

Lolo-Burmese linguistic archaeology¹

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Linguistic archaeology, or palaeolinguistics, is a method of comparative linguistics which deals with reconstructions of various properties of speech communities associated with reconstructed proto languages. Two Sino-Tibetan branches—Sinitic and Lolo-Burmese—are known sufficiently enough to be investigated using the methods of linguistic archaeology. I have addressed the problems of Chinese palaeolinguistics elsewhere (Peiros 1996), so in this paper I will discuss what linguistic data suggest about speakers of Proto-Lolo-Burmese.

Linguistic archaeology is based on comparative phonology and a reconstructed lexicon of the language family under investigation, so a few words should be said about Proto Lolo-Burmese phonological reconstruction and etymology.

Linguistic data about modern Lolo-Burmese languages are much more substantial than about most other Sino-Tibetan groups. There are descriptions of the main languages of this family, including detailed dictionaries (Matisoff 1973; Chen et al. 1985 and many others). At the same time it can hardly be said that the group is known in sufficient detail. The list of Lolo-Burmese languages is still being extended, as linguistic trips to southwest China or neighboring areas result in discovery of new languages such as Jino (Gai 1986) or Ugong (Bradley 1989).

The comparative study of Lolo-Burmese was begun in the 1960's with the publication of the first Proto-Lolo-Burmese reconstruction by Burling (1967). Later, several other versions of the phonological reconstruction were published (Matisoff 1969; 1972; Bradley 1979; Thurgood 1982, etc.). As a result one can say that all significant phonological correspondences between the investigated languages are now well established and the differences between reconstructions mainly concern the interpretation of existing phonological correspondences, rather than the establishment of new correspondences or the collection of additional data.

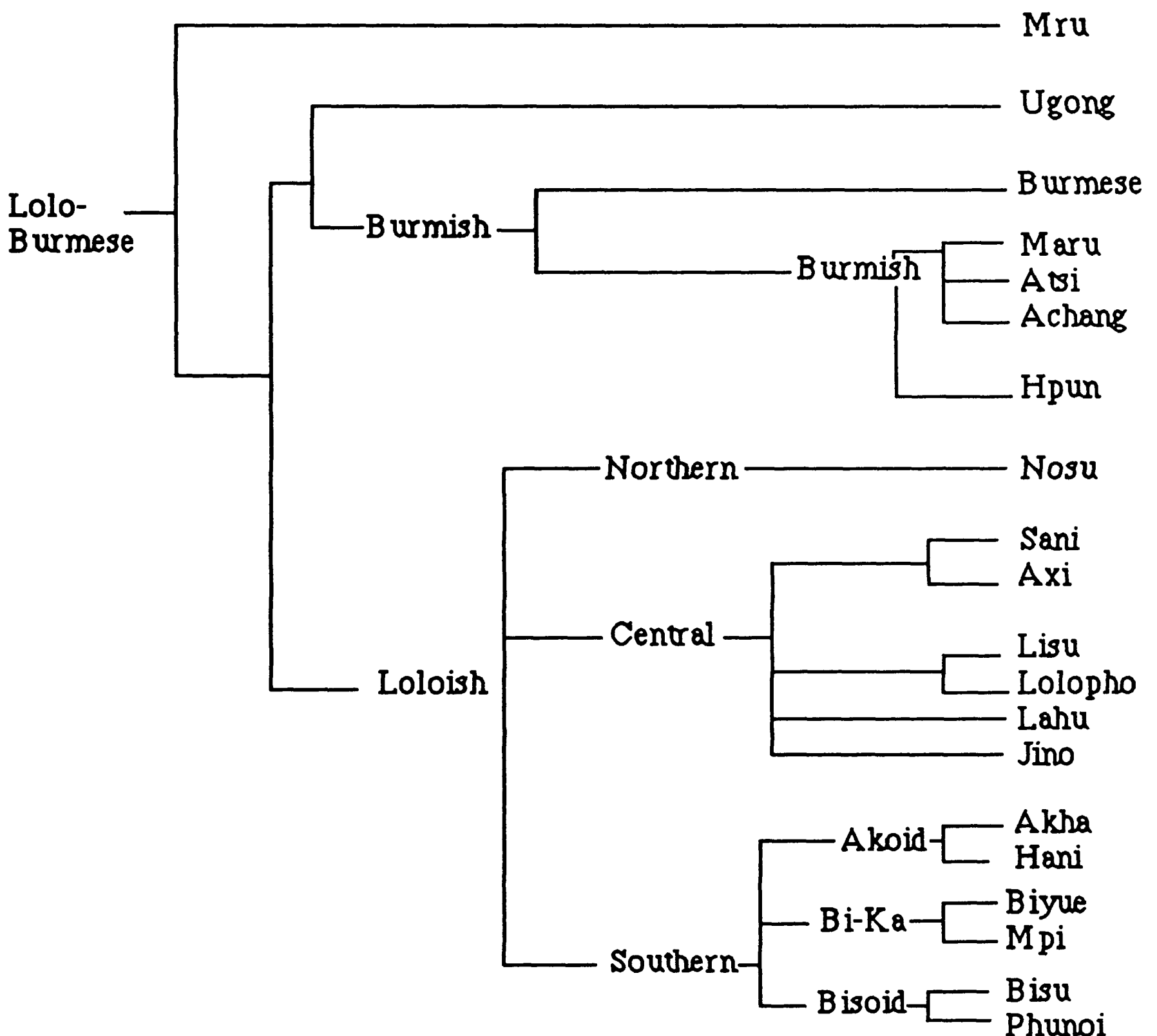
The Lolo-Burmese lexicon is known mostly, thanks to Bradley (1979). My Lolo-Burmese reconstruction (Peiros 1985) is based on a comparative dictionary which includes about 500 Proto Lolo-Burmese roots, many of them identical to Bradley's. New lexical data are available (Jin 1984; Matisoff 1988 and many others) but have not yet been investigated in all details.

¹An earlier version of this paper was presented at the workshop on 'The High Bronze Culture of Southeast Asia and South China' in Thailand 1991.

The known Lolo-Burmese languages and dialects form the following subgroups:

1. Atsi-Burmese: Burmese, Achang, Phun, Atsi, Maru, and others
2. Lisu and Lolo pho dialects
3. Sani, Ahi and related dialects
4. Northern dialects: Nosu, etc.
5. Lahu dialects
6. Nusu
7. Akha dialects
8. Bisu - Phunoi dialects
9. Jino
10. Mpi
11. Moso - Naxi dialects

Several classifications of these groups have been proposed (Matisoff 1972; Thurgood 1982 and others). Bradley (1996) suggests that the languages can be subgrouped in the following way:



The classification includes Mru, a language spoken in Bangladesh, but excludes Naxi which, according to Bradley, is only remotely related to the Lolo-Burmese family. Bradley gives no formal justification for this classification, but one can assume that it is based on certain sets of innovations, specific to each proposed group.

An alternative method of genetic classification of languages is lexicostatistics. Linguists are often very sceptical towards this method, but their well-founded scepticism is based on results obtained through the standard method of lexicostatistics. However, the modified lexicostatistical method provides us with a very powerful and reliable tool for genetic classification. Unfortunately, this modified method has not been discussed in publications,² so some comments are needed here.

The modified lexicostatistics includes several steps, each revealing its own problems and restrictions:

(1) The method is based on a list of basic meanings (α -list). Each meaning included in the α -list should be:

- universal, e.g. known to all or most human communities, regardless of the environment, level of cultural development and other features;
- easy to identify and to be translated into languages, which means that the meanings should be quite simple and preferably related to most common and well-defined objects, activities or characteristics;
- normally free from cultural influences and permanent taboos;
- historically independent from other meanings of α -list. A change of one meaning in it should not necessarily require changes of others.

There are many different ways to compile an α -list. Traditionally, in many lexicostatistical studies scholars use a standard α -list which includes 100 meanings from Swadesh, despite the fact that the list is less than ideal. Nevertheless, it seems to be useful to work with this universal list, as it allows us to compare various classifications like Germanic and Mon-Khmer, Sino-Tibetan and Australian, or Germanic, Turkic and Lolo-Burmese.

(2) Each language to be investigated by lexicostatistics is represented by its diagnostic list which is formed by words with meanings included in the α -list (α -meanings).

An α -meaning can be associated with one or several different words of a particular language. Two restrictions are essential in compiling a diagnostic list:

- the words should be taken from one single dialect;

²Starostin and I are now writing a book on lexicostatistics. The following brief discussion is based on the ideas which are supposed to be included in the book.

- only words with unmarked meanings can be included.

In some cases a particular meaning can be represented by several different forms (*young moon/full moon* with no single word for *moon*). Sometimes a word cannot be found, and that is why diagnostic lists from different languages vary in their length.

(3) Synonymic words (words of the languages with identical α -meaning) are compared and genetically identical forms are identified. For each pair of languages synonymic words are marked with:

- identical positive numbers if the words are of common origin;
- negative numbers if the words are loans (one can use identical negative numbers for words borrowed from the same source);
- different positive numbers if the words are not genetically related.

(4) The percentage of genetically identical words to all words in the diagnostic lists is established for each pair of languages and a complete matrix of percentages is compiled for the whole family. This is an automatic procedure which can be done with the help of STARLING - a software package for comparative linguistics developed by Starostin.³

(5) An interpretation of the matrix based on a certain set of principles provides us with a genetic tree of the corresponding family. Among the main principles of matrix interpretation one should mention that (i) the interpretation is given to the whole matrix, rather than to percentages between certain languages; (ii) each percentage included in a matrix should get its interpretation especially if it is higher or lower than expected.

Using a matrix STARLING automatically generates a corresponding tree.

The lexicostatistical matrix for several Lolo-Burmese languages is given in Table 1. The actual data for this matrix is from Peiros (in press).

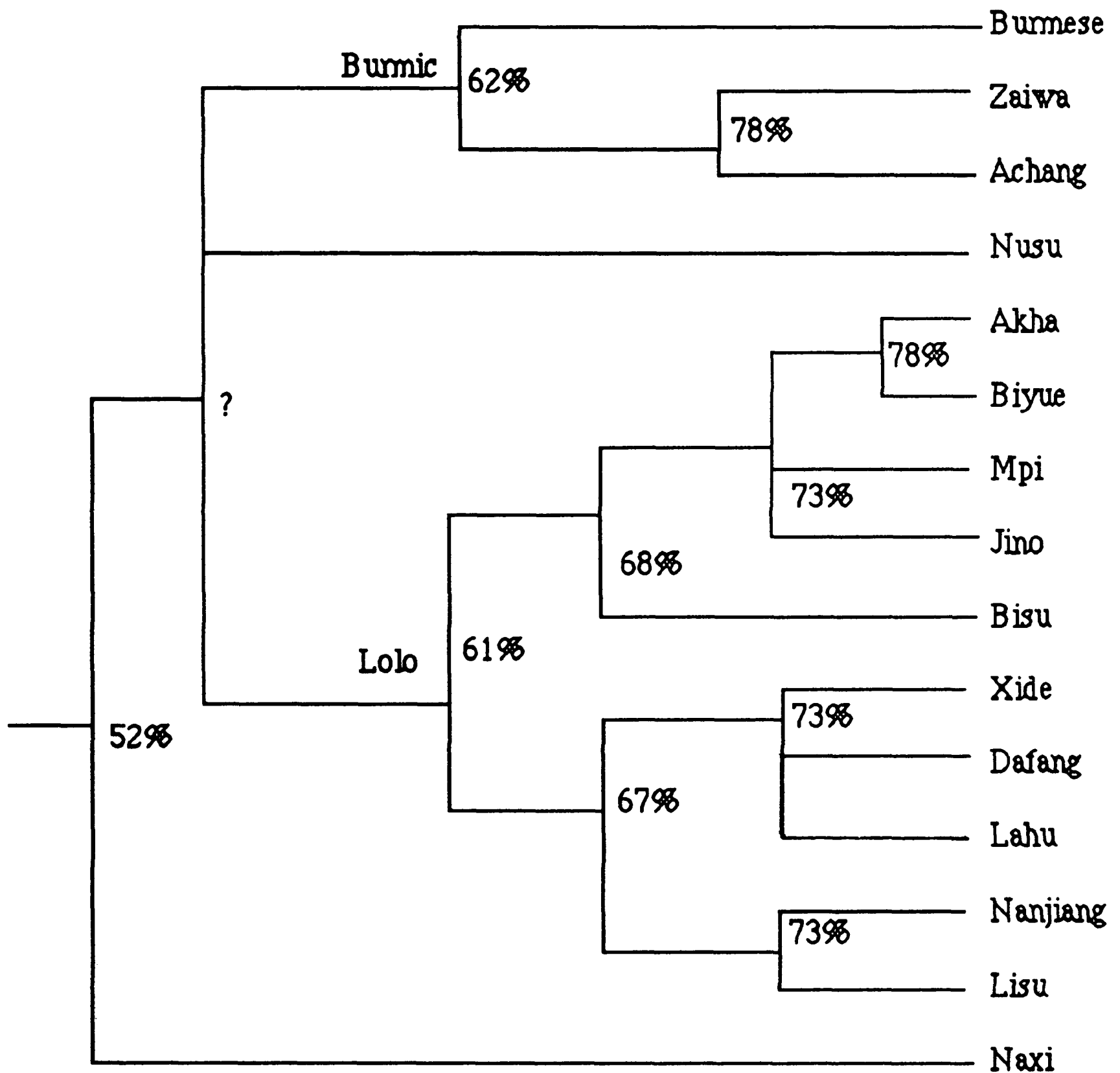
³I am grateful to Starostin for his permission to use STARLING in my research.

Table 1

Lexicostatistical matrix for 15 Lolo-Burmese languages

	BUR	ZAI	ACH	NUS	AKH	BIY	MPI	JIN	BIS	XID	DAF	LAH	NAN	LIS	NAX
BUR	x	62	65	62	57	57	58	59	53	52	58	55	53	57	54
ZAI	62	x	70	65	63	63	62	60	50	57	61	60	55	61	53
ACH	65	70	x	63	61	66	64	59	53	60	61	60	59	64	55
NUS	62	65	63	x	60	64	61	64	59	62	61	58	55	64	54
AKH	57	63	61	60	x	78	73	73	69	63	65	69	68	73	61
BIY	57	63	66	64	78	x	77	76	70	69	67	74	75	74	61
MPI	58	62	64	61	73	77	x	74	68	61	62	66	68	69	59
JIN	59	60	59	64	73	76	74	x	70	65	66	67	69	68	53
BIS	53	50	53	59	69	70	68	70	x	59	57	63	59	61	55
XID	52	57	60	62	63	69	61	65	59	x	73	67	70	68	57
DAF	58	61	61	61	65	67	62	66	57	73	x	70	69	70	56
LAH	55	60	60	58	69	74	66	67	63	67	70	x	71	71	62
NAN	53	55	59	55	68	75	68	69	59	70	69	71	x	73	59
LIS	57	61	64	64	73	74	69	68	61	68	70	71	73	x	61
NAX	54	53	55	54	61	61	59	53	55	57	56	62	59	61	x

A genetic tree generated from this matrix is as follows:



This tree requires some further comments. Formally interpreting the percentages of shared lexicon between the languages one obtains a classification with two main branches: Proper Lolo-Burmese and Naxi. But these two branches are very close to each other and the differences between them can be explained by insufficient knowledge of Naxi which has no close relatives among the Lolo-Burmese languages. If such an assumption is correct the Lolo-Burmese tree would consist of some independent branches: Burmic, Lolo, Naxi and perhaps Nusu. As I have no proof of this assumption I prefer to use the first variant of the classification (with two main branches), but such a decision is not well-grounded.

A comparison of the lexicostatistical classification with that of Bradley reveals the following points:

(1) The classifications are based on different sets of languages, but where a language is included in both classifications, it usually occupies the same position in the two genetic trees.

(2) Mru and Ugong are not included in the lexicostatistical classification, but my very limited list of Mru forms (not sufficient for lexicostatistical analysis) does not support the idea that this language should be connected to Lolo-Burmese.

(3) Naxi is included in the lexicostatistical classification, although according to Bradley it does not belong to this family.

(4) Nusu (not included in Bradley's classification) is treated in the lexicostatistical classification as the third branch of Lolo-Burmese proper, equal in status to Burmic and Lolo.

(5) The main difference is in the treatment of the Lolo languages. Both classifications identify Northern and Southern Lolo branches, but lexicostatistics does not support the existence of a Central group.

It is generally accepted that Lolo-Burmese languages form a branch of Sino-Tibetan, but their exact position in the family is not well established. A preliminary lexicostatistical classification of Sino-Tibetan conducted by Starostin and myself some time ago (discussion in Peiros (in press)) suggests that Lolo-Burmese are specifically related to such languages as Tangut, Qiang, Jiarung and some others⁴ forming with them the so-called Sichuan-Burmese group of Tibeto-Burman. The latter includes Tibetan, Chepang-Magari, Nung, Kuki-Chin, Mikir, Karenic and some other languages, but excludes East Himalayan, Bodo-Garo, Kanauri, Miri, Lepcha, Jingphaw, Newari, and Sinitic.

Three main issues of linguistic archaeology will be discussed here:

- (1) localization of Proto-Lolo-Burmese homeland
- (2) absolute dating for the disintegration of Proto-Lolo-Burmese
- (3) some features of Proto-Lolo-Burmese cultural reconstruction

The Lolo-Burmese languages are spoken now in a rather limited area which includes Yunnan and neighboring territories. Only the Burmese language is spoken far to the south, but according to historical sources, this language was brought to the south relatively recently from the same kernel area.

I believe that we have enough data to determine where the Proto Lolo-Burmese homeland was located. Most modern Lolo-Burmese languages are spoken in Yunnan and in some adjacent areas of China, Vietnam, Laos, Thailand and Burma. The southwards migration of Proto-Burmese speakers occurred in historical times. Later some Lisu, Akha and Lahu speakers also moved southwards. Their Thailand dialects hardly differ from Chinese ones, and in Yunnan one can find languages closely related to Lisu and Akha, hence their movement southwards from Yunnan looks more probable. The Lolo-Burmese dialects of Sichuan were also transferred from Yunnan relatively recently. If we

⁴Bradley (1996) includes these languages in Northeast Tibeto-Burman postulating their possible relation to Lolo-Burmese.

disengage ourselves from these migrations, the modern distribution of the Lolo-Burmese languages can be described as a circle with a high concentration of these languages on its perimeter and Chinese and some Lolo-Burmese languages on the inside. It is highly probable that the inner part of this circle was originally associated primarily with Lolo-Burmese speakers and only recently they have been substituted by the Chinese population. This assumption, together with connections with Sichuan Burmese languages to the north, allows me to postulate that the Lolo-Burmese homeland was situated somewhere in Yunnan, probably in its central and northern parts.

An additional support of this localization can be drawn from the fact that with the exception of Burmese, the languages are spoken predominantly in the hills and low mountains of moderate climate, rather than in the hot valleys of the south.

Unfortunately I have no linguistic data about the ecological environment of the homeland. For such purposes one can use words from the proto-lexicon designating different kinds of wild vegetation related to specific environments, but in the reconstructed lexicon there are no words of this type.

There are some Proto Lolo-Burmese words for such animals as tiger, leopard, wild cats, bear, different kinds of deer (including perhaps barking deer), monkeys, etc. But usually animals are not so closely connected with the particular type of environment and they can migrate from one place to another and may be found far from their original ecological zone. Thus, these Proto Lolo-Burmese roots are of little help.

However, two remarks should be made. In my Lolo-Burmese data there are no words for 'wild cattle' and 'elephant'. Both roots are absent in Proto Lolo-Burmese reconstructions. In the case of wild cattle I assume that the root simply hasn't been found because the Burmese word *prauŋ* 'bison', 'gaur' has well established Sino-Tibetan etymology:⁵ **bhronŋ* (Shafer 1966-74:51; Benedict 1972 n.136, P&S I:13). The case of 'elephant' is more complicated. The Chinese loan is used in the Burmic subgroup. The same loan is attested in Naxi. In the Lolo subgroup a root with a restricted distribution can be reconstructed (Bradley 1979; pc.) but there is not enough evidence for its Proto-Lolo-Burmese attribution. The root 'a big animal (ox, elephant)' is found in Proto-Sino-Tibetan **laŋH* (P&S III:13) and its Chinese reflex with the meaning 'elephant' has been borrowed into many other languages, including Lolo-Burmese, Tibetan, some Dravidian, Mon-Khmer and Kadai.⁶

It is very interesting to speculate about how Proto-Lolo-Burmese speakers reached their Yunnan homeland. I have only some general suggestions about it. According to my hypothesis which I have discussed in some publications (Peiros 1984; 1989; in press), the Sino-Tibetan homeland was located in the Sub-

⁵ All Sino-Tibetan reconstructions are given according to Peiros & Starostin 1996 (P&S) which includes references to other sources.

⁶ Maybe this root can be connected with specific cultural features of the Proto-Chinese speakers, which requires special investigation.

Himalayan region. After the disintegration of Proto-Sino-Tibetan some daughter-language groups were transferred eastwards. But most Sino-Tibetan groups are still spoken exclusively in South Asia. Only Chinese, Jingpo and some Tibeto-Burman languages are used to the east. Since there were no specific contacts or common substratum in these 'South Asian' language groups, one can suppose that they developed independently. That is why I cannot agree with the idea that the Sino-Tibetan homeland was located somewhere in China. It is quite improbable that all 'South Asian' branches were carried westward independently. So I think that the hypothesis of an Himalayan homeland is simpler and thus more attractive. At a certain stage of this eastward migration Proto-Lolo-Burmese was brought to Yunnan and only here it began to disintegrate into daughter languages. The last assumption is based on the fact that all known Lolo-Burmese languages can be traced back to the kernel territory in Yunnan.

In the absence of historical records glottochronology remains the only tool of obtaining absolute datings. As with the case of lexicostatistics, this method is not popular in historical linguistics and examples of erroneous dates generated by glottochronology are well-known. However, a modified glottochronological method provides us with much better results. This method (see discussion in Starostin 1989) is based on

- lexicostatistical matrix created by modified lexicostatistics
- modified glottochronological formula

Modified glottochronology has been tested upon several cases with good and reliable datings obtained through other procedures: Chinese, Romance, Germanic, Slavic, Turkic, etc. As a result one can expect that in other cases glottochronological datings would also be reliable.

For Lolo-Burmese, glottochronology suggests that the disintegration of the proto-language started about 3800–3600 years ago. It should be mentioned, however, that glottochronology provides us only with the most probable date rather than the precise dating of the disintegration which in fact could start some 200 years later or earlier than this period.

Reconstruction of material culture known to the speakers of a proto language is based on information obtained from the proto-language lexicon⁷ and thus is based on our ability:

- to attribute a word to the proto language level
- to suggest a precise semantic reconstruction of a proto form

A word belongs to the Proto-Lolo-Burmese lexicon if it is represented in Naxi and in some other languages preferably from the Burmic subbranch, as some languages of the Lolo subbranch theoretically could have been in contact with Naxi; any clear evidence of such contacts is, however, absent. If the word is not attested in Naxi it is more difficult to prove its Lolo-Burmese origin. But when the

⁷The general theory of cultural reconstruction is discussed in several of my presentations now submitted for publication: Peiros 1991b; Peiros 1994.

word is at the same time attested in other Sino-Tibetan languages, one can assume that it was also represented in Proto-Lolo-Burmese, provided that the word is not a borrowing. Using this logic, I have identified some Proto-Lolo-Burmese words which are relevant for cultural reconstruction. The list is given in Appendix I and here I simply summarise the conclusions drawn from this list.

First of all, it is quite obvious that the Proto-Lolo-Burmese speakers cultivated rice and millet. Words for these crops were definitely represented in Proto-Lolo-Burmese. It is possible that some other kinds of crops were also cultivated, but the data do not permit me to reconstruct other crop-names. In any case, Proto-Lolo-Burmese culture included highly developed agriculture based mostly on rice and millet. They cultivated beans and probably various root-crops and also bananas. But root-crops, if they were used, played only a subsidiary role, as their names are not widely represented in the Lolo-Burmese languages.

There is no clear evidence of Lolo-Burmese agricultural methods, such as ways of tilling the land, practices of rice raising, etc.

Husbandry was also important and the Proto-Lolo-Burmese population had different domestic animals, such as dogs, pigs, horses and chickens. They also had bovines, but it is difficult to say whether they were cattle or buffalo. Goats were also known, but there is no way to prove that they were domesticated. Sheep breeding practice is even less probable: the word is absent in most Lolo-Burmese languages and only the Burmese form confirms it. As in the case of crop-cultivation, there are no data of Proto-Lolo-Burmese animal breeding methods.

The third remarkable feature of the Proto-Lolo-Burmese culture is the knowledge of different metals: iron, bronze (or more likely copper or brass—the languages do not differentiate them), silver and perhaps gold.

I can add some more roots such as the names for baskets, pots, bracelet, ring, bow, weaving, etc., but I don't think that all these roots are useful for this cultural reconstruction. Perhaps the existence of two Proto-Lolo-Burmese words for boat prove that the homeland was not high in the mountains where boats were not used. However, all other words do not give any relevant additional information.

An interesting feature of most of the above mentioned words is their Sino-Tibetan or Tibeto-Burman origin which indicates that the corresponding cultural ideas were already known to the ancestors of Proto-Lolo-Burmese speakers and were simply maintained in Proto-Lolo-Burmese and its daughter languages. In some cases the words narrowed their meanings in comparison with previous stages, but now it is difficult to judge whether such changes were connected with some cultural innovations or whether they simply indicate an inadequate level of deeper semantic reconstruction.

Another remarkable feature is the absence of loans in the Proto-Lolo-Burmese cultural lexicon. Only for the word 'bean' could I find a doubtful Mon-Khmer etymology. In some other cases such as 'tiger', there are also Mon-Khmer comparisons but they clearly belong to an earlier period, perhaps Proto-Sino-Tibetan (Peiros in press). Some words of the cultural lexicon in Appendix I reveal

connections with Kadai languages, but still there is no reliable chronology or clear understanding of these connections. Therefore at present I assume that the Proto-Lolo-Burmese population at the earliest stages of its development had no intensive contact with other languages or language groups and that the Lolo-Burmese homeland was somehow isolated from habitats of other language groups. Contacts with Chinese, Kadai and Mon-Khmer languages started relatively late.

If this interpretation of the linguistic data is correct, I can propose that 3800 –3600 years ago a highly developed culture flourished in Yunnan, probably in its central part. By origin this culture was connected Southeast not with Asia but with sub-Himalayan cultures from where its main features were inherited. Its sister-cultures were perhaps represented in some regions of Sichuan. I do not assume, however, that the Proto-Lolo-Burmese speakers were the one and only group in Yunnan which was acquainted with metals and other cultural achievements outlined above, but I am quite sure that the origin of the Bronze Age in the area is at least partially connected with the Sino-Tibetan or more precisely with the Lolo-Burmese population.

A very complicated theoretical problem arose from this hypothesis: how can we connect this linguistic reconstruction with archaeological data? My personal attitude now is quite negative, and I do not think that the current level of linguistic and archaeological knowledge allows such connections. I cannot discuss the archaeological data in detail, but this linguistic reconstruction does not reveal any specific features which could be directly connected with one particular archaeological culture of the region. We can only speak about the general level of cultural development represented in the proto-language and compare it with the level of material culture found in local archaeological cultures. The best available result would be a list of local cultures (Dian, and perhaps some others) which share the same level of culture (specific set of metals, crops, domestic animals, etc.) and which are also represented in the Proto-Lolo-Burmese reconstruction. The next step in the process of such an identification requires other procedures and theories.

Appendix

Proto-Lolo-Burmese Cultural Lexicon

I. Cultural vegetation

1. rice

PLB **chan* Burmese *chan* Akha *cä^l*, Naxi *tshwa³³*

A ST etymology is known: **ʒhān* 'grain', 'rice, food' (P&S IV:140)

In some Lolo-Burmese languages one can find recent loans from Mon-Khmer languages (cf. Proto Viet-Muong *-*gaw?*) Akha *xɔ*, Bisu *kɔ*, etc.

2. millet

PLB **chap(x)*: Burmese *chap*; Nosu *chi⁵⁵ n̄o³³*

A ST etymology: **čVp* 'a k. of millet, flour'. The meaning 'millet' is reconstructed for the Proto-Lolo-Burmese and Chinese only (P&S IV: 57).

3. crop without precise meaning:

a) PLB **pronx* 'sorghum': Burmese *praun*; Nosu *km̄²¹ bu³³*.

A ST etymology: **phrum* 'grain' (P&S I: 86)

b) Burmese *kauk* 'rice'

A ST etymology **kōk* 'grain' (P&S V: 60).

c) Burmese *lu*: 'millet'

A ST etymology: **lūH* 'rice, grain' (P&S III: 43)

4. bean

PLB **hn[o]k*: Burmese *nauk*, Nusu *nu²⁵³*, Akha *ni²*, Naxi *nu³¹*

A ST etymology: **n[i]k^w* 'bean' (P&S II: 36)

Burmese *paj*: 'bean'

A ST etymology: **bhiaj* 'bean' (P&S I: 10)

5. root-crops

a) PLB **phlimx* 'arum (?)': Burmese *pin*; Bisu *plum³*

The root is not represented in Naxi (the form *le³³by³¹* is unrelated) and has no Sino-Tibetan or Tibeto-Burman etymology; so it is not clear to what stratum it belongs, but possibly not the Proto Lolo-Burmese.

b) In some Lolo languages there are forms going back to **C-muNx* (Nusu *mie⁵⁵*, Akha *maN³*, etc.), but there is not enough evidence to attribute the word to the

proto-language level. Of some interest is Khmer *maəm* 'tuber' without any Mon-Khmer etymology.

6. banana

PLB **C-ŋ(h)ak*: Burmese *hŋak*, Akha *ŋa²*
A ST etymology: **ŋak* 'banana' (P&S V: 137).

7. sesame

PLB **C-nhamx*: Burmese *hnamɿ*, Akha *nm³*, Naxi *nä⁵⁵*
A ST etymology **nam* 'sesame' (P&S II: 22)

8. plough

In some languages, including Burmese, one can find the root **thaj* 'to plough' which doesn't belong to the Proto-Lolo-Burmese level. Shafer (pp.45,181) gave it a Sino-Tibetan etymology (Midzu *thai*, etc), not supported, however, by better attested languages. The root is probably also represented in Common Tai **r-taj^A* 'to plough' (Li 1979, 120), borrowed to individual Lolo-Burmese languages.

9. field

There is no good Proto-Lolo-Burmese word for 'field'. The root **rja* (Burmese *ja*, Bisu *hja*, etc) 'field' can not be traced back to Proto-Lolo-Burmese as it is not represented in Naxi nor in other Sino-Tibetan or Tibeto-Burman languages. In this connection one can mention the Common Tai root **raj^B* with the same meaning (Li 1979, 142). The origin of these forms in the Lolo-Burmese languages is perhaps similar to that of 'plough' (above)

II. Domestic animals

10. dog

PLB **khujx*: Burmese *khweiɿ*, Nusu *khui⁵⁵*, Akha *ki³*, Naxi *khɿ⁵⁵*
A ST etymology: **qh^wij / *qh^wij* 'dog' (P&S V: 169)

11. pig

PLB **wak*: Burmese *wak*, Nusu *va²⁵³*, Akha *a³za²³*, Naxi *bu³¹*.
A ST etymology: **wak* 'pig' (P&S I: 121)

12. horse

PLB **mrVŋx*: Burmese *mraŋɿ*, Nusu *mri³¹ la⁵⁵*, Akha *maN³*, Naxi *zua³³*
A ST etymology: **mrāH / *mrāŋ* 'horse' (P&S I: 35)

13. goat

PLB **chit*: Burmese *chit*, Nusu *tšər²⁵⁵*, Akha *ci²³*, Naxi *tshi⁵⁵*
A ST etymology is absent.

14. chicken

PLB **k-rakx*: Burmese *krak*, Nusu *ra*²³¹, Nosu *ya*³³, Naxi *a*¹¹

Benedict (1972, p. 102) gives possible Tibeto-Burman parallels including Lushai *va-rak* 'duck' which shows that the meaning 'chicken' could be not of Tibeto-Burman, but of Proto-Lolo-Burmese origin.

15. sheep

Burmese *sui*: 'sheep' can be compared with PST **lo (-k)* 'sheep', but the phonological correspondences are not regular.

16. bovine

The reconstruction of these terms is rather complicated. In some modern languages 3 types of bovines are usually distinguished;

'cattle' – 'common yellow cattle' – 'water buffalo'

But any correlations between these meanings and particular forms of Proto-Lolo-Burmese are absent:

a) PLB **k-luajx*: Burmese *kjwaj*: 'buffalo', Nosu *li*³³ 'cattle'

The root has a ST etymology: **loj* 'buffalo' (P&S III: 32). Chuang-Tai **ɣwaj*^A 'buffalo' and Kam-Sui **gwVj*^A 'buffalo' have possibly been borrowed from Proto-LB.

b) PLB **nwax*: Burmese *nua* 'ox', 'cattle', Nosu *nɔ*³³ 'water buffalo', Lahu *nv*³ 'yellow cattle', Naxi *na*³¹ 'id.'

A ST etymology: **nur* 'cattle' (P&S II: 46-47).

III. METALS**17 iron**

PLB **šam*: Burmese *sam*, Nusu *ca*³⁵, Akha *šm*¹, Naxi *šu*³¹

Benedict (1972 n.228) compares this word with forms in Nung and Jiarung. In both cases Lolo-Burmese influence is probable, so I am not sure that the word was represented at stages earlier than Proto-Lolo-Burmese.

18. copper, brass or bronze

PLB **krijx*: Burmese *kre*:, Nusu *gr*⁵⁵, Akha *gi*³

Naxi *ngæ*¹¹ 'sword' was possibly borrowed from Tibetan.

A ST etymology: **Kri[i]j* 'brass' copper (P&S V: 123). The meaning is not quite clear as in languages the distinction between copper, brass and bronze does not always exist.

An interesting parallel could be found in Proto-Austronesian **kris* 'knife' but Sino-Tibetan and Austronesian contacts were much earlier (Peiros in press).

19. silver

a) Burmese *ɲwɨj* ‘silver’ has good ST etymology: **ɲəʔ* ‘silver’ (P&S V: 142) but the word is not widely attested in other Lolo-Burmese languages; however, cf. Nusu *ɲui*³⁵ *ɑ*⁵⁵. Naxi *ɲv*³¹ is likely to be a Tibetan loan.

b) To designate silver in most Lolo-Burmese languages a root **phlu* ‘white’ is used: Akha *pju*¹ ‘silver, white’, etc, but Burmese *phlu*, Naxi *phər*³¹ ‘white’. It is difficult to say whether the shift from one root (**C-ɲuj*) to another (**phlu*) was connected with a change in attitude to metal, but such a possibility is likely.

20. gold

PLB **s-ruj* (Burmese *hrwe*, Akha *ši*¹, Naxi *ši*³¹) has two meanings: ‘yellow’ and ‘gold’ which are also represented in most Lolo-Burmese languages. Both meanings of the word are also found in Proto ST: **sVr(H)* ‘yellow, bright (metal)’ (P&S IV: 114), so one can assume that the gold was known to Proto-Lolo-Burmese speakers.

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