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Notes on Tibeto-Burman Consonant Clusters

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In the People's Republic of China, there are more than thirty Tibeto-Burman languages, some having early written records e.g., Written Tibetan and Xixia, which are important to research on Tibeto-Burman consonant clusters. Of the still spoken languages, many preserve a number of different consonant clusters. Through comparing the changes undergone by clusters in cognate words, we discover that these are often quite different in each language. The variations in the way the clusters are manifested in different dialects help us in our investigation. Through comparison of Written Tibetan, Written Burmese, and materials on modern Tibeto-Burman languages, we discover regularity in the tendencies of phonological evolution of these clusters.

1 - Classification and structure.

In the modern Tibeto-Burman languages of China, the number of clusters varies from language to language. Most languages have from 10 to 30 clusters, some such as Ergong have more than 200, while others do not have any at all. Sometimes even dialects of the same language have different numbers of clusters. Among Tibetan dialects, for example, Zeku (an Amdo Tibetan dialect) has more than 90 distinct clusters, and the K'ang dialect Dege (=Derge) has only 13, while modern Lhasa Tibetan has none. A similar situation appears in the Qiang languages; the northern dialect of Mawo has 71 clusters, while the southern dialect of Tauping has twenty-four, and the southern dialect of Longxi has none at all. In this paper, the clusters in some major Tibeto-Burman languages of China are introduced (see Chart 1 below):

Zeku Tibetan	90	Gyarung	152	Yongning Naxi	0	Fugong Nung	19
Dege Tibetan	13	Ergong	201	Lisu	0	Jinghpo	4
Lhasa Tibetan	0	Muya	14	Hani	0	Trung	11
Cuona Menba	10	Zhaba	9	Lahu	0	Taruang Deng	15
Mutuo Menba	4	Ersu	32	Jino	5	Kaman Deng	22
Baima	7	Namuyi	23	Bai	0	Bogar Luoba	0
Tauping Qiang	24	Shixing	6	Tujia	0	Idu Luoba	18
Mawo Qiang	71	Xide Yi	6	Achang	7	Sulong Luoba	5
Qinghua Pumi	22	Mojiang Yi	0	Zaiwa	0	Guiqiong	21
Taoba Pumi	3	Lijiang Naxi	6	Bijiang Nung	15		

Chart 1: Consonant clusters in Tibeto-Burman languages of China

In Tibeto-Burman languages the clusters differ not only in quantity but also in their phonological type. For the sake of convenience, we divide clusters into three parts: F indicates a prefixal element, C indicates the basic consonant, and B indicates any element after the basic consonant. In modern Tibeto-Burman languages, clusters basically exhibit four patterns:

a. CB type - This type is comparatively common. They are relatively frequent in Qiang and Jinghpo languages.
b. FC type - This type is a little less frequent. They exist in some

languages of the Qiang branch, Yi, and Tibetan.

c. CC type - This type is rare, but it does exist in individual dialects.

d. FCB type - This type of cluster is not frequently seen and only exists in some dialects.

In Written Tibetan materials F_1F_2CB clusters are found, but these have basically disappeared from the modern spoken language.

In each of the four cluster types, certain regularities can be seen:

(1) Type CB

In type CB clusters, C (the basic consonant) is usually a stop, affricate, or nasal. As B (the following sound), we find fricatives, laterals, trills, or semi-vowels. For example, there are eight CB type consonant clusters in Mawo Qiang: khs, khʂ, khɕ, gz, gʐ, gʑ, qhs, and qhʂ; the southern Qiang dialect of Tauping also has pz, phz, bz, pʐ, phʐ and bʐ.

Ergong has 13 CB consonant clusters: pʂ, phʂ, bʐ, phɕ, bʑ, bl, kʂ, khʂ, gʐ, qʂ, qhʂ, ql, and qhl.

Suo-mo Gyarung[2] has 23 CB consonant clusters: phs, phʃ, bz, bʒ, khs, khʃ, gz, gʒ, pr, pl, pj, phr, phl, phj, bl, kr, kl, kw, khʂ, khl, khw, gr, and tsr.

Qinghua Pumi has 7: pʐ, phʐ, bʐ, mʐ, pʒ, phʒ, and bʒ.

Ersu has six: ps, phs, bz, pʂ, phʂ, and bʐ.

In Zhaba and Namuyi, a similar situation also exists. In these CB consonant clusters, the fricative added after the main consonant [s, z, ʂ, ʐ, ʃ, ʒ, ɕ, ʑ] is at a different position of articulation, a situation rarely seen in Tibeto-Burman languages outside of the Qiang branch.

In the Tibeto-Burman languages in the areas bordering India and Burma (mainly in dialects of the Jinghpo and Burmese branches), the majority of dialects only keep clusters of the form stop plus liquid -r (or ʐ, ʒ), although a small number also keep those with -l. For example, in Taruang Deng there are pl, phl, bl, ml, kl, khl, gl, pr, phr, br, mr, kr, khr, gr, and xr.

Kaman Deng has pl, phl, bl, kl, khl, gl, pr, phr, br, kr, khr, gr, and xr.

Trung has pl, bl, ml, kl, gl, pr, br, mr, kr, gr, and xr.

Karen, in complete accord with Deng and Trung in both type and number, also has clusters consisting basically of consonants plus the lateral -l or consonants plus the liquid -r.[3]

Fugong Nung has pr, phr, br, mr, fr, vr, khr, gr, and xr.

Jinghpo has pr, phr, kr, and khr.

Achang has pʐ, phʐ, mʐ, kʐ, khʐ, and xʐ.

Bijiang Nung has pr, phr, br, mr, mr, kr, khr, gr, xr, fr, and vr.

Individual Yi languages also have consonant clusters. For example, Jino has pr, phr, mr, kr, and khr.

(2) Type FC

In FC type consonant clusters, as F (the prefixal sound) fricatives, nasals, trills, laterals, and semivowels occur, and as C (the basic sound) stops, affricates, nasals, and laterals appear. For example in Ergong, there are 132 different consonant clusters. The main types are mp, mph, mb, mts, mtsh, mdz, mdʐ, mkh...; nt, nd, nl, ntsh, ntʂh, ntɕ, nkh, ng, nqh...; wb, wph, wm, wl, wd, wth, wtɕh, wdʐ, wɲ...; vts, vtsh, vt, vd, vl, vtɕ, vtɕh, vdʐ,

vkh...; sp, sph, sm, st, sth, stɕ, stɕh, sn, sk, sqh...; zb, zd, zl, zdz, zdʑ, zk, zg, zŋ...; lp, lb, lm, lt, ldz, ld, lk, lg, lŋ, lɣ...; ʐph, ʐb, ʐm, ʐts, ztsh, ʐt, ʐd, ʐl, ʐg, ʐŋ, ʐq...; ɦm, ɦt, ɦd, ɦn, ɦl, ɦtɕ, ɦn, ɦŋ...

In Gyarung there are 119 FC type consonant clusters, similar in structure to those of Ergong. In these clusters, the prefixal element is usually ʃ-, ʒ-, r-, or j- (but they do not have the Ergong w-, v-, ɦ-, or ʐ-). In Qiang the prefixal element is a little bit different. For instance, in Mawo the prefixal elements are r̥, r, s, z, ɕ, ʐ, x, ɣ, χ, and ʁ, producing clusters such as r̥p, r̥t, r̥k, r̥ts, rp, rb, rd, rk, rg, rm, sp, st, sk, sq, zb, zd, zg, ɕp, ɕk, ɕq, xp, xts, xtɕ, xtʃ, xl, ɣb, ɣdz, ɣdʒ, χp, χt, χtʂ, χl, ʁd, ʁdz, ʁdʑ, ʁl, ʁŋ...

In Amdo Tibetan most consonant clusters are retained. In Zeku there are 85 FC type consonant clusters, constructed mainly with the prefixal elements ɣ-, m-, n-, v-, and w-.

In certain regions, as in some languages of the Qiang branch and some dialects of Amdo Tibetan the prefixal elements (F) are often simplified into one or two consonants. For example, in Ersu, there are just n- and h-: nph, nb, ntsh, nth, ndʒ, ntɕh, ndʑ, nkh, ng..., hp, hts, ht, htʂ, htʃ, htɕ, hk. Pumi has only s-: sp, sph, sb, st, sth, sd, stʃ, stʃh, sdʒ, sk, skh, sg, sq, sqh, sG. Guiqiong has only n-: np, nph, nb, nt, nth, nd, nts, ntsh, ndz, ntʂ, ntʂh, ndʐ, ntʃ, ntʃh, ndʒ, ntɕ, ntɕh, ndʑ, nk, nkh, ng.

Although most Yi languages no longer have clusters, some Yi languages or dialects still keep the prenasalized clusters. For example, in Xide (Yi) and in Naxi nb, nd, ng, ndz, ndʐ, and ndʑ are found. A similar situation exists in the Zhaba language of Qiang, in the K'ang dialect of Tibetan, and in Baima.

From this, it is already clear that there are three types of nasals as prefixal F: (1) One case is exemplified by Ergong, Gyarung, and Zeku Tibetan, where in the same system not only is the nasal m- found in combination with consonants of different places of articulation (e.g., mt, mts, mtɕ, md, mg, mdʑ, etc.) but nasals are also found in combination with consonants of the same place of articulation e.g., nt, nts, ntɕ, nd, ng, ndʑ, etc. The second case is exemplified by Ersu and Guiqiong, where the nasal has already simplified to prenasalization at the basic place of articulation, but where the prenasalization occurs in combination with voiceless unaspirated and voiceless aspirated sounds as well as with voiced sounds. The third is exemplified by various dialects of Yi, Qiang, and Tibetan, where the prenasalization is restricted not only to the same place of articulation but also just to combinations involving voiced stops or voiced affricates.

In addition, among the clusters of a few Tibeto-Burman languages, there is preglottalization. For example in Fugong Nung, the following occur: ʔb, ʔd, ʔd, ʔg, ʔdz, ʔdʐ, ʔdʑ, ʔm, ʔn, ʔn, and ʔŋ.

Overall, FC clusters in Tibeto-Burman have a clear geographical distribution. In the eastern Qinghai and southern Gansu herding areas as well as in parts of northwest Sichuan, there are generally upwards of 40 comparatively complex clusters reflecting rather completely the history of the sounds; these may be exemplified by Zeku Tibetan, Mawo Qiang, Ergong, and Gyarung. In the southern Gansu agricultural areas and western Sichuan, there are generally between 15 to 40 largely simplified combinations; these may be exemplified by Qinghua Pumi, Ersu, Tauping Qiang, and Guiqiong. In the Szechwan, Yunnan, and Guizhou areas, there are generally less than 10 combinations. Moreover, more than half are combinations of prenasalization with voiced stops or voiced affricates. Further, in these areas, there are not a few Tibeto-Burman languages and dialects which are already without any clusters at all.

(3) Type CC

Type CC clusters consist of two sounds that are pronounced at different places of articulation but which follow the regular phonological rules for the formation of clusters. In the few languages in which these have been kept, the combinations involve stops, affricates, nasals, fricatives, and semi-vowels. For example in the Zeku dialect of Amdo Tibetan, there are 6 patterns involving both stop-plus-stop and stop-plus-affricate combinations: pt, pk, pts, ptʂ, ptɕ, pcʂ. In Suomo Gyarung, there are 18 cluster combinations: pt, pth, pk, pkh, bd, kp, kph, kt, gb, pts, ptʂ, ptʃ, pcʂ, kts, ktʂ, ktʃ, tsʃh, kcʂ. In Ergong, there are three combinations involving nasal-plus-nasal: mn, mɲ, mŋ; there are 20 combinations involving fricative-plus-fricative: vs, vz, vʐ, vɕ, vɸh, vɤ, sʐ, sx, zv, zʐ, zɣ, zʁ, ʐv, ʐz, ʐʐ, ʐɣ, ʐʁ, ɦv, ɦz, ɦʐ; and, there are six combinations of fricative plus semi-vowel: vj, ʐj, ɦj, ʐw, ʐɯ, wj.

(4) Type FCB

These three-part clusters are basically a combination of FC and CB clusters, in which two parts of the cluster generally share a place of articulation. For example in Ergong, there are 23 three-part clusters: mphʂ, mphɕ, mbʐ, mbl, mkhʂ, mkhl, nkʂ, nkhʂ, ngʐ, vkʂ, vqhl, spʂ, sphʂ, sphɕ, skʂ, skhʂ, sqʂ, sqhʂ, sql, sqhl, zbʐ, zgʐ, zphɕ. In Gyarung, there are a number of three-part clusters; for instance in Suomo, there are 21 three-part clusters: spr, skr, spj, zbr, zbj, ʃpr, ʃkr, ʃkl, ʒgr, mphr, mbr, mkr, mphʃ, mpj, mbj, ndzr, ŋkr, ŋkhr, ŋgr, ŋgl.

In contrast to those in Ergong and Gyarung, the FCB clusters in Ersu, Namuyi, and Deng are comparatively rare as most have been simplified. For example in Ganluo Ersu, there are only five: mphs, mbz, mphʂ, mbʐ, hphs. In Kaman Deng, there are four: mphl,mphr, ŋkhl, ŋkhr. In Namuyi, there are four: mphs, mbz, mphʂ, mbʐ.

In Ergong and Gyarung, they still have a few FCC, CCB, and FFC clusters. For example, in Ergong, there are nzʐ, nzɣ; in Suomo Gyarung, there are pkr, wzd; and, in Zhuokeji Gyarung, there are kpj, psr, pst, jndʐ. Some cluster have a low frequency with no systematicity in their combinations, but most of these do not appear as the initials of the first syllable in compounds, therefore they are not particularly important.

In the consonant clusters discussed above, the overwhelming tendency in the spoken languages is toward simplification or loss, but with the exact form of the change being different in each case. In CB clusters, the major type of change is the weakening of the following segment or its merger with the main element; in FC clusters, the major types of change are the loss of the prefixal sound or the prefixal sound being separated from the cluster and made into an independent syllable; and in CC clusters the major changes are loss and replacement. However, with FC clusters the changes are different. In FC clusters the typical process is loss of the F, but in CC clusters the process involves loss of either the first or the second element, but not in any regular way. In FCB clusters, the FC behaves as do FC clusters, while the CB element behaves like CB clusters. Metathesis of consonant clusters also occurs, but this is not common.

2 - Types of change and tendencies toward change in clusters

As discussed above, in the clusters of Tibeto-Burman languages the overwhelming tendency is toward simplification and loss; in the majority of

the languages, the clusters are reduced---in some of them the clusters have already completely disappeared.

In comparison of different languages, we see that, although the details of the change are different in each language, basically the changes fall into the following categories:

(1) Loss

In FC type clusters, most often the prefixal F has disappeared. For example:

	语言	garlic 大蒜	nine 九	steal 偷	smell 闻（嗅）	silver 银子
Written Tibetan	藏文	sgogpa	dgu	rku	snom	dŋul
Zeku Tibetan	泽库藏语	ɣgokkwa	rgə	rkə	rŋəm	rŋu
Ergong	尔龚语	ɣoskɯ	ngiɛ	——	snɯno	ʐŋan
Tauping Qiang	桃坪羌语	Xkə˥	Xguə˧	Xkə˥	Xmi˥	Xŋu˥
Pumi	普米语	skɯ˥	sgiɯ˥	skiɯɯ˥	ŋiə˥	ŋɑ̃u˥
Lhasa Tibetan	拉萨藏语	kok˩pa˥	ku˩	ky?˥	num˥	ŋy˥
Muya	木雅语	kɯ˥	ŋguɯ˥	kɯ˥	nɯ˥	ŋu˥
Xide Yi	喜德彝语	ka˧si˧	gu˧	khu˧	ni˩	tchu˧
Lijiang Naxi	丽江纳西语	kv˧	gv˧	khv˧	nv˩	ŋv˩
Zhaba	扎巴语	kɯ˥	gɯ˥	ku˥	nũ˥	ŋui˥
Zaiwa	载瓦语	——	kau˩	khau˩	nam˥	ŋun˥
Bozhar Luoba	博嘎尔珞巴语	kuk	konoŋ	——	nam	ŋi:
Burmese	缅语	krɑk(—)	ko˥	kho˥	nam˥	ŋwe˩
Achang	阿昌语	kǎ˩sun˥	kau˩	xau˩	nam˩	ŋui˥

In the examples in the above chart, Written Tibetan, Zeku Tibetan, Ergong, Qiang, and Pumi basically keep their clusters, although in Pumi the prefixal nasal F elements have already been lost. In the other languages or dialects, except for the n- kept in Muya 'nine', the F in FC clusters has been completely lost.

	语言	sound 声音	bile 苦胆	straight 直	snake 蛇
Written Tibetan	藏文	sgra	mkhrispa	ɦdroŋpo	sbrul
Zeku Tibetan	泽库藏语	ɣdʐa	mtʂhiwa	tʂaŋmo	ru
Gyarung	嘉绒语	(tə)skʊk	(tə)mdʒəkri	(ka)sto	khabre
Ergong	尔龚语	skiɛ	skʐɯ	lthøthɯ	mphʂi
Tauping Qiang	桃坪羌语	tchi˥	Xtʂə˥	Xtə˥	bə˩guə˩
Pumi	普米语	tʂhɑ̃u˥	tʂə˥	stu˥	bʊ˥ʐɑ˥
Lhasa Tibetan	拉萨藏语	tʂa˩	tʂhi?˥pa˥	tʂhaŋ˩ko˥	tʂy˩
Muya	木雅语	kʊ˥	tʂɯ˥	tɯ˧tɯ˥	ʐo˥
Xide Yi	喜德彝语	fu˧dzi˧	tɕ˧	dzo˩	bu˧ʂ˧
Lijiang Naxi	丽江纳西语	kho˧	kuv˩	tv˥tv˧	ʐɯ˩
Zhaba	扎巴语	kho˥	tʂhi˥pɛ˥	tõ˧tõ˥	bru˥
Trung	独龙语	ɑŋ˩sɑ̃?˥	tɕi˩xɹi˥	sm˩tu˥	bɯ˥
Jinghpo	景颇语	n˩sen˥	sǎ˩kɹi˩	tiŋ˧	lǎ˩pu˧

In the comparative materials for some languages and dialects, we can still see FC and FCB type clusters. When the F decays, it is first simplified or combined, then weakened, and then finally lost completely. For example, in Tibetan dialects the following situation exists:

	汉义	Written Tibetan 藏文	Zeku Tibetan 泽库藏语	Xiahe Tibetan 夏河藏语	Lhasa Tibetan 拉萨藏语
pour into	灌	blug	wlək	hlək	luʔʏ
tiger	老虎	stag	rtak	htak	taʔʏ
red	红	dmarpo	ɣmaro	hmaro	ma˥poʏ
horse	马	rta	rta	hta	taʏ
see	看	lta	rta	hta	tɛʔʏ
moon	月亮	zla ba	rdawa	hdawa	taˎwaˎ
sky	天	gnam	ɣnam	hnam	nam˥
spin	旋转	fikhor	nkhor	hkor	khɔ˥
head	头	mgo	ngo	ngo	koˎ

The patterns of change in the examples above can also be expressed in the chart below:

Written Tibetan	Zeku Tibetan	Xiahe Tibetan	Lhasa Tibetan
b-	w-	h-	ø
s-, r-, l-, z-	r-		
d-, g-	ɣ-		
h-, m-	n-	n-	

In the above chart it can be seen that Written Tibetan reflects the original prefixal system. In the dialect of modern Amdo Tibetan spoken in the herding areas, the prefixal elements are still kept, but in the dialect spoken in the agricultural areas only traces remain. In the Wei dialect of Lhasa Tibetan, these have been completely lost.

These phenomena can be observed quite clearly in the sound correspondences among cognates in the different Qiang languages.

	汉义	Ergong 尔龚语	Gyarung 嘉绒语	Mawo Qiang 麻窝羌语	Tauping Qiang 桃坪羌语	Pumi 普米语	Muya 木雅语	Shixing 史兴语
straight	直	lthøthɯ	(ka)sto	stəɾ	Xtə˥	stu˥	tɯɬtɯʏ	tɑ˥tu˥
bile	苦胆	skʐɯ	təmdʒəkri	xtʂə	Xtʂə˥	tʂə˥	tʂɯʏ	tɕɛ˥
name	名字	lmɯ	tərmɛ	rmə	Xmə˥	ma˥	miʏ	mɛ̃˥

nine	九	ŋgiɛ	kəngu	rguə	Xguəɬ	sgituˀ	nguɯˀ	guɐɬ
cloud	云	zdomɛ	zdɪm	zdʏm	Xdeɬ	sdīˀ	ndɯɬzɐˀ	tɕiˀɣɑ̄ɬ
garlic	蒜	(—)skɯ	(-)ʃko	(-)ʂkə	Xkəˀ	skɯˀ	kɯˀ	kuɐˀ
louse	虱子	wɕau	sor	xtʂə	Xtʂiɬ	ʃiˀ	tshʊˀmʊˀ	——
hard	硬	zgi	kərko	ʂkuʂtɕi	Xkuˀtɕɑɻ	tʂõˀ	nɢuɑɬŋɢuɑˀ	dzɔ̃ˀ
kidney	肾	zʏɛlɛ	təmbotʊm	ʂpulu	Xpəɬloˀ	spõˀɣõɻ	pʁˀlʁˀ	——
star	星星	zgzɐ	tsəuri	ʁdzə	Xdzɐɬpeˀ	dzəɻ	dziˀvuɬ	tɕɛˀ

The groups of words in the above chart show clearly that in Ergong, Gyarung, and Mawo Qiang six prefixal sounds occur, but in Tauping Qiang, Pumi, and Muya, only one does. χ occurs in Tauping Qiang and s in Pumi; both are voiceless fricatives and in each of the three languages the prefixal sounds have a definite relationship to each other. However, in Pumi the s element is already lost, in Muya only a few homorganic nasal prefixes are kept, and in Shixing the elements are already gone. These kinds of changes reflect similar tendencies throughout Tibeto-Burman. Nonetheless, the sound changes are extremely complicated. In some spoken languages with FC clusters, sometimes it is not the F but the C which is lost, with the F being retained. For example:

		tongue	heavy	flea	lick
	语言	舌头	重	跳蚤	舔
Written Tibetan	藏文	ltɕe	ldzidpo	ldziba	rdag
Zeku Tibetan	泽库藏语	rtɕi	rdzəmo	rdze	rdak
Xiahe Tibetan	夏河藏语	htɕe	ndzəmo	hdze	htak
Lhasa Tibetan	拉萨藏语	tɕeʏ	tɕiɻpuʏ	tɕoɻ	taˀɻ
Cuona Menpa	错那门巴语	leʏ	liˀpoʏ	liuˀ	klʌɻ
Qinghua Pumi	箐花普米语	ɬieˀqhoˀ	laˀ	ɬaˀ	tʂɑɻ
Nandong Yi	南涧彝语	lɑˀ	l(ɪ)ɻ	——	laɻ
Tujia	土家语	jiɬlaˀ	tuˀ	liˀliɻ	laɬ
Zhaba	扎巴语	ɬoʏ	laiɬlaiˀ	ɬaiˀ	ləɬpuˀdzɯʏ
Ergong	尔龚语	vzɛ	ldɯ	ɣɯu	nɤialа

As can be seen in the word groups in the above chart, in the Tibetan dialects prefixal elements are lost, but this is not restricted just to Tibetan but occurs generally in the majority of Tibeto-Burman languages and dialects. In FCB type clusters, the process of change also involves some weakening and certain elements of the clusters may be lost. For example:

		horse	high	see	bow
	语言	马	高	看见	箭
Proto-Tibeto-B.	原始藏缅语	*mbro(mgro)	*mdro(mbro)	*mdroŋ	*mdla
Gyarung	嘉绒语	mbro	(kə)mbro	(kə)mto	kəpɛ
Written Tibetan	藏文	rta	mthopo	mthoŋ	mdaṅ
Lhasa Tibetan	拉萨藏语	taʏ	thoʏpoʏ	thoŋˀ	taɻ
Tauping Qiang	桃坪羌语	ʐuˀ	buɬ	tɕyɬ	ləɬ
Mawo Qiang	麻窝羌语	ɹu	buɹ	(-)tiu	ɣdʒa
Pumi	普米语	sgyɛ̃ɻ	sgyɛ̃ˀ	tsuɑˀ	iɛˀsiɛ̃ˀ
Shixing	史兴语	ɣɔ̃ɬ	ɣɛ̃ɬ	dɔ̃ɬ	lyɛɬsəˀ

Ergong	尔龚语	ʐɣi	bzi	vdo	mdɔŋ
Zhaba	扎巴语	gi˥	thɣ̃˧thɣ̃˧	dɑ̃˧do˧	nd^{ɦ}˥
Namuyi	纳木义语	mo˦	da˧mo˦	ndo˦	li˧
Muya	木雅语	ɣui˥	thø˦thø˥	tø˧rɔ˧	zɯ˦ntʂhɑ˦
Ersu	尔苏语	mbo˦	jɑ˦mbo˧	ndo˦	ma˨˧
Guiqiong	贵琼语	mbu˥	thø˧nthø˧	tɕi˧tɕɔ̃˧	dzi˥
Xide Yi	喜德彝语	m(u)˦	m̩(u)˧	ɣɯ˨˩mo˦	hi˦
Lijiang Naxi	丽江纳西语	ʐuɑ˦	ʂuɑ˨˩	ly˨˩do˨˩	lɯ˦sɯ˦
Burmese	缅文	mraŋ˧	mraŋ˦	mraŋ˨	hmra˧
Achang	阿昌语	m̩ʐaŋ˨˩	m̩ʐaŋ˧	en˨˩mʐaŋ˧	kaŋ˦m̩ʐua˥
Jino	基诺语	mjo˦	mjo˨˩	mj^{ɦ}˦	lɯ˦tchø˦
Lisu	傈僳语	ɑ˧mo˨˩	mo˦	mo˦	tʃɛ˦tʃɯ˥
Zaiwa	载瓦语	mjaŋ˨	mjaŋ˦	mjaŋ˦	lai˨mjo˨

As the word groups in the chart above indicate, the processes of change in these sounds are very complicated, but if our assumptions about proto-Tibeto-Burman are believable, we can say that although change could affect any element of a cluster in some language or other, in a specific language or languages any such changes were quite regular. For example, proto-Tibeto-Burman FCB clusters are in part retained in Gyarung but the FC element is in part changed. In Qiang FC clusters, the F is sometimes lost, sometimes the B. In Yi and Lisu the majority of CB clusters are lost, but in Burmese, Achang, Jino, and Zaiwa, the C is lost.

(2) Mergers

In the historical process of change, the elements of a cluster mutually influence one another; from a comparatively loose union in the beginning, these elements change, first tightening and then blending into a single phonological unit. This kind of change can be seen mainly in CB or FCB clusters. For example:

		Written Tibetan	Zeku Tibetan	Xiahe Tibetan	Dege Tibetan	Lhasa Tibetan
	汉义	藏文	泽库藏语	夏河藏语	德格藏语	拉萨藏语
write	写	bri	ndzə	tʂi	tʂi˨	tʂhi?˨
mule	骡子	drel	ptʂi	tʂi	tʂi˨˩	tʂhe˩
boat	船	gru	tʂə	tʂə	tʂu˨	tʂhu˨
ant	蚂蚁	grogma	cçokma	tɕokma	tʂuŋ˨˩ma˦	tʂho˨˩ma?˨
wheat	小麦	gro	cço	tɕo	tʂo˨	tʂho˨
10,000	万	khri	tʂhə	tʂhə	tʂhi˦	tʂhi˦
blood	血	khrag	cçhak	tɕhak	tʂha?˦	tʂha?˦
otter	水獭	sram	ʂam	ʂam	saŋ˧	tʂam˧
pea	豌豆	sramma	ʂan ma	ʂan ma	sen˧ma˦	tʂɛ̃˧ma˨

From Written Tibetan and the correspondences among modern Tibetan dialects, we can see that in Tibetan CB clusters, if B was r, the change is generally of the form below:

Written Tibetan	Zeku Tibetan	Xiahe Tibetan	Dege Tibetan	Lhasa Tibetan
br, dr	tʂ	tʂ	tʂ	
gr	tʂ, cʂ	tʂ, tʃ		tʂ
kr	tʂ, cʂ	tʂ, tʃ	tʂ	tʂh
sr	ʂ	ʂ	s	tʂ

If the B is j, then form of the changes is slightly different:

	汉义	W. Tibetan 藏文	Zeku 泽库藏语	Xiahe 夏河藏语	Dege 德格藏语	Lhasa 拉萨藏语
bird	鸟	bja	wca	ca	caɹdi˥	tchaɹ
rich	富	phjug po	wcək kə	cək kwo	chu?˥po˥	tchuk˥pu˥
wall	墙	gjaŋ	cçaŋ	tcaŋ	tcõɹ	caŋ˩
borrow	借	gjar	ɣjar	hiar	ja˥	ja˩
right	右边	gjaspa	ɣji	hje	jɛ˩pa˥	jɛ˩gɔ?ɹ
dog	狗	khji	cçhə	tchə	tchi˥	chi˥

As the above examples show, clusters with a following j element are not identical in their behavior. When a bilabial occurs with j, the change is to a palatal sound; when a velar occurs with j, the change in Zeku and Lhasa is to an apical sound but the change in Xiahe and Dege is to a palatal one. In contrast, the combination gj changes into hj or j.

As previously noted, in FCB clusters, the F is often simply lost, while the B often merges with the C.

	汉义	W. Tibetan 藏文	Zeku Tibetan 泽库藏语	Xiahe T. 夏河藏语	Dege T. 德格藏语	Lhasa T. 拉萨藏语
wipe (table)	擦(桌)	fiphjid	wcə	ci	che˥	tchi?˥
Han (people)	汉(族)	rgja	rɟja	hdza	dza˥	caɹ
insane	疯子	smjonpa	wɲomba	ɲonpa	ɲen˩ba˥	ɲom˩pa˥
walk	走	figro	ndzo	ndzo	ndzo̱ɹ	tsoɹ
swell	肿	skraŋ	rcçaŋ	htcaŋ	tsuŋ˩	tsaŋ˥
twist (rope)	搓	sbrim		hdzəm	dzinɹ	tsim˩

In Burmese, a similar situation occurs. From inscriptions, we know that in Old Burmese CB clusters, one of at least three distinct elements could be the B element: -l, -r, or -j. In the modern Burmese spoken in Rangoon, only the -j remains. The clusters of a velar stop with -l, -r, or -j have already combined, merging into palatal affricates. For example:

	Written Burmese 缅文 (Insc.)	Rangoon Burmese 仰光缅语		Written Burmese 缅文	Rangoon Burmese 仰光缅语
religious book	klam˩	tcā˩	extinguish	ŋrim˩	ni˩
throw down	khla˥	tcha˥	front	hre˥	ce˥

grind	krit˥	tce²˥	chicken pox	kjɔk˥	tcau²˥
rub; erase	khras˥	tche²˥	dung	khje˥	tchi˥
star	groh˩	dzo˩	wheat	gjum˩	dzõ˩

From the examples above, it can be seen that in Burmese velar and alveolar consonants undergo regular changes, when combined with -l, -r, or -j:

kl, kr, kj ——> kj ——> tɕ
khl, khr, khj ——> khj ——> tɕʰ
nl, nr, nj ——> nj ——> ɲ
gl, gr, gj ——> gj ——> dʑ
hl, hr, hj ——> hj ——> ɕ

However, when the initial sound which combines with -l, -r, or -j is bilabial, the combination does not merge into a single sound. On this point, Burmese differs from Tibetan.

	汉义	W. Burmese 缅文	Rangoon B. 仰光缅语	汉义	W. Burmese 缅文	Rangoon B. 仰光缅语
do	做	plu˩ (碑文)	pju˩	bee 蜜蜂	pja˥	pja˥
say	说	prɔ˥ (Inscrpt.)	pjɔ˥	disease 病	phja˥	phja˥
comb (hair)	梳(头)	phri˥	phji˥	monkey 猴子	mjɔk˥	mjau²˥
town	城	mro˩	mjo˩			

In the changes of Tibetan and Burmese, the CB clusters appear with -l,-r, and -j as the following element, but in Qiang clusters also appear with -s, -z, -s, -z, -c, -z, and -r as the following element. In this kind of cluster C is most often velar or uvular with few bilabial sounds; in this, Qiang is similar to Burmese.

	汉义	Mawo Qiang 麻窝羌语	Tauping Qiang 桃坪羌语	汉义	Mawo Q. 麻窝羌语	Tauping Q. 桃坪羌语
god	神	khsi	tshie˦	feces 屎	qhʂə	tʃhi˦
marry (f.)	娘	gziuk	dzi˩	four 四	gχə	dʒi˦
jump	跳	qhsu	tshu˦	leaf 叶子	khɑɑq	tchɑ˥qə˦
100	百	kh(ɹ)iɹ	tʂhi˥	wooden 揉面木盆 bowl	gzuku	dzu˦ku˦
strength	力气	g(ɹ)ə˦quɹ	dzi˦qɑ˦			

The merger in CB and FCB clusters appears mainly between the C and B elements. In our analysis of the evidence, it can be noted that this kind of historical change is actually regressive assimilation. In clusters, the position of the C element is influenced by the B, making the C change to the same position of articulation as the B. In the process of change, the B itself gradually weakens, loses its independent quality, becomes an intermediate sound attached to the stop, and finally little by little merges with the stop into a single, one-element affricate.

(3) Splits

In a long period of historical sound change, splits of clusters into single consonants are a type of transitional process. Splits occur affecting the first consonant in a consonant cluster (mainly a FC or FCB cluster) of a single syllable. In these cases, a tendency exists for the F element to form a new syllable with a clear relationship to the original sound group from which it developed. The consonant of the new syllable still provides certain

evidence of the place of articulation of the original sound, while the vowel is short and unstressed; very few of these syllables have a final consonant.

In some clusters certain elements split off into separate syllables. This type of change can be delimited geographically, appearing in India and some minority languages in the Burmese border areas.

	语言	otter 水獭	three 三	connect 连接	five 五
Written Tibetan	藏文	sram	gsum	mthud(-)	lŋa
Ergong	尔龚语	sʐɛm	wshu	lthiɛ	wŋuɛ
Gyarung	嘉绒语	(-)sram	kəsam	(-)nthət	(kə)mŋo
Mawo Qiang	麻窝羌语	ɣdzi	khsi	zdə	ʁuɑ
Trung	独龙语	swɹɹɑ̃mɣ	ɑɹsɯ̃mɣ	swɹtɔtˀ	pɯɹŋɑɣ
Jinghpo	景颇语	ʃăɹɹamɨ	măɹsumɨ	măɹthɥtˀ	măŋaɨ
Taruang	达让僜语	xɑɹɹɯŋˀ	kɑɹsɯŋˀ	mɑˀthoˀ	mɑɹŋɑˀ
Bogar	博嘎尔珞巴语	cəram	a ɦum	mo:cit	oŋɔ
Kaman	格曼僜语	ɹɑmˀ	kɯɹsɑ̃mɣ	dɑ̃uɣniˀ	kɯɹlenˀ
Idu Luoba	义都珞巴语	ɑˀɹɯˀroŋˀ	kɑɹsoŋˀ	mɑˀthoˀ	mɑɹŋɑˀ

From the groups of examples in the above chart, it can be seen that Written Tibetan, Ergong, Gyarung, and Mawo Qiang have consonant clusters, but in Trung, Jinghpo, Taruang, Bogar Luoba, Kaman Deng, and Idu Luoba the initial consonant has almost completely become another syllable but the consonant of this syllable has an obvious regular correspondence with the initial sound in the cluster.

The rest of the languages also have splits but this kind of phenomenon is obvious only in Trung, Jinghpo, and Kaman Deng. Please see the chart below:

		W. Tibetan	Mawo Qiang	Gyarung
new	新	gsarpa	khsə	kəʃək
moon	月亮	zlaba	tʃhəʂa	tsəlɛ
three	三	gsum	khsi	kəsam
stone	石头	rdo	ʁlu(pi)	ɟjələk
two	二	gɲis	ɣnə	kənɛs
six	六	drug	χtʂu	kətʂok

As these examples chart show, in Written Tibetan and Mawo Qiang the cluster is in one syllable, but in Gyarung it has already split into two. This type of split not only appears in FC clusters but also in CB clusters; however, even in Trung and Jinghpo, it is relatively restricted.

Maybe some people question whether this kind of sound change exists in Tibeto-Burman. Consider, for example, when we compare Written Tibetan zla ba 'moon' and Trung s 31 la 55; Tibetan sram 'otter' and Trung s 31 am 53; Written Tibetan sna 'nose' and Trung s 31 n 55 etc., can we tell which is closer to the original form? Still one knows that in FC and FCB clusters the F was a prefix, a morpheme with a certain meaning. How then may we view this phenomenon?

We investigated the tendencies toward change in certain Tibeto-Burman languages, examining in each language the traces left behind from earlier consonant clusters and examining the relationship of certain sound elements in the clusters to prefixes. From this, certain facts have become clearer:

First, the splitting up of TB clusters into two syllables is a process that occurred sporadically at widely distant points in time. The pressure towards polysyllabicity (i.e., toward the development of two syllables from the split of an earlier cluster) is only partial; in Tibeto-Burman languages, this is not a universal tendency.

Second, the correspondences between bisyllabic or polysyllabic forms and consonant clusters involves only a small number of consonant clusters; this type of analysis cannot explain all the processes of change in consonant clusters.

Third, in the process of historical sound change, evidence exists for the split up of FC, CB, and CC clusters. If the original form was not a cluster, the phonetic changes cannot be explained. As an example found in some Tibeto-Burman languages, take the word 'six':

W. Burmese	khrɔkˀ	Cuona Menpa	kroʔˀ	Trung	kɹŭʔˀ
Taruang	tɑˬxɹoˀ	Qinghua Pumi	tʂhuˬ	Nanhua Yi	tɕhoˀ
Achang	xɹoʔˀ	Zaiwa	khjuʔˀ	Mutuo Menpa	khuŋ
Nandong Yi	khọˬ	Hani	kụˬ	Bozhar Luoba	akɯ
Namuyi	qhuˬ	Lahu	khẓˬ	Fugong Nu	kuŋˀ

As these forms show, in some languages the -r is lost from consonant clusters. In the Yi languages Nandong, Hani, and Lahu the rhyme has glottal constriction but this is frequently the residue left behind from the loss of a final -k. (If this type of cluster is reduced, it is unlikely that the same syllable will carry not only the consonant from the beginning of the syllable but also the final from the end of the syllable.)

Fourth, worthy of notice are syllables with simple vowels that clearly correspond to certain sound elements of clusters. Rhymes with diphthongs or syllable final consonants are extremely rare. The roots of proto-Sino-Tibetan must have been monosyllabic; it is not very likely that these roots have resulted from the merger of polysyllabic forms into monosyllables.

Fifth, the historical behavior of prefixes is not quite the same as that of elements in true consonant clusters. In certain modern languages, the distinction between true prefixes and prefixal syllables which have come from the split up of consonant clusters is clear: the former often have an obvious grammatical meaning; the latter do not. The former are comparatively productive, often serving to put a word into a different form class. The latter do not behave this way. Prefixes may also sometimes occur before syllables which have come from the split up of consonant clusters in the same construction e.g., the previously discussed Trung word sɯ̃ 31 tɔt 55 'connect' may itself be preceded by the grammatical prefix marking causativity.

(4) Replacements

Replacements occur when in the course of the historical change of clusters one sound element replaces another. These replacements have a certain regularity. In Tibeto-Burman languages, these replacements exhibit two distinct qualities. The first involves the replacement of positionally fixed but phonetically different prefixal elements by another element. For example, we have already mentioned the evidence of FC or FCB clusters in Tibetan dialects, where the F in Written Tibetan may have been b, s, r, l, z, d, g, h, or m, but in modern Zeku Tibetan these have been replaced by w, r, ɣ, or n, and

in Xiahe Tibetan these have been replaced by h and n. There is a similar situation in Qiang, where in the northern Qiang language Mawo the phonetically distinct prefixes s, x, z, ʂ, ɾ, ʐ, x, ɣ, χ, and ʁ are found, but in southern Qiang Tauping all of these have been replaced by χ, and in Pumi they have been replaced by s.

In the above discussion of the historical process of replacement found in the changes of FC and FCB consonant clusters, the changes reflect the transition period between weakening and loss. In the previous discussion, it was clear that in Lhasa and Shixing Tibetan the prefixal F has been completely lost.

Another kind of regular replacement also exists. In this case, the place of articulation or the pronunciation rules are the same for the sounds involved. This kind of replacement is needed for the regularization of the phonological system. This differs from the above in that the replacements we have beeen discussing above mainly involve tendencies toward merger, while this kind of replacement tends towards splits. In Mawo Qiang, for example, the -n- element of PTB *sn- clusters has been replaced by -t-.

	ear of grain	seven	heart	nose
	穗子	七	心脏	鼻子
Mawo Qiang	stɑq	stə	sti:mi	stʏq
Tauping Qiang	χtiˈqəˈ	ciɡˈ	χtieˈməˈ	χniˈqoˈpəˈ
Written Tibetan	snɐma	bdun	sniŋ	sna
Zeku Tibetan	rɲəma	wdən	rɲaŋ	rɲa
Ergong	snozˌmɛ	snie	zɣiaˈ	sni
Gyarung	tʉthʉs	kəʃnəs	təʃnɛ	təʃna
Written Burmese	ɑ hnɑmˌ	khuˈnɑsˈ	hnɑˈlumˈ	hnɑˌkhɔŋˈ
Tauba Pumi	ɲiˈ	ɲīˈ	xuɛˈ	ɲəˈɣiāˈ

Similar evidence is found in several other Tibeto-Burman languages. For example, some Written Tibetan words with dr- or hdr- correspond to words elsewhere with kr-, gr-, or k-. Consider the examples grouped below:

(1) Written Tibetan drel 'mule', Cuona Menba kre? 35, Trung tɯ 31 kʌi 55, Gyarung tɐrkɐ, Tauping Qiang ke 31 tɕe 33, Xide Yi ku 44 l(u) 33.

(2) Written Tibetan hdrecig 'bedbug', Trung gʌe 55 ɕĭ? 55, Jinghpo ʃă 55 kʌep 55, Kaman Deng mɯ 31 klap 53, Yongning Naxi kua 33 ʂe 33, Written Burmese kraṁ 55 po 55, Zeku Tibetan rʒjaɡak.

(3) Written Tibetan dris 'ask', Trung kʌi 55, Muya khi 55 mɯ 53, Ergong zɣie, Guiqiong nkhɔ̃ 55.

(4) Written Tibetan dropo 'warm (weather)', Cuona Menba kro 13 po 53, Mutuo Menba gombo, Kaman Deng kʌo 55 ma 31 lam 55.

(5) Written Tibetan drug 'six', Cuona Menba kro? 53, Trung kʌŭ? 55, Written Burmese khrɔk 55, Taruang Deng ta 31 xʌo 53, Achang xʌo? 55, Mutuo Menba khuŋ, Namuyi qhu 33, Nandong Yi kho 31, Fugong Nung kuŋ 55, Lahu khɔ̄ 31.

(6) Written Tibetan hdrus 'dig', Zeku Tibetan rko, Xiahe Tibetan hke, Deqe Tibetan ko 53, Cuona Menba ko? 53, Ergong quɛi, Namuyi qɐ 35, Nanhua Yi kɐ 55, Nandong Yi kɯ 31, Tujia ka 53, Zaiwa khai 31, Trung kɔŋ 55, Kaman Deng gua 35, Bozhar Luoba ko:, Xide Yi ndu 33, Lisu du 31, Lijiang Naxi ndv 33, Written Burmese tu 55, Achang tu 31, Jino tu 33, Jinghpo thu 31.

From the six groups of examples above we can see that Written Tibetan words with dr or hdr correspond with Tibeto-Burman kr, gr, and k. In the rather interesting sixth set, Written Tibetan hdr corresponds in some Tibeto-

Burman dialects to rk and k, but clearly in other dialects the corresponding relationship is with t, d, and nd. In order to ascertain the proto-form it is necessary to do further research if we are to get a dependable answer.

Similar replacements are also seen in the clusters of other languages. For example, examine the word 'nine': In Written Tibetan it is dgu, in Trung dɯ 31 gɯ 53, and in Cuona Menba tu 31 ku 53. It seems like the Written Tibetan form is the original proto-form. However, different forms are seen elsewhere in Tibeto-Burman: Zeku Tibetan rgə, Mawo Qiang rguə, Gyarung kəngu, Ergong ŋgiɛ, Ersu ŋgɛ 33, Muya ŋgɯɯ 35, Namuyi ŋgu 33, Yongning Naxi ŋgv 33, Pumi sgiɯ 55, Jinghpo tʃă 31 khu 31. This kind of situation is perplexing: Which replaced which? Which is the original proto-Tibeto-Burman form?

(5) Metathesis

In sound change, metathesis occurs when segments switch positions in a cluster. Although the number of instances is limited, these are of considerable interest. Consider the examples below:

(1) 'forget': Ergong lmu, Mawo Qiang rmə, Tauping Qiang Xmi 55, Gyarung kɐjməs, Lijiang Naxi le 33 mi 55, Trung a 31 mlaŋ 55, Kaman Deng a 31 man 53 la 55, Jinghpo mă 31 lap 31, Lisu me 33 le 33, Hani mu 55 te 55, Zaiwa to 51 mji 55.

(2) 'dream': Ergong (ntshɛ) lma, Mawo Qiang rmu (ɓe), Tauping Qiang Xmu 55, Gyarung tarmo, Ersu ji 55 ma 55, Lahu zi 31 ma 53, Tauba Pumi ʑi 55 mi 55, Namuyi jy 33 mɛ 35, Dafang Yi ʑi 13 ma 55, Trung mlaŋ 55, Jinghpo (jup 31) maŋ 33, Bozhar Luoba (jup) moŋ.

(3) 'name': Ergong lmu, Mawo Qiang rmə, Tauping Qiang Xmə 55, Gyarung (tə) rmɐ, Trung (aŋ 31) bɹɯŋ 53, Jinghpo mjiŋ 33, Zaiwa mjiŋ 51, Zeku Tibetan mɲaŋ, Haya Hani mjɔ 55, Dafang Yi mie 33.

(4) 'plow (ground)': Written Tibetan rmonpa, Zeku Tibetan rmo, Trung mɹa 53, Xide Yi mo 33, Lisu ma 31, Cuona Menba mø? 53 jA 13, Tauping Qiang lie 33, Ersu la 55, Namuyi li 33, Jino li 31, Lijiang Naxi lɯ 31, Achang lə 31, Jinghpo kă 31 lau 31, Idu Luoba ka 55 liaŋ 55, Kaman Deng ka 31 liɔŋ 53.

In the four word groups above, two kinds of correspondences stand out clearly. One is Ergong lm- and Qiang rm- corresponding to Trung and Jinghpo ml-. In the third example the sound has become bɹ- in Trung, but here Jinghpo is still quite close to Trung, as can be seen by a comparison with Zaiwa mj-. It is very possible that bɹ- is from mɹ- or ml-, since in Tibeto-Burman the basic consonant of the word for 'name' is *m-. In the fourth example the Tibetan and the Trung are related but both have undergone considerable change obscuring their original form. In some Tibeto-Burman languages the basic sound is m-, while in others it is l-, making it possible for us to reconstruct the original form as *lm- or *ml-.

3 - The influence of specific elements on the syllable

In the process of weakening and loss of consonant clusters, certain elements often have an effect on the syllable. The most frequent of these influences can be seen in the examples below:

(1) The influence of the prefix on the main consonant

1. When nasals and laterals have a voiceless prefixal element, the loss of the voiceless prefixal element is often accompanied by the devoicing of the lateral or nasal. For example:

(1) Devoicing to m̥. 'medicine': Written Tibetan sman, Mawo Qiang sman,

Ergong smɛn, Gyarung smon, Zeku Tibetan rmən, Dege Tibetan min 55, Qinghua Pumi miɛ 55, Tauba Pumi mĩ 55, Zhaba mẽ 55, Shixing mĩ 55, Achang n̥ɔ 31.

'son': Ergong smɛŋa, Qinghua Pumi mi 55, Tauba Pumi mə 53.

'mushroom': Ergong lmɛu, Written Burmese hmo 11, Rangoon Burmese mo 11, Xide Yi m̥(u) 33.

(2) Devoicing *to* n̥. 'nose': Written Tibetan sna, Ergong sni, Gyarung (tə)ʃna, Trung sɯ 31 na 55, Zeku Tibetan rna, Xiahe Tibetan hna, Written Burmese hna 11, Dege Tibetan na 53, Tauba Pumi nə 35 ɣiã 53, Zhaba n̥a 35, Xide Yi n̥a 21 bi 55, Rangong Burmese n̥a 11, Achang n̥aŋ 55.

'smell': Written Tibetan snom, Ergong snono, Zeku Tibetan rmɔm, Xiahe Tibetan hnɔm, Dege Tibetan nuŋ 53, Shixing (by 55) n̥o 55, Qinghua Pumi n̥iə 55, Tauba Pumi nõ 35, Bijiang Nung n̥iau 31 tha 55.

(3) Devoicing *to* n̥ or n̥. 'ear of grain': Written Tibetan snɐma, Ergong snoɀmɐ, Xiahe Tibetan hnɐma, Written Burmese a 11 hnam 11, Dege Tibetan n̥i 55 qo 53, Zhaba n̥e 53, Qinghua Pumi n̥iə 55, Tauba Pumi n̥i 53, Xide Yi n̥i 33, Rangon Burmese a 11 nă 11, Achang tɐɔ 55 n̥am 55, Bijiang Nung n̥a 35.

'heart': Written Tibetan sn̥iŋ, Gyarung təʃnE, Zeku Tibetan rn̥aŋ, Xiahe Tibetan hn̥aŋ, Written Burmese hna 53 lum 55, Rangoon Burmese n̥a 53 lʊ̆ 55, Achang n̥a 55 lum 31.

(4) Devoicing *to* l̥ or ɬ. 'flea': Trung sɯ 31 li 53, Written Burmese hlo 55, Rangoon Burmese ɬe 55, Achang l̥i 31, Zhaba ɬai 55, Qinghua Pumi ɬa 55, Tauba Pumi ɬe 53.

'moon': Written Tibetan zlaba, Trung sɯ 31 la 55, Jino pu 33 ɬa 44, Haobai Hani pɔ 33 l̥ɔ 33, Yongning Naxi ɬe 33 mi 33, Erle Yi ɬo 33 bo 33, Xide Yi ɬo 31 bo 31, Namuyi ɬi 55 mi 55, Ersu ɬa 55 phɛ 55, Shixing ɬi 33 mi 55, Zhaba ɬo 55 n̥u 53, Ergong ɬɯva, Qinghua Pumi ɬi 55, Tauping Pumi ɬi 55.

The above four groups containing eight examples show that in Tibeto-Burman the devoicing of nasals and laterals developed under the influence of the loss of the F element of FC and FCB clusters. This kind of influence is reflected both in some Tibeto-Burman languages and in the correspondences between some dialects. In the majority of cases these influences are seen.

2. When the prefix is voiceless and the basic consonant is voiced, the process of change often involves gradual devoicing. Although in some languages and dialects, the basic consonant is affected, in others it is the prefixed consonant which is voiced. For example:

(1) 'garlic': Written Tibetan sgogpa, Zeku Tibetan ɣgok kwa, Tauping Qiang Xkə 55, Qinghua Pumi skɯ 55, Gyarung (tʃəm) ʃko, Ergong (ɣo) skɯ, Muya kɯ 53, Zhaba kɯ 53, Shixing kuɐ 55, Dafang kɯ 33 sɯ 33, Lijiang Naxi kv 33.

(2) 'door': Written Tibetan sgo, Zeku Tibetan rgo, Ersu ŋga 33, Cuona Menba kɔ 53, Mutuo Menpa ko, Qinghua Pumi kãu 13, Gyarung kam, Namuyi qho 33 bu 33, Lijiang Naxi khu 33, Zaiwa khum 31.

(3) 'frog': Written Tibetan sbalpa, Pumi spa 55, Gyarung khaʃpa, Ergong spoŋal, Zhaba pɐ 33 pa 53, Ersu pɐ̃ 55 ma 55, Shixing po 55 mi 55, Namuyi pa 33 mi 55, Xide Yi ɔ 44 pa 33, Lisu o 55 pa 55, Yongning Naxi pə 21 mi 13, Written Burmese pha 55, Achang phɔ 31, Longsu pɔ 35, Taruang Deng pa 31 rai 53, Muya mbo 35 mba 33, Guiqiong bi 55 pa 53, Cuona Menba bɛ: 13 pA 53.

If the C element in FC or FCB clusters is voiceless unaspirated, when the F is lost, the C remains aspirated in some cases and becomes unaspirated in others. For example:

(1) 'thread': Written Tibetan skudpa, Mutuo Menpa kutpa, Namuyi khi 53, Dafang Yi tɕhe 31, Lijiang Naxi khɯ 31, Bike Hani khɤ 55, Lahu khɛ 33, Jino a 33 khɯ 44, Rangoon Burmese tɕhi 11, Zaiwa khjiŋ 51, Achang khzaŋ 31.

(2) 'feces': Written Tibetan skjagpa, Mutuo Menpa khi, Tauping Qiang tʃhl 55, Zhaba qhɛ 53, Shixing qha 55, Namuiyi tshɿ 33, Xide Yi tɕhɿ 33, Lijiang Naxi tɕhər 33, Yongning Naxi kha 31, Lisu khi 31, Baobai Hani ɔ 31 tɕhi 31, Jino a 33 khri 33, Jianchuan Bai tphi 55, Written Burmese khje 55, Zaiwa khji 21, Achang tɕhi 31, Jinghpo khji 55, Kaman Deng tɯ 31 khɯi 53, Idu Luoba khri 55.

(3) 'to steal': Written Tibetan rku, Mawo Qiang ʂkuə, Qinghua Pumi skiɯɯ 55, Shixing qhuʁ 55, Namuyi ŋkhu 33, Xide Yi khu 33, Lijiang Naxi khv 33, Jino tɕhø 33. Written Burmese kho 55, Zaiwa khau 21, Bika Hani tshi 31, Achang xau 31, Langsu khuk 55, Muya kɯ 55, Dege Tibetan ku 53, Trung kɯ 55.

After the loss of a voiced prefix, the following aspirated consonant is sometimes pronounced as aspirated, sometimes as unaspirated, and sometimes as voiced. The situation is quite complex. For example:

(1) 'drink': Written Tibetan ɦthuŋ, Ergong wthi, Zeku Tibetan nthoŋ, Dege Tibetan thuŋ 53, Tauping Qiang thie 33, Muya tɕhyɯ 53, Zhaba thu 55, Guiqiong tɕha 35, Shixing tɕhɿ 35, Lijiang Naxi thɯ 31, Xide Yi ndo 33, Nanhua Yi dA 33, Lisu do 33, Haya Hani do 55, Nanjian Yi du 55, Lahu dɔ 31, Lhasa Tibetan tuŋ 53 or thuŋ 55, Bika Hani tu 55, Mile Yi tu 33, Jino ta 42, Rangoon Burmese tθau? 55, Kaman Deng tauŋ 55, Bogar Luoba tɯŋ, Idu Luoba tioŋ 55.

(2) 'weave': Written Tibetan ɦthag, Xiahe Tibetan thak, Lhasa Tibetan tha? 53, Cuona Menpa the? 53, Guiqiong ntha 55, Xide Yi tshɿ 21, Tujia tha 55, Kaman Deng tho 55, Ersu dɛ 55, Namuyi ndɛ 35, Nanhua Yi dɛ 21, Lijiang da 31, Mojiang Yi dɛ 33, Tauping Qiang tia 33, Gyarung (ka)tak, Qinghua Pumi tɕa 55, Muya ti 53, Zhaba tei 55 ʐi 33, Jinghpo ta? 31, Idu Luoba tiɯ 53.

In the process of change, the situation regarding the influence of the prefixed element on the main consonant is enormously complex. Each language seems to behave differently. Even within the same language, the situation may be different according to for different dialect. The processes of change have resulted in a striking variety of dissimilar forms in the different TB languages.

3. When a fricative with a prefixed element loses the prefix, the result is an unaspirated fricative, but when the fricative was without a prefixed *element, it became an aspirated fricative causing in some Tibeto-Burman* languages a division between aspirated and unaspirated fricatives. This change *is illustrated in Tibetan dialects:*

	Written Tibetan	Zeku Tibetan	Xiahe Tibetan	Dege Tibetan
soil, dirt	sa 5	shaˈ	sha	sha˥
tooth	so	sho	sho	sho˥
who	su	shə	shə	shu˥
wood	ɕiŋ	xhaŋ	xhaŋ	ɕhinˀ
flesh	ɕa	xha	xha	xha˥
die	ɕi	xhə	xhə	xhe˥
Compare the above with the set below:				
kill	bsad	ɣsal	sal	sɛ˥
three	gsum	ɣsəm	hsəm	suŋˀ
say	bcad	wɕal	ɕal	ɕeʔ˥
open, to	phje	wɕe	ɕe	ɕu˥
skin, to	bcu	wɕi	ɕi	xu˥
wing	gʷogpa	ɣɕokkwa	ɕokkwa	xo˥pa˥

(2) The influence of the following consonant on the main consonant

Tibeto-Burman languages show a wide range of initial consonant systems: Some have as many as 50, some as few as 17 consonants. The main cause of this variety lies in the different ways the main consonant of a cluster could interact with the following consonantal segment. An analysis of the available materials shows that the main influence of the following consonants the following areas:

1. The general tendency is to make the main consonant into an affricate. It ought to be noted that Proto-Tibeto-Burman either had no affricates or very few of them. Under the influence of the loss of the consonants following the main consonants in clusters, these main consonants (stops) by and large became affricates---at most four series of affricates (e.g. in the Qiang group some languages have three series, some two, but most have one). The most typical evidence of this is found in the correspondences between the northern and the southern dialects of Qiang.

	Mawo Qiang	Tauping Qiang		Mawo Qiang	Tauping Qiang
'new'	khsə	tshi 55	'feces'	qhʂə	tʃhɿ 33
'official'	gzə	dzɿ 33	'four'	gʐə	dʒɿ 33
'lay (egg)'	kh(r)ər	tʂhi 55	'dare'	khʈu	tʈhy 33
'tendon'	g(r)ər	dzɻ 231	'wooden basin'	gʐuku	dʐu 231-ku 33

As is evident in the above chart, under the influence of the following consonant, affricates with different places of articulation result. If the following sound is s or z, an apical affricate is produced. If the following sound is r (here, I need to explain that the following r in Mawo is retroflexed), a retroflexed affricate is produced. If the following sound is ʂ or ʐ (here, ʂ or ʐ is actually pronounced as ʃ or ʒ), then a palatal affricate is produced. If the following sound is ʈ or ʈʂ, then a lateral affricate results. A similar situation exists in Tibetan and in Burmese, where the main consonant frequently becomes retroflexed, apical or palatal under the influence of the loss of r or j.

2. Another tendency is for labio-dentals to come from bilabial sounds. Labio-dental sounds are comparatively recent in Tibeto-Burman. Seventh century Written Tibetan and eleventh century Written Burmese do not have letters to represent labio-dentals. Even now a great many Tibeto-Burman languages still do not have labio-dentals. In some languages, a sound pronounced as f or phu or hu exists, which has come from Han borrowings. In scattered Yi languages, labio-dentals are found, and a small number are found scattered in the Qiang languages.

The origins of labio-dentals are fairly complex, but mainly they originate from bilabials followed by l, r, or j. Through the process of historical change, these have become labio-dentals. The basic process is:

pl-, phl-, bl-, pr-, phr-, br- ===> pj-, phj-, bj- ===> f-, v-

(1) 'pig': Qinghua Pumi phʒa 13, Taruang Deng bɯ 31 liai 55, Idu Luoba bi 55 li 55, Shixing bie 35, Written Burmese wak 55, Ergong va, Ersu vɛ 55, Namuyi va 33, Xide Yi vo 55, Lisu a 55 vɛ 31, Bika Hani va 31, Jino va 44 ni 44, Zaiwa vaʔ 31, Longsu vɔʔ 31, Bijiang Nung va 53.

(2) 'fly': Written Tibetan ɦphrur, Qinghua Pumi bʒɛ̃ 13, Ergong bʐola, Gyarung (ka)bjam, Written Burmese pjam 11, Jino prɛ 33, Namuyi fɛ 53 ha 35, Dali Bai fv 35, Jianchuan Bai fv 55, Bijiang Bai fer 55, Xide Yi vo 33.

(3) 'divide': Written Tibetan bgos, Ersu mbzɿ 33 mbzɿ 55, Kaman Deng pra 55, Taruang Deng pen 53, Mutuo Menpa bun, Tujia phi 31, Hani bi 55, Written Burmese we 11, Mojiang Yi vɯ 55, Mile Yi vi 33, Dali Bai fv 35, Lijiang Naxi fe 33, Fugong Nung a 31 vɐn 53.

(4) 'buy': Taruang Deng brai 35, Tauping Qiang po 55, Tujia phu 55, Written Burmese waj 11, Trung wan 55, Dafang Yi va 21, Xide Yi vɿ 33, Mile Yi vA 33, Mojiang Yi vɛ 21, Lisu vu 33, Bika Hani v̩ 55, Zaiwa vui 51, Langsu vai 31, Fugong Nung vɐn 35.

(5) 'fart': Taruang Deng (kɯ 21) brai 53, Idu Luoba khri 55 pri 55, Gyarung tɐphʃErbo, Jinghpo phjet 31, Ergong wɒa, Trung pi 53, Bijiang Nung vi 55, Xide Yi vu 21, Mile Yi vA 21, Jianchuan Bai fu 31, Dali Bai fv 31, Bijiang Bai fv 42.

3. The tendency towards palatalized affricates comes from the influence of j on velar stops or fricatives. These both can be seen in Tibeto-Burman languages and dialects. For example:

	Written Tibetan 藏文	Lhasa Tibetan 拉萨藏语	Trung 独龙语	Cuona Menpa 错那门巴语
house	khjim	chimˀ	cʊ̃mˋ	chemˋ
intestine	rgjuma	cuʌmaʌ	puɹʃɯˀ	cuʌmoˋ
eight	brgjad	cɛʔʌ	çâtˀ	cenʌ
hundred	brgja	caʌ	ɕɑˀ	chɛʔˋ
Han (people)	rgja	caʌ	ʃɑˀ	cʌʌ
weigh	rgjama	caʌmaʌ	cɑʔˀ	cʌʌmʌˋ

(3) The influence of the following sound on the rhyme.

It is likely for the sound following the main consonant of the consonant cluster to influence the rhyme because of its location and its connection with the rhyme. In the materials examined thus far, most have the following characteristics:

1. The sound following the main consonant becomes a glide. From the processes of change seen in many Tibeto-Burman languages, it appears that Proto-Tibeto-Burman did not have glides. Some Tibeto-Burman languages are still in the glideless stage. *At this point, we do not want to analyze the* origins of all glides, but only want to examine some examples in which a close relationship exists between the loss of following consonants and the development of glides. Please note the development in Burmese of the glide i from l, r, and j:

	Written Burmese	Rangoon Burmese	Pronunciation
'do'	plu 53 (Inscript.)	pju 53	[piu 53]
'earth, soil'	mle 11 (Inscript.)	mje 11	[mie 11]
'break'	prat 55	pja? 55	[pia? 55]
'scatter'	phra 11	phja 11	[phia 11]
'completely'	bra 53 saŋ 53	bja 53 sɪ̃ 53	[bia 53 sɪ̃ 53]
'grass'	mrak 55	mjɛ? 55	[miɛ? 55]
'bee'	pja 55	pja 55	[pia 55]
'(straw) mat'	phja 11	phja 11	[phia 11]
'wooden plate'	bjap 55	bja? 55	[bia? 11]
'many'	mja 55	mja 55	[mia 55]

In some languages, the evidence for the change of l into the glide u is extremely clear. For example, in the correspondences between the northern Qiang dialect of Mawo and the southern Qiang dialect of Tauping:

	Mawo	Tauping		Mawo	Tauping
'wheat'	ɣlə	ɣuə 213	'eagle'	Xlu	Xua 55
'late'	ɣla	ɣue 33	'they'	thaXla	tha 55 Xua 55
'daytime'	stiaXlu	nə 31 Xua 55			

The relationship with the glides i and u is clear. Thus, this should help our search for a deeper understanding of the history of the Sino-Tibetan sound system.

2. The influence of following consonants on changes in the main vowel.

When the following consonant is ʐ or r, the main influence during the process of change is in the causing of retroflexion in the main vowel. These retroflexed vowels are found scattered in some Yi languages and in some Qiang languages. Please see the examples below:

(1) 'white': Tauping Qiang phʐi 55, Qinghua Pumi phʐə̃ 55, Gyarung (kə)pram, Ergong phʐɯ phʐu, Written Burmese phru 11, Jinghpo phro 31, Achang phʐo 55, Jino a 33 phro 33, Lijiang Naxi phər 31, Yongning Naxi phər 33, Dali Bai per 42.

(2) 'comb (head)': Written Burmese phri 55, Achang phʐa 31, Qinghua Pumi pʐɯu 55, Tauping Pumi pʐa 53, Lijiang Naxi pər 55, Namuyi pər 35.

(3) 'write': Written Tibetan bris, Cuona Menpa pri 13, Trung bri 53, Lijiang Naxi pər 35, Dali Bai ver 53.

(4) 'snake': Written Tibetan sbrul, Cuona Menpa bre: 13, Zhaba bru 53, Namuyi bər 35, Bijiang Bai tʂher 33.

In northern Qiang dialects, there is an abundance of retroflex vowels. The relationship between the origins of these retroflex vowels and the sounds following the main consonants of earlier consonant clusters is quite clear. For example:

	Tauping	Mawo		Tauping	Mawo
'to tear'	phʐi 33	phirphir	'to cut'	tʂhu 55	qhuar
'rope'	bʐe 33	bir	'hundred'	tʂhi 55	khir
'big'	bʐa 33	bar	'eight'	tʂhe 33	khar
'fine'	bʐi 33	bərtsi	'throw'	tʂhi 33	qhur

As the examples show, the velar or uvular consonant assimilated to the following ʐ, but it appears that the bilabials were kept. In Mawo the fricative led to retroflexion of the vowel. In fact, with the retroflex vowels in Mawo a slight ʐ still exists following the main consonant.

(4) The influence of clusters on tones.

The influence of consonants on tones is already quite clear for many Tibeto-Burman languages. Tauping Qiang has six tones. Its rising-falling tone or its low-falling tone mainly appears after voiced consonants, while its high level tone mainly appears after voiceless consonants. Because of the relationship between the voicing of consonants and tones in the sound system of Tauping Qiang, the functional load of the tones is limited. In Lhasa Tibetan the relationship between the loss of voicing and tones is quite clear: generally speaking, voiceless consonants produced high tones, and voiced consonants produced low tones. For example:

voiceless consonants			voiced consonants		
	Written Tibetan	Lhasa Tibetan		Written Tibetan	Lhasa Tibetan
'he, she'	kho	kho 53	'hear'	go	kho 13
'dirt'	sa	sa 53	'eat'	za	sa 13
'valley'	phu	phu 53	'boy'	bu	phu 13
'blood'	khrag	tʂhaʔ 53	'rock'	brag	tʂhaʔ 13

The prefixal part of a cluster may determine the tone of secondarily voiced consonants. Consonants without prefixes are pronounced with low tone; consonants with prefixes are pronounced with high tone. For example:

unprefixed initials			prefixed initials		
	Written Tibetan	Lhasa Tibetan		Written Tibetan	Lhasa Tibetan
'I'	ŋa	ŋa 13	'five'	lŋa	na 53
'not, no'	ma	ma 13	'wound'	rma	ma 53
'mountain'	la	la 13	'ghost'	bla	la 53
'year'	lo	lo 13	'wisdom'	blo	lo 53

From comparing the examples in the above chart, it can be clearly seen that tones are influenced not only by the voicing of the main consonant but also by the presence of prefixes. These phenomena also occur in other languages. Of course, Tibeto-Burman tones can also be influenced by the rhymes, but this will not be discussed here.

This paper simply discusses the structure of consonant clusters, their patterns of change, and their main influences on the syllable. Inevitably, mistakes will have been made so please be kind enough to send me corrections.

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[1] Editor's note on the translation. Two translations were done independently by Grace Lin (Lin Shiang-Jiun) and myself at CSU Fresno and by Sue Bremner, Mark Hansell, Randy La Polla, Jing Wang, Grace Wiersma, David Solnit, and James A. Matisoff at UC Berkeley. This translation started out as the Lin

version, but was then amended for style and content on the basis of comparison with the Bremner et al. version. The shape of the final version shows the effects of a final, thorough editing by Jim Matisoff.

2 See Jin Peng etc. "Gyarung phonology and morphology" in Yuyan Yanjiu [Language research] 1957.2.

3 See Robert B. Jones, Jr., Karen linguistic studies, University of California Press, Berkeley and Los Angeles, 1961.

4 The Written Tibetan forms are a transliteration.

5 The h following a fricative indicates aspiration e.g., sh = s^{h}, xh = c^{h}, xh = x^{h}.

材料来源

1982年中国社会科学院民族研究所语言室第三、四调组协议编写缅语词汇集，目前已完成，本文引用了其中的资料，计有：张济川、安世兴、陆绍尊：羌文、羌语。张济川：墨脱门巴语。陆绍尊：普米语、扎巴语、错那门巴语。刘光坤：羌语。林向荣：嘉绒语。陈士林、李秀清、武自立、纪嘉发：彝语。徐琳：白语。木玉璋：傈僳语。麦竹仪：纳西语。李永燧、王尔松：哈尼语。汪大年：缅文、缅语。高发元、张公瑾：拉祜语。孟兴之：基诺语。陈 康：土家语。戴庆夏：阿昌语。刘璐、徐悉艰：景颇语。徐悉艰：载瓦语。戴庆夏、徐悉艰：浪速语。欧阳觉亚：博嘎尔珞巴语、苏龙珞巴语。其余材料均为我当三收集整理，

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