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Rethinking Sino-Tibetan phylogeny from the perspective of North East Indian languages

1 Introduction

Sino-Tibetan has more speakers than any other language phylum and covers a major proportion of the land area of East Asia. Despite some two centuries of study and publication, the subclassification of Sino-Tibetan remains highly controversial, as does its external affiliation (van Driem 2008a; Blench 2008a,b; Handel 2008). Originating as "Indo-Chinese" in the middle of the nineteenth century, it originally carried racial connotations (van Driem 2002). The first recognition of the phylum probably dates to Julius von Klaproth (1823) who recognised three parallel branches: Chinese, Burmese and Tibetan. Von Klaproth explicitly excluded Austroasiatic and Daic, unlike many later classifications, which sequentially included all the regional phyla. Although such views still sometimes surface (primarily in Chinese publications), they have been fairly conclusively rejected by most scholars.

Considering the importance of Sino-Tibetan and its history of scholarship, there is a striking lack of consensus as to its internal classification. Historically speaking, there have been two opposing camps: those who consider Sinitic (i.e. the several varieties of Chinese) as representing a primary branch of the family (Wolfenden 1927; Benedict 1972, 1976; Bodman 1980; Weidert 1987; Bradley 1997b, 2002; Matisoff 2003, 2008; Thurgood and LaPolla 2003; Handel 2008) and those who situate it within the remaining languages, consequently applying the name Tibeto-Burman to the whole phylum (Shafer 1955, 1966/67; van Driem 2002).

In recent years, successful reconstructions of low-level groups have begun to appear (e.g. Sun 1993; Mortensen 2003; VanBik 2007; Wood 2008; Button 2009), raising hope that higher-level reconstructions may eventually be able to be placed on a stronger footing - or at least, that their validity will be able to be more rigorously tested. Nonetheless, many putatively Sino-Tibetan languages remain very sparsely documented, with accessible comparative lexical material of any significant scale being largely confined to Chinese and (to a lesser extent) Indian sources. The largest-scale comparative database of Sino-Tibetan languages compiled to date, the Sino-Tibetan Etymological Dictionary and Thesaurus (STEDT) project, was finally made generally available in "beta" form in October 2010, with some additional functionality added in 2012 (though still in "beta"). Consequently, historical linguists can now see the evidence for Proto-Tibeto-Burman

forms given in Matisoff (2003), which did not explicitly present the data on which most reconstructions are based.[1] Some potential problems with the linguistic data employed in Matisoff (2003) have been pointed out in various reviews (e.g. Sagart 2006; response by Matisoff 2007; further reply Sagart 2008; Hill 2009). One point that we will underscore here, however, is that there are also problematic disconnects with the archaeological evidence (Blench 2008b). For example, while 'iron' is reconstructed at the Proto-Tibeto-Burman level, it seems clear that terms for 'iron' are in fact a series of loanwords, reflecting the diffusion of iron-smelting technology (Chang 1972;[2] Blench in press a).

Perhaps most significantly, however, Proto-Sino-Tibetan (PST) reconstructions have traditionally relied very heavily on citations from "major" languages, and reference to epigraphic and written sources for earlier forms of certain such languages, i.e. Chinese, Tibetan and Burmese. It cannot be emphasised too strongly that these are, if not indeed irrelevant, of relatively very low significance for the reconstruction of proto-forms of a phylum the great majority of whose members have never been written and which must be far beyond the reach of epigraphy. This emphasis on "major" languages has had another consequence: "minor" and often poorly documented languages have generally been excluded from consideration. This is particularly true of the languages of North East India, where the way of life hardly matches the settled agricultural lifestyle depicted for Proto-Sino-Tibetan speakers.[3]

This paper,[4] then, is intended to redress the balance in two ways. First, by suggesting what sorts of revisions to the image of Sino-Tibetan are required if

1 To be fair, Matisoff (2008) does present much supporting data, but generally only forms which contribute to the argument; complete accounts of all available data are not found in this work either.

2 Chang does not say this; indeed, his observations of roots that cross-phylic boundaries were adduced as evidence of a large-scale "inclusive" Sino-Tibetan.

3 We do not of course mean to suggest that the earliest Sino-Tibetan comparativists *deliberately* excluded "minor" languages which they could have included had they cared to. As we note in several places herein, and as was pointed out by Matisoff (1991), data for many North East Indian Tibeto-Burman languages were simply unavailable throughout much of the last century, and indeed remain sparse to this day. However, the result is nevertheless the same: undue prominence has been givenand generally, without qualification – to potentially only marginally useful languages such as Chinese, and little mention has been made of potentially much more important languages such as Puroik (Sulung). These structures of unwarranted imbalance, having come to exist for whatever reason, are perpetuated almost without remark throughout the Sino-Tibetanist literature.

4 Paper presented at the 16th Himalayan Languages Symposium 2–5 September 2010, School of Oriental and African Studies, London. The authors would like to thank the many individuals who assisted with language data and offered hospitality in remote areas, and particularly Jiken

the full spectrum of minority languages are given equal weight, and second, to sketch the sort of model of its evolution that would be required to be congruent with the available archaeological and historical data. It cannot be emphasised too strongly that this approach is provisional; as new data appears, the model presented herein can and should be revised.

2 Assumptions about Proto-Sino-Tibetan

The "standard model" of Sino-Tibetan is represented by the reference volume Thurgood and LaPolla (2003) and by the listing in *Ethnologue* (Lewis et al. [eds.] 2013). Convention dictates a primary Sinitic/Tibeto-Burman split, despite that there is *no* unambiguous published evidence to support such a view. Instead, it appears to us that Sinitic was likely to have been historically set apart for cultural and/or other non-linguistic reasons. Along similar lines, van Driem (1997) has long claimed that Sinitic is co-ordinate with Bodic and thus simply within Tibeto-Burman, a view strongly opposed by Matisoff (2000). However, even if Sinitic is simply part of Tibeto-Burman, its position remains far from obvious (Matisoff 2008; van Driem 2008a).

Similar considerations apply to arguments concerning the homeland of Sino-Tibetan. Matisoff (STEDT website) proposes the Himalayan Plateau, which supposes the ancestral speakers of the different Sino-Tibetan branches to have migrated down various river valleys to reach their present locations. Van Driem (1998) challenges this view on the basis of archaeological evidence, with a claim that we should look instead to Sichuan. Northern China is favoured by other researchers, and the Yangshao culture (*Yǎngsháo wénhuà* 仰韶文化) which flourished on the Yellow River from around 6800 BP, has also been canvassed (e.g. LaPolla 2001). Related to this is the conventional reconstruction of Proto-Tibeto-Burman in Matisoff (2003) which implies that its speakers were fully settled agriculturalists, with a wide range of livestock and crop species, and using iron tools. However, where starred forms are not congruent with the known archaeology of the region, and the reconstruction methodology produces false positives, it becomes harder to have confidence in items with credible semantics. Is it then presently possible to have long lists of starred Proto-Tibeto-Burman reconstruc-

Bomjen, Serwa Dajusow, Rebecca Gnuechtel, Tia Toshi Jamir, Jummar Koyu, Meri Koyu, Jokut Modi, Adde Modi, Kindi Modi, Aamin Modi, Yankee Modi, and Oken Tayeng. Some of the results presented here derive from fieldwork by the authors in Arunachal Pradesh 2010–2012 subsequent to the initial conference presentation.

tions? Only if they are treated with appropriate scepticism, as hypotheses for consideration. Attributing a putative reconstruction to a genetic node that is not congruent with external evidence, such as dates for iron or the horse, is unjustified and potentially misleading.[5]

3 Large groupings and spiky trees

Using the density of individual branches to speculate on the homeland of a phylum is fraught with possible errors. The expansion of an individual branch may simply obscure a former diversity, and secondary diversification can also occur. Nonetheless, deep divisions among languages in close proximity are at least highly indicative; in the case of Sino-Tibetan, this is nowhere more the case than in the Eastern Himalaya.[6] While relatively little has been known about the languages of this region up to and including the present time, this has not stopped scholars from proposing that these languages either constitute or fall within some other Tibeto-Burman subgroup. However, in absence of any sort of systematic comparison – whether the data are thought reliable or not – such "subgroupings" are essentially vacuous. The use of pseudo-genetic labels such as "Himalayish" and "Kamarupan" inevitably give an impression of coherence which is at best misleading. As is well known from voluminous research in contact linguistics, common features in a geographical area are far from proof of genetic affiliation; while it may well be the case that an armchair glance at, say, a 200-item Puroik (Sulung) wordlist yields greater-than-chance resemblances among certain forms and parallel items in well-known Tibeto-Burman languages (the usual suspects tend to be 'fire', 'sun/day', 'person', 'two' and 'three', the first and second person pronouns, and a handful of other common forms), it is wrong to discount the possibility that such forms could have come about via contact and borrowing. Although the reality of language contact in the Tibeto-Burman region and the difficulties it can pose for subgrouping and reconstruction have long been discussed

5 Not all linguists take this view, and Roger Blench has been taken to task at conference presentations for "missing the point" of historical linguistics by requiring reconstructed forms to match external evidence. The authors remain unrepentant and stand by the rather strong statement in the main text.

6 By "Eastern Himalaya", we mean the area immediately South of the Tibetan plateau, to the East of Bhutan, and to the North of the Brahmaputra and Irrawaddy Valleys. In modern geopolitical terms, this region includes almost all of India's state of Arunachal Pradesh, spilling slightly across the Tibet, Burma, and China border regions. This area has also been identified from a cultural perspective by Blackburn (2007), among others.

in the Tibeto-Burman literature (e.g. Hashimoto 1976; Matisoff 1991), caution is often thrown to the wind when a large-scale subgrouping scheme is in fact attempted.[7] Robbins Burling (1999) has correctly attacked the use of geographic groupings such as "Kamarupan" as unhelpful. Language families do not necessarily develop in ways convenient for graphic designers, especially in montane regions, where communities may be several days' walk from one another across difficult terrain. Two examples will serve to illustrate this point.

The Gongduk language is spoken by around 1000 individuals in central Bhutan (van Driem 2001). Little has been published on it as yet, although a grammar is in preparation (van Driem p.c.). This language has complex verbal morphology characteristic of the Kiranti languages, although it is highly lexically divergent. On this basis, it is presumably Sino-Tibetan but does not seem to be part of any major subgroup. It therefore will probably have to be assigned to a single branch; either extremely high on the tree as part of the primary diversification or as a single node within the general grouping of Himalayan languages.

Similar problems arise with 'Olekha (Black Mountain Monpa) which has highly conservative verbal morphology (van Driem 1995). Originally assumed to be part of East Bodish, it now appears that it has very little in common with this grouping (Hyslop, this volume). The initial explanation was that 'Olekha was conservative and the rest of the group had thus innovated; but the low level of cognacy with other East Bodish languages provides no evidence for this. Provisionally, 'Olekha may accordingly be treated as an isolate branch.

In these two cases and more generally, high-level branching (essentially, the postulation of "within-family isolates") should be practised until we have better evidence for the position of individual languages. If this results in an untidy "tree" which is hard to capture, so be it. In language classification, Ockham's razor must sometimes be turned on its head; entities must be multiplied rather than assumed. Put differently, the postulation of differently-structured "family trees" in absence of adequate supporting evidence is nothing more than window-dressing – an exercise in comparative aesthetics – the results of which are then naively referenced in the literature as though they were true taxonomies. They are nothing of the kind.

7 Even when acknowledging the linguistic shaping effects of contact, there is a widespread tendency to understand the dynamics involved in terms of "major" languages influencing "minor" languages. Matisoff's widely-adopted labels "Indosphere" and "Sinosphere" (Matisoff 1991) neatly encapsulate this tendency (Post 2011; see also DeLancey, this volume).

4 The contribution of the languages of North East India

A comparison of the various classificatory proposals for Sino-Tibetan makes clear that they have a common feature, a tendency to pass over the highly diverse languages of North-Eastern India. The most recent survey of North East Indian Sino-Tibetan languages is Robbins Burling (2003) which, although valuable in terms of bringing some order to the region, is far from comprehensive. Only the *Ethnologue* (Lewis et al. [eds.] 2013), whose agenda mandates completeness, includes all those so far recorded; however, its ethnonyms and classification are frequently inaccurate, apparently privileging the unpublished reports of SIL's local operatives over established international research (as is the case with Tani, cf. the corrected table in Appendix 1). An intriguing source, Abraham et al. (2005) which provides the only available material on a variety of hard to classify lects of Arunachal Pradesh, including Sartang, Koro, Chug and Lish, is grossly misrepresented in the *Ethnologue*.

The difficulties of making accurate maps are reflected in the *Anthropological Map of Northeast India*, re-issued in 2009 by the Archbishop's House at Guwahati. This includes many ethnolinguistic groups not found in other publications. There is no accompanying text, so it is not possible to be sure of the source of the data, and some of the ethnonyms may not represent distinct linguistic entities. Nonetheless, it represents a major advance in linguistic geography of the region, and creates a series of problems that will keep linguists occupied for years to come.[8] A revised and updated version of this map is given in Figure 1.

Political difficulties for researchers have made this region inaccessible, but the situation is changing rapidly.[9] There is, moreover, a wealth of local publications available concerning the languages of North East India, in particular those of Arunachal Pradesh. Often the only record of a language is a descriptive but thin and under-researched account published by local administrative officers in a QWERTY-style Romanization. That is to say, there is generally no identification of non-standard consonants, non-cardinal vowel qualities, contrastive vowel length, nasalization, or prosodic features such as glottalization, breathiness and tone (all of which are highly endemic to the region). These "language guides" nonetheless generally

8 This map will not be reproduced here in the interest of space, but may be found in reproduction in Matisoff (1991).

9 Between drafts of this paper, Nagaland and Manipur were both opened to international researchers, joining Mizoram and Tripura. This leaves only Arunachal Pradesh among the North Eastern "seven sisters" to remain in principle closed to outside research, a highly regrettable situation which we can only hope will also eventually change.

provide a basic vocabulary and grammar, and often include a list of subsistence vocabulary; there is no excuse for not making use of them.

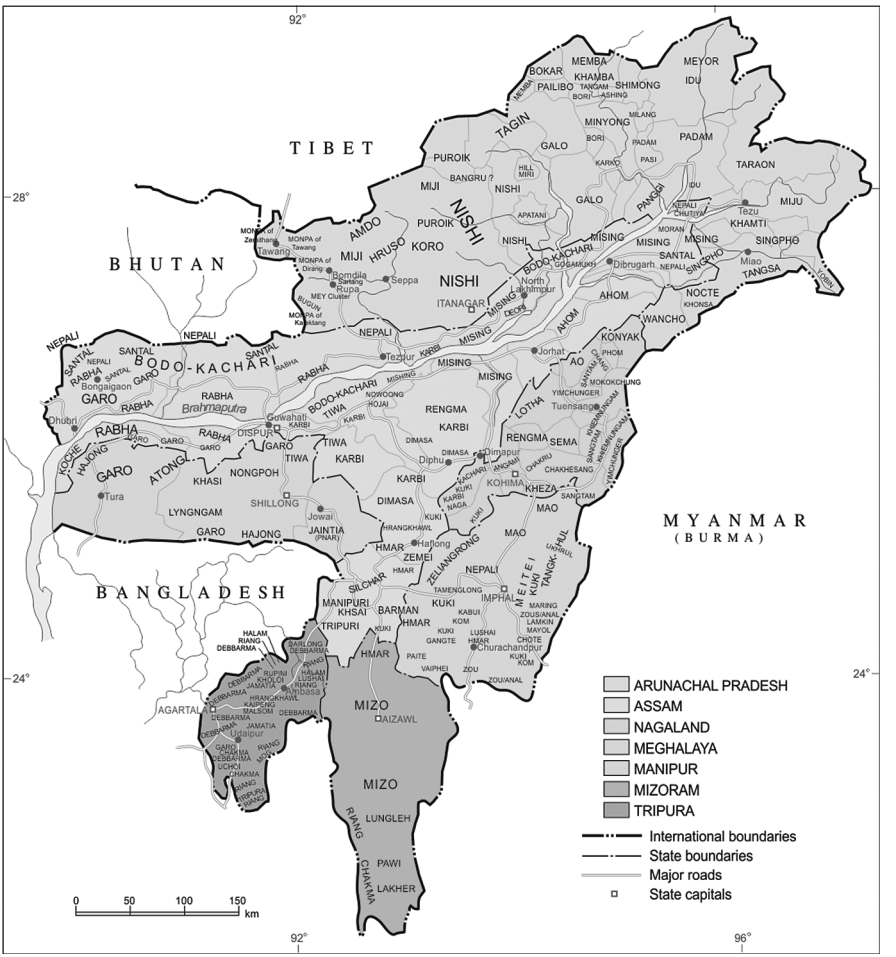

Fig. 1: Languages of North East India. *Source:* Redrawn and language names edited by Roger Blench from a map published by Bishop's House, Guwahati

Once this material is taken into account, it becomes clear that these languages are very different from one another. There are large groups of related languages, such as the Tani and Tangsa clusters, whose Tibeto-Burman affiliation is not generally disputed (even if the genetic status of at least some putative members remains

somewhat unclear). But for many more isolated languages of the region, assignment to Tibeto-Burman is highly questionable. In addition to languages for which there is some data, the *Ethnologue* has listed a number of "ghost" languages, such as Anu, Lui and Palu, as "unclassified Sino-Tibetan". But if there is no data, it is hard to see how such languages – if they exist – can be classified *as* Sino-Tibetan (or allied to any other recognized phylum), and astonishing that such "classifications" are actually accepted by scholarship.[10]

What is even more striking, however, is the acceptance of received wisdom concerning languages for which data in fact exists. For example, Aka (Hruso) has been known since the early nineteenth century, and has been referenced as a "Sino-Tibetan" language ever since it was surveyed by Konow (in Grierson 1909) and Shafer (1947). However, evidence for this alignment is minimal. Aka not only shows few clear cognates with Sino-Tibetan, but there does not even appear to be a significant level of borrowing. Similar doubts must arise concerning Miji, Koro, Puroik (Sulung), Bugun and Mey (Sherdukpen), at a minimum. Moreover, histories of intensive contact and borrowing may well have undermined our ability to see clearly. Milang, which has been classified as an "aberrant" Tani language by Sun (1993) is distinguished by the strikingly irregular relationship of cognates with mainstream Tani as well as a highly-differentiated lexicon and morphology (Post and Modi 2011). Recent research links some of these items with the geographically remote Koro language (data for which is provided in Grewal 1997 and Abraham et al. 2005), pointing to a possible Koro-Milang small phylum which may further underlie some aspects of Tani (Post and Blench 2011). Konow (1909) was thus correct to frame the "North Assam" group as a heuristic, geographical classification rather than a defensible genetic subgroup. An even more appropriately cautious assumption would have been to suppose that some area languages may in fact be isolates with Sino-Tibetan loans, and that moreover, substrate lexicon and morphology from such isolates may indeed account for the extreme diversity of languages which nonetheless "are" Sino-Tibetan.

If this is so, we need to change our perspective on the "Tibeto-Burman" languages of North East India, and to regard them as constituting a centre of linguistic diversity more characteristic of North East Asia or parts of the Amazon, whose potential importance has been obscured only by unwarranted assump-

10 The ISO, for example, whose coding system and nomenclatures are increasingly obligatory features of grant applications and archive deposits, accepts without question the lists of languages and non-languages put forth by SIL/Ethnologue (whether or not there is evidence for them) while requiring the rest of the world's scholars to petition SIL/Ethnologue on the basis of published argumentation. This "standardization" regime, whatever its laudable intentions, is thus neither equitable, nor scientific.

tions and assertions concerning the classification of its languages. Even where a Sino-Tibetan affiliation is well-accepted, groups such as Bodo-Garo only have about 25% of their basic lexicon drawn from inherited Sino-Tibetan lexemes (DeLancey p.c.). The rest must be presumed to derive from assimilated substrate languages. Given the massive grammatical restructuring characteristic of Bodo-Garo (DeLancey 2012), it would be just as logical to regard the family as an isolate with heavy relexification from Sino-Tibetan.

Fig. 2: Sago palm under cultivation, Riga (Minyong) Village

5 Foragers and sago palms

Linked directly with a pattern of extreme linguistic diversity is the subsistence strategy which remains dominant in Arunachal Pradesh and adjacent regions, which balances extensive hunting and foraging with swidden cultivation. A particularly striking element in foraging strategies is the traditional exploitation of the sago palm (Figure 2) (Blench in press d). As in New Guinea (Rhoads 1981) and Borneo (Morris 1991), several varieties of sago palm grow wild throughout central Arunachal Pradesh, although it has also been adapted for cultivation in some areas. The trunk of sago contains a starchy interior which can be processed as a staple food once the tree is cut down (Figure 3). In a region with a low human population density and dense forest, this is an attractive subsistence strategy, requires considerably less work than conventional agriculture, and has the added advantage of year-round availability. The ethnographic literature makes it clear that peoples such as the Puroik/Sulung (Stonor 1952; Deuri 1982), Milang (Yankee Modi, p.c.) Idu (Bhattacharjee 1983) and others have only adopted rice farming in recent times.[11] Some groups, such as the Sulung and Bangni/Nyishi, continue to balance sago exploitation with other productive strategies to this day (Tassar ms), while other groups, such as the Upper Minyong and the Milang, retain sago cultivation only to provide animal fodder (authors' field notes).

Similar patterns are found in livestock production. Although livestock is highly characteristic of the high Himalayan way of life in general, with yaks and sheep being predominant species until recently, the mithun, or gayal (*Bos frontalis*) is the most prominent animal exploited by Eastern Himalayan groups (Figure 4). The mithun is a semi-domesticate, managed in fenced tracts of forests rather than being kept in or near villages. Outside North East India, mithun are primarily imported for the purpose of cross-breeding with other bovids, for example in Bhutan. It is very common among Eastern Himalayan languages to find lexical sets denoting fauna in which the mithun is lexicalized as a "prototypical" meat animal, with all other terms being derived. Table 1 illustrates such a set for Hruso (Aka); similar sets can be formed for many other area languages, including Proto-Tani.

11 The possibility that there was an older farming culture which was dropped in favour of sago exploitation, something which does happen with Austronesians arriving in Papua, seems less likely here, as pseudo-grain field crops such as Job's tears (*Coix lacrima-jobi*) have been maintained in this region.

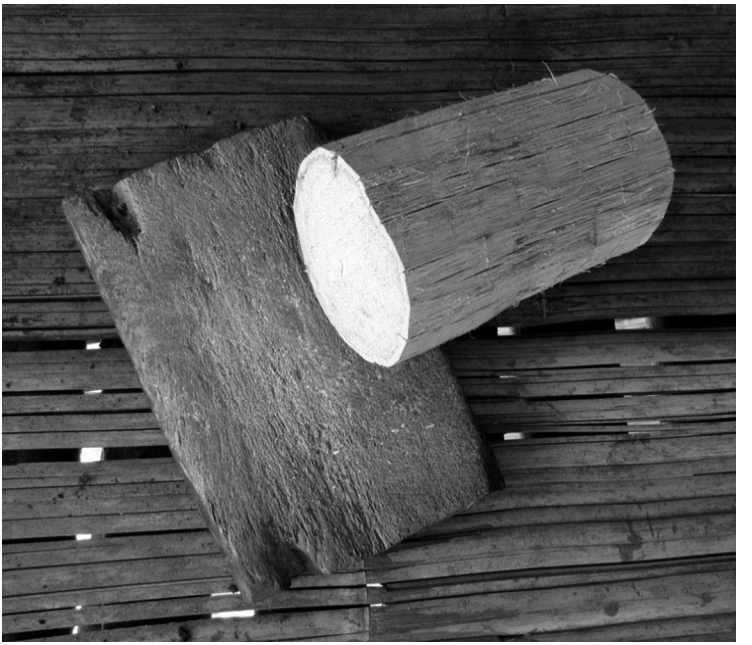

Fig. 3: Prepared sago trunk, Riga Village

Fig. 4: Mithun (*Bos frontalis*), Dali (Galo) Village

Tab. 1: Hruso livestock terminology

Hruso	Gloss
fú	mithun
fũ babu	donkey
fú-glu	sheep
f(ú)-gra	horse
fú ɦu	wild pig
fú-ɲ	cattle
fũ lhu imɲi	cow
fú msu	wild dog, wolf
fú fu bʃə	buffalo

Source: Fieldwork by Roger Blench

Terms for 'mithun' in other languages of Arunachal Pradesh are typically cognate with Aka *fu* (e.g. Miji *ʃu*, Koro *sù*, Puroik *ʧa* and Proto-Tani **ɕo*), suggesting that this is probably not a case of semantic shift from a wild species. The implication is that the semi-wild mithun was seen as the core species, and the true domesticates such as cattle, which arrived subsequently, as marginal to the system.

In the light of this, the earliest phases of Sino-Tibetan take on a wholly new appearance. Ethnolinguistic diversity is highly characteristic of hunter-gatherers in other regions of the world, for example among the Khoisan of Southern Africa, in Siberia, the Amazon and of course among the sago palm exploiters of Western Papua. The overlay of agriculture in recent times in North East India has disguised this pattern so that it is not usually seen as comparable to elsewhere in the world. But in reconstructing a language phylum surface appearances must be discarded. Logically, if languages show highly diverse structures, they are more likely to have a place at the top of the Sino-Tibetan phylogenetic tree. The better known groupings, and therefore the proposed reconstructed forms, must be downgraded to meso-languages.

Apart from the diverse forager languages, North East India is also home to agricultural populations falling under the general labels of "Naga" and others such as the Kuki-Chin (Marrison 1967). Some of these form more coherent groupings than others; Naga in particular is a term that describes more a lifestyle than a linguistic unity (van Driem 2008b). As with the former foragers, it seems likely that cereal culture is a relatively recent superimposition on these populations. The millets (*Setaria* and *Panicum*) probably spread down from the Tibetan Plateau, whereas rice-growing (as well as sorghum, a highly marginal recent arrival) appears to be an innovation spreading up from the valley of the Brahmaputra. The basic subsistence strategy, as in much of island and humid South-

east Asia, seems to have been vegeculture, the cultivation of tubers and other non-seed cultigens such as bananas, palms and ferns (Blench in press b). Islands such as Borneo have switched from vegeculture to rice systems in the relatively recent past. Taylor (1953) mapped out these crops for North East India some time ago, but this approach has been little exploited, in part because of the difficulties of finding vegetative crops in the archaeological record. Nonetheless, there is every reason to consider that the basic cultigen repertoire of the Naga and related peoples may well have been yams (*Dioscorea* spp.), taro (*Colocasia* spp.) and the Musaceae. As it happens, there is evidence, provided by Matisoff (2003), that taro (both the plant and the word) was borrowed from Austroasiatic into Sino-Tibetan. Matisoff (2003:173) proffers **sr(y)a* as proto-Tibeto-Burman for 'yam/potato' and **grwa* for taro. The evidence for the former, according to the STEDT database, is as follows:

Lushai [Mizo]	*ba-hra*
Meithei	*ha*
Dimasa	*tha*
Garo	*tha*

This number of attestations is restricted at best and these languages are geographically extremely close to one another; this suggests a regional loanword. Table 2 compiles vernacular names for 'taro' from Austroasiatic; these are the probable sources of Tibeto-Burman forms for 'yam/potato':

Tab. 2: Some reflexes of ***#traw?***, 'taro' in Austroasiatic

Branch	Language	Attestation
Monic	Nyah Kur	*traw*
Vietic	Proto-Vietic	**sroʔ*
Khmuic	Khmu	*sroʔ*
Katuic	Bru	*ʔarn̥w*
Palaungic	Riang	*sroʔ*
Khasian	Khasi	*shriew*
Muṇḍā	Santal	*saru*

Source: Blench (2012)

In terms of livestock, 'cow' and/or 'buffalo' appears to be a regional borrowing among Sino-Tibetan, Austroasiatic and Indo-Aryan. Cattle appear in the archaeological record on the Yellow River in China around 4500–4200 BP and must have been regionally diffusing around this time period (Yuan et al. 2008). Table 3 shows the reflexes of a widespread root which appears in all three phyla.

Tab. 3: Attestations for a form ***#mVCV*** 'cow' in Sino-Tibetan and Austroasiatic

Phylum	Branch	Language	Attestation	Gloss	Source
Sino-Tibetan	Loloish	Phu Noi	*hmyaŋ*^{453}	cow	Edmondson (n.d.)
Sino-Tibetan	Luish	Cak	*θa `mul*$^{?}$	cow	Bernot (1966)
Sino-Tibetan	Bodish	Manange	*mʌyi*	buffalo	Hildebrandt (2003)
Sino-Tibetan	Tangkhulic	P-Tangkhul	*si.muk ?* < Wa	cow	Mortensen (2003)
Sino-Tibetan	Bodo-Garo	Garo	*maˑsu*	cow	Burling (2003)
Sino-Tibetan	Jingpho-Konyak	Tangsa	*maan*	cow	Bandyopadhyay (1989)
Sino-Tibetan	Puroik	Puroik	*ce amwa*	cow	Tayeng (1990)
Sino-Tibetan	Mijuish	Miju	*mansöu*	cow	Boro (1978)
Sino-Tibetan	Mishmi	Idu	*macu*	cow	Pulu (2002)
Austroasiatic	Palaungic	Samtao	*moi*^{2}	cow	Paulsen (1989)
Austroasiatic	Palaungic	Proto-Waic	**mɤk*	cow	Diffloth (1980)
Austroasiatic	Bahnaric	Bahnar [Pleiku]	*rəmɔɔ*	cow	Sidwell (2000)
Austroasiatic	Khasic	Khasi	*masiː*	cow	Singh (1906)
Austroasiatic	Khasic	War Jaintia	*mut*	buffalo	Brightbill et al. (2007)
Austroasiatic	Munda	Santali	*mĩhũ*	calf	Stampe (ined.)
Austroasiatic	Munda	Ho	*miu*	calf	Stampe (ined.)
Indo-Aryan	Eastern	Assamese	*maŋso*	meat	University of Gauhati (1962)
Indo-Aryan	Central	Hindi	*mans*	meat	Caturvedi (1970)

It is striking that the different consonants in C_2 position, the nasal /n/, the fricative /s/ and the velar /k/ occur in both Tibeto-Burman and Austroasiatic phyla, suggesting a CV root with affixation that has undergone a complex history of borrowing, presumably with the animal itself.

It is a long speculative leap to characterise a whole nexus of languages, but the broad picture may be that speakers of Naga-like languages gradually adopted vegeculture and livestock production thus slowly parting company with the foragers. If there was an arc of diverse foragers in the North East Indian region, then it is not difficult to imagine the slow exploration of higher latitudes in search of game. Not all of these foragers would have been Sino-Tibetan speaking, as the presence of a language isolate such as Kusunda (in Nepal) suggests. The archaeology of the Tibetan region is sketchy at best, but Middle Stone Age foragers were reaching the high altitudes as early as 20,000 BP (Zhang et al. 2003). A second phase of occupation, beginning by 7500 BP, is marked by the presence of microliths indicating seasonal exploitation by foragers (Huang 1994). It is reasonable to imagine that these represent the first forays by Sino-Tibetan speakers into the Tibetan Plateau in search of wild yak and antelope. However, without stored crops and other sources of nourishment, climatic conditions would have

been too forbidding to stay there all year round. Permanent human occupation of the Plateau begins by 5000–4000 BP (Aldenderfer and Zhang 2004) and this is most likely to reflect the domestication of the yak, which would make it possible to exploit the pastures of the Plateau and subsist in the inimical climate all year round (Xue-bin et al. 2008). Fu Daxiong (2001: 66) has reported carbonised *Setaria* grains in Eastern Tibet ca. 5000 BP, which would fit with the early dates reported for this millet in China.

The other aspect of the structure of Sino-Tibetan that needs to be explained is the early eastward spread of isolated groups prior to the expansion of Sinitic. The whole region of China would presumably have been occupied by very different language phyla prior to the Sinitic expansion, Altaic and Koreanic in the North, Hmong-Mien, Austroasiatic and probably Austronesian in the centre-south. Archaeology suggests pig domestication by 8000 BP (Yuan and Flad 2002; Yuan et al. 2008), broomcorn millet by ~10,000 BP (Lu et al. 2009), foxtail millet by 6000 BP (Hiroo et al. 2007) and rice by 7700 BP in the Yangtse Valley (Zong et al. 2007).[12] The shouldered celts which connect the Himalayas and Szechuan focused on by van Driem (1998) may well reflect this eastward flow of diverse early populations who were either foragers or had begun the management of pigs and high-altitude crops such as buckwheat (see Section 6.3). Populations such as the Bai (Wiersma 1990) and Tujia (Brassett and Brassett 2005) represent pre-Sinitic migrations of Sino-Tibetan peoples. Although much of their lexicon has been replaced by deep-level Chinese loans, both languages retain non-Chinese names for both crops and livestock (Blench 2011). Their encounter with resident farming populations would have encouraged sedentarisation and the adoption of a wider range of crops. Starostin (2008) has argued that some key terms relating to subsistence in Old Chinese are of Altaic origin. The proto-Sinitic encounter with livestock-producing, millet-growing Altaic speakers could well have led to a subsistence and military revolution which in turn resulted in the overwhelming expansion of Sinitic and thus the dominance of this branch of Sino-Tibetan in East Asia today.

12 Although the dating of truly domestic rice has been the subject of much debate (Fuller, Qin and Harvey 2008).

6 Inferences from ecological reconstruction

6.1 General

Assumptions about homelands and dispersals can be tested using reconstructions of lexical items characteristic of particular ecologies. If, for example, the Sino-Tibetan phylum did originate in the mid-level Himalayas, then it should be possible to reconstruct the fauna, flora and meteorological phenomena typical of that ecozone. If the early phases of the expansion were indeed characterised by agriculture, crops typical of such high-altitude regions should be prominent and humid zone crops absent. This section discusses two examples of what can be deduced from this type of linguistic data, using the examples of 'snow/ice' and buckwheat.

6.2 'Snow' a  'ice' and a Himalayan origin

Dempsey (1995) may have been the first author to consider the terms for 'snow' and 'ice' as relevant to the quest for a Sino-Tibetan homeland, although he gives no actual data. If a language phylum originated in a region where these were common there should be a deep-level root. And indeed there is a claimed form **khyam* for Proto-Tibeto-Burman (suspiciously similar to Burmese). Appendix Table 2 collates the words for 'snow' in Sino-Tibetan. But of 190 languages and dialects collated there are some 30% unidentifiable forms, the remainder assigned to some ten different roots, each of low frequency. In Sinitic, we find attestations of four of these roots suggesting that this may in fact represent a complex network of borrowing rather than reconstructions of great antiquity. Accordingly, the probability is low that 'snow' was part of the environment of early Sino-Tibetan speakers.

6.3 Buckwheat: A high altitude crop

Buckwheat is the most important crop of the mountain regions above 1600m both for grain and greens and occupies about 90% of the cultivated land in the higher Himalayas. The domestication of buckwheat is described in Joshi and Rana (1995) and Ohnishi (1998). There are two species of domestic buckwheat: "bitter" buckwheat (*Fagopyrum tartaricum*), which is cold and high altitude tolerant and occurs wild throughout the Tibetan plateau, and "sweet" buckwheat (*F. esculentum*), which is restricted to the eastern Plateau and some hills in

Yunnan and Sichuan. Bradley (1997a) has compiled terms for buckwheat in Lolo-Burmese, and shows that it clearly reconstructs to Proto-Lolo-Burmese. Table 4 compiles terms for buckwheat in the Sino-Tibetan area. There appears to be a common root, something like *#tɕiau*, but also at least one other term in Qiangic of unknown etymology.

Tab. 4: Terms for 'buckwheat' in Sino-Tibetan languages

Phylum	Branch	Language	*#tɕiau* [?]	Others	Comment
Sino-Tibetan	Sinitic	Chinese	*qiáo mài* (蕎麥)		
Sino-Tibetan	Sinitic	Chinese	*ku qiao*		bitter
Sino-Tibetan	Sinitic	Chinese	*tian qiao*		sweet
Sino-Tibetan	Sinitic	SW Chinese	*tɕiau*^{1}		
Sino-Tibetan	Tibetic	Tibetan (Lhasa)	*tʂhau*^{15}		< Sinitic?
Sino-Tibetan	Tibetic	Amdo Tibetan	*tʂu*		< Sinitic?
Sino-Tibetan	Tujia	Tujia	*khu*^{21}*tɕhiau*^{21}		bitter
Sino-Tibetan	Qiangic	Jinghua	*tāu tʃə*^{13}		
Sino-Tibetan	Qiangic	Taoba	*tō*^{55} *tə*^{55}		
Sino-Tibetan	Qiangic	Caodeng	*ʃɔ*		
Sino-Tibetan	Qiangic	Queyu (Yajiang)	*ʐõ*^{35}*qa*^{55}		sweet
Sino-Tibetan	Qiangic	Queyu (Yajiang)	*ʐõ*^{35}*tʂa*^{53}		bitter
Sino-Tibetan	Qiangic	Ersu		*ndzɿ*^{33}	sweet
Sino-Tibetan	Qiangic	Muya	*ɳɛ*^{35}*ndʑyɯ*^{53}		sweet
Sino-Tibetan	Qiangic	Qiang (Mawo)		*dzə*	sweet
Sino-Tibetan	Qiangic	Qiang (Mawo)		*dzəʂ*	bitter
Sino-Tibetan	Rgyalrongic	Rgyalrong	*ʃok*		
Sino-Tibetan	Burmish	Achang (Longchuan)	*tɕhauʔ*^{55}		< Sinitic?
Sino-Tibetan	Burmish	Atsi [Zaiwa]	*khjau*^{55}		< Sinitic?
Sino-Tibetan	Burmish	Bola (Luxi)	*khjau*^{31}		< Sinitic?
Sino-Tibetan	Loloish	Jinuo	*tɕhɔ*^{31}*tsi*^{44}		< Sinitic?
Sino-Tibetan	Miju	Kaman	*tɕi*^{31}*ka*^{55}		bitter
Sino-Tibetan	Mishmic	Taraon	*tɯ*^{31}*ka*^{53}		bitter

Source: Blench in press c

The importance of buckwheat among the Qiangic peoples and the phonological diversity of the names, does suggest its possible origin in this region. However, the SW Sinitic *tɕiau* is clearly an important source of secondary loans, as suggested in the comment column. In particular it looks as if Tibetic forms are borrowings from Sinitic, suggesting that buckwheat travelled west from China once domesticated, as it was suitable for high-altitude cultivation.

Table 5 shows the distribution of a second root, *#bram-*, for buckwheat;

Tab. 5: The #bram- root for 'buckwheat' in SE Asian languages

Phylum	Branch	Language	Attestation	Comment
Sino-Tibetan	Qiangic	Horpa	*brɛ və*	
Sino-Tibetan	Nungish	Trung	*ɟam^{55}bɹai^{55}*	
Sino-Tibetan	Bodish	Tshona (Wenlang)	*bre^{35}mo^{55}*	bitter
Sino-Tibetan	Tibetic	Written Tibetan	*bra bo*	
Sino-Tibetan	Kiranti	Bahing	*bramt-*	
Sino-Tibetan	Kiranti	Kulung	*bham*	
Sino-Tibetan	Mishmic	Idu	*a^{55}bɹa^{55}*	bitter
Sino-Tibetan	Mishmic	Taraon	*xa^{31}bɹa^{55}*	
Sino-Tibetan	Tani	Damu	*pra-ɦu*	probable loan

It seems at least possible that this root was originally associated with the domestication of bitter buckwheat. Apart from these, there are many more low-frequency roots, especially in the Himalayas. We can therefore conclude that buckwheat domestication was important in the early period of the development of agriculture among Sino-Tibetan speakers, but that it was certainly not part of the proto-language but was rather a later spread.

7 How old is Sino-Tibetan?

Determining the age and homeland of a linguistic phylum depends on several types of evidence coming together. It is assumed here that the results from linguistic reconstruction should be congruent with known archaeological, ecoclimatic and genetic data; if they are not, then the reconstruction should be treated as problematic. It is possible to claim that reconstruction is an abstract historical exercise, such that if there is apparently a form for 'trousers' in proto-Tibeto-Burman then it is irrelevant whether that was indeed its original referent. But most linguists would be unhappy with this; they would rather there was some correspondence between their constructs and real-world situations. Alternatively, one can suppose that there might have been a systematic semantic shift; that a proto-referent has been discarded in favour of a modern item. Such shifts clearly occur, but usually they leave traces, semantic doubling in some languages or the original referent in conservative cultures. At any rate, historical reconstruction ought surely to show awareness that the semantics of proto-forms should also be credible, not merely their phonology and morphology.

Without adhering to any strict version of glottochronology, it is reasonable to expect there to be some correlation between internal diversity and age. There

are now reasonable dates for the diversification of phyla or subgroups such as Polynesian, Bantu, Mayan or Turkic. These estimates are based on a combination of linguistic trees, reconstructible roots and archaeology in the presumed homeland. Furthermore, these are all branches of families where agriculture can be reconstructed without question. In other words, these allow us to estimate approximately the level of diversity there should be over a period of 3000–4000 years, the approximate age of Sinitic.

If the arguments of this paper are accepted, then in its earliest phase Sino-Tibetan was a congeries of diverse foragers in the Eastern Himalayan region. Dates for systematic exploitation of the Tibetan Plateau by hunters go back to 7500 BP, and presumably some time must be allowed for the movement from thick forests to the more open montane regions. If this is so, it seems reasonable to place the origins of Sino-Tibetan at around 9000–8000 BP. The diversification of the Naga and related peoples through vegeculture can be placed at around 6000–5000 BP and the beginnings of livestock production in the Himalayas immediately after this. At the same time, the primary movement eastward towards China begins and the expansion of Sinitic proper can then be placed at around 4500–4000 BP. These dates remain approximate and further archaeological research may well provide a far more nuanced picture. But this model at least has the advantage of not contradicting the known parameters of prehistory and not requiring improbable reconstructions of subsistence lexemes at various levels of Sino-Tibetan.

8 Sino-Tibetan: an alternative model

The evidence presented in this paper is marked by absences; lack of cognate reflexes in many of the smaller branches of Sino-Tibetan, lack of evidence for a coherent internal structure and a failure of congruence with archaeology and genetics. Given this, any hypothesis concerning the spread and diversification of the phylum must be speculative and subject to revision. However, we can do better than any of the claims presently on the table with an account which at least does not contradict the external evidence. With this in mind, the following summary is put forward as a model of the evolution of the phylum:

- The earliest speakers of Sino-Tibetan were highly diverse foragers living in an arc between the eastern slopes of the Himalayas and regional lowland jungles up to 9,000 years ago and practising arboriculture (sago)
- Some spoke early Sino-Tibetan languages, others unknown languages now present primarily as substrates and the rare case of a modern isolate such as Kusunda

- Seasonal foragers exploit the high Tibetan Plateau from 7500 BP
- Perhaps 6000–5000 BP a "livestock revolution" takes place in the mid-level Himalayas. Yak herders move up and settle the Tibetan Plateau permanently.
- Gathering of wild cereals (buckwheat etc.) and tubers (high-altitude taro) leads to proto-agriculture in the mid-level Himalayas
- Foragers who will become the Naga complex began to practise vegeculture (taro, plantains) (NE India) and animal management (mithun) by 6000 BP
- By 5000 BP diverse early Sino-Tibetan groups in the Himalayas begin spreading eastwards to China. Sinitic is not a primary branch, but simply the language of one of many migratory groups
- Proto-Tujia, Proto-Bai and probably others meet unknown populations (Hmong-Mienic? Austronesians?) with domestic pigs, millet, while also cultivating and beginning to domesticate rice
- Proto-Sinitic speakers encounter early Altaic speakers with foxtail millet and other crops
- The Sinitic languages expand southwards, assimilating or encapsulating many small groups. They encounter Hmong-Mien speakers with rice and switch millet terminology to rice
- Rice moves up from India but also westwards from China (hence hybridised types) and overlays older cereals where ecologically possible
- Ruminants (cows, sheep, goats) spread downwards into China from Central Asia 4400 BP (? Altaic for small ruminants but not cattle)
- Tibetic speakers undergo a major expansion (perhaps as late as 500 AD?) assimilating linguistic diversity on the Plateau
- Rice invades the lowland vegecultural zones rather later, pushing taro into residual systems, possibly as late as the spread of Assamese (10th century?)
- Groups such as early Burmic spread southwards, fragmenting resident Austroasiatic-speaking peoples

Figure 5 shows a highly simplified map of the early phases of this proposed movement:

Fig. 5: Possible pathways of early Sino-Tibetan expansion

9 Rethinking Sino-Tibetan phylogeny

The subtext of this paper is a critique of existing Sino-Tibetan phylogenies. Is it possible to put anything more nuanced in its place? If it is to be based on numerous low level reconstructions and regular sound correspondences then this will be impossible for a long time to come. Any "tree" should thus be treated as a speculation, a tool for thinking, a graphic that minimally shows consilience with low-level classifications and which is credible in the light of historical, epigraphic and archaeological evidence. Such a classification should not be afraid of single language branches. Especially in the arc of the Himalayas, where individual communities have been diverging from one another for millennia, it is entirely possible they will no longer have transparent relatives. With these caveats, Figure 6 puts forward a new proposal for Sino-Tibetan phylogeny. Languages backgrounded in grey are those for which there is apparently no data, so their position is simply a default. Also marked (with a box outline) are languages whose Sino-Tibetan

affiliation has not in fact yet been demonstrated, and where the authors maintain doubts as to the likelihood of a genetic relationship in fact being demonstrable.

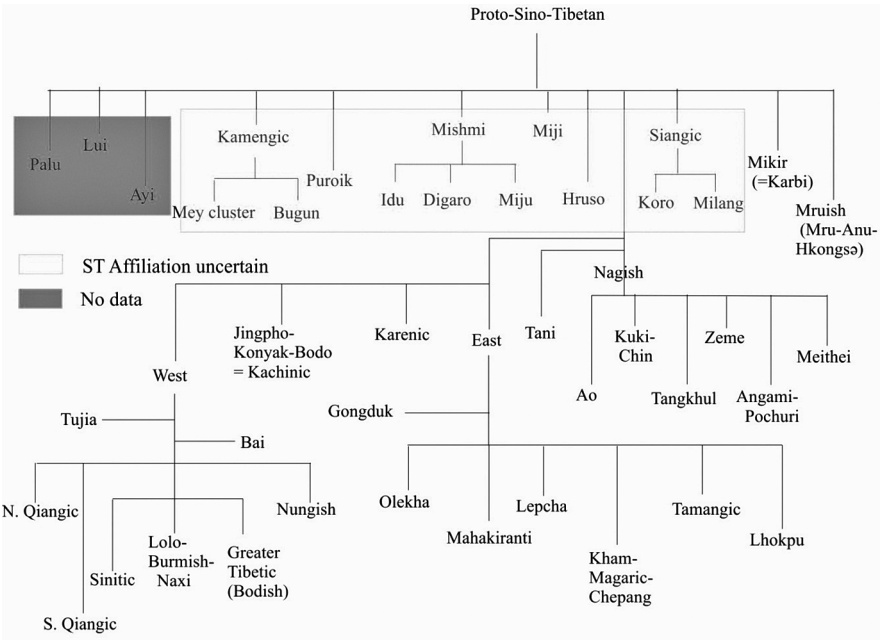

Fig. 6: A new proposal for Sino-Tibetan phylogeny

Future developments will quite likely involve the exclusion of some of these languages from the Sino-Tibetan phylum as they are treated as isolates with a Sino-Tibetan superstrate, as well as the inclusion of barely documented languages within larger groups as they become better known. But it seems likely that some languages will remain controversial, even when we know more about them.

10 What's in a name? "Trans-Himalayan" and other possibilities

If these arguments are even partway accepted, then "Sino-Tibetan" becomes a highly inappropriate name for the phylum, privileging as it does two low-level subgroups. It has been proposed to use the term "Tibeto-Burman" to refer to the

whole phylum (van Driem 2002); but in fact, the same objection applies – Tibetan and Burmese simply being two culturally prominent groups, with no special classificatory significance. One proposal on the table, also endorsed by the authors, is to use the term "Trans-Himalayan"; this would capture the geographical locus of much of the phylum without emphasising individual subgroups. Of course, the academic community may well put forward other suggestions, and we should be open to these.

11 Conclusions

The primary object of this paper has not been to put forward a definitive phylogenetic proposal, but instead to suggest that for too long a bundle of ideas and assumptions has been repeated in the literature without any serious evidential base. "Reconstructions" have been proposed which have failed to take many languages of high phyletic significance into account; these forms have been repeatedly quoted without remark in the literature, in the process gaining a lustre they hardly deserve. Sino-Tibetan has no agreed internal structure, and yet its advocates have been happy to propose dates for its origin, expansion and homeland in stark contradiction to the known archaeological evidence. A focus on "high cultures" (Chinese, Tibetan, Burmese) has led to an emphasis on these languages and their written records, something wholly inappropriate for a phylum where an overwhelming proportion of its members speak unwritten languages. Standard handbooks have ignored minority languages whose lexicon and grammar do not fit with prevailing stereotypes. This paper is intended as a contribution towards redressing this balance.

12 Abbreviations, acronyms and symbols

*	reconstruction regular based on established sound correspondences
#	quasi-reconstruction based on rapid inspection of forms
BP	before present
C	consonant
N	nasal
PST	proto-Sino-Tibetan
PTB	proto-Tibeto-Burman
V	vowel

Appendix: Languages of NE India and Sino-Tibetan terms for 'snow'

Appendix Table 1 is a list of the languages of NE India and adjacent territories listed in *Ethnologue*, with correct names, classification and other information where this is available. Absence of an ISO number implies that it is likely that the lect has the status of a language but is not listed separately or at all in the *Ethnologue*. We also here identify "languages" with ISO codes, but whose status is either in clear error, or whose identification as languages is seemingly not based on any available data.

Appendix Tab. 1: Corrected table of languages of NE India and adjacent territories

Branch	Language	ISO	Country	Also
Mikir	Amri Karbi	ajz	India	
	Karbi	mjw	India	
Mruish	Mru	mro	Bangladesh	
	Anu	anl	Myanmar	
	Hkongsə		Bangladesh	
Jingpho	Singpho	sgp	India	
Tani	Lower Adi	adi	India	Abor (pejorative), Padam, Pasi, Panggi, Minyong, Komkar
	Upper Adi		India, Tibet	Karko, Shimong, Bori, Aashing
	Tangam		India	
	Mising	mrg	India	Miri (pejorative)
	Pao	ppa	India	(this is not a language, but rather a Mising clan name)
	Galo	adl	India	(Adi) Gallong (exonym)
	Central-Western		India, Tibet	Bokar, Ramo, Pailibo
	Lower Nyishi	dap	India	Dafla (pejorative)
	Hills Miri		India	Hill Miri
	Apatani	apt	India	
	Upper Nyishi	nbt	India, Tibet	Na(h), Bengni, Bangni
	Tagin		India, Tibet	M(a)ra
Siangic	Milang		India	Mala, Holon, Dalbo
	Koro		India	(Koro) Aka

Branch	Language	ISO	Country	Also
East Bodish	Khamba	kbg	India	Khams Tibetan
Tibetic?	Memba	mmc	India, Tibet	Tshangla?
	Meyor	zkr	India	Zakhring
Kamengic	Bugun	bgg	India	Khowa
	Mey	sdp	India	Sherdukpen
	Sartang	onp	India	But Monpa, dialect of Sherdukpen
	Lish	bqh	India	forms a close dialect cluster with Chug
	Chug	cvg	India	forms a close dialect cluster with Lish
Mishmic	Idu	clk	India	Chulikata (exonym, pejorative)
	Taraon	mhu	India	Digaru
Mijiic	Miji	sjl	India	Sajalong, Dhammai
	Bangru		India	Levai
Isolate	Puroik	suv	India, Tibet	Sulung
Isolate	Miju	mxj	India	Kaman
Isolate	Hruso	hru	India	Aka
Unclassified	Baima	lsh	China	
	Ayi	ayx	China	Erroneous. Deleted from most recent *Ethnologue*
	Lui	lba	Myanmar	Erroneous. Deleted from most recent *Ethnologue*
	Palu	pbz	Myanmar	Erroneous. Deleted from most recent *Ethnologue*

Appendix Tab. 2: Sino-Tibetan terms for 'snow'

Branch	Language	Attestation	Root
*Tibeto-Burman		**kyam*	*#kyam*
Bai	Bai	*suɛ²*	*#ʃü[ri]*
Bodo-Garo	Atong	*suri*	*#ʃü[ri]*
Bodo-Garo	Garo (Bangladesh)	*bo-rop*	*?*
Bodish	Cuona Menba	*kha⁵⁵ru⁵³*	*#kyam*
Bodish	Motuo Menba	*phom*	*#pham*

Branch	Language	Attestation	Root
Burmish	Achang (Longchuan)	*xan³¹ʑai⁵⁵*	*#xan*
Burmish	Atsi [Zaiwa]	*kjoʔ²¹*	*#kliN*
Burmish	Burmese (Yangon)	*shi⁵⁵ŋ̊ĩ⁵⁵*	*#fü[ri]*
Burmish	Burmese (Written)	*khyàm*	*#kyam*
Burmish	Burmese (Written)	*hsi³ hnaŋ³*	*#naŋ*
Burmish	Lalo	*va²¹*	*#[te] van*
Burmish	Marma	*rəkhébraŋ*	*?*
Burmish	Sani [Nyi]	*va²¹*	*#[te] van*
Himalayish	Kanauri	*tshō*	*#fü[ri]*
Himalayish	Kanauri	*rīsŭr*	*#fü[ri]*
Himalayish	Kanauri	*stil(h)*	*?*
Himalayish	Kanauri	*ṭhāṇöṅ*	*?*
Himalayish	Pattani [Manchati]	*mug*	*?*
Jingpho-Konyak	Jingpho	*khyen²*	*#kliN*
Jingpho-Konyak	Jingpho	*kjo³¹naʔ⁵⁵*	*#kliN*
Jingpho-Konyak	Phom	*shü*	*#fü[ri]*
Jingpho-Konyak	Tangsa (Moshang)	*thikhek*	*?*
Jingpho-Konyak	Chang	*ninthu*	*#naŋ*
Jingpho-Konyak	Konyak	*yi*	*?*
Karenic	Pa-O	*wàʔ*	*#[te] van*
Kiranti	Bahing	*phyrky*	*?*
Kiranti	Dumi	*rim*	*?*
Kiranti	Kulung	*noŋ_*	*#naŋ*
Kiranti	Limbu	*naŋ*	*#naŋ*
Kiranti	Thulung	*phomu*	*#pham*
Kiranti	Yamphu	*naŋ*	*#naŋ*
Kuki-Chin	Daai	*ʁaːŋ*	*#naŋ*
Kuki-Chin	Khumi	*kʰu.tᵊmáiˀ*	*?*
Kuki-Chin	Lushai [Mizo]	*vuːr*	*#[te] van*
Kuki-Chin	Matu	*xɔsɔŋ*	*?*
Kuki-Chin	Tiddim	*vuːk²*	*#[te] van*
Kuki-Chin	Mkaang	*ɓɔk.kɜm*	*#kyam*
Kuki-Chin	Wakung	*sʰənãŋ*	*#naŋ*
Kuki-Chin	Sorbung	*ʔəhúr*	*#fü[ri]*
Loloish	Ahi	*ɣo²¹*	*#kyam*
Loloish	Bola (Luxi)	*ŋɛ̃⁵⁵*	*#naŋ*
Loloish	Gazhuo	*xoa⁵⁵*	*#xan*
Loloish	Hani (Gelanghe)	*xa³¹*	*#xan*
Loloish	Jinuo	*njɛ³³ji⁴⁴*	*?*
Loloish	Jinuo (Youle)	*se⁵⁵tha⁵⁵*	*?*
Loloish	Lahu (Black)	*vʌ⁵³mei¹¹*	*#[te] van*
Loloish	Lipho	*ɣo²¹*	*#kyam*
Loloish	Lisu	*wa⁵/wa³¹*	*#[te] van*
Loloish	Lusu	*ʑy³⁵*	*#dʑyɛp*
Loloish	Nasu	*vo³³*	*#[te] van*

Branch	Language	Attestation	Root
Loloish	Neisu	*ɣu³³*	*#kyam*
Loloish	Nusu (Bijiang)	*va⁵⁵*	*#[te] van*
Loloish	Yi (Dafang)	*vu³³*	*#[te] van*
Loloish	Yi (Nanhua)	*ɣo²¹*	*#kyam*
Loloish	Yi (Nanjian)	*va²¹*	*#[te] van*
Meithei	Meithei	*un*	*?*
Mikir	Mikir	*arekelok*	*?*
Mikir	Mikir	*ephik*	*?*
Mijuic	Miju	*so⁵⁵*	*#ʃü[ri]*
Mishmic	Idu	*põ*	*#pham*
Mishmic	Darang [Taraon]	*a³¹ɹuai⁵⁵*	*#aru*
Naish	Naxi	*be³³*	*#pu[n]*
Naga Angami	Khonoma	*pekri*	*?*
Naga Angami	Ntenyi	*ghula*	*?*
Naga Angami	Mao	*ovumara*	*?*
Naga Angami	Sumi	*mora sü*	*? #ʃü[ri]*
Naga Angami	Sumi	*apüghü*	*?*
Naga Angami	Sumi	*kukhukite*	*?*
Naga Ao	Ao (Chungli)	*rürjep*	*?*
Naga Ao	Ao (Mongsen)	*azu*	*#ʃü[ri]*
Naga Ao	Lotha Naga	*šérə*	*?*
Naga Ao	Sangtam	*shurü*	*#ʃü[ri]*
Naga Ao	Yimchungrü	*aru*	*#aru*
Naga Zeme	Mzieme	*moŋ zui*	*?*
Naga Zeme	Rongmei	*gun*	*#kyam*
Newaric	Newar	*chwãpõ*	*#pu[n]*
Nungish	Anong	*thi³¹vɛn⁵³*	*#te van*
Nungish	Trung	*tɯ³¹wan⁵³*	*#te van*
Puroik	Puroik (Sulung)	*kə³³ʑɯh⁵³*	*#ʃü[ri]*
Qiangic	Caodeng	*tʰɐ-jpe*	*#pu[n]*
Qiangic	Daofu	*kha va*	*#kyam*
Qiangic	Ergong (Danba)	*nkhɛ va*	*#[te] van*
Qiangic	Ersu	*zɿ⁵⁵*	*#dʑyɛp*
Qiangic	Guiqiong	*khə⁵⁵wʉ⁵⁵*	*#kyam*
Qiangic	Muya	*βə²⁴*	*#pu[n]*
Qiangic	Muya [Minyak]	*vɯ³⁵*	*#pu[n]*
Qiangic	Namuyi	*jʉ³¹*	*#pu[n]*
Qiangic	Pumi (Jinghua)	*spy⁵⁵*	*#pu[n]*
Qiangic	Pumi (Jiulong)	*py⁵⁵*	*#pu[n]*
Qiangic	Pumi (Lanping)	*fpy⁵⁵*	*#pu[n]*
Qiangic	Qiang (Mawo)	*piɛ*	*#pu[n]*
Qiangic	Qiang (Mawo)	*tɕi qəˈ βu*	*#pu[n]*
Qiangic	Queyu (Xinlong)	*kha⁵⁵wa⁵⁵*	*#kyam*
Qiangic	rGBenzhen	*te va*	*#te van*
Qiangic	Rgyalrong	*tɐi jpa*	*#pu[n]*

Branch	Language	Attestation	Root
Qiangic	Rgyalrong	*tey va*	*#te van*
Qiangic	Shixing	*dʑyɛ³⁵*	*#dʑyɛp*
Qiangic	Tangut [Xixia]	*wjị*	*?*
Qiangic	Taoping	*mə³¹pa⁵⁵*	*#pu[n]*
Qiangic	Zhaba	*vʑi¹³*	*#dʑyɛp*
Siangic	Milang	*ta-pim*	*#pham*
Sinitic	Modern Chinese	*bīng [ice]*	*#pham*
Sinitic	Old Chinese	**prəŋ [ice]*	*#pham*
Sinitic	Modern Chinese	*jiāo [frost]*	*?*
Sinitic	Old Chinese	**krû*	*? #kliN*
Sinitic	Modern Chinese	*xuě*	*#fü[ri]*
Sinitic	Old Chinese	**sot*	*#fü[ri]*
Tangkhulic	Tangkhul	*pham*	*#pham*
Tani	*Tani	**ta-pam*	*#pham*
Tani	Apatani	*pēm-bè*	*#pham*
Tani	Galo	*ta-pam¹*	*#pham*
Tamangic	*Tamang	*gliŋ⁴*	*#kliN*
Tamangic	*Tamang	*gaŋ^A*	*#kyam*
Tamangic	Tamang (Risiangku)	*kliŋ⁴*	*#kliN*
Tamangic	Tamang (Sahu)	*‘sera ‘yu-pa*	*?*
Tamangic	Tamang (Taglung)	*khliŋ*	*#kliN*
Tamangic	Gurung (Ghachok)	*klĩq*	*#kliN*
Tamangic	Gurung (Ghachok)	*ɬĩ²*	*#kliN*
Tamangic	Manang (Gyaru)	*kyin⁴*	*#kliN*
Tamangic	Manang (Gyaru)	*gɛː⁴*	*?*
Tamangic	Manang (Ngawal)	*khĩ⁴*	*#kliN*
Tamangic	Manang (Prakaa)	*kaŋ³*	*#kyam*
Tamangic	Thakali (Marpha)	*lin⁴*	*#kliN*
Tamangic	Thakali (Syang)	*lim¹¹*	*#kliN*
Tamangic	Thakali (Tukche)	*kin⁴*	*#kliN*
Tibetic	Tibetan (Alike)	*kaŋ*	*#kyam*
Tibetic	Tibetan (Amdo)	*khaŋ*	*#kyam*
Tibetic	Tibetan (Batang)	*kha⁵⁵*	*#kyam*
Tibetic	Tibetan (Khams:Dege)	*kha⁵⁵wa⁵³*	*#kyam*
Tibetic	Tibetan (Lhasa)	*khaŋ¹³²*	*#kyam*
Tibetic	Tibetan (Spiti)	*kʰá*	*#kyam*
Tibetic	Tibetan (Written)	*gaŋs [ice]*	*#kyam*
Tibetic	Tibetan (Written)	*khaba*	*#kyam*
Tibetic	Tibetan (Xiahe)	*khaŋ*	*#kyam*
Tujia	Tujia	*su³⁵su⁵⁵*	*#fü[ri]*

Sources: Compiled from the STEDT database, with additional inputs from other published and manuscript sources, as well as the authors’ field notes. The proposed quasi-reconstructions are by the authors

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