a reconstruction model for ST is that of Benedict 1972b and 1973. In terms of the theory concept outlined here we shall label Benedict's reconstruction attempt as 'potential model of a rec(onstruction)-theoretical tonogenetic two-tone system'. The central question of course is how this model explains the data. All that can be said is that it answers none of the above-mentioned questions; in addition, the data from the KN languages are either recorded with their wrong tones or grouped in a completely idiosyncratic ad-hoc way. There is not enough space available to demonstrate that a potential model of a rec-theoretical tonogenetic two tone system taken at its face value leads into irreparable difficulties because of its poor fit with the empirical data. The main problem for such a theory is to account for the tonal alternations found in the verbal paradigm of Central and Northern Kuki languages and the Arunachal subgroup of Baric languages (henceforth EB-II).

Another way of positing a rec-theory for ancestral TB is to presuppose a purely segmental stage preceding all observable developments into the different subgroups. By positing two classes of syllable initial stops (voiceless vs. voiced), the development into different tonal categories is explained by the nature of the initial consonant. The presentation of comparative data in STC seems to suggest such a solution although no hints are given anywhere in the text; a theory based on such data material might be labeled 'potential model of a rec-theoretical tonogenetic purely segmental system' with a basic distinction of voiceless vs. voiced consonants. Such a system could explain at least question f) above and, to a lesser degree, a) and b); all other features of TB languages, in particular the distinction between finite and non-finite forms of the verb as observed in d) and e), could not be taken into account. The main disadvantage of a two-class initial consonant proto-system is the limited choice of reconstructional entities required to establish anything like hard core facts in terms of Lautgesetze. The only resolution in this case is the proliferation of consonantal combinations in syllable initial position; unfortunately, there is no directly available empirical evidence for all such proto-clusters in a fairly large number of etyma.

The reconstruction system proposed by Shafer 1974 for ST fares slightly better. Although in general no comments are made about the development of tonal systems in TB languages, we may infer that tonological development has to be thought of in terms of the nature of syllable initial consonants and consonant clusters. Shafer posits three classes of stops, that is, voiceless unaspirated, voiceless aspirated and voiced ones. A rec-theory based on such assumptions may be labeled 'potential model of a rec-theoretical tonogenetic purely segmental system with three classes of initial consonants (C_{vl}, C_{asp}, C_{vd})'. It automatically meets the same objections as those raised against Benedict's STC model. Although it provides a greater choice in reconstructional entities in syllable initial position, such a model is unable to explain the vexing problem of questions d) and e).

Although the reconstruction attempt of Burling 1967 is limited to the Lolo-Burmese subgroup of TB languages, it may

nevertheless be generalized such that a three tone system is posited for Proto-TB. A tonogenetic rec-theory based on such an assumption will be labeled 'potential model of a rec-theoretical tonogenetic three-tone system'; the number of initial consonant classes of which Burling posits the voiceless unaspirated, voiceless aspirated, and ejective series, is of no immediate relevance for the development of tonal systems. A model such as proposed by Burling easily accounts for questions a), b) and c) above; but there is no way yet to explain d) and e) without having recourse to special constraints. The consequence for the reconstruction process methodology would be a very arbitrary division into explanation of tone systems on the one hand, and explanation of the finite vs. non-finite verbal distinction on the other. Therefore, our final judgment of this theory is that there is undoubtedly a high initial plausibility for a TB proto-system containing three tones; a carefully selected set of data may thus be explained successfully. The model significantly fails, however, to explain the facts that there are also a large number of non-tonal languages in TB and that the overt distinction of the finite and non-finite forms of the verb is not a restricted Central and Northern Chin phenomenon, but, because of the discovery of essentially the same dichotomy in EB-II, it has to be regarded as a common TB feature.

Matisoff's articles on special reconstruction problems of the Lolo subgroup (such as Matisoff 1970 and 1972) implicitly assume the basic soundness of Burling's approach. In Matisoff 1974 an attempt is made for the first time in TB linguistics to apply the strictness of the neogrammarian reconstruction method at the inter-subgroup level of TB languages. The comparison between Kachin and Lolo-Burmese tacitly presupposes the existence of Burling's three tone system for Lolo-Burmese; given the extraordinary difficulties of the comparison, Matisoff 'succeeds' in establishing a comparative two-tone system for Kachin. Unfortunately, his classification of high tone /3/ as 'secondary' to the synchronous tone system represents an incorrect attitude and thus leads him to rule out any comparative importance of /3/ beforehand. As long as we refrain from according such comparisons the status of rec-theoretical processes, there might be, upon further refinement of the data and the results obtained therefrom, some chance of successful applica-

tion of the neogrammarian method. But, as soon as we enter the scene of historical theories, all attempts based on a tonogenetic two or three tone system raise the objections cited above.

Similar remarks hold true for the rec-theory worked out in Weidert 1977a. The basic assumption underlying this rec-theory is that question f) be answered immediately so that a purely segmental stage of Proto-TB is posited from which all tonological developments must be explained. Since at that time I was heavily influenced by works such as the ones cited above, I believed the answer to all other questions lay in the postulation of a C_i-derived (C_i= initial consonant) tonological theory of which one model termed 'potential model of a rec-theoretical tonogenetic purely segmental system' was investigated for over 20 KN languages. Five classes of initial consonants plus their unrestricted combinations had to be postulated initially:

(1) Voiceless unaspirated: *p-, *t-, *k-, *s-, *x-,...
(2) Voiceless aspirated: *p^h-, *t^h-, *k^h-, *ts^h-,...
(3) Glottalized: *$p^?$-, *$t^?$-, *$k^?$-, *$s^?$-, *$ts^?$-, *$m^?$-,...
(4) Voiced: *b-, *d-, *g-, *z-, *tz-, *m-, *r-, *w-,...
(5) Prenasalized: *^{m}b-, *^{n}d-, *^{ŋ}g-, *^{n}tz-,...

In a modified reconstruction theory, the class of voiceless aspirated consonants was eliminated so that a proto-system containing four series of initial consonants plus their unrestricted combinations remained.

These two models were of no import for the explanation of the phenomena cited in question d) above; it was impossible to establish a theoretically significant connection between phenomena that were thought to manifest themselves in syllable initial position and those that apparently affected the consonantal elements in syllable final position (e.g., Lushai finite form I. /ˌmaŋ/ '(he) dream(s)', non-finite form II. /_man/ '(the) dream(ing)'; or Tiddim Chin I. /-xum/ '(is) sweet', II. /ˋxum/ '(its) sweet(ness)'). Therefore, all problems relating to the finiteness dichotomy of the verbal paradigm of Chin languages were 'swept under the rug'. As regards their explanatory power, the two models were able to reconstruct TC-I etyma rather easily, TC-II closed syllable etyma fairly well, TC-II open syllable noun etyma not as well (because of the two-fold distinction mentioned in question a)), and TC-III

closed syllable etyma and open syllable noun etyma fairly well insofar as the existence of such queer-looking elements as $*^{m}w$, $*^{n}r$, $*^{n}l$, $*^{\tilde{n}}y$, $*^{\eta}\gamma$, $*^{z}b$, $*^{z}tz$, etc. had to be acknowledged.

The basic tonological developments in the model having five series of initial consonants were as follows:

(A) $\left\{\begin{array}{lll} *C_{vd} & \rightarrow & C_{vl} \\ *C_{ej} & \rightarrow & \text{mostly } C_{asp} \end{array}\right\}$ + TC-I

[Reconstructed voiced and ejective/glottalized consonants are represented, in comparative terms, in all, or in the majority of languages under consideration by homorganic voiceless consonants (*b→ p, etc.) or aspirated consonants ($*p^{?}\rightarrow p^{h}$, etc.), respectively, plus development to TC-I.]

(B) $\left\{\begin{array}{lll} *C_{vl} & \rightarrow & C_{vl} \\ *C_{asp} & \rightarrow & C_{asp} \end{array}\right\}$ + TC-II

[Voiceless unaspirated and voiceless aspirated consonants are represented, in comparative terms, in all, or in the majority of languages by the same consonantal sounds plus development to TC-II.]

(C) $\left\{\begin{array}{lll} *C_{nas} & \rightarrow & C_{vl} \text{ in most languages} \\ *C_{sib} & \rightarrow & C_{asp} \text{ in most languages} \end{array}\right\}$ + TC-III

[Pre-nasalized or pre-sibilized voiced consonants are represented, in comparative terms, in most of the languages analyzed by voiceless unaspirated stops ($*^{m}b\rightarrow$ p, etc.) or voiceless aspirated stops ($*^{z}b\rightarrow$ ph, etc.) plus development to TC-III.]

In addition to the awkwardness of the consonantal elements postulated for the development to TC-III there were also other weaknesses inherent in this model. Take, for instance, the case of l-sounds in Lushai. Both voiced /l/ and its voiceless counterpart /hl/ occur in etyma having high level and rising tones. The following correspondence rules are supplied by the rec-theoretical system:

*l- → Lushai /l-/ plus high level tone [= KN TC-I],

$*l^{?}$- → Lu. /hl-/ plus high level tone [= KN TC-I],

*sl- → Lu. /hl-/ plus rising tone [= KN TC-II].

So far so forced; but what about etyma with /l-/ plus rising tone? Suppose a cluster like *sl$^{?}$- is postulated for Proto-KN; the evidence shows, however, that a consonant group is nowhere observable in all languages examined to date:

'way, road': Lu. ˌlam, An. ^{2}lham, Kom ^{1}lam, La. ^{3}la^{3}pi, Kh. ^{1}le^{3}dye, NR ^{1}a^{1}nĭ, Se. ^{1}a^{1}la, Lo. ^{1}o^{3}lan, Sa. ^{2}laŋ.

Without raising the question of the extremely complicated phonetic processes involved in such hypothetical developments, the same degree of plausibility could also be given to 'solutions' such as

*l--? → l- plus TC-II,

assuming final glottal stops which are otherwise nowhere required by the proto-system, except in this and in a few similar cases. Some other radical reconstruction attempts are equally unconvincing.

As regards the problem raised in question a) it was found extremely difficult to account in a meaningful way for the two-fold tonal development of open syllable TC-II noun etyma. The majority of etyma in this category have a tone quite different from the TC-II tonal representation in closed syllables in a couple of languages. Only eight etyma were found to agree in tone with the TC-II closed syllable class in those languages. Despite the tonal identity they had to be considered as exceptions because their tonally divergent counterparts did not show any signs of special treatment as regarded their phonological, morphological and semantic aspects; both single consonants and consonant clusters had to be postulated for them. The consequence for the reconstruction of the eight etyma was that peculiar consonant clusters had to be posited. This posed no problem for 'blood', 'goat', 'frog', 'mushroom', 'nine', 'boundary', 'parrot' (*Prefix-consonant plus *C_{vl}/*s-C_{ej} → TC-II in open syllable nouns only), e.g.

'blood' *d-sywi ~ *d-hywĭ:

Lu. ˌthi, Ti. ˌsi, Ta. ^{1}ə^{2}ši, Ze. ^{1}he^{4}zai, Ag. ^{5}u^{5}zie ~ ^{2}the^{5}zie, Mi. ^{2}vi (=[-vi?]), Yi. ^{2}Ti^{2}i? ~ ^{2}Tɯ^{2}i?, etc.[1];

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[1] In this essay, stop and affricate systems that arrange on the lax vs. tense dichotomy are rendered by capital letters: /P,T,K,tS,tŠ,pF,kF,tP/ tense, /B,D,G,tZ,tŽ,pV,kV,tB/ lax.

but there was the problem of finding a trace of the prefix consonant in 'song': Lu. ʼhla, An. ^{2}hla, Ta. ^{3}la (tone?), Ze. ^{4}lei, Mao ^{2}o^{3}lo, SR ^{3}lö, Se. ^{1}a^{1}le.

Another problematical issue in connection with such a theory concerns the surprising amount of language-specific tonological development that cannot be explained by the theory. One example may suffice to illustrate this point. There is no problem of correlating the high-level, low-level, rising (both open and closed syllables) and falling (only open syllable nouns) tone categories of Lushai with their corresponding comparative tonological representations in other KN languages. But what about closed syllable nouns and verbs in falling tone (such as, for instance, `troŋ 'language', `booŋ 'cow', `kaar 'to step, pace')? First of all it will be noted that the comparability of such nouns and verbs quickly lessens as soon as one leaves the Kuki languages. Compared to the high number of etyma in TC-I and to the less numerous examples of etyma in TC-II and the even less numerous ones in TC-III, the number of good etyma[2] in the closed syllable falling tone category is less than half a dozen. The original rec-theory has nothing to offer as a possible explanation for this puzzling phenomenon; it has rather to relegate this and similar problems found in other languages to the vague notion of language-specific development, analogy, dialect mixture, Chinese/Burmese/Tai/Austro-Tai...loans, or other strange bedfellows (cf. also note 25).

Since no claim is made in our assumptions on rec-theoretical explanatory models regarding their possible falsification or falsifiability, the argument for giving up such an experiment runs along a different line. In the case of our tonogenetic purely segmental C_i-derived reconstruction theory, it eventually turns out that the range of intended applications of this theory is not properly contained among the sub-sets of phonological systems for which the theory ought to apply. At least the theory core (cf.3.) may not be said to be able to account for the tonological data of KN languages as established by comparison. It is poor in explaining, for instance, TC-II open syllable nouns and verbs because of its taking refuge in

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[2]'Good etymon' is a technical term based on Katičić 1970. A phonemic string is said to be a good etymon if it fulfills two requirements: "(1) the phonemic correspondences as to the place in strings must be recurrent and (2) they must occur in strings with correspondent content"(70).

special constraints (we should rather expect special constraints for developments such as the falling tone closed syllable words in Lushai). The disappointing result obtained with this theory motivates our further searching for alternative theories.

Attention will be focused now on the evidence of Archaic Chinese which yields an altogether different rec-theoretical framework[3].

2. THE EVIDENCE OF CHINESE: PHONATION TYPES.

In Ancient Chinese there is a full-fledged 3-tone system for syllables ending in vowels and voiced consonants. Grammatical tradition refers to these tones as 1 = p'ing, 2 = shang, 3 = ch'ü, respectively. The fourth tone, 4 = ju, is a phonemically redundant feature of syllables ending in a voiceless stop. Statements of crucial importance for the establishment of our tonogenetic reconstruction theory include the following ones from Egerod 1971:

> 'Haudricourt (...) and Pulleyblank (...) have adduced evidence which makes it a safe conclusion that the phonetics which conditioned the origin of tones 2 and 3 (shang and ch'ü, written : and - by Karlgren) of Ancient Chinese had their origin in two kinds of laryngeal activity, one voiced and lax (and crescendo) the other one voiceless and tense (and diminuendo). The two laryngeal features enter into a system with the features voiced - voiceless in the following manner:
>
> | | +L | -L |
> |---|---|---|
> | +V | 2 | 1 |
> | -V | 3 | 4 |
>
> L = laryngeal, V = voiced.'(161)
>
> 'We can roughly say that tones developed from final features are pre-Ancient and tones developed from initial features are post-Ancient. Tones however often tend to retain laryngeal features from their origin, as redundant phonetic ma-

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[3] I admit that at first I underestimated the strength of this evidence. Two reasons for this underestimation should be mentioned: (1) the Chinese evidence is contained in a small paper of 13 pages (Egerod 1971) whereas the mass of literature written on TB reconstruction usually considers the initial consonant to be responsible for subsequent tonological development, and (2) while working out the details of the above theory on the sole basis of the KN languages, there still lingered a gleam of hope that besides the successful application of the theoretical model for the TC-I etyma there might exist some more successful applications; only after collecting the Baric, Jinghpaw and North Assam material, did it dawn on me that there was obviously something better, that is, a theory which comes to 'grips' with the data, and not the other way round.

terial, and these redundant features may clash with each other and influence the actual phonetic tone which develops.' (163)

It has, however, been made abundantly clear that a causal relationship between different phonation types which may manifest themselves in any position of the syllable and subsequent tonal (or register) developments, is by no means a trivial articulatory fact (cf. Gregerson 1976). 'Phonation' as defined by Catford 1964 means 'production of voice':

'Laryngeal activity which generates a sound which functions as a term in a system of phonematic units is ARTICULATORY. Laryngeal activity which generates a sound which is common to two or more terms in a system of phonematic units, differentiated by supraglottal modulation, is PHONATORY.'

Different phonation types are classified in terms of TYPES OF STRICTURE and LOCATION OF STRICTURE. The phonation stricture types are the following:

BREATH = glottis widely open

WHISPER = glottis constricted

VOICE = periodic vibration of vocal folds under pressure

CREAK = low frequency periodic vibrations of a small section of the vocal folds

STOP = glottis tightly closed: pressure is built up behind the stop

We shall see below that all stricture types are needed in our accounting for the facts of tonal development in the Baric, Jinghpaw and KN subgroups of TB.

The basic assumption underlying all reconstruction attempts for our TB rec-theoretical model will be the postulation of 3+2 phonation types, namely, where the first group containing voice, creak, and breath leads to the primary tonological development of TB languages, whereas the second group containing whisper and stop stands apart in that it manifests itself already in the proto-language by final segmental consonantal units like *-s and a series of occlusives which secondarily also trigger tonological development[4]. If we were successful

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[4]The problems encountered in final stop systems of TB languages have to be treated separately. Clearly their analysis follows the reconstructional principles proposed for the first group.

in demonstrating the historical validity of such a rec-theoretical model for TB, it would mean a remarkable typological rapprochement of the Austroasiatic with the Sino-Tibetan language stocks.

Before detailed evidence is given in favor of the assumption of a fundamental three-fold phonatory opposition of Proto-TB, we should take a glance at the analytical premises underlying the postulation of reconstructional theories.

3. THE PRELIMINARIES: WHAT IS A RECONSTRUCTION THEORY?

The starting point of an explication of 'reconstruction theory' is the discrimination of two kinds of dichotomies, viz., the observability dichotomy ('observable fact' vs. 'non-observable fact') and the theoreticalness dichotomy ('theoretical' vs. 'non-theoretical'). According to the positivist philosophy of science the division of observable and non-theoretical and of non-observable and theoretical events is paralleled by the division of the scientific descriptive vocabulary V_d which consists of V_o = observation terms and V_t = theoretical terms. The division of the descriptive vocabulary into these two classes is established BEFORE any theory is worked out and applied to the empirical data. It is easy to see that comparative reconstruction in its classical usage is essentially of the same nature: the observation terms refer to observable states and events found in different languages and the theoretical terms refer to theoretical states and events of the proto-language which is assumed to have split off into different branches, subgroups, etc. The formal way of differentiating between observable and theoretical states and events is the use of the asterisk for the latter.

In recent years there has been growing dissent over this conception of empirical sciences. According to Bar-Hillel 1970 the dichotomy 'observable vs. theoretical' may be considered as the result of a confusion, viz., a confusion between 'observable vs. non-observable' and 'theoretical vs. non-theoretical'. I believe that the same confusion holds true in comparative reconstruction (a term which clearly indicates this confusion), and that we ought to differentiate three rather than two different levels of historical analysis according to their explanatory power:

Level of analysis	Observability	Theoreticalness
Phonological theory P	observable	----------
Comparative theory C	non-observable	non-theoretical
Historical theory H	----------	theoretical

All that can be said about a particular historical theory H in terms of its observable states and events refers to the phonological theory P entailed by H. All that can be said about a particular historical theory H in terms of its non-observable states and events refers to a theory different from the historical theory, viz., a comparative theory C. All that can be said about a particular historical theory H in terms of its non-theoretical states and events also refers not to H itself but to the comparative theory C. And finally all that can be said about H in terms of its theoretical structure refers to H itself. In other words, the facts elicited by a phonological theory P are granted the status of observable entities in terms of an historical theory H; the facts elicited by a comparative theory C are granted the status of both non-observable and non-theoretical entities in terms of H, and finally, the facts elicited by H are theoretical in terms of H itself.

When considering the data presentations of all authors involved in TB reconstruction so far, a remarkable fact becomes evident: the most up-to-date analyses establish entities that are non-observable and non-theoretical within the framework of an underlying historical theory. A perfect example of a non-theoretical analysis is the comparison of six Lolo-Burmese languages by Burling 1967. The consonantal elements and the tones 'reconstructed' by him are comparative entities in the sense that no underlying reconstruction theory is employed. The additional analysis yet to be performed concentrates on the question in what way a tonogenetic reconstruction theory can be applied to this comparative material.

These remarks bring us to the main point: What kind of entity is a theory and what, in particular, is a linguistic reconstruction theory?

The most widely accepted conception of 'theory' provides

for an explanation in terms of a set of statements some of which may be empirically true or false. This view is termed 'the micrological conception' because all statements relating to a particular theory may be thought of in terms of the theory's axiomatization, that is, the reducibility of all statements derived from the theory to the non-reducible axioms of that theory.

The main disadvantages that result from such a conception of a scientific theory are the following:

(1) The analyst is primarily occupied with devising experiments that put the theory to test. Falsification tests or experiments are the most important objective of analysts. All problems relating to deductive proofs and inductive justification of linguistic theories arise in this context. Something close to a minimal requirement for such a scientific explanation is expressed by this statement: '...an explanation will be SATISFACTORY only if its universal laws, its theory, can be tested independently of the EXPLICANDUM' (Popper 1972:355).

In opposition to this theory conception there is another theory concept labeled 'non-statement view of theories' (cf. Sneed 1971, Balzer/Sneed 1978, Stegmüller 1973). Such a theory is interpreted as a mathematical structure divided into separate structures and combined with a set of intended applications. The logical relationships that obtain between the different statements of the theory are expressed by an axiomatic system exactly like the 'statement view'; but now there is the difference of introducing, for the purpose of axiomatization, a set-theoretic predicate. The definition of this set-theoretic predicate at the same time serves to express the empirical claims of the theory ('that which the theory is talking about') in the form of a sentence like "c is an S" where "c" is a model of the theory and "S" = the mathematical structure characteristic of that theory. All problems relating to deductive proofs and inductive justification are relegated to the realm of singular empirical claims and empirical hypotheses such that they do not affect the theory itself. Now the theory no longer serves the purpose of verification or falsification, rather it becomes a conceptual instrument or tool to work (= analyze) with. This differentiation also allows for the strict conceptual distinction between 'theory' and 'hypothesis' which became blurred within the traditional view.

(2) According to the statement view the range of applications of a theory is principally universal; there is no possibility of separating different intended applications from each other. It may be that this was a desired consequence of the adoption of the statement view lest a theory lose its generality or applicability to as many 'falsification instances' as possible. As the whole theory stands on test, a single observation may cause its rejection.

As for the non-statement view of theories, the idea of universal application of the theory has to be abandoned. Several intended ranges of application can be divided from each other. In a certain respect there is an 'autodetermination' of the theory because the theory determines the intended range of application(s). As regards our historical theory H, we shall see that H explains certain intended ranges of applications particularly well (in particular, the tonological phenomena obtaining in the KN, the Baric and Kachin groups of TB), that is, without having recourse to special constraints and special laws valid only for the application to these TB subgroups.

(3) According to the statement view of theories a relativization to certain theory structures is impossible. In any case, the whole theory is subject to test. The customary view does not permit the existence of special laws and special constraints which are valid only for special aspects of a theory plus the special range(s) of application.

On the other hand, the relativization to certain theory structures is principally possible within the non-statement view. The existence of special laws or hypotheses within special applications of the theory is possible. With reference to H the existence of singular language-specific phenomena can be taken account of by means of special constraints or special laws that apply only to such phenomena. Examples of such singular phenomena may be found in the realm of purely descriptive phonological analysis (for instance, all facts characteristic of the non-primary phonological extension systems, cf. Weidert 1975 for Lushai), but may as well exist in comparative analysis (for instance, the well-defined tonal 'split' phenomena occurring within TC-I in the Naga-I languages).

(4) According to the statement view different scholars may not have different views about one and the same theory.

The theory is a monolithic 'block' that does not permit having different convictions, beliefs or expectations associated with it.

On the other hand, a theory based on the non-statement view does permit empirical convictions and expectations that different scholars associate with one and the same theory. Such differential opinions are presupposed by the notion of 'availability of a theory in the sense of Kuhn'[5]. This notion obtains a realistic touch by referring to the creator of the theory as well as to the paradigmatic set I_o of intended applications originally determined by him[6].

(5) The micrological way of thinking which corresponds to thinking in logically deductive relationships permits neither a comparison of different theories, nor a comparison of different manifestations of one and the same theory.

On the other hand, a 'macrological' way of thinking which corresponds to axiomatizations of scientific theories in terms of set-theoretic predicates, does permit the comparison of different manifestations of one and the same theory[7]. With

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[5] Cf. Kuhn 1962. It should be noted in passing that Kuhn's 'paradigm' is by no means identical with our notion of 'theory'. In Balzer/Sneed 1978 'theory' has been replaced by 'theory elements' mainly in order to take account of intertheoretical relationships, the study of which leads to the notion of 'theory-net'.

[6] 'Der Begriff erhält einen realistischen Anstrich durch Bezugnahme auf den Schöpfer der Theorie sowie auf die von ihm festgelegte paradigmatische Beispielsmenge I_o der intendierten Anwendungen.' (Stegmüller 1973:15)

[7] At present it is open to debate whether a theory which replaces another can be compared with the replaced theory. According to holistic views theories are accepted or rejected as a whole, not in a piecemeal way. If identified with the notion of 'paradigm' in Kuhn's sense, a new scientific theory is a priori non-comparable to the replaced theory. This difficulty of comparability is also seen when trying to compare the ST tonogenetic laryngeal rec-theory Rec-T_L with the C_i-derived tonogenetic rec-theory Rec-T_{C_i} in 1. What ultimately determines the acceptance of a theory such as Rec-T_L is the ease, explanatory power and elegance with which this theory is able to explain the empirical data.

reference to the paradigmatic sets of intended applications such as the tonological data of the KN, Baric and Jinghpaw subgroups of TB, it will be possible to judge the merits of such a successfully applied Rec-T_L in terms of its future success or failure by applying it to the tonological data of, e.g., the Lolo-Burmese and the Karen[8] subgroups.

With these background remarks in mind, we may now enter into a brief discussion of the formal structure of a theory developed along such lines. On the basis of Balzer/Sneed 1978 we shall define, in general terms, the notion of 'theory core'. The empirical claims conditioned by such a theory core are defined in macrological terms by citing D5 of Balzer/Sneed[9]. The notion of 'theory core' will subsequently be applied in order to sketch the bare outlines of a theory core of tonogenesis called 'tonogenetic laryngeal reconstruction theory' and abbreviated by 'Rec-T_L'. This theory core is used to postulate the empirical claims with reference to the tonological manifestations of three subgroups of Tibeto-Burman (KN, Baric, and Jinghpaw). We shall only occasionally touch the problems relating to special tonological phenomena found in individual languages of these groups; their historical

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[8] Contrary to often repeated assertions by Benedict that Karen necessitates a genetic ranking at the same hierarchical level as Tibeto-Burman (such that from Sino-Tibetan one subgroup termed Tibeto-Karen is derived from which the subgroup called Tibeto-Burman is derived), we make the as yet unconfirmed claim that Karen stands at the same level as all other TB subgroups. The descriptive material in my possession as well as the data supplied by Jones 1961 on the Karen languages will make it relatively easy to substantiate this claim.

Another unsubstantiated claim of Benedict is the remark that Kachin 'stands at the linguistic cross-roads of Tibeto-Burman'. There is nothing special about Kachin that could make it superior in any analytical sense to the other TB languages. On the contrary, a very serious 'defect' must be noted: There is no way of discriminating, in comparative terms, TC-I from TC-III etyma because both tonal categories result in toneme /2/ [= mid level] in Kachin. In other words, the Kachin toneme /2/ words are useless as regards the discrimination of original TC-III from TC-I etyma.

[9] For the time being it is unnecessary to express the empirical claims conditioned by our Rec-T_L through a single indivisible set-theoretic predicate termed 'the Ramsey solution to the problem of theoretical terms'; cf. Sneed 1971, chap. III.

explanation requires an analytic treatment in terms of special constraints and special laws as indicated above[10]. Thus our intent is to supply a minimum set of data material of TB tone languages that will make the postulation and application of Rec-T_L highly plausible.

In order to avoid a distinction of theoretical versus non-theoretical within a framework that would divide the scientific empirical vocabulary before any theory has been formulated, the new criterion of 'theoretical' by Sneed entails that the distinction between theoretical vs. non-theoretical be drawn RELATIVE TO A GIVEN THEORY. This notion of T-theoretical (T = a particular theory) is based, in Sneed's explanation of the logical structure of mathematical physics, on the concepts of T-theoretical and T-non-theoretical FUNCTIONS such that only functions are able to yield theoretical values[11]. The possible existence of metrical concepts in the humanities, however, is a complex problem for which no solution has been proposed so far. Because of the non-existence of metrical concepts in comparative reconstruction we shall not introduce Sneed's notions of 'measurability in a T-dependent way' and 'the function n is theoretical with respect to T'; rather what we want to show is the fruitfulness of the theoreticalness criterion for comparative reconstruction, the conceptual apparatus of which has not yet reached the status of quantitative concepts. Therefore the notion of 'measurability in a T-dependent way' is replaced here by 'T-dependent truth value'[12] or 'T-dependent determination' ("T-abhängige Bestimmung"). Now

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[10] For such a purpose it would be necessary to define the notion of 'extended theory core'. Since it would by far transcend our present analytical ambitions, we shall abstain from discussing questions like the theoretization, reduction and equivalence relations obtaining between different theory elements.

[11] The objects or the domain of objects about which the theory speaks, cannot be theoretical or non-theoretical in themselves; it is the context of functions which puts them into a theoretical or non-theoretical dimension.

[12] An idea suggested by Stegmüller (1973:60).

'function' is replaced by the non-quantitative notion 'relation' and, in a way similar to the distinction of abstract versus concrete functions, the distinction of 'abstract relation' R and 'concrete relations' R_i subsumed under R will be drawn. For a class of n individual objects the definitions of 'determination of truth value in a T-dependent way' and 'T-theoretical relation' can be given in the following way:

(D1) The TRUTH VALUE of the class of R_i-sentences IS DETERMINED IN A T-DEPENDENT WAY, if and only if there are n individuals from the domain D_i ($n \in D_i$) of the i-th application of the theory such that in every existing exposition of application i of theory T the validity of the statement $n \in R_i$ presupposes a successful application T_j of T.

In this definition, 'concrete relation R_i' means that there is an application R_i (usually several such applications) of an *abstract relation R of a theory T in its i-th application*; 'in every existing exposition' means that different representations of the application T_i of a theory may exist in the form of textbooks, essays in scientific journals or notes taken from a college course, in which the truth value of the relation R_i belonging to T_i is determined in a T-dependent way in like manner; and 'presupposes a successful application T_j' means that there is a domain D_j for which R_j of T is true.

(D2) The RELATION R IS T-THEORETICAL if and only if in every application T_i the truth value of the class of R_i-sentences is determined in a T-dependent way.

Now we apply (D1) and (D2) to our historical theory H which will be defined below as consisting of a 3-tuple of elements termed 'Rec-T' = reconstruction theory, 'C' = comparative theory, and 'Rec-P' = the methodology of reconstruction processes. In this 3-tuple, 'Rec-T' and 'C' establish the domains of all individual objects about which the theory speaks. 'Rec-P' is the macro-term for the relations that obtain between the theoretical (established by Rec-T) and the non-theoretical (established by C) parts of H. The most convenient way of giving a concrete meaning to the notion 'relation' will be by interpreting it as 'sound relation' (with some distant connotation of neogrammarian sound-law). In opposition to the conventional, in particular neogrammarian, view presupposing the notion of sound laws, the sound relations as they are

conceived of in our framework are not necessarily deductive-nomological[13] unidirectional derivations from Rec-T to C to P (P = the underlying phonological theory), but may principally be multidirectional and of different logical (viz., deductive, inductive and abductive) and mathematical (viz., nomological vs. statistical) qualities.

The notions of 'determination of the truth value of a sound relation sr_i (or a class of sound relations SR_i) in a Rec-T-dependent way' and 'Rec-T-theoretical sound relation' can be defined in the following way:

(D1-H) The truth value of a sound relation sr_i (or a class of sound relations SR_i) is determined in a Rec-T-dependent way, if and only if there is a certain number n of individuals of the domain D_i of the i-th application of Rec-T such that in every existing exposition of application i of Rec-T the validity of the statement $n \in sr_i$ (or $n \in SR_i$) presupposes a successful application $Rec\text{-}T_j$ of Rec-T.

(D2-H) The sound relation sr is Rec-T-theoretical if and only if in every application $Rec\text{-}T_i$ the truth value of the class of sr_i-sentences is determined in a Rec-T-dependent way.

In 4. and 5., (D1-H) and (D2-H) will be further specialized for the application to the particular tonogenetic laryngeal reconstruction theory we intend to exemplify.

With regard to the historical theory H, a very important analytical distinction should be noted. That which is a fact of the comparative theory C may be determined by notions of some other theory. That which is a fact of the reconstruction theory can only be determined by notions of Rec-T itself. This observation permits us to take over all reconstructional knowledge and experience gained by former historical analyses and which manifests itself in instruction books on historical analyses (such as, for instance, Pike 1950); its proper place of application is the comparative theory C which, by definition, establishes non-theoretical relations within the observability dichotomy.

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[13] *'Nomological' = permitting of no exceptions.*

Stated in general terms, a theory according to Sneed may be considered as consisting of a description of a kind of set-theoretic predicate - the core of the theory - and the way it may be used to make statements about another set-theoretic entity - the range of intended applications of the theory: $T = \langle K, I \rangle$ (cf. infra). The set-theoretic structures that appear in scientific theories are characterized by the following definition (Balzer/Sneed, D1):

(D1) X is an m+k-theory-matrix[14] iff

1) $X \in \mathcal{M}$

2) m and k are integers: $0 < m$ and $0 \leq k$

3) for all $x \in X$ there exist $n_1, \ldots, n_m, t_1, \ldots, t_k$ such that $x = \langle n_1, \ldots, n_m, t_1, \ldots, t_k \rangle$

In this definition, $x \in X$ may be any m+k-tuple of sets, relations and/or functions. The most important aspect of D1 is the discrimination between theoretical components or relations (denoted by t_i) and non-theoretical components or relations (denoted by n_j). The claim implicit in D1 is that theories of empirical science can be characterized by defining a set-theoretic predicate which at the same time is used to express the empirical claims of that theory ($X \in \mathcal{M}$) and that any x which may be said to be a POTENTIAL MODEL of the theory X is characterized by a certain set of non-theoretical and theoretical relations ($x = \langle n_1, \ldots, n_m, t_1, \ldots, t_k \rangle$).

The formal core of a theory is defined in the following way:

(D2) X is a THEORY CORE iff there exist M_p, M_{pp}, r, M, C, m and k such that

1) $X = \langle M_p, M_{pp}, r, M, C \rangle$

2) M_p is an m+k-theory-matrix

3) $M_{pp} = \{\langle n_1, \ldots, n_m \rangle / \langle n_1, \ldots, n_m, t_1, \ldots, t_k \rangle \in M_p\}$

4) $r: M_p \to M_{pp}$ is such that

$r(n_1, \ldots, n_m, t_1, \ldots, t_k) =_d \langle n_1, \ldots, n_m \rangle$

5) $M \subseteq M_p$

6) C is a constraint for M_p

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[14] Balzer/Sneed speak of 'm+k-theory-element-matrix' because of their aim of interrelating various theories (= theory-elements) within a scientific field; cf. note 5. 'The present terminology emphasizes the fact that THEORIES are generally more complex entities than simple theory-elements.' (Balzer/Sneed, note 9).

[M_p = potential model, M_{pp} = partial potential model, r = restriction function (in our terminology: restriction relation), M = the fundamental mathematical structure of the theory, C = (general) constraint.]

> 'There are three intuitive ideas compressed into this definition. First, there is a distinction between theoretical and non-theoretical components. Roughly, M_p is the set of all possible models for the FULL conceptual apparatus of a theory including theoretical functions, while M_{pp} is the set of all models obtained by simply "lopping-off" the theoretical components leaving only the non-theoretical part of the conceptual apparatus. This "lopping-off" is executed by the function r. M_p and M_{pp} are called POTENTIAL MODELS and PARTIAL POTENTIAL MODELS. Second, there is the idea of laws formulated with theoretical components. This is captured by M which picks out of the set of all potential models of the full conceptual apparatus just those which satisfy certain laws. Third, there is the idea that different applications of the theory are interdependent in the sense one may not -at least for theoretical components- employ values of function in one application of the theory without regard of the values of the same component in other applications. This is captured by the constraints C on M_p. These have the effect of ruling out certain combinations of theoretical components in different applications, but no assignments in single applications. The intuitive idea is that a distinction may be drawn between what is ruled out by the structure of the theory's models M and what is ruled out by restrictions on the way that structure is applied "across" a number of different applications.' (Balzer/Sneed,7).

As for an historical theory H defined as a 3-tuple consisting of Rec-T (a particular reconstruction theory), C (a particular comparative theory), and Rec-P (the methodology of reconstruction processes), its theoretical core is characterized in terms of (D2) in the following way. The theoretical core is equivalent to the definition of a particular reconstruction theory Rec-T such that

$$\text{Rec-T} = \langle M_p, M_{pp}, r, M, C \rangle.$$

M_p is the set of potential rec-theoretical models obtained by postulating a certain array of rec-theoretical entities (e.g., morphemes, phonemes, or distinctive features which are all marked by the asterisk). M is the basic set-theoretical structure in which all models (both potential and partial potential) of the theory are expressed; according to (D1) the rec-theoretical phonological structure of a reconstruction theory may be conceived of as expressing the number, the different varieties and the combinatorial possibilities of the rec-theoretical entities established through M_p. Within synchronically des-

criptive analysis, these entities should usually correspond to those entities resulting from the deep structural phonological level of analysis[15]; but they need not necessarily do so in case some or most languages of a language family subject to reconstruction have not yet attained the degree of abstraction implied by representations of the deep structural level of phonological analysis.

Partial potential models of Rec-T are those that lack the theoretical components or relations expressed by the theoretical models. They result from applying the restriction function r identified in our rec-theoretical considerations as the sound relations sr which, for purposes of generality, not only express deductive-nomological relationships (as was the neogrammarian doctrine), but also any other conceivable ones such as inductive-statistical or abductive modes of reasoning. On the other hand, that which is determined as partial potential models of the reconstruction theory, has hithertofore been expressed in terms of a separate theory, viz., the comparative theory C. Any analytical or prescriptional devices such as 'axioms and procedures for reconstructions in comparative linguistics' (cf. Pike 1950) may be thought of as being designed for the purpose of establishing comparative theories. The usual domains of comparative analysis are, macrologically speaking, 1) the comparative structure relative to a language, 2) the comparative diasystem relative to a group or family of languages, and 3) the methodology of relating comparative entities (established within the theoreticalness dichotomy) to synchronically established phonological entities (established within the observability dichotomy as viewed

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[15] For the time being we shall not bother about the qualitative aspects of such deep structural entities, so they may be conceived of as anything like systematic phonemes, distinctive feature matrices, 'autonomous' phonemes, morphophonemes, or the like. In a work entitled 'the representation of phonological alternations in a componential model and its application to the phonology of German', I make it quite plain that the basic underlying entities called 'morphophonemes' (for lack of a better term) are theoretical entities within the theoreticalness dichotomy of a phonological theory P. They can thus be defined in the terms of Sneed's theory concept. The interrelationship with their non-theoretical counterparts is established by way of introducing a limited number of deep structural process relations called 'phonological components'.

from C itself)[16]. If comparative work relative to a language is carried out to the exclusion of genetically related languages, we may speak of 'internal reconstruction'; if the comparative diasystem is of primary concern to comparative analysis, excluding more or less aspects of single languages, it results in what has (misleadingly) been termed 'comparative reconstruction' relative to a group or family of languages[17].

As for the fundamental rec-theoretical structure M, $M \in M_p$ in (D2) says that M is contained by the set of potential models of the theory such that, out of all 'thinkable' models, only those models are picked out by M that satisfy 'laws' such as the linearity condition (a sequence of theoretical elements *ABC 'surfaces', both comparatively and phonologically speaking, in the same linear arrangement as long as no special constraints prevail), the identity condition (a rec-theoretical entity such like $*A_1$ may be said to be identical with other entities like $*A_2$,$*A_i$, if its defining contexts are identical in structural terms), or other conditions, in particular phonological, morphological, and syntactical conditions stating that any supposition, hypothesis, assumption etc. in terms of Rec-T is not contradicted by the epistemological content of phonology/morphology/syntax-theories.

Statement 6) of (D2) is another important fact of reconstruction theories. Constraints are necessary in order to guarantee the cohesion and integration of the various parts of the theory in different applications. With reference to Rec-T_L, general constraints are due to the nature of the posited phonation types, the potential developments which may be expected in different ST subgroups and the phonological interconnections "across" these subgroup applications. For instance,

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[16] A very novel and unique approach to performing such a task may be observed in Foley 1977 which, in my opinion, refers to the wrong analytical context; that is, Foley's work has more to do with comparative, rather than with phonological theory.

[17] Obviously a hierarchy of different theoretical structures is overlaying each other from the viewpoint of H. Our analytical claim implicit in the conception of H is that all kinds of analysis relative to H presuppose a qualitative and quantitative amount of research work performed within phonological and comparative theories.

constraints expressed by a restriction relation will make it highly unlikely that a ST subgroup be found with, comparatively speaking, two tonal categories such that the basic laryngeal reconstruction model becomes inapplicable.

The theory core represents the apparatus required to make empirical claims about the theory's range of intended applications. The relationship between the core K and the range of intended applications I is defined in

(D3)[18] X is a theory only if there exist

K and I such that

1) $X = \langle K, I \rangle$

2) $K = \langle M_p, M_{pp}, r, M, C \rangle$ is a theory core

3) $I \subseteq M_{pp}$

'Note that this is only a necessary condition for a theory [-element]. The set I is to be interpreted as the range of intended applications of the theory[-element] - what the theory is about. The only requirement of D3) put on I is that its members have the same structure as the non-theoretical part of K -that they are members of M_{pp}.' (Balzer/Sneed,8).

In this definition, the range of intended applications is contained in the set of partial potential models selected by the theory core. With reference to H, Rec-T selects a set of partial potential models which are represented in terms of the comparative theory C. In order to guarantee that Rec-T does not apply vacuously to some M_{pp}'s which are actually found not to occur in any existing language or subgroup or family under investigation, a condition must be stated to the effect that the actually observable set of intended applications (in case of $Rec\text{-}T_L$ some TB subgroups) is contained in the set of partial potential models selected by Rec-T.

This leads us finally to the definition of the empirical claims of the theory $\langle K,I \rangle$ (in which A(K) = the class of sub-sets of M_{pp}, that is, a sub-set of the power-set $Pot(M_{pp})$, the application operation of the core being equivalent to its empirical content).

'It is just the claim that the range of intended applications is among those sub-sets of M_{pp} that are singled out by K, *i.e.*

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[18] Corresponds to (D4) in Balzer/Sneed 1978.

(D4)[19] If $\langle K, I \rangle$ is a theory[-element] then that
$I \in A(K)$
is the claim of $\langle K, I \rangle$

'The idea here is again simple. M_{pp} is all possible non-theoretical descriptions of some body of phenomena; I consists of phenomena that actually occur. The core K narrows down $Pot(M_{pp})$ to A(K) -it restricts the range of possibilities. It claims to do this in a way that narrows down onto what is actually observed to occur.' (Balzer/Sneed,9).

As for an historical theory H, its empirical claims of the form $I \in A(K)$ mean that the range of intended applications, that is, those languages, subgroups and families, for which H ought to apply, is among those sub-sets which are singled out by the theory core, that is, a particular reconstruction theory. As regards the historicity of well-documented older stages of languages, subgroups or families (examples: the Romance languages, the modern New Indo-Aryan languages, the Sinitic languages, the Semitic languages), a particular reconstruction theory may be (or is usually) identified with the customary historical analysis in terms of letters. Of course the claim of such a theory incorporating historically attested elements is not essentially different from the claim of a rec-theory which does not have the possibility of being checked against its historical background. It also does not represent any essentially different narrowing down of the non-theoretically described possibilities. Now we see that the theory concept as adopted from Sneed for the historical analysis of languages is primarily intended to provide the 'real' historical dimension for those languages, subgroups and families, that lack historical depth because of the non-existence of written records.

Finally, it should be noted that the application of the theory concept of Sneed to the historical study of language is up to this point by no means exhausted. Short mention at least must be made of the notion of 'extended core of a theory(-element)' which, in addition to the above definition of K, the theory core, accounts for the existence of special laws and special constraints in particular applications of the

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[19] Corresponds to (D5) in Balzer/Sneed 1978.

theory. There is a parallel here, too, as regards the (phonological and comparative) existence of phonological alternation phenomena of particular word classes which require their being taken care of in the theoretical terms of a reconstruction theory. An example of an extended theory core containing such special 'laws' and constraints in historical analysis is the Proto-Indo-European laryngeal theory where the existence of rec-theoretically reconstructed laryngeal sound units of the proto-language is motivated by the ablaut phenomena occurring in the verbal paradigms of several Indo-European languages. Its proper place of application is first of all constrained to just these ablaut phenomena which, from the synchronical point of view, have the lowest plausibility value of all possible phonological alternations. Later on, the systematic extension of the explanatory potential inherent in such a rec-theory to language-specific phenomena which have no directly observable relationship to the original ablaut alternations created a feeling of almost limitless applicability so that $A(K) = Pot(M_{pp})$ and the original claim $\langle E, I \rangle$ (E = extended theory core) had become more or less vacuous.

In 5., we shall present comparative evidence of a TB alternation phenomenon in the verbal paradigm similar to Indo-European ablaut. The explanatory model devised for such synchronical alternations is, in opposition to IE ablaut, integrated at the outset into the full theory; such a supposition is necessitated, not by criteria internal to the reconstruction theory, but by language-specific evidence which suggests a 'combined' homogeneous analytical treatment within the range of intended applications.

4. EVIDENCE OF TONAL AND NON-TONAL DEVELOPMENTS IN DIFFERENT SUBGROUPS OF TIBETO-BURMAN.

In this section, evidence will be presented in support of the following claims:

1) The comparative diasystem of Kuki-Naga languages can be considered as consisting of three tonal categories for so-called smooth syllables[20].

2) The comparative diasystem of Eastern Baric languages can be considered as consisting of four TC's for smooth syllables.

3) The comparative structure of Kachin consists of three TC's for smooth syllables.

4) All TC's established in these three different TB subgroups can be shown to mutually agree with each other (a few anomalous correspondences notwithstanding).

As has been implied in the remarks on the failure of a tonogenetic C_i-derived rec-theory (1.), the comparative evidence 1)-4) is in itself not sufficient to provide good grounds for accepting a C_f-derived, that is, laryngeal, rec-theory. Besides the evidence of verbal alternations quoted below (cf. 5.), we shall strengthen Rec-T_L by investigating the role of the glottal stop as it occurs in present-day phonological systems of KN and Baric languages, and as it purports to be a non-suprasegmental remnant of the postulated proto-TB phonological system[21]. This means that we shall substantiate the following claim:

5) There are some glottal stops in synchronically observable TB languages which will be considered as the immediate successors of the proto-TB final laryngeal sound system and which, upon comparison with the evidence presented in 1)-4), can be systematically correlated predominantly with TC-II, less so with TC-III, BUT NEVER WITH TC-I.

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[20] That is, syllables not ending on a plosive. The role of final glottal stop is a different one and has to be analyzed separately.

[21] Thus we do not consider a synchronically observable glottal stop that has developed, for instance, from final plosives. One such example is Anal (Old Kuki) where all final (comparative) -p, -t, -k have changed into /-ʔ/ with concomitant realization in high tone.

Let us begin now with claim 1). It was the primary aim of my investigation of over 20 KN languages (Weidert 1977a) to show that all KN languages are reducible, in comparative terms, to a three TC comparative diasystem for smooth syllables despite their extremely heterogeneous individual phonological structures. The precondition for such an analysis was that all phonological systems could be represented on a very abstract phonological level which was devoid of phonetic redundancies and which contained 'the bare essentials' of sounds necessary for the rendition of the meaning content of words[22]. Generally this did not present many problems for those languages with a restricted number of tonological alternations. In the following, we shall concentrate on these languages rather than those exhibiting complex alternation patterns[23]. One additional remark about the formal presentation of tone systems is necessary. All languages considered here are representable, in phonemic and abstract underlying = morphophonemic terms, according to Pike's distinction of contour tone vs. pitch tone (= register tone) languages (Pike 1948). It was suggested in Weidert 1977a that contour tone systems be rendered by diacritical marks (usually accents) and pitch tone systems by numbers ranging from /1/ = the lowest level upwards according to the number of tonemes found in a language. Both accents and numbers are placed in front of their respective syllables (namely for the reason

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[22]The criterion to achieve such a goal is termed 'criterion of minimal contrastivity' already mentioned in Weidert 1977b.

[23]One such case is Ao Naga. Within a three-toneme pitch tone system there is only clarity about the mid level /2/ toneme which is the representative of TC-I etyma. In the other two TC's, words may be found either in the low toneme /1/, or in the high toneme /3/, or in /1/ plus glottal stop closure, or in /3/ plus glottal stop closure. It will not be discussed here in what way such language-specific complexities should be considered as "crucial" for the modification and/or specifications of any TB and ST tonogenetic rec-theory.

that tones influence not only the frequency of the vocalic nuclei, but rather the frequential confines of the whole syllable)[24].

The evidence for three comparative TC's of the KN subgroup may be diagrammatically represented in the following way:

Number of underlying tones in brackets	TC-I (nouns and verbs, open and closed syllables)	TC-II			TC-III (cl.syl.n.and vb., op.syl. nouns only)
		a (cl.syl., n.and vb.)	(op.syl.nouns) b_1 (most etyma)	b_2 (8 etyma)	
Lushai (4)	¯ (high)	ˊ (rise)	ˋ(fall)	ˊ(rise)	_ (low)
Tiddim (3)	- (flat)	ˊ (rise)	ˊ	ˊ	ˋ (falling)
Thadou (2)	1	2	2	2	1
Kom (2)	2	1	1	1	2
Lakher (3)	1	3	3	3	2
Tangkhul (3)	1	2	1	2	3
Angami (5)	2 ¦ 3	5	1	5	4
Chakhesang (5)	2 ¦ 3	4	1	4	5
Northern Rengma(3)	3	1	2	1	2
Lotha (3)	1	3	2	3	3
Yimchunger (2)	2	1	-?	-? ~ 1	1

Diagram 1.- Kuki-Naga tonal categories (smooth syllables)

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[24]This is a critique against the use of diacritical accent marks FOR ANY TONE SYSTEM. The undesired analytical consequence of such a practice is that the true nature of a tone system becomes completely blurred for anyone who has not heard the language himself. There are some problems inherent in the contour tone vs. pitch tone interpretation, but this is no reason for obfuscating it by using accent marks indiscriminately for any tone system. A contention, such as found in Hyman 1975, that Oriental tone languages are predominantly of the *contour tone type* and African languages generally of the pitch tone type, is easily refuted when looking at the overall evidence of TB languages (e.g., there are at least 18 pitch tone systems amongst the KN languages compared to 6 contour tone systems analyzed so far [but disregarding the numerous Cl[illegible]alects which most probably are of the latter type]).

This diagram shows beyond the slightest doubt that three *TC's exist in comparative terms*[25]. *It is important to see in* what way TC-I has tonemic exponents in the individual languages different from TC-II and TC-III, and in what way TC-III is different from TC-I and TC-II.

Differentiation of TC-I vs. TC-IIa: There is hardly a KN language which does not differentiate these two categories tonologically. The only exceptions so far observed appear to be Meithei (= Manipuri) and Bâwm, both two-tone languages where TC-I etyma appear in both tones (as is the case in Meithei), or where TC-I and TC-IIa etyma appear in the same tone (as is the case in Bâwm). As regards the frequency of the respective tonemes of the pitch tone systems, it is quite obvious that the TC-IIa representative IS ON A HIGHER FREQUENCY than the TC-I representative, the ratio standing now at 13:5 in favor of this claim. At the same time, there is also something 'special' about the realization of TC-IIa etyma: In Lushai, Tiddim and Siyin, the TC-I tones are level tones compared to the rising contour of TC-II words; in Angami and Lotha, TC-II tones are at the extreme upper end of the frequential realizability, their audible distinctiveness being apparent without much phonetic training; in Mao, a five-toneme pitch tone system, TC-IIa words are realized on a mid (= /3/) level describing a wave-like contour, whereas the remaining four tones fall straight down from their respective pitch heights.

Differentiation of TC-III vs. TC-I and TC-II: All three logical possibilities seem to occur equivalently:

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[25] As regards closed syllables with falling tone in Lushai, they do not appear in this diagram. It should be noted that there are not more than half a dozen good etyma occurring with falling tone in Lushai; their tonal correspondences with other Kuki (predominantly Central Kuki, Northern Kuki and Old Kuki) languages establish a connection with the TC-IIa category (e.g. Lu. `kooŋ, Ti. ,kooŋ, Kom ^{1}kooŋ 'waist'). The Lushai falling tone closed syllable etyma can be covered, however, by means of the evidence presented in [illegible]. Their ultimate origin is the final *-s category.

a) languages in which the TC-III representative is different both from TC-I and TC-II: Lushai, Tiddim, Siyin, Lakher, Tangkhul, Zemei, Liangmei, Angami, Chakhesang, Mao (with a few exceptions in the TC-I group), Northern Rengma;
b) languages in which the TC-III representative is identical in tone with the TC-I category: Thadou, Anal, Mon (= Monshang), Kom, Lamgang, Meithei, Rongmei, Khezha (in certain 'split' groups of TC-I), Southern Rengma, Sema (some words only); and
c) languages in which the TC-III representative is identical in tone with the TC-IIa category: Sema (some words only), Lotha, Ao, Yimchunger, Sangtam (apparently being confined to the Naga-II languages).

As regards the frequency range of TC-III representatives, the following facts should be noted: In languages such as Lushai, Tiddim, and Siyin (and most probably a lot more of Central Chin dialects), the TC-III contour creates the impression of a 'downward' movement compared to the TC-I and TC-IIa representatives[26]. On the other hand, the TC-III representatives of Tangkhul, Chakhesang and Zemei appear considerably higher than the remaining tonemes. The TC-III representative may also appear in a relatively mid frequency range as is evidenced by Lakher, Khezha, and Northern Rengma.

Let us now consider the TC-IIa and the two columns of TC-IIb. There is the surprising fact that only the small group containing eight good etyma agrees in its tone with the TC-IIa closed syllable column, whereas there is evidence of a tonal 'split' in the left column of TC-IIb for the following languages: Lushai, Mon, Lamgang, Tangkhul, Zemei, Liangmei, Angami, Chakhesang, Khezha, Mao, Northern Rengma, Southern Rengma, Lotha, and Yimchunger (at least some nouns). Since there is absolutely nothing special about the etyma occurring in all of these TC's, either in regard to their meaning or in regard to their phonological or comparative structures, they have to be considered as a serious 'split' phenomenon to be taken care of by a future tonogenetic reconstruction theory.

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[26]Thus, the frequential difference between a word in high level tone compared to a word in low level in Lushai may exceed, in careful pronunciation, the musical interval of an octave.

As regards the frequency range of TC-IIb$_1$ tonal representatives, it is noteworthy that the tendential upward movement created by some representatives of the TC-IIa category appears to be inverted to its opposite, downward *movement. This is* the case in Lushai (falling vs. rising), Angami (/1/ vs. /5/), Chakhesang (/1/ vs. /4/) and Southern Rengma (/1/ vs. /3/ in a 5-toneme pitch tone system). In Lotha, the TC-IIb$_1$ representative /2/ (= mid level) establishes a separate toneme not found in any other comparative context. In Northern Rengma, there is the interesting fact of tone identity of the TC-IIb$_1$ representative with the TC-III representative, both appearing in /2/ within a three-toneme pitch tone system. The ratio of good etyma of the TC-IIb categories at present stands at 34:8 in favor of the left-hand column.

EVIDENCE FOR CLAIM 2) As regards the range of tonological evolution, the Baric subgroup of TB, about which next to nothing is known in the literature, must be judged as the most heterogeneous subgroup of all TB subgroups. On the one hand, we have the Boro-Garo languages of Western Assam with no tonal systems at all (Boro, Garo, and most probably also Rabha, Lalung and Dimasa). As the comparison makes evident, the basic syllable structure dichotomy has to be sought in the absence vs. presence of a glottal stop. A very peculiar connection of glottal stop with the emergence of tonal distinctions exists in Boro as already observed by Burling 1959. If, in a disyllabic word structure, the first syllable has an inherent glottal stop (which'surfaces' if that syllable is spoken in isolation), the pitch of the following syllable attached to it is on a higher frequency level compared to the first syllable and compared to its own pronunciation in isolation; e.g. /no?/ 'house' and |no?ma?| → [nɔmá?] 'big house'. Inductively speaking, as soon as we hear a realization such as [CV(N)CV̋(N)(?)] (N = nasal consonant), where the second syllable is high compared to the first, we infer that underlyingly the first syllable is of |CV(N)?| structure. Though phonetically three different pitch heights undoubtedly exist, the absence or presence of final glottal stop is responsible, in underlying phonological terms, for the classification of Boro as a non-tonal language.

In Eastern Baric the 'normal' phonological systems seemed

to be three-toneme systems (either contour tones such as found in Chang, or pitch tones such as in Nocte and Tangsa), but then the real shocks came in the form of Khiamngan[27] with a 6-tone system (interpretable both in terms of a contour tone system or of a pitch height system), and Konyak with a two-fold tonal distinction in monosyllables and a ⌐+1-fold tonal distinction in disyllables[28].

Concerning the tone systems of all of these languages, the following facts should be noted.

The tone system of Chang is interpretable as a three-toneme contour tone system, with /_/ = low level, /¯/ = high level, and /ˋ/ = falling contour. The language is extremely rich in tonal variations, there are no problems, however, for the exposition of the tonological data in terms of the comparative diasystem presented here.

The tone system of Konyak is worthless as regards the 'two' lower tones; in the two major dialects (Tamlu/Tanhai and Wakching/Wanching), the low contoureme in monosyllables stands for both possibilities such that /↓yan/ 'iron' = underlying |^{1}yan| AND |^{2}yan|. As for disyllabic words, the syllables in final position are tonologically 'determined' in four out of the main five contouremes; unfortunately there are hardly a dozen etyma of such structure, and even then there appear to be exceptions. Contouremes: /↓/ = low-falling (/↓nau/ |^{1}nau, ^{2}nau| 'child', /↓huha/ |^{1,2}hu^{1}ha| 'dog'), /↑/ = low-rising (/↓ʌušu/ |^{1,2}ʌu^{2}šu| 'dove'), /→/ = high level (/→na/ |^{3}na| 'ear', /→yanɯŋ/ |^{3}ya^{3}nɯŋ| 'midnight'), /↑/ = steep-rising (/↑DɯBoŋ/ |^{1,2}Dɯ^{3}Boŋ| 'flower'), and /↓/ = steep-falling (/↓nagoŋ/ |^{3}na^{1,2}Goŋ| 'nose').

The tone system of Nocte is of another peculiar nature. It has two 'clear' tones (low-falling and high-falling, respec-

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[27]This unknown language is spoken in 120 villages in North-Western Burma and in 15 villages in Eastern Nagaland of India.

[28]Such 'tones', the contours of which stretch over more than one syllable, are termed 'contoureme' in Weidert 1978a and are graphically represented by arrows. Unlike the tone system of Tamang described by Mazaudon 1973, the second syllables of disyllabic words in Konyak may be of any semantic structure, that is, lexemes, grammatical formatives, or unanalyzable. There is the possibility of analyzing this 5+1-system in terms of an underlying 3-toneme pitch tone system by means of an abstract phonological 'component' (termed Q = QUALITY EXCHANGE component), cf. Weidert 1978b.

tively) and in between these two there is a level tone with concomitant glottal stop realization if the syllable stands in final position; in addition, there is a syllable type with more or less mid level pitch (sometimes also on a higher pitch than the ordinary mid level tone) where the glottal stop is always *maintained. The pitch of the latter syllable type may be said* to be predictable as soon as we know that a glottal stop terminates the syllable. We thus obtain the following notations for the tones: /^{1}/ = low tone, /^{2}/ = high tone, /-/ = mid level (with obligatory final glottal stop if the syllable is pronounced in isolated or final position), and /CV?/ = glottal stop syllables.

The toneme system of Tangsa (Jugli dialect) is representable in terms of a three-toneme pitch tone system, with /^{1}/ = low, /^{2}/ = mid, /^{3}/ = high. Two peculiarities exist: Tone /1/ syllables are obligatorily pronounced with a glottal stop if the syllable is in isolated or final position (this is considered to be a case of phonetic redundancy so that the glottal stop is dropped in phonemic representations); and there are syllables with very short vowels in pitch /2/ and final glottal stop which is never elided (such that we consider the glottal stop as primary and omit the pitch sign in redundancy-free phonemic representations).

The tone system of Khiamngan may be thought of in terms of a 3-toneme pitch tone system plus the addition of contours interrelating adjacent pitch heights: /^{1}/ = low, /^{2}/ = mid, /^{3}/ = high, /^{21}/ = mid-to-low falling, /^{12}/ = low-to-mid rising, and /^{23}/ = mid-to-high rising. Similar to Chang, there exist numerous tonal alternations with a tendency towards obfuscating the tonological exposition in terms of the comparative *Baric diasystem.*

We now group the resulting suprasegmental comparative diasystem of the Baric languages by automatically taking account of the statistical occurrence of the four TC's (such that TC-I etyma are the most numerous and TC-IV etyma are the least numerous ones):

	TC-I	TC-II	TC-III	TC-IV
Garo	no -?	both with -? and no -?	no -?	with -?
Boro	no -?	with -?	no -?	with -?
Nocte	1	- (mid level plus [-?])	2	CV?
Tangsa	3	1 (+ [-?])	2	CV?
Chang	_ (low)	¯ (high)	` (falling)	_ (low)
Konyak	|2| (by induction)	|1| (by induction)	|3|	CV?
Khiamngan	21	1 ~ 12 ~ 23	2	/^{1}-?/ ~ /^{12}-?/ ~ /^{23}-?/

Diagram 2.- Baric tonal categories (smooth syllables)

It should be noted that, because of its numerous exceptions, this diagram is not of such a conclusive and convincing nature as the diagram of the KN TC's. The most troublesome language is Khiamngan which has exceptions of various kinds in every TC. Words having tone /^{3}/ appear to be associated with every TC; there is a small group of TC-I exceptions having /^{12}/-tone (such as /^{12}tZam/ 'house', /^{12}šam/ 'mat, /^{12}e^{12}he ^{23}tžek/ 'sour', and /^{12}ši/ 'shield'). In TC-II, most of the etyma appear in /^{1}/, but there are also numerous examples of /^{12}/ and /^{23}/ tones. There is no difficulty, however, with abrupt syllable closure (indicated by /-?/) indicative of TC-IV versus smooth closure indicative of all other TC's.

Besides this, there is in general no difficulty in identifying TC-I etyma. As regards TC-II, the conditions under which Garo has glottalized syllables, and under which it has not, cannot be stated in unequivocal terms without doing harm to synchronic reality. Though most of the etyma have the glottal stop, there are nevertheless such good etyma like /Jumaŋ/ 'dream', and /BiTe/ 'fruit'. In case of /Do? Bit-Ci/ 'to lay eggs' (/Do?/ 'fowl'), it is reasonable to infer assimilation of the glottal stop to the denti-alveolar place of articulation: *Bi?-Ci > /Bit-Ci/ = [Bɯt-ts^{h}i].

The occurrence of glottal stops in the TC-II and TC-IV categories suggests a sub-category relationship of the two,

but, on the sole evidence of the Baric languages, there is no way of determining it because both nouns and verbs, as well as open syllables, occur in both of them. In addition, the original difference between syllables ending in a single vowel or diphthongs like /-ia/ and /-ua/, and those ending in falling diphthongs (with /-i/ and /-u/ as second elements and not permitting of any following consonant), is obscured because some languages have developed a monophthong out of a falling diphthong in TC-II, and some others a diphthong out of a monophthong in TC-IV.

At least as regards Nocte, Tangsa and Chang, it can be said that the tonal representatives of TC-I and TC-III are more 'natural' or 'neutral' than the ones of TC-II and TC-IV.

EVIDENCE FOR CLAIM 3) Since several confusing remarks have been made in the past about the synchronic tonological structure of Kachin, we think it suitable to first outline the Kachin tone system from the point of view of its underlying (deep structural) representation. As regards monosyllables in isolation and having a sonorant final, that is, either final nasal consonant or semi-vowel (in falling diphthongs) or vowel, a three-toneme pitch tone system with the following usual phonetic realizations can be established:

T(oneme) /1/ = [⟶] ('low falling')
T /2/ = [→] ('lower-mid level')
T /3/ = [⟶] ('higher-mid level')

Since there are no further complications either semantically or phonologically, the same three tones can be posited for the abstract underlying level: |1|, |2|, |3|.

After some search in the polysyllabic and/or polymorphemic material, we discover two further tonal contours which may be rendered as [^{2}...↓] (= mid-level falling) and [^{3}...↓] (= high-falling) phonetically. As for [^{2}...↓], a realization rule can be formulated such that a toneme |1| preceded by toneme |2| is realized phonetically as [^{2}...↓]:

|1| = /1/ ⟶ [^{2}...↓] / |2| = /2/ ——

Since this is a perfectly natural pitch assimilation rule, phonemic status will therefore be denied to **/21/.

As for [^{3}...↓], we observe that on purely distributional grounds phonemic status must be accorded to /31/, e.g., /^{31}wa/ 'father' contrasts with /^{2}wa/ 'tooth', /^{1}wa/ 'to come', and

/^{3}kə^{3}wa/ 'bamboo'. The same [^{3}...↓] pronunciation occurs, however, in the following word structures containing a 'minor' syllable with /ə/-vocalism and tone /3/ and a 'major' syllable type with no /ə/-vocalism:

|^{3}C^{T}CV(N,P)| (T = one of the three tones defined above, N = nasal consonant, P = plosive)

↓

/^{3}Cə^{3}CV(N,P)/ → [^{3}Cə^{3}CV] [^{3}Cə^{3}CVN] [^{3}Cə^{3}CVP]

/^{3}Cə^{2}CV(N)/ → [$^{\bar{3}/\underline{3}}$Cə^{2}CV] [$^{\bar{3}/\underline{3}}$Cə^{2}CVN] ($\bar{3}$ = a bit higher than 2, $\underline{3}$ = a bit lower than 3)

/^{3}Cə^{31}CV(N)/ → [^{3}Cə^{3}CV↓] [^{3}Cə^{3}CVN↓]

A realization such as **[^{3}Cə^{1}CV(N)] does not occur. Thus syllable structure /^{3}Cə^{31}CV(N)/ suggests an interpretation as |^{3}C^{1}CV(N)| underlyingly because a) there is no phonetic/phonemic syllable sequence **/^{3}Cə^{1}CV(N)/, and b) a structural gap would be created morphophonologically by acknowledging only tonemes |2| and |3| in these disyllabic structures.

A deep structural π-rule (π = a mutation rule with a high degree of phonemic plausibility and no change of the semantics involved) can be formulated to the effect that a realization as /31/ is plausible for a |1|-toneme syllable when following a preformative ('prefix') in toneme |3|:

|1| → /31/ / |^{3}C| ——

Examples: |^{3}1^{1}ŋai| → /^{3}1ə^{31}ŋai/ 'one'

|^{3}1^{1}khoŋ| → /^{3}1ə^{31}khoŋ/ 'two'

|^{3}n^{1}ta| → /^{3}n^{31}ta/ 'house'

|^{3}tž^{1}khan| → /^{3}tžə^{31}khan/ 'crab'

The intuitive correctness of this rule is confirmed by the fact that after the negation marker |^{3}N| → /^{3}N/ → [^{3}ŋ̩] ~ [^{3}m̩], a monosyllabic verb in |1|-toneme appears as /31/ phonemically/phonetically:

'I don't want to meet (= see) him tonight":

/^{2}ŋai ^{2}ši^{3}phe? ^{1}dai^{3}na? ^{3}N^{31}mu ^{1}mə^{2}yu ^{2}ai./

I he-obj. tonight not-see want vb.pcle.

As regards such monosyllabic words as /^{31}wa/ 'father', /^{31}nu/ 'mother', /^{31}gu/ 'WiFa' and /^{31}sa/ 'HuFa', they are most probably derived from original vocatives; besides, their regular g-prefixed reference forms occur side by side: /^{1}gə^{1}wa/, /^{1}gə^{1}nu/, etc.

The overall analytical evidence[29] thus points to the elision of /31/ as an underlying tonemic entity. The result is that, from the purely synchronic point of view, there are three underlying tones for syllables with sonorant finals and non-/ə/-vocalism, two tones (high and low) for syllables with final occlusives plus the glottal stop, and two tones (high and low) for 'prefix' syllables with /ə/-vocalism (not recognized by Matisoff 1974).

Since there is remarkable similarity among the different Kachin dialects observed so far in points of sound structure, tone systems, and identity of vocabulary, we need not dwell here on the question of sub-groupings. Rather, we can make an on-the-spot comparative tonological identification by attributing to each underlying toneme a comparative TC, such as for instance |1| → TC-I, etc., and trying to establish comparative TC correspondences among the three TB subgroups considered here. For purposes of expository clarity, the identification of underlying tonemes with comparative TC's shall not be made, however, because an inter-dialect tonological comparison of Kachin is yet to be effected. In this context it is quite sufficient to take the tones at their face value, and compare them with the TC's of KN and Baric. This leads to the

EVIDENCE FOR CLAIM 4) The diagram of KN, Baric and Jg. tonological correspondences is a compromise in as far as a sizeable number of good etyma, for which there is every reason to believe in their common TB origin, shows divergent tonological development in the three subgroups. A rough guess as to the number of these exceptional tonological developments would be in the 15-20% range, although, in my optimistic opinion, this number should decrease when more etyma are established along the analytical lines depicted here. For the time being, it will be proper to concentrate on the 80-85% regularity phenomena; for them, a tonological super-group correspondence diagram can be established, in comparative terms, as follows:

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[29] Some more of it can be found when analyzing the system of clause-final grammatical formatives.

PROTO-KUKI-NAGA-BARIC-JINGHPAW

	TC-I	TC-II		TC-III
		a	b	
Kuki-Naga	TC-I	TC-IIa and TC-IIb$_2$	TC-IIb$_1$	TC-III
Baric	TC-I	TC-II	TC-IV	TC-III
Kachin	|2|	|1|	|3|	|2|

Diagram 3.- Kuki-Naga, Baric, and Kachin tonological correspondences (smooth syllables)

Obviously the development of Proto-KNBJ in TC-I and TC-III has led to the same result in Kachin. This is the reason why we said (cf. note 8) that the Kachin evidence is useless for the differentiation of TC-I from TC-III etyma. On the other hand, the diagram shows that Kachin makes the same, consistent (almost exceptionless) difference between open syllable TC-IIa and TC-IIb etyma as Lushai, Tangkhul, Angami, Chakhesang, Northern Rengma, Lotha, etc. of the KN languages, and Nocte, Tangsa and Chang of the Baric languages. On purely comparative analysis, there is no way of determining why there is a 'split' in TC-II where most of the open syllable etyma are in a tone different from their closed syllable TC-II counterparts. Spoken in terms of a tonogenetic reconstruction theory, the claim will be made that this 'split' phenomenon is due to a special configuration of reconstructional elements of the ancestral language, and must be explained by constraints. As it stands, the Proto-KNBJ tonological diagram may be interpreted in any reasonable way that is congruent with linguistic background knowledge about such tone system developments. Since the reconstruction experiment sketched in 1. was found to be fraught with extreme difficulties as soon as the TC-I reconstruction domain was left, we try now, for the first time, to sketch a reconstruction theory, the basic idea of which, is to make syllable-final laryngeal elements responsible for the development of the tone systems found in the three language subgroups. In particular, it will be our claim that TC-II etyma ultimately derive from a creaky phonation type (indicated by a superscript -ʔ) and TC-III etyma from a breathy phonation type (indicated by a superscript -h), whereas TC-I

etyma will be assumed to be of the 'clear' type (with no superscript at all). All three phonation types must, in addition, be differentiated from a fourth, namely, whispery voice, the manifestation of which we see in final -s in Tibetan. Final *-s will play a decisive role in the explanation of the verbal paradigms of Central and Northern Kuki and the Arunachal branch of Eastern Baric (Nocte, Tangsa, and most probably Wanchuk); words having TB final *-s lead to a separate tonological comparative category and may never in any case be mixed with any other TC.

The aim of positing a tonogenetic laryngeal reconstruction theory for TB necessitates another procedural step, that is, the search for synchronical remnants of such laryngeals. This leads us to
EVIDENCE FOR CLAIM 5). The three TC diagrams given above lead one to the conclusion, that, if a laryngeal reconstruction theory is made the explanatory base of TB tone languages,

a) there should not be any laryngeal elements associated with TC-I tones;

b) since TC-II tones are most markedly dissimilar from TC-I tones (that is, hardly or almost no coalescence of tones within a single tone system), there must be a laryngeal differentiation more fundamental than the one to be made responsible for the not so marked dissimilarity of TC-III tones from the other two tonal categories;

c) if a breathy phonation type is assumed to be responsible for the development of tones into the TC-III category, then we should expect a 'closer' tonological relationship of the TC-III with the whispery voice or *-s category; and

d) on the other hand, if a whispery voice or *-s category is assumed to have existed in Proto-TB, we should expect tonological relationship with all other phonation types.

The negative evidence in support of a) and the positive one in support of b) is easy to come by. For this purpose, we disregard those languages that either have no special laryngeal features associated with any tones (such as Lushei, Tiddim, Thadou, Anal, Mon, Kom, Lamgang, Chiru, Meithei, Tangkhul, Zemei, Angami, Chakhesang, Northern Rengma, Southern Rengma, Sema, Yimchunger, Sangtam, Chang, Konyak, Khiamngan, and Kachin), or that have the same laryngeal features

associated with all tones (such as Lakher, Rongmei and Liangmei, where all syllables are combined with final glottal stop or creaky voice regardless of their inherent tone). We have, however, the noteworthy evidence of Garo and Boro where TC-I etyma NEVER occur with a glottal stop; of Lotha Naga where low tone /1/ syllables freely glide down without laryngeal obstruction, whereas mid level and high level tone syllables are automatically realized with final glottal stop in the position before pause:

/1/ → [↘],
/2/ → [→ʔ],
/3/ → [↗ʔ];

of Mikir and Nocte where the majority of good TC-I and TC-III etyma glide down from their respective pitch heights (low and high), whereas TC-II etyma are realized generally on a mid level closed by final glottal stop:

/low/ → [↘],
/mid/ → [→ʔ],
/high/ → [↗];

and of Tangsa where TC-IIa etyma are realized on low level with automatic final glottal stop, whereas the two other tonemes have no such glottal stop:

/1/ → [→ʔ],
/2/ → [→], and
/3/ → [↗].

In addition, the Baric group with the exception of Chang is very consistent in having final glottal stop in its TC-IV = Proto-KNBJ TC-IIb category.

As for evidence relating to c) and d), it will be most convincing to cite the complete data of one *-s etymology, of which there cannot be the slightest doubt about the comparative identity, that is, 'two' (Tibetan gñis):

Lu. hniʔ (that is, *-s > -ʔ, = separate tone class; the realization of -ʔ syllables is predictably low; the frequency of this low level is identical with low tone [= KNBJ TC-III] /_/ syllables),

Th. ^{1}ni (*-s dropped, tone identical with low tone /1/ syllables [= KNBJ TC-I and TC-III]),

An. ^{1}a^{2}nhɑ (*-s dropped, tone identical with high tone /2/ syllables [= KNBJ TC-IIa and TC-IIb]),

Kom ^{1}in^{2}ni (*-s dropped, tone identical with high tone /2/ syllables [= KNBJ TC-I and TC-III]),

Lg. ^{1}ki^{2}ni (*-s dropped, tone identical with high tone /2/ syllables [= KNBJ TC-IIa]),

La. ^{3}sa^{2}nɑ (*-s dropped, tone identical with mid level tone /2/ syllables [= KNBJ TC-III]),

Ta. ^{3}khə^{3}ni (*-s dropped, tone identical with high level tone /3/ syllables [= KNBJ TC-III]),

Ro. -ka-nai (*-s dropped, tone identical with higher-mid level tone /-/ syllables [= KNBJ TC-II]),

Li. ˌne (*-s > mid-falling tone, tone apparently not identical with any of the major TC's),

Ze. ^{1}ke^{2}na (*-s dropped, tone identical with /2/ tone [= KNBJ TC-IIb] syllables within a five-toneme pitch tone system),

Ag. ^{2}ke^{2}nie, and Ck. ^{2}kɤ^{2}na (*-s dropped, tone identical with /2/ tone syllables [= KNBJ TC-I, one sub-category only]),

NR ^{1}Gi^{2}ni (*-s dropped, tone identical with mid level tone /2/ syllables [= KNBJ TC-III and TC-IIb]),

SR ^{4}kʌ^{4}n^{4}yhũ (*-s dropped, tone identical with /4/ tone [= KNBJ TC-I and TC-III] syllables within a 5-toneme pitch level system),

Lo. ^{1}e^{3}ni (*-s > [-ʔ], tone and ʔ-realization identical with high tone /3/ syllables [= KNBJ TC-IIa and TC-III]),

Yi. ^{1}maʔ^{2}ñe (= |^{1}|) (*-s dropped, tone identical with low tone /1/ syllables [= KNBJ TC-II and TC-III]),

Mi. ^{2}hi^{3}ni (*-s dropped, tone identical with high tone /3/ syllables [= KNBJ TC-III in the majority of cases]),

No. ^{1}wan^{2}ni (*-s dropped, tone identical with high tone /2/ syllables [= KNBJ TC-III]),

Ts. ^{1}ʌ^{2}nʌi (*-s dropped, tone identical with mid level tone /2/ syllables [= KNBJ TC-III]),

Ch. `ñi (*-s dropped, tone identical with falling tone syllables [= KNBJ TC-III]),

Ko. †ʌñi (*-s dropped, tone identical with high tone |3| syllables [= KNBJ TC-III]), and

Ga. Gni, and Bo. nɤi (*-s dropped, non-glottalized syllable types agreeing with the ones found in KNBJ TC-I and TC-III).

Of particular importance is the testimony of the Baric languages which all seems to point towards a coalescence of the

KNBJ TC-III and *-s categories. In conclusion, it may be said that the hypothetical glottal stop responsible for the tonological development to KNBJ TC-II is still an observable entity in some of the languages under consideration. As regards a breathy phonation type with final *-h, its trace is no longer observable anywhere, but must be inferred from the development to KNBJ TC-III etyma.

The overall evidence presented up to this point is sufficient to establish a tonogenetic laryngeal TB reconstruction theory. Luckily for the historical analyst, there is one additional range of observational phenomena in TB languages that should play the decisive role of the ultimate arbiter with regard to the acceptance or rejection of a laryngeal TB reconstruction theory. This evidence is the concern of the following analysis.

3. THE VERBAL ALTERNATION PATTERNS OF KUKI-CHIN AND EASTERN BARIC-II.

Whereas the verbal alternation phenomena involving regular tone changes so far observed in some Central and Northern Kuki[30] languages could lead one to the conclusion that they are restricted to a limited subgroup area and thus deserve no analytical treatment within a TB tonogenetic perspective, this is no longer the case after the discovery of essentially the same tonal regularities existing in Nocte and Tangsa. A possible explanation as areal diffusion is ruled out because, apart from the alternation phenomenon itself, these two groups share the same extremely low number of cognates with each other that is characteristic of the Kuki-Naga and Baric languages in general. What we will be able to show here is the fact (now no longer a claim) that the major classes of tonological alternations in Kuki Chin have their analogous counterparts in Nocte and Tangsa, and, that the tonal categories involved in these alternations mutually agree with each other by way of identical relationships with the comparative KNBJ tonal categories established in diagram 3. As regards the semantic distinction involved in these tone changes, there is

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[30] Cf. Henderson 1965 for Tiddim Chin, Weidert 1975 for Lushai, and Löffler 1974 for an attempt to reconstruct these phenomena.

about 90% similarity between Kuki and Baric, in that the first form (the quotation form) represents the verb in its finite state (such as it may be used in verbal present or past tense expressions), whereas the second form represents it in its non-finite state (such as it may be used for verb-derived nouns or attributes)[31].

Dealing first with the Kuki languages, we observe that there is a fairly large number of alternation patterns where we have to take into account a) whether the syllable is open or closed, b) what kind of tone a syllable may have in its first form, and c) whether open syllable verbs are subject or not to an underlying process termed ρ = REDUCTION[32]. Reduction phenomena of the verb in Kuki have so far been observed only for Lushai; the rules state that only those verb stems that undergo reduction also show segmental changes in their second form (such as /¯ba/ → /bat/, /_khu/ → /ˋkhuk/), whereas verb stems that are not subject to reduction only undergo non-segmental, that is, tonal changes (such as /¯pi/ → /_pi/ 'to be stunted in growth', /ˊbua/ → /_bua/ 'to be immature'). Another significant correlation appears to exist at the comparative level where only the reduction group of verbs has cognates in other languages[33]. Thus, for the purpose of this

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[31]There is a hypothesis put forth by Löffler that different verbal tone classes are arranged on a transitive vs. intransitive dichotomy. Judged from the viewpoint of comparative EB-II - Kuki Chin, there is nothing that could be adduced in support of such an hypothesis. So it looks as if this dichotomy manifests itself only in Bâwm (where Löffler 1974 quotes a number of exceptions that are hard to follow up).

[32]Reduction phenomena have been described in Weidert 1975 for Lushai; e.g., a noun such as /¯aar/'fowl' reduces to /¯ar/ when standing in first position of certain compounds, or /¯mu/ 'hawk' reduces to the short high tone /ˋmu/ when standing in the first position of compounds. There are two reduced/short tones in Lushai with phonemic relevance (high vs. low). The possibility of reduction versus non-reduction of open syllable verbs does not appear to exist with open syllable nouns where reduction in compounds is compulsory.

[33]It is of course not difficult to provide possible explanations as to why this could be so. We feel, however, that as long as not even the main problems in this field have been effectively dealt with, the analysis of such particular phenomena should be postponed. Anyhow, the small group of no-reduction verbs does not constitute a stumbling block for the system outlined here.

paper, we shall omit the treatment of no-reduction verbs.

A five-fold division for the Kuki verbal paradigm may be established in terms of tonological categories:

(1) TC-I: The first verbal form is comparatively identical with TC-I nouns established by diagram 3.

(2) TC-II: The first verbal form is comparatively identical with TC-II nouns established by diagram 3.

(3) TC-III: The first verbal form is comparatively identical with TC-III nouns established by diagram 3.

(4) TC-IV: The final *-s category

(5) TC-V: The final plosive category (P = /p, t, k/)

In the TC-I category, the overwhelming number of verbs have the following kind of alternation:

[Closed syllables] First verbal form I. ^{I}CV(V)Ć ⟶

Second verbal form II. ^{III}CV(V)Ć [34].

[Open syllables] I. ^{I}CV ⟶ II CVt[35]

Examples:

'pregnant': I. Lu. ¯dam, Ti. -dam ⟶ II. Lu. _dam, Ti. `dam.

'owe': I. Lu. ¯ba, Ti. -ba ⟶ II. Lu.Ti. bat

One segmental change is significant here, too. A final velar nasal is changed to a dental nasal in the second form:

'hang': I. Lu. ¯baaŋ, Ti. -baaŋ ⟶ II. Lu. _baan, Ti. `baan.

Looking at the historical dimensions that might be involved in these changes, we have to answer at least the following questions:

a) Why do closed TC-I verbs change to TC-III in the second verbal form?

b) Why does the same change occur with TC-II verbs?

c) Why does an open syllable TC-I verb change to a CVt syllable?

d) Why is this change different from the TC-II open class which changes to Lu. [`CVVk]/Ti. [,CVVk]?

e) Why do ^{I}ŋaai 'to love' and ^{I}nui 'to laugh' change to II. ^{IV}ŋai? and ^{IV}nui?, in opposition to a)?

f) What is the reason for the change of I. Lu. ¯man, Ti.

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[34] Ć = continuants containing the two subclasses R(esonant) = -i, -u, -r, -l, and N(asal) = -m, -n, -ŋ.

[35] The pitch level of CVP syllables is predictably low.

-man, to II. Lu. `man, Ti. mat 'to catch' (and similarly a few other verbs such as Lu. I. ¯riŋ, II. `rin 'to believe', and I. ¯kheeŋ, II. `khen 'to hammer')?

g) Why does final /-ŋ/ change to /-n/ in the second form?

h) Should there be a significant interrelationship between a tonogenetic laryngeal reconstruction theory and an explanation in terms of the phonetics involved of the verbal alternation phenomena?

This final question is the crux of the whole argument in support of the establishment of a laryngeal rec-theory. Until now, the entire evidence in favor of a particular rec-theory, that is able to explain the development of tones in ST languages, is nothing but an approximation, where certain facts agree particularly well with the rec-theoretical premises, whereas others, that might be equally significant, have to be disregarded because the theory in question does not make any significant statement about them. The evidence that led to the postulation of C_i-derived tonogenetic rec-theories thus left the whole question of verbal alternations completely untouched. And this may now be viewed as the major defect of C_i-derived rec-theories, compared to the significant statements a laryngeal rec-theory is able to make about these changes.

The comparative and phonological evidence advanced so far pointed to the postulation of a laryngeal rec-theory where TC-I etyma would be reconstructed without a final laryngeal (positing clear voice phonation), TC-II etyma with final glottal stop (positing creaky phonation), and TC-III etyma with final aspiration (positing breathy phonation). Let us see how this scheme translates into the field of verbal alternations.

A change of TC-I and TC-II verbs to TC-III in verb stem II. is equivalent, historically, to the following process:

I. *CV(V)C or *CV(V)$C^{ʔ}$ ⟶ II. *CV(V)C^{h}

This, of course, is no explanation because the rule does not tell us just WHY most of the verbs change to TC-III (viewed synchronically, they could change equally well to TC-II or remain as they are in TC-I). We now venture the following hypothesis: There must be a suffix, of which the peculiar phonetic nature conditions the change to breathy phonation

of the verb stem, and which has left its segmental imprint in the form of final /-t/ in the open class (dropping it after final continuants is quite a natural phonetic process). All other observable derivations are secondary and have to be accounted for by special assumptions.

Assuming that *-d^h is this final suffix, the following explanatory pattern is obtained for TC-I closed syllable verb stems:

I. *CV(V)C [yielding ^{I}CV(V)C comparatively and Lu. /¯CV(V)C/ and Ti. /-CV(V)C/ descriptively]
⟶ II. *CV(V)C-d^h → *CV(V)C^{h}d → *CV(V)C^h [yielding ^{III}CV(V)C comparatively and Lu. /¯CV(V)C/ and Ti. /ˋCV(V)C/ descriptively].

Similarly for TC-I open syllable verbs:

I. *CV⟶ II. *CV-d^h → *CV^{h}d [yielding ^{V}CVt (TC-Va = short vowel CVP syllables) comparatively, the realization of CVt syllables on a low level pitch in Lu. is historically explained by the breathy nature of *V^h, that is, association with the TC-III category]

Now we reconstruct 'pregnant' and 'owe':

Proto-Kuki I. *dam ⟶ II. *dam-d^h → *dam^{h}d → *dam^h [→ ^{III}dam comparatively]

Proto-Kuki I. *ba ⟶ II. *ba-d^h → *ba^{h}d [→ ^{V}bat, TC-Va = short vowel CVP syllables]

As regards questions e) and f) above, another suffixal element has to be recognized; in conformity with aspects of changes occurring in the TC-III, TC-IV and TC-V categories, it will be reconstructed as a voiceless dental sibilant *-s-:

P-K I. *ŋai [^{I}ŋaai[36], = Lu. ¯ŋaai, Ti. -ŋaai] 'to love'
⟶ II. *ŋai-s-d^h → *ŋai^{h}sd → (change of *-R-s(-d) to the TC-IVb_1 category, cf. inf.) ^{IV}ŋai? , = Lu. Ti. ŋai?.

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[36]There is no historical evidence for the /-ai/ and /-au/ diphthongs of Lushai. We reconstruct /-ei/ and /-ou/ rhymes as *-ei and *-ou, and /-aai/ and /-aau/ rhymes as *-ai and *-au, respectively. The change of short to long vowel nuclei may be explained by system pressure where different structural layers have mutually influenced each other.

P-K I. *nui [^{I}nui, = Lu. ¯nui, Ti. -nuui (long vowel analogous to /-ŋaai/)] 'to laugh'
——→ II. *nui-s-d^{h} → *nui^{h}sd → ^{IV}nui?, = Lu.Ti. nui?.
P-K I. *man [^{I}man, = Lu. ¯man, Ti. -man] 'to catch'
——→ II. *man-s-d^{h} → *man^{h}sd → (change of *-N-s(-d) to TC-IVb$_{2}$, Ti. *-nsd > *-d) ^{IV}man?, = Lu. `man, Ti. mat.
P-K I. *yuar [^{I}zuar, = Lu. ¯zuar, Ti. -zuak] 'to sell'
——→ II. *yuar-s-d^{h} → *yuar^{h}sd → (vowel shortening conditioned by *-s-, *-Rs(-d) > TC-IVb$_{1}$) ^{IV}zor?, = Lu. zɔr? (Ti. II. `zuak either < *yuar-d^{h} or analogical leveling).

As regards the open syllable verb 'to be dead', the change to a TC-IV syllable is explained in a like manner:
P-K I. *t^{ʔ}i [^{I}shi, = Lu. ¯thi, Ti. -si] 'dead'
——→ II. *t^{ʔ}i-s-d^{h} → *t^{ʔ}i^{h}sd → (*-is(-d) → TC-IVa) ^{IV}shi?, = Lu. thi?, Ti. si?.

The assimilatory change of final *-ŋ to *-n before the following dental plosive yields the desired explanation of question g) above:
P-K I. *sriŋ [^{I}hriŋ, = Lu. ¯hriŋ, Ti. -hiŋ] 'to be green'
——→ II. *sriŋ-d^{h} → *srin^{h}d → ^{III}hrin, = Lu. _hrin, Ti. `hin.
Lu. I. /¯kheeŋ/, II. /`khen/ 'to hammer' is of course explained by
I. *kheeŋ ——→ II. *kheeŋ-s-d^{h} → *kheen^{h}sd → (vowel shortening because of *-s-) *khen^{h}sd → (*-Nsd > TC-IVb$_{2}$) ^{IV}khen? = /`khen/.

In the TC-II category, the overwhelming number of closed syllable verbs has the following alternation pattern:
I. ^{II}CV(V)C ——→ II. ^{III}CV(V)C
As regards open syllable verbs that are suspected of TC-II membership, we shall associate the LESS NUMEROUS GROUP
Lu. I. ˏCV, II. `CVt[37] = Ti. I. -CV, II. ˏCVt ~ CVt ~ `CVt with KN TC-IIa [= closed] = TC-IIb$_{2}$ [= 8 open syllable noun etyma]; and the MORE NUMEROUS GROUP
Lu. I. _CV, II. `CVk = Ti. I. ˏCV, II. ˏCVk with KN TC-IIb$_{1}$.

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[37]Lengthening of the vowel before final plosives is phonemically redundant and not indicated in phonemic representations, thus /`CVP/ (that is, any syllable with one of the four 'full' tones combined with final plosive) =

This yields the following historical explanations:
[Closed syllables] I. *CV(V)C$^{?}$ [yielding ^{II}CV(V)C comparatively, = Lu.Ti. rising tone syllables]
——→ II. *CV(V)C$^{?}$-d^{h} → *CV(V)C^{h}d → *CV(V)C^{h} [→ ^{III}CV(V)C, = Lu. low level and Ti. falling tone syllables].

Examples:
P-K I. *glheem$^{?}$ [^{II}klheem, = Lu. ˌtlheem, Ti. ˌxɛɛm] 'to tempt'
——→ II. *glheem$^{?}$-d^{h} → *glheem^{h}d → *glheem^{h} → ^{III}klheem, = Lu. ˍtlheem, Ti. `xɛɛm.
P-K I. *lei$^{?}$ [^{II}lei, = Lu.Ti. ˌlei] 'to buy'
——→ II. *lei$^{?}$-d^{h} → *lei^{h}d → *lei^{h} → ^{III}lei, = Lu. ˍlei, Ti. `lei.

Again the change of /-ŋ/ to /-n/ before *d^{h} poses no problems:
P-K I. *yaaŋ$^{?}$ [^{II}zaaŋ, = Lu.Ti. ˌzaaŋ] 'light - not heavy'
——→ II. *yaaŋ$^{?}$-d^{h} → *yaan$^{?}$d^{h} → *yaan^{h}d → ^{III}zaan, = Lu. ˍzaan, Ti. `zaan.

A small class of 'exceptions' is easily accounted for by *-s-:
P-K I. *thou$^{?}$ [^{II}thou, = Lu.Ti. ˌthou] 'to rise up'
——→ II. *thou$^{?}$-s-d^{h} → *thou^{h}sd → (diphthong reduction conditioned by *-s-) *tho^{h}sd → ^{IV}tho?, = Lu. and Ti. tho?.
P-K I. *nuam$^{?}$ [^{II}nuam, = Ti. ˌnuam, Lu. ˍnuam, low level tone analogous to similar TC-III closed syllable alternation patterns] 'Ti. to yearn for, Lu. to be comfortable'
——→ II. *nuam$^{?}$-s-d^{h} → *nuam^{h}sd → (with *-msd> Ti. -p, vowel shortening because of [*-s-], *-N-s(d) > TC-IVb$_{?}$) ^{IV}nom?, = Lu. `nom, Ti. nop[38].

As regards the MORE NUMEROUS open syllable group of verb stems, it is easily explained by
P-K I. *CV$^{?}$ ——→ II. *CV$^{?}$-d^{h} → (assimilatory change of *-d > *-g because of two laryngeal elements without intervening sibilant, plus compensatory vowel lengthening) *CVV^{h}g → (with falling

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[38] Similar explanations result for the following etyma:
'to be near' Lu. I. ˍhnaai, II. hnai? (= *hnai$^{?}$-s-d^{h}) = Ti. I. ˌnaai, II. `naai (= *hnai$^{?}$-d^{h})
'to be afraid' Lu.I. ˌhlaau, II. hlau? Ti.I. ˍlaau, II. `laau
'to weed' Lu. I. ˌtlhou, II. tlho? Ti.I. ˌxou, II. xo?
'to finish' Lu. I. ˌzou, II. zo? Ti.I. ˌzou, II. zo?, and Lu. I. ˌsin, II. `sin 'to wear'.

tone in Lushai = association with /CV(V)C/ low tone [TC-III] syllables[39]) ^{V}CVVk (TC-Vb, = long vowel CVVP syllables), = Lu. `CVk, Ti. ,CVk (Ti. rising tone = association with /,CV(V)C/ syllables [= TC-II] probably because the glottal stop element in *CV$^{?}$-d^{h} dominates over the breathy element, thus *CV$^{?}$-d^{h}→ *CVV$^{?}$g).

The LESS NUMEROUS GROUP is explained by infixed *-s-:

P-K I. *CV$^{?}$ ——→ II. *CV$^{?}$-s-d^{h} → *CVV^{h}sd (or Ti. *CVV$^{?}$sd) → ^{V}CVVt, = Lu. `CVt, Ti. ,CVt.

Examples:

P-K I. *kha$^{?}$ [^{II}kha, = Lu. _kha, Ti. ,xa] 'to be bitter'
——→ II. *kha$^{?}$-d^{h} → *khaa^{h}g (or Ti. *khaa$^{?}$g) → ^{V}khaak, = Lu. `khak, Ti. ,xak.

P-K I. *ru$^{?}$ [^{II}ru, = Lu. _ru, Ti. ,gu] 'to steal'
——→ II. *ru$^{?}$-d^{h} → *ruu^{h}g (or Ti. *ruu$^{?}$g) → ^{V}ruuk, = Lu. `ruk, Ti. ,guk.

P-K I. *la$^{?}$ [^{II}la, = Lu. _la, Ti. ,la] 'to take'
——→ II. *la$^{?}$-d^{h} → *laa^{h}g (or Ti. *laa$^{?}$g) → ^{V}laak, = Lu. `lak, Ti. ,lak.

P-K I. *sne$^{?}$ [^{II}hne, = Lu. _hne, Ti. ,nɛ] 'to suck'
——→ II. *sne$^{?}$-d^{h} → *snee^{h}g (or Ti. *hnee$^{?}$g) → ^{V}hneek, = Lu. `hnek, Ti. ,nɛk.

P-K I. *de$^{?}$ [^{II}de, = Lu. ,de, Ti. -dɛ] 'to shine, to appear (of moon)'
——→ II. *de$^{?}$-s-d^{h} → *dee^{h}sd → ^{V}deet, = Lu. `det, Ti. det (analogous to TC-I open verbs?)

P-K I. *gle$^{?}$ [^{II}kle, = Lu. ,tle, Ti. -tɛ] 'to shine, gli '
——→ II. *gle$^{?}$-s-d^{h} → *glee^{h}sd (or Ti. *glee$^{?}$sd) → ^{V}kleet, = Lu. `tlet, Ti. ,tɛt.

P-K I. *phe$^{?}$ [^{II}phe, = Lu. ,phe, Ti. -phɛ] 'to twinkle, to tremble'
——→ II. *phe$^{?}$-s-d^{h} → *phee^{h}sd → ^{V}pheet, = Lu. `phet, Ti. `phɛt.

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[39] Cf. [TC-I] /¯CV(V)C/ corresponding with /¯CVP/, [TC-II] /,CV(V)C/ corresponding with /,CVP/, so [TC-III] /_CV(V)C/ corresponding with /`CVP/.

In the TC-III category, two different major developments should be expected according to whether the suffix is only *-d^h, or whether it is combined with *-s-. For the closed syllable type which occurs much more frequently than the open syllable type, the following alternation patterns are obtained:

I. ^{III}CV(V)C ⟶ II. a) ^{III}CV(V)C (no change at all)
b) ^{IV}CV(V)C?

The identity of the two verbal forms in case a) is easily taken account of by postulating only *-d^h for II.:

I. *CV(V)C^h ⟶ II. *CV(V)C^h-d^h → *CV(V)C^hd → *CV(V)C^h [→ ^{III}CV(V)C]

In case of b), the derivation by means of *-s-d^h is obvious:

I. *CV(V)C^h ⟶ II. *CV(V)C^h-s-d^h → *CV(V)C^hsd → (vowel shortening because of *-s-) *CVC^hsd → (= TC-IVb$_1$) ^{IV}CVR?,= Lu.Ti. final glottal stop syllables, or (= TC-IVb$_2$) ^{IV}CVN?, = Lu. `CVN, Ti. CVP.

Examples:

P-K I. *lou^h [^{III}lou, = Lu. _lou, Ti. `lou] 'not to be'
⟶ II. *lou^h-s-d^h → *lou^{h}sd → *lou^{h}s → (= TC-IVb$_1$) ^{IV}lou?, = Lu.Ti. lou?.

P-K I. *ŋeen^h [^{III}ŋeen, Lu. _ŋeen, Ti.`ŋeen] 'to ask for'
⟶ II. *ŋeen^h-s-d^h → *ŋeen^{h}sd → (vowel shortening, TC-IVb$_2$, Ti. *-nsd > *-d) ^{IV}ŋen?, = Lu.`ŋen, Ti. ŋet.

P-K I. *laŋ^h [^{III}laŋ, = Lu. _laŋ, Ti. `laŋ] 'to appear'
⟶ II. *laŋ^h-s-d^h → *lan^h-s-d^h → *lan^{h}sd → (TC-IVb$_2$, Ti. *-nsd > *-d) ^{IV}lan?, = Lu. `lan, Ti. lat.

P-K I. *kai^h [^{III}kaai, = Lu. _kaai, Ti. `kaai] 'to pull,drag'
⟶ II. *kai^h-s-d^h → *kai^{h}sd → (= TC-IVb$_1$) ^{IV}kai?, = Lu. Ti. kai?.

P-K I. *bal^h [^{III}baal, = Lu. _baal, Ti. `baal] 'to be dirty'
⟶ II. *bal^h-s-d^h → *bal^{h}sd → (vowel remains short, TC-IVb$_1$) ^{IV}bal?, = Lu. and Ti. bal?.

As regards open syllable TC-III verbs, the clashing together of two laryngeals without intervening *-s- produces another example of assimilatory change of *-d > *-g:

I. *CV^h ⟶ II. *CV^h-d^h → *CVV^hg (with compensatory lengthening) or *CV^hg (without lengthening)

In case of the suffix combination *-s-d^h, we should expect a development similar to TC-IVa:

I. *CV^{h} ⟶ II. *CV^{h}-s-d^{h} → *CV^{h}sd → (analogous to TC-IVa)
^{IV}CVs, = Lu. and Ti. CV?.

Examples:

P-K I. *si^{h} [^{III}si, = Lu. _si, Ti. `si] 'to fight with horns'
⟶ II. *si^{h}-d^{h} → *sii^{h}g (or Ti. *si^{h}g) → ^{V}si(i)k, = Lu. `sik, Ti. sik.

P-K I. *sa^{h} [^{III}sa, = Lu. _sa, Ti. `sa] *'to sing'*
⟶ II. *sa^{h}-d^{h} → *sa^{h}g → ^{V}sak, = Lu.Ti. sak.

P-K I. *smu^{h} [^{III}hmu, = Lu. _hmu, Ti. `mu] 'to see, to get'
⟶ II. *smu^{h}-s-d^{h} → *smu^{h}sd → ^{IV}hmu?, = Lu. hmu?, Ti. mu?.

In case of P-K *brha^{h}'to be good', dissimilation of the two laryngeals by dropping the first one must be assumed:

P-K I. *brha^{h} [^{III}prha, = Lu. _trha, Ti. `pha, Ta. [illegible]]
⟶ II. *brha^{h}-d^{h} → *brha-d^{h} → *brha^{h}d → ^{V}prhat, = Lu. trhat, Ti. phat.

The TC-IV alternation category is also termed 'final *-s category' because all syllable types established in comparative terms will be explained by means of final *-s. To establish the tonological identity of nouns and verbs within this class is a trivial task which we shall not pursue here. TC-IV will be differentiated according to whether a single short vowel, or combinations of short or long vowel plus resonant (R = -i,-u,-r,-l) or nasal continuant (N = -m,-n,-ŋ) precede final *-s:

[TC-IVa] = words of *CVs structure
[TC-IVb] = words of *CVCs structure
[TC-IVb$_1$] = *CVRs, [TC-IVb$_2$] = *CVNs.
[TC-IVc] = words of *CVVCs structure
[TC-IVc$_1$] = *CVVRs, [TC-IVc$_2$] = *CVVNs.

In Lushai, all TC-IV verb etyma are the same segmentally as well as tonologically in both verbal forms. In the TC-IVb$_2$ and TC-IVc categories, Tiddim shows both segmental as well as tonological changes in the second forms. These facts pose the question of the identity of the suffixal element(s). As for TC-IVa and TC-IVb$_1$, it could be either *-d^{h} or *-s, or a combination of both (maybe the same *-s had already been firmly affixed to such etyma in Proto-TB):

[TC-IVa]

I. *CVs ——→ II. *CVs-d^h → *CV^{h}sd → *CVs → ^{IV}CV?, or *CVs-s or *CVs-s-d^h → *CVs → ^{IV}CV?, = Lu.Ti. CV?.

[TC-IVb_1]

I. *CVRs ——→ II. *CVRs-d^h ~ *CVRs-s ~ *CVRs-s-d^h → *CVR^{h}sd → *CVRs → ^{IV}CVR?, = Lu.Ti. CVR?.

Examples:

P-K I. *khus [^{IV}khu?, = Lu. khu?, Ti. xu?] 'to cover'
——→ II. *khus-d^h → *khu^{h}sd → *khus, or *khus-s or *khus-s-d^h → *khus → ^{IV}khu?, = Lu. khu?, Ti. xu?.

P-K I. *kals [^{IV}kal?, = Lu.Ti. kal?] 'to lock or fasten (a door)'
——→ II. *kals-d^h ~ *kals-s ~ *kals-s-d^h → *kal^{h}sd → ^{IV}kal?, = Lu.Ti. kal?.

In the other TC-IV subgroups, however, there is no uniform comparative relationship in the second forms of Lushai and Tiddim. In Tiddim, *CV(V)Ns and *CVVRs verbs are not overtly differentiated from the first and second forms of *CV(V)C$^?$ [→ TC-II] verbs. This suggests the possibility of analogical reshaping or leveling in the second form according to the TC-II model. Only one example has so far been found which appears to be a genuine development of the TC-IV category:

P-K I. *ens [^{IV}en?, = Lu. `en, Ti. ˌen] 'to look'
——→ II. Lu. *ens-s or *ens-d^h → *en^{h}sd → /`en/;
Ti. *ens-d^h → *en^{h}sd → (*-nsd > *-d) /et/.

As regards verb stems with final *-ŋ, it should be noted that under no circumstances, does *-ŋ change to *-n. Contrary to our assumptions, a derivation by means of *-d^h would condition the change from *-ŋ-d^h to *-nd^h, so we postulate only *-s as derivative suffix in the second forms:

P-K I. *maŋs [^{IV}maŋ?, = Lu. `maŋ, Ti. ˌmaŋ] 'to be lost'
——→ II. *maŋs-s → ^{IV}maŋ?, = Lu. `maŋ (Ti. `man reshaped according to TC-II, otherwise a form like **mat should be expected).

P-K I. *kaŋs [^{IV}kaŋ?, = Lu. `kaŋ, Ti. ˌkaŋ] 'to dry up'
——→ II. *kaŋs-s → ^{IV}kaŋ?, = Lu. `kaŋ (Ti. `kan by analogy).

The same remark holds true for TC-IVc verb forms:

P-K I. *kaans [^{IV}kaan?, = Lu. `kaan, Ti. ˌkaan] 'to walk over'
——→ II. *kaans-s → ^{IV}kaan?, = Lu. `kaan.

If **kaans-d^h, then vowel shortening should be expected: **kan^{h}sd = Lu. **`kan, Ti. **kat. The actual Tiddim form

II. `kaan is either reshaped analogous to TC-II verbs or may be explained in terms of a dissimilation of two *-s > *h:

II. *kaans-s → *kaan^{h}s → *kaan^{h} → (TC-III) `kaan.

Finally, one explanatory difficulty should be pointed out. The TC-IV explanation model developed so far does not allow the integration of words of Lu. /`CVR/ structure. There is at least one etymon that makes the comparative existence of this structure highly likely:

Lu. I. and II. `bal, Ti. I. ,bal, II. `bal 'to tear off'. This verb cannot be explained as TC-IVb$_1$ (then we would expect instead **/CVR?/ in Lushai) or TC-IVc$_1$ (this would lead to **/`baal/). The simplest solution to this problem is of course structural reshaping such that, if all verbs of the TC-IV category are overtly the same in both verbal forms, then any recently integrated (borrowed?) vocabulary items such as /`bal/ behave in the same way. The genetical solution would be to assume a particular combination of a laryngeal with final *-s, e.g.,

I. *CVR$^{?}$s, II. *CVR$^{?}$s-s → Lu. /`CVR/; Ti. II. *CVR$^{?}$s-s → (assimilatory change to *-h) *CVR$^{h}$ → (TC-III) /`CVR/.

Suffice it to mention that the treatment of such minor problems, which most probably do not touch on common TB dimensions, should be postponed until more material becomes known on the Central and Northern Kuki dialects[40].

'TC-V syllables' is the comparative label for TB syllables with final plosives *-p, *-t, and *-k. Two differentiations are necessary:

[TC-Va] = words of *CVP structure, and

[TC-Vb] = words of *CVVP structure.

The second forms of verb stems in Lushai and Tiddim are either identical with the first form or they have a /CV?/ syllable structure. This difference is again explained by the absence

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[40]The number of /`CVR/ words in Lushai is low compared /CVR/ words in the other three possible tones.

Examples of /`CVR/ words: /`pei/ 'to trade, hawk', /`v... 'to wave' (Benedict: STC, No. (90) is wrong), /`soi/ 'to shake', /`zui/ 'to follow', /`dau/ 'shallow', /`bel/ 'to cause or make to wear', /`khal/ 'solidified, congealed', /`tsol/ 'yeast', /`dul/ 'to be loose', /`tlir/ 'to beat rapidly', /`tser/ 'to bind with a string', /`zar/ 'to tickle, irritate', /`nor/ 'to push, thrust', /`tur/ 'to urge, compel'.

or presence of the *-s- suffix:

I. *CVP [^{V}CVP, = Lu. Ti. CVP] ——→ II. *CVP-d^h → *CV^hPd → *CV^hP → ^{V}CVP, = Lu.Ti. CVP (no change from I. to II.)

I. *CVP ——→ II. *CVP-s-d^h → *CV^hPsd → *CV^hsd → *CVs → ^{IV}CV?, = Lu.Ti. CV?.

I. *CVVP [^{V}CVVP, = Lu. `CVP, Ti. ˏCVP] ——→ II. *CVVP-$d^h$ → *$CVV^hPd$ → *$CVV^hP$ → $^{V}$CVVP, = Lu. `CVP, Ti. ˏCVP.

I. *CVVP ——→ II. *CVVP-s-d^h → *CVV^hPsd → *CVV^hsd → (vowel shortening because of *-s-) *CV^hs → ^{IV}CV?, = Lu. CV?.

The Tiddim derivational pattern deviates from Lushai in that most of the verb stems do not undergo the change to final glottal stop in the second form, cf.

Lu.I. `zap, II. za? Ti. I. ˏzap, II. `zap 'to fan'

Lu.I. `vat, II. va? Ti. I. ˏvat, II. `vat 'to beat down'

Lu.I. `vak, II. va? Ti. I. ˏvak, II. `vak 'to walk'

Again we have two explanatory possibilities: either we assume analogical reshaping according to the TC-II model, or we trace the difference back to an intermediate form like *CVV^hPsd where *CVV^hP eventually became associated with TC-III because of the laryngeal plus the peculiar structure of the syllable-final elements. This could explain the falling tone of Ti. II. ˏCVP syllables (but, by the same token, why does Ti. have the same etyma in rising tone in their first forms?)[11].

Examples:

P-K I. *ap [^{V}ap, = Lu.Ti. ap] 'mouldy, mildewed'
——→ II. *ap-d^h → *a^hpd → ^{V}ap, = Lu.Ti. ap.

P-K I. *thad [^{V}that, = Lu.Ti. that] 'to kill'
——→ II. *thad-s-d^h → *tha^hdsd → *tha^hsd → ^{IV}tha?, = Lu.Ti. tha?.

P-K I. *sraad [^{V}hraat, = Lu. `hrat, Ti. ˏhat] 'brave, strong'
——→ II. *sraad-d^h → *$sraa^hdd$ → *$sraa^hd$ → ^{V}hraat, = Lu. `hrat, Ti. ˏhat.

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[11] Apparently there exist some more explanatory models for *CVP and *CVVP syllables. The testimony of Classical Tibetan makes the existence of *-s in the first form likely; so maybe some verb forms should be reconstructed with *-s in the first form. In addition, there is a small number of comparable nouns of Lu. CVVP syllables in high level [→ TC-I] and rising tones [→ TC-II]. Since `CVVP → TC-III (cf. note 39), we should perhaps start our reconstruction with the assumption of different laryngeals in *CVVP syllables.

P-K I. *tshuag [^{V}tshuak, = Lu. `tshuak, Ti. ,suak] 'to go out'
——→ II. *tshuag-s-d^{h} → *tshua^{h}gsd → *tshua^{h}sd → ^{IV}tshua?,
= Lu. tshua?, Ti. sua?.
P-K I. *gaab [^{V}kaap, = Lu. `kap, Ti. ,kap] 'to shoot'
——→ II. *gaab-s-d^{h} → *gaa^{h}bsd → *gaa^{h}sd → ^{IV}ka?, = Lu. ka?
(Tiddim `kap either analogous to TC-II [→ second form in TC-III], or *gaa^{h}bsd → *gaa^{h}bd → *gaa^{h}b).

THE EASTERN BARIC-II VERB ALTERNATION PATTERNS

The study of verbal alternation patterns in Nocte and Tangsa shows a remarkable comparative and phonological similarity to the Kuki system despite the large upheavals that nowadays separate the Kuki-Naga from the Baric languages. Since there is no trace of the final *-s category any more, we establish a four-fold division of the EB-II verb paradigm in terms of tonological categories:

(1) TC-I: The first verbal form is comparatively identical with TC-I nouns established by diagram 3.

(2) TC-II: The first verbal form is comparatively identical with TC-II nouns established by diagram 3 (so that it contains the verbal paradigms of Baric TC-II and TC-IV [= corresponding to KN TC-IIb$_1$ verbs, = the MORE NUMEROUS GROUP] categories).

(3) TC-III: The first verbal form is comparatively identical to TC-III nouns established by diagram 3.

(4) TC-IV: The final plosive category (P = /p, t, k/) TC-IV = final plosive verbs will be omitted in the following investigation because there is no change at all in the two forms of the Nocte and Tangsa verb, e.g.,
Proto-EB-II I.*šag [^{IV}šak, = No. sʌk, Ts. šʌk] 'to close'
——→ II. *šag-d^{h} → *ša^{h}gd → *ša^{h}g → ^{IV}šak, = No. sʌk, Ts. šʌk.
P-EB-II I. *yab [^{IV}tžap, = No. Ts. tžʌp] 'to fan'
——→ II. *yab-d^{h} → *ya^{h}bd ^{IV}tžap, = No.Ts. tžʌp.

It will now be shown that a) the two suffixal element *-d^{h} and *-s- are again sufficient in order to explain all existing alternation patterns, and b) the basic derivational processes of the Kuki and the EB-II verb are almost iden[illegible] in their respective TC's. It is to be noted that the total number of verbal alternations in EB-II is much less than in Kuki because adjectives usually appear to be exempted [illegible]

undergoing any change. Thus the whole alternational pattern of EB-II languages is not so productive as in the Kuki languages; in my view it presents itself as being on the decline.

In the TC-I category, a distinction of closed versus open syllable types has to be made first of all:

[Closed syllables]

P-EB-II I. *CV(V)C [^{I}CV(V)C , = No. /1/, Ts. /3/ syllables]

——————→ II. *CV(V)C-d^h → *CV(V)C^{h}d → (= association with *CV(V)C^h → TC-III syllables, = No.Ts./2/) ^{III}CV(V)C , = No. Ts. /2/ syllables.

[Open syllables]

P-EB-II I. *CV [^{I}CV, = No. /1/, Ts. /3/ syllables]

——————→ II. *CV-d^h → *CV^{h}d → (vowel and consonant change caused by *-^{h}d) *CVg → ^{IV}CVk;

——————→ II. *CV-s-d^h → *CV^{h}sd → No. ^{IV}CVd, Ts. ^{II}CV (that is, with final glottal stop)[42].

Examples:

P-EB-II I. *ryuaŋ [^{I}tžyuaŋ, = No. ^{1}doŋ, Ts. ^{3}tžuŋ] 'big'

——————→ II. *ryuaŋ-d^h → *ryuaŋ^{h}d → (*ry-> tžy-, TC-III) ^{III}tžyuaŋ, = Ts. ^{2}tžuŋ (Nocte no change because of adjective).

P-EB-II I. *hul [^{I}hul, = No. ^{1}hʌn, Ts. ^{3}hul] 'to carry'

——————→ II. *hul-d^h → *hul^{h}d → ^{III}hul, = No. ^{2}hʌn, Ts. ^{2}hul.

P-EB-II I. *maan [^{I}maan, = No. ^{1}man, Ts.^{3}man] 'to sharpen'

——————→ II. *maan-d^h → *maan^{h}d → ^{III}maan, = No.Ts. ^{2}man.

P-EB-II I. *šai [^{I}šaai, = No. ^{1}se, Ts. ^{3}šai] 'to sing'

——————→ II. *šai-d^h → *šai^{h}d → ^{III}šaai, = No. ^{2}se, Ts. ^{2}šai.

The combination *-s-d^h explains the exceptional behavior of 'to laugh' (= KN *mnyui, = closed syllable) in its second form:

P-EB-II I. *nyei [^{I}ñei, = No. ^{1}ŋe, Ts. ^{3}ni] 'to laugh'

——————→ II. *nyei-s-d^h → *nyei^{h}sd → No. ^{IV}ñid = /ŋit/, Ts. ^{II}ñeis = [^{1}ni?] = /^{1}ni/.

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[42] In Tangsa, the alternational patterns involve changes either to tone /2/ or to /1/, the latter usually being accompanied by an i-offglide. No final /-t/ or /-k/ occur in the Tangsa alternations. Our reconstructional strategy is such that derived stems in /1/ are reconstructed by means of *-s-d^h; if there is final /-t/ in Nocte, it also means involvement of *-s-; if the final is /-k/, no such *-s- must be posited.

P-EB-II I. *ri [^{I}ri, = No. ^{1}ri, Ts. ^{3}ri] 'to buy'
——→ II. No. *ri-d^h → *ri^{h}d → (*-^{h}d > *-ɡ plus vowel change)
*reeg → ^{IV}reek, = reʌk;
Ts. *ri-s-d^h → *ri^{h}sd → *ris → [^{1}ri?] = /^{1}ri/.
P-EB-II I. *pu [^{I}pu, = No. ^{1}pu, Ts. ^{3}pʌu] 'to fly'
——→ II. No. *pu-d^h → *pu^{h}d → (*-^{h}d > *-g) ^{IV}puk = puk;
Ts. no change.
TC-II [closed syllables]
I. *CV(V)Ct? [^{II}CV(V)Ct, = No. /-/, Ts. /1/ syllables]
→ II. *CV(V)Ct?-d^h → *CV(V)Ct^{h}d → (= TC-III, = No.Ts. /2/)
^{III}CV(V)Ct , = No.Ts. /2/ syllables.

Examples:
P-EB-II I. *huan? [^{II}huan, = No. -hoʌn, Ts. ^{1}hon] 'to build'
——→ II. *huan?-d^h → *huan^{h}d → ^{III}huan, = No. ^{2}hoʌn, Ts. ^{2}hon.
P-EB-II I. *waŋ? [^{II}waŋ, = No. -vʌŋ, Ts. ^{1}vʌŋ] 'to come'
——→ II. *waŋ?-d^h → *waŋ^{h}d → ^{III}waŋ, = No.Ts. ^{2}vʌŋ.
P-EB-II I. *xuaŋ? [^{II}xuaŋ, = No. -hoŋ, Ts. ^{1}xuŋ] 'to come out'
——→ II. *xuaŋ?-d^h → *xuaŋ^{h}d → ^{III}xuaŋ, = No. ^{2}hoŋ,
Ts. ^{2}xuŋ.

Similarly:
'to cross over': P-EB-II *ryaan?
No. I. -dan, II. ^{2}dan Ts. I. ^{1}tžan, II. ^{2}tžan
'to cut': P-EB-II *khan?
No. I. -khʌn, II. ^{2}khʌn Ts. I. ^{1}khʌn, II. ^{2}khʌn
'to dream': P-EB-II *maŋ?
No. I. -mʌŋ, II. ^{2}mʌŋ Ts. I. and II. ^{1}mʌŋ
'to run': P-EB-II *tshuan?
No. I. -tšhoʌn, II. ^{2}tšhoʌn Ts. I. ^{1}son, II. ^{2}son
'to sew': P-EB-II *phin?
No. I. -phin, II. ^{2}phin Ts. I. ^{1}phin, II. ^{2}phin

TC-II [open syllables]: It can be shown that those verb stems agreeing in tone with TC-II closed syllables derive their second forms by means of the combination *-s-d^h (so that their explanation is similar to the LESS NUMEROUS GROUP of Lushai I. ˌCV, II. ˋCVt which again is identical with the TC-IIb_2 noun class of the KN tone diagram), whereas another group of TC-II open verbs which is identical in tone with TC-IV of the Baric noun class derives its second forms simply by *-d^h (so that its explanation is similar to the MORE NUMER-

OUS GROUP of Lushai I. _CV, II. `CVk which again is identical with the TC-IIb$_1$ noun class of the KN tone diagram). Thus the correspondences are as follows:

[TC-IIa]

P-EB-II I. *CV$^?$ ⟶ II. *CV$^?$-s-d^h (= No. I. -CV, II. CV(V)t, = Baric TC-II)

= P-K I. *CV$^?$ ⟶ II. *CV$^?$-s-d^h (= Lu. I. ˏCV, II. `CVt, = KN TC-IIb$_2$).

[TC-IIb]

P-EB-II I. *CV$^?$ ⟶ II. *CV$^?$-d^h (= No.Ts. I. and II. without change, = Baric TC-IV)

= P-K I. *CV$^?$ ⟶ II. *CV$^?$-d^h (= Lu.I. _CV, Ti. I. ˏCV, II.Lu. `CVk, Ti. ˏCVk, = KN TC-IIb$_1$).

Examples:

[TC-IIa]

P-EB-II I. *lua$^?$ [^{II}lua, = No. -lo, Ts. ^{1}lu] 'to catch'

⟶ II. *lua$^?$-s-d^h → *lua^{h}sd → No. *lua^{h}d → lo^t, Ts. (vowel reduction, i-offglide, glottalization and association with TC-II caused by *-s-) *loi^{h}sd → ^{1}loi? = ^{1}loi.

P-EB-II I. *thu$^?$ [^{II}thu, = No. -thu, Ts. ^{1}t̬hu] 'to dig'

⟶ II. *thu$^?$-s-d^h → *thu^{h}sd → No. *thu^{h}d → thut, Ts. (vowel change, i-offglide, glottalization and association with TC-II caused by *-s-) *thoi^{h}s → ^{1}t̬hoi? =/^{1}t̬hoi/.

P-EB-II I. *ka$^?$ [^{II}ka, = No. -ka, Ts. ^{1}ka] 'to go'

⟶ II. No. *ka$^?$-s-d^h → *ka^{h}sd → (compensatory vowel lengthening) *kaa^{h}d → kat;

Ts. *ka$^?$-d^h → (vowel change because of two laryngeals, = Baric TC-IV) k^i? = [^{2}k^i̯?].

P-EB-II I. *wa$^?$ [^{II}wa, = No. -va, Ts. ^{1}vai (= analogously generalized from II.)] 'to plait'

⟶ II. *wa$^?$-s-d^h → *wa^{h}sd → No. (compensatory vowel lengthening) *waa^{h}d → vat, Ts. (*-^{h}s causing vowel lengthening, i-offglide, glottalization and association with TC-II) *vaai? → [^{1}va:i̯?] = /^{1}vai/.

[TC-IIb]

P-EB-II I. *tša$^{?}$ [^{II}tša = ^{IV}tša$^{?}$, = No. tša?, Ts. sa?]
'to eat'

——→ II. *tša$^{?}$-d^{h} → No. *tša$^{?}$d (*-? stronger than *-^{h})[43]
→ /tša?/, Ts. *tša$^{?}$-d^{h} → (i-offglide because of two laryngeals, *-? stronger than *-^{h}) *tšhai? → /sʌi?/.

P-EB-II I. *kua$^{?}$ [^{II}kua, = ^{IV}kua$^{?}$, = No. ko?, Ts. ku?] 'to give'

——→ II. No. *kua$^{?}$-d^{h} → *kua$^{?}$d (*-? stronger than *-h) → ko?,
Ts. *kua$^{?}$-s-d^{h} → *kua^{h}sd → (*-^{h}s causing i-offglide, vowel change, glottalization and association with TC-II) ^{II}ki → [^{1}ki?] = /^{1}ki/.

P-EB-II I. *hu$^{?}$ [^{II}hu, = ^{IV}hu$^{?}$, = No. hu?, Ts. hʌu?] 'to steal'

——→ II. *hu$^{?}$-d^{h} → (*-? stronger than *-h) → ^{II}hu, = No. hu?, Ts. hʌu?.

TC-III [Closed syllables]

I. *CV(V)C^{h} [^{III}CV(V)C, = No.Ts. /2/ syllables]

→II. *CV(V)C^{h}-d^{h} → *CV(V)C^{h}d → ^{III}CV(V)C = no change.

Examples:

P-EB-II I. *nam^{h} [^{III}nam, = No. Ts. ^{2}nʌm] 'to borrow'

——→ II. *nam^{h}-d^{h} → *nam^{h}d → ^{III}nam, = No.Ts. ^{2}nʌm.

P-EB-II I. *wal^{h} [^{III}wal, = No. ^{2}vʌn, Ts. ^{2}vʌl] 'to crow'

——→ II. *wal^{h}-d^{h} → *wal^{h}d → ^{III}wal, = No.^{2}vʌn, Ts. ^{2}vʌl.

P-EB-II I. *tuam^{h} [^{III}tuam, = No. ^{2}toʌm , Ts. ^{1}kʌ^{2}tom] 'to promise'

——→ II. *tuam^{h}-d^{h} → ^{III}tuam, = I.

TC-III [Open syllables]

I. *CV^{h} [^{III}CV, = No. Ts. /2/ syll... es]

→II. *CV^{h}-d^{h} → *CV^{h}d → (*-^{h}d > *-g) *CVg → No. CVk;
or *CV^{h}-s-d^{h} → *CV^{h}sd → No. *CVd → CVt, Ts. *CV^{h}s → (*-^{h}s causing i-offglide, glottalization and association with TC-II closed syllables) [^{1}CVi?] = /^{1}CVi/.

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[43]This proposal is highly tentative at present. A number of other possible explanations like analogical leveling between I. and II. forms and the like suggests itself. According to our hypothetical premises, a reconstruction such as *tša$^{?}$-s-d^{h} should lead to No. **tšhat and Ts. **/^{1}sʌi/. The same would hold true, of course, for a single *-s suffix without *-d^{h}; and moreover, there is the structural identity or near-identity with the Kuki languages.

So far only one etymon has been found in this category:
'to arrive': No. I. ^{2}hu, II. hok Ts. I. ^{2}ṭhʌu, II. ^{1}ṭho;
it can be reconstructed in the following way:
P-EB-II I. *dhu^{h} ⟶ II. No. *dhu-d^{h} → *dhu^{h}d → *dhug → hok;
Ts. *dhu^{h}-s-d^{h} → *dhu^{h}sd → [^{1}ṭhɔ?]
= /^{1}ṭho/.

The other examples in this category are language-specific, e.g.,
'to ache': No. I. ^{2}tšha, II. tšhʌt
Proto-Nocte I. *tšha^{h} ⟶ II. *tšha^{h}-s-d^{h} → *tšha^{h}d → tšhʌt.
'to die': No. I. ^{2}ri, II. rit
Proto-Nocte I. *ri^{h}⟶II. *ri^{h}-s-d^{h} → *ri^{h}d → rit.
(Occurs in 'ashamed', 'thirsty', 'ticklish' as verbal component): Ts. I. $^{\circ 2}$sa, II. $^{\circ 1}$sʌi
Proto-Tangsa I. *sa^{h}⟶II. *sa^{h}-s-d^{h} → *sa^{h}sd → ^{II}sai? → ^{1}sʌi.
There are five verbs in Tangsa without change in the second form: ^{2}ba 'bad', ^{1}kʌ^{2}tsa 'clean', ^{2}tsi 'finish', ^{2}tsa 'dye', ^{1}kʌ^{2}to 'play'. At least four explanatory possibilities have to be considered:

a) independent and recent origin (loans?),
b) analogical leveling with those stems that do not change at all,
c) another suffix (e.g. *ma), and
d) another suffix combination (e.g. *-d^{h}-s).

The mechanism of reconstruction of regular verb stem alternations by means of *-s and *-d^{h} is extendable to at least one more field that has proved troublesome in the past, that is, it is able to account now for such 'sub-regularities' like

Jg. ^{3}khu 'smoky' vs. ^{1}wan^{1}khut 'smoke, n.'
^{1}lə^{3}gu 'to steal' vs. ^{1}lə^{1}gut 'thief'
^{3}tži 'to urinate' vs. ^{1}tžit 'urine'
^{3}ša 'to eat' vs. ^{1}šat 'rice, food'; and

Konyak (Tamlu dialect)	vs.	Konyak (Wakching dialect)	
/$^{\rightarrow}$šɯt/ = |^{3}šɯt|		/$^{\rightarrow}$ši/ = |^{3}ši|	'urine'
/$^{\rightarrow}$Pat/ = |^{3}Pat|		/$^{\rightarrow}$Pai/ = |^{3}Pai|	'vomit, n.'
/$^{\circ\rightarrow}$Kɯt/= |^{3}Kɯt|		/$^{\circ\rightarrow}$ši/ = |^{3}ši|	'smoke, n.'[44]
/$^{\rightarrow}$Dat/ = |^{3}Dat|		/$^{\rightarrow}$cai/ = |^{3}cai|	'to hear'
/$^{\circ\rightarrow}$vat/ = |^{3}vat|		/$^{\rightarrow}$vai/ = |^{3}vai|	'rain, n.'
/$^{\rightarrow}$šot/ = |^{3}šot|		/$^{\rightarrow}$hoi/ = |^{3}hoi|	'a fly'

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[44] *Tamlu /K-/ corresponding with Wakching /š-/ is regular, e.g. T $_{\downarrow}$Kaŋ, W $_{\downarrow}$šaŋ 'head', T $^{\rightarrow}$Kɛm, W $^{\rightarrow}$šɛm 'to boil', etc.*

The historical explanations will be as follows:

'urinate'/'urine': Proto-Jg-EB I. *tži$^{?}$, II. *tži$^{?}$-d^{h}.

Jg. I. *tži$^{?}$ → ^{3}tži, II. *tži$^{?}$-d^{h} → *tži^{h}d → ^{1}tžit.

Ko.(T) II. *tži$^{?}$-d^{h} → *tži^{h}d → (*-^{h}d > -t plus association with *CV(V)C^{h} → TC-III = |^{3}|-syllables) |^{3}šɯt|.

Ko.(W) II. *tži$^{?}$-d^{h} → *tži^{h}d → *tži^{h} (= TC-III = |^{3}|-syllables) → ^{3}ši.

Ts. I. *tži$^{?}$s → ^{1}ši.

Ch. II. *tži$^{?}$-d^{h} → *tži^{h}d → ^{2}Jʌt.

'vomit': P-EB I. *pha$^{?}$, II. *pha$^{?}$-s.

Ko.(T) II. *pha$^{?}$s → *pha^{h}s → ^{3}Pat.

Ko.(W) II. *pha$^{?}$s → (*-$^{?}$s > -i) ^{3}Pai.

No.Ts.Km. II. *pha$^{?}$s → No. phat, Ts. ^{1}phai, Km. ^{12}a^{23}Pu?.

'smoky'/'smoke': P-Jg-EB I. *khu$^{?}$, II. *khu$^{?}$-d^{h}.

Jg. I. *khu$^{?}$ → ^{3}khu, II. *khu$^{?}$-d^{h} → *khu^{h}d → ^{1}khut.

Ko. *khu$^{?}$-d^{h} → *khu^{h}d → (T) ^{3}Kɯt, (W) ^{3}ši.

No.Ts. II. *khu$^{?}$-d^{h} → *khu$^{?}$d (*-? stronger than *-h) → No. khu? (I. dto.), Ts. khʌu? (I. dto.).

'to hear': P-EB I. and II. *ta$^{?}$-s.

Ko.No.Ts. *ta$^{?}$s → (T) ^{3}Dat, (W) ^{3}cai, No. tat, Ts. ^{1}tai.

'to steal': P-Jg-EB I. *rɣu$^{?}$, II. *rɣu$^{?}$-d^{h}.

Jg. I. *rɣu$^{?}$ → ^{1}lə^{3}gu, II. *rɣu$^{?}$-d^{h} → *rɣu^{h}d → ^{1}lə^{1}gut.

Ko.No.Ts. I. *rɣu$^{?}$ → Ko. hɯ?, No. hu?, Ts. hʌu?,
II. *rɣu$^{?}$-d^{h} → *rɣu$^{?}$d (*-? stronger than *-h) = no change.

'eat'/'food': P-Jg-EB I. *tšha$^{?}$, II. *tšha$^{?}$-d^{h}.

Jg. I. *tšha$^{?}$ → ^{3}ša, II. *tšha$^{?}$-d^{h} → *tšha^{h}d → ^{1}šat.

Ch. ^{1}šau, No. tšha?, Ts. I. sa?, II. sʌi?, Ko. ha?, Ga. Ca?, Bo. Ja?.

'rain': P-EB II. *ba$^{?}$-s

Ko.(T)•^{3}vat, Ko.(W) ^{3}vai, No. •pat, Km. •^{23}u?.

'a fly': P-EB *šo$^{?}$-s

Ko.(T) ^{3}šot, Ko.(W) ^{3}hoi (*š- > h- regular), No. mit tšit, Ts. ^{1}šoi.

'thorn': P-Jg-EB *tšu$^{?}$(-d^{h})

Jg. ^{3}tšu, No. -su (tone?), Ts. šʌu?, Ko. šɯ?, Ga. Bu?su, Km. ^{23}tZau?.

FINAL REMARKS. Investigations into three different TB subgroups have hopefully made it obvious that a reconstruction theory based on laryngeal phonation types will become the top competitor amongst TB reconstruction theories considered so far. The idea of postulating different phonation types mainly derives from recent advancements in the Sinitic field where the 3+1 tone system of Ancient Chinese is traceable to a non-suprasegmental final system consisting of the combinations of the features [± voiced] and [± laryngeal]. The tonogenetic laryngeal rec-theory for TB languages recognizes a primary distinction into five reconstructional relations that have the potential of a five-fold tonological development:

1)	* [+voice, -laryngeal]	*--	(no mark) VOICE	TB TC-I [= KN I, B I, Jg. |2|]
2)	* [-voice, +laryngeal]	*-ʔ	CREAK	TB TC-II [= KN IIa+b, B II+IV, Jg. |1| + |3|]
3)	* [+voice, +laryngeal]	*-h	BREATH	TB TC-III [= KN III, B III, Jg.|2|]
4)	* [-voice, +constricted glottis]	*-s	WHISPER	TB TC-IV [= KN IV, B (?), Jg. /^{3}CVC/ syllables]
5)	* [-voice, +closed glottis]	*-P	STOP	TB TC-V

As regards KN TC-IV, we are now able to precisely determine its reconstructional status by inferring from the behavior of verbal paradigms in Kuki-Chin that comparative entities such as the falling tone closed syllables of Lushai must be traced to historical *-s.

Let us finally approach the question of what could have been the conditioning factor for the tonological differentiation of open versus closed syllable noun etyma in TC-II. A possible explanation has already been given by the derivational pattern of TC-II open syllable verb stems. Basically, we have to start from a *CV^{ʔ} syllable type for open syllable developments. TC-II noun etyma of those languages which do not make any overt tonological distinction of open vs. closed syllable types are simply reconstructed as *CV^{ʔ}. For the sake of simplicity it will be assumed that they never had such a distinction in open syllables throughout the course of their

development. As regards the languages that do indeed make such a tonological distinction (leading to two different comparative entities in the TC-IIb category of KN languages, or to TC-II and TC-IV in the Baric languages), we are in a position to postulate, not necessarily for the proto-stage of ST or TB, three alternative possibilities:

a) All etyma with the correspondence

KN TC-IIb$_1$ = B TC-IV = Jg. |3|

are assumed to have been combined with a suffix like *-d^h; the etyma of the opposing TC are assumed not to have been combined with any suffix;

b) all etyma with the correspondence

KN TC-IIb$_2$ = B TC-II = Jg. |1|

are assumed to have been combined with a suffix like *-s; the etyma of the opposing TC are assumed not to have been combined with any suffix; and finally,

c) all etyma of the two opposing TC classes are assumed to have been combined with *-d^h and *-s, respectively.

As for a) and c), I believe that they should be taken as the most highly valued proposals because they account for the sometimes rather strange tonological aberrations that occur in the a) category (for instance, the change from rising to falling tone in Lushai or the change from the highest frequency level /5/ to the lowest /1/ in Angami). Alternatively, solution b) is unable to explain just why the etyma of a) are able to change their tone so drastically. As regards c), its acceptance amounts to an as yet unconfirmed conclusion according to which both suffixal elements *-d^h and *-s should be freely combinable with any noun stem of TC-I and TC-III. Solution c) brings into play the additional assumption of a disyllabic ST proto-language.

As a result of these preliminary investigations, a potential model of the TB tonogenetic laryngeal reconstruction theory should now be developed, containing the set of reconstructional entities by means of which the comparative and the synchronously descriptive phonological data is derived. The examples of reconstructed etyma that follow below should be understood as a proposal for the fundament upon which such a potential model could be based.

No matter what solution we accept as the working hypothesis

for future investigations, the precision of our comparison and reconstruction in Tibeto-Burman linguistics has generated a pledge yet to be redeemed by future TB studies.

6. SAMPLE SETS OF RECONSTRUCTED ETYMA FOR TIBETO-BURMAN TONAL CATEGORIES I, II, AND III.

6.1. Kuki-Naga TC-I = Baric TC-I (Boro-Garo non-glottalized syllables) = Kachin |2|

'baby': (KN) Lu. ¯naau, Ti. -naau, Lg. ^{1}naau, Ag. ^{5}u^{2}nuo, Mao ^{2}o^{1}na, Ao ^{1}ki^{2}nɯ.
(B) No. ^{1}na, Ts. ^{3}nau^{3}šaŋ, Ko. ↓nau.
(Jg) ^{1}gə^{2}nau 'younger brother'
TB *nau

'buffalo': (KN) Lu.¯looi, Kom ^{1}sʌ^{2}roi, Ta. ^{1}si^{1}lui, Ze. ^{1}re^{1}lui, Ag. ^{2}rɯ^{3}li, NR ^{1}a^{1}γɯ^{3}li, Sa. ^{1}ñɯ^{1}rɯ.
(B) No. ^{1}le, Ts. ^{3}loi.
(Jg) ^{2}u^{2}loi
TB *rloi

'corpse': (KN) Ag. ^{2}the^{3}mo (< *sdmaŋ), NR ^{1}a^{1}Ga^{3}mã, Se. ^{1}a^{1}ku^{3}mo, Lo. ^{1}o^{1}mɯŋ, Ao ^{2}ta^{2}sɯ^{2}maŋ.
(B) No. ^{1}mʌŋ, Ts. ^{1}ʌ^{3}mʌŋ, Ko. ↑maŋBɯm, Km. ^{21}mia, Ga. maŋGisi (<si-a 'die, dead').
(Jg) ^{2}maŋ
TB *gmaŋ

'deaf': (KN) Lu. ¯beŋ¯ŋoŋ, Lg. ^{1}kʌ^{1}bɛɛŋ, Sa. ^{1}a^{1}naŋ^{1}tBiŋ, Yi. •^{2}Beaŋ.
(B) No. ^{2}na^{1}ba (< ^{2}na 'ear'), Ts. ^{3}baŋ, Ga. Beŋ-a, Bo. BeŋGa.
(Jg) The Kachin form ^{2}na^{1}lə^{3}phaŋ belongs to a different comparison set for which final *-s has to be postulated (leading to Ch. _o¯Baŋ, Lo. ^{3}Bɯŋ, Se. •^{2}ku^{2}γu^{3}bo, = TC-IV).
TB *bweŋ

'eagle': (KN) Ta. ^{1}khə^{1}laŋ (= |g^{1}laŋ|), Yi. ^{2}mɯ^{2}leaŋ (= |m^{2}leaŋ|), Li. -ka ^leŋ.
(B) No. ^{1}la, Ts. ^{3}laŋ, Ko. ↑ʌulɛŋ, Km. ^{21}le^{12}tŠe, Bo. sila.
(Jg) ^{1}gə^{2}laŋ
TB *gleeŋ

'enemy': (KN) Lu. ¯raal, Mon ^{1}raar, Ti. -gaal, Kh. ^{1}e^{2}ri, NR ^{3}ʕi^{2}u, Lo. ^{1}o^{3}rɯ.
(B) No. ^{1}ran, Ts. ^{3}ral, Ch. _la, Ko. ↓γan, Km. ^{21}e.
TB *raal

'fence':(KN) Lu. ¯pal, Ta. ^{1}ŋə^{1}vei (= |ŋ^{1}vei|, < *rbal), NR ^{1}a^{1}ʕa^{3}Bĭ (<*rbal), Lo. ^{1}e^{1}Bi, Sa. ^{2}Gu^{1}tBɯ, Mi. ^{1}pai, SR ^{4}tšwi.

(B) No. ^{1}pan, Ts. ^{3}pal^{2}rik, Ko. ↓Ban, Ch. _Ba.
(Jg) ^{1}n^{2}phan ~ ^{3}tžə^{2}phan
TB *rbwal

'forehead':(KN) Ag. ^{5}u^{2}ti^{3}khie, C . ^{2}tɤ^{3}kha, Sa. ^{1}a^{1}Gye^{2}Kaŋ (tone?), Mi. ^{2}te^{1}haŋ.
(B) No. ^{1}khʌŋ, Ts. ^{3}khʌŋ, Ko. ↑Kaŋšan, Ch. _Kɯ ŋ↑Ja (= |^{1}Kɯŋ|).
TB *dk^{h}aaŋ

'ginger': (KN) Lu. so?¯thiiŋ (so? 'a tasty Lushai relish, cf. thak ¯thiiŋ 'cinnamon', < thak 'to itch'), NR ^{1}a^{3}sã, Lo. ^{1}o^{1}swŋ, Sa. ^{1}šiŋ.
(B) No. ^{1}tšin (final?), Ts. ^{3}tsiŋ^{3}keŋ, Ko. ↓tšeŋ, Ch. _si, Ga. e?Ciŋ ~ Ki?Ciŋ, Bo. |hai?Jeŋ?| → /haiJéŋ?/.
TB *t$^{?}$iiŋ

'head': (KN) Lo. ^{1}kVɯ^{3}rɯ, Sa. ^{1}a^{1}Gu, Yi. ^{2}Gu.
(B) No. ^{1}kho, Ts. ^{3}khu, Ch. _Ku, Km. ^{1}Kaiw, Ga. sKo, Bo. Boro?.
TB *sgua

'iron': (KN) Lo. ^{1}yon tŽak, Sa. ^{1}yi^{1}tSe, Yi. ^{2}yin^{2}tŠi.
(B) No. ^{1}tžan, Ts. ^{3}tžan, Ko. ↓yan, Km. ^{21}son.
TB *yaan

'laugh': (KN) Lu. ¯nui, Kom ^{1}mʌ^{2}nui, Lg. ^{1}kʌ^{1}pʌ^{1}ni, La. ^{2}pə^{1}hnei, Ta. ^{1}khə^{1}mə^{1}nə (= |g-m-^{1}nə|), Ag. ^{2}nɯ, Kh. ^{1}nvɯ, Se. ^{2}nu, Sa. ^{1}mɯ^{1}ñɯ (= |m^{1}ñɯ|), Li. ^nui.
(B) No. ^{1}ŋe, Ts. ^{3}ni, Ko. ↓ñi, Km. ^{12}a^{21}ñai (^{12}a vb. prefix), Bo. mini.
(Jg) ^{1}mə^{2}ni
TB *mnyui

'new': (KN) Lu. ¯thar, Ta. ^{1}kə^{1}thər (= |g^{1}thər|), Ag. ^{2}ke^{3}sa, Kh. ^{2}ke^{3}tshe, NR ^{1}Gi^{3}Ta^{3}γɯ (< *g^{3}Tar), Lo. ^{1}e^{1}Tan, Ao ^{2}ta^{2}swn, SR ^{1}kʌ^{4}šɤ̃.
(B) No. ^{1}ñan (< n^{1}dar), Ts. ^{3}ñal (< n^{3}dar), Ko. ↓γʌn, Ch. _han, Km. ^{12}a^{21}yan, Ga. |Git-(D)al| → ⌊Gɯta·l⌋, Bo. GɤDan.
(Jg) ^{1}n^{2}nan (< *n^{2}dar)
TB *gt$^{?}$ar

'three': (KN) Lu. ¯thum, Ta. ^{1}kə^{1}thum, Ag. ^{3}se, Kh. ^{2}ke^{3}tshɯ, NR ^{1}Gi^{3}tŠĩ, Lo. ^{1}e^{1}Tɯm, Ao ^{1}a^{2}sɯm, SR ^{4}kʌ^{4}n^{4}šɤ̃.
(B) No. ^{1}wan^{1}rʌm (^{1}wan numeral prefix), Ts. ^{1}ʌ^{3}ḍim, Ch. _sʌm, Ko. ↓ʌγɯm (< *arum), Ga. Git-Tam, Bo. Tam.
(Jg) ^{1}mə^{2}shum
TB *gsum

'tongue': (KN) Lu. ¯lei, An. ^{1}pi^{1}li, Kom ^{1}mʌ^{2}lei, La. ^{2}pə^{1}lei, Ze. ^{3}mi^{1}n^{1}leu, Ag. ^{5}u^{2}mhi^{3}e = ^{5}u^{2}mhi^{3}ye, Kh. ^{2}me^{3}ži, Lo. ^{1}n^{1}li, Ao ^{2}tɯ^{2}mɯ^{2}li, Mi. ^{1}de, SR ^{4}n^{4}yi (cf. ^{1}a^{4}yi 'my tongue').
(B) No. ^{1}thʌ^{1}li, Ts. ^{3}li, Ko. ↓Dʌle, Ch. _li↑ _šʌŋ (= |^{1}li|), Km. ^{21}lei, Ga. sre, Bo. salai.
(Jg) ^{1}šiŋ^{1}let (< *lei-d^{h} ?)
KN *smlyei, B *sdlei.

'warm': (KN) Lu. ¯lum, Kom ^{1}kʌ^{2}lum, La. ^{2}lə^{1}lou, Ta. ^{1}khə^{1}lum, Ag. ^{2}le, Lo. ^{1}lɯm, Ao ^{2}ta^{2}lɯm.
(B) Ts. ^{3}lim, Km. ^{12}a^{21}lam.
(Jg) ^{2}lum
TB *lum

6.2. Kuki-Naga TC-IIa = Baric TC-II (Boro-Garo glottalized syllable types) = Kachin | 1|

'to come': (KN) Th. ^{2}huŋ, An. ^{1}i^{2}vaŋ (^{1}i vb.prefix), Kom ^{2}kʌ^{1}hɔŋ, La. ^{2}ə^{3}ve, Ze. ^{1}ke^{4}guaŋ, Ag. ^{5}vo^{2}r (^{2}r = *directional marker*), Ck. ^{4}vo^{5}ri.
(B) No. I. -vʌŋ, II. ^{2}vʌŋ, Ts. I. ^{1}vʌŋ, II. ^{2}vʌŋ.
(Jg) ^{1}wa
TB *γwuaŋ$^{?}$

'dog': (KN) Lu.Ti. ˏui, Th. ^{2}ui, An. ^{2}vi, Kom ^{1}ui, La. ^{3}i, Ta. ^{2}fə, Mn. hùi, Ag. ^{2}te^{5}fɯ, Ck. ^{2}tɤ^{4}šɯ, NR ^{1}a^{1}fɯ, Se. ^{1}a^{1}tsɯ, Lo. ^{3}fɯ^{3}ro (^{3}ro = nominal suffix), Ao ^{3}a^{1}zɯ, SR ^{1}tʌ^{3}hi.
(B) No. -hu, Ts. ^{1}hi, Ch. ¯GʌI, Ko. ↓huha, Km. ^{23}tŽi, Bo. sɣi?ma?
(Jg) ^{1}gui
TB *xyui$^{?}$ ~ *s-xyui$^{?}$

'dream': (KN) Lu. ˏmaŋ, Th. ^{2}maŋ, An. ^{1}mhal (final?), Kom ^{1}rʌ^{1}maŋ, La. ^{3}ma, Ta. ^{2}məŋ^{2}šoŋ, Ag. ^{5}u^{5}mho, Ck. ^{4}mho, NR ^{1}a^{1}mã, Lo. ^{1}o^{3}mɯŋ, Yi. ^{1}mi^{1}lim ('dream-picture', cf. Lu. _lem 'model, image, picture'), Mi. ^{2}maŋ, SR ^{2}n^{3}mi.
(B) No. I. -mʌŋ, II. ^{2}mʌŋ, Ts. ^{1}mʌŋ, Ch. ¯mʌŋ, Ko. ↓vʌnmaŋ (= |^{2,1}vʌn^{1}maŋ|), Km. ^{1}mia, Ga. Jumaŋ, Bo. simaŋ?.
(Jg) ^{1}yup^{2}maŋ ' ^{2}maŋ (tone?)
TB *srmaŋ$^{?}$

'fruit': (KN) Lu. ˏthei, Kom ^{1}thei, La. ^{3}thei, Ta. ^{1}ə^{2}thəi, Lo. ^{3}tSɯŋ^{3}Ti (cf. ^{1}o^{3}tSɯŋ 'firewood'), Yi. ^{1}saŋ^{2}a^{2}so (= |^{1}so|), Mi. ^{2}a^{2}the, Mn. hə̀i.

(B) No. ^{1}pʌn -ri, Ts. ^{3}pul^{1}ʤi, Ga. BiTe, Bo. BiTai? ~ PiTai?.
(Jg) ^{1}nam^{1}shi
TB *ts$^{?}$ei$^{?}$

'to get up': (KN) Lu.Ti. I. ˎthou, II. tho?, An. ^{2}haŋ^{2}thi, Kom ^{2}kʌ^{1}thui, La. ^{3}thəu, Ta. $^{\bullet 1}$kə^{2}thui, Mn. hə̀u, Ag. ^{5}sie, Ck. ^{4}sɯ, Se. ^{1}i^{1}thu, Lo. ^{1}Pan^{3}Ti, Yi. ^{1}a^{2}sɯ^{1}rɯ, SR ^{3}so.
(B) Ko. $_{\downarrow}$ɣʌu, Km. ^{12}a^{12}tSu?.
(Jg) ^{1}shu
TB *ts$^{?}$ou$^{?}$

'to be light - not heavy': (KN) Lu. ˎzaaŋ, An. ^{1}i^{2}jaaŋ, Kom ^{2}kʌ^{1}zaaŋ, Lg. ^{1}kʌ^{2}yaaŋ, Sa. ^{1}a^{2}yiŋ^{1}ya, Mi. ^{2}ar^{2}jaŋ, SR ^{1}n^{3}šẽ.
(B) No. -tša, Ts. I. ^{1}tšhaŋ, II. ^{2}tšhaŋ, Ga. Ceŋʔ-a, Bo. reʔJeŋʔ.
(Jg) ^{2}saŋ
Additional languages: Miju Mishmi ^{2}ʔkyuŋ
TB *rk$^{?}$yaaŋ$^{?}$ (→ KN *ryaaŋ$^{?}$)

'mortar': (KN) Lu. Ti. ˎsum, Kom ^{1}sum, La. ^{3}sou^{2}kho, Ta. ^{2}šum^{1}khur (^{1}khur 'hole'), Ag. ^{5}tsie^{2}khe, NR ^{1}a^{1}sĩ, Lo. ^{3}tSɯm^{3}Po, Sa. ^{2}tSaŋ^{1}Ki (< ^{2}tSam), Yi. ^{1}tSam.
(B) No. tšhaʔ -thʌm (tšhaʔ 'paddy'), Ts. ^{1}thim, Ch. $^{-}$šʌm, Ko. $_{\downarrow}$Tɯm, Km. ^{12}Tam, Ga. CaʔamʔCam ~ CaʔsamʔBo. suʔniʔ.
(Jg) ^{1}thum
TB *tsum$^{?}$

'slippery': (KN) Lu.Ti. ˎnaal, An. ^{1}i^{2}naal, Lg. ^{1}kʌ^{1}tʌr^{2}naal, Ze. ^{3}ke^{1}re^{4}neu, Ag. ^{2}rɯ^{5}nɯ, Ck. ^{2}re^{4}ni, Ro. -a-ni.
(B) No. -ñʌn, Ts. ^{1}ñʌl, Ko. $_{\downarrow}$ñʌn, Km. ^{12}a^{3}ñin^{12}tŠeiʔ.
(Jg) ^{1}mə^{2}nyen
TB *rnaal$^{?}$ ~ *rnyaal$^{?}$

'stone': (KN) Lu. ˎluŋ, An. ^{2}hlʊŋ, Kom ^{1}luŋ, Ta. ^{1}ŋə^{2}luŋ (< *r^{2}luŋ), NR ^{1}a^{1}nũ, Lo. ^{1}o^{3}loŋ, Yi. ^{1}luŋ, Mi. ^{2}har^{2}loŋ (= Eastern Mikir) ~ ^{2}ar^{2}loŋ (= Western Mi.).
(B) No. -loŋ, Ts. ^{1}luŋ, Ch. $^{-}$laŋ, Ko. $_{\downarrow}$lɔŋ, Km. ^{1}luŋ, Ga. roʔoŋ (= |roŋʔ|), Bo. onʔTaiʔ (initial?).
(Jg,) ^{1}n^{1}luŋ
TB *rluŋ$^{?}$

'tail': *(KN) Lu.Ti. ˎmei, Th. a^{2}mei, An. ^{1}a^{1}mhĩ (tone irregular),* Lg. ^{1}mar^{2}mei, Ta. ^{1}ə^{1}khə^{2}məi, Ag. ^{5}u^{5}mi, Lo. ^{1}e^{3}mhi, Yi. ^{2}a^{2}mo (= |^{1}mo|), Chiru (Old Kuki) ʌrʌmei, Mi. ^{2}ar^{2}me.

(B) No. ^{1}ʌ -me, Ts. ^{1}ʌ ^{1}mi, Ch. $^{-}$mʌi, Ko. $_{\downarrow}$mʌiGoŋ, Km. ^{12}a^{1}mi, Ga. Ki?me.
(Jg) ^{1}niŋ ^{1}mai
TB *rmei$^{?}$

'yarn,thread': (KN) 'rope' Lu. ˏhrui, Ti. ˏgui, An. ^{2}hrʊ, La. ^{2}ə^{3}ri 'string', Ta. ^{1}khə^{2}rə, Ze. ^{1}he^{4}ria, Ag. ^{2}ke^{5}ro, NR ^{1}a^{3}li (tone?), Se. ^{2}a^{2}ki^{3}γi, Lo. ^{1}o^{3}žɯ, Mi. ^{2}ri.
(B) No. khʌt -ri (khʌt 'cloth'), Ts. ^{1}rʌi, Ch. $^{-}$lʌi, Ko. $_{\downarrow}$γi, Km. ^{12}e^{2}wi, Bo. lu?nai?.
(Jg) ^{1}ri
TB *sgrui$^{?}$

6.3. Kuki-Naga TC-IIb-left column = Baric TC-IV = Kachin |3|
Nouns:
'bamboo': (KN) An. ^{1}ra^{1}wa, Kh. ^{1}ka^{2}vɯ, NR ^{1}a^{1}Gu^{2}wa, SR ^{1}gö^{4}nyo, Se. ^{1}a^{1}kha^{1}u, Lo. ^{2}ve^{3}pVɯ, Sa. ^{2}xu, Yi. $^{(1)}$hɯ?, Ao ^{3}a^{1}u?.
(B) No. va?, Ts. vʌ?$^{\bullet}$, Ch. $_{-}$wau, Km. ^{1}ou?, Ko. a?, Ga. wa?-a, Bo. ou-a?.
(Jg) ^{3}kə^{3}wa
TB *grwa$^{?}$(d^{h})

'chin': (KN) Lu. `kha, An. ^{1}pa^{1}kha, La. ^{1}ka, Ta. ^{1}ə^{1}mə^{1}kha, Ag. ^{5}u^{2}me^{1}pfhɯ, Ck. ^{2}me^{1}khu, Se. ^{1}a^{1}mu^{1}khu, Yi. ^{2}mɯ^{2}Kɯ?.
(B) No. ka?, Ts. ka?, Ch. $_{-}$Gau$^{\bullet}$, Ko. $_{\downarrow}$Ga?γɛŋ ($_{\downarrow}$γɛŋ 'bone').
(Jg) ^{1}n^{3}kha
TB *mk^{h}a$^{?}$(d^{h})

'fish': (KN) Lu. ˬsa`hŋa, An. ^{2}ha, La. ^{3}ŋə, Lo. ^{1}o^{2}ŋo, Yi. ^{2}Tɯ^{2}ŋɯ?, Ao ^{3}a^{1}ŋu?.
(B) No.Ts. ŋa?, Ch. ^{1}ŋau, Ko. ña?, Km. ^{1}ŋou?, Ga. na?Tok, Bo. na?.
(Jg) ^{3}ŋa
TB *sŋa$^{?}$(d^{h})

'man': (KN) Lu. `mi, Th. ^{2}mi, Ag. ^{2}the^{1}mie, Ck. ^{2}thɤ^{1}ma, Kh. ^{1}e^{2}mi, NR ^{1}a^{2}ni, SR ^{1}tʌ^{1}mi, Yi. $^{(1)}$mi?$^{\bullet}$.
(B) No. mi? -ñan, Ts. mʌi?, Ch.$^{-}$mʌt (< *mi^{h}d < *mi$^{?}$ d^{h}).
TB *dmi$^{?}$(d^{h})

'rat': (KN) Lu. ˬsa`zu, Th. ^{2}zu, Kom ^{2}m$\wedge^{1}$tzu, Lg. ^{1}pu^{1}yu, La. ^{2}pə^{3}zu, Ze. ^{1}he^{2}za, Ag. ^{2}the^{1}zu, NR ^{1}a^{2}mi^{2}žɯ, Se. ^{1}a^{1}ži, Lo. ^{2}žɯ^{3}ro, Mi. ^{2}phi^{2}ju.
(B) No. tžu? ^{1}pu, Ts. tž$\wedge$u? ^{3}pi, Ko. yɯ?, Bo. enJot (< *n-yu^{h}d).
(Jg) ^{3}yu
TB *byu?(d^{h})

'smoke': (KN) Lu. °`khu, vb.: I. _khu, II. `khuk, Kom °^{1}khu, Ag. °^{1}khu, Ck. °^{1}kho, NR °^{2}Ku, SR ^{1}khü, Lo. °^{2}kFɯ, Yi. °Kɯ?.
(B) No. °khu?, Ts. kh$\wedge$u?, Ko. |^{3}Kɯt| (< *khu?d^{h}), Ga. °Ku, Bo. Ku? (=vb.), Ch. ¯wan_Kɯk (< *khu^{h}d per assimilation).
(Jg,) ^{1}wan^{1}khut^{3}khu
TB *k^{h}u?(d^{h})

'stool': (KN) Lu. vb.I. _e, II. `ek, Ti. ˏek (< *khye^{h}g < *khyc^{h}d < *khye?d^{h}), An. ^{1}ɪ^{2}ɛɛ, Lg. ^{1}kɛ^{1}ɛ, La. ^{2}ɪ.
(B) No. hi?, Ts. x$\wedge$i?, Ko. i?, Ch. ¯s$\wedge$t (< *khyi^{h}d or *khyi^{h}sd?), Km. ^{23}ši?, Ga. Ki? ~ Ki?-i, Bo. Ki?.
(Jg.)^{3}khi
TB *k^{h}ye?(d^{h})

Verbs:
'bitter': (KN) Lu. I. _kha, II. `khak, An. ^{1}i^{2}kha, Kom ^{2}k$\wedge^{1}$kha, La. ^{2}khə, Ta. ^{1}kə^{1}kha, Ag. ^{1}pfhɯ, Ck. ^{1}khu, NR ^{2}Ka°, SR ^{1}khö, Lo. ^{2}Ko, Yi. ^{2}a^{2}Kɯ?, Mi. ^{2}ho.
(B) No. kha?, Ts. ^{1}kha (tone?), Ko. Ka?, Ch. _Kau°, Ga. Ka?-a, Bo. GχKχi.
(Jg) ^{3}kha
TB *k^{h}a?(d^{h})

'to carry the baby on the back': (KN) Lu. I. _pua, II. `puak, An. ^{1}i^{2}pu, Kom pik ~ puk, Lg. ^{2}ku^{2}pu, Ag. ^{1}pfɯ, NR ^{1}Gi^{2}pVɯ, SR ^{2}pfχ, Se. ^{1}pu, Lo. ^{2}pVɯ, Yi. Bu?, Mi. ^{2}bu.
(B) No. ba?, Ts. bo?, Ko. Bɯ?, Km. ^{12}a^{23}Bau?, Ga. Ba?-a, Bo. Ba?.
(Jg) ^{1}ba? (< *ba?-s)
TB *pua?(d^{h})

'to eat': (KN) An. ^{1}i^{2}tsa, Kom saak, Lg. ^{1}k$\wedge^{1}$tsa, Ta. ^{1}kə^{1}tsa, Ag. ^{1}tsɯ, Ck. ^{1}ti, NR ^{1}Gi^{2}tZa, SR ^{2}tő, Lo. ^{2}tZo.
(B) No. tša?, Ts. I. sa?, II. s$\wedge$i?, Ko. ha?, Ch. _šau, Km. ^{12}e^{12}he, Ga. Ca?-a, Bo. Ja?.
(Jg) ^{3}ša
TB *tza?(d^{h})

'to steal': (KN) Lu. I. _ru, II. `ruk, Kom ^{2}m$\wedge^{1}$ruuk, Lg. ^{1}ku^{1}pu^{1}ru, Ag. ^{2}rɯ^{1}gu, NR ^{1}Ga^{1}ʔã^{2}fɯ, SR ^{1}rɤ^{1}rhü, Lo. ^{1}e^{2}fɯ, Yi. ^{2}a^{2}hɯʔ, Mi. ^{2}iŋ^{2}hu.
(B)No. huʔ, Ts. h$\wedge$uʔ, Ko. hɯʔ, Km. ^{12}a^{23}Gauʔ, Ga. Caʔ-u-a, Bo. Kau.
(Jg) ^{1}lə^{3}gu (^{1}lə^{1}gut 'thief')
TB *mrxu^{ʔ}(d^{h})

'to wash': (KN) Lu. I. _su, II. `suk, Chiru (Old Kuki) rusuk, Ta. ^{1}khə^{1}ŋə^{1}sə (< *g-rsu), NR ^{1}Ga^{1}ʔa^{2}su (< *g-rsu), SR ^{1}thü, Lo. ^{1}e^{2}tSɯ, Yi. ^{2}mɯ^{2}sɯʔ.
(B) Ko. hɯʔ, Km. ^{12}a^{23}tZauʔ, Ga. suʔ-a, Bo. suʔ.
TB *rsu^{ʔ}(d^{h})

6.4. Kuki-Naga TC-IIb-right column = Baric TC-II = Kachin | 1 |
'blood': (KN) Lu. ˌthi, Ti. ˌsi, Th. ^{2}thi, An. ^{2}sɑ, Kom ^{1}thi, La. ^{3}thi, Ag. ^{5}u^{5}zie ~ ^{2}the^{5}zie, Se. ^{1}a^{1}ži, Mi. ^{2}vi.
(B) No. -he, Ts. $^{1}\wedge^{1}$h$\wedge$i, Ko. ↓tši^{ʔ}-i, Ch. ¯si, Km. ^{1}se, Ga. anʔCi, Bo. Tɤiʔ.
(Jg) ^{1}shai
TB *dsywi^{ʔ}(s) ~ *d-hywi^{ʔ}(s)

'boundary': (KN) Lu. ˌri, Ta. ^{1}thə^{2}ri, Ze. ^{1}he^{4}rai, Ag. ^{2}the^{5}rie, Ck. ^{2}thɤ^{4}ra, Kh. ^{1}e^{1}ri, NR ^{1}a^{1}γɯ, SR ^{1}t$\wedge^{3}$rhi, Lo. ^{1}e^{3}rɯ.
(B) No. °-ri , Ts. haʔ^{1}r$\wedge$i (haʔ 'earth'), Ch. ¯l$\wedge$i¯l$\wedge$ŋ (< ^{2}laŋ 'stone'), Ko. ↓lɔŋγi, Ga. ari, eri.
TB *sdri^{ʔ}(s)

'nine': (KN) Lu. ˌkua, Th. ^{2}ko, An. ^{1}tu^{2}ku, La. ^{2}tsə^{3}ki, Ta. ^{1}tši^{2}ko, Ag. ^{2}the^{5}pfɯ, NR ^{1}Du^{1}Gu, SR ^{1}t$\wedge^{3}$kö, Lo. ^{1}Do^{3}kVɯ, Yi. ^{2}Du^{2}Gu (= | D-^{1}Gu |).
(B) No. $^{1}\wedge$ -khu, Ts. ^{2}↕$\wedge$ k$\wedge$uʔ (tone?), Ch. `Gɯ, Km. ^{3}lɤ^{1}Gauʔ, Ko. ↓tšɯ, Ga. sKu, Bo. Guʔ.
(Jg) ^{1}tžə^{1}khu
TB *jgua^{ʔ}(s) ~ *dgua^{ʔ}(s)

'to be thin': (KN) Ti. I. ˌpa, II. ˌpat, Th. a^{2}pa, An. ^{1}pi^{1}i^{2}pa, La. ^{2}a^{3}pə, Ta. ^{1}khə^{1}ŋə^{2}va (< *g-rba), Ag. ^{2}rɯ^{5}pfɯ, Ck. ^{2}re^{4}pu, Kh. ^{2}e^{1}pfɯ, NR ^{1}ʔa^{1}Ba^{12}si, Lo. ^{1}e^{3}Bo^{3}ro, Ao ^{3}ta^{3}pu, SR ^{1}rɤ^{3}pfɤ.
(B) Ga. Baʔ-a ~ Paʔ-a, Bo. GɤBaʔ.
(Jg) ^{1}pha
TB I. *rba^{ʔ}s, II. *rba^{ʔ}s-d^{h}.

6.5. Kuki-Naga TC-III = Baric TC-III = Kachin |2|

'hundred': (KN) Lu. _za, Th. ^{1}za, An. ^{1}tsa^{1}ma, Kom ^{2}rei ~ ^{1}r^^{2}z^°, La. ^{2}zə, Ag. ^{4}krie, Ck. ^{5}kra, Mao ^{5}kri, NR ^{1}mi^{2}za, Lo. ^{1}n^{3}zoa, Yi. ^{1}tŠi, Mi. ^{2}pha^{3}ro, Ro. `phai°, Li. -kai°, Ze. ^{5}hai.

(B) No. ^{2}tša°, Ts. ^{2}ša°, Ga. rit-Ca°.

(Jg) ^{1}lə^{2}sa

TB *bgrya^{h}

'moon': (KN) Lu. _tlha, Th. ^{1}hla, An. ^{1}trha, Kom ^{2}tha, Lg. ^{1}hla, Ti. ^xa, La. ^{2}tlhə, Ze. ^{1}he^{5}kei, Ag. ^{4}krhw, Ck. ^{5}ṭrhi, Kh. ^{1}e^{2}ṭrhw, Mao ^{2}o^{5}krho, NR ^{1}a^{2}ša, SR ^{4}šö, Se. ^{1}a^{1}qhi, Lo. ^{3}tŠo^{3}ro, Yi. ^{1}Ki^{2}nu, Ao ^{1}i^{1}ta, Ro. `bu, Li. -ka-liu ~ -ka-hiu (dialectical varieties).

(B) No. ^{2}da, Ts. ^{2}tža^{3}poi, Ch. _lit¯ñu, Ko. ↓letñw (< *sdla^{h}-d^{h}), Km. ^{21}a^{23}lei? (^{21}a < *raŋ 'weather prefix'), Ga. Ja.

(Jg) ^{3}šə^{2}ta

TB *sdla^{h}

'to peck': (KN) Lu. I. _tsu, II. tsuk, An. ^{1}pi^{1}i^{1}tv, Kom ^{2}m^^{1}tsuk, La. ^{2}pə^{2}tsu, Ag. ^{2}me^{4}du, Ck. ^{2}mɤ^{5}do, NR ^{1}Gi^{1}mi^{2}tŽw, SR ^{1}n^{3}dü (tone?), Lo. ^{1}n^{3}tŽw, Yi. ^{2}mu^{2}Gyu (= |m^{1}Gyu|).

(B) No. ^{2}tu, Ts. ^{2}ṭ^u, Ko. ↓tŠɔt (< *tsu^{h}sd^{h}), Ga. su?-a.

TB I. *mtsu^{h}, II. *mtsu^{h}-d^{h} (> *mtsu^{h}g).

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