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**HISTORY THROUGH LOANWORDS:  
THE LOAN CORRESPONDENCES BETWEEN HANI AND CHINESE**

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**Titre français:** l’histoire par les emprunts: les correspondances phonétiques dans le vocabulaire emprunté par le hani au chinois

**Mots-clés:** chinois, hani, tibéto-birman, emprunts, stratification

**Keywords:** Chinese, Hani, Tibeto-Burman, loanwords, stratification

**résumé en français:** on a étudié la stratification des emprunts lexicaux faits par le hani de Dazhai, une langue tibéto-birmane, au chinois. Les principes de l’analyse (principe de cohérence, principe étendu de cohérence) sont exposés dans une partie méthodologique. Deux grandes couches d’emprunts au mandarin du sud-ouest, l’une constituée d’emprunts contemporains au dialecte mandarin de Lüchun, l’autre datant de l’introduction de la pomme de terre et du tabac, sont distinguées. Des emprunts anciens (en nombre limité) sont identifiés, mais seulement une partie des correspondances phonétiques peut être dégagée. Deux termes: “aubergine” et “thé” semblent être des emprunts tibéto-birmans en chinois.

**English abstract:** the stratification of Chinese loanwords into Dazhai Hani, a Tibeto-Burman language, has been studied. The basic principles (principle of coherence; extended principle of coherence) guiding analysis are presented in a methodological section. Two main strata of borrowings from SW Mandarin, a modern layer reflecting the phonology of Lüchun Mandarin, and the other from another, earlier source (contemporary with the introduction of the potato and tobacco), are distinguished. A set of early Chinese borrowings is also identified but the sound correspondences in that layer are incomplete. The words for ‘eggplant’ and

'tea' are shared with Chinese but appear to be Tibeto-Burman loanwords to Chinese rather than the opposite.

## 1. introduction

We have studied the stratification of Chinese loanwords into Hani, with the aim of furthering knowledge of the linguistic and cultural history of the Chinese south-west.

Hani belongs to the southern branch of Yi or Loloish, a group of languages allied with Burmese within the Burmese-Lolo group of Tibeto-Burman languages. For a comparative study of Loloish, see Bradley (1979). Within Yi, Hani is most closely related to Akha (or Yani), spoken in the Xishuangbanna and elsewhere in southwest Yunnan, as well as in Thailand, Laos and Burma. Chinese scholars consider Hani and Akha dialects of the same language. Hani itself is spoken in south Yunnan, primarily in the vast area between the Yuanjiang and Lancang (=Mekong) rivers. The main zone of concentration of the Hani proper is in the Honghe Hani-Yi autonomous prefecture, which adjoins Vietnam and Laos. The Hani are cultivators who construct terraced ricefields on the mountainsides. Short linguistically oriented general introductions to the Hani can be found in Li and Wang (1986, in Chinese) and Lewis and Bai (1996, in English). According to the latter (*ibid.*: 2-3), the ancestors of the Hani practised nomadic dryland farming in the Qinghai-Gansu-Tibetan highlands: after migrating to Sichuan around the 3<sup>rd</sup> century BCE, they moved on to south Yunnan, where they settled down around the beginning of the Common Era. Of course, this account, which reflects traditional stories, in no way suggests that the Hani had already separated themselves from other Yi groups before the move to Yunnan. Still according to Lewis and Bai, the divergence between Hani and Akha took place some 1000 to 800 years ago, when the latter continued migrating toward the south-west, crossing the Lancang River and leaving the Hani behind. However, the dates derived from comparing Akha and Hani genealogies, which diverge about 20 generations ago, suggest a separation date of 400 to 500 years, about half the time suggested by Lewis and Bai<sup>1</sup>. Since the separation, the Hani have undergone influence from SW Mandarin Chinese while the Akha have been subjected to strong influence from Dai (a.k.a. Shan). Consequently whatever influence Chinese may have had on *both* Hani and Akha must be acquired prior to their separation (although parallel influence from Mandarin cannot be discounted completely).

At present almost all Chinese dialects in Yunnan belong to SW Mandarin, which is also spoken in Sichuan as well as in parts of Guizhou and Guangxi. Many Chinese words in Hani are loans from SW Mandarin, as we will show. We do not have a full description of Mandarin as spoken in Lüchun, but some indications can be extracted from Wu et al. (1989), and a sketch of Gejiu 箇 舊 Mandarin, not far from Lüchun, can be found in Yang (1969). SW Mandarin began gaining a foothold in the Chinese south-west during the Ming 明 dynasty (1368 - 1644 CE), through migration from the Yangzi River valley. A major event making this expansion possible was the overthrow of the Dali Kingdom in the 13<sup>th</sup> century by the armies of the Yuan (Mongol) dynasty. The Dali Kingdom and its predecessor the Nanzhao state had ruled Yunnan and adjoining areas since ca. 820 CE. The state language of the Nanzhao state and Dali Kingdom was Bai, a Tibeto-Burman language which has been so

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<sup>1</sup> We are grateful to one anonymous reviewer for this information.

inundated with Chinese loanwords that about half of its *basic* vocabulary (Swadesh-100) is of Chinese origin (Sagart and Lee 1998)<sup>2</sup>.

The linguistic situation in Yunnan before Nanzhao is not well documented, especially regarding Chinese. The initial penetration of the Chinese language into what is now the Chinese south-west occurred in 316 BCE, when the northern Chinese state of Qin annexed the Sichuan region. Sichuan had until then been ruled by Shu 蜀, a non-Chinese state of unknown linguistic affiliation. Sichuan later on served as a basis for further Chinese expansion. By 111 CE Chinese influence had been extended to Yunnan and Guizhou, where new administrative divisions were created. That a form of late archaic Chinese was spoken around Dali in the first centuries CE is evident from the early layer of Chinese loanwords into Bai (Sagart and Lee 1998). The Chinese census of 140 CE shows a notable increase of tax-paying populations in the Yongchang Commandery 永昌郡 (region of present-day Dali), and this may reflect an influx of Chinese speakers around that date. What linguistic characteristics did this early Yunnan Chinese have, and how long was it able to maintain itself? One of the exciting aspects of research on Chinese loanwords into the languages of the region is that it brings new evidence to bear on these questions.

## 2. documentation

We have investigated the dialect of Dazhai 大寨 in Lüchun county 綠春縣, which is the most abundantly documented variety of Hani. Scholars in China regard it as standard Hani. The romanization created in 1957 reflects the phonology of Dazhai Hani. Anonymous (1984) is a small Hani-Chinese lexicon using Hani romanization. Li and Wang (1986) is a general introduction to Hani in Chinese. It includes a description of the phonology, grammar and lexicon of Dazhai Hani. Lexical lists are given for Yani, Haoni and Biyue, treated as dialects of Hani. Yani is identical with Akha. Phonetic transcription is used throughout the book, giving a more precise image of Hani phonology than Hani romanization. In addition, a discussion of Chinese loanwords is given, and a basic distinction between modern and old loanwords is drawn: modern loanwords reflect Chinese voiceless stops as voiceless with lax vowels, while old loanwords reflect them as voiced with lax vowels. Lewis and Bai (1996) is a large Hani-English and English-Hani dictionary in Hani romanization. Corresponding Akha cognates are given in the Hani-English section. It includes a short but useful introduction. Li (1993) is a discussion of loanwords into Hani, mainly from a cultural point of view. Two main sources are identified: Chinese and Dai. Finally, we have made important use of Bradley (1979), a general comparative work on Loloish, with a reconstruction of Proto-Loloish.

Dazhai village and Lüchun city are in direct physical contact: there is no question that the variety of SW Mandarin to which Dazhai Hani speakers are the most directly exposed is that spoken in Lüchun. Unfortunately we do not possess a full description of Lüchun Mandarin, but useful indications (notably on tone contours) can be drawn from Wu et al. (1989). We have also relied on Yang's description of Gejiu 箇舊, the capital town of a nearby district

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<sup>2</sup> This has led some authors to claim that it is a sister language of Chinese within a Sinitic branch of Sino-Tibetan (Benedict), or an archaic Chinese dialect influenced by TB (Starostin). This cannot be, however, as the Bai numerals for '1' and '2' are Tibeto-Burman, while numerals above '2' (as well as literary variants for '1' and '2') are Chinese; moreover inscriptions in the Bai script (basically Chinese with added special characters), made during the past 400-500 years, show evidence of a recent shift from SOV (Tibeto-Burman) to SVO (Chinese) word order. It is possible, however, that when Nanzhao achieved its independence, Chinese speakers in Yunnan shifted in large numbers to Bai, thus augmenting the level of Chinese influence on that language.

(Yang 1969) and on a monograph on Jianshui 建水 Mandarin, spoken north of Gejiu (Zhang 1986).

### 3. progress of research

The extremely simple CV syllable structure of Dazhai Hani is a challenge to the detection of loans among the morass of look-alikes and true cognates. It also makes a study of the stratification difficult, since when Chinese syllables are borrowed, many features of the rhyme are typically left out. This fact put our methodology to a severe test.

In a first step, we searched Anonymous (1984), Li and Wang (1986), Li (1993) and Lewis and Bai (1996) for Hani words resembling Chinese. A list of loan candidates was compiled based on perceived resemblances in sound and meaning. In compiling the list, we used the transcription in Li and Wang (1986), with two minor changes for reasons of typographical convenience<sup>3</sup>. It was immediately clear to us that the list we had compiled contained, in unknown proportions: (a) look-alikes, (b) words inherited from Proto-Loloish, (c) genuine Chinese loanwords into Hani, and (d) blends—words which are inherited Tibeto-Burman words in Hani, but whose form has been influenced by a Chinese form—; we understood that category (b) itself included both true Chinese-TB cognate words, as well as words borrowed in either direction *before* the break-up of Loloish. Our hope was to be able to separate these components in a principled way, and as far as would be possible.

In a second step we compared Dazhai Hani with Bradley's reconstructed Proto-Loloish and gained some understanding of the patterns of correspondence between them (see section 4.1.3). Once this was done, we proceeded to eliminate from our list those words which fitted Bradley's reconstruction. At the same time, perusal of the dictionary of Lewis and Bai (1996) indicated that some of our loan candidates must be look-alikes. We got rid of those too.

Finally (a logical 'finally', because all the steps overlapped in time), we analyzed the remaining forms for sound correspondences with SW Mandarin and Middle Chinese (ca. 600 CE). As the patterns of loan correspondences became clearer, we added words which had until then eluded us: and we rejected more which did not fit.

## 4. things you will need to know

Before we start on our exploration of Chinese loanwords into Hani, a few facts about Hani and Chinese phonology should be presented, especially regarding the evolution of features involving laryngeal function: voicing, aspiration, voice quality, and tone: these form the basic framework of our comparisons.

### 4.1 about Hani

#### 4.1.1 Hani initial voicing/aspiration and the tense/lax contrast

Like Proto-Loloish, most varieties of Hani, including Dazhai, contrast voiced and voiceless stops and affricates. There is among voiceless stops and affricates a subphonemic distinction between aspirated and unaspirated variants, conditioned by phonemic vowel tenseness. While

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<sup>3</sup> We used 'ɲ' for the palatal nasal in Li and Wang and 'i' for their apical vowel.

both tense and lax vowels occur with voiced initials, aspirated initials occur only with lax vowels, and voiceless unaspirates only with tense vowels. The resulting pattern is shown below:

	p t k	ph th kh	b d g
Lax vowels		+	+
Tense vowels	+		+

*Table 1: voicing, aspiration and tense voice in Hani inherited words*

SW Mandarin vowels are perceived, and treated, as lax vowels by Hani speakers: as a result, until fairly recently, Chinese words beginning in voiceless unaspirates could not be directly integrated into the Hani sound system. In order to import them into their own language, Hani speakers had to change their initials to the corresponding voiced segments: thus Hani ba<sub>33</sub> dʒ<sub>55</sub> ‘wooden stool’ reflects Chinese 板凳, a word with initials p-, t- in SW Mandarin. Many more examples will be presented below. Only in the most recent layer of modern Chinese loanwords is this pattern abandoned: in a major concession to Chinese speech habits, Hani speakers now allow combinations of voiceless unaspirated stops plus lax vowels in the borrowed vocabulary, e.g. te<sub>24</sub> pi<sub>033</sub> ‘representative’, a modern political term. This change of behaviour is an important observation of Li and Wang (1986:36sq). Hani romanization makes full usage of the situation of complementary distribution between voiceless aspirates and unaspirates with respect to tenseness: as a result, it cannot express a contrast like da vs. ta. Thus in Hani lexica using Hani romanization, this very recent realignment of Hani on Chinese phonotactics is invisible: for instance the word te<sub>24</sub> pi<sub>033</sub> ‘representative’ is romanized as ‘deifbiao’, with voiced initials. It is only through works using phonetic transcription (such as Li and Wang 1986, Li 1993) that this important change can be apprehended.

#### 4.1.2 Cooccurrence of tones, initials and voice qualities

Indigenous tones are H = 55, M = 33, L = 31. In addition there is a rising tone 24, which occurs only in modern Chinese loans.

	p t k	ph th kh	b d g
H-tense			
H-Lax	(modern loans)	+	+
M-tense	+		+
M-lax	(modern loans)	+	+
L-tense	+		+
L-lax	(modern loans)	+	+

*Table 2: synchronic distribution of tones, voice qualities and initial types in the Hani inherited vocabulary.*

One notes the absence of forms having the high tone and tense vowels. This is because inherited words in Hani with tense vowels come from the two proto-Loloish checked tones, \*L(ow) and \*H(igh), which emerge in Hani as \*H > 33 and \*L > 31 (see below). There is no source in Proto-Loloish for combinations of tense vowels and tone 55.

#### 4.1.3 Hani as a Loloish language

Tonal correspondences with proto-Loloish (Bradley 1979:275) are:

P-Loloish		Hani tone and vowel quality
tones	<i>syllable endings</i>	
<b>1</b>	<i>sonorants</i>	55-lax
<b>2</b>		31-lax
<b>3</b>		33-lax
<b>H</b>	<i>stops</i>	33-tense
<b>L</b>		31-tense

Table 3: correspondence of Proto-Loloish and Hani tones

The development of initial stop manners in Dazhai agrees with Akha as described in Bradley (1979:130). By and large, the evolution for Dazhai Hani is as follows:

Proto-Loloish	<b>lax vowels</b>	<b>tense vowels</b>
<b>initial voiced stops</b>	voiced stops	voiced stops
<b>initial voiceless stops</b>	voiceless unaspirated+tense vowel	voiceless aspirated+lax vowel

Table 4: correspondence of proto-Loloish (bold type) and Hani (plain type) stops

In general, Proto-Loloish voiced obstruents (stops, affricates, fricatives) remain voiced in Hani<sup>4</sup>. Change of voiceless stops to voiceless aspirated is seen in most Loloish languages. In Dazhai Hani, a lax vowel is necessary for the change to occur; a tense vowel impedes it. There lies the reason for the basic complementary distribution of aspirated/lax vs. unaspirated/tense in modern Hani.

## 4.2 about Chinese

Two periods are relevant to this investigation: an early period, covering part of the first millennium CE; and a recent period, roughly between the 16<sup>th</sup> century and the present. The donor to Hani (in fact to Akha-Hani) in the early period was an unrecorded variety of Chinese, perhaps the same language that gave Bai its early borrowings. ‘Early Middle Chinese’ (EMC) is the phonological system embodied in the rhyme dictionary *Qie Yun* (late 6<sup>th</sup> century). It represents a style of pronunciation which was standard in the northern capital, Luoyang, in the 4<sup>th</sup> century CE, and which continued prevailing as a literary pronunciation among educated circles in the south until the beginning of the 7<sup>th</sup>. It is characterized by a system of three tones plus one: in the Chinese tradition, these ‘four tones’ are called *ping*, *shang*, *qu* and *ru*. The first three contrasted on syllables ending in sonorants (vowels, glides, nasals). The fourth (*ru*) did not contrast with the preceding three: it was in fact not a tone at all. Syllables in the *ru* ‘tone’ were those ending in oral stops (-p, -t, -k). But as Chinese tradition places *ru* on the same level as *ping*, *shang* and *qu*, we continue speaking of a *ru* tone. Old Chinese (second half of 1<sup>st</sup> millennium BCE) was a non-tonal language. The formation of the Chinese tones was explained by Haudricourt (1954ab) and Mei (1970). For a recent summary see Sagart (1999b). In a nutshell, the *shang* tone finds its origin in words ending in a glottal stop, the *qu* tone finds its origin in words with suffixed -s, evolving to -h, then to creak. The *ping* tone comes from words ending in sonorants. In our early period, while pitch variation was undoubtedly an important component of tonal contrasts, *shang* and *qu* may still have possessed these original glottal characteristics: a final glottal stop in *shang* and either

<sup>4</sup> The only exception is that voiced stops preceded by one of the prefixes b-, d-, g-, r-, l- (symbolized as ‘C’ in Bradley’s book) become voiceless in Hani: PL C-guk<sub>L</sub> ‘bark’, Hani xQ<sub>31</sub> ‘peel; outer layer of grain’.



breath or creak in *qu*. Thus in early Chinese loans to Bai, *qu* words are reflected by a tense vowel (Sagart and Lee 1998). There was a threefold contrast of voiceless unaspirated, voiceless aspirated and voiced among stops and affricates, and no incompatibility between any of the tones and any of the initial types.

In the Tang period (early 7<sup>th</sup> to 10<sup>th</sup> century), following the establishment of the capital in Xi'an in north-western China, Early Middle Chinese gave way to a new style of pronunciation, Late Middle Chinese (LMC), which had evolved there, also out of the 4<sup>th</sup> century Luoyang standard. Late Middle Chinese was characterized by tone splits: each tone had been split into two, this resulting in eight tones, forming two series: a high tone series after voiceless initials, and a low tone series after voiced initials. Among voiced initials, the obstruents were in the process of devoicing, and the low tone series was characterized by breathiness. Lower *shang* words with voiced obstruent initials soon merged with Lower *qu*, and the remaining part of lower *shang* (words with sonorants initials) merged back with upper *shang*. The fate of lower *shang* words forms an important part of Chinese dialectological lore to this day.

Mandarin evolved in north-eastern China, gradually after the fall of the Tang dynasty (10th century CE), apparently out of north-eastern offshoots of LMC. In a typical Mandarin dialect, devoicing is completed: the old voiced initials have changed to aspirated stops in tone *ping* and to unaspirated stops in other tones. There remains only a contrast of voiceless unaspirated vs. voiceless aspirated stops syllable-initially. Among nasal endings, *-m* has merged into *-n*. Final stops have weakened and merged into a glottal stop, or, more often, have disappeared entirely. The seven tones of LMC have been reduced to five, or four, through the merger of upper and lower variants of *qu* and *ru*, respectively; in addition, *ru* as a tone category seldom survives the loss of its final glottal stop, and merges with one (or several) of the other tones. Mandarin dialects can be classified according to their treatment of *ru*-tone words. SW Mandarin dialects often merge tone *ru* with lower *ping*. In Table 5, tones are numbered from '1' to '4', as in Modern Standard Chinese, a Mandarin dialect:

	<b>ping</b>	<b>shang</b>	<b>qu</b>	<b>ru</b>
<b>p</b>	p-1	p-3	p-4	p-???
<b>ph</b>	ph-1	ph-3	ph-4	ph-???
<b>b</b>	ph-2	p-4	p-4	p-???
<b>m</b>	m-2	m-3	m-4	m-???

Table 5: a typical Mandarin dialect

## 5. the loans and their stratification

### 5.1 method

When loans are numerous enough, they form identifiable patterns of correspondence with the donor Chinese dialect: we call these loan correspondences. Each period has its signature which can be stated as a set of loan correspondences. The methodology for treating stratified lexicons was developed by Chinese dialectologists (see Norman's ground-breaking 1979

study for Min) who faced the problem of explaining the coexistence in one dialect of forms apparently relating to different periods in the history of Chinese. Variant treatments for a given initial, final, tone, of Middle Chinese, if they are recurrent, indicate different chronological layers of borrowings. Loanwords from Chinese in a non-Chinese language are in effect like loanwords from standard Chinese in a Chinese dialect: their stratification can be worked out like one would work out the stratification of the lexicon of a Chinese dialect, by comparison with the categories of Early Middle Chinese (the *Qie Yun* system). In working out loan correspondences, one relies on the Principle of Coherence:

- *the initial, rhyme and tone correspondences on a borrowed syllabic morpheme obey the same set of correspondences.*

This principle follows from the fact that all the components of a borrowed monosyllable were borrowed simultaneously (obviously!). From this it follows that when two distinct forms in the recipient language (a ‘doublet’) correspond to one Chinese morpheme, this is normally attributable to borrowings effected at different times. The features which differ between the two members of the doublet may then be taken as characteristic of two different layers of borrowings. It is preferable to have two pairs of doublets exemplifying the same pattern of variation.

As an illustration, Chinese 保 ‘protect’ has two distinct corresponding forms in Hani: pɔ<sub>33</sub> (in pɔ<sub>33</sub> tse<sub>24</sub> ‘guarantee’) and bo<sub>31</sub> ‘protect’. The same goes for 高 ‘high’, Hani kɔ<sub>55</sub> (in thi<sub>31</sub> kɔ<sub>55</sub> ‘elevate’) and go<sub>31</sub> ‘high’. This indicates that we are in the presence of two layers, of which one treats EMC p- and k- as voiceless stops, tones *ping* and *shang* as 55 and 33 respectively, and EMC -aw as -ɔ, while the other gives voiced stops for p- and k-, 33 and 31 for *ping* and *shang*, and -o for -aw.

The principle of coherence can be extended to di- or polysyllables when the disyllable is semantically non-compositional (i.e., its meaning is not deductible from the meaning of its parts): in such cases the disyllable was certainly borrowed as one word. Examples mixing Chinese loans of different periods probably exist but they are rare. The vast majority of disyllabic forms listed in lexical lists are noncompositional, i.e., they are true words. From this an Extended Principle of Coherence follows:

- *the initial, rhyme and tone correspondences on all syllables of one borrowed polysyllabic morpheme obey the same set of correspondences, provided the morpheme is semantically noncompositional.*

While doublets are a useful tool for probing the *vertical* dimension of stratified borrowing, disyllables are an extremely powerful tool for discovering the *horizontal* characteristics of each layer: with each disyllabic morpheme you get two co-stratal (if we may risk this neologism) tones, initials, rhymes. Thanks to the extended principle of coherence we may expand our understanding of the layer which treats 保 and 高 as pɔ<sub>33</sub> and kɔ<sub>55</sub> by observing that it also treats 提 as thi<sub>31</sub> and 證 as tse<sub>24</sub>.

An added bonus is that disyllables reduce the risk of chance resemblances to a minimum, and—in a Sino-Tibetan context—practically eliminate the risk of mistaking genetic cognates for loanwords. Even more useful are disyllables forming doublets! These allow you to probe in both directions: for instance the Chinese word 政府 ‘government’ was borrowed twice by Hani, once as tse<sub>24</sub> fu<sub>33</sub>, and another time as tɕɣ<sub>55</sub> phu<sub>55</sub>. From this we may infer the existence

of two distinct chronological layers, with different treatments for different initials, finals and tones.

For all these nice things, however, disyllables have a serious shortcoming: they form a very minor part of the loanwords issued by Chinese before the Mandarin period. At such periods doublets are the preferred tool. When loanwords become scarce, doublets are even rarer, and the method outlined here reaches its limits. In some cases it is still possible to expand one's understanding of the phonological characteristics of an early layer, by looking for sets of words sharing recurrent correspondences to various Chinese sound categories.

Once each layer has been identified and as much as possible of its characteristic loan correspondences discovered, there remains to establish the relative chronology of layers. This is often a matter of common sense. It can be effected by reference to the phonology of the donor language: a loan layer which reflects a distinction between EMC voiced and voiceless initials is probably earlier than a layer which doesn't. The *absolute* chronology can sometimes be deduced from the words within the layer. Thus a layer of borrowings which contains the name of a Western Hemisphere plant (potato, tomato, tobacco, maize, chilli...) cannot be earlier than the 16<sup>th</sup> century. Naturally, even though we are professional linguists and not cultural historians, we do *not* have to choose between cultural arguments and phonological arguments. We are happy to use whatever we can lay our hands on.

Finally, a last principle: in a situation of stratified borrowing, only the lowest layer *can possibly* be genetic, all the layers above it *must* be the result of contact.

## 5.2 identifying the layers

In identifying the layers of Chinese borrowings into Hani, we work our way from the top (the most recent borrowings) to the bottom (the most ancient). Each time we have identified a layer, we 'remove' it and go on.

## 5.3 the modern layers

### 5.3.1 layer M2b

We start by delineating a set of words which anybody familiar with the political events in China in the sixties and seventies will recognize at once: words like 'great leap, revolution, masses, comrade, mobilize, movement, criticize, cadre, attitude, policy, politics, investigate, correct, liberate' etc. There is an abundant supply of such forms in Li and Wang (1986, esp. 186sq). All are disyllabic and it is a very simple task to work out the overall pattern of correspondences for initial types and tones, though not for every detail of every rhyme correspondence. For reasons which will become obvious in a moment, we call this layer M2b. A sample is given below:

advanced	ɕe tsi	55 24	先進
attitude	the tu	31 24	態度
awareness	tɕo u	31 24	覺悟
brave	jo ka	33 33	勇敢

bright	<b>kua mi</b>	<b>55 31</b>	光明
cadre	<b>ka pu</b>	<b>31 24</b>	幹部
chairman	<b>tsu çi</b>	<b>33 31</b>	主席

Table 6. A sample of disyllables in layer M2b

The words in Table 6 exhibit very direct sound correspondences with SW Mandarin as spoken in Lüchun. The tone correspondences are:

	Lüchun	Hani
T1	55	55
T2 (incl. <i>ru</i> )	31	31
T3	33	33
T4	213	24

Table 7: tone correspondences for M2b.

The correspondences for initial consonant types are also very straightforward: the Mandarin voiceless unaspirated and aspirated stops are reflected by Hani voiceless unaspirated and aspirated stops, respectively. The voiced stops of Hani do not occur in these loanwords. The main differences lie in the rhyme system: SW Mandarin (Gejiu) has diphthongs and nasal vowels, Hani has fewer diphthongs and no nasalization. To this extent, these forms look like Chinese words pronounced by Hani bilinguals who however have difficulties with diphthongs and nasality. The following points are of interest:

- tone 24 (*qu*) does not occur in inherited Hani words, only in Chinese loanwords of this layer and the immediately preceding layer, as shown below.
- all vowels are lax (except for two cases in sandhi, see below).
- the combination of voiceless unaspirated stops and lax vowels violates inherited Hani phonotactics. This combination only occurs in Chinese loans of this layer.
- a disyllable where one would expect 24 + 24, or 24 + 55 usually occurs with the first syllable in tone 31: An example in Table 6 is ‘cadre’. We interpret this as an instance of tone sandhi in the donor language.

In our data, these words belong to layer M2b: active; advanced; aeroplane; attitude; awareness; bad points; bell; box; brave; bright; cadre; cannon; chairman; Chinese cabbage; commune; comrade; construct; cooperate; correct; country; county head; criticize; cup; deer’s pilose antler (medicinal); democracy; develop; dish; economize; economy; education; electric light; enemy; equality; experience; factory; farmer; film; flashlight; freedom; glorious; good points; government; graduate; great; great leap; guarantee; head of commune; help one another; increase; industry; inspect; invade; investigate; labour; leader; liberate; lose; machine; masses; minister; mobilize; movement; newspaper; opinion; oppose; ordinal marker; pen; pencil; people; plan; policy; politics; praise; prime minister; propagandize; protect; report; representative; results; revolution; secretary; shop; skill; soap; soldier; solution; song; steel; struggle; telephone; television; tractor; unite; visit; vote; wages; wheat; whip; window; work point; worker.

Although they do not exhibit the tell-tale voiceless stops, we cannot doubt that the following are also post-1949 loans: exemplary; backward; support; hold a meeting; victory; discuss; member of commune; mistake; task; culture; chemical fertilizer; woman.

This vocabulary is political, technical (plane, tractor, factory, electric light, flashlight, telephone, etc), educational (graduate, pencil, pen), cultural (newspaper, film, television) commercial (shop), military (cannon). Of special interest is ‘wheat’, discussed by Li Yongsui (Li 1993: 692). Li argues that not only wheat itself but the whole wheat complex, including wheat noodles, did not penetrate into Hani culture until after 1949. The Hani term for ‘wheat noodles’: mje<sub>24</sub> thjɔ<sub>31</sub>, conforms to the M2 correspondences<sup>5</sup>. Based on the meanings listed above, one supposes M2b is very recent, typically post-1949.

### 5.3.2 layer M2a

We next encounter a limited set of words which exhibit the same tone correspondences as M2b without however allowing combinations of voiceless unaspirated initials and lax vowels. In these words, Chinese voiceless unaspirated stops are interpreted as Hani voiced stops, which can then lawfully combine with lax vowels:

barley	<b>da me</b>	<b>24 31</b>	大麥
capability	<b>be si</b>	<b>33 24</b>	本事
capital letters	<b>da ɕi</b>	<b>24 33</b>	大寫
delay	<b>da go</b>	<b>55 31</b>	耽擱
hand hay cutter	<b>dza dɔ</b>	<b>31 55</b>	鋤刀
word	<b>da tshi</b>	<b>55 31</b>	單詞

*Table 8. disyllables borrowed from Chinese in the M2a layer.*

We call this layer M2a because, except for the correspondence of Chinese voiceless stops, the correspondences are the same as for M2b. Note that ‘capability’ 本事 has a doublet be<sub>33</sub> si<sub>31</sub> where the second syllable seems to be in a kind of ‘light’, or destressed, tone of the kind of the Standard Mandarin ‘light tone’ or *qingsheng*.

By our definition M2a shows the same tone correspondences as M2b: the news here is that the lexicon is definitely not of the same type as M2b. Nothing characteristically modern, industrial, etc. Barley has been introduced; hand hay cutters are being used. There is a suggestion of schooling in Chinese (‘word’). The term ‘capital letters’ may refer to a complex form of numerals in the Chinese script, which can be seen on Chinese banknotes, and is designed to prevent fraud. Our interpretation is that in M2a Dazhai Hani has borrowed from the same SW Mandarin donor as M2b, but there has been less exposure, and probably less bilingualism too. The time period cannot be determined precisely, but it is certainly earlier than the previous layer, and also quite short: at a guess, pre-49 republican.

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<sup>5</sup> Bradley (1997) argues that there are good Yi group cognate forms for ‘wheat’ and ‘barley’. The absence of these terms from Hani may be due to their specialization as rice growers.

Although small, this layer is important in that it lets us see that the process of relaxing inherited Hani phonotactics to accommodate Chinese loanwords probably occurred under societal rather than linguistic conditions (i.e. there were apparently no major changes in the donor or receiving languages themselves between M2a and M2b).

### 5.3.3 layer M1

Having clarified the situation in the most recent layers of borrowings, we now wish to probe deeper in time and identify whatever layers exist ‘below’. To this end we make use of doublets. One of our M2a words: ‘capability’ 本事 *be<sub>33</sub> si<sub>24</sub>*, has a doublet *be<sub>31</sub> si<sub>55</sub>*, suggesting the existence of a layer where Mandarin tone 3 is treated as 31 and tone 4 as 55. We find these characteristics in a fair number of disyllables: in them, the Mandarin tone 2 is treated as 31 as in M2; the Mandarin tone 1 is 55 word-initially (‘cooking ladle’, ‘discuss’, ‘elder brother’, ‘aunt’) but 33 word-finally (‘everybody’, ‘elder brother’, ‘aunt’<sup>6</sup>). We suppose this is the result of sandhi. In addition a ‘light’ tone T0 with contour 55 must be supposed in the second syllable of ‘government’ and ‘discuss’, Standard Mandarin *zheng<sub>4</sub>fu<sub>0</sub>* and *shang<sub>1</sub> liang<sub>0</sub>*.

a few	go ba	55 31	個 把
abacus	so phe	55 31	算 盤
aunt (FaYS)	a ja	55 33	阿 孃
bandits	da dze	31 55	打 劫
broad bean	tsha du	31 55	蠶 豆
capability	be si	31 55	本 事
Chinese cabbage	pe tsha	31 55	白 菜
cooking ladle	go tsha	55 31	鍋 鏟
copper-covered end of a musket	tho pha	31 55	銅 炮
courage, guts	da dzi	31 33	膽 子
discuss	sa lia	55 55	商 量
do accounts	so dza	55 55	算 賬
elder brother	a go	55 33	阿 哥
everybody	da dza	55 33	大 家
gamble	du tshe	31 31	賭 錢

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<sup>6</sup> In Jianshui SW Mandarin (Zhang 1986:114) ‘father’s younger sister’ is 回回●? *a<sub>44</sub> niã<sub>44</sub>*, and ●? is in tone 1, apparently through analogy.

get together	da xo	31 31	打仗
government	dʒɤ phu	55 55	政府
horse's girth	du de	55 55	肚帶
main road	da lu	55 55	路大
malaria	dza tɕhi	55 55	瘴氣
potato	ja ju	31 55	洋芋
tea	tsha yi la pe	31 55 31 33	茶葉

Table 9. Disyllabic borrowings in layer M1

This layer, which we call M1, is clearly Mandarin: it aspirates the old voiced stops in tone *ping* ('abacus', 'broad bean', 'copper-covered end of musket', 'money'), but not in the other tones ('horse's girth', 'broad bean', 'everybody', 'main road', 'Chinese cabbage'). In general it treats the Mandarin voiceless stops as voiced stops, like M2a, but one glaring exception is 'Chinese cabbage', with initial p- in 白 for Mandarin p-. However, notice that this syllable also has an unexpected tense vowel. An unaspirated voiceless stop *has* to be followed vowel tenseness in Hani, and this form therefore does not indicate a concession to Chinese phonotactics. As to what might have caused tenseness in this syllable, we speculate that this is a loan made at a time when the SW Mandarin *ru* tone still had a final glottal stop, or traces of glottal constriction.

Another form argues that Hani at some point was in contact with a form of Mandarin having a *ru* glottal stop or glottal constriction: 'blood', Hani sɿ<sub>31</sub> is irregular as a reflex of Proto-Loloish swe<sub>2</sub> 'blood': there should not be a tense vowel because there is no final stop in Proto-Loloish. The regular, lax-vowel reflex is found in Akha ɕi<sub>31</sub>. On the other hand, Hani sɿ<sub>31</sub> is regular as a reflex of the SW Mandarin word for 'blood' (Jianshui 血 ɕi<sub>tone 2</sub>) if it was borrowed at a time when *ru* still had glottalization of some sort<sup>7</sup>.

The treatment of *ru* in M1 cannot, however, be given a unique solution, because the evidence is too scarce, and conflicting. Two disyllables: 'bandits' and '(tea) leaves' treat *ru* as 55. M1 may have been a fairly long period during which *ru* in the Chinese donor was changing. Additionally, there may have been more than one SW Mandarin donor.

We can expand the M1 pattern to a few monosyllables. Hani tɕhi<sub>55</sub> 'angry' is homophonous with one of the syllables in 'malaria' and therefore probably corresponds to 氣 in M1; the vowel in 'crime' dzø<sub>55</sub> corresponds to that of 罪 (Standard Mandarin -ui) in several M2 words, but the tone indicates that it must be M1; Hani go<sub>55</sub> 'experiential aspect suffix' clearly represents Chinese 過: it must be M1 on account of its tone 55 corresponding to Chinese *qu*, and of its segmentals which are the same as those of 鍋 in go<sub>55</sub> tsha<sub>31</sub> 鍋鏟 'cooking ladle', a homophone in Chinese, and a secure M1 word. Hani ju<sub>55</sub> 'green' must be the M1 equivalent

<sup>7</sup> Naturally the similarity between the TB and Chinese forms probably played a role in the borrowing of this form. One thinks of a situation like that of French *haut* 'high', from Lat. *altus*, where initial *h-* is due to contamination from a similar-sounding Frankish word. On 'blood' in Chinese and TB, see Sagart (1999a).

of Chinese 綠: it shows a Mandarin rhyme with palatal medial; initial j- for Mandarin lj- has a parallel in an M2 word: tsi<sub>55</sub> ɲo<sub>31</sub> ‘invade’, cf. 侵略. ‘Saddle’, Hani mo<sub>31</sub> ɣa<sub>33</sub>, consists of the Hani word for ‘horse’ (1<sup>st</sup> syll.) and a Chinese borrowing for ‘saddle’ 鞍 (tone 1 in Chinese): its initial has a parallel in M2: ‘project’ 方案, Hani fa<sub>55</sub> ɣa<sub>24</sub>. We suspect ‘saddle’ has tense voice because it had a glottal stop initial in the Chinese donor. Generally Hani 33 corresponding to Mandarin T1 indicates layer M1:

cigarettes	ja xø	33 31	煙	yan <sub>1</sub>
collect	sɣ	33	收	shou <sub>1</sub>
cow-pea	bɛ dza	33 33	豇	jiang <sub>1</sub>
joss stick	ɕa	33	香	xiang <sub>1</sub>
lose, fail	su	33	輸	shu <sub>1</sub>
saddle	mo ɣa	31 33	鞍	an <sub>1</sub>
stupid	xa	33	戇	gang <sub>4</sub>
grain volume measure (“litre”)	sɣ	33	升	sheng <sub>1</sub>

Table 10. Monosyllabic borrowings with T1 treated as Hani 33 in layer M1

The forms in Table 10 show typical Mandarin segmentals.

Other characteristics of M1 initials are of interest.

In M2 and M1, Hani uses its palatal affricates to represent SW Mandarin palatals, which are historically derived from (a) velar obstruents and (b) alveolar affricates and fricatives. Aside from these palatals, although many modern SW Mandarin dialects in Yunnan do retain a contrast between an alveolar and an alveopalatal (sometimes called ‘retroflex’) series, in Dazhai Hani both the M2 and M1 layers clearly reflects a dialect with only one series of sibilants, ts-, tsh-, s-. This basically agrees with the situation of SW Mandarin in southern Yunnan (such as Jianshui, see Zhang 1986). In M1, however, at least one form: ‘government’ 政府 dzɣ<sub>55</sub> phu<sub>55</sub> shows a palatal affricate where one would expect an alveopalatal affricate initial in those varieties of Mandarin which have two series of affricates. Other examples: ‘excrement’ ɕi<sub>31</sub> 屎 EMC syijX, ‘chopsticks’ dzɣ<sub>55</sub> 箸 EMC trjoH, and ‘true’ dzi<sub>55</sub> 真 EMC tsyn, fit the tone correspondences for M1 but attribution to M1 is somewhat uncertain: ‘chopsticks’ is widespread areally, cf. Bradley’s ‘reconstruction’ PL 248 d/gy/j/ɣu<sub>1/3</sub> ‘chopstick’; note also Bai tsu<sub>21</sub> ‘chopsticks’, where the tone indicates a non-recent borrowing. It is possible, nevertheless, that one subset of M1 is a Mandarin dialect with two series of affricates.

M1 has no initial f- but uses ph- in the rare instances where Mandarin f- words are borrowed (‘government’). This feature is still seen occasionally in M2: ‘(bean starch) noodles’ phɣ<sub>33</sub> 粉<sup>⊙</sup>. The Mandarin rhyme –ai usually corresponds to –e in M2. It has two correspondences in

<sup>8</sup> See also the f- ~ph- doublet for ‘airplane’ in Lewis and Bai (1996).



M1: -e ('horse's girth'; 'debt') and -a ('Chinese cabbage'). Here it will be remembered that 'Chinese cabbage' has the particularity of showing a tense vowel (and voiceless initial) with tone 31 for 白 'white': pɛ<sub>31</sub>. Since 'Chinese cabbage' is semantically non-compositional, its two components must be co-stratal. If so, then the reflex -a for Mandarin -ai is co-stratal with tense 31 for *ru* within M1. Consequently, the reflex -e for Mandarin -ai must be co-stratal with lax 55 for *ru*. This will form the basis of a sub-layer distinction within M1, to be discussed shortly.

We next encounter a set of monosyllabic words which show 31 for *yinping*:

dry, as leaves	<b>khu</b>	<b>31</b>	枯	ku <sub>1</sub>
guess	<b>tsha</b>	<b>31</b>	猜	cai <sub>1</sub>
high	<b>go</b>	<b>31</b>	高	gao <sub>1</sub>
increase	<b>dzɤ</b>	<b>31</b>	增	zeng <sub>1</sub>
star	a <b>si</b>	<b>55 31</b>	星	xing <sub>1</sub>

Table 11. M1 words with *yinping* 31

These forms show typical M1 segmentals. 'Guess' shows the same vowel -a as 'Chinese cabbage'; 'increase' has the typical M1 vowel -ɤ for MSC -eng ('government'; 'litre'; 'stool'), against -e in M2b ('correct', 'government', 'electric light', 'victory' etc.); 'high' has vowel -o, like M1 words 'treasure' b<sub>031</sub> 寶 and 'protect' b<sub>031</sub> 保, against -ɔ for 'protect' 保證 in M2b). For this reason we ascribe them to the M1 layer.

The vowel in 'guess' tsha<sub>31</sub> 猜 is the same as tsha<sub>55</sub> 菜 in 'Chinese cabbage' pɛ<sub>31</sub> tsha<sub>55</sub> 白菜. The following features are then cohesive, and characteristic of a sub-layer in M1:

- (a) Mandarin -ai treated as -a ('guess', 'Chinese cabbage')
- (b) Mandarin -ao treated as -o ('high', 'protect', 'treasure')
- (c) tone *ru* 31 glottalized ('Chinese cabbage'; 'blood')
- (d) T1 treated as 31 ('guess', 'high', 'star', 'increase', 'dry')

We create a sub-layer M1a for any M1 word showing at least one of these characteristics. The opposing features definitely characterize a different area within M1:

- (a) Mandarin -ai treated as -e ('horse's girth'; 'debt')
- (b) Mandarin -ao treated as -a ('copper-covered end of musket')
- (c) tone *ru* 55, lax vowel ('bandits', 'tea')
- (d) T1 treated as 55 or 33 (many examples).

We create a sub-layer M1b for any M1 word showing at least one of these characteristics. We label ‘M1’ any M1 word not showing any of these characteristics. Either the difference between M1a and M1b is a chronological one, or it involves a different donor.

The cultural vocabulary tells us something about the period of M1 borrowings. New crops had been introduced from China: the *potato*, *broad bean* (*Vicia faba*) and *cow-pea* (*Vigna faba*). Contact with Chinese probably occurred in the towns where the *shops* were. One went there to buy consumable goods like *tea leaves*, *sesame oil*, *joss sticks* and *tobacco*, utensils like *wooden stools* and *cooking ladles*, and equipment for horses, such as *saddles* and *girths*. But when there were *bandits* on the *road* it sometimes took *guts* to go there. At the shop, one’s *account* was calculated with an *abacus*. There were many dangers in town: one could *lose* one’s money *gambling*, or worse, leaving the altitude at which Hani villages are located, one risked catching *malaria*.

The approximate date of this layer can be deduced from terms for two American plants, the potato and tobacco. The introduction of the potato into SW China is perhaps mid Qing, ca. 1750-1850 at a guess. Tobacco was introduced in China in mid-Ming times from the Philippines. More research is needed to establish the date at which it took hold in south Yunnan.

#### 5.3.4 transition from M1 to M2a

We have identified a number of features which distinguish M1 from M2a-M2b: contour of T1 (33~55 vs. 55); contour of T3 (31 vs. 33); contour of T4 (55 vs. 24); treatment of *ru* (55 or 31 vs 31), *see* Table 20; only T2 is identical: 31. It is interesting and undoubtedly significant that we have no evidence at all for a transition period. The implication is that M1 is a different donor dialect from M2. Hani first borrowed from M1 and then switched its attention, as it were, to M2, that is, to Lüchun Mandarin. In real-life terms, this means that until a fairly recent date the source of Chinese loanwords to Hani was not Lüchun Mandarin, but a more distant dialect. Perhaps Lüchun City grew in importance not too long ago, and from then on became the main source of Chinese loanwords into Hani.

#### 5.4 earlier borrowings

We have come to the end of our supply of disyllables. At the same time, we suppose that earlier layers of borrowed Chinese material exist in Hani, because we still see monosyllables which look like Chinese loanwords but do not fit in any of the layers we have identified so far. The reason why these still undetermined layers include only monosyllables, we assume, is that they were formed during more ancient periods, when disyllables were not numerous.

The changes affecting OC l- and r- in the first centuries CE are useful chronological landmarks. OC l- changed to d- and y- (depending on syllable type) in the 1<sup>st</sup> century CE. The gap left in the system by this change was soon filled by the change of OC r- to l- (the Middle Chinese *lai*<sub>2</sub> initial or 來母). Chinese loanwords to Bai include some cases of OC r- treated as y- but none of OC l- treated as l-, showing that the interaction with Chinese began shortly after the 1<sup>st</sup> century CE, in good agreement with the historical and demographical evidence alluded to in our introduction. In Hani we found no evidence of OC l- being treated as l- (except in words which are widespread in TB and probable ST cognates). One instance of OC r- being treated as an r-type sound in Hani is ‘strength’ 力, Hani ya<sub>31</sub>. However this word is

also found in other Loloish languages and Bradley reconstructs PL 423 ra<sub>2</sub> ‘strength’. This word may be a Chinese borrowing into Proto-Loloish. But the Chinese and Loloish forms can also be cognates. This suggests that Hani-Akha had not yet individualized around the 2<sup>nd</sup> and 3<sup>rd</sup> centuries CE, when OC l- was already d- or y-, and r- was still r-. Early borrowings into Hani-Akha proper cannot be before that date.

We will now discuss the evidence for an early layer of borrowings. We proceed by identifying sets of forms showing consistent reflexes for LOC or MC categories.

#### 5.4.1 MC voiced stops in tone Ping reflected as Hani voiced or unaspirated stops

level road	ga bi	55 55	平	ping <sub>2</sub>
money	dze	31	錢	qian <sub>2</sub>

Table 12: unaspirated Hani reflexes of MC voiced stops in tone Ping.

‘Level’ 平, an OC –ang word, shows a recent-looking high front vowel in Hani. It is not directly related to PL 530 ʔ-bra<sub>2</sub> ‘flat’, as the tone and vowel do not correspond. Mpi also borrowed this Chinese word, as ping<sub>5</sub> (Bradley 1979 #530). Note that tone 5 in Mpi is the regular reflex of the PL tone 1, as is the high tone of Hani. This may indicate, then, that this word was first borrowed into a language ancestral to Mpi and Hani.

‘Money’ 錢 EMC dzjen is definitely a Chinese word and is the kind of word that one expects to be borrowed, but it is also an old loanword into Bai (tse<sub>42</sub>, with correspondence to lower Ping in the old layer of borrowings). This word could have entered Hani through Bai.

From these data we cannot tell whether the MC voiced stops were voiced or voiceless in the donor language, whatever it was, since a voiceless unaspirated initial in the donor language would have been converted to a Hani voiced initial in a lax-vowel context anyway. However, EMC 碟 dep ‘plate’ was borrowed into Hani with a tense vowel for the Chinese stop ending (see below): d<sub>a</sub>33: this word clearly had a voiced initial in the donor, and Hani d- represents Chinese d- (had the Chinese initial been t-, there would have been no reason not to borrow the word as t<sub>a</sub>33).

#### 5.4.2 Unpalatalized MC division-3 velars

Chinese velar initials became palatalized in Mandarin preceding front vowels. Unpalatalized velar initials indicate a non-Mandarin source. We have only this one example:

Chinese chives	gu tsj	31 33	韭	jiu <sub>3</sub>
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Table 13: unpalatalized velar initial in ‘Chinese chives’.

‘Chinese chives’ 韭 EMC kjuwX is an old Chinese word: it occurs in the Shi Jing and in Zhuang Zi. Hani –u for EMC –juw is found in other forms, see below.

### 5.4.3 Early Chinese bilabials reflected as Hani bilabials

Old and Early Middle Chinese bilabials \*p \*ph \*b \*m changed to \*f \*v \*w preceding back vowels, starting in LMC. Hani has some apparently conservative bilabials corresponding to these words:

rich	<b>bɣ</b>	<b>31</b>	富	fu <sub>4</sub>
float	<b>bu</b>	<b>55</b>	浮	fu <sub>2</sub>
to repeat; to turn over	<b>pɯ</b>	<b>33</b>	覆	fu <sub>4</sub>
boil (v.)	<b>bɯ</b>	<b>55</b>	沸	fei <sub>4</sub>
tiny	<b>mɯ</b>	<b>55</b>	微	wei <sub>2</sub>

Table 14. Hani words with apparently conservative bilabials

Interpretation of these data is tricky. The problem is that Proto-Loloish and its daughter language Proto-Hani-Akha have always lacked labiodental fricatives: it is not known how early Hani-Akha would have treated a Chinese f- or v-. One supposes that ph- would have been the preferred treatment for Chinese f- (as in M2) and b- for Chinese v-. This appears to indicate that ‘rich’ and ‘boil’, which had p- in EMC, and are treated by b- in Hani, were indeed borrowed before labiodentalization occurred (if it ever did) in the donor language: otherwise one would expect them to show Hani ph- corresponding to Chinese f-. ‘Float’ is a Chinese b- word, treated as b- in Hani: it is unclear whether Hani b- represents an original b- or a labiodentalized v- in the donor. Likewise for ‘repeat’: it is uncertain whether the Hani p-tense syllable (where tenseness presumably is a characteristic of *ru* syllables in that layer, see below) reflects a Chinese ph- of a Chinese f-. At any rate, ‘tiny’ is reliable, as a Chinese w- would hardly be represented by a Hani m-.

### 5.4.4 EMC –a ~ -wa reflected as Hani -∅

The EMC rhyme Ge 歌 (EMC –a) and its *hekou* counterpart Ge 戈 (EMC –wa) are reflected by Hani -∅ in the following forms:

gong	<b>b∅ l∅</b>	<b>33 33</b>	鑼	luo <sub>2</sub>
goose	<b>o ŋ∅</b>	<b>31 55</b>	鵝	e <sub>2</sub>
lazy	<b>d∅</b>	<b>55</b>	惰	duo <sub>4</sub>

Table 15. Hani -∅ for EMC –(w)a

According to Bradley, the Proto-Loloish rhyme \*o evolves to Akha -oe, which is the same as Hani -∅. It is likely, then, that these words were borrowed when their vowel in Chinese was close to early Hani-Akha \*o, with later evolution to -∅ in Hani. Note the difference in tonal treatment between ‘gong’ and ‘goose’, both *ping* words in Chinese. This is suggestive of a chronological difference in the time of borrowing.

#### 5.4.5 EMC –u reflected as Hani -ɔ.

bamboo hoop	mja ɣɔ	33 55	箍	gu <sub>1</sub>
do, make	dzo	55	做	zuo <sub>4</sub>
buttocks	dɔ khɔ	31 31	胯	kua <sub>4</sub>

Table 16. Hani -ɔ for EMC –u

Baxter’s reconstruction for the EMC *mu*<sub>2</sub> 模 rhyme is –u. The real phonetic value was probably lower, perhaps –o or -ɔ.

#### 5.4.6 EMC -jij reflected as Hani -ɯ.

boil (v.)	bɯ	55	沸	fei <sub>4</sub>
tiny	mɯ	55	微	wei <sub>2</sub>

Table 17: Hani -ɯ for EMC -jij.

The word for ‘boil’ is not the regular reflex of PL 639B \*m-bi<sub>1/2</sub> ‘boil’, as the vowel would be –i.

#### 5.4.7 MC final stops reflected by Hani tense vowels.

Chinese *rusheng* words were characterized by stop endings: -p, -t, -k still in LMC. These final stops have been lost (or are represented by a vestigial glottal stop) in Mandarin (they are maintained in many southern Chinese dialects, however). Proto-Loloish also had words with stop endings. In native Hani words, these stops have been lost, but they have left tense vowels as a reminder of their former existence. In the M layers, Chinese *rusheng* words usually have lax vowels: this is normal since there is no reason at all for Hani speakers to treat them as tense. However, we do find in our list of loan candidates a number of comparisons which have –p –t –k endings in Chinese and *tense* vowels in Hani. We suspect that at least some of them are words borrowed by Hani at a time when they still had stop endings in Chinese. We can think of two alternative explanations of why such words have tenseness in Hani. In one explanation, Hani still had its final stops at the time the loans were made. The Chinese words were borrowed with their stops: contrastive vowel tenseness developed later on, when the stops were lost. In another explanation, Hani had already lost its stops and developed contrastive vowel tenseness when the loans were made. The Chinese words were borrowed without their stops, but were treated as tense, because Chinese *rusheng* words have noncontrastive glottalization. We now present comparisons of this kind.

bamboo hoop	mja ɣɔ	33 55	篾	mie <sub>4</sub>
plate	da za	33 31	碟	die <sub>2</sub>
to repeat; to turn over	pu	33	覆	fu <sub>4</sub>
skilled, used to	su	33	熟	shu <sub>2</sub>

Table 18. Hani tone 33-tense for Chinese stop endings.

As indicated earlier, we believe the initial in da<sub>33</sub> ‘plate’ is historically voiced, i.e. it is not the result of converting a Chinese t- to d-: had Hani speakers wanted to integrate into Hani a Chinese word with initial t- and tense vowel, they could have done so without any difficulty, because t-tense is lawful in Hani. In general, Hani voiced initials plus tense vowels indicate an etymological d-, whether the form be indigenous or a loan.

We also found these two forms, which show tone 31-tense corresponding to Chinese *ru*. Note the early-looking d- in ‘bracelet’.

bracelet	la <b>du</b>	31 31	鐲	zhuo <sub>2</sub>
build	<b>tsu</b>	31	筑	zhu <sub>4</sub>

Table 19. Hani tone 31-tense for Chinese stop endings.

### 5.5 reaching the limits

We regard the forms discussed in sections 5.4.1 to 5.4.7 as likely early Chinese borrowings, because each of them is part of (at least) one pattern of correspondence with Middle Chinese. However, the evidence is scarce and an unambiguous general pattern of correspondences for tones does not emerge.

Things are a little better with voicing and aspiration. In the data we have presented in sections 5.4.1 to 5.4.7, we find a pattern of correspondences similar to layer M1, that is, the vowels in Chinese *ping*, *shang* and *qu* tones are interpreted as lax, and Chinese voiceless unaspirated stops are converted to voiced stops once they are borrowed into Hani. There are, to be sure, a small number of Hani forms with tense vowel which appear to correspond to Chinese words not in *ru*, for instance ‘to plait’ 編 EMC pjen (IV), Hani pje<sub>31</sub>. But we have found no pattern of correspondence between Hani tense vowels and any specific Chinese category within tones *ping*, *shang* and *qu*.

A different situation obtains in the *ru* tone, however: because the stop endings were still present in the Chinese donor, Chinese syllables in tone *ru* were given a tense vowel in Hani. We suppose there would have been no need to convert Chinese voiceless unaspirates to voiced, but we cannot back this up with a reliable example. We also suppose that in *ru* syllables it would have been necessary to convert an aspirated Chinese initial to the corresponding Hani unaspirated initial. It is possible that ‘repeat’ 覆 EMC \*phjuwk, Hani pu<sub>33</sub> is such an example, but as mentioned previously one cannot exclude that the Hani initial reflects a Chinese ‘labiodentalized’ f-.

This situation is interesting. It suggests that on the Hani side, the prohibition against combinations of voiceless unaspirate initials and lax vowels was already in place, in other words that the complementary distribution between ph-lax and p-tense already existed at the time of these early borrowings, in other words again that the Proto-Loloish p-lax had already become aspirated.

## 5.6 ‘eggplant’ and ‘tea’: Tibeto-Burman loans to Chinese ?

The eggplant (*Solanum melongena*) requires a warm climate and is said to be native to southern and western Asia. The Chinese term 茄 EMC gja ‘eggplant’ all by itself forms the *kaikou* part of the *Qie Yun*’s division-3 Ge 戈 rhyme, where it appears to be filling an accidental gap. One of the earliest textual occurrences of the character is in Wang Bao’s 王褒 *Tong Yue Fu* 僮約賦. Wang Bao (fl. 73-48 BCE) was a poet from Sichuan. We suspect that the word for ‘eggplant’ is a loan *into* Chinese from a southwestern language, perhaps Tibeto-Burman, rather than the opposite<sup>9</sup>.

The Hani term for ‘tea’: tsha<sub>31</sub> yi<sub>55</sub> la<sub>31</sub> pɛ<sub>33</sub> consists of a Chinese M1 loanword: tsha<sub>31</sub> yi<sub>55</sub> followed by the inherited Lolo-Burmese word. Sagart (1999a: 188) argued that 茶 ‘tea’ is a Tibeto-Burman loanword into Chinese. The Tibeto-Burman etymon is \*la ‘leaf’, reflected *inter alia* in Hani la<sub>31</sub> pɛ<sub>33</sub>. In Late Old Chinese 茶 ‘tea’ may be reconstructed as \*<sup>a</sup>lra. Incidentally the first textual occurrence of the word 茶 ‘tea’ is also in Wang Bao’s *Tong Yue Fu* 僮約賦! It seems that the two plants became known to the Chinese following their expansion into Sichuan.

## 5.7 other forms of interest

### 5.7.1 mule

The Hani term for ‘mule’ is la<sub>55</sub> dzi<sub>33</sub>, a form which agrees well with the Han-time pronunciation of 騾 ‘mule’ in Chinese. We tentatively treat it as an early loan from Chinese, like Burmese la:, Mpi la<sub>4</sub>, both ‘mule’. The tone correspondence Hani tone 55 : Burmese heavy tone: Mpi tone 4 is not inherited, hence we must be dealing with separate loans. However, a similar form occurs in Dai, and the possibility exists that the word entered Hani through Dai.

### 5.7.2 spinning wheel

Needham regards the spinning wheel as a Chinese invention. The term 車 OC \*<sup>b</sup>kha > tsyhae originally designated chariots, but came to designate any machine using wheels, including the spinning wheel. Burmese *khya*: ‘reel for winding thread’ is certainly a very early loan from Chinese. The Hani word: yO<sub>33</sub> tsha<sub>55</sub> is also clearly a Chinese loanword. The Burmese and Hani forms were borrowed separately, as in inherited words the WB heavy tone normally corresponds to the Hani low tone.

## 5.8 summary

We have identified two recent layers of borrowings, labelled M1 and M2. We think they are loans from different varieties of SW Mandarin because there is no evidence at all for a transition between M1 and M2. M2 is definitely the dialect of Lüchun. M2 borrowings are very recent, perhaps post-1911. The majority was made after 1949, and especially during the

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<sup>9</sup> A Tai source is in theory also conceivable, but the corresponding Tai word has a voiceless aspirate initial, reflected as h- in Dai, the most likely contact Tai language for Hani: it is not clear why this would wind up with a voiced initial in Hani. At any rate, Tai presence in southwest China seems too recent to provide the source of a Han-time loan to Chinese.

Cultural Revolution. A change in sound correspondences can be observed during the M2 period. Early M2 borrowings (labelled M2a by us), typically for non-modern notions, convert Chinese voiceless unaspirated stops and affricates to voiced, to comply with Hani inherited phonotactics (which forbid combinations of lax vowels and voiceless unaspirated initials). Later M2 borrowings (our M2b words), typically for modern notions (political, technical etc.), do not convert Chinese voiceless unaspirates to voiced, and basically do not mind contravening Hani phonotactics. We think that this change is essentially a change in the behaviour of Hani speakers, not a change in either the donor or the receiving languages. In our opinion, this change was driven by a sharp increase in Hani-Chinese bilingualism among Hani speakers after 1949.

The M1 donor has not been identified. It treats Chinese stops like M2a but otherwise differs from M2 in a variety of respects, notably tone, and is not entirely homogeneous. We have subdivided M1 into two sub-layers, M1a and M1b. In the M1 layer we found a word for ‘potato’: M1 therefore includes at least part of the Qing period.

The M1 and M2 borrowings consist of both monosyllabic and disyllabic morphemes.

We have gathered what evidence we could find for pre-Mandarin borrowings into Hani in our A layer. This is a tentative entity, of which only a few recurrent features have been identified. The evidence is scanty, and entirely monosyllabic. Moreover, the existence of secondary donors of Chinese vocabulary, like Tai and Bai, has to be considered.

The correspondences of tone, voicing, aspiration and tenseness in the M layers are summarized in Table 20, where ‘p’ means ‘any voiceless unaspirated obstruent’, ‘ph’ means ‘any voiceless aspirated obstruent’, ‘b’ means ‘any voiced obstruent’, and underlines mean ‘tense voice’.

<b>MC tone and initial</b>	M1a	M1b	M2a	M2b	Lüchun Mandarin (Wu et al. 1989:116)
<i>ping</i> <b>p-</b>	b-31	b-33~55	b-55	p-55	p-55
<b>ph-</b>	ph-31	ph-33~55		ph-55	ph-55
<i>ping</i> <b>b-</b>	ph-31		ph-31	ph-31	ph-31
<b>m-</b>	m-31			m-31	m-31
<i>shang</i> <b>p-</b>	b-31	b-31	b-33	p-33	p-33
<b>ph-</b>				ph-33	ph-33
<i>shang</i> <b>b-</b>	b-55			p-24	p-213
<b>m-</b>	m-31			m-33	m-33



<i>qu</i>	<b>p-</b>		b-55		p-24	p-213
	<b>ph-</b>	ph-55	ph-55		ph-24	ph-213
<i>qu</i>	<b>b-</b>	b-55		b-24	p-24	p-213
	<b>m-</b>	m-55			m-24	m-213
<i>ru</i>	<b>p-</b>	f- <u>31</u>	b-55	b-31	p-31	p-31
	<b>ph-</b>				ph-31	ph-31
<i>ru</i>	<b>b-</b>	p- <u>31</u>			p-31	p-31
	<b>m-</b>		m-55	m-31	m-31	m-31
qingsheng			55	31	33	

Table 20: summary of tone and initial type correspondences in the M layers

Table 21 presents some vocabulary items which we regard as characteristic of each period.

A	M1a	M1b	M2a	M2b
spinning wheel, mule, goose, gong, lazy, bamboo hoop, plate, do, float, rich, buttocks	Ch. cabbage, treasure, dry, guess, high, increase, star, blood	debt, tea, horse's girth, joss-stick, saddle, bandits, cooking ladle, tobacco, cow-pea, elder brother, father's sister, lose, fail	barley, capital letters, chisel, hay cutter, word, north, delay (v.)	modern vocab. (political, technical, cultural), box, bell, ordinal marker, soap, soldier, steel, wheat, wheat noodles
	potato, malaria, gamble, abacus, broad bean, government, to pawn, shop, wooden stool, main road, green		letter (mail), ink, sesame oil, table, window, train, doctor, father's younger brother	
	cattle, city, coal, compass, copper coin, dollar, grapes, week, zero			

Table 21: some characteristic vocabulary items borrowed from Chinese.

Overall, in the period considered, Hani has received moderate influence from Chinese. It has borrowed much cultural vocabulary, including names of domesticated animals: ‘mule’, ‘goose’, ‘cattle’; names of domesticated plants: ‘Chinese cabbage’, ‘potato’, ‘barley’, ‘wheat’; Hani has also borrowed quite a few non-cultural notions such as ‘do’, ‘float’, ‘rich’, ‘high’, ‘star’, ‘green’, ‘dry’, ‘guess’, ‘increase’. Borrowed kinship terms are: ‘elder brother’, ‘father’s younger sister’, ‘father’s younger brother’. There are a couple of very basic notions: ‘excrement’ and ‘blood’, the latter however more a case of blending than borrowing. The Chinese numerals have been borrowed, but only as part of ordinal expressions (on which more below): the basic numerals remain Loloish. There are a few measure words, but no true classifiers. SW Mandarin has provided a couple of function words: the experiential aspect marker  $go_{55}$  (Chinese 過), which can be used in modern Hani instead of the inherited form  $be_{33}$  (Li and Wang 1986:101); the ordinal marker  $ti_{24}^{10}$  (Li and Wang 1986: 62). There is a distinct possibility that some of the Proto-Loloish words reconstructed by Bradley are Chinese loanwords. A study of this question is beyond the scope of this paper. We have not found abundant evidence of contact between Hani and Dai. One item which we suspect of having been borrowed from Dai is ‘chilli pepper’, an American plant, Hani  $phi_{55}$ : compare Dai  $ma:k_9$   $phik_8$  ‘id.’. Finally, we have argued that two plant names: ‘eggplant’ and ‘tea’, are Tibeto-Burman loanwords into Chinese rather than the opposite.

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<sup>10</sup> The basic numerals have not been borrowed, but whole ordinal expressions consisting of ordinal marker + numeral have: ‘first’  $ti_{24}$   $ji_{31}$ , ‘third’  $ti_{24}$   $sa_{55}$ , ‘fifth’  $ti_{24}$   $u_{55}$ , ‘eighth’  $ti_{24}$   $pa_{31}$ . These numerals fit the M2b pattern, except for ‘5<sup>th</sup>’ where one would expect tone 33. Hani does not have a dedicated morpheme for expressing ordinality.

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## 7. annex: list of Chinese loanwords to Hani

### 7.1 layer unknown: possible-to-probable loans

bad smell (fish)	sa xɣ	55 33	腥		xing <sub>1</sub>
band of cloth for carrying children on the back	bɯ the	33 31	被		bei <sub>4</sub>
barnyard grass (when young looks like rice seedlings)	su ma	55 33	粟		su <sub>4</sub>
bedding bag	bɯ xo	33 33	被		bei <sub>4</sub>
betel nut	be lo	55 55	檳		bin <sub>1</sub>
betel nut	be lo	55 55	榔		lang <sub>0</sub>
cotton fibre	bɯ u	33 55	被		bei <sub>4</sub>
die	si	55	死		si <sub>3</sub>
duck	o a	31 33	鴨		ya <sub>1</sub>
edible	xo phu	55 31	瓠		hu <sub>4</sub>
eggplant	dze dzu	55 31	茄		qie <sub>2</sub>
father	a da	31 33	爹		die <sub>1</sub>
FeB	da da	55 33	爹		die <sub>1</sub>
few	a ɕu	31 33	少		shao <sub>3</sub>
FySis	ma ma	55 33	媽		ma <sub>1</sub>
hoe (v.)	tɕu	33	鏟		jue <sub>2</sub>
insect	a dzu	31 31	蟲		chong <sub>2</sub>
k. o. small steelyard	du xo	31 31	戩		deng <sub>3</sub>
k.o. small steelyard	lu du	55 31	戩		deng <sub>3</sub>
manure basket	la tɕhi	31 31	箕		ji <sub>1</sub>
mosquito net	bɯ ɕa	33 33	被		bei <sub>4</sub>
parents	da ma	33 33	爹		die <sub>1</sub>
parents	da ma	33 33	媽		ma <sub>1</sub>
pick (v.)	tsɣ	31	摘		zhai <sub>1</sub>
pick, catch	ɲe	31	捏		nie <sub>1</sub>
quarrel	tsho	55	吵		chao <sub>3</sub>
quilt	a bɯ	55 33	被		bei <sub>4</sub>
rub	zu	31	揉		rou <sub>2</sub>
rust	su ni	55 55	鏽		xiu <sub>4</sub>
spider	bø dzu	31 31	蟲		chong <sub>2</sub>
stepfather	da tshe	33 31	爹		die <sub>1</sub>
throw, cast	dze	33	擲		zhi <sub>4</sub>
to drown; wipe out	me	33	滅		mie <sub>4</sub>
to plait	pje	31	編		bian <sub>1</sub>
weeds	bja	33	稗		bai <sub>4</sub>

what	<b>xa</b>	<b>55</b>	何		he <sub>2</sub>
white	<b>ba</b>	<b>33</b>	白		bai <sub>2</sub>

## 7.2 words of layer A

(autumn) season	tɕy dzø	31 31	季	A	ji <sub>4</sub>
(spring) season	yɔ dzø	55 31	季	A	ji <sub>4</sub>
(summer) season	ze dzø	55 31	季	A	ji <sub>4</sub>
(winter) season	tshə dzø	31 31	季	A	ji <sub>4</sub>
bamboo hoop	mjǎ gɔ	33 55	篾	A	mie <sub>4</sub>
bamboo hoop	mjǎ gɔ	33 55	箍	A	gu <sub>1</sub>
boil (v.)	bu	55	沸	A	fei <sub>4</sub>
bracelet	la du	31 31	鐲	A	zhuo <sub>2</sub>
build	tsu	31	筑	A	zhu <sub>4</sub>
buttocks	də khə	31 31	胯	A	kua <sub>4</sub>
do, make	dzo	55	做	A	zuo <sub>4</sub>
float	bu	55	浮	A	fu <sub>2</sub>
gong	bə lə	33 33	鑼	A	luo <sub>2</sub>
goose	o ŋə	31 55	鵝	A	e <sub>2</sub>
large bamboo basket	mjǎ xa	33 33	篾	A	mie <sub>4</sub>
lazy	də	55	惰	A	duo <sub>4</sub>
level road	ga bi	55 55	平	A	ping <sub>2</sub>
mule	la dzi	55 33	騾	A	luo <sub>2</sub>
plate	də za	33 31	碟	A	die <sub>2</sub>
rich	br	31	富	A	fu <sub>4</sub>
skilled; used to	su	33	熟	A	shu <sub>2</sub>
spinning wheel	yɔ tsha	33 55	車	A	che <sub>1</sub>
tiny	mu	55	微	A	wei <sub>2</sub>
to repeat; to turn over	pu	33	覆	A	fu <sub>4</sub>
wait	do	31	待	A	dai <sub>4</sub>
want	ɔ	55	要	A	yao <sub>4</sub>
writing, character	so mjǎ	31 33	字	A	zi <sub>4</sub>
Chinese chives	gu tsi	31 33	韭	A?	jiu <sub>3</sub>
fertile; full, esp. of ears of grain	ma	55	滿	A?	man <sub>3</sub>
money	dze	31	錢	A?	qian <sub>2</sub>
peck	tu	33	啄	A?	zhuo <sub>2</sub>
pine tree	thə su a bo	31 31	樹	A?	shu <sub>4</sub>
to nail	di	31	釘	A?	ding <sub>4</sub>
year of snake	se xu	55 31	蛇	A?	she <sub>2</sub>

### 7.3 words of layers A or M1

all, completely	dzi	55	盡	AM1	jin <sub>4</sub>
bucket	u tho	55 31	桶	AM1	tong <sub>3</sub>
horseshoe	ma dza	31 31	掌	AM1	zhang <sub>3</sub>
horseshoe	ma dza	31 31	馬	AM1	ma <sub>3</sub>
rule, custom	jo li	33 31	禮	AM1	li <sub>3</sub>
splash	se	31	洒	AM1	sa <sub>3</sub>

### 7.4 words of layer M (unknown whether M1 or M2)

(to ...) a bit	xa	31	下	M	xia <sub>4</sub>
ball	tchu	31	球	M	qiu <sub>2</sub>
beef	ju sa	31 31	牛	M	niu <sub>2</sub>
buffalo	ju phu	31 55	牛	M	niu <sub>2</sub>
bush	tsho	31	叢	M	cong <sub>2</sub>
cattle	a ju	31 31	牛	M	niu <sub>2</sub>
cattle dung	ju ei	31 31	牛	M	niu <sub>2</sub>
cattle feed	ju dza	31 55	牛	M	niu <sub>2</sub>
cattle pen	ju ku	31 33	牛	M	niu <sub>2</sub>
city	tshe	31	城	M	cheng <sub>2</sub>
coal	me	31	煤	M	mei <sub>2</sub>
compass	lo phe	31 31	盤	M	pan <sub>2</sub>
compass	lo phe	31 31	羅	M	luo <sub>2</sub>
compensate	phe	31	賠	M	pei <sub>2</sub>
copper coin	tho xo	31 31	銅	M	tong <sub>2</sub>
copper coin	tho xo	31 31	毫	M	hao <sub>2</sub>
dollar	je	31	元	M	yuan <sub>2</sub>
farmer	no mi	31 31	農	M	nong <sub>2</sub>
farmer	no mi	31 31	民	M	min <sub>2</sub>
grapes	phu tho	31 33	葡	M	pu <sub>2</sub>
grapes	phu tho	31 33	萄	M	tao <sub>0</sub>
hour	sr	33	辰	M	chen <sub>0</sub>
lame	tche	31	癩	M	que <sub>2</sub>
lame in one hand	la tche	31 31	癩	M	que <sub>2</sub>
lame person	a khuu khuu tche	31 55 55 31	癩	M	que <sub>2</sub>
ox horn	ju khø	31 55	牛	M	niu <sub>2</sub>
ox, cattle	ju ni	31 55	牛	M	niu <sub>2</sub>
peace	xo phi	31 31	平	M	ping <sub>2</sub>
peace	xo phi	31 31	和	M	he <sub>2</sub>
plough	ju tshe	31 31	牛	M	niu <sub>2</sub>

rake	<b>ju</b> kə	<b>31 33</b>	牛	M	niu <sub>2</sub>
rinderpest (cattle disease)	<b>ju</b> na	<b>31 55</b>	牛	M	niu <sub>2</sub>
south	<b>na</b>	<b>31</b>	南	M	nan <sub>2</sub>
spiral shell	<b>lo</b> ɲu	<b>31 33</b>	螺	M	luo <sub>2</sub>
stride across	ɲa <b>jo</b>	<b>31 31</b>	越	M	yue <sub>4</sub>
suspect (v.)	<b>xø</b> nø	<b>31 31</b>	懷	M	huai <sub>2</sub>
time	<b>si</b> sɣ	<b>31 33</b>	時	M	shi <sub>2</sub>
time	si <b>sɣ</b>	<b>31 33</b>	辰	M	chen <sub>0</sub>
week	<b>çi</b> tçi	<b>55 55</b>	星	M	xing <sub>1</sub>
week	çi <b>tçi</b>	<b>55 55</b>	期	M	qi <sub>1</sub>
wolf	<b>la</b>	<b>31</b>	狼	M	lang <sub>2</sub>
year of cow	<b>ju</b> xu	<b>31 31</b>	牛	M	niu <sub>2</sub>
year of dragon	<b>lo</b> xu	<b>31 31</b>	龍	M	long <sub>2</sub>
zero	<b>li</b>	<b>31</b>	零	M	ling <sub>2</sub>

### 7.5 words of layer M1 uncertain whether M1a or M1b)

a few	go <b>ba</b>	<b>55 31</b>	把	M1	ba <sub>3</sub>
a few	go ba	<b>55 31</b>	個	M1	ge <sub>0</sub>
abacus	so <b>phe</b>	<b>55 31</b>	盤	M1	pan <sub>0</sub>
abacus	so phe	<b>55 31</b>	算	M1	suan <sub>4</sub>
angry	<b>tçi</b>	<b>55</b>	氣	M1	qi <sub>4</sub>
broad bean	<b>tsha</b> du	<b>31 55</b>	蠶	M1	can <sub>2</sub>
broad bean	tsha <b>du</b>	<b>31 55</b>	豆	M1	dou <sub>4</sub>
calculate	<b>so</b>	<b>55</b>	算	M1	suan <sub>4</sub>
capability	be <b>si</b>	<b>31 55</b>	事	M1	shi <sub>4</sub>
capability	<b>be</b> si	<b>31 55</b>	本	M1	ben <sub>3</sub>
commit crime	o <b>dzø</b>	<b>55 55</b>	罪	M1	zui <sub>4</sub>
courage, guts	<b>da</b> dzi	<b>31 33</b>	膽	M1	dan <sub>3</sub>
courage, guts	da <b>dzi</b>	<b>31 33</b>	子	M1	zi <sub>0</sub>
crossroad; fork in path	ga <b>tsho</b>	<b>55 55</b>	岔	M1	cha <sub>4</sub>
deceive	<b>phje</b>	<b>55</b>	騙	M1	pian <sub>4</sub>
do accounts	so <b>dza</b>	<b>55 55</b>	賬	M1	zhang <sub>4</sub>
do accounts	so dza	<b>55 55</b>	算	M1	suan <sub>4</sub>
excrement	<b>çi</b>	<b>31</b>	屎	M1	shi <sub>3</sub>
experiential suffix	<b>go</b>	<b>55</b>	過	M1	guo <sub>4</sub>
fast	<b>kho</b>	<b>55</b>	快	M1	kuai <sub>4</sub>
fermented beans	a <b>tshi</b>	<b>31 31</b>	豉	M1	chi <sub>3</sub>
gamble	<b>du</b> tshe	<b>31 31</b>	賭	M1	du <sub>3</sub>
gamble	du <b>tshe</b>	<b>31 31</b>	錢	M1	qian <sub>2</sub>

get together	<b>da</b> xo	<b>31 31</b>	打	M1	da <sub>3</sub>
get together	da <b>xo</b>	31 <b>31</b>	伙	M1	huo <sub>3</sub>
government	dzɿ <b>phu</b>	<b>55 55</b>	府	M1	fu <sub>0</sub>
government	<b>dzɿ</b> phu	<b>55 55</b>	政	M1	zheng <sub>4</sub>
green	<b>ju</b>	<b>55</b>	綠	M1	lü <sub>4</sub>
main road	<b>da</b> lu	<b>55 55</b>	大	M1	da <sub>4</sub>
main road	da <b>lu</b>	55 <b>55</b>	路	M1	lu <sub>4</sub>
main road	ga ma <b>da</b> lu	55 33 <b>55 55</b>	大	M1	da <sub>4</sub>
malaria	<b>dza</b> tɕhi	<b>55 55</b>	瘴	M1	zhang <sub>4</sub>
malaria	dza <b>tɕhi</b>	55 <b>55</b>	氣	M1	qi <sub>4</sub>
pawn (v.)	<b>da</b>	<b>55</b>	當	M1	dang <sub>4</sub>
pay sb back	<b>dze</b> so	<b>55 31</b>	債	M1	zhai <sub>4</sub>
potato	<b>ja</b> ju	<b>31 55</b>	洋	M1	yang <sub>2</sub>
potato	ja <b>ju</b>	31 <b>55</b>	芋	M1	yu <sub>4</sub>
real	<b>dzi</b> xɿ ne	<b>55 33 33</b>	真	M1	zhen <sub>1</sub>
respect old people	<b>ɕo</b>	<b>55</b>	孝	M1	xiao <sub>4</sub>
sauce (for dipping meat)	<b>dza</b> u	<b>55 55</b>	蘸	M1	zhan <sub>4</sub>
shop	phu <b>dzi</b>	55 <b>31</b>	子	M1	zi <sub>0</sub>
shop	<b>phu</b> dzi	<b>55 31</b>	鋪	M1	pu <sub>4</sub>
solution	lu <b>su</b>	55 <b>55</b>	數	M1	shu <sub>4</sub>
solution	<b>lu</b> su	<b>55 55</b>	路	M1	lu <sub>4</sub>
stupid	<b>xa</b>	<b>33</b>	蠢	M1	gang <sub>4</sub>
unit of measure	<b>da</b>	<b>55</b>	石	M1	dan <sub>4</sub>
wooden stool	<b>ba</b> dɿ	<b>31 55</b>	板	M1	ban <sub>3</sub>
wooden stool	ba <b>dɿ</b>	31 <b>55</b>	凳	M1	deng <sub>4</sub>
chopsticks	<b>dzu</b> da	<b>55 55</b>	箸	M1?	zhu <sub>4</sub>
chopsticks	<b>dzu</b> da da bɔ	<b>55 55 55 31</b>	箸	M1?	zhu <sub>4</sub>
chopsticks	<b>dzu</b> da xɑ phu	<b>55 55 33 31</b>	箸	M1?	zhu <sub>4</sub>

## 7.6 words of layer M1a

blood	<b>si</b>	<b>31</b>	血	M1a	xue <sub>3</sub>
Chinese cabbage	<b>pɛ</b> tsha	<b>31 55</b>	白	M1a	bai <sub>2</sub>
Chinese cabbage	pɛ <b>tsha</b>	31 <b>55</b>	菜	M1a	cai <sub>4</sub>
dry, as leaves	<b>khu</b>	<b>31</b>	枯	M1a	ku <sub>1</sub>
guess	<b>tsha</b>	<b>31</b>	猜	M1a	cai <sub>1</sub>
high	<b>go</b>	<b>31</b>	高	M1a	gao <sub>1</sub>
increase	<b>dzɿ</b>	<b>31</b>	增	M1a	zeng <sub>1</sub>
star	a <b>si</b>	55 <b>31</b>	星	M1a	xing <sub>1</sub>



to protect	<b>bo</b>	<b>31</b>	保	M1a	ba <sub>03</sub>
treasure	<b>bo</b>	<b>31</b>	寶	M1a	ba <sub>03</sub>

### 7.7 words of layer M1b

aunt (FaYS)	<b>a na</b>	<b>55 33</b>	阿	M1b	a <sub>1</sub>
aunt (FaYS)	<b>a na</b>	<b>55 33</b>	孃	M1b	niang <sub>2</sub>
bandits	<b>da dze</b>	<b>31 55</b>	打	M1b	da <sub>3</sub>
bandits	da <b>dze</b>	31 <b>55</b>	劫	M1b	jie <sub>2</sub>
cigarettes	<b>ja xø</b>	<b>33 31</b>	煙	M1b	yan <sub>1</sub>
collect	<b>sr</b>	<b>33</b>	收	M1b	shou <sub>1</sub>
cooking ladle	go <b>tsha</b>	<b>55 31</b>	鏟	M1b	chan <sub>3</sub>
cooking ladle	<b>go tsha</b>	<b>55 31</b>	鍋	M1b	guo <sub>1</sub>
copper-covered end of a musket	<b>tho pha</b>	<b>31 55</b>	銅	M1b	tong <sub>2</sub>
copper-covered end of a musket	tho <b>pha</b>	31 <b>55</b>	炮	M1b	pao <sub>4</sub>
cow-pea	b <sub>e</sub> <b>dza</b>	<b>33 33</b>	豇	M1b	jiang <sub>1</sub>
debt	<b>dze</b>	<b>55</b>	債	M1b	zhai <sub>4</sub>
discuss	sa <b>lia</b>	<b>55 55</b>	量	M1b	liang <sub>0</sub>
discuss	<b>sa lia</b>	<b>55 55</b>	商	M1b	shang <sub>1</sub>
edible	dza <b>de</b>	31 <b>55</b>	得	M1b	de <sub>2</sub>
elder brother	a <b>go</b>	<b>55 33</b>	哥	M1b	ge <sub>1</sub>
elder brother	<b>a go</b>	<b>55 33</b>	啊	M1b	a <sub>1</sub>
everybody	<b>da dza</b>	<b>55 33</b>	大	M1b	da <sub>4</sub>
everybody	da <b>dza</b>	<b>55 33</b>	家	M1b	jia <sub>1</sub>
grain volume measure (“litre”)	<b>sr</b>	<b>33</b>	升	M1b	sheng <sub>1</sub>
horse’s girth	du <b>de</b>	<b>55 55</b>	帶	M1b	dai <sub>4</sub>
horse’s bellyband	<b>du de</b>	<b>55 55</b>	肚	M1b	du <sub>4</sub>
incense; joss stick	<b>ca</b>	<b>33</b>	香	M1b	xiang <sub>1</sub>
joss stick	<b>ca</b>	<b>33</b>	香	M1b	xiang <sub>1</sub>
lose, fail	<b>su</b>	<b>33</b>	輸	M1b	shu <sub>1</sub>
saddle	dzi <b>ya</b>	31 <b>33</b>	鞍	M1b	an <sub>1</sub>
saddle	mo <b>ya</b>	31 <b>33</b>	鞍	M1b	an <sub>1</sub>
sing	<b>tsha</b>	<b>55</b>	唱	M1b	chang <sub>4</sub>
tea	<b>tsha yi la pɛ</b>	<b>31 55 31 33</b>	茶	M1b	cha <sub>2</sub>
tea	tsha <b>yi la pɛ</b>	31 <b>55 31 33</b>	葉	M1b	ye <sub>4</sub>
thin	<b>ba</b>	<b>31</b>	薄	M1b	ba <sub>02</sub>
to be missing; short of	<b>tsha</b>	<b>33</b>	差	M1b	cha <sub>1</sub>
true	u <b>dzi me</b>	<b>55 55 55</b>	真	M1b?	zhen <sub>1</sub>
true, real	<b>dzi</b>	<b>55</b>	真	M1b?	zhen <sub>1</sub>

## 7.8 words of layers M1 or M2a

a unit of weight	<b>dzi</b>	<b>55</b>	斤	M1M2a	jin <sub>1</sub>
back basket	<b>be dzu</b>	<b>55 55</b>	背	M1M2a	be <sub>1</sub>
sesame oil	<b>ɕa jɤ</b>	<b>55 31</b>	油	M1M2a	you <sub>2</sub>
sesame oil	<b>ɕa jɤ</b>	<b>55 31</b>	香	M1M2a	xiang <sub>1</sub>

## 7.9 words of layer M2 (uncertain whether M2a or M2b)

a letter (mail)	<b>si</b>	<b>24</b>	信	M2	xin <sub>4</sub>
a unit of area	<b>mu</b>	<b>33</b>	畝	M2	mu <sub>3</sub>
a unit of length	<b>tshi</b>	<b>31</b>	尺	M2	chi <sub>3</sub>
agriculture	<b>nɔ̃ ji</b>	<b>31 31</b>	農	M2	nong <sub>2</sub>
agriculture	<b>nɔ̃ ji</b>	<b>31 31</b>	業	M2	ye <sub>4</sub>
ask for leave	<b>tshi dza</b>	<b>33 33</b>	假	M2	jia <sub>4</sub>
ask for leave	<b>tshi dza</b>	<b>33 33</b>	請	M2	qing <sub>3</sub>
automobile	<b>tɕhi tshe</b>	<b>31 55</b>	汽	M2	qi <sub>4</sub>
automobile	<b>tɕhi tshe</b>	<b>31 55</b>	車	M2	che <sub>1</sub>
backward	<b>lo xɤ</b>	<b>31 24</b>	後	M2	hou <sub>4</sub>
backward	<b>lo xɤ</b>	<b>31 24</b>	落	M2	luo <sub>4</sub>
bank	<b>zi xa</b>	<b>31 31</b>	行	M2	hang <sub>2</sub>
bank	<b>zi xa</b>	<b>31 31</b>	銀	M2	yin <sub>2</sub>
bean-starch noodles	<b>le phɤ</b>	<b>31 33</b>	粉	M2	fen <sub>3</sub>
chemical fertilizer	<b>xua fei</b>	<b>24 31</b>	化	M2	hua <sub>4</sub>
chemical fertilizer	<b>xua fei</b>	<b>24 31</b>	肥	M2	fei <sub>2</sub>
chilli	<b>la phi</b>	<b>31 55</b>	辣	M2	la <sub>4</sub>
Chinese inch	<b>tshø</b>	<b>24</b>	寸	M2	cun <sub>4</sub>
Chinese ink	<b>me</b>	<b>31</b>	墨	M2	mo <sub>4</sub>
class	<b>kho</b>	<b>24</b>	課	M2	ke <sub>4</sub>
correct, right, proper, suitable	<b>ho</b>	<b>31</b>	合	M2	he <sub>2</sub>
culture	<b>ue xua</b>	<b>31 24</b>	化	M2	hua <sub>4</sub>
culture	<b>ue xua</b>	<b>31 24</b>	文	M2	wen <sub>2</sub>
day of dragon	<b>lɔ̃ nɔ̃</b>	<b>31 33</b>	龍	M2	long <sub>2</sub>
deer's pilose antler (medicinal)	<b>lu zɔ̃</b>	<b>31 31</b>	鹿	M2	lu <sub>4</sub>
deer's pilose antler (medicinal)	<b>lu zɔ̃</b>	<b>31 31</b>	茸	M2	rong <sub>2</sub>
destroy	<b>ɕɔ̃ mi</b>	<b>55 31</b>	消	M2	xiao <sub>1</sub>
destroy	<b>ɕɔ̃ mi</b>	<b>55 31</b>	滅	M2	mie <sub>4</sub>
discuss	<b>thɔ̃ lue</b>	<b>33 24</b>	論	M2	lun <sub>4</sub>
discuss	<b>thɔ̃ lue</b>	<b>33 24</b>	討	M2	tao <sub>3</sub>
distribute	<b>fa</b>	<b>31</b>	發	M2	fa <sub>1</sub>
doctor	<b>ji se</b>	<b>55 55</b>	醫	M2	yi <sub>1</sub>

doctor	ji se	55 55	生	M2	sheng <sub>1</sub>
examination	khə si	33 24	試	M2	shi <sub>4</sub>
examination	<b>khə</b> si	<b>33</b> 24	考	M2	kao <sub>3</sub>
exemplary	mo fa	31 24	模	M2	mo <sub>2</sub>
exemplary	mo <b>fa</b>	31 <b>24</b>	範	M2	fan <sub>4</sub>
FyB	a su	55 31	叔	wM2	a <sub>0</sub>
FyB	a <b>su</b>	55 <b>31</b>	叔	M2	shu <sub>1</sub>
grain, food	lja si	31 31	食	M2	shi <sub>0</sub>
grain, food	<b>lja</b> si	<b>31</b> 31	糧	M2	liang <sub>2</sub>
happy	si fu	24 31	幸	M2	xing <sub>4</sub>
happy	si <b>fu</b>	24 <b>31</b>	福	M2	fu <sub>2</sub>
hate	<b>xe</b>	<b>24</b>	恨	M2	hen <sub>4</sub>
hold a meeting	khe xø	55 24	會	M2	hui <sub>4</sub>
hold a meeting	<b>khe</b> xø	<b>55</b> 24	開	M2	kai <sub>1</sub>
ink	me çø	31 33	墨	M2	mo <sub>4</sub>
ink	me <b>çø</b>	31 <b>33</b>	水	M2	shui <sub>3</sub>
labour	lɔ tɔ	31 24	勞	M2	lao <sub>2</sub>
labour	lɔ <b>tɔ</b>	31 <b>24</b>	動	M2	dong <sub>4</sub>
market	si tsha	24 31	市	M2	shi <sub>4</sub>
market	si <b>tsha</b>	24 <b>31</b>	場	M2	chang <sub>3</sub>
mistake	tsho u	31 24	誤	M2	wu <sub>4</sub>
mistake	<b>tsho</b> u	<b>31</b> 24	錯	M2	cuo <sub>4</sub>
nation	mi tshu	31 31	民	M2	min <sub>2</sub>
nation	mi <b>tshu</b>	31 <b>31</b>	族	M2	zu <sub>2</sub>
notoginseng (a kind of herbal medicine)	sa tchi	55 31	七	M2	qi <sub>1</sub>
notoginseng (a kind of herbal medicine)	<b>sa</b> tchi	<b>55</b> 31	三	M2	san <sub>1</sub>
produce	se tsha	55 33	產	M2	chan <sub>3</sub>
produce	<b>se</b> tsha	<b>55</b> 33	生	M2	sheng <sub>1</sub>
relatives	tshi tshi	55 31	戚	M2	qi <sub>4</sub>
relatives	<b>tshi</b> tshi	<b>55</b> 31	親	M2	qin <sub>1</sub>
sanitation	ue se	31 55	衛	M2	wei <sub>4</sub>
sanitation	ue <b>se</b>	31 <b>55</b>	生	M2	sheng <sub>1</sub>
scald	a la tha	31 31 55	燙	M2	tang <sub>4</sub>
school	çə çə	31 24	校	M2	xiao <sub>4</sub>
school	<b>çə</b> çə	<b>31</b> 24	學	M2	xue <sub>2</sub>
science	kho çə	55 31	學	M2	xue <sub>2</sub>
science	<b>kho</b> çə	<b>55</b> 31	科	M2	ke <sub>1</sub>
sesame oil	ça jiu	55 33	油	M2	you <sub>2</sub>
sesame oil	<b>ça</b> jiu	<b>55</b> 33	香	M2	xiang <sub>1</sub>

sow (v.)	<b>se</b>	<b>31</b>	撒	M2	sa <sub>3</sub>
student	<b>çø se</b>	<b>31 55</b>	學	M2	xue <sub>2</sub>
student	<b>çø se</b>	<b>31 55</b>	生	M2	sheng <sub>1</sub>
summon	<b>xø tso</b>	<b>24 24</b>	召	M2	zhao <sub>4</sub>
summon	<b>xø tso</b>	<b>24 24</b>	號	M2	hao <sub>4</sub>
support	<b>jø xu</b>	<b>55 24</b>	護	M2	hu <sub>4</sub>
support	<b>jø xu</b>	<b>55 24</b>	擁	M2	yong <sub>1</sub>
table	<b>fa</b>	<b>55</b>	方	M2	fang <sub>1</sub>
task	<b>ze u</b>	<b>31 24</b>	務	M2	wu <sub>4</sub>
task	<b>ze u</b>	<b>31 24</b>	任	M2	ren <sub>4</sub>
teacher	<b>lø si</b>	<b>33 55</b>	老	M2	lao <sub>3</sub>
teacher	<b>lø si</b>	<b>33 55</b>	師	M2	shi <sub>1</sub>
thought	<b>si çä</b>	<b>55 33</b>	想	M2	xiang <sub>3</sub>
thought	<b>si çä</b>	<b>55 33</b>	思	M2	si <sub>1</sub>
train	<b>xø tshe</b>	<b>33 55</b>	火	M2	huo <sub>3</sub>
train	<b>xø tshe</b>	<b>33 55</b>	車	M2	che <sub>1</sub>
uncle	<b>a su</b>	<b>55 31</b>	叔	M2	shu <sub>1</sub>
vehicle	<b>tshe</b>	<b>55</b>	車	M2	che <sub>1</sub>
victory	<b>se li</b>	<b>31 24</b>	利	M2	li <sub>4</sub>
victory	<b>se li</b>	<b>31 24</b>	勝	M2	sheng <sub>4</sub>
wheat noodles	<b>mje thjø</b>	<b>24 31</b>	麵	M2	mian <sub>4</sub>
wheat noodles	<b>mje thjø</b>	<b>24 31</b>	條	M2	tiao <sub>2</sub>
wife's father	<b>jo pha</b>	<b>31 31</b>	岳	M2	yue <sub>4</sub>
wife's mother	<b>jo ma</b>	<b>31 33</b>	岳	M2	yue
window	<b>tshua tsi</b>	<b>55 33</b>	窗	M2	chuan g <sub>1</sub>
woman	<b>fü nø</b>	<b>24 33</b>	婦	M2	fu <sub>4</sub>
woman	<b>fü nø</b>	<b>24 33</b>	女	M2	nu <sub>3</sub>
wooden wedge	<b>tsha tshø</b>	<b>31 31</b>	插	M2	cha <sub>1</sub>

### 7.10 words of layer M2a

barley	<b>da me</b>	<b>24 31</b>	麥	M2a	mai <sub>4</sub>
barley	<b>da me</b>	<b>24 31</b>	大	M2a	da <sub>4</sub>
capability	<b>be si</b>	<b>33 24</b>	事	M2a	shi <sub>4</sub>
capability	<b>be si</b>	<b>33 24</b>	本	M2a	ben <sub>3</sub>
capital letters	<b>da çï</b>	<b>24 33</b>	寫	M2a	xie <sub>3</sub>
capital letters	<b>da çï</b>	<b>24 33</b>	大	M2a	da <sub>4</sub>
chisel	<b>dzø za</b>	<b>31 31</b>	鑿	M2a	zao <sub>2</sub>

delay	da go	55 31	攔	M2a	ge <sub>0</sub>
delay	da go	55 31	耽	M2a	dan <sub>1</sub>
hand hay cutter	dza do	31 55	鋤	M2a	zha <sub>2</sub>
hand hay cutter	dza do	31 55	刀	M2a	dao <sub>1</sub>
north	be	31	北	M2a	bei <sub>3</sub>
to team up and help sbd	ba xo	55 55	伙	M2a	huo <sub>3</sub>
to team up and help sbd	ba xo	55 55	幫	M2a	bang <sub>1</sub>
word	da tshi	55 31	詞	M2a	ci <sub>2</sub>
word	da tshi	55 31	單	M2a	dan <sub>1</sub>

### 7.11 words of layer M2b

These very recent loanwords are too numerous and are not listed here to save space. For a partial list see section 5.3.1.