Chinese historical phonology differs from most domains of contemporary linguistics in that its general framework is based in large part on a genuinely native tradition. The non-Western outlook of the terminology and concepts used in Chinese historical phonology make this field extremely difficult to understand for both experts in other fields of Chinese linguistics and historical phonologists specializing in other language families.

The framework of Chinese phonology derives from the tradition of rhyme books and rhyme tables, which dates back to the medieval period (see section 1 and 2, as well as the corresponding entries). It is generally accepted that these sources were not originally intended as linguistic descriptions of the spoken language; their main purpose was to provide standard character readings for literary Chinese (see subsection 2.4). Nevertheless, these documents also provide a full-fledged terminology describing both syllable structure (initial consonant, rhyme, tone) and several phonological features (places of articulation of consonants and various features that are not always trivial to interpret, see section 2) of the Chinese language of their time (on the problematic concept of “Middle Chinese”, see the corresponding entry).

The terminology used in this field is by no means a historical curiosity only relevant to the history of linguistics. It is still widely used in contemporary Chinese phonology, both in works concerning the reconstruction of medieval Chinese and in the description of dialects (see for instance Ma and Zhang 2004). In this framework, the phonological information contained in the medieval documents is used to reconstruct the pronunciation of earlier stages of Chinese, and the abstract categories of the rhyme tables (such as the vexing 俸等‘division’ category) receive various phonetic interpretations. Moreover, the language encoded in the rhyme books is generally believed to be the common ancestor of all non-Mín閩 Chinese dialects, and is used as a blueprint for phonological analysis in descriptions of dialects. Several scholars have expressed reservations about this traditional approach (Norman and Coblin 1995, also Handel 2011), and this issue will be discussed in section 3.

Unlike Paninian linguistics, traditional Chinese phonology has not been applied to many other languages. The only true application of this tradition to a non-Chinese language is Tangut historical phonology, briefly described in section 4.

1. The sources on pre-modern Chinese phonology: why rhyme books?
Unlike other ancient languages like Greek, Sanskrit or Hebrew, the logographic nature of the Chinese script considerably hampers the reconstruction of the pronunciation of the earlier stages of Chinese. Although the Chinese script reveals some indirect clues about the pronunciation of Chinese dialects that were spoken
before the script was standardized in the Hàn dynasty (see section 3 of this article and the article on Old Chinese), the data that can be gleaned from it are difficult to interpret and would not be sufficient to reconstruct the language if no other source existed. After the Hàn dynasty, the Chinese script has changed very little; almost nothing can be learned from it concerning the phonological evolution of the Chinese language from Hàn times to the modern period.

Fortunately, these defects can be partially compensated by three alternative philological sources on early Chinese pronunciation: the transcription of Chinese in alphabetic scripts, the transcription of foreign languages (especially Indic) into Chinese, and finally the rhyme books and rhyme table tradition that will be the main topic of this article.

These three sources of data appear relatively late in the history of Chinese: the earliest foreign transcriptions and sound glosses date from the late Han period (second century AD), but the first systematic data are as late as the Suí/Táng-dynasty (late sixth century). None is available for Pre-Hàn Chinese (Old Chinese).

The stage of the language that can be reconstructed of the basis of these three sources is broadly called Middle Chinese (Zhōnggǔ Hányǔ 中古漢語). In Middle Chinese, there was a one-to-one relationship between character and syllable in the Chinese script. The general syllabic structure, as in modern Chinese languages, was C(G)V(C), where C represents a consonant, G a glide (w or j) and V a vowel.

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1.1 Alphabetic sources on Middle Chinese pronunciation

The first two philological sources—transcriptional data—have played a significant role in the reconstruction of Middle Chinese (see the article on Middle Chinese
reconstruction), but contrary to what a general historical linguist might expect, they are by no means central in the study of Chinese dialectology and historical phonology. In the framework of traditional Chinese historical phonology, the most central source of data on early Chinese pronunciation is the non-alphabetic system of the rhyme books, which has no equivalent elsewhere in the world. This puzzling state of affairs can be understood if we compare the value of these various sources.

The first phonetic transcriptions of Chinese appear in Tibetan script in the ninth century (Tokio 1988), but a systematic representation of Chinese in an alphabetic writing system only emerges much later with the ‘Phags-pa script in the thirteenth century (Coblin 2007). The ‘Phags-pa script documents the pronunciation of an early Mandarin dialect with unprecedented precision, but since most Chinese dialects had already diverged by the thirteenth century, it is of limited use for the study of the historical phonology of non-Mandarin dialects. All alphabetic transcription systems of Chinese before ‘Phags-pa have the critical defect of being extremely unsystematic and limited in quantity. For instance, in the corpus that Tokio (1988) has studied, the Chinese character 是 has at least five distinct spellings in Tibetan. Such a source is useful as a complement, but it would be clearly impossible to build a reconstruction system mainly on the basis of such data.

The Chinese transcriptions of Sanskrit in Buddhist texts also provide critical evidence concerning the reconstruction of Tang Chinese phonology, and have even been put to use to date some sound changes (see Maspéro 1920 on the evolution of the voiced stops of early Chinese). However, these transcriptions suffer from the same problems as early alphabetic transcriptions: limited corpus and lack of systematicity.

1.2 fānqiè 反切 sound glosses and rhyme books

The earliest comprehensive and systematic source on early Chinese pronunciation is non-alphabetic. This somewhat paradoxical situation is almost unique to Chinese: the only other language whose phonology is reconstructed on the basis of such data is Tangut (see section 2).

In this section, we will first discuss the nature of the sound glosses, and then present the rhyme books, their purpose and their structure.

1.2.1 Sound glosses and fānqiè

The need for phonetic glosses is motivated by two problems specific to the Chinese script. First, the total number of characters is and has always been extremely large, so that even learned scholars will inevitably encounter characters they might never have seen before, and will have no way to guess with certainty their pronunciation. Second, some characters, including common ones, can have more than one reading. This difference in reading is usually correlated with a difference in meaning (see the chapter on Old Chinese for an account of such phenomena).

This problem was eventually resolved by the invention of fānqiè sound glosses,
which use two “speller” characters to indicate a pronunciation. The first character represents the onset of the syllable (the initial consonant, since Middle Chinese did not have clusters), while the second character indicates the medial, the rhyme and the tone.

We provide here an example of fǎnqiè from the Qièyùn 切韻 rhyme dictionary; the Middle Chinese readings provided here follow Baxter’s (1992) transcription, which will be explained below in more detail.

Table 1: Example of a fǎnqiè from the Qièyùn dictionary.

<table>
<thead>
<tr>
<th>Character</th>
<th>glossed character</th>
<th>first speller</th>
<th>second speller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle Chinese</td>
<td>t-uwng</td>
<td>t-ok</td>
<td>h-uwng</td>
</tr>
<tr>
<td>Mandarin</td>
<td>dōng</td>
<td>dé</td>
<td>hóng</td>
</tr>
<tr>
<td>Meaning</td>
<td>east</td>
<td>virtue</td>
<td>red</td>
</tr>
</tbody>
</table>

Naturally, any fǎnqiè is only meaningful for one particular dialect. For instance, the Middle Chinese fǎnqiè 東德紅 is not valid anymore in Mandarin, since dōng 東 and hóng 紅 now have developed distinct tones. The systematic use of such fǎnqiè in medieval rhyme books is an invaluable resource for the work of historical linguists.

1.2.2 Rhyme books and their significance for Chinese historical phonology

The rhyme books constitute the basis on which the whole tradition of Chinese historical phonology is built. These documents were originally created to provide a standard pronunciation for composing poetry. Such a standard would have been felt as a necessity for the purpose of official examinations, for which poetic composition was an important component. Besides, short definitions or citations from classical literature are sometimes included, so that these dictionaries could be used to check the meaning of a character when one knew its pronunciation.

The oldest extant rhyme dictionary is the Qièyùn, a work originally compiled by the scholar Lù Fǎyán 陸法言 in 601 at the end of the Suí dynasty. The Qièyùn is quite comprehensive: it includes the pronunciation of thousands of characters. Its textual history is quite complex. The original edition has been lost and the Qièyùn was known in modern times essentially through its expanded edition published in 1007, the Guǎngyùn 廣韻. Fortunately, a Táng dynasty corrected edition of the Qièyùn was discovered in 1947 among Dunhuang texts, and confirms that most of the data in the Guǎngyùn relatively faithfully reflects the original fǎnqiè of the Qièyùn.

In the rhyme books, the characters are classed by tone and rhyme, and then within each rhyme by initial consonant, though in a less systematic way. Rhyme books therefore encode the rhyme of each character redundantly by both its place in the structure of the book and its second fǎnqiè speller. Initial consonants are on the other hand only indicated by the first speller of their fǎnqiè. Homophonous characters are grouped together into one homophone group, and only one fǎnqiè for the whole group is indicated at the end. There are several possible fǎnqiè spellers for
all the initials and rhymes: in any case, two spellers for a given initial or rhyme is the theoretical minimum, as a character cannot be used in its own fānqiè as a speller. In practice all rhymes and initials have more than three spellers.

Although the Qièyùn encodes an abstract phonological system, where all contrasts (and even sub-phonemic distinctions) are explicitly distinguished, there are four major obstacles against using the Qièyùn as a model for reconstructing Suí dynasty Chinese pronunciation.

First, there is only an explicit list of rhymes, no list of initial consonants. One needs to study in detail the first speller of fānqiè to be able to determine the consonantal inventory. This process will be explained in section 2.

Second, although rhymes are clearly distinguished, there are no clues as to the phonetic value behind the phonological contrasts encoded in the Qièyùn. The only way their phonetic value can be reconstructed is by using other sources of data such as modern dialects and foreign transcriptions (see the article on Middle Chinese).

Third, and most seriously, there is no guarantee that the abstract system of the Qièyùn represents the genuine synchronic phonological system of any one dialect. The standard view (Zhou 1966) is that it constitutes a diasystem, combining all the phonological distinctions of at least two dialects of the Suí period.

Fourth, the rhyme books only include learned character readings, which are likely to have been considerably different from the pronunciation of the words in actual speech. In particular, it cannot preserve any traces of the morphology that can still be detected in various Chinese dialects (Sagart 1999).

The first of these obstacles is the easiest to overcome, as we will see in the following section; the other three issues go beyond the scope of the present article.

2. Rhyme tables
The rhyme books are not the only non-alphabetic philological sources on Middle Chinese pronunciation. Another class of documents has had tremendous importance in the development of traditional Chinese historical phonology: the rhyme tables.

The rhyme tables appear in the 12th century. In spite of this 500-year gap, these documents are generally believed to encode the phonological system of a language congruent with that of the rhyme books. In the tradition of Chinese historical phonology, the fānqiè of the rhyme books are generally studied through the framework of rhyme table terminology.

Unlike rhyme books, where only rhymes are explicitly listed, rhyme tables not only list rhymes, but also present in convenient tabular fashion the initials as well as some categories whose exact phonetic value is still debated. In this section, the structure of the rhyme tables and the terminology used to describe them will be presented in detail.

2.1 Basic layout of the rhyme tables
The two most ancient rhyme tables are the Qīyīnlüè 七音略 and the Yùnjìng 韻鏡, both dating from the twelfth century: the Yùnjìng was published by Zhāng Līnzhī 张
麟之，and the Qīyīnlùè was included in Zhèng Qiáo’s Tōngzhì 通志. By a curious coincidence, both works were first published in the same year: 1161.

These two documents present slight differences in arrangement, but their content is largely the same, as even a cursory comparison can reveal. Both works include forty-three charts, in which initial consonants are listed in the columns, and rhymes and tones in the rows. Unlike rhyme books, the rhyme tables are obviously not intended as dictionaries: we do not find either fànqiè spellings or definitions of the meaning of words. Besides, the rhyme tables make no attempt at comprehensiveness. Each attested syllable is represented by a character on the grid. In the case of syllables that can be written using several homophonous characters (most syllables, actually), only one of those characters is chosen to be placed on the chart. A striking property of the rhyme tables is the presence of blank slots, which represent gaps in the distributions of initial and rhyme combinations in Middle Chinese: unattested or phonotactically impermissible syllables. While some of these gaps are fortuitous, their overall distribution reveals important facts about the reconstruction of both Middle and Old Chinese (see the articles on Middle and Old Chinese).

In the Qīyīnlùè, the onsets are indicated by the so-called thirty-six initials, ordered by place of articulation in six categories: yǔ 羽, zhī 徵, jué 角, shāng 商, gōng 宫 and bánshāngzhǐ 半商徵, the names of the notes in the pentatonic musical scale. In the Yùnjìng, the basic structure is the same, but the initials are not designated by individual names and musical notes: instead, we find terms that directly refer to articulatory organs. Within each column belonging to the same place of articulation (for example, the first, chúnynǐn 脣音 ‘lip sounds’, refers to the labials), the initials are distinguished from one another by the terms qīng 清 ‘clear’ and zhuó 濁 ‘muddy’, to which cì 次 ‘secondary’ is added in some cases. The meaning of these terms will be addressed in 2.2.

On the extreme left of each row, one finds the names of each rhyme, which are essentially the same as the rhyme names found in the Qièyuèn with a few exceptions. As in the rhyme books, rhymes are first listed by tone, always in the order píng 平 ‘level’, shāng 上 ‘rising’, qù 去 ‘departing’ and rù 入 ‘entering’ (the ‘entering’ tone includes in fact only syllables with a final stop –p, –t or –k, which had no tonal contrasts in Middle Chinese).
Then, within each tone category, one always finds four sub-rows, which are called *divisions* or *děng* 等 in the tradition of Chinese historical phonology. In some cases, one rhyme of the *Qièyùn* will correspond to more than one row: the same rhyme will appear in two divisions.

Additionally, each of these charts is labelled with three indications: a number (23 for the example we have chosen), the *zhuan* 轉 category (either *wài* 外 ‘outer’ or *nèi* 内 ‘inner’), and a third category called *qīng* 轻 or *zhòng* 重 in the *Qiènlüè* and *kāikǒu* 開口 or *hékǒu* 合口 in the *Yùnjìng*.

The exact meaning of *zhuan* is not entirely clear (see Li Xinkui 1983:19-23 for a discussion of its interpretations and Coblin 2006b:126-7), but the third category corresponds to the presence of a -w- medial or a rounded vowel (*hékǒu* / *qīng*) or its absence (*kāikǒu* / *zhòng*).

The rhyme tables group together different rhymes on the same chart, for instance 寒 -an, 删 -æn, 仙 -jen and 先 -en in our example. These rhyme groups are called *shè* 撟. Their interpretation is again controversial, but some scholars such as Pulleyblank (1984) proposed that some of the rhymes of the *Qièyùn* had merged by late Táng times, and that *shè* represent the categories resulting from these mergers.
2.2 The thirty-six initials
In the earliest stage of development of Chinese historical phonology, the list of initials as indicated in the rhyme tables was believed to reflect the Middle Chinese system of initial consonants, but this idea was shown to be incorrect in the 19th century by Chén Lǐ 陈醴. In this section, we will first present how the initials are represented in the rhyme table, then discuss the origin of the system of thirty-six initials and finally give a brief account of Chén Lǐ’s work and revision of the list of initial consonants.

2.2.1 The initials in the rhyme tables
The rhyme tables use a system of thirty-six initials (sānshíliù zìmǔ 三十六字母). The following table lists these initial consonants by their traditional name, indicated with pīnyīn and Middle Chinese transcription. (The name of each initial begins with that initial sound, so the Middle Chinese transcriptions can be taken as an approximate indication of the reconstructed Middle Chinese pronunciation of the initials).
The terms qǐng ‘clear’ and zhuó ‘muddy’ come from the Yūnjìng, and mean here respectively unvoiced and voiced. Unvoiced aspirated stops and affricates are called cì qǐng 次清 ‘secondary clear’, as opposed to the unaspirated unvoiced obstruents which are simply called qǐng in the Yūnjìng or quán qǐng 全清 ‘fully clear’ in other sources. With voiced consonants, the nasals are called qǐngzhuó 清濁 ‘clear muddy’ in Yūnjìng, and cìzhuó 次濁 ‘secondary muddy’ in other sources, as opposed to the quán zhuó 全濁 ‘fully muddy’ non-nasal voiced stops.

The actual names of the initials appear in the Qīyīnlìè, and the names of places of articulation presented above in the Yūnjìng. On the charts, some places of articulations have been collapsed: zhòng chún yīn 重唇音 ‘bilabials’ and qǐng chún yīn 輕唇音 ‘labiodentals’ appear together, as do shé tóu yīn 舌頭音 ‘dental stops’ and shé shàng yīn 舌頭音 ‘dental affricates’ and zhèng chǐ yīn 正齒音 ‘alveolo-palatal/retroflex affricates’ on
the other hand. These series of initials are in quasi-complementary distribution with regards to the rhymes that they can appear with, so that merging the cells can reduce space in an efficient manner. However, it also increases the difficulty of using the rhyme tables.

The following table merges the layout of the Qīnǐnlüè and the Yūnjìng; the initials found in each column are also given in Baxter’s transcription:

<table>
<thead>
<tr>
<th>半商徵</th>
<th>宫 gōng</th>
<th>商 shāng</th>
<th>角 jué</th>
<th>徽 zhǐ</th>
<th>羽 yǔ</th>
</tr>
</thead>
<tbody>
<tr>
<td>齫音舌 shé yín</td>
<td>‘glottals and laryngeals’</td>
<td>齫音舌 chí yín</td>
<td>‘coronal affricates and fricatives’</td>
<td>齫音舌 yá yín</td>
<td>‘velars’</td>
</tr>
<tr>
<td>清</td>
<td>濁</td>
<td>清</td>
<td>濁</td>
<td>清</td>
<td>濁</td>
</tr>
<tr>
<td>ny-</td>
<td>hj-</td>
<td>y-</td>
<td>h-</td>
<td>x-</td>
<td>zj-</td>
</tr>
</tbody>
</table>

As an example of how these initials are encoded in the table, let us use xīn 心 ‘voiceless dental fricative’ and shēn 督 ‘voiceless alveolo-palatal fricative’, whose transcription in Baxter’s system are s- and sr- / sy- respectively. In Table 2, both appear in the eighth column from the left. Let us now observe the first four characters in that column and their reconstruction.

<table>
<thead>
<tr>
<th>Rhyme</th>
<th>Division</th>
<th>Example</th>
<th>xīn 心 or shēn 督</th>
</tr>
</thead>
<tbody>
<tr>
<td>寒 –an</td>
<td>1</td>
<td>珊 s-an</td>
<td>xīn 心</td>
</tr>
<tr>
<td>删 –æn</td>
<td>2</td>
<td>刪 sr-æn</td>
<td>shēn 督</td>
</tr>
<tr>
<td>仙 –jen</td>
<td>3</td>
<td>仙 sy-jen</td>
<td>shēn 督</td>
</tr>
<tr>
<td>先 –en</td>
<td>4</td>
<td>先 s-en</td>
<td>xīn 心</td>
</tr>
</tbody>
</table>

The initial xīn appears in the first and fourth rows (divisions, as we will see in section 2.3), and shēn in the second and third. This conflation of two columns would have been fine had the complementary distribution been perfect, but in fact both xīn and shēn (and all the other chǐyīn initials) can appear with the rhyme 仙 –jen. However, there is obviously no place on the chart for a syllable sjen with xīn s- initial and rhyme 仙 –jen. For syllables such as these, the rhyme 仙 –jen appears again on another chart, presented below:
On this chart, the rhymes that were in the third division of the rows in Table 3 (仙 –jen, 獏 –jenX, 線 –jenH and 薛 –jet) now appear on the fourth division of each row. All the syllables in the chǐyīn ‘dental/alveolo-palatal affricates/fricatives’ column here have in fact dental affricate/fricative initials. For instance, the character xiān 仙 –jen which appears in the eight column from the left has the xīn s- initial consonant, unlike the corresponding character shān 羞 sy-jen in the preceding table. The general rule here is that whenever a rhyme can appear on both the third and the fourth divisions, then characters belonging to this rhyme have dental initials when in the fourth division and retroflex/alveolo-palatal initials when in the third division.

There are also characters in the labial and velar columns on the same line, but their presence here does not indicate a different initial consonant; these cases will be discussed in 2.3.

This example shows that the rhyme tables are cleverly crafted charts representing the distribution of syllables in a two-dimensional grid in a very economic way, by collapsing rows and column in quasi-complementary distribution. An exhaustive treatment of all the complementary distributions in the Yùnjìng charts in beyond the scope of this paper, but the example just given represents the most complex case.

2.2.2 The origin of the thirty-six initials
The thirty-six initials actually predate the rhyme tables by several centuries. The earliest attestation of such a system is the Táng-dynasty fragments of a manuscript.
by the Buddhist monk Shǒuwen 守温 (Luo 1931, Coblin 2006b). It contains thirty initials instead of thirty-six: it omits the four qīng chún yīn ‘labiodentals’ and niáng 娘 which are in complementary distribution with bilabials and mí 泥 respectively, and the initial chuáng 床 which is not distinguished from shàn 禪. The fragmentary manuscript includes detailed articulatory descriptions, and shows that the pentatonic notes were used as phonological terms as in the Qǐyǐnlǜè.

In view of the obvious Buddhist connection of the Shǒuwen manuscript and of rhyme table phonology in general, it is legitimate to envision a possible Indic inspiration for this tradition, unlike rhyme books and fǎnqiè which seem to be genuinely Chinese inventions (Branner 2006b:8-9).

In the Indic tradition, five places of articulation, or varga-, are distinguished:

<table>
<thead>
<tr>
<th>Name etymology value</th>
<th>Name etymology value</th>
</tr>
</thead>
<tbody>
<tr>
<td>kaṇṭhya- ‘guttural’</td>
<td>kaṇṭha- ‘throat’ velar stops</td>
</tr>
<tr>
<td>alavya- ‘palatal’</td>
<td>tālu- ‘palate’ palatal stops</td>
</tr>
<tr>
<td>mūrdhanya- ‘cerebral’</td>
<td>mūrdhan- ‘head’ retroflex stops</td>
</tr>
<tr>
<td>dantya- ‘dental’</td>
<td>dant- ‘tooth’ dental stops</td>
</tr>
<tr>
<td>oṣṭhya- ‘labial’</td>
<td>oṣṭha- ‘lip’ labial stops</td>
</tr>
</tbody>
</table>

A direct comparison with the names for the places of articulation in the Yùnjìng is disappointing: the only terms that could be direct loan translations are the ‘labials’ and the ‘dentals’, but these are not really specific enough: one could easily argue that they were independently recreated:

<table>
<thead>
<tr>
<th>Name etymology value</th>
<th>Name etymology value</th>
</tr>
</thead>
<tbody>
<tr>
<td>chún yīn 脣音 ‘labial’</td>
<td>labial stops</td>
</tr>
<tr>
<td>shé yīn 舌音 ‘tongue’</td>
<td>dental and retroflex stops</td>
</tr>
<tr>
<td>yá yīn 牙音 ‘molar’</td>
<td>velars</td>
</tr>
<tr>
<td>chí yīn 齦音 ‘front tooth’</td>
<td>dental and retroflex affricates/fricatives</td>
</tr>
<tr>
<td>hóu yīn 喉音 ‘guttural’</td>
<td>laryngeal / velar fricatives, glottal stop</td>
</tr>
</tbody>
</table>

One can understand however, why the velars were not called ‘gutturals’ in Chinese: a term ‘guttural’ was needed for the glottal stop and the unvoiced velar/laryngeal fricative which do not exist in Sanskrit: Sanskrit only has h-, a voiced laryngeal fricative [ɦ].

An indirect Indic origin for the rhyme tables is probable, but in any case the Chinese scholar who established the rhyme table tradition and its terminology did not slavishly translate the Sanskrit terms, but rather invented a new framework inspired by them.

2.2.3 Chén Lǐ
Up to the nineteenth century, it was taken for granted by scholars that the thirty-six initials faithfully reflected the initial system of Middle Chinese.
The scholar Chén Lǐ 陳醴 investigated the fānqiè data of the Qièyùn in the first half of the nineteenth century, only the Guǎngyuàn version was available, and devised a method of analysis called xìliánfǎ 系聯法 in order to extract the phonological system of the Qièyùn directly from the fānqiè. He discovered that five initials of the thirty-six must be divided into two: four of the zhèngchī īn (zhào 照 穿 chuān 床 chuáng 審 shěn 喻 yù) as well as yù 喻. Two alternative series of names exist for these five new initials, either by adding a number referring to the divisions where the initial in question can appear (see section 2.3) or by making up a new name.

<table>
<thead>
<tr>
<th>Retroflex affricates</th>
<th>Alveolo-palatal affricates</th>
</tr>
</thead>
<tbody>
<tr>
<td>照 zhào 照二  莊 zhuāng tsrjang</td>
<td>照三 章 zhāng tsyang</td>
</tr>
<tr>
<td>穿 chuān 穿二  初 chū tsrhjo</td>
<td>穿三 昌 chāng tsyhăng</td>
</tr>
<tr>
<td>床 chuáng 床二  崇 chóng dzrjuwng</td>
<td>床三 船 chuán zuw</td>
</tr>
<tr>
<td>審 shěn 審二  生 shèng srjæng</td>
<td>審三 青 shū syo</td>
</tr>
<tr>
<td>喻 yù 喻三  雲 yún hjun</td>
<td>喻四 以 yǐ yiX</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>fānqiè spellers</th>
<th>fānqiè of the character</th>
</tr>
</thead>
<tbody>
<tr>
<td>可 khaX 枯我切 khu ngaX tshet</td>
<td></td>
</tr>
<tr>
<td>枯 khu 胡胡切 khuX hu tshet</td>
<td></td>
</tr>
<tr>
<td>肚 khuX 康杜切 khang duX tshet</td>
<td></td>
</tr>
<tr>
<td>康 khang 肚岡切 khuX kang tshet</td>
<td></td>
</tr>
<tr>
<td>空 khuwng 肚紅切 khuX huwng tshet</td>
<td></td>
</tr>
<tr>
<td>梃 khojX 肚駭切 khuX hojX tshet</td>
<td></td>
</tr>
<tr>
<td>口 kuwX 肚後切 khuX huwX tshet</td>
<td></td>
</tr>
<tr>
<td>客 khæk 肚格切 khuX kaek tshet</td>
<td></td>
</tr>
</tbody>
</table>

These data show that the fānqiè spellers 可可苦康空楷口客 all represent the same initial. However, this method has its limits, because not all the fānqiè spellers of a single initial can necessarily be linked. For example, the initial duān 端 t- is marked with the seven following fānqiè spellers:

<table>
<thead>
<tr>
<th>fānqiè spellers of initial 端 t-</th>
</tr>
</thead>
<tbody>
<tr>
<td>冬 towng  都宗切 tu tsowng</td>
</tr>
</tbody>
</table>
In the table above, it appears that 冬都丁當 and 多得德 are two different groups, and cannot be linked one with another. In order to overcome these difficulties, the solution is to use the 兩 音: 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. Fortunately, the same 業 is not always used to mark a given pronunciation, which provides us with two different sound glosses for the same pronunciation.

For example, on the first page of the 广韵, 涑 has two 業 tuwng 德紅切 and tuwngH 都貢切 (ta kuwngH). Turning to the location where the latter pronunciation is classified, however, the 業 given there for 涑 is this time 多貢切 (tu kuwngH), and it is therefore certain that these two 業, 都貢切 and 多貢切 represent the same pronunciation. Therefore, this means that 都 and 多 are homonymous 業 spellers, and that the two groups of Table 15 can be linked together.

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

2.3 Deng

The interpretation of the four divisions, or 業, of the rows in the 晚经 and 羲囝, is one of the most enduring and controversial issue in Chinese historical phonology.

The divisions are generally thought to encode a phonological feature of some stage of Middle Chinese, either a medial (presence of j-, i- medials etc) or a feature of the vowel; this topic is discussed in the entry on Middle Chinese and 業 (see also the articles collected in Branner 2006a).

As we have seen in section 2.2.1 however, in some cases the placing of a rhyme in the third or in the fourth row indicates a distinct initial consonant: in the case that we have seen, it distinguishes between dental and retroflex / alveolo-palatal affricates or fricatives. With velar or labial initials, this kind of phenomenon is called 業 重纽 ‘repeated button’. Those syllables occurring in the third division are called 業 三 重纽三 ‘chóngniǔ three’, and those which appear in the fourth division simply 業 四 重纽四 ‘chóngniǔ four’. For instance, the character miǎn 免 mjenX in the second right hand cell of Table 23 of the 晚经 is 業 三, while miǎn 纡 mjenX in Table 21 of the 晩经 is 業 四 four.

The 業 重纽 distinction has been neglected by some scholars (such as Karlgren and 王力), but it has clear reflexes in Sino-Vietnamese and Sino-Korean (see the entry on Middle Chinese) and is reconstructed as a special type of medial.
The use of division in the framework of historical Chinese phonology can be slightly misleading: the rhymes -jen, -jenX, -jenH, -jet of Tables 21 and 23 of the Yùnjìng are all considered to be third division, even in the case of words like xiān 仙 which appear in the fourth row to indicate a different initial. In almost all other cases however, the place of the rhyme in the grid indicates its intrinsic division, and is not a special trick to represent initial consonant contrasts.

Following Lǐ Róng (1952), contemporary Chinese historical linguistics classifies the rhymes of the Qièyùn into six groups on the basis of divisions as follows:

1. First division: rhymes that only appear in the first division and never have alveolo-palatal or retroflex initials.
2. Fourth division: rhymes that only appear in fourth division and never have alveolo-palatal or retroflex initials.
3. Second division: rhymes that only appear in the second division and never have alveolo-palatal initials.
4. Third division, type 1 (referred to as zǐ 子): rhymes that only appear in the third division and only have labial or velar initials.
5. Third division, type 2 (referred to as chǒu 丑): rhymes that can appear in the second, third and fourth divisions and have no restriction on the initials. With these rhymes, the chí yǐn 齒 ‘coronal affricates and fricatives’ characters appearing in the second division have retroflex initials, those appearing in third division have palatal initials and those appearing in the fourth division have dental initials.
6. Third division, type 3 (referred to as yǐn 寅): rhymes that can appear in the second, third and fourth divisions and in addition have chóngniǔ distinctions.

These distributions can be explained historically, as they shed important light on the internal reconstruction of Old Chinese (see the corresponding entry).

2.4 The purpose of the rhyme tables

In the early stages of Chinese historical phonology, both Chinese and Western scholars tended to view rhyme tables as the work of linguists trying to analyze the phonological system of Middle Chinese.

Pulleyblank (1984) proposed that rhyme tables did not reflect the phonological system of Suí/early Táng Chinese (a stage he calls Early Middle Chinese), but rather a much later system, dating from late Táng (which he calls Late Middle Chinese). In this view, the divisions and the rhyme groups of the rhyme table shed light on the phonological evolution that had taken place between Early and Late Middle Chinese, and should not be used to reconstruct the pronunciation of Early Middle Chinese as had been done by his predecessors.

An alternative view has been proposed by Coblin (2006b), who suggests that rhyme tables were not the works of linguists, but rather practical tools devised by speakers of late Táng / early Sòng Chinese to convert the fānqiè of the Qièyùn into pronounceable syllables of their native dialects. By Sòng times, at least 20% of the fānqiè of the Qièyùn did not work anymore in the standard literary dialects due to various sound changes (in particular, the tonal bipartition and the change from
rising tone to falling tone in syllables with voiced stop initials), but Coblin explains how rhyme tables could be used to correctly interpret ancient fànqiè.

3. The centrality of the Chinese tradition in dialect studies
Rhyme books and rhyme tables are not only the basis upon which the reconstruction of Middle and Old Chinese is undertaken; it is also the main framework in Chinese dialectology, exemplified by standard works such as Ding (1984) and especially Anonymous (1989), which serves as a workbook for fieldwork on Chinese dialects.

The rhyme table terminology that has been explicated in section 2 is ubiquitous in description of Chinese dialects. Indeed, most of the rhyme and consonantal contrasts found in Chinese dialects can be correlated with the phonological categories of the Qièyùn. Even if, as most specialists now believe, the Qièyùn system is not the genuine phonological system of any language which ever existed, it still provides a useful diasystem which can be used to organize the data: to sort out the correspondences between the dialects and distinguish between inherited and borrowed layers of vocabulary.

The Qièyùn system is therefore of critical interest for studying the historical phonology of Sinitic languages, just like Latin for Romance languages or Old Tibetan for Tibetan languages. Only Min dialects do not fit in this framework, as they preserve archaic pre-Qièyùn phonological contrasts (see Norman 1974).

However, the centrality of the Qièyùn system and the use of rhyme tables in Chinese dialectology is being increasingly criticized (Norman and Coblin 1995, Branner 2006a). This framework causes some degree of confusion between the etymological categories and the phonological categories of the modern dialects.

In the tone system for instance, the traditional terms are píng ‘level’, shǎng ‘rising’, qù ‘departing’ and rù ‘entering’, alongside with yīn 陰 ‘upper register tone’ (associated with voiceless initials) and yáng 陽 ‘lower register tone’ (associated with voiced initials). As explained in the entry on Middle Chinese, all Chinese dialects have undergone a tonal bipartition depending on the voicing of the initial consonant, and almost all tonal systems can be understood as deriving from the following eight-tone system:

<table>
<thead>
<tr>
<th></th>
<th>1. yīn píng</th>
<th>2. yáng píng</th>
<th>3. yīn shǎng</th>
<th>4. yáng shǎng</th>
<th>5. yīn qù</th>
<th>6. yáng qù</th>
<th>7. yīn rù</th>
<th>8. yáng rù</th>
</tr>
</thead>
<tbody>
<tr>
<td>陰 yīn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>陽 yáng</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These eight tonal categories are sometimes referred to by a number 1-8 rather than by their full names. The use of these terms in modern dialect descriptions poses two problems.

First, the phonetic values of the tones have considerably changed in all dialects since Middle Chinese. It is often the case that the phonetic realization of a tone category is unrelated to its etymological label. For instance an etymological shǎng ‘rising’ tone may have become a falling tone in a particular dialect, but the tone in question is still described as shǎng ‘rising’.
Second and more seriously, there is in general no one-to-one correspondence between the etymological tones and the actual tone categories in modern dialects for the four following reasons:

a) Most dialects have undergone tonal mergers; for instance in Mandarin tones 5, 6 and part of 4 have merged as the fourth tone, which is generally called ǎ. Some ǎ-tone words in Mandarin had shǎo tone in Middle Chinese (for instance 道 dawX > dào), but this tone is nevertheless called ǎ because most of the words it contains derive from Middle Chinese qù tone.

b) Some tonal splits were determined by factors other than voicing. For instance in Nanchang tones have different reflexes with aspirated and unaspirated unvoiced stops initials (Sagart 1993:109-115).

c) There are many irregular tonal evolutions in Chinese dialects. In Mandarin for instance, some words with tone 2 (yāng píng) according to the traditional framework, such as mā 妈 ‘mother’ or māo 猫 ‘cat’, seem to have changed to tone 1 (yīn píng).

d) In dialects which preserve distinctions more archaic than Middle Chinese, such as Mǐn, this system becomes impractical and even misleading as pointed out by Handel (2011:387-8). Even in non-Mǐn dialects, it could lead to neglecting archaic distinctions, by interpreting irregular correspondences as dialect mixture rather than preservation of archaic contrasts. Indeed, it is possible that non- Mǐn dialects preserve more evidence relevant to Archaic Chinese reconstruction than is generally believed, but only a survey of the dialectal data unprejudiced by the Qièyùn system can reveal whether or not such evidence exists.

Of course, the use of etymologizing terminology is not unique to Chinese phonology. This situation is comparable to terms like “o-stems” in Germanic linguistics, referring to the Indo-European origin of a given declension, not its actual form in any attested Germanic language. Just as Indo-European linguistics can be daunting to read for non-specialists, Chinese dialectology presented in this framework is unintelligible to generalist linguists. This has the detrimental effect of hindering the dialogue between theoreticians interested in panchronic linguistics (the general principles of sound change) on the one hand and Chinese dialectologists on the other hand.

This critical appraisal of the use of the Qièyùn terminology should not be misunderstood as a dismissal of the entire tradition of Chinese dialectology. Quite the contrary, most of our knowledge of the history of Chinese dialects was built on the basis of the Qièyùn framework, and it will always remain a useful starting point for analyzing the phonological systems of Chinese languages. However, now that most dialects have been thoroughly analysed in terms of the traditional framework, we could gain newer insights on the dialect data by escaping the overwhelming influence of the traditional rhyme book and rhyme table tradition and broadening our research perspectives.

4. Beyond Chinese: Tangut rhyme table phonology
In spite of the fact that many languages of East Asia are typologically similar to Chinese, the rhyme table tradition was not applied to the analysis of any other language except Tangut.

Tangut is a dead language without any modern descendant, and although we have a sizeable body of texts, its logographic script, like Chinese, yields few clues about the actual pronunciation of this language. As in Chinese, we have foreign transcriptions both from and into Tangut that can be used to reconstruct the system, but these transcriptions are not sufficiently consistent or systematic to serve as primary data to reconstruct the language.

Fortunately, we have several rhyme books and rhyme tables in Tangut, which are clearly closely based on Chinese models. One of the dictionaries, the 蔡 jwir²jjow² ‘Sea of characters’, includes fānqiè readings for each character, along with a definition and an analysis of the structure of the character. Like the Qièyùn, the characters are classified by rhymes, so that the total number of rhymes of the Tangut language is known, but there is no clear list of initials. Scholars such as Sofronov (1968) had to apply Chén Lǐ’s xīliánfǎ method to analyze the fānqiè spellers and determine the initial system of the Tangut languages.

5. Conclusion
Chinese historical phonology, as well as Tangut phonology, constitutes a sub-branch of historical linguistics without equivalent in other language families by dint of their peculiar methodology, based mainly on the analysis of a non-alphabetic system for encoding phonological information.

Although this traditional approach has come under criticism in recent years, it is still the generally accepted method for reconstructing Middle Chinese, studying Chinese dialects and reconstructing the Tangut language.

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