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Introduction to Chinese Historical Phonology

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Lesson 1: Basic phonology

Modern Chinese dialects, as well as many other languages of Asia, have similar typological features: these languages have tones, their syllabic structure forbids initial and final consonant clusters, and only a small part of their segmental inventory can occur in final position. They have limited morphology, and most syllables can be analyzed as independent morphemes.

The Chinese Syllable is usually analyzed as follows:

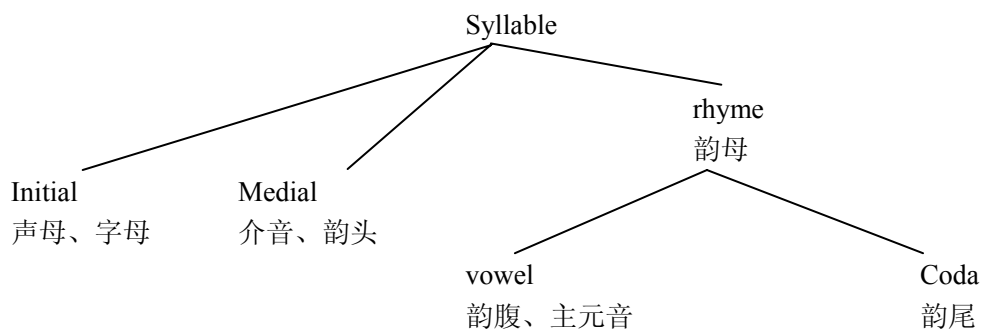


Table 1: Syllable structure in Chinese Dialects

Medials are approximants like -w-, -j-, -ɥ-. Some of the slots in Table 1 are optional, in particular the Medial and the Coda. Another important feature is the tone, that bears on the rime (Howie 1974). We shall present each of the constituents of the syllable separately, taking Mandarin as an example whenever appropriate.

1.1 Tone

Tones are modulations of fundamental frequency (F0) with phonemic contrast. Voice quality often is a secondary characteristic of tones in many dialects, in particular creaky voice, breathy voice, strident voice etc. Some linguists distinguish pitch accent languages (where tonal oppositions only appear on some syllables) and tone languages (where each syllable has its proper tone). Some have been tempted to analyze Chinese dialects such as Mandarin or Wu as pitch accent languages, due to the presence of neutral tone – syllables whose tonal oppositions are neutralized. However, most specialists consider Chinese dialects as typical tone languages.

Chinese dialects with the least tonal contrasts are variants of Mandarin spoken in the northernmost part of the Chinese-speaking area, such as Dungan that has only three tones. Some dialects (such as Cantonese or Wenzhou) can maintain more than 8 distinct tones.

In order to transcribe tones, linguists usually use Chao Yuan-ren 赵元任's system. According to this system, tones are represented on a « score » ranging from 1 (the lowest value) to 5 (the highest). Tones can be noted either with numbers or with “tone-letters” (see next page). The four tones of standard mandarin usually are transcribed respectively 55, 35, 214 and 51.

This transcription can allow more precision than the symbols used by africanists, such as HL or diacritics on the vowels: á (high), à (low), ǎ (rising), â (falling). For Asian languages with more than two contour tones, the Chao Yuan-ren's system is the only one usable.

5					
4					
3					
2					
1					
	51	55	35	214	21
	∨	┘	∩	∨	∩
	High falling	High level	Middle rising	Falling-rising	low falling

Table 2: Examples of tones in Chao's transcription.

Excluding the tonal alternations inherited from ancient suffixes from Old Chinese (such as 买卖), a sizeable number of innovative alternations with a definite function can be found in modern dialects. Change to tone 35 in Cantonese is a well-known example of such phenomena (Yue-Hashimoto 1972:98-100¹):

1. After the prefixes 阿 a⁴⁴ and 老 lou²⁴, tones of proper names (except those with tone 53 or final stops) changes to 35. For instance, 陈 tshɛn²¹ become 阿陈 a⁴⁴tshɛn³⁵.

2. Reduplication of monosyllabic adjectives with intensive meaning: the second syllable changes to tone 35, for example 红 hoŋ²¹ “red” becomes 红红 hoŋ²¹ hoŋ³⁵ “very red”

3. With some verbs, change to tone 35 indicates completed action: 口黎 lei²¹ “come” lei³⁵ “came”.

1.2 Initials

No true initial consonant clusters are found in modern Chinese dialects. In the 青衣苗语 Qingyi miaoyu language, a Chinese dialect of Hunan spoken by ethnic Miaos that was recently described (李蓝 2004), Middle Chinese dental affricates correspond to clusters kl-. The presence of these groups was the influence of a Miao substrate, or as preservation from Old Chinese, but it seems more straightforward to interpret these alleged « clusters » as lateral affricates.

Among the consonants that can appear in initial position in Chinese dialects, some deserve special attention. Ladefoged and Maddieson 1996 proposed a more precise terminology to describe some places of articulation found in those languages. They distinguish several types of postalveolar laminals:

1) palatalized laminal postalveolars usually called alveolo-palatals ɟ ʒ (in pinyin j q x).

2) flat laminal postalveolars plates written ʂ ʐ (pinyin zh ch sh r) instead of retroflexes ʃ ʒ. They suggested that Chinese « retroflex » fricatives and affricates were different from those appearing in Dravidian and Indo-Aryan languages.

3) domed laminal postalveolars corresponding to the fricatives ʃ ʒ of European languages.

However, we shall keep the usual terms “alveolo-palatal” and “retroflex” to avoid unnecessary complications.

1.3 Medial

In Mandarin, finals usually are classed into four categories:

¹ *The Phonology of Cantonese*, Cambridge University Press

开口 kāikǒu	i [ɿ] [ʅ]	a	e [ɤ]	ai	ei	ao	ou	an	en [ɤn]	ang	eng	er
合口 hékǒu	u	ua	uo	uai	ui			uan	un	uang	ong	
齐齿 qíchǐ	i [i]	ia	ie			iao	iou	ian [jen]	in	iang	ing	
撮口 cuōkǒu	ü [y]		üe					üan [ɥen]	ün		iong	

Table 3: The finals of Standard Mandarin

These four categories, known as 四呼 *sihū* are determined by the Medial: *kaikou* are syllables without Medials, *hekou* have a -w- Medial (or vocalic u), *qichi* have -j- Medial (or vocalic i) and *cuokou* have -ɥ- (or vocalic y). The last one is sometimes analyzed as a combination of -j- and -w-.

In Mandarin, alveolo-palatals (j q x) are in complementary distribution with velars (g k h), dental affricates (z c s) and retroflex affricates (zh ch sh): the former appear only with *qichi* and *cuokou*, while the latter appear with *kaikou* and *hekou*.

	<i>kaikou</i>	<i>hekou</i>	<i>qichi</i>	<i>cuokou</i>
velar g k h	gān 甘	guān 官		
alveolo-palatals j q x			jiān 尖	juān 捐
dentals z c s	zān 簪	zuān 趲		
retroflexes zh ch sh	zhān 瞻	zhuān 砖		
lateral	lè 勒	luò 落	liè 列	lüè 掠

Table 4: Complementary distribution of initials in Mandarin

It is possible to synchronically analyze alveolo-palatals as variants of either velars, dentals or retroflexes.

1.3 Vowels

Various vocalic systems are found in Chinese dialects, though some features such as vowel length are relatively rare (length is phonemic only in Yue dialects).

Some linguists (Hartman 1944) have attempted to analyze Mandarin as a two vowel system (see also Pulleyblank 1984), with only ɤ and a:

开口 kāikǒu		a	ɤ	aj	ɤj	aw	ɤw	an	ɤn	aŋ	ɤŋ
合口 hékǒu	w	wa	wɤ	waj	wɤj			wan	wɤn	waŋ	wɤŋ
齐齿 qíchǐ	j	ja	jɤ			jaw	jɤw	jan	jɤn	jaŋ	jɤŋ
撮口 cuōkǒu	jw		jwɤ					jwan	wɤn		jwɤŋ

Table 5: Mandarin as a two-vowel language

In this analysis, high vowels u, i and y are viewed as vocalized variants of Medials when there is no main vowel.

1.4 Coda

In Sino-Tibetan languages, whatever their syllable structure – presence of complex clusters as in rGyalrong and Tibetan or absence of clusters as in modern Chinese), the Coda position always has a smaller inventory than the initial. This is a striking typological difference with other languages of the region such as Mongolian, where the situation is reversed.

Here are the Codas attested in Chinese dialects:

- a) $-j / -w$
- b) nasals $-m -n -ŋ$
- c) glottal stop $-ʔ$
- d) unreleased stops $-p -t -k$

In Mandarin, only five are possible $-j -w -n -ŋ$ (see Table 3) and retroflex $-r$ [ɻ]. Some dialects have lost nasals altogether.

This type of syllabic structure is found in non-Sino-Tibetan languages of Asia: Vietnamese, Kra-Dai, Miao-yao, and the Austronesian language Huihui spoken on Hainan.

Lesson 2: Written sources of Middle Chinese

Chinese writing has remained almost unchanged since the Han dynasty, and very little information on the pronunciation of Middle Chinese can be inferred from the script itself. Fortunately, the phonological system of Sui-Tang Chinese can be reconstructed with precision through using the rime dictionaries of that period. These sources, however, are not as convenient as an alphabetic writing system. They require a special analysis to be usable.

2.1. Fanqie

Historically the first method to indicate the pronunciation of characters is the *dúruò* 读若 method that appeared in Han times. It is found in particular in the *shuowenjiezi* 说文解字. According to that method, the pronunciation of a rare character is indicated by using another homonymous or quasi-homonymous more common character. Indicating the pronunciation of a character by means of another one has the serious disadvantage that when the character to be glossed has no exact homonym, it is impossible to accurately convey its pronunciation.

Therefore, another technique was devised to indicate the pronunciation: the *fānqiè* 反切. The principle of *fānqiè* is to gloss the pronunciation of one character with two characters, the first one indicating the Initial and the second the Rime (see Lesson 1). This is a first step towards an analysis of the syllable. Here is an example, using Baxter Middle Chinese transcription:

东 tuwng 德红切 tok huwng tshet

This means that the character 东 tuwng has the same initial as 德 tok and the same rime as 红 huwng: tuwng = t(ok) + (h)uwng. This *fanqie* was perfect in Middle Chinese, but in Mandarin and in nearly all dialects, due to phonetic changes to be explained in Lesson 3, it is not correct anymore, as 东 dōng and 红 hóng do not have the same tone. Therefore, while using *fanqie*, it is of utmost importance to restrict oneself to data reflecting the same dialect and the same period, otherwise no reliable analysis of the phonology can be made.

Fortunately, we have collections of *fanqie* reflecting a more or less homogeneous tradition: Rime Dictionaries. They were originally created as reference books to define a literary standard. The most ancient rime dictionary still extant is Lù Fǎyán 陆法言's *Qièyùn* 切韵 written in 601 in the Sui period. The language of the Qieyun represents a standard reading pronunciation that seems to be a diasystem of several dialects. Karlgren originally thought it was the dialect of the capital - Chang'an, but Zhou Zumo (1966) has shown that it was rather the literary language of Luoyang and Jinling (Nanjing).

The Qieyun was long believed to be lost, and only its Song-time expanded version, the *Guǎngyùn* 广韵 (compiled under 陈彭年 Chén Péngnián and 丘雍 Qiū Yōng in 1007) was available to scholars. This book, serving to define the riming standard for imperial examinations, included *fanqie* from the Qieyun with other from later Tang works, and includes 26000 characters, two times more than the Qieyun. Qing-dynasty philologists such as Chen Li who only had Guangyun to study MC pronunciation had to discriminate between early and later *fanqie*.

However, a version of the Qieyun close to the original, the 刊谬补缺切韵 Kanmiu buque Qieyun by 王仁煦 Wáng Rénxù, was discovered in 1947, and confirmed the authenticity of most *fanqie* in the Guangyun.

Guangyun classifies characters by tone: 平 píng (level), 上 shǎng (rising), 去 qù

(departing) , 入 rù (entering). Characters in level tone being more numerous, they are divided in two parts 上平 and 下平), then organized by rimes. There are 206 rimes in all in the Guangyun, 13 more than the Qieyun (Some rimes with medial -w- (*hekou*) are distinguished from their *kaikou* equivalents, whereas they were lumped together in the Qieyun).

The characters are followed with a definition and a *fanqie*. In the case of characters with several readings, the second pronunciation can be indicated by a *fanqie* or a homonymous character (又音 *youyin*).

Characters having the same reading are placed one after the other in the dictionary, and only the first of them has a *fanqie*, followed by a number indicating how many homonymous characters follow. For instance, on the first page of the Guangyun, at the end of the entry for 东, we find the following indications: 德红切十七. This means 德红 is a *fanqie* for 东 and that the 16 characters that follow have the same pronunciation. Those among them that have two pronunciations, such as 涑 or 冻, have 又音 *youyin* (又都贡切, which represents a departing tone reading tuwngH).

Given that Guangyun is organized by tone and by rime, it contains redundant information about the rimes. However, not all information on the rimes are represented in the 206 categories, and *fanqie* are the only source for initial consonants. In order to understand fully the phonological distinctions in the Guangyun, it is therefore necessary to analyze its *fanqie*. Before we explain Chen Li's analysis of the Guangyun, we shall give an account of the traditional ideas on MC initials, as well as Baxter's transcription for initial consonants.

2.2 The 36 initials

From the end of the Tang period onwards, more explicit descriptions of MC initial consonants have appeared. The oldest known system, that of 守温 Shǒu Wēn , distinguishes 30 initials. Later, in the Song period, appears the system of 36 initials三十六字母 (see page 8), and until Chen Li's work, it was considered to represent the system of the Qieyun. Although this system is flawed, as it misses several important distinctions of MC, it is important to know the traditional names of the 36 initials and the phonological terminology, as these terms are still widely used in Chinese Historical Phonology.

This system also makes distinctions that did not exist in early Tang, such as that between bilabials and labiovelars.

	全清	次清	全浊	次浊
	quán qīng	cì qīng	quán zhuó	cì zhuó
重唇音	帮	滂	并	明
zhòng chún yīn	bāng	pāng	bīng	míng
	pang	phang	bengX	mjæng
轻唇音	非	敷	奉	微
qīng chún yīn	fēi	fū	fèng	wēi
	pjǐj	phju	bjowngX	mjj
舌头音	端	透	定	泥
shé tóu yīn	duān	tòu	dìng	ní
	twan	thuwH	dengH	nej

舌上音 shé shàng yīn	知 zhī trje	彻 chè trhjet	澄 chéng drjeng	娘 niáng nrjang		
齿头音 chǐ tóu yīn	精 jīng tsjeng	清 qīng tshjeng	从 cóng dzjowng		心 xīn sim	邪 xié zjæ
正齿音 zhèng chǐ yīn	照 zhào tsyewH	穿 chuān tshywen	床 chuáng dZRjang		审 shěn syimX	禅 chán dzyen
牙音 yá yīn	见 jiàn kenH	溪 xī khej	群 qún gjun	疑 yí ngi		
喉音 hóu yīn	影 yǐng ‘jængX	喻 yù yuH			晓 xiǎo xewX	匣 xiá hæp
半舌音 bàn shé yīn	来 lái loj					
半齿音 bàn chǐ yīn	日 rì nyit					

Table 6: The 36 Initials

In this table we indicate the traditional name of the initial, the pronunciation of its character in Mandarin, then in Baxter’s system. Chen Li has shown that five initials in this system must be divided into two: four of the *zhèngchǐyīn* 照穿床审 as well as 喻. His method to obtain this result will be explained later. Here are the name of these initials and their transcription in Baxter’s system:

	Retroflex affricates	Alveolo-palatal affricates
照 zhào	庄 <i>zhuāng</i> tsrjang	章 <i>zhāng</i> tsyang
穿 chuān	初 <i>chū</i> tsrhjo	昌 <i>chāng</i> tsyhang
床 chuáng	崇 <i>chóng</i> dzrjuwng	船 <i>chuán</i> zywen
审 shěn	生 <i>shēng</i> srjæng	书 <i>shū</i> syo

喻 yù	云 <i>yún</i> hjun	以 <i>yǐ</i> yiX
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Originally, influenced by the representation of the initials in the yunjing (see next chapter) and the 36 initials, Karlgren thought that 船 *chuan* was an affricate *dz-*, whereas 禅 *chan* was a fricative *z-*, but Lu Zhiwei 陆志韦 has proven that these reconstructions must be reversed.

Labiodentals are an innovation of Late Middle Chinese and stand in complementary distribution with bilabials: they appear only in the Third division (see below).

2.3 Rime Tables

During the Song period, tabular representations of the phonological system contained in the fanqie of the Guangyun was created. The two oldest rime tables are the 韵镜 *Yunjing* and the 七音略 *Qiyinlüe*. The *Yunjing* in its modern version was published by 张麟之 *Zhāng Línzhī* in 1161.

The *Yunjing* is a two-dimensional representation of Middle Chinese phonological system. Each attested syllable is indicated by one character (homonyms are not included), and empty slots are noted by a small circle. Each row represents a rime and the columns represent the initials.

Initials are described with a terminology close to that of the 36 Initials. Here is a sketch of the row from *Yunjing* compared to corresponding initials in Baxter's system and the 36 initials.

齿音舌		音喉				音齿					音牙				音舌				音唇			
清	浊	清	浊	清	清	浊	清	浊	次清	清	清	浊	次清	清	清	浊	次清	清	清	浊	次清	清
ny-	l-	y- hj-	h-	x-	'-	zj- dzy-	s- sy- sr-	dz- dzr- zy-	tsh- tsyh- tsrh-	ts- tsy- tsr-	ng-	gj-	kh-	k-	n- nr-	d- dr-	th- trh-	t- tr-	m-	b-	ph-	p-
日	来	喻	匣	晓	影	斜 禅	心 审	从 床	清 穿	精 照	疑	群	溪	见	泥 娘	定 澄	透 彻	端 知	明	并	滂	帮

Table 7: Initial Consonants in the *Yunjing*

From this table, we might believe that the *Yunjing* omits several important distinctions, in particular that between dentals, palatals and retroflexes, but this isn't the case. In order to understand how the *Yunjing* represents these distinctions, several explanations on Middle Chinese Phonology are necessary.

2.3.1 The four Divisions

It can be noticed that the rimes are all organized in tables of four rows. These rows are called the four divisions (四等), numbered 1 to 4. Some rimes only appear on one division each. For instance, in Table 25, we have four rimes 毫 (1) 爻 (2) 宵 (3) 萧 (4), whereas other rimes such as 脂 in Table 6 take the four rows by themselves. Finally, some rimes appear on two tables, such as 仙 that appear on both Table 21 and 23 (apart from the 开/合 distinction).

The phonological meaning of the 4 divisions seems to be linked with the medials other than -w- (see Lesson 4).

division	examples	Characteristic	voyelles dans la notation de Baxter
1	毫 haw	no medial other than -w-	a u o
2	爻 hæw	Maybe a medial -y- in early Tang, then front vowel	æ ε
3	宵 sjew	-j-	i et jV
4	萧 sew	ie in Song Chinese but from early Tang ε a	e

Table 8: The four divisions

From the point of view of early Tang phonological system, the fourth and the first divisions do not need to be distinguished: they are rimes without palatal medial. After the breaking of ϵ into i , Chinese phonologists had a need to make a special category four rimes with medial i .

Most rimes of the Guangyun only correspond to one division. There are five exceptions:

戈 (合口) $-wa$ $-jwa$ (divisions 1 and 3)

麻 $-\text{æ}$, $-\text{jæ}$ (divisions 2 and 3)

庚 $-\text{æng}$, $-\text{jæng}$ (divisions 2 and 3)

东 $-\text{uwnɡ}$, $-\text{juwnɡ}$ (divisions 1 and 3)

屋 $-\text{uwk}$, juwk (divisions 1 and 3)

Excepting these five rimes, when a rime of the Guangyun appears on several divisions in the Yunjing, it indicates something else.

2.3.2 Coronal initials in the Yunjing

The four divisions are in complementary distribution with some series of initials. For example, with the $-w$ final:

	1 毫	2 爻	3 宵	4 萧
t 端	刀 taw			雕 tew
tr 知		啁 $træw$	朝 $trjew$	
ts 精	遭 $tsaw$		焦 $tsjew$	湫 $tsewX$
tsr 庄		抓 $tsræw$		
tsy 章			昭 $tsyew$	
p 帮	褒 paw	包 $pæw$	膘 $pjew$	X
k 见	高 kaw	交 $kæw$	骄 $kjew$	浇 kew

Table 9: Complementary distribution of initials and divisions (1)

And with final $-ng$:

	1 唐	2 庚	3 阳	4 青
t 端	当 $tang$			丁 $teng$
tr 知		趟 $træng$	张 $trjang$	
ts 精	赃 $tsang$		将 $tsjang$	青 $tsheng$
tsr 庄		铛 $tsrhæng$	庄 $tsrjang$	
tsy 章			章 $tsyang$	
p 帮	帮 $pang$	彭 $bæng$	方 $pjang$	瓶 $beng$
k 见	冈 $kang$	羹 $kæng$	疆 $kjang$	经 $keng$

Table 10: Complementary distribution of initials and divisions (2)

With labials and velars, the four divisions all appear, but with coronals, the situation is different: Divisions 1,2 and 4 appear each only with two series of coronal, one series of stop and one series of fricative / affricate. In divisions 1 and 4, these are dentals, and in division 2, retroflexes. With division 3, four series appear, two of stops and two of affricates. The only series that does not appear with div. 3 is that of dental stops². This distribution is not due to chance and a

² There are three exceptions to these rules 地 $dijH$, 打 $tængX$ and 冷 $længX$. These exceptional cases are

full explanation will be given when we discuss Old Chinese.

If we look back to Table 7: , it becomes clear that since only two series of coronals exist in div. 1,2 and 4, the representation of the Yunjing in 舌音 (stops) 齿音 (fricatives / affricates) is not ambiguous: with Div. 1 and 4, 舌音 and 齿音 must be dentals, and with div. 2, they must be retroflexes.

A problem remains with div. 3 rimes. As they appear only with retroflex stops not dental stops, the 舌音 are always retroflex stops. For the 齿音, however, we face a serious problem: how to distinguish in the table the three possible place of articulation, dental, retroflex and alveolo-palatal? The solution used in the Yunjing can be understood easily by looking at the Table 6 of this book:

	音齿				
	浊	清	浊	次清	清
脂	O	O	O	O	O
	O	师	O	O	O
	O	尸	O	鸱	脂
	O	私	茨	鄴	咨

Table 11: Affricates / fricatives in Table 6 (内转第六开) of the Yunjing in level tone

The rime 脂, transcribed -ij in Baxter's system, is a pure div. 3 rime, as its transcription indicates. Why does it appear also in div. 2 and div. 4?

In the fourth column 清 of the 齿音 (unvoiced fricatives, s-, sr- or sy-), we find three characters, respectively in div. 2, 3 and 4: 师 srij 尸 syij and 私 sij. Divisions are here a way to convey information on initial consonants: div. 2 marks retroflexes, div. 3 alveolo-palatals and div. 4 dentals. These kinds of examples are called 'false div. 2' 假二等 and 'false div. 3' 假四等.

In the Guanyun, 11 rimes of div. 3 can occur with retroflex affricates / fricatives:

鱼	虞	支	脂	之	尤	侵	真	淳	阳	蒸
-jo	-ju	-je	-ij	-i	-juw	-im	-in	-win	-jang	-ing

These rimes never appear together with a div. 2 rime in the same table, in order to avoid ambiguity. They differ from rimes such as 宵, that are not compatible with retroflex initials, and can occur with their corresponding div. 2 rime on a single table.

	音齿				
	浊	清	浊	次清	清
毫	O	骚	曹	操	糟
爻	O	捎	巢	言巢	耳巢
宵	韶	烧	O	昭	昭
萧	O	萧	O	O	O

Table 12: Affricates / fricatives in Table 25 (外转第二十五开) of the Yunjing in level tone

probably only isolated rimes.

In conclusion, it appears that the Yunjing preserves the distinctions of the *Qièyùn* better than the system of 36 initials.

2.3.3 The chongniu problem

Besides, eight third division rimes have another distinction:

支	脂	祭	宵	侵	盐	真	仙
-je	-ij	-jejH	-jew	-im	-jem	-in	-jen

The characters with labial (唇音) or velar (牙音) initials in these rimes can appear in div. 3 and 4. Here is for example the Table 4 of the Yunjing, level tone (rime 支 -je):

	音牙				音唇			
	清	浊	次清	清	清	浊	次清	清
支	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○
	宜	奇	危奇	羈	縻	皮	鉞	陂
	○	祇	○	○	弥	陴	披	卑

Table 13: Labials and velars in Table 4 (内转第四开合) of the Yunjing, level tone

These doublets are called 重组 *chóngniǔ*, those from div. 3 重组三等 and those of div. 4 重组四等. In Baxter's transcription, chongniu 4. are marked with an additional i or j. For instance, 陂 will be *pje* while 卑 will be *pjie*. The phonetic nature of the opposition probably was that *chongniu 4* characters had a slightly fricative medial *-z- while *chongniu 3* had a simple -j- medial.

In Vietnamese, words from Middle Chinese syllables with labial initials in *chongniu 4* have a special evolution: their initials become t- in oral stops and d- for the nasal (pronounced z- or j- in modern Vietnamese, but coming from a palatal):

	Middle Chinese	chongniu	Mandarin	Vietnamese
秘	pjH	3	bì	bí
庇	pjH	4	bì	tý
贫	bin	3	pín	bàn
频	bjin	4	pín	tàn
縻	mje	3	mí	my
弥	mjie	4	mí	di
岷	min	3	mín	mân
民	mjin	4	mín	dân

Table 14: The chongniu opposition in Vietnamese

This situation is due to a phonetic change in Vietnamese³ that lead to a confusion of all

³ Michel Ferlus 1992. 'Histoire abrégée des consonnes initiales du vietnamien et du sino-vietnamien', *Mon-Khmer Studies* 20 : 111-125

ancient apical and alveolo-palatal fricatives and affricates into t-. With *chongniu 4*, a phonetic change such as *pʒ- > *tʃ- > t- occurred. Traces of the chongniu opposition are found in Sino-Korean with velar initials, but no Chinese dialect seems to have a trace of the chongniu.

2.3.4 Conclusion

In Mandarin, the system of initials was considerably simplified. Besides an important tonal opposition, (see next lesson), dental affricates and velar in division 3 became alveolo-palatal affricates. The confusion is late, and in Peking opera, actors are taught to make this distinction. Alveolo-palatals from dental origin are called 尖音 *jiānyīn*, and those of velar origin 团音 *tuányīn*.

2.4 Fanqie analysis

As we have shown, the Yunjing maintains more distinctions than the system of 36 initials. A thorough analysis of the *fanqie* in the Guangyun also makes it possible to determine these rime distinctions.

It is 陈澧 Chén Lǐ, in his 《切韵考》 *Qiè yùn kǎo* published in 1842, who devised a technique to discover the missing distinctions, called 系联法 *xiliánfǎ*. The problem with *fanqie* analysis is that there always are several characters for each rime (反切下字 *fǎnqiè xiàngzì*) and each initial (反切上字 *fǎnqiè shàngzì*).

The principle of *xiliánfǎ* comes from the idea that the relationship between *fǎnqiè shàngzì* is transitive, that is, characters with the same *fǎnqiè shàngzì* have the same initial. Therefore, if we look for the *fǎnqiè shàngzì* of each *fǎnqiè shàngzì* and that we link them together with one another, we obtain a series of *fǎnqiè shàngzì* all representing the same initial:

<i>fǎnqiè shàngzì</i>	<i>fǎnqiè</i> the character
可 khaX	枯我切 khu ngaX tshet
枯 khu	苦胡切 khuX hu tshet
苦 khuX	康杜切 khang duX tshet
康 khang	苦冈切 khuX kang tshet
空 khuwng	苦红切 khuX huwng tshet
楷 khojX	苦骇切 khuX hojX tshet
口 kuwX	苦后切 khuX huwX tshet
客 khæk	苦格切 khuX kæk tshet

Table 15: Some *fǎnqiè shàngzì* of the initial 溪 kh-

These data show that the *fǎnqiè shàngzì* 枯可苦康空楷口客 all represent the same initial. However, this method has its limits, because, the *fǎnqiè shàngzì* of one initial can not always be linked. For example, the initial 端 t- is marked with the seven following *fǎnqiè shàngzì*:

冬 towng	都宗切 tu tsowng
都 tu	当孤切 tang ku
丁 teng	当经切 tang keng
当 tang	都郎切 tu lang
多 ta	得何切 tok ha
得 tok	多则切 ta tsok

德 tok	多则切 ta tsok
-------	-------------

Table 16: *fǎnqiè shàngzì* of initial 端 t-

In the table above, it appears that 冬都丁当 and 多得德 are two different groups, and cannot be linked one with another. In order to get along these difficulties, the solution is to use the 又音 *yòu yīn*: when a character has more than one pronunciation, as we indicated above, its second pronunciation is always indicated. Therefore, the character and its two pronunciations redundantly appear in two places in the body of the text. However, not always the same *fǎnqiè* is used to mark a given pronunciation.

For example, on the first page of the *Guangyun*, 涑 has two *fanqie* tuwng 德红切 and tuwngH都贡切 (ta kuwngH). In the *Qusheng* section, however, the *fanqie* of the departing tone reading of 涑 is this time 多贡切 (tu kuwngH), and it is therefore certain that these two *fanqie*, 都贡切 and 多贡切 represent the same pronunciation. Therefore, this means that 都 and 多 are homonymous *fǎnqiè shàngzì*, and that the two groups of Table 16 can be linked together.

By systematically applying this method, it becomes possible to make classes of *fǎnqiè shàngzì* for the initials and *fǎnqiè xiàzì* for the rimes of the *Guangyun*. When two classes can never be linked together by any method, we may conclude that they represent distinct initials or distinct rimes.

Using this method, Chen Li has proven that 正齿音 and 喻 had to be divided in two sets of initials.

Lesson 3: Middle Chinese Tones

As indicated in the *Guangyun*, there were four tones in Middle Chinese:

平	bjæng	level
上	dzyangX	rising
去	khjoH	departing
入	nyip	entering

The name itself of each tone is an example of the tone in question. The *rù* tones end in stops -p, -t, -k, and it is possible to analyze it not as a tone, but only as a context where tonal distinctions are neutralized. Karlgren, Pulleyblank and Baxter do not mark the level tone, but for the departing and the entering, they add the following symbols:

	Karlgren	Pulleyblank	Baxter
Shang	:	ʔ	X
Qu	-	h	H

Table 17: Tone Shang and Qu in different systems of transcriptions

Another system used by Chinese dialectologists is to add half circles on the four sides of the character: 平 上 去 入.

3.1 Tones in the Tang period

Since Haudricourt (1954)⁴, most linguists agree that Middle Chinese tones come from lost consonants. By comparing Vietnamese and other mon-khmer languages, Haudricourt first demonstrated that Vietnamese *săc* and *nặng* tones came from final -ʔ and that *ngã* and *hỏi* came from *-s through a *-h stage. He made the conclusion that a similar change occurred in Chinese, and proposed that *shang* came from a glottal stop, and *qu* from an *-s.

In modern dialects, We can find direct traces of these earlier segments. In 孝义 Xiaoyi of Shanxi 山西 (Sagart 1999: 132-3), rising tones have a glottalization, and departing tones have a slight -^h. Mei (1970)⁵ and Pulleyblank (1962, 1978) have found independent evidences to reconstruct a glottal stop in tone Shang and a -h in tone Qu.

The descriptions of tones from the Tang period are difficult to interpret and sometimes contradictory. According to the 元和韵谱 Yuanhe yunpu:

平声者哀而安、上声者厉而举、去声者清而远、入声者直而促

« The level tone is mournful and calm, the rising tone is stern and lifts, the departing tone is clear and distinct, the entering tone is straight and abrupt. »

3.2 The evolution of tones in Chinese dialects

As in most languages of Southern Asia, Chinese dialects have undergone a tonal split that was caused by the loss of voicing in initial consonants, and the creation of registers.

Here are some data from Cantonese (the entering tone will not be discussed):

⁴ Haudricourt, A.G. 1954 'Comment reconstruire le chinois archaïque', *Word* 10.2-3, 351-64

⁵ Mei Tsu-lin 1970. 'Tones and Prosody in Middle Chinese and the origin of the rising tone'. *Harvard Journal of Asian Studies* 30.86-110.

	Cantonese	Middle Chinese		Cantonese	Middle Chinese
都	tou\ 53	tu			
賭	tou\ 35	tuX	土	t ^h ou\ 35	thuX
妒	tou\ 33	tuH	兔	t ^h ou\ 33	thuH
奴	nou\ 21	nu	徒	t ^h ou\ 21	du
怒	nou\ 24	nuX	肚	t ^h ou\ 24	duX
弩	nou\ 22	nuH	渡	tou\ 22	duH
低	tei\ 53	tej	梯	t ^h ei\ 53	thej
底	tei\ 35	tejX	体	t ^h ei\ 35	thejX
帝	tei\ 33	tejH	替	t ^h ei\ 33	thejH
提	t ^h ei\ 21	dej	泥	nei\ 21	nej
弟	tei\ 22	dejX	礼	nei\ 24	lejX
第	tei\ 22	dejH	丽	nei\ 22	lejH

Table 18: Correspondences between Middle Chinese and Cantonese Tones

The data can be summarized in such a table:

	Ping	Shang	Qu
t 全清 voiceless	t 53	t 35	t 33
th 次清 aspirated	th 53	th 35	th 33
d 全浊 voiced	th 21	th 24 (t 33)	t 22
n 次浊 sonorant	n 21	n 24	n 22

Table 19: Middle Chinese and Cantonese tones

In Cantonese each of the three tones of Middle Chinese corresponds to two tones. One of these appears in syllables whose initials were unvoiced (high register tones) and the others in syllables whose initials were voiced (low register tones).

	平	上	去
High register 阴	阴平 53	阴上 35	阴去 33
Low register 阳	阳平 21	阳上 24	阳去 22

Table 20: High and low registers in Cantonese

We notice that High Register tones have a higher F₀ than their Low Register counterparts. This phenomenon can be generally observed in Asian languages, and is linked to a physiological tendency. However, in some cases complex tonal changes can lead to situations where low register tones have a higher F₀ (such as in Standard Thai, or in the Tianjin dialect).

The tones of Cantonese that come from the same tone in Middle Chinese have the same modulation: *ping* tones are falling, *shang* tones are rising and *qu* tones are flat.

Moreover, we notice that MC voiced stops can become either aspirated or non-aspirated stops in the modern language depending on the tones. Tone *shang* before *quanzhuo* has several possible developments in Cantonese: either 24 (aspirated) or 22 (unaspirated). In the second case, words in tone *shang* merge with those of tone *qu*. This is due to dialect mixture.

From Table 20, we can also deduce that there will be gaps in the distribution of tones: High

register tones 53, 35 and 33 can appear with both aspirated and unaspirated initials but those of low register should only appear with one of them (aspirated for 21 and 24 and unaspirated for 22). This is in general the case in Cantonese, though the detail is quite complex.

Mandarin has a much simpler tonal system than Cantonese, but its tonal evolutions were much more complex. As an exercise, use the data in Table 18 to make a table such as Table 19 and explain the history of Mandarin tonal system.

In Mandarin and in some layers of Cantonese, we observe the change from low register *shang* tone 阳上 to low register *qu* tone (阳上归去). It happens only with ancient voiced stops, sonorants are not affected. Pulleyblank explains this phenomenon as assimilation. we know that contrarily to what Karlgren thought, voiced stops of MC changed to aspirated voiced stops during the Tang dynasty. (Maspéro 1920). Then, in tone *shang*, aspiration of the initial assimilates the final glottal stop characteristic of tone *shang* into an aspiration that makes it become tone *qu*. Then, a Grassmann-like dissimilation occurs that changes aspirated into non-aspirated in syllables with final -h in tone *qu*.

		aspiration of voiced	devoicing	assimilation	breathy voice	dissimilation
全清—平	p ₋	p ₋	p ₋	p ₋	pV	pV
次浊—平	m ₋	m ₋	m ₋	m ₋	mV̤	mV̤
全浊—平	b ₋	bɦ ₋	pɦ ₋	pɦ ₋	pɦV̤	pɦV̤
全清—上	p ₋ ʔ	p ₋ ʔ	p ₋ ʔ	p ₋ ʔ	pVʔ	pVʔ
次浊—上	m ₋ ʔ	m ₋ ʔ	m ₋ ʔ	m ₋ ʔ	mV̤ʔ	mV̤ʔ
全浊—上	b ₋ ʔ	bɦ ₋ ʔ	pɦ ₋ ʔ	pɦ ₋ ^h	pɦV̤ ^h	pɦV̤ ^h
全清—去	p ₋ ^h	p ₋ ^h	p ₋ ^h	p ₋ ^h	pV ^h	pV ^h
次浊—去	m ₋ ^h	m ₋ ^h	m ₋ ^h	m ₋ ^h	mV̤ ^h	mV̤ ^h
全浊—去	b ₋ ^h	bɦ ₋ ^h	pɦ ₋ ^h	pɦV ^h	pɦV̤ ^h	pɦV̤ ^h

Table 21: Evolution of tones according to Pulleyblank.

However, this explanation poses a problem because voiced initials become unaspirated in in the entering tone too though no such dissimilation is likely to have occurred in these syllables.

The pronunciation *shǎng* in third tone in Mandarin is conventional, the MC reading *dzyangX* can only become *qu* according to regular sound laws.

Exercise:

dangX, thawH, daw, beng, dejH, tejH, damH, tam

MC	Mandarin	Cantonese
ang	ang	ɔŋ
aw	ao	aw
eng	ing	iŋ
ej	i	ɛj
am	an	am

3.3 Tones and poetry

The meter of Tang and Song poems was not exclusively based on the number of syllables and rimes, but also on the tones. The four tones were divided into two groups: 平 *píng* and 仄 *zè*, the latter including *shǎng*, *qù* and *rù*. In a given meter, a syllable can be defined either as *píng*, or as *zè*, or any of these.

As an example, we chose the 词 *ci* 菩萨蛮 *púsaman*:

O	平	O	仄	平	平	仄 ¹
O	平	O	仄	平	平	仄 ¹
O	仄	O	平	平 ²		
O	平	平	仄	平 ²		
O	平	平	仄	仄 ³		
O	仄	O	平	仄 ³		
O	仄	仄	平	平 ⁴		
O	平	O	仄	平 ⁴		

Table 22: Score of *Pusaman* poems

O indicates syllable that can be either *píng* or *zè*. The numbers indicate syllable that rime one with another

Here is an example with MC transcription:

平林漠漠烟如织
 bjæng lim mak mak ‘en nyo tsyik
 寒山一带伤心碧
 han srean ‘jiet tajH syang sim pjæk
 暝色入高楼
 meng srik nyip kaw luw
 有人楼上愁
 hjuwX nyin luw dzyangH dzrjuw
 玉阶空伫立
 ngjowk keaj khuwng drjoX lip
 宿鸟归飞急
 sjuwk tewX kjwíj pjíj kip
 何处是归程
 ha tsyhoH dzyeX kjwíj drjeng
 长亭连短亭
 drjang deng ljen twanX deng

In the table next page, we represent the tones of this poem. Syllables with undefined tone are between brackets, and *zè* tones are in bold:

(平)	平	(入)	入	平	平	入 ¹
(平)	平	(入)	入	平	平	入 ¹
(平)	入	(入)	平	平 ²		
(上)	平	平	去	平 ²		
(入)	平	平	上	入 ³		
(入)	上	(平)	平	入 ³		
(平)	去	上	平	平 ⁴		
(平)	平	(平)	上	平 ⁴		

Table 23: Tones in Li Bai's poem

We see that this poem fully respects the score (it is not always the case). Some of the rimes are not perfect from the point of view of the *Qièyùn*: div. 3 rimes can rime with div. 1 and 4 rimes.

As an exercise, analyze these poems:

Wen Tingyun:

玉楼明月长相忆，柳丝袅娜春无力。门外草萋萋，送君闻马嘶。画罗金翡翠，香烛销成泪。
花落子规啼，绿窗线梦迷。

Wei Zhuang:

人人尽说江南好，游人只合江南老。春水碧于天，画船听雨眠。垞边人似月，皓腕凝霜雪。
未老莫还乡，还乡须断肠。

Lesson 4: The rimes of Middle Chinese

The rimes of Middle Chinese are usually gathered in rime groups known as 摄 *shè*, that represent rime distinctions in Late Middle Chinese (LMC) rather than Early Middle Chinese (EMC). Here are the rimes of the *Qieyun* in different systems of reconstruction, not including tones, but taking medial-*w*- into account

摄	韵		Karlgren	Pulleyblank 1991	Baxter 1992	Chan 2004	
						Jinling	Luoyang
果	歌一	开	â	a	a	ɑ	ɐ
	歌三		ĵâ	ia	ja	ɑ	œ
	戈一	合	uâ	wa	wa	wɑ	wɐ
	戈三		ĵwâ	ua	jwa	wɑ	wœ
假	麻二	开	a	ai	æ	æ	ɛ
	麻三		ĵa	ia	jæ	jæ	jɛ
	麻二	合	wa	wai	wæ	wæ	wɛ
遇	模一	合	uo	ɔ	u	u	ə
	鱼三		ĵwo	iǒ	jo	œ	ø
	虞三		ĵu	uǒ	ju	ø	ø
蟹	咍一	开	âi	əj	oj	əj	əj
	泰一		âi-	aj ^h	ajH	ɔj	ɛj
	皆二		ăi	əj	ej	ɔj	ej
	佳二		ai	aij	ei	ɛ	ej
	夬二		ai-	aij ^h (s)	æjH	æj	ej
	祭三		ĵâi-	iaj ^h / jiaj ^h	jejH / jiejH	ej / jej	ej / jej
	废三		ĵɔi-	iaj ^h	jojH	øj	øj
	齐四		iei	ej	ej	ɛj	ij
	灰一	合	uâi	wəj	woj	ɤj	ɤj
	泰一		wâi-	waj ^h	wajH	wɔj	wɛj
	皆二		wăi	wəj	wej	wɔj	wɛj
	佳二		wai	waij	wɛi	wɛ	wɛj
	夬二		wai-	waij ^h (s)	wæjH	wæj	wɛj
	祭三		ĵwâi	wiaj ^h / jwiaj ^h	jwejH / jwiejH	wɛj / wɛj	wɛj / wɛj
	废三		ĵwɔi-	uaj ^h	jwojH	wəj	wəj
	齐四		iwei	wɛj	wɛj	wɛj	wij
止	支三	开	iɛ	iǒ / jiǒ	je / jie	e / je	i / ji
	脂三		i	i / ji	ij / jij	i / ji	i / ji
	之三		i	ɨ	i	i	e
	微三		ɛi	ij	jij	yj	yj
	支三	合	wiɛ	wiǒ / jwiǒ	jwe / jwie	wɛ / wɛj	wi / wji
	脂三		wi	wi / jwi	wij / jwij	wi / wji	wi / wji
	微三		wɛi	uj	jwij	wyj	wyj

效	豪一	开	âu	aw	aw	ɔw	ɐw
	肴二		au	aiw	æw	ɛw	ɛw
	宵三		ɨwäu	iaw	jew / jiew	ew / jew	ew / jew
	萧四		ieu	ɛw	ew	ɪw	ɪw
流	侯一	开	ɤu	əw	uw	ɰ	u
	尤三		ɨu	uw	juw	y	y
	幽三		ɨëu	jiw	jiw	iw	iw
咸	覃一	开	âm	əm	om	ɔm	ɔm
	谈一		âm	am	am	am	ɐm
	咸二		ãm	əim	em	em	em
	衔二		am	aïm	æm	æm	ɛm
	盐三		ɨäm	iam	jem	øm	øm
	严三		ɨɔm	iam	jæm	em / jem	em / jem
	添四		iem	em	em	im	im
	凡三	合	ɨwɔm	uam	jwom	œm	øm
深	侵三	开	ɨəm	im / jim	im / jim	im / jim	im / jim
山	寒一	开	ân	an	an	an	ɐn
	山二		ăn	əin	ɛn	ɛn	ɛn
	删二		an	aïn	æn	æn	æn
	仙三		ɨän	ian	jen / jien	en / jen	en / jen
	元三		ɨɔn	ian	jon	øn	øn
	先四		ien	ɛn	en	in	in
	桓一	合	uân	wan	wan	wan	wɛn
	山二		wăn	wəin	wɛn	wɛn	wɛn
	删二		wan	wain	wæn	wæn	wæn
	仙三		ɨwän	wian	jwɛn / jwien	wɛn / wjen	wɛn / wjen
	元三		ɨwɔn	uan	jwon	wøn	wøn
先四	iwen	wɛn	wɛn	wɪn	wɪn		
臻	痕一	开	ən	ən	on	ən	ən
	真三		ɨěn	in / jin	in / jin	in / jin	in / jin
	殷三		ɨən	in	jɪn	in	yn
	魂一	合	uən	wən	won	ɣn	ɣn
	淳三		ɨwěn / ɨuěn	win / jwin	win / jwin	win / wjin	win / wjin
	文三		ɨuən	un	jun	yn	yn
宕	唐一	开	âng	aŋ	ang	aŋ	ɐŋ
	阳三		ɨang	iaŋ	jang	œŋ	œŋ
	唐一	合	wâng	waŋ	wang	waŋ	wɐŋ
	阳三		ɨwang	uaŋ	jwang	wœŋ	wœŋ
江	江二	开	âng	aɪwŋ	æwŋ	ɔŋ	ɔŋ

曾	登一	开	əng	əŋ	ong	oŋ	oŋ
	蒸三		ɿəng	iŋ	ing	iŋ	iŋ
	登一	合	wəng	wəŋ	wong	wɔŋ	wɔŋ
	蒸三		ɿwəng	wiŋ	wing	wiŋ	wiŋ
梗	庚二	开	ɔng	aɿŋ	æng	æŋ	ɛŋ
	耕二		eng	əɿŋ	eng	ɛŋ	ɛŋ
	庚三		ɿɔng	iaɿŋ	jæng	ɛŋ	jɛŋ
	清三		ɿäng	iaɿŋ / jiaɿŋ	jeng / jieng	ɛŋ / jɛŋ	ɛŋ / jɛŋ
	青四		ieng	ɛŋ	eng	iŋ	iŋ
	庚二	合	wɔng	waiŋ	wæng	wæŋ	wɛŋ
	耕二		weng	wəɿŋ	weng	wɛŋ	wɛŋ
	庚三		ɿwɔng	wiaɿŋ	jwæng	wɛŋ	wjɛŋ
	清三		ɿwäng	wiaɿŋ / jwiaɿŋ	jweng / jwieng	wɛŋ / wjɛŋ	wɛŋ / wjɛŋ
	青四		iweng	wɛŋ	weng	wiŋ	wiŋ
通	东一	合	ung	əwŋ	uwng	ɰŋ	ɰŋ
	冬一		uɔng	awŋ	owng	uŋ	uŋ
	东三		iung	uwŋ	juwng	yŋ	yŋ
	钟三		ɿwɔng	uawŋ	jowng	øŋ	øŋ

To these rimes we may add 臻, that all authors except Karlgren and Chan reconstruct as 真. This rime contains words with retroflex affricate / fricatives initials such as 榛瑟虱. Karlgren's reconstruction is $\text{ɿ}en$.

4.1 Coda

The reconstruction of Codas in Middle Chinese is not a very controversial problem. 8 codas can be distinguished: -j (蟹), -w (效、流), -m (深、咸), -n (臻、山), -ŋ (通、宕、梗、江、曾) and -p, -t, -k. (nasals in *rù* tone). The only problem is whether the rimes of 流 *shè* had a final -w, and if the rimes 脂 and 佳 had a final -j.

The reconstruction of vocalic nuclei however, is much more complex, as both data on loanwords in neighboring languages or alphabetic transcriptions from Tang period represent LMC rather than EMC, and are not informative enough in most case to reconstruction the vocalic system without ambiguity.

Besides, the very nature of the Qieyun system is problematic. It is certain that all of these distinctions, including the chongniu neglected by Karlgren, are authentic and give us information on Old Chinese. However, the *qieyun* is not a homogeneous dialect, but the fusion of at least two literary norms from the Sui dynasty, that of Nanjing and Luoyang. Already at that time, no dialect probably had all these distinctions.

Baxter's system is not a reconstruction in the proper meaning of the tem, but an orthographic representation of these distinctions, more practical to use than traditional terms. For those starting to learn Chinese historical phonology, it is preferable to familiarize oneself with this system for some time before learning traditional names of rimes and initials.

4.2 The four divisions

The four divisions are not categories of Early Middle Chinese (EMC), but rather of (Late Middle Chinese, LMC). In Karlgren's reconstruction, the difference between the four divisions was as follows. Div 1 and 2 had a different set of vowels: div. 1: â, âi, ə, u and div. 2: ɛ, ǎ, a, ǎ, ɒ (mostly front vowels explaining the palatalization in many dialects). Div. 3 was reconstructed with an i or a medial j. Div. 4 had ie with medial i.

All reconstructions agree that **division 1** rimes had no medials other than -w-, and no front vowels.

Following Maspero (1920) and Lu Zhiwei (1947), Pulleyblank showed that the diphthongal pronunciation ie of **division 4** was a LMC feature, and that a single vowel ɛ had to be reconstructed in div. 4 rimes in EMC. No reconstruction system of MC maintains Karlgren's error, except Starostin's (1989).

The nature of **division 3** is the subject of a controversy.

Karlgren reconstructed his yod back to OC, but Pulleyblank and Norman have given convincing arguments to prove that these rimes probably had no medial in OC: no trace of this medial can be found in other ST languages or in older loanwords, nor in the older layers of Min dialects or even in Indic loanwords (3 div. syllables are often used to transcribe non palatalized words). Besides, div. 3 words represent more than half of the vocabulary, and it seemed not normal that most words had such a marked feature.

Pulleyblank reconstructs high vowels u i i that develop a secondary palatalization in LMC. It seems that some div. 3 rimes, like 钟, have no palatalization in many dialects. For example, 共 gjowngH, Mandarin gòng, Cantonese kuj²². Besides, some rimes such as 之 -i appear as o in go'on (coming from *ə) and ɔ in some layers of Sino-Vietnamese:

	Baxter	Pulleyblank	SV 1	SV 2	go'on	kan'on
棋 碁	gi	gi̯	cờ	kỳ	go	ki
起	khiX	khi̯ [?]	khởi	khi		

Table 24: Examples of rime 之 in Sino-Vietnamese and Sino-Japanese

It seems unlikely that this vowel was a front vowel in EMC. khởi cannot be a loanword from OC, because, the rising tone of Chinese corresponds to *hỏi*, and it would correspond to *sắc* if it were ancient.

In **division 2**, Pulleyblank 1984 reconstructs vowels with retroflex secondary articulation a^r and ə^r, but in this 1991 book, these are reconstructed as diphthongs ai and əi. These reconstructions are influenced by the idea that div. 2 comes from syllables with -r- in Old Chinese. The MC reconstructions by Pan Wuyun and Zhengzhang Shangfang with a medial -ɣ- in division 2 are based on this idea too. However, reconstructing such a medial in MC seems difficult, it would mean that retroflex affricates were always followed by a medial -j- or -ɣ- and were never directly followed by a vowel, and that there was a triple opposition -w- (hekou div. 1), -ɣ- (kaikou div. 2) and -wɣ- (hekou div. 2). For example, in Zhengzhang's EMC 撰 dzrwænX would be dzɣuan, and there is no *dzuan. A reconstruction with open front vowels fits the data better.

Abraham Chan (2004) put forth a new reconstruction for EMC that deserves attention. Following Pulleyblank, he makes two distinct reconstructions: one for the Northern dialect, and one for the southern. According to him, *Qieyun* categories a a conflation of rime categories found

in the two dialects, but the major difference with Pulleyblank is that he does not consider that the northern dialect preserves all rimes distinctions. For example, in the case of 支脂之, he thinks that Luoyang merged 支 and 脂, while Nanjing merged 脂 with 之: the distinction between the three was not synchronically present anymore in Sui dynasty.

He also believes that a successful reconstruction of EMC ought to explain the distribution of the rimes in the Qieyun (why some hekou rimes are distinguished and not others, why 麻 and 庚 have both div. 2 and div. 3 words) as well as riming practices in late Nanbeichao and Sui.

Interriming		Pulleyblank	Baxter	Chan 1	Chan 2
div. 3 / div. 4 (same final)		iaC εC	jeC eC	eC ɪC	eC ɪC
div. 2 with the same final (north)		aɪC əɪC (ɛ:C)	æC εC	æC εC	ɛC
no final	脂之 (south)	i i	i ij	i	i e
	支脂 (north)	iə i	je ij	e i	i
	模鱼虞 (north)	ɔ iə uə	u jo ju	u œ ø	ə ø
-j	废灰哈	iaj wəj əj	joj woj oj	øj ɣj əj	øj ɣj əj
	脂 (合口) 微 (south)	wi uj	wij jwɪj	yj	wi yj
	泰皆 (south)	aj əj	aj ej	ɑj	ɛj ej
-n	元魂痕	ian wən ən	jon won on	øn ɣn ən	øn ɣn ən
	真殷臻 (south)	in in in	in jin in	in	in ɣn un
	殷文 (north)	in un	jin jun	in ɣn	ɣn
-ŋ	唐阳 (north)	aŋ iaŋ	ang jaŋ	ɑŋ œŋ	ɛŋ œŋ
	冬钟 (north)	awŋ uawŋ	owŋg jowŋg	uŋ øŋ	əŋ øŋ
-m	严凡 (north)	iam uam	jæm jom	œm øm	øm

Table 25: Interriming in Nanbeichao / Sui

In this table, the symbol C represents any final consonant. Chan's reconstruction tries to systematically account for interriming by reconstructing identical or similar vowels for rimes that can rime together

In Chan's theory, div. was characterized by a peripheral vowel: i e æ ɑ o u y ø œ, (non peripheral vowels are ɛ ɔ ɪ ɣ ə ɐ ʌ).

However, Chan's reconstruction has several flaws:

1. 模. was not a high vowel in EMC (earliest Tibetan transcriptions, early Sino-Vietnamese)
2. 登. He reconstructs -oŋ on the basis of the use of characters from this rime to note Old Japanese o² in *manyōgana*. However, it is well known that o² was a schwa, and that in any case the use of Chinese characters in *manyōgana* was not based on EMC, but on a much older form of Chinese.
3. 之. Chan has a front vowel i or e. However, we have seen that it was not a front vowel in EMC as Sino-Vietnamese shows.
4. *chongniu 4* was not a simple palatal medial -j-, but an alveolo-palatal fricative -ʒ-

Miyake (1999: 366-370) proposes some emendations to Pulleyblank's EMC that can be summarized as follows:

	Baxter	Pulleyblank	Miyake
division 2	æ	ai	æ
	ɛ	əi	ɛ
division 4	e	ɛ	e
division 1	u	ɔ	o
division 3	je	iə	iə
	jo	iə	iə
	ju	uə	uə
	je(j t n)	ia(j t n)	iə(j t n)
	jo(j t n)	ia(j t n)	iə(j t n)
	jwo(j t n)	ua(j t n)	uə(j t n)
	jæ	ia	ja

Table 26: Miyake's emendations on Pulleyblank's EMC

4.3 古近字音对照手册

A convenient source of data on EMC is the Handbook by Ding Shengshu 古近字音对照手册. This book encodes Qieyun categories by six characters, and all Chinese phonologists use this system:

褒一博毛切 效开一平毫帮

The characters indicate the following categories (the first and the fourth are redundant):

1. shè
2. kaikou / hekou
3. division
4. tone
5. rime
6. initial

The division also is redundant except in rimes such as 麻 or 庚, and kaikou / hekou can be redundant in rimes without this opposition. Only *chongniu* is not indicated in these 6 characters, so one has to add a dot before the characters:

碑一彼为切 • 卑一府移切 止开三平支帮

This indicates that 碑 pje is *chongniu* 3, while 卑 pjie is *chongniu* 4.

Exercices:

1. 6 characters → Baxter's transcription:

丑	流开三上有昌	(尤)	序	遇合三上语邪	(鱼)
福	通合三入屋非		• 臂	止开三去寘帮	(支)
父	遇合三上虞奉	(虞)	琴	深开三平侵群	
夯	江开二平江晓		窃	效开四上篠影	(萧)
庆	梗开三去映溪	(庚)	庵	咸开一平覃影	

2. Baxter's transcription → 6 characters

周	tsyuw	痛	duwngH
爪	tsræwX	村	tshwon
浩	hawX	眠	men
窄	tsræk	刮	kwæt
睡	dzyweH	杉	srem

平	上	去	去
肴	巧	效	
东	董	送	屋
豪	皓	号	
支	纸	寘	

Lesson 5: Old Chinese

Old Chinese 上古汉语 can be defined in several ways, either as the common ancestor of all attested forms of Chinese (but the term proto-Chinese might be more appropriate) or as the language of pre-Han texts (especially rimed texts).

The methodology of Old Chinese reconstruction is not based on the comparative method. It would be possible, though difficult to apply the comparative method to Chinese, but since modern dialects split in Han time at the earliest, we could not go much further than Han dynasty by this type of method. In order to reconstruct Old Chinese, we use pre-Han rimes combined to the phonetic parts of xiesheng 谐声 characters, and then systematically compare it to Middle Chinese. Loanwords from OC in other languages, as well as ST cognates can also be helpful.

5.2 The origin of the four divisions

We saw that in EMC some series of initials were in complementary distribution:

	1 唐	2 庚	3 阳	4 青
t 端	当 tang			丁 teng
tr 知		趟 træng	张 trjang	
ts 精	脏 tsang		将 tsjang	青 tsheng
tsr 庄		铛 tsrhæng	庄 tsrjang	
tsy 章			章 tsyang	
p 帮	帮 pang	彭 bæng	方 pjang	瓶 beng
k 见	冈 kang	羹 kæng	疆 kjang	经 keng
l 来	郎 lang		良 ljang	灵 leng

The main opposition is between div. 3 rimes and div. 1,2,4 rimes: more than half of words belong to div. 3, and it appears with all the series of initials except dental stops. Div 1, 2 and 4 appear with only one series of stop and one series of affricates, while div. 3 appears with series of each. This situation suggests that there were only one series of stops and one of affricates also in OC, that retroflex and affricates are secondary⁶.

If we try to reorganize the table in terms of two series as the distribution suggests, we have to distinguish two kinds of div. 3 words, those before retroflex stops / affricates and those before alveolo-palatals / dental affricates.

	1 唐 4 青	2 庚	3 阳	3 阳
occlusive	当 tang 丁 teng	趟 træng	章 tsyang	张 trjang
affriquée	脏 tsang 青 tsheng	铛 tsrhæng	将 tsjang	庄 tsrjang

Table 27: Coronal affricates and the four divisions

What is the nature of the div. 124 / div. 3 opposition on the one side, and of the div. 14 / div. 2 opposition on the other side?

⁶The first to propose this idea was 钱大昕 Qian Daxin (1728-1804): 舌音类隔之说不可信.

The first opposition is the subject of an important controversy. Karlgren reconstructed his yod in div. 3 back to OC, but most phonologists now reject this reconstruction, except Gong Hwangcheng. Pulleyblank (1962) thought this opposition came from vowel length, and idea further developed by Zhengzhang and Starostin.

Jaxontov and Ferlus have proposed the presence of prefixes as the origin of the distinction (Jaxontov had a *d- in type B syllables, while Ferlus reconstructs stop prefixes in type A). Norman proposed a voiced quality distinction linked with pharyngealization. We keep here Sagart (1999)'s notation ^a and ^b to distinguish the two types of syllables in OC without accepting any theory.

The second opposition, according to (1959)⁷'s theory, comes from a *-r- medial in div. 2 (originally reconstructed as *-l-). Several independent facts support this idea. First, div. 2 does not appear with initial 来 (that comes from *r-, cf. 5.4). Secondly, there is an important number of phonetic series where both l- initial words and stop initial words are found, where the stop initial word have div. 2, such as 監 *kæm* and 藍 *lam*. In this word, the presence of a consonant cluster is confirmed by the Thai form กราม *gra:m*.

The *chongniu* problem is also linked to this *-r- medial: *chongniu* 4 syllables before labials and velars come from OC syllables without medial, while those in *chongniu* 3 had an*-r-.

	1,4	2	3	3
occlusive	t- 端组 * ^a t-	tr- 知组 * ^a tr-	tsy- 章组 * ^b t-	trj- 知组 * ^b tr-
affriquée	ts- 精组 * ^a ts-	tsr- 庄组 * ^a tsr-	tsj- 精组 * ^b ts-	tsrj- 庄组 * ^b tsr-

Table 28: The origin of the four divisions in OC

In this table, we indicate OC reconstructions for MC series of coronals. These general laws apply to different stops and affricates, whatever voicing and aspiration (for example, dzy < *^bd- etc).

5.3 Final stops in OC and tonogenesis

A phenomenon that attracted the attention of phonologists since the Qing dynasty is the riming and xiasheng contacts between open syllables 阴声韵 (especially *qusheng*, *shangsheng* and *pingsheng* examples are rarer) and checked finals (入声韵). For example, the series GSR 766 whose phonetic is 各, has both *rùsheng* words, such as 各 *kak*, 格 *kæk* or 客 *khæk*, and *qùsheng* words such as 路露 *luH*. In the rimes of the Shijing, we observe the same kind of contact between *qusheng* and *rusheng*:

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Jingdian shiwen glosses:

执爨：七乱反 (tshwanH)

踏踏：七夕反 (tshjek) 又七略反 (tshjak)

或燔：音烦

炙：之赦反

莫莫：音麦 (mæk) normal reading: mak

献酬：市由反 (dzyuw)

卒度：如字法也 (duH) 沈 (沈重) 徒洛反 (dak)

⁷Яхонтов С. Е. 1959. 'Фонетика китайского языка 1. тысячелетия д.н.э. (система финалей).' Проблемы востоковедения 2: 137-47.

执爨蹠蹠	tsyip tshwanH tshjek <u>tshjek</u>
为俎孔硕	hjwe tsrjoX khuwngX <u>dzyek</u>
或燔或炙	hwok bjon hwok <u>tsyæH</u>
君妇莫莫	kjun bjuwX mək <u>mək</u>
为豆孔庶	hjwe duwH khuwngX <u>syoH</u>
为宾为客	hjwe pjın hjwe <u>khæk</u>
献酬交错	xjonH dzyuw kæw <u>tshak</u>
礼仪卒度	lejX ngje tswot <u>duH</u>
笑语卒获	sjewH ngjoX tswot <u>hwək</u>
神保是格	zyin pawX dzyeX <u>kæk</u>
报以介福	pawH yiX kejH <u>pjuwk</u>
万寿攸酢	mjonH dzyuwH yuw <u>dzak</u>

In these rimes, two qùsheng character 庶 *syoH* and 度 *duH* appear with rusheng words. Besides, 度 (GSR 801) has a *rùsheng* reading dak.

Karlgren's solution was to consider that open syllable characters belonging to a series with rusheng syllables or riming with rusheng syllables had a voiced final –g (with final –k) or –d (avec with –t). Voiced stops dropped without leaving a trace. This idea was accepted by most specialists of OC (Dong Tonghe, Li Fang-kuei) up to the half of the last century, but refused by Wang Li and proponent of the 6 vowel system. It faces four problems:

1. No attested ST language has a voicing opposition with final stops, though it exists in other Northern Asian languages, such as Turkic.
2. In this type of reconstruction, there are almost no open syllables (3 rimes in Karlgren's system, one in Dong Tonghe's, and non in Li Fang-kuei's).
3. No explanation is given why words belonging to 祭 (with final *-d) only have qusheng.
4. Almost no *-b are reconstructible. In the rare phonetic series where open syllable characters and characters with –p appear (except the series of 去), such as GSR 695 (内 nwojH and 入 nyip / 纳 nop), Karlgren reconstructed the highly improbable change *-b > -d: *nwəb > *nwəd for 内).

Haudricourt's tonogenesis theory seen in Lesson 3 can explain all these phenomena.

By reconstruction *qusheng* as *-s and *shangsheng* as *-ʔ, the reason of the contact between open and close syllables becomes clear. In the series of 各 for example, qusheng characters such as 路, belonging to OC 鱼 rime, have to be reconstructed with an *a, and luH could be reconstructed as *ras. The contact between 格 *krak and *ras is better understood if we suppose that this *ras comes from an older *raks, by a rule according to which in final clusters [stop+s], the stop drops. It is not necessary to reconstruct voiced finals anymore, and solves problem 1. The same goes for the rimes of the Shijing:

执爨蹠蹠	^b tip ^a tshon-s ^b tshak ^b tshak
为俎孔硕	^b waj ^b tsraʔ ^a khonʔ ^b dak
或燔或炙	^a wik ^b ban ^a wik ^b tak-s
君妇莫莫	^b kun ^b biʔ ^a mrak ^a mrak
为豆孔庶	^b waj ^a dos ^a khonʔ ^b stak-s

为宾为客	^b waj ^b pin ^b waj ^a khvak
献酬交错	^b hjan-s ^b du ^a kraw ^a tshak
礼仪卒度	^b rijʔ ^b ɲaj ^a tsut ^a lak-s
笑语卒获	^b s-ʔaw-s ^b ɲaʔ ^a tsut ^a wrak
神保是格	^b mliŋ ^a puʔ ^b deʔ ^a krak
报以介福	^a pus ^b liʔ ^a krits ^b piŋ
万寿攸酢	^b mans ^b dos ^b liw ^a dzak

-k drops without direct traces (-ks and *-shave the same evolution), but *-ts had a change different from *-s: *-t became of final -j. The rimes appearing only in qusheng such as 泰 -ajH, 祭 -jejH or 废 -jojH come from syllables with final *-ts cluster. For example, GSR 337:

祭 tsjeH < ^bts[e,a]t-s

蔡 tshajH < ^atshat-s

察 tsret < ^atshret

Or GSR 302:

括 khwat < ^ak^wat

活 hwat < ^ag^wat

话 hwæjH < ^ag^wrat-s

This type of reconstructions make more distinctions than those by Karlgren or Li Fang-kuei: *qùsheng* word with rime or *xiésheng* contact with *rùsheng* words (such as 路 luH < ^arak-s) are reconstructed differently from those without (故 kuH < ^aka-s). In Li Fang-kuei, both would be reconstructed with *-agh. There is no need to reconstruct a language without open syllables anymore: problem 2 is solved.

Finally, the problem of final *-b also receives a proper explanation: ancient *-ps clusters became *-ts by assimilation: 内 ^anups > ^anuts > nwojH. The scarcity of contact between qusheng and -p in phonetic series and rimes is simply due to the fact that the change *-ps > *-ts occurred early in the history of Chinese. Characters created after this change have *xiésheng* / rime contact with *rùsheng* -t words.

Not everybody accepts Haudricourt's theory. Here are the main arguments against it:

1. The reconstruction of Shangsheng by a *-ʔ is not satisfying because this model, built on the comparison of Vietnamese and other Austro-Asiatic languages, does not explain shangsheng words with final nasals: one would have to reconstruct *-mʔ, *-nʔ or *-ŋʔ, though such clusters do not exist in AA languages. Answer: it is true that these clusters are quite rare in AA (though they existed in proto-Viet-Muong), but they are well attested in ST languages such as rGyalrong and Chepang, and the typological argument is therefore invalid.
2. Reconstructing final voiced stops is necessary to explain 对转 *duizhuan* phenomena, word families between open-syllable words and nasal-final words in EMC. For example (reconstructions by Gong Hwangcheng).

往 *gwrjangx 于 *gwrjag

扬 *lang 鼻 *lag

Answer: The examples of *duizhuan* between 阴声韵 and 入声韵 are few, and have

no common meaning. They may be either unrelated words, or words related by suffixation.

5.4 The 6 vowel system

Jaxontov (1960)⁸ was the first to notice the abnormal distribution of hekou syllables in MC. Some rimes with closed syllable such as 唐阳 –wang / -jwang, 登 –wong, 庚二 –wæng, 耕 –weng, 先 –wen, appear only with velar or glottal initials (or labials, but in this case the kai/he opposition is not distinctive). There were no such syllables as *trwæng, *tswen, *lwong or *dwang in MC. Other hekou syllables however appear with all initials, such as –win, –won, etc.

Jaxontov concluded that we ought not to reconstruct a medial *-w- in OC as Karlgren did, but that MC medial -w- had two origins:

A. *hekou* syllables that appear only before velars and glottals (as well as part of the other *hekou* syllables) had labiovelar initials *kw-, *khw-, *gw-, *hw-, *ʔw- in OC. In this case, MC medial -w- comes from the labial element of ancient labiovelars.

光 kwang < * ^a kwaŋ	狂 gjwang < * ^b gwaŋ
获 hwek < * ^a wrak	
犬 khwen < * ^a khwir	玄 hwen < *gwin

B. In other *hekou* syllables, medial –w- is due to the breaking of rounded vowels *u and *o:

敦 twon < * ^a tun	淳 tsywin < * ^b tun
端 twan < * ^a ton	专 tsywen < * ^b ton
卒 tswot < * ^a tsut	出 tsyhwit < * ^b thut
掇 twat < * ^a tot	拙 tsywet < * ^b tot

These are syllables with acute finals in OC *-j, *-r, *-n *-t

This analysis, combined with the –r- medial theory see in 5.2, leads to a reorganization of OC vocalic system. In order to determine the number of vocalic opposition in OC, we shall see how many distinctions must be reconstructed in open syllables, and then in closed syllables.

EMC open syllables (or final –j –w) come from ten traditional *yùnbù* of OC. Here is the list (without indicating the syllables with *-r-:

	Karlgren	Li Fang-kuei	6 vowels	EMC div. 124	EMC div 3
鱼	*o	*ag	*a	u 模	jo (ju) 鱼虞
侯	*u	*ug	*o	uw 侯	juw 尤
之	*əg	*əg	*i	oj 哈	i 之
幽	*ôg	*əgw	*u / *iw	aw 豪	juw 尤
微	*iər	*əd	*ij < *il	oj (ej) 哈齐	jjj (ij) 微脂
脂	*iər	*id	*i / *ij < *il	ej 齐	ij 脂
支	*ieg	*ig	*e	ej 齐	je 支
歌	*âr *â	*ar	*aj < *al / *oj < *ol	a 歌	je 支
宵	*og	*agw	*aw / *ew	aw 豪	jew 宵
祭	*âd	*adh	*ats / *ots	ajH 泰	jojH (jejH) 废祭

In order to determine how many vocalic distinctions there were in open syllables, we need to distinguish among these *yùnbù* those that had a plain vowel and those that had final *-j and *-w in

⁸Яхонтов С. Е. 1960. ‘Фонетика китайского языка 1. тысячелетия д.н.э. (лабиализованные гласные).’ Проблемы востоковедения 6:53-77.

OC. Rime 祭, as we have seen, had a final cluster *-ts, and does not go back to an open syllable in OC.

For 歌, we need to reconstruct final *-j and *-r, give the contacts between this rime and 元, in series such as 雉 na < *^anaj or 难 nan < *^anar. Ancient Vietnamese and Thai loanwords also kept the final -j. For example, 多 ta < *^at-laj was loaned as หลาลัย hlai^A in Thai.

There was a chain shift *-a > -ɔ, *-aj > -a and finally *-ats > ajH. The loss of *-s in this rime occurred later than in others. Reconstructing *a for 鱼 is not controversial, it is confirmed among others by cognates in other ST languages (苦 *^akha? :: kha-ba, 吾 *^aŋa :: nga, 五 *^aŋa? :: lnga, 鱼 *^bŋa :: nya etc).

We even find contacts between 微 rime words and -n rime words in MC, and it justifies to reconstruct here also a final. If we put aside 宵, whose rimes all have final -w in EMC, there are only six yùnbù left. Li Fangkuei's system has the same distinctions, but most of the oppositions lay on the finals and the medial, and there are only four vowels.

In syllables with velar finals, there are five yùnbù:

	6 voyelles	EMC div. 124	EMC div 3
蒸	*iŋ	ong	ing
冬	*uŋ	owng	juwng
耕	*eŋ	eng	jeng
阳	*aŋ	ang	jang
东	*oŋ	uwng	juwng

Rime *iŋ in EMC merged with *in 真, in words such as 年 nen < *^aniŋ. Here too, we find six vowels. For rimes with dental or labial finals, EMC readings are ambiguous: one often needs to use phonetic series and Shijing rimes.

5.5 How to reconstruct a word in OC

In some cases, it is possible to determine the OC directly from the EMC form. For example, 堵 tuX can come only from *^ata?. These cases are not common (模 comes only from 鱼部 *^a). As can be observed in the tables, rime 麻 -æ can come either from 鱼 *^a-a, or from 歌 *^a-aj. Therefore, 马 mæX and 麻 mæ can be a priori reconstructed either as *^amraj? / *^amra? or as *^amra? / *^amra. We need to use Shijing riming or phonetic series to decide.

For these characters, we are fortunate to have Shijing rimes. 麻 rimes three times. Some of its rime words are unambiguous, such as 歌 ka < *^akaj or 娑 sa < *^asaj, and the others, even though ambiguous, clearly come from rime 歌 *aj. 马 rimes 21 times, and its rime words are unambiguously 鱼 *^a-a words, such as 组 tsuX < *^at-sa?. Therefore, we must reconstruct 麻 *^amraj and 马 *^amra?.

Phonetic series can also be used to solve ambiguity, especially for the reconstruction of initials, for which Shijing rimes give no information.

Correspondences between EMC and OC

⁹ Even with this rime, there is an ambiguity before uvulars. A syllable such as ku can be reconstructed with a single velar *^aka or a labiovelar *^akwa.

Divisions 1, 2 et 4

A: Acute initial

G: Grave initial

L: Labial initial

V: Velar initial

EMC	OC (Baxter)
-a 歌	-aj 歌
-æ 麻	-raj -ra 歌鱼
-æjH 夬	-rats 祭
-æk 陌	-rak 职
-æm 衔	-ram 谈
-æn 删	-ran 元
-æng 庚	-raŋ 阳
-æp 狎	-rap 盍
-æt 辖	-rat 月
-æw 肴	-ru -riw -raw -rew 幽宵
-æwk 觉	-rawk -rewk -riwk -rok -ruk 药觉屋
-æwng 江	-roŋ -ruŋ 冬东
-ajH 泰	-ats 祭
-ak 铎	-ak -awk 铎药
-am 谈	-am 谈
-an 寒	-an 元
-ang 唐	-aŋ 阳
-ap 盍	-ap 盍
-at 曷	-at 月
-aw 豪	-aw -u 宵幽
-ej 皆	-rij -rij -ri 脂微之
-ejH 皆	-rits -rits -rets 脂微祭
-ek 麦	-rik -rek 职锡
-em 咸	-rem -rom -rim -rum -rim 谈侵
-en 山	-ren -rin -rin 真文元
-eng 耕	-reŋ -riŋ 耕蒸
-ep 洽	-rep -rop -rip -rup -rip 缉盍
-et 黠	-ret -rit -rit 月质物
-ei 佳	-re -raj 支歌
-ej 齐	-e -ij 支脂
-ej A 齐	-ij 微
-ejH 齐	-its -ets 质祭

-ejH A 齐	-its 物
-ek 锡	-ek -iwk -ewk 锡觉药
-em 添	-em -im 谈侵
-en 先	-en -in -iŋ 元真
-en A 先	-in 文
-eng 青	-eŋ 耕
-ep 帖	-ep -ip 盍缉
-et 屑	-et -it 月质
-ew 萧	-iw -ew 宵
-oj 哈	-i 之
-oj V 哈	-ij 微
-ojH V 哈	-its 微
-ok 德	-ik 职
-om 覃	-om -im -um 谈侵
-on V 痕	-in 文
-ong 登	-iŋ 蒸
-op 合	-op -ip -up 盍缉
-owk 沃	-uk -awk 觉药
-owng 冬	-uŋ 冬
-u 模	-a 鱼
-uw 侯	-o -ro 侯
-uw L 侯	-u 幽
-uwk 屋	-ok -awk 屋药
-uwng 东	-oŋ 东
-wa 歌	-oj 歌
-wæ 麻	-roj 歌
-wæ LV, L 麻	-ra 鱼
-wæjH 夬	-rots 祭
-wæjH LV 夬	-rats -rets 祭
-wæt 鐸	-rot 月
-wæt LV 鐸	-rot -rat 月
-wæn 删	-ron 元
-wæn LV 删	-ren -ran -ron 元
-wajH 泰	-ots 祭
-wan 桓	-on 元
-wat 末	-ot 月
-wej 皆	-ruj 微
-wej LV 皆	-ri 之
-wejH 皆	-rots -ruts 祭微

-wɛn 山	-run 文
-wɛn LV 山	-rin 文
-wɛt 黠	-rot -rut 月物
-woj 灰	-uj 微
-woj L 灰	-i -ij 之
-wojH 灰	-uts 微
-wojH L 灰	-its 微
-won 魂	-un 文
-won L 魂	-in 文
-wot 没	-ut 物

Division 3

-i 之	-i 之
-ij 脂	-rij -rij 脂微
-ij A 脂	-ij -ij 脂微
-ij L 脂	-ri 之
-ijH 脂	-rits -rits 脂微
-ijH A 脂	-its -its 脂微
-ik 职	-ik -rik 职
-im 侵	-rim 侵
-im A 侵	-im 侵
-im A, V 侵	-im -um -rim -rum 侵
-in 真臻	-rin -rin 真文
-in A 真臻	-in -in 真文
-ing 蒸	-iŋ -riŋ 蒸
-ip 缉	-rip 缉
-ip A 缉	-ip 缉
-ip A, V 缉	-ip -up -rip -rup 缉
-it 质	-rit -rit 质物
-it A 质	-it -it 质物
-jæ A 麻	-aj -a 歌鱼
-jæk 陌	-rak 铎
-jæk G 陌	-rek 锡
-jæm G 严	-ram 谈
-jæm V 严	-am -om -rom 谈
-jæŋ G 庚	-raŋ -reŋ 阳耕
-jæŋ TS 庚	-reŋ 耕
-jæp G 业	-rap 盍
-jæp V 业	-ap -op -rop 盍

-jak 铎	-ak -awk -rawk -ewk -rewk 铎药
-jak A 铎	-rak 铎
-jang 阳	-aŋ 阳
-jang A 阳	-raŋ 阳
-je 支	-raj -re -aj 歌支
-je A 支	-e 支
-jejH 祭	-rats -rets 祭
-jejH A 祭	-ats -ets 祭
-jek 昔	-ek 锡
-jek A 昔	-ak -rek 铎锡
-jem 盐	-ram -rem 谈
-jem A 盐	-am -em -om -rom 谈
-jen 仙	-ran -ren 元
-jen A 仙	-an -en 元
-jeng 清	-reŋ 耕
-jeng A 清	-eŋ 耕
-jep 叶	-rap -rep 盍
-jep A 叶	-ap -ep -op -rop 盍
-jet 屑	-rat -ret 月
-jet A 屑	-at -et 月
-jew 宵	-aw -raw -rew 宵
-jew A 宵	-ew 宵
-jie G 支	-e 支
-jiejH G 祭	-ets 祭
-jiem G 盐	-em 谈
-jien G 仙	-en 元
-jieng G 清	-eŋ 耕
-jiep G 叶	-ep 盍
-jiet G 屑	-et 月
-jiew G 宵	-ew 宵
-jij G 脂	-ij 脂
-jijH G 脂	-its 脂
-jim G 侵	-im 侵
-jin G 真臻	-in 真
-jip G 缉	-ip 缉
-jit G 质	-it 质
-jiw G 幽	-iw -riw 幽
-jo 鱼	-a -ra 鱼
-jojH G 废	-ats 祭
-jom L 凡	-am 谈
-jom L 凡	-om -rom 谈
-jon G 元	-an 元

-jop L 乏	-ap -op -rop 盍
-jot G 月	-at 月
-jowk 烛	-ok -rok 屋
-jowng 钟	-oŋ -roŋ 东
-ju 虞	-o -ro 侯
-ju LV, L 虞	-a -ra 鱼
-jun G 文	-un 文
-jun L 文	-in 文
-jut G 物	-ut 物
-jut L 物	-it 物
-juw 尤	-u 幽
-juw A 尤	-ro -iw -riw 侯幽
-juw A, V, L 尤	-ru 幽
-juw L 尤	-i 之
-juwk 屋	-uk -ruk -iwk -riwk 觉
-juwk L 屋	-ik 职
-juwng 东	-uŋ -ruŋ 东
-juwng L 东	-iŋ 蒸
-jwe 支	-oj -roj 歌
-jwejH 祭	-rots 祭
-jwejH A 祭	-ots 祭
-jwen 仙	-ron 元
-jwen A 仙	-on 元
-jwet 薛	-rot 月
-jwet A 薛	-ot 月
-jwiejH 祭	-ets LV 祭
-jwiet 薛	-ot -et 祭
-jwojH G 废	-ots 祭
-jwon G 元	-on 元
-jwot G 月	-ot 月
-jwij G 微	-uj 微
-jwijH G 微	-uts 微
-jĵj G 微	-ij 微
-jĵjH G 微	-its 微
-jin V 殷	-in 文
-jit V 迄	-it 物
-wij 脂	-ruj 微
-wij A 脂	-uj 微
-wij LV 脂	-ri -ru 之幽
-wijH 脂	-ruts 微
-wijH A 脂	-uts 微
-win 真	-run 文
-win A 真	-un 文

-wit 质	-rut 物
-wit A 质	-ut 物