

A Classified Account of J. F. Needham's A Collection of A Few Môshâng Naga Words*

Kellen Parker VAN DAM
Universität Passau / La Trobe University

Wanglung KELIM MOSSANG
Tangsa Script Development Committee

J. F. Needham's 1897 publication *A Collection of A Few Môshâng Naga Words* provides the first written account of Muishaung (Glottolog mosa1240), and one of the first ever accounts of any language within the Tangsa-Nocte group. While not completely free of typographic oddities, the text serves as an invaluable record of language change and documentation of an otherwise under-documented language within the Sino-Tibetan family. One of four texts produced by Needham from the region in this period, the collection of Muishaung lexical and syntactical data provides unique insights and an important window into historical sound changes of a language which otherwise lacks a written tradition. His account is not without errors, and contains a number of potential misinterpretations and typographical oddities. Despite this, the text is invaluable for its contribution to understanding the language both in terms of historical developments and in providing a window to the role of elicitation methodology and linguistic practices employed at the time. Through Needham's description, as well as his references to other languages on which he had published such as Singpho and Tai Hkamti, we are able to point to somewhat recent changes in tense-aspect-mood marking, lexical diffusion pertaining to certain sound changes such as vowel fracture which are unique to Muishaung within the Tangsa-Nocte group of languages. Other important features include shifts in explicit gender marking of some animal names through a degree of morphological levelling. This paper thus presents a detailed account of the text, including lexical items and grammatical structures of the original, with a comparison to the modern form of the language as spoken in the Tərit Valley of Arunachal Pradesh, India at the Burmese border, highlighting changes that have occurred over more than a century.

Keywords: Legacy materials, J. F. Needham, Tibeto-Burman, Tangsa-Nocte, Muishaung

Table of Contents

1. Introduction
 - 1.1. Language background
 - 1.2. Orthographic Conventions
 - 1.3. Data availability
2. Lexicon
3. Grammatical Notes
 - 3.1. Gender
 - 3.2. Adjectives
 - 3.3. Personal Pronouns

* This paper was originally presented at the workshop Discussions on Legacy Materials (DiLegMa) in Paris, France, March 2024. The authors thank the attendees for their comments and fruitful discussion. We also like to thank the anonymous reviewers for their helpful comments and suggestions.

- 3.4. Verbs
- 3.5. Numerals
- 4. Conclusions

1 Introduction

Descriptions of the languages of eastern Arunachal Pradesh and northwestern Myanmar are few, despite the incredible linguistic diversity of the region. Early descriptions are even rarer, with only a very small handful of accounts from before the 1900s. Perhaps the most significant contributor of such descriptions was Jack Francis Needham, who published word lists and sketches of the Hkamti variety of Southwestern Tai, still spoken in Northeast India and Myanmar today, as well as the Tibeto-Burman varieties Mising, Singpho, and Muishaung Tangsa. His description of Muishaung — which includes occasional references to the neighbouring and closely related Shecyü (Shangke) Tangsa variety — is the first account of any of the languages within the Tangsa-Nocte group to include grammatical analysis; the few earlier published terms of resources on the language, and brief unpublished records were limited to the type of word lists such as is found in Brown (1851). Along with his description of Singpho, he produced the first accounts of any Patkaian (Northern Naga) variety available to the outside world. It would be almost a century before additional works beyond lexical collections would come out in the work by Das Gupta (1978; 1980).

Needham's account of Muishaung is still invaluable today, providing a window into a version of the language from nearly a century and a half ago and a clear account from which a number of significant changes in phonology, lexicon and morphosyntax can be timed.

This paper presents much of the original data as documented by Needham, with additional analysis and commentary on the work relating to both the data and the collection methodology as much as it can be reconstructed. We also provide parallel data from the modern language as it is spoken in the Tərit Valley where the headwaters of the Namchik River are to be found, except in cases where no modern equivalent to Needham's form is attested. In many cases, Needham's account closely matches the modern form of the language. However, a significant number of differences are to be found, sometimes minor and sometimes the result of significant miscommunications. Even in cases where the differences are substantial or where miscommunications have occurred when the data was originally collected in 1888, there is much to be learned relating to how this under-documented language of only around 2,000 speakers between India and Myanmar has changed in the past 136 years in terms of phonology, lexicon, semantics, and morphosyntax.

1.1 Language background

Written as «Môshâng» in the original text, the name of the community and their language is today spelt ⟨Muishvung⟩ in the official Roman orthography and pronounced /mi₂ʃeuŋ₂/. The other common spelling under which it is known is ⟨Mossang⟩.

The Muishaung community is today believed to be one the largest of the dozens of Tangsa-Nocte subtribes in India today. They are classified among the Scheduled Tribes in India, and are also found throughout northwestern Sagaing Region in Myanmar, in the greatest numbers around the Lake of No Return, as well as in Nanyun and Hkamti Townships. In Arunachal Pradesh, India, the population originally settled in the Tərit Valley along the modern national border, where their villages appear on

the oldest maps produced by the British Survey of India. Speaker numbers are estimated to be around 2,000-3,000, however reliable numbers are not available.

In terms of resources on the language, a brief un-published sketch grammar has been compiled (Morey, 2019b) and a community-driven dictionary is currently in development. Bible and Hymnal translations are in use within the community, and children still regularly learn the language as their mother tongue today. A handful of partial descriptions can also be found in the literature, including in Morey (2015, 2018) and van Dam (2020). The Glottolog code for the language is mosa1240.

1.2 Orthographic conventions

Modern orthographic forms are given in ⟨single angle brackets⟩. This is the system currently in use among Members of the Muishaung community for the Bible translation, although a new non-Roman orthography is currently becoming more widely used. The Roman orthography is largely phonemic, although some combinations of glyphs may be unexpected to the reader. These include ⟨ht⟩ for /t^h/, ⟨th⟩ for /t/, and ⟨htt⟩ for /t^h/. In the modern system, ⟨z x⟩ and ⟨c⟩ indicates tone 1, 2, and 3 respectively, and any syllable ending in ⟨p t k⟩ or ⟨q⟩ is a 4th tone checked syllable. Digraphs ⟨ui⟩ and ⟨ue⟩ represent /i/ and /u/ respectively, and ⟨v⟩ represents /ə/ when part of a toneless semi-syllabic prefix and /e/ otherwise. This system was first developed by Rev. Gam Win based on missionary orthographies used in Myanmar in the past, and subsequently updated by the creator based on suggestions of community member Mr. Wanglung Keluim.

When occurring in the prose rather than section headers, Needham’s orthography is given in ⟨double angle brackets⟩, which are otherwise skipped in entry headers. Bold headers indicate Needham’s original transcription. Modern phonemic forms are given in slashes with broad IPA transcription, in which subscript numerals represent tone categories. Subscript zeroes indicate unstressed semi-syllables which do not carry a tone. Glosses in the prose are in single quotes. Fully reconstructed proto forms are prefixed with an asterisk, while potential proto-language etyma which are not reconstructed are prefixed with a hash mark (#). All headwords have been changed to lowercase in the following text to bring the data set in line with modern word lists.

For Needham’s transcription, a different set of transcriptions are given, as seen in Table 1, reproduced with the original typographic inconsistencies.

Vowels	
a	short, as in “company,” or like the u in but’
â	long, as in “father”
e	short, as in “met”
ê	long, as in “they”
i	short, as in “pin”
î	long, as in “machine”
o	short, as in “hop”
ô	long, as in “yeoman”

Vowels	
û	broad sound, as in “pool”
ü	like the French u in lune
Diphthongs	
au	like ow in “how.”
Consonants	
n	has a nasal sound like French n in “enfant.”
r	has such a distinct roll to it that I have used a double r.

Table 1: Needham’s original key to pronunciation

In most cases these conventions are followed, but many exceptions are to be found throughout the text. Where inconsistencies are present, they are discussed below in the sections in which they occur. This is especially common with other diphthongs and occurrences of the letter ⟨r⟩.

1.3 Data availability

The entirety of the word list from Needham's text is available in CLDF format along with the modern pronunciation and notes consistent with the following section. It can be downloaded at <https://github.com/phonemica/needhammuishaung>.

2.0 Lexicon

This section presents each of the concepts in the word list section of the original 1897 publication. Entries are organised under Needham's glosses, with adjustments made for clarity to the reader; in certain cases “ditto” is replaced with the appropriate term, and cases where Needham used local Indic terms, more modern spellings may be used or the term has been replaced entirely with or supplemented by a suitable English equivalent for the sake of the reader. When a Shecyü (Shangke) form is given in the original text, it has also been included.

above • rang • ⟨rvungx⟩ • /reuŋ₂/

This stem is given as ‘above’, but is rather the stem for ‘sky’, today ⟨rvungx⟩ /reuŋ₂/. In order to mean ‘above’, it would need to be ‘sky’-LOC, ⟨rvungxnuex⟩ /reuŋ₂nx₂/. This is an early form for the proto-Tangsa *-aŋ rime, in this case not showing the sound change in Needham’s transcription that the rime has since fully undergone by today. ‘Above’ is otherwise commonly ⟨htvuk⟩ /t^heuk₄/ today, from proto form *t^hak₄, a stem within the checked-tone counterpart to the *-aŋ rime.

acid • â^hhi • ⟨vhix⟩ • /ə₀hi₂/

The base verb ⟨hix⟩ /hi₂/ ‘to be acidic’ prefixed with nominalising particle ⟨v-⟩ /ə₀-. Adjectival modifiers are forms in Tangsa-Nocte languages by nominalising stative verb stems with this prefix. Nearly all lexemes in Muishaung which might be translated as adjectives in English will be composed in this manner. Additionally, colexification of ‘sharp’ and ‘sour’ is common across the region.

This is the first instance of Needham describing a sound as ‘sharp’ in the margin notes, referring to the ‘checked’ quality of words ending in a glottal stop. Any time a word is referred to in this way, it can be understood as having a CV? syllable structure. Significantly, however, certain stems were described as being sharp which today would not have a glottal stop coda. However, in closely related languages, the cognate stem does have such a coda, indicating that the stem in Muishaung may have either undergone a sound change in losing the coda on those stems, with Needham’s description being an indication of the timing, or that he simply misheard an unintentional glottalisation by the speaker, i.e. a production error.

An example of the etymon found elsewhere in Patkaian would be /hiʔ²²/ in northern Khamniungan, today meaning ‘to sharpen a blade’. In Muishaung today, all glottalisation is lost, and the stem occurs with tone 2, the reflex of *modal CV syllables in the proto language. That it occurs today with tone 2 also excludes the possibility of an error in elicitation for which verb stem alternation (suppletion) would have occurred, as the suppletive counterpart to tone 4 (checked) stems is tone 1. In other words, if instead the modern form were to be tone 1, one might rightfully suspect suppletion rather than full elision of the coda.

As with much of Tangsa-Nocte, Muishaung has a system of verbal stem alternation, where nominalised verb stems will either remain unchanged, or show a change in tone (typically to third tone), or, as is the case here, undergo a much more substantial change.

all · waʼtong · ⟨wvtvungx⟩ · /βə₀teuŋ₂/

In the modern Roman orthography, ⟨v⟩ represents /ə/ in prefix position and /ɐ/ in stem nuclei, with a measurable difference in formant frequencies.

This entry is the first in Needham’s text which shows an intermediate stage of what was at the time an ongoing sound change within proto-Tangsa-Nocte *-aŋ rimes. This change to /-euŋ/ in modern Muishaung is nearly fully complete at the present day with only rare exceptions, but at the time of Needham’s data collection in 1888, this change was found only for a handful of stems. These *-aŋ stems were variously transcribed by Needham as ⟨-ang⟩, ⟨-ong⟩ or ⟨-aung⟩. Some stems occurred only with the ⟨-aung⟩ spelling, indicating having completed the change, while others were given with multiple spellings, indicating alternation as the change was still ongoing.

A small number, including ⟨waʼtong⟩, instead have ⟨o⟩ in the rime. This may represent an intermediate stage, although other words are transcribed with both ⟨-ang⟩ and ⟨-aung⟩ in the text, and not with ⟨-ong⟩. More likely, this was a feature of the speakers’ idiolect, or a transcription error on Needham’s part.

alive · â-taʼrong · ⟨vthrvungx⟩ · /ə₀tə₀reuŋ₂/

The bare verb is /reuŋ₂/, with causative prefix /tə₀-/ and nominalising (nomz) prefix /ə₀-. Note that CAUS is more generally /tə₀/ with a non-dental onset, however a handful of verbal stems have undergone dentalisation of the causative prefix. This is very rare at the present time, and the result of an irregular change, but has been confirmed with multiple speakers. It may be a change which is still

occurring and thus possibly something to be discussed by future scholars. Needham's remark is 'Is alive?' as a verb phrase, suggesting additional attention on his part to the morphology.

anger · **an'yürr** · ⟨vnyerx⟩ · /ə₀ner₂/

A number of terms given have slightly different meanings than given, such as ⟨vnyerx⟩ /ə₀ner₂/. The actual meaning of this is to avoid someone as a sign of being emotionally hurt, more properly translated as 'to shun', rather than being angry. More typically, 'angry' is ⟨thuinzkhvyx⟩ /t̪in₁k^hei₂/, 'liver+bitter'.

This entry is one of a handful of /ɲ/ onsets on which Needham has misidentified syllable boundaries. The prefix is nominaliser /ə₀-/.

arm · **yok'phûm** · ⟨yvukphumz⟩ · /ʒeuk₄p^hum₁/

The stem ⟨yvuk⟩ /ʒeuk₄/ typically refers to the whole arm and hand. For compounds in which it is not the semantic head, it will more typically mean 'hand', such as in 'finger'. It is also used for 'leaf'.

The Shangke form is given as ⟨yâ phûm⟩. The difference in the initial vowel is due to *-ek rimes shifting in parallel with *-aŋ rimes as their fourth-tone equivalent, thus the parallelism with the second syllable of ⟨wa'tong⟩ 'all'. Additionally, the stem still retains a coda in Shangke, with the full form of the first morpheme being /jaʔ/, once more a case of Needham not transcribing glottal stop codas.

This is the first entry which has a form for Shangke, given as ⟨yâ'phûm⟩.

arrow · **lâ'san** · ⟨laqsanz⟩ · /laʔ₄san₁/

Here ⟨laq⟩ /laʔ₄/ means 'bow', and ⟨san⟩ /san₁/ refers to any narrow rod-like item. The same ⟨san⟩ /san₁/ morpheme is found on names for the parts of looms, guns, or anything else which may have such a shape.

ash · **tap'thâ** · ⟨tvphtaq⟩ · /tɛp₄t^haʔ₄/

This is specifically the ash that is produced at the hearth. Other ash can also be called by this name, but is more appropriately called ⟨wvrz buenx⟩ /βɛr₁bɤn₂/.

aunt · **ĩ sî** · ⟨izsuiyz⟩ · /i₁s̺i₁/

The /i₁-/ prefix here is a first person possessive, so this will actually mean 'my aunt'. This term will only refer to one's mother's sister. 'Paternal aunt' is instead ⟨nguizy⟩ /ŋji₁/, as is 'mother-in-law'. Little attention was paid in the original text to the differences between English and Muishaug kinship systems, in which relative age and gender both play a significant role.

axe · mang'kî · ⟨muingxkix⟩ · /miŋ₂ ki₂/

Here, Needham's «ang» does not match either the **-aŋ* or **-eŋ* rimes. Nearly all Tangsa-Nocte varieties will have a stem similar to /miŋ/ for 'axe', while the rest of Patkaian instead has something more similar to /βa/.

bad · â' bâ · ⟨vbac⟩ · /ə₀ba₃/

bag · yâ'khâk · ⟨nyackhak⟩ · /ja₃k^hak₄/

A satchel, literally 'tobacco'+bag'. This term would not apply to something like a larger bag such as for rice, nor modern day backpacks or duffel bags. The Shangke form is given as «khâk».

bamboo · wâṇ · ⟨wawx⟩ · /βɔ₂/

While not explained in the text, the underlined «ṇ» indicates nasalisation, likely of the preceding vowel. This is the most likely analysis of its intended use, rather than any sort of segmental feature, based on its occurrence elsewhere such as in 'bee' below.

Two stems occur for 'bamboo' in modern Muishaung, being /βɔ₂/ and /βaʔ₄/. The former, which is the stem given in the account, shows an important intermediate step in a sound change which today has completed. Nasalisation on the vowel at Needham's time derives from a velar coda, which has been completely lost by now. No phonemic vowel nasalisation is found today, but clearly existed in 1888. The /ɔ/ vowel is the modern reflex of the **-aŋ* rime.

Note the Shangke form «wâ» likely represents the other stem given the height of the vowel in Needham's account.

basket, man's · phâng'phai · ⟨phangxphvyc⟩ · /p^haŋ₂p^hei₃/

This is not actually a basket but rather a type of carrying bag, thus a more accurate lexeme for what may otherwise be interpreted by the reader for «yâ'khâk» above.

basket, woman's · khêṇ · ⟨khec⟩ · /k^he₃/

This term represents the largest of multiple basket types. The ⟨khec⟩ /k^he₃/ basket is typically used for carrying paddy rice. Nasalisation is again found on cognate terms elsewhere in Patkaian, such as in northern Khamniungan, where the basket for carrying paddy is known as /k^han⁵⁵/.

basket, small flat · phê · ⟨phec⟩ · /p^he₃/

This is a rare case where the modern form has a potential match with a liquid coda but Needham's does not, although in modern Muishaung a liquid-less form also occurs. Related stems are · ⟨pherx⟩ and ⟨phenx⟩ occurring in certain compounds.

bead · **lik' sâ** · ⟨luikthuiyz⟩ · /lik₄t̪i₁/

Needham's ⟨lik' sâ⟩ (today ⟨luik.saz⟩ /lik₄sa₁/ means a type of woman's necklace which is worn closely around the neck, with little slack. For 'beads' the term is ⟨luikthuiyz⟩ /lik₄t̪i₁/. This is another instance where it is easy to imagine elicitation through pointing to objects around the speakers.

bear · **cha' bâ** · ⟨jvɸbawx⟩ · /tɕɸp₄bɔ₂/

This is a very usual lexeme across Tangsa-Nocte varieties, most typically with /ba/ as the final morpheme. Interestingly, however, the modern form in Muishaung suggests the *-aŋ rime, despite most other Tangsa varieties not showing any similar likeness. An exception is Hahcheng, which has the form /sap.ben/, Shangwan with /ɸap.ban/, and Tikhak with /t̪ʰa.ban/. All other varieties suggest an *-a rime. For Shangke, Needham gives ⟨châb' bî⟩.

bee · **yân** · ⟨nyaq⟩ · /jaŋ₄/

Despite the apparent dissimilarity between the modern form and Needham's transcription this is a clear match with the modern form, /jaŋ₄/. Needham consistently transcribes as /j/ ⟨y⟩ what are /j/ onsets. In some cases, palatal nasal onsets prefixed with nominaliser ⟨a-⟩ are incorrectly syllabified in Needham's text. Despite the lack of nasal onset, the stem is transcribed with final 'n'.

In all cases where underlined ⟨n⟩ occurs, it corresponds with a nasal coda in the proto language which has been lost in Muishaung, and can be understood to mark vowel nasalisation.

This provides an excellent snapshot of the timing of nasal coda loss in Muishaung first described in van Dam (2019). In this case, the nasalisation is rather from the palatal onset, but was interpreted as part of the rime. Needham also consistently fails to transcribe glottal stop codas, but often describes such syllables as 'sharp' as discussed above.

Notably, confusion caused by misinterpretation of Needham's transcription resulted in the incorrect identification of the etymon in STEDT¹ as being #2788: PTB *s-b-(r/y)aŋ FLY (n.) / BEE.

belly · **vak** · ⟨wuk⟩ · /βuk₄/

bird · **vû** · ⟨wuz⟩ · /βu₁/

As with most languages of the region, as well as elsewhere in Southeast Asia, the simplest unmarked stem for bird will often refer to chickens in the default context. Here Needham has given the gloss as 'bird', but in modern Muishaung the general class will be ⟨wuzshawx⟩ /βu₁ʃɔ₂/, as is the case elsewhere in Tangsa-Nocte as well. See the entry for 'child (baby)' for more on the final morpheme.

1 Sino-Tibetan Etymological Dictionary and Thesaurus, <https://stedt.berkeley.edu/>

black · âṇ'yak · ⟨vnyvuk⟩ · /ə₀neuk₄/

Here syllabification is incorrect, but the form is otherwise as today.

bite, v · kok · ⟨kvuk⟩ · /keuk₄/

This is one of two forms of the stem in Muishaung. The nominalised/gerundive stem in Muishaung is ⟨kuiuz⟩ /kiu₁/.

bitter · â'krip · ⟨vkhuip⟩ · /ə₀k^hip₄/

This form for 'bitter' specifically refers to flavour, such as of the traditional tea. Another stem which is additionally used in emotive contexts is ⟨khvyz, khaq⟩ /k^hei₁, k^haʔ₄/, a verbal stem with suppletive forms. This alternate form is additionally used as a pairing word for ⟨khuip⟩ /k^hip₄/ in poetic phrases, a common feature of Muishaung in which related stems or phonologically parallel nonce words are used in elaborate expressions.

blood · ta'gri · ⟨tvghuiyz⟩ · /tə₀ɣii₁/

Needham describes the ⟨r⟩ transcription as significantly strong, often trilled, and makes note that at times he has written ⟨rr⟩ to further emphasise this. The use of ⟨r⟩ is not otherwise described in a way as to make cases such as ⟨â'krip⟩ for 'bitter' or ⟨ta'gri⟩ for 'blood' particularly clear to the reader. These should not be interpreted as the trilled /r/ here, but rather a deviation from his own orthographic conventions. Instead, the ⟨ri⟩ digraph indicates something along the lines of /ɛi/, with ⟨r⟩ serving more to indicate vowel quality, similar to the use in British spelling conventions for terms such as 'Burma' or 'Myanmar' in English, which are not in any way representative of /ɹ/ or similar sounds but rather indicate neighbouring vowel quality.

The Shangke form is given as ⟨tê'yai⟩

bone · â'rân · ⟨vrawz⟩ · /ə₀rɔ₁/

This is another case of the *-aŋ stem at an intermediate stage along the sound change, with nasalisation represented by ⟨ân⟩.

bow · lâ · ⟨[kazlic]laq⟩ · /[ka₁li₃]laʔ₄/

Described as 'sharp' by Needham, reflecting the glottal coda.

bough · pûlphâk · ⟨pulxphak⟩ · /pul₂p^hak₄/

While there is nothing notable about Needham's transcription here, it is very rare that Muishaung words will end in -ak/, as nearly all morphemes with *-ek in the proto language have shifted to -euk/ in the modern language. Few exceptions are to be found, but this is one such example where the sound change has not completely spread in the lexicon. Whether this stem will also change in the future remains to be seen.

bracelet · **yok' sân** · ⟨yvuksanx⟩ · /ʒeuk₄san₂/

Here again we see ⟨ok⟩ from *-ek.

bridge · **hî** · ⟨hix⟩ · /hi₂/

brother, elder · **î'phû** · ⟨vphuz⟩ · /ə₀p^hu₁/

Here as with ‘younger brother’ below, the ⟨i-⟩ prefix is possessive. Likewise in the Linguistic Survey of India (Grierson 1928) gives it in the possessed form. The general kinship term will instead have the schwa prefix when not specifically referring to one’s brother.

brother, younger · **î'nô** · ⟨vnox⟩ · /ə₀no₂/

As with other Patkaian varieties, there is no lexical distinction between younger sister and younger brother. The ⟨nox⟩ /no₂/ stem here applies to any younger sibling. Sex is only distinguished for older siblings. One can explicitly mark a younger sibling as male or female with an additional gender marking suffix, but this is not obligatory.

buffalo · **ngâ** · ⟨ngac⟩ · /ŋa₃/

This is one of the few nominal stems which take third tone. In most cases, third tone is the result of derivation from a now-lost nominalising *-h suffix. It has been suggested by Weidert (1987:182ff) that this may be a borrowing from Tai, thus accounting for the morpheme having tone three, a tone category which is otherwise uncommon for underived nouns. The potential for borrowing was investigated in van Dam (2018) and shown to be plausible for this stem, but cannot be clearly shown to be the case for the other third-tone nominal stems. Needham gives ⟨nî⟩ for the Shangke form.

bullet · **chûn'dî** · ⟨junxthuiyz⟩ · /tɕun₂ti₁/

Given as ⟨chûn'thî⟩ in Shangke.

bury, v · **lîp** · ⟨luip⟩ · /li_p₄/

buy, v · **rî** · ⟨ruiyx, vrez⟩ · /ri_i₂, ə₀re₁/

The bare verb stem ⟨ruiyx⟩ /ri_i₂/ undergoes suppletion to ⟨rez⟩ /re₁/ when nominalised. This would be a case like ‘blood’ and ‘bitter’ above where Needham’s ⟨ri⟩ corresponds to the modern /-ii/ pronunciation, however as the syllable onset is also ⟨r⟩, and ⟨rr⟩ would indicate a trill by Needham’s own conventions, we may still assume Needham had the 1888 equivalent of /-ii/ in mind when transcribing.

calf of leg · yavuín · ⟨yazwuenc⟩ · /ʒa₁βɤn₃/

call, v · ka'châ · ⟨kvjaz⟩ · /kə₀tca₁/

The actual meaning of this is ‘to say’. ‘To call’ would be instead ⟨ghvlz⟩ /ɣəl₁/.

cane (small kind) · rî · ⟨ruiyx⟩ · /rii₂/

The Shangke form is given as ⟨rai⟩, with a regular correspondence to the Muishaung diphthong.

cane (large kind) · het · ⟨het⟩ · /het₄/

catch hold of, v · lô · ⟨luz⟩ · /lu₁/

caoutchouc · nĩ'türr · ⟨nuiyxtuirx⟩ · /ni₂tir₂/

Natural rubber from the rubber tree.

child (able to walk) · nô'yân · ⟨nox yawx⟩ · /no₂ ʒɔ₂/

child (baby) · nô'shân · ⟨nox shawx⟩ · /no₂ ʃɔ₂/

The second morpheme here is also that found on ‘bird’ when referring to the general class, and not chickens more specifically. Needham’s inclusion of two phonologically similar forms here is not a mistake, but reflects an actual phonemic distinction. This is worth noting, as typesetting errors have at times been suggested by modern speakers in cases where Needham’s account may not match modern forms.

chillic · ma'kât · ⟨muitkat⟩ · /mit₄kat₄/

This term refers specifically to chili peppers, whereas ⟨thoyz⟩ /toi₁/ refers to the spicy taste sensation caused by capsaicin.

claw · yok'thin · ⟨yvukhttuinx⟩ · /ʒeuk₄t^hi₃/

This is specifically the fingernail of a human hand, the ⟨yok⟩ stem being ‘hand’. A claw of an animal would be ⟨khuingx⟩ /k^hiŋ₂/.

climb, v · dü · ⟨duiz⟩ · /di₁/

cloth (chudder) · khaithûm · ⟨khvyzhtumc⟩ · /k^hei₁t^hum₃/

This will also refer to any blanket rather than specifically a chador. ⟨Htumc⟩ /t^hum₃/ refers to any rectangular piece of cloth. The Shangke form is given as ⟨kâ⟩, the final *-l having been lost without reflex in the variety.

cloud · rông

In earlier sources for Tangsa-Nocte varieties, albeit none as old as Needham's, there is a stem typically transcribed «rong» which refers in some way to rain. It is often distinct from the 'sky' stem, typically <rang> . Here it occurs as 'cloud', quite possibly a rain cloud. After considerable investigation into numerous communities by the author, no version of this stem is to be found today in any of the Tangsa-Nocte varieties surveyed for this term. It may be a case of an irregular sound change corresponding with a split from the 'sky' stem, which was then lost.

'Cloud' in Muishaung today is <phuemx> /p^hɤm₂/, an etymon found throughout the region and related languages referring to either clouds, fog/mist or both. If it is the case that an earlier «rong» form fell out of fashion, it may be due to the concept of rain cloud being absorbed by this more general cloud/fog stem.

cold · rong'shûng · <rvungxsungc> · /reun₂sun₃/

«Rong» here is again the term for 'sky', today <rvungx> /reun₂/, and not the «rông» of cloud, above. This term for 'cold' will refer specifically to coldness of weather, and not of objects. In

Shangke the form is given as «vâ'song».

comb · chû · <tsuz> · /tsu₁/

come, v · kâ'lô · <kazloq> · /ka₁lo₄/

Here «kâ» is the verb meaning 'to go (downriver)'. Muishaung and other Tangsa-Nocte varieties have topographical sensitivity in their verbs for 'to go'. The suffix «lô» is a cislocative marker, indicating directionality toward the speaker. This form of 'come' as given by Needham will be appropriate in cases where a speaker is at a lower altitude relative to the listener. Otherwise the verb <wvungz> /βeun₁/ will be used in place of /ka₁/.

corpse · mî-tî'kâ · <miq thuiyc kaz> · /mi₄t̪i₃ka₁/

In the margin notes, Needham mentions that this may be person-die, which is correct. 'Corpse' is <mvungx> /meun₂/ or <miqmvungx> /mi₄meun₂/ for humans specifically.

cooking pot · tik · <tuik> · /tik₄/

cotton · rî'pü · <ruiyzpuic> · /ri₁pi₃/

The first morpheme /ri₁/ is the term for thread or string.

cow · mân'sû · <manxsuiux> · /man₂siu₂/

The suffix «sû» will be replaced by sex suffixes when specifying female or male. The form given here is the general form for domestic cattle.

cry · â´kwarr · ⟨khorx⟩ · /k^hor₂ ~k^hor₂/

This is an early example of vowel fracture on /o/, a process which is nearly complete today. A salient feature of Muishaung which is not found in other varieties of Tangsa-Nocte is the high frequency of diphthongisation of vowels which would be monophthongs elsewhere in the branch. This change is ongoing with /o/, and in the approximately 10 years the first author has been working on the language, lexemes which were given without diphthongs at the start of the work will today reflect the shift. The sound change appears to also have followed in some way the frequency of the words, with lower frequency lexemes such as ‘squirrel’ ⟨ratpop⟩ only having shifted in this most recent decade.

cross bow · kong´kî

This term is not known to speakers today. However, many Tangsa-Nocte varieties spoken in Myanmar will still have similar forms, most frequently /laʔ.koŋ/, such as is the case in Rangsa, Nahen, Henchin and Chamkok.

crow · wû´khâ · ⟨wuzkhax⟩ · /βu₁k^ha₂/

dance, v · va´nrm · ⟨wvnuemz⟩ · /βə₀nɾm₁/

Needham uses ⟨r⟩ in a number of places, typically as part of digraphs in the nucleus, which do not correspond to the pronunciation guide given at the start of the text. This is one such case, where instead it indicates a difference in vowel quality.

daughter · yâ´shikshâ/yâ´shikshân · ⟨yalxjiksaz⟩ · /ʒal₂tɕik₄sa₁/

Daughter is given as both ⟨yâ´shikshâ⟩ and ⟨yâ´shikshân⟩, providing a good indication of the timing of nasalisation loss. It is clear that the original stem had a nasal coda at some point in the past, which today is entirely lost. That both forms are given by Needham indicates that the change was occurring at that time, whereas other stems such as with ‘dog’ below had not yet begun to lose their nasalisation to the same extent. Based on this, we can conclude that nasalisation loss began around the 1880s, and was completed by the time Das Gupta (1980) provided sketches of the varieties.

to-day · ta´nî · ⟨tvnhuiyq⟩ · /tə₀ɲiʔ₄/

There are different ways of saying ‘today’ in Muishaung based on the time of day of the speech event. The form /tə₀ɲiʔ₄/ is said in the morning, and /m₁ɲiʔ₄/ in the afternoon. A more general way can also be used, /mɛi₁tɕiu₃reu₂ɲiʔ₄/, which literally means ‘current day’ as a general term. This is the form given for Shangke, ⟨m´sa râ´nî⟩.

morrow · **ĩ nap** · ⟨iznvp⟩ · /i₁nɛp₄/

dhao · **yaung** · ⟨yvungz⟩ · /ʒɛuŋ₁/

Here the form given reflects the completed sound change for **-aŋ* stems. Needham gives the Singpho equivalent as ⟨yaung-hi⟩, with the ⟨u⟩ present. This nearly matches to the more general term for ‘knife’ in Muishaung, whereas in modern Singpho, machete or dao (dha) is /n.t^hu/.

daily · **varong’ nî** · ⟨wvrvungxnhuiyq⟩ · /βə₀rɛuŋ₂ŋɿiʔ₄/

deer · **ngam** · ⟨ngvmx⟩ · /ŋɛm₂/

Given as ‘deer’, ⟨ngam⟩ instead refers to animals in general, as well as flesh or meat. This may suggest that deer is somehow the least marked animal, as is the case with the chicken among birds, or that there was a slight miscommunication between the attendees. The Shangke form is given as ⟨ngâm⟩ showing a slight difference in vowel quality.

dhan (paddy) · **sam** · ⟨tsvmz⟩ · /tɕɛm₁/

On a number of stems, the modern form has affricated the onset where Needham gives a fricative for Muishaung and often Shecyü, as in this case. There is a distinct dialectal difference of affricate vs stop onsets for some terms, but not ones which would correspond to Needham’s ⟨s⟩. It may be the case that this reflects something like fortition at that place of articulation resulting in affricates becoming stops and fricatives becoming affricates. The Shangke form is given as ⟨sâm⟩ again showing a perceived difference in vowel quality.

different · **adai** · ⟨vdvyx⟩ · /ə₀dɛi₂/

dog · **gui’hen** · ⟨ghuizhex⟩ · /ɣui₁he₂/

The suffix ⟨-hen⟩ was previously productive as a plural marker for animals. It has fossilised on ‘dog’, and is not transparently a number marker today. Nasalisation is fully lost.

The Shecyü form given by Needham is an Assamese loan, commonly borrowed by languages in the region which have had close contact with Assamese.

door · **khâ’lû** · ⟨kacluix⟩ · /ka₃li₂/

drink · **ning** · ⟨nuingx⟩ · /niŋ₂/

This is another stem which undergoes suppletion, although in this case the only change is a shift to third tone for the gerundive/nominalised stem. Segmentally, no change occurs.

drinking cup (of bamboo) · khap · ⟨khap⟩ · /k^hap₄/

Two stems are commonly attested for ‘cup’. Cross linguistically, there is often with a distinction between modern cups and traditional bamboo cups. Here ⟨khap⟩ /k^hap₄/ is given, which in other varieties often refers to modern cups, but in Muishaung refers to jugs. The other stem in Muishaung is ⟨kok⟩ /kok₄/, which means ‘cup’ here but often restricted to traditional bamboo cups in related languages. A similar phonological form for both stems is found throughout Tangsa-Nocte, as well as in other Patkaian varieties, as is the case in Cholim and Longri.

The /kok₄/ stem also shows close similarities to Tai, such as Shan ຄູ່ນ: /káuk/ and Phake ကွက် /kauk₁/. In northern Khamniungan, the final /-p/ form /kap²²/ is believed by speakers to be a borrowing from English.

drum · nûng · ⟨nungx⟩ · /nuŋ₂/

beat drum · nungtim · ⟨nungx tuimz⟩ · /nuŋ₂ tim₁/

dung · dî · ⟨diq⟩ · /diʔ₄/

Another stem which is described by Needham as ‘sharp’, corresponding to final /ʔ/.

dust · mût'gui · ⟨bokkhuiyx⟩ · /bok₄k^hi₂/

ear · nâ · ⟨nac⟩ · /na₃/

earring · nâchî · ⟨nacjic⟩ · /na₃tci₃/

earth · gâ · ⟨ghaq⟩ · /ɣaʔ₄/

This is again a stem marked as ‘sharp’ which corresponds to a modern final glottal stop.

eat · sâ · ⟨saq⟩ · /saʔ₄/

While having final /ʔ/ today as the verbal stem with ⟨svyz⟩ /sɛi₁/ as the suppletive nominal, Needham did not transcribe this stem as being ‘sharp’. That is, there was no indication of it as a checked tone. The stem has final /ʔ/ in all varieties of Tangsa-Nocte, as well as in elsewhere in related languages such as Makyam. It is most likely that Needham simply missed the glottalisation or failed to mark it as ‘sharp’. Note in some varieties, it is instead the form cognate with the gerundive stem that is found, as is the case in both Lainong and Pounyiu.

Muishaung, as with other Tangsa-Nocte languages, has two distinct verbs for ‘to eat’. This is the form for soft foods. For hard foods the term is ⟨phvuk⟩ /p^heuk₄/ or ⟨phuiuz⟩ /p^hiu₁/ depending on whether it is verbal or gerundive.

egg · **wû** **dî** · ⟨wuztiz⟩ · /βu₁ti₁/

The stem ⟨tiz⟩ /ti₁/, derived from ‘juice’ or ‘water’, is pronounced with affricate onset by some modern speakers, as mentioned above. This is considered non-standard and dialectal. However, this may shed some light on the ts/s alternation previously mentioned. The Shangke form is ⟨wû ^ˈdai⟩.

empty · **shok** **thü** · ⟨shvukhttuiz⟩ · /ʃɐuk₄t^h₁/

eye · **mak** · ⟨muik⟩ · /mik₄/

Shangke matches the Muishaung form as given by Needham, ⟨mak⟩.

face · **thal** · ⟨htvlx⟩ · /t^hɛl₂/

false · **â** **rot** · ⟨vrovt⟩ · /ə₀roɐt₄/

Vowel fracture has occurred on the nucleus since the time of Needham’s transcription. In Shangke this is given as nearly the same, ⟨â ^ˈrôt⟩, with only a small difference in vowel quality.

elephant · **jân** · ⟨jawz⟩ · /tɕɔ₁/

This stem was first pointed out in van Dam (2018) as a good candidate for Tai borrowings, expanded upon in van Dam & Morey (2019). An additional form for ‘elephant’ is found throughout Tangsa-Nocte, /bok.la/. This is not attested in Muishaung, which only uses the Tai-like stem. Note that in Needham’s transcription the final ⟨n⟩ is segmental, and not vowel nasalisation, as it lacks the underline. Needham also points out the connection to Tai, marking this as being borrowed from Tai Hkamti.

Given his familiarity with Hkamti, it is likely the lack of an underline is not an oversight. This may suggest that loss of nasal codas in favour of nasalisation was not yet complete, or it may just be that Needham was unnecessarily biased toward matching the Tai form which retains the coda. It is certainly not the case that the borrowing occurred within Needham’s lifetime, however, so that should at least be eliminated from the list of possible explanations. It is more likely that there was either a typographical error with the missing underline, or that Needham transcribed it as the Tai Hkamti form. The indication for Tai borrowing would instead place the borrowing event at likely many centuries before the present.

In Shangke, Needham gives ⟨jü⟩, the final nasal already gone from the language at the time of documentation. In the modern variety this is /tɕi₁/

fat (not lean) · **â** **pü** · ⟨vpuiz⟩ · /ə₀pü₁/

Needham’s glossing here is as in ‘overweight’ but the term which was given in Muishaung rather means fat on a piece of meat. The word for ‘not lean’ is instead ⟨vphenz⟩ /ə₀p^hen₁/.

far · â´jâl · ⟨yalz⟩ · /ʒal₁/

Final /l/ is retained in the transcription, where it is often absent or variable on other stems.

father · vâ · ⟨vwaz⟩ · /ə₀βa₁/

fear · â´hî · ⟨vhiz⟩ · /ə₀hi₁/

Needham notes that this has a ‘very long i’, which is surprising given the tone category of the modern term, as well as the fact that it had a definite glottalisation in the proto language as clear through comparison to other languages in the family such as Khamniungan, for which the tone category is also a reflex of final glottalisation. It is unclear what Needham was hearing in this case. That is unless it was a case of third-tone suppletion as a result of nominalisation, in which case it would have a phonemically longer duration. Diachronically, the distribution of where stem suppletion occurs is not yet well understood from variety to variety.

feather · mûl · ⟨mulz⟩ · /mul₁/

The stem here is more generally ‘fur’ or ‘body hair’. Today /mul₁/ will be unspecified, whereas /βu₁ mul₁/ will be explicitly referring to feathers, where /βu₁/ means ‘bird’.

female · yâ´shik, yâ´shik · ⟨yalxjuik⟩ · /ʒal₂tcik₄/

The initial syllable here today has final /-l/, but is given in the text both with and without the coda. This may have been simply phonetic alternation on the part of the speaker. While many Tangsa-Nocte varieties have lost *-l codas, Muishaung is particularly conservative regarding codas.

Note that Needham only gives the form ⟨yâ´shik⟩ in the entry, but gives ⟨yâ´shik⟩ elsewhere in the text. This is one of many examples of ongoing change and variation occurring at the time of documentation that has been preserved in alternating transcriptions.

finger · yok´shî · ⟨yvukshix⟩ · /ʒeuk₄fi₂/

The Shangke form is given as ⟨yâ´shî⟩, although the first syllable should have a glottal stop as the coda, which Needham never transcribed. The modern pronunciation in Shangke/Shecyü is /jaʔ₄fi₂/.

fire · varr · ⟨wvrz⟩ · /βer₁/

fire-place · varrkun · ⟨tapkhux⟩ · /tap₄k^hu₂/

The first syllable here is ‘fire’. The second syllable is less clear. Today we might expect ⟨khux⟩ /k^hu₂/, from ‘head’. The transcribed ⟨kun⟩ is anomalous, both for nasalisation and lack of aspiration, should it be tied to the modern term. Marrison (1967) repeats this form as ⟨varkun⟩, likely adapted directly from Needham. Across Patkaian, the only formally similar potential matches are in Khamniungan, for which ‘hearth’ is /ao.k^han/, again with aspiration. Here

/k^han⁴¹/ refers to a hole or pit, which may give some suggestion for how this term came into the text in case the elicitation was done around a dug-out fire pit and not a flat in-home hearth.

However, in that case, the Muishaung term would be ⟨khurx⟩ /k^hur₂/, again with aspiration, as is the cognate in Jinghpaw, /khun³³/. Thus, Needham's transcription were it to fit would need to have omitted aspiration, either in his own writing or in the typesetting, and the final nasalisation would have to be in parallel with that of 'flame'.

This is the most likely explanation for the given form. That is, we are likely looking at a compound which originally meant 'fire pit', with extant cognates elsewhere in Patkaian, but which has since been replaced by the modern term.

See 'flame' below for additional possibilities in light of potentially anomalous transcriptions from Needham.

fire-gun · gâp · ⟨ghap⟩ · /ɣap₄/

This term is related to that for 'to kick', and in many varieties they are homophonous if not polysemous. Needham specifies 'gun' here, but it will apply as well to firing arrows. An irregular sound change has occurred in many varieties differentiating between 'shoot' and 'kick', but these were clearly a single etymon in the distant past.

fish · ngâ · ⟨ngaɣ⟩ · /ŋaɣ₄/

Another case of a 'sharp' syllable matching a glottal stop coda.

flame · vâṇ

This form is identified as an error by modern Muishaung speakers, however there are a few notable issues to point out. First, in many varieties, coda /-r/ is dis-preferred if not entirely impossible, often resulting in a shift to final /-n/. The same occurs for final /-l/, which is often even less common than /-r/. It is possible therefore that Needham's consultant was one who may have had experience with other varieties (which was likely the case regardless) and thus presented a form that was less accurate for Muishaung, but acceptable elsewhere. Additionally, there may have been non-Muishaung speakers present, resulting in possible priming. At any rate, Needham would surely not have mistaken his well-described ⟨rr⟩ for ⟨ṇ⟩, and so we can trust that the transcription is most likely accurate, despite not being the actual term for flame in Muishaung.

This may shed light on 'hearth', then, as well. Since we know Needham often transcribed nasality incorrectly in terms of phonemic syllabification, or as nasalisation on the nucleus when it should have been the onset as in 'bee', it may be the case that his consultant/s for this work did have alternating nasalisation on /βer₁/, which may have carried over into the second syllable of 'hearth'. The lack of aspiration is still problematic, but this may at least be a possible answer for why 'hearth' looks as it does.

Since Needham left absolutely nothing about his speaker's or speakers' background, we cannot know what other possible factors may have been at play. Still, for as careful as Needham was generally, it is more likely that there was either some phonetic variation going on, or other complicating factors which would account for his transcriptions as they are.

flea · **kar'khî** · ⟨tvlic⟩ · /tə₀li₃/

This is simply a mistake. The lexeme ⟨khvrxkhix⟩ /k^hər₂k^hi₂/ is 'wildcat' and not flea. Likely a simple mistake on Needham's part, or perhaps we can speculate that this was elicited by pointing to a cat with fleas and not being understood.

flint striker · **varrpai** · ⟨wvrzpayc⟩ · /βər₁pai₃/

This instead means means to light a fire with flint. Flint striker should instead be ⟨payclungz⟩ /pai₃luŋ₁/. The /pai₃/ stem is likely a Tai loan, as in Shan ၵႁႃႈ /p^haa₁ p^haj₄/ 'flint stone'.

fly, **v** · **bâ** · ⟨baz⟩ · /ba₁/

fog · **pharm** · ⟨phuemx⟩ · /p^hʁm₂/

Today fog is ⟨tvpuκ⟩ /tə₀puk₄/, and ⟨phuemx⟩ is instead 'cloud'. The modern form for fog appears similar to a verbal stem with a causative prefix, but an appropriate verb stem was not found which may explain this as such a construction.

foot · **yâ'phâ** · ⟨yazphac⟩ · /ʒa₁p^ha₃/

Here /ʒa₁/ is the general term for both leg and foot, and /p^ha₃/ is the form used for 'palm' when compounded with hand. This thus specified foot as distinct from the larger leg-foot concept. For Shangke the form is given as ⟨yî'phî⟩.

forget · **â'lok** · ⟨vlvuk⟩ · /ə₀lɛuk₄/

Derived from *lak₄, with the sound change expected for that rime.

forest · **ling** · ⟨luingx⟩ · /liŋ₂/

The Shangke form is given as ⟨yazphac⟩.

forehead · **khâng** · ⟨khvungxkuimx⟩ · /k^hɛuŋ₂kim₂/

fowl · **wû** · ⟨wuz⟩ · /βu₁/

As 'bird' above.

friend · **î-hî'wâ**

This lexeme does not clearly match anything in the modern lexicon. The ⟨î-⟩ prefix appears to be the possessive prefix, and ⟨-wâ⟩, cognate with 'father', occurs as an agentive marker — today

more commonly /tci₂/ ‘grandfather’ serves this role — but it’s unclear what «-hî-» is here, and discussions with speakers did not resolve the issue.

get up, v (rise) · ka’ten · <kvtenc> · /kə₀ten₃/

<Tenc> /ten₃/ means to pull up or raise, and <kv-> /kə₀-/ is the reflexive prefix.

girl · yâ’shikshâ · <yaxjuiksaz> · /ʒal₂tɕik₄sa₁/

As ‘daughter’ above.

give · kû · <kuq, kuyz> · /ku₄, kui₁/

This stem undergoes suppletion when nominalised. The form given by Needham is likely the bare verbal stem, but for which the ‘sharp’ marking was not given. It is possible that stem alternation developed in its current state somewhat more recently, as closely related Tangsa-Nocte varieties which show stem suppletion do not undergo the same patterns on the same stems.

go away, v · ka’thot · <kvhttovt> · /kə₀t^hoet₄/

This means to move slightly or gradually. It is not specifically to depart or leave, nor is it imperative.

goat · kir’kî · <khelxkhix> · /k^hel₂k^hi₂/

gong · nyâm · <nyamx> · /ɲam₂/

good · â’hal · <vhvix> · /ə₀hel₂/

granary · sam’tâp · <tsvmztap> · /tsəm₁tap₄/

Also · <tsvmztumz> /tsəm₁tum₁/ in the modern language.

gun · koŋ · <koz> · /ko₁/

This term is almost certainly a loan from Tai, where it means ‘pipe’ or ‘gun’, being ကွန် /kauŋ₃/ in Phake and ဂွန် /koŋ₃/ in Shan.² The Shangke form given, <sa’nit>, is a borrowing from Burmese ဆေနီတံ senat.

gunpowder · nâm’van · <namxwanx> · /nam₂βan₂/

The morphemes for this term are homophonous with a general term for plants, /nam₂/, and the term for flour bread /βan₂/. A connection to the concept ‘fire’ is especially unlikely given the modern pronunciation of the second syllable having final /n/ and the wrong tone for a match.

flint for ditto · palûng · <payclungz> · /pai₃luŋ₁/

Literally ‘igniting stone’.

² Shan forms are from the SEALang Library Shan Lexicography sealang.net/shan/dictionary.htm while Phake forms are from Hailowng, p.c

hail · **ting'ür** · ⟨nyerxlox⟩ · /ɲer₂lɔ₂/

Syllabification is incorrectly identified in the original text, and should be ⟨ti'ngür⟩, the first morpheme in Needham's case being that of 'water, juice' /ti₁/.

hair · **kû'mûl** · ⟨khuxmulz⟩ · /k^hu₂mul₁/

Literally 'head fur', although Needham failed to transcribe aspiration of the initial consonant. Aspiration is marked elsewhere, such as in the entry for 'hat'. The Shangke form is given as ⟨khû⟩, the stem for 'head', rather than as in the modern language /k^hu₂bin₁/ which is cognate with the Muishaung form for both morphemes.

hand · **yok'phâ** · ⟨yvukphac⟩ · /ʒvuk₄p^ha₃/

In Shangke ⟨yâ'phî⟩, missing the glottal stop coda on the first syllable. Today this is pronounced /ja₄pe₃/ or /ja₄pi₃/.

hat · **khû'phûk** · ⟨khuxphuk⟩ · /k^hu₂p^huk₄/

The form in Shangke is fully cognate, ⟨khû'phau⟩, with the final glottal stop of the second morpheme absent in the transcription.

he · **â'pî** · ⟨vpiq⟩ · /ə₀pi₄/

Another case of a checked syllable not marked as 'sharp'. The stem is checked in all varieties of Tangsa-Nocte. Notably this is not the case in other Patkaian branches,³ nor are reflexes of the coda attested in other branches such as Lainong where glottal stop codas were lost, but for which reflexes of the CV? syllable are a consistent toneme with 44: contour. It is possible that the coda is innovative in Tangsa-Nocte, since it is absent elsewhere. However, this would still be an oversight to Needham's were he to be consistently marking -? codas, as the development must have happened at the proto-Tangsa-Nocte stage.

here · **â'nü** · ⟨vnuex⟩ · /ə₀nɣ₂/

here · **â'yü**

Needham transcribed a number of palatal nasal onsets with ⟨y⟩, either due to the speaker's production or his own interpretation, so it is likely this was simply a palatalised /n/ due to effects of the nuclear vowel. Therefore it is likely that this form was a case of allophonic variation.

head · **khû** · ⟨khux⟩ · /k^hu₂/

The Shangke form is identical in Needham's transcription, ⟨khû⟩, today /k^hu₂/ also as in Muishaung.

³ An anonymous reviewer has pointed out that the addition of glottal codas is common after /i/ in other cases in the larger region, including in Maru (Burling 1966) and Huishu (Mortensen 2004, 2012), which may also explain the presence here.

heavy · â'ñ · ⟨vliz⟩ · /ə₀li₁ / liʔ₄/

Adjectives in Muishaung are derived from nominalised stative verbs. The form given by Needham – marked as ‘sharp’ – is the gerund form of to be heavy . When used as a nominal predicate, translatable as a simple adjectival clause modifying a nominal subject, this form will be used. This stem undergoes verbal suppletion when the meaning changes to ‘weight’, in which case it should be /ə₀li₁/ rather than /ə₀liʔ₄/ . This stem is of particular interest more generally for being a clear case of suppletion affecting meaning.

hill · kû · ⟨kuz⟩ · /ku₁/

Shangke ⟨kû⟩, today /ku₁/.

horn · â'rûng · ⟨vrungx⟩ · /ə₀ruŋ₂/

Shangke form is given as ⟨rong⟩ . Pronounced in modern-day Shangke as /a₀roŋ₂/.

hot · â'kâl · ⟨vkalx⟩ · /ə₀kal₂/

The Shangke form gives another example of the loss of final *-l, here resulting in a change to the vowel. The form given by Needham is ⟨â'kê⟩, as final *-l shifted first to /j/ before affecting the vowel quality or being lost entirely depending on the environment and word.

house · yim, yüm · ⟨yuimx⟩ · /ɜim₂/

The high central vowel often shows alternation between /i/ and /u/ in many Tangsa-Nocte varieties. This is often allophonic. Today ‘house’ is /ɜim₂/ in Muishaung. Needham included two spellings, possibly to account for allophony.

notched steps leading up to house · hî'khû · ⟨hixkhux⟩ · /hi₂k^hu₂/

Literally ‘bridge head’

how · m'khô'lâ · ⟨mz'khoc lac⟩ · /m₁k^ho₃ la₃/

high · yûng · ⟨yungx⟩ · /ɜuŋ₂/

This is also ‘big, large’. Likely this would have been elicited with reference to some landmark such as a mountain, for which ‘big’ would have been appropriate. Shangke ⟨yong⟩.

I · ngâ · ⟨ngaz⟩ · /ŋa₁/

ill · â'tû · ⟨vthuiuz⟩ · /ə₀t̪i₁/

Indian corn · powûng · ⟨puixwungx⟩ · /pi₂βuŋ₂/

Needham’s ⟨o⟩ vowel will be influenced by the following ⟨w⟩ .

iron · **yân** · ⟨yanx⟩ · /ʒan₂/

jungle · **yâ rū, jâ rū** · ⟨yayzruix⟩ · /ʒai₁ri₂/

The /ʒ/ phoneme is represented in the modern orthography as ⟨y⟩ but is realised anywhere between /j/ and /ʒ/, with some Tangsa-Nocte varieties also having /dʒ/ as an allophone. Needham's transcription shows an awareness of this alternation, still present today.

kill · **tat** · ⟨thvt⟩ · /t̪et₄/

This is the plain verb stem for the etymon. The nominalised form is /t̪i₃/ . The dentalised /t̪/ is a reflex of proto-Tangsa *ð-.

knee · **long kū** · ⟨lvungxkuix⟩ · /leuŋ₂ki₂/

knife · **yân hî** · ⟨yanxhix⟩ · /ʒan₂hi₂/

«Yân» here is 'metkill · tatal, iron'. The Shangke form is given as «yâ hî».

kochu · **dü** · ⟨tuiz⟩ · /t̪i₁/

The term Needham uses is from Bangla কচু kochu, kosu in Assamese, and refers to taro or similar root vegetables.

large · **â dil** · ⟨vdvlz⟩ · /ə₀dɛl₁/

This is more typically ⟨yungx⟩ /ʒuŋ₂/ today in the most general sense. Here the Shangke form given by Needham differs more considerably, given as «â kai». This form given for Shangke instead means 'to be old', as referring to human beings, giving us another glimpse into the elicitation experience and methods under which the data were collected.

laugh, v · **nî** · ⟨nhuiyx⟩ · /n̪i₂/

Dentalisation of nasal onsets is an innovation in Muishaung not seen in other Tangsa-Nocte varieties. It likely occurs through analogy of /t̪/. It sometimes occurs as a result of semantic splits, such as between 'two' /n̪i₃/ and the dual pronominal marker /n̪i₃/ . Today the distinction is phonemic and lexically specified.

leech · **ta wat** · ⟨tvwvt⟩ · /tə₀βet₄/

This is specifically terrestrial leeches. Aquatic leeches are /na₂piŋ₂/, a compound of two borrowed Tai stems, for example Shan 𑜀𑜢𑜤𑜰𑜫 /naa₄/ for wet rice field and 𑜀𑜢𑜤𑜰𑜫 /piŋ₁/ for leech. In Shangke the term is cognate, given by Needham as «ta vat» .

leaf · **nâm yok** · ⟨namxyvuk⟩ · /nam₂ʒeuk₄/

The stem /ʒeuk₄/ here is polysemous with 'hand'. The initial component in the compound acts as a semantic head. In this case, Needham's form with «nâm» limits this to plants which are not trees,

«nâm» being the term for shrubs, grasses and other jungle plants. ere the Muishaung form has the semantic head «nâm» thus referring to leaves of non-tree plants. An alternative form is ⟨pulxyvuk⟩ /pul₂ɜ̥uk₄/ for which the semantic head is specifically ‘tree’. This is cognate with the Shangke form «pê’yâ» which occurs in the text, along with being cognate with the Phom and Konyak forms, both /pi.yak/.

leg · yâ · ⟨yaz⟩ · /ɜ̥a₁/

This is the most general term and includes the foot. Shangke is given as «yî».

lightning · rong’lep · ⟨rvungxlep⟩ · /reun₂lep₄/

This refers to lightning in the sky, not a lightning strike. This is a distinction found throughout Patkaian. Lightning striking would be ⟨pheq⟩ /p^heʔ₄/ in Muishaung.

lip · na’warr · ⟨nuixbuirz⟩ · /ni₂bir₁/

The modern form is · ⟨nuixbuirz⟩ /ni₂bir₁/. The second morpheme, ⟨buirz⟩, is best translated as lobe and occurs in compounds for both ‘earlobe’ as well as ‘buttocks’.

light (not heavy) · â’chân · ⟨vjawz⟩ · /ɜ̥oʔɜ̥ɜ̥₁/

Final « n » here is likely intended as ng, given the /ɜ̥/ of the modern form. The proto-Tangsa-Nocte form would likewise have had *-aŋ as the rime.

loin cloth · rî · ⟨ruiyq⟩ · /riiʔ₄/

This is again a case where if the onset were not ⟨r⟩ we may expect Needham’s ⟨ri⟩ nucleus transcription. While many of Needham’s conventions are consistently used, even if not explicitly described, often there are enough exceptions that would make it nearly impossible for a reader to work out the pronunciation of a word based just on its spelling. Shangke is given as «rai».

look, v · lân · ⟨lawx⟩ · /lɜ̥ɜ̥₃/

Like ‘elephant’, this is another instance of the *-aŋ rime written with a segmental nasal rather than the vowel nasalisation signified by the underlined «n». In the case of ‘elephant’ where Needham attributed it to being a Hkamti borrowing, the segmental /n/ transcription may have been due to the influence of Hkamti on Needham himself. However in this case we may suspect it as a typographical error. There is not a reasonable pathway for *-aŋ to have become /ɜ̥/ that would have included an intermediate stage of final /n/ that did not also result in a merger. Thus, this transcription should be assumed to be erroneous, and instead intended as «lân».

louse · **thik** · ⟨httuik⟩ · /t^hɪk₄/

make, v · **gür** · ⟨ghuir⟩ · /ɣir₃/

This verbal stem is also common in compounds referring to occupations. ‘Carpenter’ will be house + /ɣir₃/ + SPEC. ‘Mason’ will be ‘stone’ + /ɣir₃/ + SPEC. As with most Sino-Tibetan languages, word formation in Muisaung is largely through compounding.

male · **mĩ wâ** · ⟨miqwaz⟩ · /miɭ₄βa₁/

Person /miɭ₄/ combined with the SPEC ⟨ ‘father’ /βa₁/ . Today ‘grandfather’ /tci₂/ is a more productive specifier, but previously /βa₁/ was common, and still occurs today as a masculine marker on humans.

many · **â pâng** · ⟨vpvungc⟩ · /ə₀pɛuŋ₃/

mat · **dam** · ⟨dvmx⟩ · /dɛm₂/

monkey · **vĩ sil** · ⟨wixsuilx⟩ · /βi₂sɪl₂/

mortar for pounding paddy · **thim, thüm** · ⟨htuimz⟩ · /t^hɪm₁/

pestle for ditto · **thim yâ** · ⟨htuimzyaz⟩ · /t^hɪm₁ʒa₁/

This is likely ‘mortar leg’, with ⟨yaz⟩ /ʒa₁/ being the form for ‘leg’ generally.⁴

mother · **n yû** · ⟨nyuiuz⟩ · /ɲiu₁/

Nearly all cases where a palatal nasal occurs in the data, Needham marks syllabification as if it is /n.j/. In some cases, the nasal is missed entirely, as is the case for ‘bee’. This is frequent enough that it may be indicative of a feature of the speaker’s pronunciation, rather than Needham’s ear, such as the speaker under-pronouncing the nasality and therefore overcompensating.

moon · **yâ pî** · ⟨yacpix⟩ · /ʒa₃pi₂/

Shangke ⟨yî pî⟩, today /ʒi₃pi₂/.

mod · **choâl** · ⟨jovlz⟩ · /tɕoɛl₁/

This is the traditional fermented rice drink previously common across cultures in the region, but which has fallen somewhat out of favour after conversion to Baptist Christianity.

mouth · **nürr** · ⟨nuix⟩ · /ni₂/

A significant phonological departure from the modern variety, Needham transcribes this with double ⟨rr⟩ indicating a strong trill. For terms which today end in coda /r/, the transcription is an appropriate choice. However, today ‘mouth’ is /ni₂/ for the native speaking author. There is

⁴ As pointed out by an anonymous reviewer.

potential dialectal variation also encoded in the text as compared to modern pronunciations, particularly with coda ⟨l⟩ and ⟨r⟩. In some such cases Needham's transcription does not directly match that of speakers who were consulted by the authors. However, coda /r/ and /l/ are particularly unstable across Tangsa-Nocte varieties when looked at diachronically, and a shift in the pronunciation between dialects should not be surprising.

mud · bok · ⟨bok⟩ · /bok₄/

nail · yok' thin · ⟨yvukhttuinc⟩ · /ʒeuk₄t^hin₃/

In Shangke this is given as ⟨yâ'sun⟩. These are cognate terms, with Muishaung retaining a clearer reflex to the proto-language onset *ð- which typically merged with other onsets in most modern varieties.

name · ming · ⟨muingc⟩ · /mɪŋ₃/

near · ân'yek · ⟨vnyek⟩ · /ə₀nek₄/

Again syllabification splitting a palatal nasal onset. The ⟨â⟩ prefix is the nominaliser, forming an adjectival modifier from a stative verb stem.

nest · wûshanchîan · ⟨wuzshawxjez⟩ · /βu₁ʃɔ₂tce₁/

net · châk · ⟨jak⟩ · /tɕak₄/

now · mâ'chû · ⟨mvyzjuiuc⟩ · /mei₁tɕiu₃/

old · â-kîon · ⟨vkez⟩ · /ə₀ke₁/

As with 'nest', the final nasalisation is from a loss of *-ŋ coda. The cognate in Joglei is /keŋ₁/, with similar cognates in some other Tangsa-Nocte varieties. In most, however, the coda has likewise been lost. It is /ki/ in Rëra, /ki/ in Chamchang (Kimsing), and /ke/ in Gaji.

old man · vî-kânwâ · ⟨lixkawx waz⟩ · /li₂kɔ₂βa₁/

old woman · vî'krû · ⟨wizkuiux nyuiuz⟩ · /βi₁kɪu₂ɲi₁/

petticoat · nî'sâ · ⟨nhuiyqsaz⟩ · /ɲi₁ʔ₄sa₁/

Another instance of dentalisation of a nasal onset analogous to the dental plosive.

woman's chudder · khaipân · ⟨khvyzparx⟩ · /k^hei₁par₂/

This is another instance like 'flame' where a nasal vowel is given in place of what is today /r/, further supporting the analysis that these were in alternation for the speaker consulted by Needham. Given the strength of articulation of /r/ in modern times as well as in Needham's description, it is unlikely to be a simple mistake.

pig · vak · ⟨wvuk⟩ · /βeuk₄/

pipe · yâ' tik · ⟨nyactuik⟩ · /ɲa₃tik₄/

There is again a lack of nasalisation here, using only ⟨y⟩ for a palatal nasal onset. Likely the speaker simply did not enunciation the nasalisation clearly, as evidenced by a number of other words in the list. However, Needham's interpretation may also be the culprit. This is supported by the cognate Shangke form, given as ⟨nĩ' tak⟩.

place or put, v · tâ · ⟨taq⟩ · /taʔ₄/

poison · la' pû · ⟨lvpuz⟩ · /lɔ₀pu₁/

This is poison gathered from leaves and then put on spears or arrows, rather than the type used for fishing. The Shangke form is given as the same, ⟨la' pû⟩.

post · thung · ⟨thungz⟩ · /tʰuŋ₁/

plantain · yâm ngâ · ⟨nyapngak⟩ · /ɲap₄ŋak₄/

Initially ⟨yâm ngâ⟩ does not look like a particularly good match for /ɲap₄ŋak₄/. In spite of this, it likely is. The use of ⟨ŋ⟩ adjacent to a syllable with ⟨y⟩ onset likely accounts for the palatal onset, frequently missed in the text. Final ⟨m⟩ on the first syllable occurs due to underlying assimilation of /p/ to the following nasal manner of articulation. The ⟨ngâ⟩ is /ŋa/, but with the nasalisation ⟨ŋ⟩ having been conflated with the velar onset. Then the only unaccounted-for aspect is the final /k/. This can often come across as a glottal stop in less careful speech, especially when in isolation, and Needham never accounts for final glottal stops except on monosyllables which he then describes as being 'sharp'. Based on this, Needham's ⟨yâm ngâ⟩ almost certainly is an effort at transcribing /ɲap₄ŋak₄/ when taking into account the various other near misses in transcription elsewhere in the text.

rice · vûng · ⟨wungx⟩ · /βuŋ₂/

This is rice which has been husked, as opposed to paddy, for which other terms are given.

cooked rice · dûng · ⟨dungc⟩ · /duŋ₃/

rain · rang · ⟨rvungxyunc⟩ · /reuŋ₂ʒun₃/

Historically it is likely that there was a #raŋ stem for rain, distinct from the sky *raŋ stem, attested in some older texts. This has been lost throughout many Rangpangic varieties, while the meaning of 'rain' for such a stem is still widely attested across Tibeto-Burman. It is likely this developed due to a semantic split (as described in van Dam 2022), or simply is a case of polysemy which has now been lost.

See also ⟨rông⟩ 'cloud', for which the vowel is distinctly different in Needham's transcription.

red · kaishân · ⟨vshawx⟩ · /ɔ̌ɔ̌ɔ̌₂/

Here «shân» is another case where the final nasal is expected to be underlined «n̄». The modern form of this morpheme is /ɔ̌ɔ̌/, the rime derived from **-aŋ*. The initial «kai» is less transparent, however compare /ko.xin/ in Gaqkat, a Southwestern Patkai variety closely related to Wancho, as well as /nan.k^hai/ in Kaisan and /nan.ki/ in Konnu, where /nan/ is likely a Tai loan, common in varieties in the Kaisan-Kon subgroup. This morpheme closely resembles **k^hal*, ‘hot’, possibly a connection to ‘red-hot’.

ring · yoktû’op · ⟨yvuktop⟩ · /ʒeuk₄top₄/

Here again evidence of vowel fracture is apparent based on syllabification marking in Needham’s transcription.

ripe · â’muin · ⟨muinx⟩ · /m̄i₂/

Transcription of earlier forms of /i/ are not fully consistent. In some cases, when a monophthong occurs in the modern variety, Needham uses «ui» to transcribe the corresponding segment. Coincidentally, this is also the orthographic convention used for the sound in the modern Roman orthography.

river, also water · yeng · ⟨yuix⟩ · /ʒi₂/

The final nasal here is not accounted for. It may be a reduction of /ɲi₁/ ‘mother’, a typical augmentative. Such assimilation of /ɲi₁/ (or cognate stems) is common in Patkaian, often rendered semantically opaque to speakers. The Shangke form is given as «sâ» of uncertain etymology. This may be a mis-transcription of /ʒa/, or a form more in line with Wancho, today /s̄ɔ̌₃/, wherein the final nasal had been lost in Shangke.

road · lam · ⟨lvmx⟩ · /lɛm₂/

Shangke «lâm».

roof of house · ship, shüp · ⟨shuip⟩ · /ʃip₄/

In the modern variety, /ʃip₄/ refers to the action of covering the roof beams with leaves. The modern lexeme for ‘roof’ is ⟨wuxkhux⟩ /βu₂k^hu₂/, the latter part being ‘head’ and the former a morpheme used on a great many compounds relating to the roof.

run · **yû** · ⟨yuz⟩ · /ʒu₁/

salt · **shûm** · ⟨shumz⟩ · /ʃum₁/

sand · **phân** · ⟨phawx⟩ · /p^hɔ₂/

This is one of a couple of sand words. This one refers to sand or gravel found at the bank of a river. Again the underlined «ân» ending corresponds to the *-aŋ rime.

see, v · **khî** · ⟨khiz, khic⟩ · /k^hi₁, k^hi₃/

Third-tone form is as it occurs when nominalised as part of the verb stem alternation found in much of Tangsa-Nocte.

seek, v · **thî** · ⟨thuiyx⟩ · /t^hɨ₂/

seize, v · **lû** · ⟨luz⟩ · /lu₁/

sell, v · **shong** · ⟨shvungz⟩ · /ʃeun₁/

send, v · **târ** · ⟨tvghurx⟩ · /tə₀ɣur₂/

Here Needham likely elicited the same lexeme as is found in the modern language, but with elision of the velar. This is today typically a fricative, but can occur as an obstruent.

sharp · **â'thî** · ⟨vh^httuiyx⟩ · /ə₀t^hɨ₂/

shoot, v · **gâp** · ⟨ghap⟩ · /ɣap₄/

similar (alike) · **âdam, dam** · ⟨vdvmz, dvmz⟩ · /ə₀dəm₁, dəm₁/

sing, v · **â'shir** · ⟨shic⟩ · /ʃi₃ (song)/

The equivalent stem today /ʃi₃/ refers to a song rather than the verb 'to sing'. Needham transcribes this with final «r», also not present today.

sit down, v · **nong** · ⟨ngvungc⟩ · /ŋeun₃/

skin · **â'krü** · ⟨shuix⟩ · /k^hɨ₂/

Based on other transcriptions this is expected to be «â'kri», however «ü» is commonly used for what Needham describes as /y/, suggesting difficulty hearing the 1888 equivalent of /ɨ/ as a clear phoneme. Muishaung is somewhat unique today in the number of central vowel phonemes, and a distinction between /ɤ/ and /ɨ/ which is often not entirely clear in casual speech, often becoming more like [ɤ] and [ɨ] respectively, the latter often erroneously transcribed as /u/ in the literature anyway.

sky · rong · ⟨rvungx⟩ · /reuŋ₂/

This is a case of the **-aŋ* rime with ⟨o⟩ transcription indicating either an intermediate step in the sound change, or just an inconsistency in Needham's transcription. This term was historically and still today rhyming with the 'machete' stem, now /ʒeuŋ₂/, aside from a difference in tone which has not affected the phonological development of the rime. Shangke is given as ⟨râ⟩, today /ra/.

This stem is homophonous with the general morpheme 'wing' ⟨rong⟩ when not affixed by the animal to whom the wing belongs.

slave · dâ · ⟨dax⟩ · /da₂/

slippery · ân'yâr · ⟨vnyelz⟩ · /ə₀pel₁/

Incorrect syllabification with the nominalising prefix. Significantly, this again shows a potential dialectal variation between his speakers and one of the current authors of this comparison in the liquid coda. A similar case is seen in 'young man' and 'sun' below.

sleep, v · voil · ⟨wovlc⟩ · /βoel₃/

This does not mean 'sleep' exactly, but rather the act of lying down flat. Stems for 'sleep' today are ⟨yuiþ⟩ /ʒip₄/ and ⟨tsovix⟩ /tsoel₂/.

small · â-phûn'sâ · ⟨vphuinc saz⟩ · /ə₀p^hɪn₃sa₁/

This term means 'a small amount', rather than smallness of size. The Shangke form given is ⟨â'yong⟩, likely a mistake or problem in communication, as this is instead the word for 'large', /joŋ₂/. The modern Shangke term for 'small in size' is /a₀ran₂/, cognate with modern Muishaung /ə₀rɪn₂/.

smell · â' thing · ⟨thuingx⟩ · /tɕiŋ₂/

smoke · varrkârû · ⟨wvrzkhuiuq⟩ · /βer₁k^hɪuŋ₄/

Use of ⟨r⟩ on the nucleus again corresponding to central vowels. No mention if given of the glottal coda, but again words are only described as 'sharp' when they are monosyllabic.

snake · pû · ⟨puiuc⟩ · /piu₃/

By comparison with other entries, ⟨prû⟩ would be expected here. The 'snake' stem is found throughout Patkaian, and often with a diphthong involving a central vowel followed by /u/. It is therefore surprising that Muishaung, a variety with substantially more diphthongs than any other in Patkaian, would have a /pu/ pronunciation even in Needham's time. Compare Hahcheng and Joglei /pəu/, Khalak and Chamchang /pau/, Lochhang /pao/, Mungre /poi/, as well as Khamniungan and Pounyiu /pau/ and Lainong /pio/.

snow · **thik'hek** · ⟨tsikhek⟩ · /tsik₄hek₄/

This is a case where Needham gives an obstruent, but the modern version has an affricate. There is alternation between /ts/ and /t/ in modern Muishaung, which this may also be a case of.

son · **mĩ vâshâ, mĩ vâshân** · ⟨miqwazsaz⟩ · /miʔ₄βa₁sa₁/

The original transcription in the text is given as «mĩ vâshâ or shâṇ». Here Needham is giving «shâṇ» not as a stand-alone lexeme, but as an alternate form of the final syllable. This «shâṇ» is seen elsewhere in the text and would correspond to /ʃɔ₂/ today, as seen in ‘child’ ⟨noxshawx⟩ /no₂ʃɔ₂/ above, as well as being the second part of the general category term for ‘bird’, ⟨wuzshawx⟩ /βu₁ʃɔ₂/. The morpheme «shâṇ» can not stand on its own in the language.

It is also distinct from the ⟨saz⟩ /sa₁/ diminutive found in the language today. This /sa₁/ is a diminutive marker and also means ‘son’ or ‘child’ on it’s own. The nasalisation is not a mistake, and is found throughout the text. ‘Child’ ⟨noxshawx⟩ /no₂ʃɔ₂/ has a cognate in Ngaimong as /nau₂seŋ₂/, but can also be said as noxsaz /no₂sa₁/, for which the non-nasalised «mĩ vâshâ» is likely a representation. Thus, the two forms given here are not allophonic variation of nasalisation, but rather represent two entirely different morphemes which also occur with a tonal distinction. Both stems occurred in 1888 serving as diminutives or possibly nominalisers, similar to the way 子 has developed in Sinitic.

sow, v · **win** · ⟨wuinc⟩ · /βin₃/

spear · **pâ** · ⟨paq⟩ · /paʔ₄/

Yet another instance of Needham’s use of ‘sharp’ to refer to a checked tone CV? syllable. The Shangke form is ⟨pị̂⟩, also described as being ‘sharp’.

spark · **varrpü** · ⟨wvrzpuic⟩ · /βer₁pị̂₃/

spirit (evil) · **thâng, thâung** · ⟨thvungc⟩ · /tʰeun₃/

Here Needham gives both a pre- and post-change form of the word, showing that the two pronunciations coexisted and were perhaps in free variation. Shangke is given as «thậ» reflecting a loss of the coda.

stand · **châp** · ⟨jvp⟩ · /tɕɛp₄/

star · **rî sî** · ⟨ruiyzsuiyq⟩ · /rîi₁siŋ₄/

stay, v · **gal** · ⟨ghuile⟩ · /yil₃/

stead · **â'gû, â'grû** · ⟨vghuez⟩ · /ə₀yɣ₁/

It is unclear what was meant here, but this is likely meant to be /ə₀yɣ₁/, ‘to lack’, as the only potential verb which will have the correct pronunciation and a possible semantic connection, although this is speculative.

stone · **lûng** · ⟨lungz⟩ · /luŋ₁/

Shangke ⟨long⟩.

sun · **rong'shâr** · ⟨rvungxshalx⟩ · /reuŋ₂ʃal₂/

Here again is a case of alternation between /l/ and /r/. This is only attested as having coda /-l/ today, which is also the more conservative reading of the morpheme. That the ⟨r⟩ is doubled indicates it was clearly a trilled /r/ for Needham, therefore dialectal variation has to be assumed. In Shangwan, which has lost final *-l (and for which the final /n/ in ‘Shangwan’ is a replacement strategy), ‘sun’ will be /rəŋ.ʃar/. For Shangke Needham gives ⟨râ shî⟩.

tail · **â'mî** · ⟨vmiz⟩ · /ə₀mi₁/

take, v · **lam'van** · ⟨lvmc wvnc, lvmz wvnc⟩ · /ləm₃ βən₃, ləm₁ βən₃/

that · **ka'rau, ka'rû** · ⟨kvruex⟩ · /kə₀rɣ₂/

them or they · **tsing'shî** · ⟨tsuingcshiq⟩ · /tsiŋ₃ʃiŋ₄/

This is another case of Needham showing alternation in the forms given. In the section on personal pronouns, this is given instead as ⟨thing'shî⟩. In modern varieties, all cognate forms will have /ts/ or /s/ reflexes for the onset rather than /tʰ/, suggesting that this may be a typesetting error as much as any other possible reason. The second morpheme, /ʃiŋ₄/, is a formerly productive plural marker for pronouns, which can also be replaced by other similar plural markings on the same stem. Additional markers are given below in Table 6. In modern Shanke the form is /tsəŋ₃ʃiŋ₄/.

there · **ga'nü** · ⟨kvnuex⟩ · /kə₀nɣ₂/

The initial ⟨g⟩ in Needham’s transcription is an error, and should be ⟨k⟩.

thief · **â'grûwâ** · ⟨vghuiuwaz⟩ · /ə₀yɣi₄βa₁/

This is NOMZ-steal-father/man, which is an interesting case of the grammatical specifier being /βa₁/ ‘father, man’ rather than /tɕi₂/ ‘grandfather’ as is common today.

thin (not thick) · â'vâr · <vwarx> · /ə₀βar₂/

thin (not thick) · â'gü

An appropriate modern equivalent was not able to be found for this form as given by Needham. The intended meaning and provided form combination does not resemble any currently used terms.

thin (not fat) · â'rê'ân · <vrex> · /ə₀re₂/

this · â'rau, â'rü · <vrux> · /ə₀rɤ₂/

thorn · shû · <shuiuq> · /ʃi_uɿ₄/

Notably, this is not referred to as ‘sharp’ in Needham’s account, possibly due to the diphthong.

thumb · yok'shî · <yvukshix> · /ʒeuk₄ʃi₂/

This is simply ‘finger’. The full form of ‘thumb’ today is /ʒeuk₄ʃi₂ki_u₂/, the final morpheme also being the feminine marker for certain animals, calling back to the use of ‘mother’ as an augmentative used elsewhere in the languages of the region.

thunder · rong'mûk · <rvungxmuk> · /reun₂muk₄/

tiger · châ · <jaq> · /tɕaɿ₄/

As elsewhere, Needham marks this as ‘sharp’, indicating a checked syllable. The recognition and indication of /-ʔ/ codas is largely not consistent, and more often than not, checked syllables are not indicated as such. Shangke is given as «chî».

tobacco · nyâ · <nyac> · /ɲa₃/

This is one of the rare cases of a clear palatal nasal onset correctly transcribed as «ny». The form is given as «nî» for Shangke.

toe · yâ'shî · <yazshix> · /ʒa₁ʃi₂/

The /ʃi₂/ morpheme refers to both fingers and toes, compounded with the word for either arm/hand or leg/foot when needing to specify. Shangke «yî'shî».

tongue · la'li · <tvlix> · /tə₀li₂/

The initial «l» of the first syllable is likely a mistake, either a production error by the speaker or having been misheard by Needham. Given the similarity in place of articulation, either explanation would be reasonable.⁵

⁵ It has been pointed out by an anonymous reviewer that this may be allophonic variation, which may be the case, although modern-day speakers are reluctant to consider this as anything other than a mistake on Needham's part.

tooth · **vâ** · ⟨wac⟩ · /β_{a3}/

Given as ⟨vî⟩ for Shangke.

touch wood · **mü**

An equivalent modern form was not found for this phonemic form, including for meanings related to the English phrase “touch wood” or “knock on wood”.

track, v · **yür** · ⟨yurc⟩ · /ʒur₃/

The actual meaning here is ‘to chase’ rather than to track.

true · **â´sing** · ⟨vsuingz⟩ · /ə₀siŋ₁/

The Shangke form is given as ⟨no´hur⟩. This is not a typical form, as most modern varieties will have forms similar to /k^hak₄/ or /tsiŋ₁/ for ‘true’, or /huʔ₄/ in cases of varieties in close contact with Burmese.

tree · **pûl** · ⟨pulx⟩ · /pul₂/

Shangke is given as ⟨pê⟩, as discussed above under ‘leaf’.

uncle · **î´vong** · ⟨vwvungx⟩ · /ə₀βeun₂/

This is specifically one’s paternal uncle. Maternal uncle is /yu₁/. The ⟨î⟩ prefix is possessive, as with other kinship terms collected here, although absent on other kinship terms provided by Needham such as ‘father’.

unripe · **â´thing** · ⟨vhttuŋx⟩ · /ə₀t^hiŋ₂/

village · **kí`aŋ** · ⟨kez⟩ · /ke₁/

A more common term for village today is ⟨ghaqshungc⟩ /ɣaʔ₄ʃuŋ₃/. Nasalisation in Needham’s transcription is of uncertain source.

war · **râ´lung** · ⟨rvlungc, rvkhvt⟩ · /rə₀luŋ₃, rə₀k^het₄/

what? · **yam´lû** · ⟨yvmxlīx⟩ · /ʒəm₂li₂/

Given as ⟨yam´vâ⟩ in Shangke.

where · **m´jû´lâ** · ⟨mzyuqlac⟩ · /m₁ʒuʔ₄la₃/

white · **â´lû** · ⟨luiz⟩ · /ə₀li₁/

who? · **u´lâ** · ⟨uzlac⟩ · /u₁la₃/

Given as ⟨vû´vâ⟩ in Shangke.

why? · **kham'la** · ⟨khvmc lac⟩ · /k^hem₃ la₃/

wing · **wûrong** · ⟨wuzrvungx⟩ · /βu₁reun₂/

worm · **chil'ba** · ⟨jvlxbaz⟩ · /tɕel₂ba₁/

This term is specifically used for worms which give some feeling of disgust, and would not typically be used for grubs that could be a food source. It also serves as a temporary name for infants in order to ward off evil in a capacity as linked to disgust.

yesterday · **ma'yâ** · ⟨mzyac⟩ · /m₁ʒa₃/

you · **m'nang** · ⟨mznvungz⟩ · /m₁neun₁/

young man · **yâr'roâ** · ⟨yalxroxwaz⟩ · /ʒal₂ro₂βa₁/

Compare 'young woman' ⟨yâr'tû⟩. The final syllable ⟨wâ⟩ is the 'father' stem which occasionally occurs as a specifier or agentive marker.

young woman · **yâr'tû** · ⟨yalxtux⟩ · /ʒal₂tu₂/

This is another case of /l/ as ⟨r⟩. Final /l/ is often lost in Needham's transcription when in coda position otherwise.

3.0 Grammatical notes

Following the word list, Needham provided a very brief sketch grammar with example sentences. It is only a few pages long, but provides additional insight into changes that the language underwent during the past century.

3.1 Gender

Grammatical gender is not a feature of Muishaung or related Tangsa-Nocte varieties. It is typically not a part of pronominal systems, except in cases where such distinctions have been innovated in the third person singular pronominal forms. Gender marking is typically restricted to overt marking through the addition of 'man' or 'woman' to terms. Table 2 shows terms where gender specification is semantically specified, adapted from the original.

⟨mî'vâ or wâ⟩	man, male	⟨vî'krû⟩	old woman
⟨yâl'shik or yâ'shik⟩	woman, female	⟨vâ or wâ⟩	father
⟨lî'kâng⟩	old man	⟨nyû⟩	mother

Table 2: Semantically gendered terms

These terms are explained by Needham as terms for which gender is inherent in the semantics. The alternation between ⟨w⟩ and ⟨v⟩ on father reflects the likely underlying realisation of the

phoneme back in 1888 as /β/, the same as it is today. The same type of alternation is found on ⟨y⟩ today, realised anywhere between /j/ and /ʒ/.

Needham describes the terms in Table 2 as being used to explicitly mark sex of human concept such as slave or child by appending the term for that concept to the terms for ‘man’ or ‘woman’ above. The examples given by Needham are shown in Table 3.

⟨dâ⟩	slave	⟨no´shân⟩	child		
⟨mî´vâ dâ⟩	male slave	⟨mî´vâ no´shân⟩	male child	⟨mî´vâ shâa⟩	son
⟨yâ´shik dâ⟩	female slave	⟨yâ´shik no´shân⟩	female child	⟨yâ´shik shân⟩	daughter

Table 3: Gender-marked compounds

In the original printing, the forms for ‘son’ and ‘daughter’ are printed as shown in Table 3, with the underline missing on ⟨n̄⟩ in ‘daughter’ and printed as ⟨a⟩ on ‘son’. These are almost certainly typographical errors introduced at the time of printing, given the clear compositional nature of the compounds which was the focus of the section in the text.

The description of gender continues with examples for marking what he calls ‘inferior animals’, for which different strategies are given. These are ⟨lâ⟩ and ⟨pûng⟩ for males, today /la₁/ and /puŋ₁/, and ⟨shârr⟩ or ⟨krû⟩ for female, today /ʃar₂/ and /kiu₂/ . Needham provides the forms shown in Table 4.

⟨vak⟩	pig	⟨vî sî⟩	monkey	⟨gui hên̄⟩	dog
⟨vak lâ⟩	male pig	⟨vî lâ⟩	male monkey	⟨gui hên̄ lâ⟩	male dog
⟨vak shârr⟩	female pig	⟨vî krû⟩	female monkey	⟨gui hên̄ krû⟩	female dog
⟨kê´kî⟩	goat	⟨châ⟩	tiger		
⟨kê´pûng⟩	male goat	⟨châ lâ⟩	male tiger		
⟨kê´shârr⟩	female goat	⟨châ krû⟩	female tiger		

Table 4: Gender-marked animal terms

The strategies described by Needham are still present today, but with some additional complexity. Needham presents the terms in a way which may suggest that these are lexically specified. This is not the case, and instead the terms for female animals differ based on whether it has given birth or not. Feminine /ʃar₂/ is typically used for female animals which have not yet given birth. Thus today ⟨wvuksharx⟩ /βeuk₄ʃar₂/ is a female pig which has not, and ⟨wvukkuiux⟩ /βeuk₄kiu₂/ will refer to a female pig which has previously given birth.

Despite this system, female goat is instead ⟨khelxkuiux⟩ /k^hel₂kiu₂/ today regardless, with Needham’s ⟨kê´shârr⟩ rejected by speakers as being incorrect. In spite of the brevity of the section, Needham largely captures the extent to which gender is a feature of the language.

3.2 Adjectives

The subsection on adjectives includes a very short collection of glossed examples of adjective use. Needham states that it can occur before or after the noun, which is correct in one sense. However, in Muishaung, as in other Tangsa-Nocte varieties, adjective-like nominal modifiers are formed from stative verbs that take the nominaliser prefix /ə₀-/. When preceding the noun, as with «â'hal vâ» good+man, the result is a noun phrase which cannot serve as an independent clause.

Examples (1a) and (2a) are adapted from Needham, preserving the original glossing in bold, while (1b) and (2b) are the modern-day equivalents.

- | | |
|--|---|
| <p>(1a) <i>â'hal</i> <i>vâ</i>
 a good man
 `good man'</p> | <p>(2a) <i>vak</i> <i>â'pü</i> <i>vâ</i>
 pig, fat
 `a fat pig'</p> |
| <p>(1b) <i>ə₀-hel₂</i> <i>βa₁</i>
 NOMZ-good man
 `good man'</p> | <p>(2b) <i>βeuk₄</i> <i>ə₀-pi₁</i> <i>βaʔ</i>
 pig NOMZ-fat INT
 `[A] pig is fatty!'</p> |

Despite the order described as flexible, when following the noun as in the other three examples provided by Needham, the result instead is a subject-predicate construction in (2b), and forms an independent clause. Thus «vâ â'hal» would be understood as 'the father/man is good'. Such constructions lack any sort of copula. A similar commonly used construction adds a focus marker /kɣ₂/ between the subject and predicate. The omission of /kɣ₂/ in Needham may suggest that this is something which has increased in frequency since his time.

- | | |
|---|---|
| <p>(3a) <i>yân'hî</i> <i>â'thî</i> <i>vâ</i>
 knife, sharp
 `a sharp knife'</p> | <p>(4a) <i>khai</i> <i>â'lu</i> <i>vâ</i>
 cloth, long
 `a long cloth'</p> |
| <p>(3b) <i>zan₂hi₂</i> <i>ə₀-t^hi₂</i> <i>βaʔ</i>
 knife NOMZ-sharp INT
 `[A] knife is sharp'</p> | <p>(4b) <i>k^hei₁</i> <i>ə₀-lu₁</i> <i>βaʔ</i>
 cloth NOMZ-long INT
 `[A] cloth is long'</p> |

Significantly, Needham includes «vâ» in all examples. In the first it is glossed as 'man'. In the other examples, this can not be, and instead it is almost certainly /βaʔ₄/, an intensifier. This leads the authors to suspect the «vâ» in 'good man' may also possibly be the intensifying /βaʔ₄/ rather than 'father, man' /βa₁/. No explanation is given for the additional occurrences of «vâ». Without more information on the original methodology, it may not be an answerable question.

3.3 Personal pronouns

This section includes a single table of the pronominal system with a valuable footnote: ‘*I am not sure that the plural is right*’. It is an excellent example of the type of transparency which is so badly needed to be able to properly interpret texts from this era. Needham’s account is seen in Table 5 adapted from the original text.

	SG	PL
1	ngâ	nî´shî
2	m´nang	nüm
3	â´pî	thing´shî

Table 5: Muishaung pronouns according to Needham

The modern-day pronominal system is as in Table 6. Our analysis of the pronominal system treats overt dual, trial, and plural marking as affixes. These are pragmatically conditioned and not necessary for the bare stem to be interpreted as non-singular.

	SG	N.SG.INCL	N.SG.EXCL	DU	TRI	PL
1	ŋa ₁	neuŋ ₁	nii ₁	--ŋii ₃	--t̥im ₂	--fiʔ ₄ --he ₁
2	m ₁ neuŋ ₁		nim ₁	--ŋii ₃	--t̥im ₂	--fiʔ ₄ --he ₁
3	ə ₀ piʔ ₄		tsiŋ ₃	--ŋii ₃	--t̥im ₂	--fiʔ ₄ --he ₁

Table 5: Muishaung pronouns according to Needham

Despite Needham’s concerns, he was fully correct in his analysis. The plural forms given were the exclusive first person singular, and the overt plural marker /-fiʔ₄/ was not included on the second person plural, but it is also not necessary.

3.4 Verbs

The section on verbs is brief in terms of prose but contains many examples. Imperatives are rightfully identified as being marked by «shû» and «krû», today /ʃiu₁/ and /kiu₁/. The role of these two is never commented on, although from the examples given it is clear that this is a distinction of transitivity, as it is today as well. The transitivity distinction is not made in other Tangsa-Nocte varieties, and is surely an innovation in Muishaung which predates Needham’s visit. Morey (2019a:170) provides a comparative account of the imperative markers across varieties, and in no other is such a distinction attested.

Some examples of the imperative are given in (5–8). The modern forms and translations match those given by Needham and are included in the second line of the examples.

- (5) â´pî´ dat´ shû (6) kong gâp´ shû
 ə₀piʔ₄ t̥ɛt₄ ʃiu₁ ko₁ ɣap₄ ʃiu₁

3SG	hit	IMP.TR	gun	fire	IMP.TR
`Hit him'			`Fire the gun'		

(7)	<i>châp</i>	<i>krû</i>	(8)	<i>yû</i>	<i>krû</i>
	<i>tsep₄</i>	<i>kîu₁</i>		<i>zu₁</i>	<i>kîu₁</i>
	stand	IMP.INT		flee	IMP.INT
	`Stand [up]'			`Run away'	

Note in (6) 'gun' is given as «kong» whereas before in the word list it was given as «kɔŋ», reflecting either assimilation with the following velar onset or variation in the pronunciation at the time.

Transitivity is distinguished for the imperative, but not shown elsewhere in the sentences, as in (9-10).

(9)	<i>Ngâ</i>	<i>kâ</i>	<i>khâung</i>	(10)	<i>Ngâ</i>	<i>shong</i>	<i>khâung</i>
	1SG	go	FUT		1SG	sell	FUT
	`I will go'				`I will sell'		

In the modern language, transitivity occurs in these cases, as in (11) and (12), having replaced the earlier «khâung».

(11)	<i>ŋa₁</i>	<i>ka₁</i>	<i>t^heuŋ₂</i>	(12)	<i>ŋa₁</i>	<i>ʃeuŋ₃</i>	<i>ʃeuŋ₂</i>
	1SG	go	FUT		1SG	sell	FUT
	`I will go'				`I will sell'		

The situation around transitive marking verbs in Muishaung as it relates to Needham's account has previously been discussed in Morey (2019a:164f), which states:

This distinction in future marking between transitive and intransitive appears to be a relatively recent innovation. Muishaung is the only Pangwa Tangsa variety for which we have substantial historical records dating back more than a short time. Needham (1897:10) recorded ... that the future was marked by verbal operator k^h- used for both transitive and intransitive.

The «khâung» /k^heuŋ₂/ form still exists today but as a first person singular hortative.

The other major difference between Needham's sentence examples and the modern variety is the frequent use of «kâ» /ka₁/ 'to go' at the end of declarative sentences, as in (13).

(13a)	<i>sam</i>	<i>muin</i>	<i>kâ</i>	(b)	<i>tsem₁</i>	<i>min₂</i>	<i>ka₁</i>
	rice	ripen	REAL		rice	ripen	REAL
	`The rice is ripe'				`The rice has become ripe'		

Glossing has been changed in (13) to reflect the actual function of the morphemes, rather than the original glossing given by Needham, 'Rice ripe is'. This is due to the fact that the presence of /ka₁/ here is not used for simple declaratives, as translated by Needham, but instead means that the ripening of the rice has come to pass.

3.5 Numerals

The final section of the text gives the numbers 1-13, and then all multiples of 10 up to 100 in Muishaug, followed by 1-10 in Shangke, with the final note from the author that '...the rest [of Shangke numbers] are so similar to the Môshâng ones, that I did not think it worth while writing them down'.

Needham	modern form	gloss	Needham	modern form	gloss	
â'shi	vshiz	/ə ₀ ʃi ₁ /	one	tâ'rûk	thvruk /tə ₀ ruk ₄ /	six
â'nî	vnhuiyc	/ə ₀ ŋi ₃ /	two	ma'shî	miqshix /miʔ ₄ ʃi ₂ /	seven
â'tûm	vthuimc	/ə ₀ t̪im ₃ /	three	ta'chat	tvjvt /tə ₀ t̪æt ₄ /	eight
ba'lî	bvlic	/bə ₀ li ₃ /	four	ta'krû	tvkuiuz /tə ₀ kiu ₁ /	nine
bang'â	bvngac	/bə ₀ ŋa ₃ /	five	rok'shî	rokshiz /rok ₄ ʃi ₁ /	ten

Table 7: Numbers 1-10

All numerals are consistent with modern-day forms, aside from Needham again failing to correctly identify syllable boundaries in the case of nasal onsets. Thus 'five' is given as « bang'â », when it should instead have been ba'ngâ, today /bə₀ŋa₃/. The Shangke form is likewise incorrectly syllabified, given as « bang'î ».

4.0 Conclusion

Fieldwork documentation provides ample opportunities to the one collecting the data to realise one's past mistakes. At the time of writing, the authors of this paper have worked closely together on a single language variety for a full decade, and in that time have had many chances to revisit past discussions in the form of audio or video recordings and to build upon those past interpretations with new knowledge and improved language skills. As part of that process, many amendments, additions, and total corrections of past understandings have occurred. Needham's text provides a rare and wonderful snapshot not just of the language as spoken by his main contact/s in 1888 --- precisely the outcome Needham himself would have intended --- but also an intriguing picture of all the complications that fieldworkers have faced from the start. There are difficulties in understanding the important features of an unfamiliar language, difficulties of communicating the data one may wish to elicit, difficulties in understanding what a researcher from far away may be asking in the first place, and of course difficulties in capturing the sounds one may be hearing, especially with the limitations of 1888's technology.

In this way *A Collection of A Few Môshâng Naga Words* is not only an invaluable record of language change, but a particularly humanising document about its author, about whom so little has survived to the present time. Little remains of the details behind Jack Francis Needham's time travelling through the areas, and even fewer details --- hardly any at all --- of the people he spoke to in the communities through which he passed. Instead we are left attempting to forensically reconstruct his methods, for which we fortunately have at least some clues.

The importance of legacy materials is clear, both for understanding not only the historical background of language documentation as well as the state of the modern languages. By approaching these documents with the goal of working out the underlying systems which may otherwise be dismissed simply as mistakes on the original author's part, we can shed new light into important changes in the language, while also better understanding which aspects have remained the same.

References

- Brown, Nathan. 1851. "Specimens of the Naga language of Asam". *Journal of the American Oriental Society* 2, 157–165.
- Burling, Robbins. 1966. "The addition of final stops in the history of Maru (Tibeto-Burman)". *Language* 42.3, 581–586.
- Dam, Kellen Parker van. 2018. "The tone system of Tangsa-Nocte and related Northern Naga varieties". PhD thesis. La Trobe.
- 2019. Horsing around: The Complicated State of Tangsa-Nocte *-aŋ Rhymes. *Himalayan Languages Symposium / International Conference of Sino-Tibetan Languages & Linguistics*. Sydney.
- 2020. "The syntax of intensifiers in Muishaung". *Linguistics of the Tibeto-Burman Area* 43.1, 19–36.
- Dam, Kellen Parker van and Stephen D Morey. 2019. "Material culture and agriculture in Tangsa (Naga) languages: Evidence from Tai borrowings and traditional song". *24th International Conference on Historical Linguistics (ICHL24)*.
- Das Gupta, Kamalesh. 1978. "A note on the Tangsa language". *Resarun: Journal of the Research Department, Government of Arunachal Pradesh* 4.2, 6–16.
- 1980. The Tangsa language: a synopsis. Shillong: The Philology Section, Research Department, North-East Frontier Agency, p. 77.
- Grierson, George Abraham. 1928. Linguistic Survey of India. Comparative Vocabulary. Calcutta: Government of India Central Publication Branch.
- Hailowng Gohain, Ailot. 2024. personal correspondence.
- Marrison, Geoffrey Edward. 1967. "The classification of the Naga languages of north-east India." PhD thesis. School of Oriental and African Studies (University of London).
- Morey, Stephen. 2015. "The internal diversity of Tangsa: vocabulary and morphosyntax". *Language and culture in Northeast India and beyond*, 23–40.
- 2018. "Verb stem alternation in Pangwa Tangsa". *North East Indian Linguistics* 8 (NEIL 8), 86–109.
- 2019a. "Pangwa Tangsa agreement markers and verbal operators". *Himalayan Linguistics* 18.1, 141–179.
- 2019b. Preliminary Muishaung Grammatical Sketch.

Mortensen, David R. 2004. “The emergence of dorsal stops after high vowels in Huishu”. *Annual Meeting of the Berkeley Linguistics Society*, 292–303.

— 2012. “The emergence of obstruents after high vowels”. *Diachronica* 29.4, 434–470.

Needham, Jack Francis. 1897. *A Collection of A Few Môshâng Naga Words*. Shillong: Assam Secretariat Printing Office.

Weidert, Alfons. 1987. *Tibeto-Burman Tonology: A Comparative Analysis*. John Benjamins Publishing Company