

# Sanskritic Phonetical Ideas and Rime Tables

Saroj Kumar Chaudhuri

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## 1. Introduction

Essentially pictographic, a Chinese character expresses the meaning and not the reading. Historically speaking, the meaning of a character by and large has remained constant, whereas its reading has changed with time and place. The number of characters proliferated with the passing of time, and memorizing their readings became a big problem. It became necessary to evolve some means to express their readings. To cater to this need there evolved a method, called the *hansetsu* 反切 system, for expressing the sound of a character with two characters. Here, the first one expressed the consonant with which the reading started, and the second one expressed the remaining part, called final. Dictionaries giving the readings of characters according to this system appeared in due course of time. Tone is an essential feature in Chinese. The finals together with their tones were called rimes. Following the *hansetsu* dictionaries, rime dictionaries were produced where characters were

arranged under rime headings. Next, Chinese scholars recast the rimes in the form of tables. These rime tables together with one for the consonants with which the readings of the characters started accommodated the entire sound system of Chinese. The number of such sound tables varied from writer to writer, from as few as twenty to as many as forty-four. One such work is Inkyo on which the present study is based. The role the phonetical concepts of Sanskrit played in the formation of the sound tables will be discussed in this paper.

The Chinese characters did not develop into a phonetic script. Although the Indian Brahmi script evinced much academic interest, it was neither adopted, nor did it provide the stimulus to evolve phonetic script. So the Chinese scholars had no option but to use their own characters to express the sounds of other characters in their phonetical writings. Since the sounds of characters varied from region to region, and also with the passing of time, it is very difficult to work out, at present, the actual phonetical values of the characters. The readings shown within / / in this study give only the probable phonetical values.

## **2. Chinese Syllables**

The Chinese language is basically monosyllabic which means that a word, or in other words a character, consists of a syllable. The syllable can be expressed as  $S=IMVE/T$ , where, S: syllable, I: initial consonant or just initial, M: medial vowel which is a glide, V: main vowel, E: end consonant or ending, and T: tone. The group MVE/T is called rime, and MVE is called final. Quite often

the two terms rime and final are used loosely in the same sense.

In the character 官 read as /kuan<sup>T</sup>/, /k-/ is the initial consonant, /-u-/ is the medial vowel, /-a-/ is the main vowel, /-n/ is the ending, and /-<sup>T</sup>/ is the tone. This is an even tone character. A syllable may or may not have I, M, E, but must have V and T. Each Chinese character is a syllable with such composition. Tone is an in-built property of Chinese syllables. The syllables come in four tones: *heisei* 平声 or even tone, *josei* 上声 or rising tone, *kyosei* 去声 or departing or falling tone, and *nyusei* 入声 or entering tone. All entering tone syllables end in the consonant /k/, /t/ or /p/, and vice-versa. Traditional Chinese phonetical studies divided the sound of a character into three major parts, initial I, final MVE and tone T. The unit MVE was not resolved further, although the awareness that M, V and E represented separate entities was there.

### 3. Developments up to the Rime Tables

#### 3.1. Rime Dictionaries

Poems constituted an important area in Chinese literature since the early times. Rhyming was an essential feature in Chinese poems. Similar sounds appeared at set intervals in poems. Since the phonetical values of characters changed with time and place, two characters read as /kung/ and /tung/ and belonging to the same rime /-ung/ of a period or a region often became dissimilar, and consequently members of different rimes in another period or region. In such a situation, a poem remained a poem no more. The *hansetsu* system that the Chinese evolved for expressing the reading

of a character became handy in such a situation. The second character conveyed to the reader the hint of probable reading of a rime at the time when the poem was composed.

In 543 A.D. a dictionary Gyokuhen 玉篇 was compiled where the readings of all the characters were given in *hansetsu*. Shortly after this, a dictionary Setsuin 切韻 was published in 601 A.D., where the characters were arranged under rime headings. Toin 唐韻, an enlarged version of this, was produced in 751 A.D. This was followed by Daiso Jushu Koin 大宋重修廣韻, popularly known as Koin 廣韻, published in 1007 A.D. Of the three rime dictionaries, only Koin is still extant. These dictionaries, perhaps, motivated the Chinese scholars to put the rimes in the form of tables. Such tables, perhaps, served the purpose of a ready reference for reading the poems and writing them. The rime tables along with one devoted to the initial consonants covered the entire sound system of the Chinese language. So they are popularly known as the Chinese sound tables.

### 3.2. Composition of Koin

#### 3.2.1. Rimes

The composition of Koin will be seen here because rime tables have borrowed heavily from this dictionary. Koin is divided into four parts, each devoted to a tone. The first part consists of the first two volumes of the work and covers the rimes belonging to the even tone. The characters belonging to the even tone rimes are too numerous, and consequently have been accommodated in two volumes. The second part consists of the third volume and lists the

rising tone rimes. The third part is made up of the fourth volume giving the departing or falling tone rimes. Finally, the fourth part is constituted by the fifth volume and is devoted to the entering tone rimes.

Each part starts with a table of contents showing all the rimes given there. The first two volumes constituting the first part give 57 rimes of even tone. The third volume gives 55 rimes of rising tone. The fourth contains 60 rimes of departing or falling tone, and the fifth consists of 34 rimes of entering tone. Thus, there are 206 rimes in all in Koin.

A study of the order in which the 206 rimes are distributed among the four tones reveals the existence of a strict principle. The rimes can be divided into two types, one type ending in a vowel and the other type ending in a consonant. If we eliminate the vowel-ending rimes and see the arrangement of the consonant-ending rimes, this principle becomes very obvious. The first rimes listed in the four tones are: even tone 東 /-ung/, rising tone 董 /-ung/, departing tone 送 /-ung/ and entering tone 屋 /-uk/. It will be seen that the end consonant in the first three rimes is /ng/, followed by the fourth rime with the ending /k/. A study of Sanskrit Varnamala, shown in Table 1, reveals that both /ng/ and /k/ are members of the same velar category, one nasal and the other oral. In Koin, the rimes ending in /ng/ and /k/ have been lumped together and entered in two places. Similarly, the rimes ending in /n/ and /t/ have been lumped together and entered in one place. The same rule has been followed for the rimes ending in /m/ and /p/. The four groups are punctuated by entries of vowel-ending rimes. This suggests that the compilers used sound category, like

Table 1 : Sanskrit Varnamala

Vowels: **a ā i ī u ū ṛ ṛī ḷ ḷī e ai o au am ah**

**chandravindu (☺)** : nasal stop element

**visarge ( : )** : oral stop element

Consonants

(a) Plosives	UV-UA	UV-A	V-UA	V-A	N	
Velar	<b>ka</b>	<b>kha</b>	<b>ga</b>	<b>gha</b>	<b>nga</b>	UV: Unvoiced V: Voiced
Palatal	<b>ca</b>	<b>cha</b>	<b>ja</b>	<b>jha</b>	<b>ña</b>	UA: Unaspirated A: Aspirated
Retroflex	<b>ṭa</b>	<b>ṭha</b>	<b>ḍa</b>	<b>ḍha</b>	<b>ṇa</b>	N: Nasal
Dental	<b>ta</b>	<b>tha</b>	<b>da</b>	<b>dha</b>	<b>na</b>	[ng is a single sound denoted by ṅ in pho- netic script.]
Labial	<b>pa</b>	<b>pha</b>	<b>ba</b>	<b>bha</b>	<b>ma</b>	

(b) Non-plosives: **ya ra la va śa ṣa sa ha llam kṣa**

- Notes:** 1. Conventionally aspirated letters are transcribed as kh, gh, th, etc., in Sanskrit.
2. Conventionally Chinese aspirated sounds are transcribed as k', g', t', etc.

velar, dental, labial, etc., as an important criterion in arranging the rimes in Koin. When the 206 rimes of Koin are rearranged in this light, they form 61 groups as shown in Table 2. Read horizontally, the table shows the rimes of the same category, and read vertically, it shows the order in which the rimes appear in Koin. It should be noted that the groups without the entering tone rimes are the vowel-ending rimes. There is one exception in the rime groups ending in /n/ and /t/. The entering tone rime is somehow missing for the twenty-eighth group.

Table 2 : Two hundred and six rimes and sixteen *setsus*

Rimes	Setsu	Rimes	Setsu
1. 東董送屋	通	35. 蕭篠嘯○	効
2. 冬○宋沃		36. 宵小笑○	
3. 鍾腫用燭		37. 肴巧效○	
4. 江講絳覺	江	38. 豪皓號○	果
5. 支紙寘○	止	39. 歌哿箇○	
6. 脂旨至○		40. 戈果過○	
7. 之止志○		41. 麻馬禡○	仮
8. 微尾未○	遇	42. 陽養漾藥	
9. 魚語御○		43. 唐蕩宕鐸	
10. 虞麌遇○	蟹	44. 庚梗映陌	梗
11. 模姥暮○		45. 耕耿靜麥	
12. 齊霽霽○		46. 清靜勁昔	
13. ○○祭○	臻	47. 青迥徑錫	曾
14. ○○泰○		48. 蒸拯證職	
15. 佳蟹卦○		49. 登等證德	
16. 皆駭怪○	山	50. 尤有宥○	流
17. ○○夬○		51. 侯厚候○	
18. 灰賄隊○		52. 幽黝幼○	深
19. 哈海代○	臻	53. 侵寢沁緝	
20. ○○廢○		54. 覃感勘合	
21. 眞軫震質		55. 談敢闕盍	咸
22. 諄準稕術	山	56. 鹽琰豔葉	
23. 臻○○櫛		57. 添忝忝帖	
24. 文吻問物		58. 咸嫌陷洽	咸
25. 欣隱焮迄		59. 銜檻鑑狎	
26. 元阮願月		60. 嚴儼釅業	
27. 魂混恩沒	山	61. 凡范梵乏	
28. 痕很恨○			
29. 寒旱翰曷			
30. 桓緩換末	山		
31. 刪潛諫黠			
32. 山產櫛錯			
33. 先銑霰屑	山		
34. 仙獮線薛			

The 206 rimes are divided into 61 groups. In each group the rimes are arranged in the order of even, rising, departing and entering tones. The 206 rimes are distributed among the 16 *setsus*.

In Inkyo, rimes of the same category, or in other words, of the same group have been put together in the same table. Since there are 43 rime tables and 61 rime groups, some tables have more than one group. It may be mentioned here that the group of four rimes belonging to the velar category discussed above constitutes the first rime table in Inkyo. This has been shown in Table 3.

Table 3 : Rime Table 1 of Inkyo

UV-VA  
Voiced  
Nasal  
UV-VA  
Voiced  
Nasal  
UV-VA  
Voiced  
Nasal

Velar Lingual Labial

音	牙	音	舌	音	唇
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19 Source: 韻鏡, 等韻五種, 芸文印書館, 台北, 中華民國64年, pp. 18-19 UV-UA: unvoiced unaspirated UV-A: unvoiced aspirated

### 3.2.2. Small-Rimes

It has been stated above that the characters are arranged under 206 rime headings in Koin. There are 26,194 characters listed in Koin<sup>(1)</sup>. Consequently, each rime, on average, consists of more than one hundred characters. These characters are arranged in the rime



according to a system called *shoin* 小韻 or small-rime. A small-rime groups together the characters with identical pronunciation, i.e., identical IMVE/T of a rime. Thus, a small-rime gives the actual pronunciation of characters listed under it. Now, within a rime the MVE/T is common. So, a small-rime differs from another if the initial consonant I differs. This is the broad framework. There is no fixed rule in the arrangement of the small-rimes excepting that the character used for representing the rime is also used to represent the first small-rime of the rime. For instance, as shown in Fig. 1, the first rime listed in Koin is /-ung/ in even tone represented by the character 東. This character 東 also represents the first small-rime /tung/ of this rime. Next, the meaning and the reading of the character are given followed by the number 17. It means that this small-rime is made up of 17 characters of identical pronunciation. For other characters of this group, usually the meaning is given. These seventeen characters are followed by the next entry 同, with a circle on the top and the reading /dung/ given in *hansetsu* spelling. It carries the number 45, which means that there are 45 characters with the reading /dung/. In this way, 3,874 small-rimes are listed in Koin distributed among the 206 rimes. Although the characters belonging to a small-rime are supposed to have identical pronunciation, occasionally some characters within a small-rime carry different *hansetsu* spellings.

A scrutiny of Koin reveals some interesting facts. In some cases, a character has more than one reading and consequently belongs to more than one rime. In fact, there are 235 characters having both even and rising tones, 470 characters with both even and departing tones, 252 characters with both rising and departing tones, and 29

同

*hansetsu*  
reading  
17 →

**東**

春方也說文曰動也从日在木中亦東風廣州記云陸地生莖赤和肉作羹味如醑香似蘭吳郡臧云草則東風扶留又姓舜七友有東不謗又有漢複姓十三氏左傳魯卿東門襄仲後因氏焉齊有大夫東郭偃又有東官得臣晉有東關嬖五世仙傳有廣陵人東陵聖母適杜氏齊景公時有隱居東陵者乃以爲氏出本宋大夫東鄉爲賈叔英賢傳云今高密有東鄉姓宋有負外郎東陽無疑撰齊諧記七卷昔有東閭子嘗富貴後乞於道云吾爲相六年未薦一士夏禹之後東樓公封于杞後以爲氏莊子東野稷僕有平原東方朔曹瞞傳有南陽太守東里昆何氏姓苑有**東**上庄俗加艹**鵝**鸕鷀鳥名美形**棘獸**東萊氏德紅切十七

**武**分  
**文第二十九**欣同用

許元第廿二魂痕同用

胡寒第二十五桓同用

所刪第二十七山同用

官乎恒第二十六

恩戶痕第二十四

間山第二十八

做宋景印

characters with three tones, viz., even, rising and departing tones<sup>(2)</sup>.

—490—

with probable reading /b' ung/ belonging to the first rime 東. This 梵 appears as an independent rime with probable reading /-iwam/. Since it is a rime, it is also the first small-rime of the group with probable reading /b' iwam/.

#### 4. Sound Tables – Shoun's Work

It has been stated above that the sound tables are a direct offshoot of the rime dictionaries. One of the earliest works that can be directly associated with the sound tables is that of Shuon 守溫, a monk who is believed to have lived towards the end of the Tang period (618-907 A.D.). Only three pages of his work, popularly known as Shuon Zankan 守溫殘卷, have been found. There are references to other sound tables like Koin 洪韻 prepared around this period by Buddhist monks, but they are now lost<sup>(3)</sup>.

Shuon first gives the consonants, thirty in all, dividing them into five categories, labials, linguals, velars, dentals and gutturals. There are four labial sounds, with probable values /p/, /p' /, /b' / and /m/. The linguals are divided into two groups. One is tongue tip sounds (*zettoon* 舌頭音) with probable values /t/, /t' /, /d' /, /n/. The other is tongue top sounds (*zetsujoon* 舌上音) with probable values /t'/, /t'' /, /d'' /, /n''/ respectively. The velars are given by six characters. One stands for /l/ which later day phoneticians established as a separate category, viz., semi-lingual. The probable values of the other five are /k/, /k' /, /g' / and /ng/. It should be noted that there is one character in excess here. It is significant that Shuon has used the expression "etc." only with this group. This expression has not been used with any other group. The

dentals are also divided into two groups, teeth tip sounds (*shitoon* 齒頭音) consisting of three probable sounds /ts/, /ts' /, /dz' /, and pure teeth sounds (*seishion* 正齒音) consisting of four probable sounds /t̥s/, /t̥s' /, /d̥z' /, /s̥/ or /ts//, /ts'' /, /dz'' /, /s'/. There are six guttural sounds divided into two groups, three unvoiced sounds /s/, /z/, /χ/ and three voiced sounds /r /, / ' /, /?/. There is one discrepancy in the guttural group. Two dental sounds /s/ and /z/ belonging to the teeth tip group are lumped in the guttural group. Later in this work the teeth tip sounds have been mentioned twice, and on both these occasions these two sounds have been lumped with the teeth tip sounds. He mentions the unaspirated and aspirated sounds, but their exact phonetical values are not clear. He divides the rimes into four *to* 等 or divisions and gives their examples under the four tone headings, viz., even tone, rising tone, departing tone and entering tone<sup>(4)</sup>.

This framework of Shuon developed into the later day sound tables. The sound tables that have survived in complete form and come down to us were prepared during the Sung (960-1279 A.D.) and subsequent periods. One such work *Inkyo* 韻鏡 is the topic of this paper.

## 5. Sound Tables of *Inkyo*

### 5.1. *Inkyo*

The sound tables of *Inkyo* deal basically with the sound values of characters for the period from around the sixth century to the tenth century. The author of *Inkyo* is not known. However, it carries two prefaces by Cho Rin Shi 張麟之 dated 1161 and 1203.

He says that sound tables titled Koin 洪韻 prepared by Buddhist monks are known. He searched for the author for fifty years, but the search proved futile. Inkyo did not attract much attention in China. In Japan, its value was discovered by a Japanese monk Shinpan 信範, who made a copy of it in 1252. Since then it has been used widely as a basic reference material in linguistic studies in Japan<sup>(5)</sup>.

There are forty-four sound tables in Inkyo. These forty-four tables accommodate the entire sound system of the Chinese language. The introductory section gives the first table which gives the initial consonants. The remaining forty-three tables devoted to the rimes constitute the main text of the work. All the rime tables have identical set-up.

## 5.2. Table of Initial Consonants

Table 4 shows the first table of Inkyo that gives the initial consonants. The initial consonants have been given in Inkyo with Chinese characters. Their phonetical values as worked out by Karlgren and others have also been shown alongside.

The title of this table is 36 Consonants. The table is divided into six columns. The first column carries the heading *shinon* 唇音 or labials. Then there are four sub-headings, *sei* 清, *jisei* 次清, *daku* 濁 and *seidaku* 清濁, meaning unvoiced unaspirated, unvoiced aspirated, voiced and nasal respectively. It will be seen that the unvoiced sound has two forms unaspirated and aspirated, whereas the voiced sound has only one form. There is some dispute over the exact nature of this voiced sound. It is generally assumed that it represents the voiced aspirated sound. Next, the phonetical values of the four

Table 4 : The thirty-six initial consonants

Type Class	Unvoiced unaspirated 清音	Unvoiced aspirated 次清音	Voiced 濁音	Nasal 清濁音	Unvoiced Unaspirated 清音	Voiced 濁音
Labial heavy 重唇音	幫 <i>p</i>	滂 <i>p'</i>	並 <i>b'</i>	明 <i>m</i>	0	0
Labial light 輕唇音	非 <i>f</i>	敷 <i>f</i>	奉 <i>v</i>	微 <i>m</i>	0	0
Lingual 舌音	端 <i>t</i>	透 <i>t'</i>	定 <i>d'</i>	泥 <i>n</i>	0	0
	知 <i>t'</i>	徹 <i>t'</i>	澄 <i>d'</i>	娘 <i>n'</i>	0	0
Velar 牙音	見 <i>k</i>	溪 <i>k'</i>	群 <i>g'</i>	疑 <i>n</i>	0	0
Dental 齒音	精 <i>ts</i>	清 <i>ts'</i>	從 <i>dz'</i>	0	心 <i>s</i>	邪 <i>z</i>
	照 <i>ts</i>	穿 <i>ts'</i>	牀 <i>dz'</i>	0	審 <i>s</i>	禪 <i>z</i>
	<i>ts'</i>	<i>ts''</i>	<i>dz''</i>		<i>s'</i>	<i>z'</i>
Guttural 喉音	影 ?	0	匣 <i>γ</i>	喻 ,	曉 <i>x</i>	0
Semi-lingual 半舌音	0	0	0	來 <i>l</i>	0	0
Semi-dental 半齒音	0	0	0	日 <i>nz</i>	0	0

Note: 0 indicates absence of initial consonant.

sub-headings are given with two sets of characters. The top set carries a remark "heavy labial sounds" and represents the sounds /p/, /p' /, /b' / and /m/. The bottom set also carries a remark "light labial sounds" and represents the sounds /f/, /f' /, /v' / and /m<sup>v</sup>/. This last one is a dentilabial sound as of /mf/ in the German word: Kamfer<sup>(6)</sup>. Thus the top row gives the bilabial consonants and the bottom row gives the dentilabial consonants.

The second column carries the heading *zetsuon* 舌音 or linguals. The four sub-headings are the same as those mentioned above. Here also the phonetic values are given with two sets of characters. The top set carries a remark "tongue tip sounds" and represents the dental consonants /t /, /t' /, /d' / and /n/. The bottom set also carries a remark "tongue top sounds" and represents the palatal consonants / t' /, /t' ' /, / d' ' / and / n' /.

The third column carries the heading *gaon* 牙音 or velars. The same four sub-headings are given here, representing the consonants /k/, /k' /, /g' / and /ng/.

The fourth column carries the heading *shion* 齒音 or dentals. It has five sub-headings, unvoiced unaspirated, unvoiced aspirated, voiced, unvoiced unaspirated and voiced. There is no nasal sound here. The phonetic values are given by two sets of characters. The top set carries the remark "teeth tip sounds". They represent five dental sounds, three affricates /ts/, /ts' /, /dz' / and two fricatives /s/, /z/. The bottom set carries the remark "pure teeth sounds". Although Inkyo has treated the "pure teeth sounds" as one group, studies have revealed that this group consists of two types of sounds. One is retroflex, consisting of three affricates /ṭs/, /ṭs' /, /ḍz' / and two fricatives /ṣ/, /ḷ/. Karlgren, however, assumes that

the fifth sound /z/ is missing here. The other is palatal, consisting of three affricates /ts' /, /ts' /, /dz' / and two fricatives /s' /, /z' /<sup>(7)</sup>.

The fifth column carries the heading *koon* 喉音 or gutturals. It carries four sub-headings, unvoiced unaspirated, unvoiced aspirated, voiced and nasal. They represent the sounds /ʔ/, /ɣ/, /χ/, /' /. The sound /ɣ/ represents the unvoiced guttural fricative (as in German: ach). As against this, the sound /χ/ represents the voiced guttural fricative (like the sound /g/ in North German: wagen). The sound /ʔ/ is an unvoiced plosive sound in the laryngeal position analogous to the unvoiced /k/, /t/, /p/, etc<sup>(8)</sup>. Although the sub-heading says that the sound /' / is nasal, it is actually voiced, a smooth vocalic ingress, as found in English: the aim<sup>(9)</sup>.

The sixth and last column carries the heading *zetsuonshi* 舌音齒 or linguals/dentals. This heading shows that this group represents two categories of sounds. The sub-headings say that the two sounds are nasals. However, the first is the sound /l/, and not a nasal. The second is the palatal nasal sound /n'/. Karlgren has shown the value of this as /n'z'/. Chinese phonetical writings define them as *hanzetsuon* 半舌音 or semi-linguals and *hanshion* 半齒音 or semi-dentals respectively in order to differentiate them from the normal linguals and dentals, and avoid confusion. In short, traditional Chinese phonetical works divide the consonants into seven categories and call them *shichion* 七音 or seven sounds.

A word must be said here about the significant difference in the usage of terminology in Varnamala and Chinese phonetical writings. The palatals and dentals of Varnamala have been lumped together as linguals in Chinese works. The dentals of Chinese works consist of affricates, fricatives and a form of nasal. The affricates are



not recognised as simple sound in Varnamala. The fricatives correspond to śa, sa, sa of Varnamala.

### 5.3. Rime Tables – Their Composition

#### 5.3.1. *naiten*, *gaiten* and *setsu*

The rime tables of Inkyo have a standard set-up as shown in Table 3 above. Each rime table starts with the word *naiten* 内転 or *gaiten* 外転. These two terms were transmitted orally from religious teacher to disciple as a part of sectarian teaching called *monpo* 門法. However, the original meaning was lost with the passing of time. Shisei Toshi 四声等子, believed to have been written during the Southern Sung Period (1127–1279), describes the two terms as follows. In the case of *naiten*, Div. II does not contain any characters of labial, lingual, velar and guttural categories. Div. II contains only dental category characters. In the case of *gaiten*, characters of all the five labial, lingual, velar, guttural and dental categories are present in all the four divisions. It is very difficult to determine the precise meaning of these two terms at present<sup>(10)</sup>.

The term *setsu* 攝 is applied to a group of rimes that have akin main vowel V. As shown in Table 2, the 206 rimes are divided into sixteen *setsus*. Some of the *setsus* have been designated by the characters used for designating the rimes. For others a character belonging to one of the concerned rimes has been used. For instance, the first *setsu* is designated by the character 通 which is a constituent member of the rime 東, or rather small-rime 東 to be precise, with the reading /tung/. On the other hand, the second *setsu* 江 has been named after its constituent rime 江 with the reading /kang/.

The *setsus* have not been mentioned specifically in Inkyo. Even then the *setsu* of a rime table can be determined easily by looking up the rimes in Table 2.

The sixteen *setsus* are divided into two groups, eight *naiten* and eight *gaiten* as shown in Table 5. This suggests that *naiten* and *gaiten* denote some properties of *setsu*, but it is difficult at present to say precisely what the properties are. Since *setsu* is a type of grouping based on the main vowel, it is very much likely that *naiten* and *gaiten* have some relation with vowels. A scrutiny of the Sino-Japanese readings of the *setsus*, which have been shown in Table 2 for reference, reveals that the *setsus* with main vowel V related to /-a-/ belong to the *gaiten* group, and the others belong to the *naiten* group.

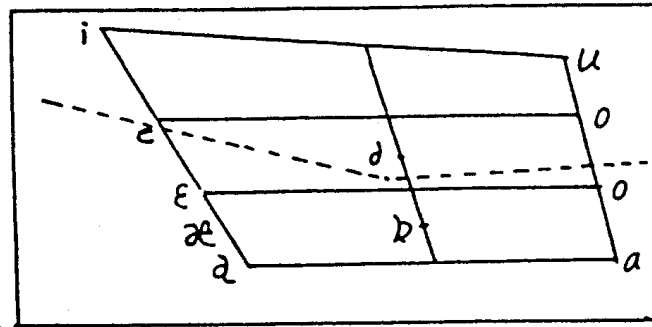
**Table 5: Division of sixteen *setsus* into *naiten* and *gaiten***

<i>naiten setsus</i>	通	止	遇	果	宕	曾	流	深
<i>gaiten setsus</i>	江	蟹	臻	山	梗	效	假	咸

A twelfth century scholar Tei Sho 鄭樵 (1104–1162) has written in the preface of his *Shichionryaku* 七音略, a work on rime tables, that by preparing the *naiten* and *gaiten* charts he has explained the use of vowel lattice charts of the monks of the West<sup>(11)</sup>. Some scholars believe that the main vowels of the *setsus* of *naiten* group are of narrow type, and those of the *setsus* of *gaiten* group are of broad type. According to another hypothesis, *naiten* contains the back vowels and *gaiten* contains the front vowels<sup>(12)</sup>. A modern Chinese scholar has analysed the main vowels of *naiten* and *gaiten*, and proposed that the rimes containing the vowels located above

the dotted line in Fig. 2 belong to the *naiten* group, and those containing the vowels located below the dotted line belong to the *gaiten* group<sup>(13)</sup>.

Fig. 2 : Rimes of *naiten* and *gaiten*



### 5.3.2. Open-Mouth Pronunciation and Closed-Mouth Pronunciation

The Inkyo rime tables are divided into three types, *kai* 開, *go* 合 and *kaigo* 開合. Literally, *kai* means 'to open' and *go* means 'to put together'. The meaning of *kaigo* is not very clear. In the case of *go* the lips are rounded while pronouncing. No such manipulation of lips is involved in the case of *kai*. Karlgren has termed *kai* as 'open mouth pronunciation' and *go* as 'closed mouth pronunciation'.

Broadly speaking, the rimes containing /u/ or /w/ as the medial vowel M are called closed-mouth, and those not containing these medial vowels are called open-mouth. In certain rimes, the rounding of lips is required even when no medial /u/ or /w/ is present. The rimes with /u/ as the main vowel V belong to this category. Inkyo treats these also as closed-mouth. It has been stated in the preceding section that the *setsu* of a rime table can be identified easily from the rimes given in the table. Some *setsus* contain two types of rimes, open-mouth and closed-mouth. Again, in Inkyo, some *setsus* contain all the three types, open-mouth, closed-mouth and *kaigo*.

Separate tables have been allotted to the open-mouth, closed-mouth and *kaigo* rimes belonging to the same *setsu* in Inkyo.

There are some discrepancies in the tables of Inkyo. The first and eleventh rime tables have been designated as open-mouth, although rounding of lips is involved in pronouncing them. This naturally has created some controversy. The first table involves the rime /-ung/. Onin Nichigetsuto 音韻日月灯 written during the Ming period (1368-1644) and many subsequent Chinese works have treated this rime as closed-mouth. Two Japanese works on Inkyo, Kango Onzu 漢吳音圖 and Teisei Inkyo 訂正韻鏡, as well as Karlgren have treated it as closed-mouth. The eleventh table involves the rime /-iwo/. It also has been treated as open-mouth in Inkyo. Onin Nichigetsuto, mentioned above has treated it as closed-mouth. A Japanese monk Monno 文雄 (1700-1763) has stated categorically that it is wrong to treat this table as open-mouth<sup>(14)</sup>.

### 5.3.3. Tones

Each rime table is divided into four broad rows, each assigned to a tone, even, rising, departing and entering. It has been stated above that the Chinese characters are basically monosyllabic, and that these syllables can be represented by  $S = IMVE/T$ . It has also been stated that a syllable may or may not have IME, but must have V. Now, the end consonant E of the final constitutes an important criterion in arranging the rimes in the four tones. Some Chinese characters do not have end consonant, for instance, the character 大 /ta/ (big). The rime tables accommodating such characters have only three tones, even, rising and departing. The entering tone row in these tables is blank. The end consonant

comes in three categories, velar /-ng/ and /-k/, lingual /-n/ and /-t/, and labial /-m/ and /-p/. In these pairs, the first is nasal and the second is oral. Rimes accommodating these characters have entries in all the four tones. Here, the even, rising and departing tones have nasal endings, and the entering tone has oral. For instance, in the first rime table of Inkyo shown in Table 3 earlier, the even, rising and departing tones end in /-ng/, and the entering tone ends in /-k/. The same rule holds good for the lingual pair /-n/ and /-t/, and the labial pair /-m/ and /-p/.

#### 5.3.4. Division

Inkyo divides each tone into four subgroups, called *to* 等 or division. Division is a phonetical criterion based on the extent by which mouth opened at the time of pronouncing it. Ko Ei 江永, an eighteenth century scholar, says about the four divisions in his *Ongaku Benbi* 音学弁微 that in the group of four divisions, Division 1 is the biggest, Division 2 is the next big, both the Divisions 3 and 4 are narrower, Division 4 being the narrowest. A Japanese scholar has interpreted this by saying that mouth is opened to the maximum extent in the case of the Div. 1 sounds, and the opening is narrowed down in steps till Div. 4, which is the narrowest. Another scholar has interpreted Ko Ei from the degree of opening of the two rows of teeth. When the two rows of teeth are fully open, the sound produced is /a/. But, when the two rows touching each other, the sound produced is /i/. Reduction in the gap of the two rows of teeth introduced the medial /i/ in Div. 3 and Div. 4<sup>(15)</sup>. What Ko Ei, perhaps, had in view is that when, say, /a/ is pronounced with mouth wide open, the sound that is produced is

/a/. But when the same /a/ is produced by narrowing the mouth, it acquires a short, subordinated /i/, called medial /i/. Thus the sound becomes something like /ia/, where /i/ is medial.

Identifying the four divisions accurately has been rendered very difficult because of a number of factors. The political centre has changed many times in China. Sometimes a number of centres contended for power. The language of officialdom, which held the status of standard language, was often synonymous with the dialect spoken around the capital. Even within the same dialectical area the language changed with the passing of time. Because of all these factors, it is very difficult to discover any consistent rule in the pronunciations of the four divisions. In many cases, difference in pronunciation between Div. 1 and Div. 2 as well as between Div. 3 and Div. 4 has vanished.

The Chinese phoneticians first made a broad grouping on the basis of medial /i/. The finals of some characters possessed a medial /i/ in them, and some didn't. As stated above, pronouncing the characters having this medial /i/ required a narrowing down of the opening of mouth, a process not involved with the non-medial /i/ characters. They placed the characters with the medial /i/ in Divs. 3 and 4, and those without in Divs. 1 and 2<sup>(16)</sup>. It appears that the main vowel of Div. 1 was broader than that of Div. 2. For instance the Div. 1 had /a/ and the Div. 2 had a sound closer to /e/. The difference between Div. 3 and Div. 4 was much more complex, although in this case also the difference has vanished to a great extent. An eminent Japanese scholar Todo Yasuaki has suggested the presence of an intercalary semi-vowel like /r/ as one of the probable factors involved here. He suggested that this /r/

was present before the medial /i/ in some characters and not in others. Those with this /r/ were placed in Div. 3, and those without in Div. 4. For instance, Div. 3: 寄 /grie/ and Div. 4: 祇 /gie/<sup>(17)</sup>.

While borrowing Chinese characters during the sixth and seventh centuries of the Christian era, the Japanese borrowed the Chinese readings of the characters as well. The Japanese language has retained these readings ever since under the name Sino-Japanese readings. A scrutiny of the Sino-Japanese readings suggests that there existed some sort of vocalic difference in the four divisions. A study of the twenty-third rime table shown in Table 6 here clearly reveals this point. In this table, the even tone velar category unvoiced unaspirated Div. 1 干 is read as /kan/ as against Div. 2 姦 with the reading /ken/. The entering tone lingual category unvoiced unaspirated Div. 3 哲 is read as /tetsu/ as against this, the Div. 4 窒 is read as /chitsu/. The Japanese of that period probably heard the sounds as /tet/ and /tit/ respectively<sup>(18)</sup>.

### 5.3.5. Consonant Categories

Each rime table carries on the top the consonant categories given in Section 5.1. above. The consonants are given in the same order, viz., labial, lingual, velar, dental, guttural and lingual/dental, along with their unvoiced, voiced, unaspirated, aspirated and nasal sub-headings.

### 5.3.6. Rimes

The rimes treated in a table are given on the left hand side of the table. The 206 rimes of Koin are distributed among the 43

tables of Inkyo. The tables can be divided into two types. One type accommodates rimes with labial, lingual and velar consonantal endings. Here the tables usually have rimes in all the four tones, the first three with the nasal endings /-m/, /-n/ and /-ng/, and the last with their corresponding oral endings /-p/, /-t/ and /-k/. The other type accommodates the rimes ending in vowels. There are no entering tone entries in these tables.

### 5.3.7. Small-Rimes

It has been stated above that there are 3,874 small-rimes in Koin distributed among the 206 rimes. The rime tables of Inkyo are based almost entirely on these small-rimes. Since the Inkyo tables contain about 3,790 characters, almost all the small-rimes of Koin are given here. However, there are some entries in Inkyo which do not exist in Koin. This is perhaps due to regional variations in pronunciation and the changes that took place in the language during the period intervening Koin and Inkyo.

The tables of Inkyo are designed in the form of a grid. The point where the horizontal and the vertical axes meet gives the actual reading of that point. For instance, the reading of the first entry 蓬 in the first rime table, shown in Table 3 above. The horizontal column says that the initial consonant 1 is a labial voiced sound. So its phonetic value is /b'/. Since the rime is /-ung/, the reading of this entry is /b' ung/<sup>(19)</sup>.

### 5.3.8. Rimes with Multiple Finals

A closer look at the rime tables shows certain anomalies. This point will be discussed here with the help of the first and the



twenty-third rime tables of Inkyo shown here in Tables 3 and 6 respectively.

First, the Table 6 will be taken up. It will be seen that each

### Table 6 : Rime Table 23 of Inkyo

[illegible]

Approximate rime values have been shown here.

Source: 韻鏡, 等鏡五種, 芸文印書館, 台北, 中華民國64年, pp.62-63

division in each tone here forms an independent rime. Since there are four tones and each tone has four divisions, there are sixteen rimes in all in this table. As explained in Section 5.3.4 above, the pronunciations of the four divisions differ slightly from each other. So it is natural that they should form four independent rimes.

In Table 3, each tone is represented by one rime. For instance, the rime 東 or /-ung/ has been given against the even tone. But there are small-rimes in all the four divisions. According to Section 5.3.4 above, their pronunciations should differ slightly from each other. For instance, in the case of Div. III, there should be a

medial /-i-/ present. This shows that the rime in this case ought to be /-iung/, and not /-ung/. In other words, there are at least two rimes, one without the medial /-i-/ and the other with medial /-i-/ in this tone. This means that, although 東 officially represents /-ung/, it actually consists of at least two rimes /-ung/ and /-iung/. In the same way, the third rime 送 represents the rimes /-ung/ and /-iung/ in departing tone, and the fourth rime 屋 represents the rimes /-uk/ and /-iuk/ in entering tone. This anomalous situation has arisen, perhaps, because there are no independent /-iung/ and /-iuk/ rimes among the 206 rimes. On the other hand, in the case of Table 6, all the sixteen rimes are members of the 206 rimes.

A scrutiny of the *hansetsu* spellings of the small-rimes of the rime 東 /-ung/ given in Koin reveals that one set of characters has been used to denote the spellings of the finals of the Div. I small-rimes, whereas another set of characters has been used for expressing the spellings of the finals of the small-rimes of the remaining three divisions<sup>(20)</sup>. There is no mix-up of the two sets. This shows that the rime 東 /-ung/ actually represents at least two rimes /-ung/ and /-iung/. In short, the rule that a rime consists of a single final has been violated occasionally in the rime tables of Inkyo.

## 6. Study

Buddhist monks, especially those of Chinese origin, played a crucial role in introducing Sanskritic phonetical ideas to the Chinese scholarly world. One of the early eminent Chinese to show interest in Sanskritic phonetical ideas was Sha Rei Un 謝靈運 (385-433).

While translating Mahaparinirvana Sutra, the Indian monk Dharm

araksha, better known by his Chinese name Mu Shin 無識 (died 433 A.D.), incorporated the Varnamala as a part of a chapter. Sha Rei Un revised the sutra along with two Chinese monks. While doing so, he made the Varnamala an independent chapter. This shows the importance he attached to the phonetical ideas embodied in the Varnamala. He wrote about Sanskrit phonetical categories also. He defined the velars as tongue root sounds, the palatals as mid tongue sounds or around the molar teeth sounds, the retroflexes as close to the tongue tip sounds, the dentals as tongue tip sounds or the tongue top sounds, and the labials as within the lips sounds

<sup>(21)</sup>. Sha Rei Un's definitions did not get universal acceptance. Other scholars used their own terms. One such scholar was monk Chiko 智広 (died 806 A.D.) the author of Shittan Jiki, the widely used text book of Sanskrit in the Far East. He called the velars as molar sounds, palatals as teeth sounds, the retroflexes as tongue sounds, dentals as throat sounds, and labials as lip sounds<sup>(22)</sup>. These terms of Chiko are normally rendered in English as velars, dentals, linguals, gutturals and labials respectively.

The Chinese scholars adopted and adapted these concepts, and categorised the consonants of Chinese into velar, lingual and labial, etc. An application of this categorisation can be seen in Koin. In Koin there are rimes with and without end consonants. If the rimes without end consonants are eliminated, and the rimes of the four tones are written down in the order they appear in the dictionary, then they form three groups. The first group consists of three /-ng/ rimes followed by the /-k/ rime. The second group consists of three /-n/ rimes followed by the /-t/ rime. Similarly, the third group consists of three /-m/ rimes followed by the /-p/ rime. A

comparison with the Varnamala shows that these three groups are constituted by the nasal and oral pairs of the velar, lingual and labial consonants. Koin has kept the velar, lingual and labial rimes separated from each other by placing vowel-ending rimes in between. It must be noted here that the dental category of Varnamala was treated as linguals in most of the Chinese phonetical works.

The Chinese scholars tried various methods for classifying the characters. One such method was *chu* 紐 or character bundle. A brief study of *chu* will give a better idea of the role Sanskritic phonetical concepts played in the compilation of Koin. According to this method, the characters were divided into *yosei* 陽聲, *nyusei* 入聲 and *insei* 陰聲 groups. The *yosei* characters ended in nasal /ng/, /n/, /m/, the *nyusei* characters ended in oral /k/, /t/, /p/, and the *insei* characters ended in vowel like /a/, /o/, /ei/, etc. Both the *yosei* and *insei* characters came in three tones each, namely, even tone, rising tone and departing tone. The *nyusei* characters constituted the fourth tone, i.e., the entering tone. One set of character bundles was formed by lumping three *yosei* characters of even, rising and departing tones with one *nyusei* character. A rule was followed here while lumping. The characters ending in /ng/, /n/ and /m/ were lumped with the characters ending in /k/, /t/ and /p/ respectively. Now, in the *insei* characters there were many with two readings, one *nyusei* and the other *insei*, like 塞: /sek/ and /sei/. This, perhaps, suggested the existence of some sort of a bond between the *insei* characters and the *nyusei* characters. So, another set of bundles by lumping three such *insei* characters having even, rising and departing tones with one *nyusei* character was prepared. Thus the bundles of both the types consisted of four

characters of four tones. Next, bundles of seven characters were created by joining the two types with the *nyusei* character as the common link. In other words, this bundle was constituted by three characters each of *yosei* and *insei*, along with one *nyusei* character positioned in the middle. Here the IMV in all the seven characters were the same. The three types of bundles are shown in Table 7 below<sup>(23)</sup>. In the first bundle, the four characters are read as /rang/, /rang/, /rang/ and /rak/, in even, rising, departing and entering tones respectively. The second bundle is read as /rei/, /rei/, /rei/ and /ret/, in same tonal order. In the last bundle, the middle one is the *nyusei* or entering tone character with reading /kwak/. The readings of the first three *yosei* and the last three *insei* characters are /kwang/ and /kwa/ respectively, in the order of even, rising and departing tones.

**Table 7 : Character bundles**

a) Bundle of *yosei-nyusei* characters:

郎	朗	浪	洛
/rang/	/rang/	/rang/	/rak/

b) Bundle of *insei-nyusei* characters:

黎	禮	麗	振
/rei/	/rei/	/rei/	/ret/

c) Bundle of *yosei-nyusei-insei* characters:

光	廣	珣	郭	戈	果	過
/kwang/	/kwang/	/kwang/	/kwak/	/kwa/	/kwa/	

Later on, the *insei-nyusei* bundle was discontinued, leaving behind the *yosei-nyusei* bundle. The *yosei-nyusei* bundle can be justified from

phonetical angle, since the endings /ng/ and /k/ form velar pair, /n/ and /t/ form lingual pair, and /m/ and /p/ form labial pair. But no such phonetical justification is possible in the case of *insei-nyusei* bundle. The discontinuation of this bundle suggests a strong influence of Sanskritic phonetical ideas. The *yosei-nyusei* bundle constituted an important basis in the compilation of Koin.

The Sanskritic phonetical concepts have been applied further in the rime tables. In the tables, the consonants are grouped under their respective categories of labials, linguals and velars, etc. In each category the unvoiced and voiced forms as well as the unaspirated and aspirated forms have been entered as separate entities. Especially in the case of the labials, linguals and velars, it appears that the Varnamala arrangement has been reproduced straightway, excepting for the voiced unaspirated sounds. As stated earlier, Chinese distinguished the unaspirated and aspirated sounds in the unvoiced category, but this distinction was not maintained in the voiced category. The voiced sounds were treated as a single entity.

The voiced letters of Varnamala attracted special attention of the Chinese scholars from the very beginning. As stated earlier, Mushin's translation of Mahaparinirvana Sutra introduced the Varnamala to the Chinese scholarly world. He gave the voiced letters here without any remark. But, Sha Rei Un appended the note "aspirated" with the voiced aspirated letters when he revised Mushin's translation. He did not add any remark to the voiced unaspirated letters. Chiko, however, has added the remarks "unaspirated" and "aspirated" with both unaspirated and aspirated voiced letters in his Shittan Jiki<sup>(2)</sup>. These facts suggest that unlike Varnamala, the Chinese treated the voiced sounds as a single entity. Because of

this, some modern scholars treat the voiced sounds as aspirated, whereas others treat them as unaspirated.

## 6. Conclusion

Sanskritic phonetical ideas introduced through the Varnamala played a significant role in the development of phonetical studies in China. These ideas were applied in compiling the rime dictionaries like Koin. The idea of lumping up the *nyusei* rimes ending in /p/, /t/, /k/ with the *yosei* rimes ending in /m/, /n/, /ng/ respectively can be traced to the Varnamala. A look at the sound tables of Inkyo, which recast the entries of Koin in tabular form, immediately reveals their connection with the Varnamala. The arrangement of consonants in the Inkyo tables is just a copy of the same given in the Varnamala.

## References

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- (4) Misawa, Junjiro: Inkyo no Kenkyu, Inkyo Kenkyukai, Kobe, 1960, p. 190, 三沢諄治郎『韻鏡の研究』

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- (6) Bernhard Karlgren: Compendium of Phonetics in Ancient and Archaic Chinese, The Museum of Far Eastern Antiquities, Bulletin 22, Stockholm, 1954, p. 230
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- (8) Karlgren: p. 228  
Here, the vocal chord opens suddenly, a "Knacklaut", as found in German: die • Ecke.
- (9) Karlgren: p. 228 Karlgren has assigned the symbol / • / for /?/. Some Japanese works like those of Ushijima, Tokuji et. al, Misawa, Junjiro and Oya, Toru have refrained from assigning any phonetical value to /' /.
- (10) Todo: pp. 246-47  
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- (16) Karlgren: p. 221  
Todo: p. 208. Todo has used /j/ instead of /i/.
- (17) Todo, pp. 120-121



- (18) The Japanese syllables, as a rule, ended in vowel. So the Japanese added the vowel /u/ to /tet/ and /tit/ and Japanised them into /tetu/ and /titu/. However, the sound /tu/ changed into /tsu/, and the sound /ti/ changed to /chi/. Consequently the readings became /tetsu/ and /chitsu/.
- (19) Since no unaspirated-aspirated distinction has been made here, some scholars say that the phonetic value of this initial is unaspirated /b/, and the reading of this entry is /bung/.
- (20) Koin, Vol 1, Taiwan Chuka Shokyoku, Taipei, 1967, pp. 2-7, 広韻, In Div. 1, 紅, 東 and 公 have been used to denote the finals of the small-rimes. In Divs. 2, 3 and 4, 弓, 戎, 中, 宮, 終 and 融 express the small-rime finals. There is no common character in the two sets. Only in one case, a Div. 1 small-rime 空 has been used to denote the pronunciation of the final of a Div. 3 small-rime 豐. The *hansetsu* spelling of this character has been given as 敷空切.
- (21) Annen: Shittanzo, Shinshu Taisho Daizokyo, V. 84, Daizo Shuppan, Tokyo, 1963, p. 409-B, 安然『悉曇藏』
- (22) Chiko: Shittan Jiki, Shinshu Taisho Daizokyo, V. 54, Daizo Shuppan, Tokyo, pp. 1,187B-1,188M, 智広『悉曇字記』
- (23) Annen: Shittanzo, p. 381-B
- (24) Mushin: Daihatsu Nehangyo, Vol. 8, Taisho Daizokyo, V. 12, Daizo Shuppan, Tokyo, p. 413 無識『大般涅槃經』  
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Chiko: Shittan Jiki, p. 1,188

## List of Chinese characters used in this study

biwam 梵    b'ung 梵    b'ung 蓬    Chiko 智広    chitsu 窒    chu 紐  
 Daiso Jushu Koin 大床重修広韻    daku 濁    dung 同    gaiten 外転  
 gaon 牙音    gie 祇    go 合    grie 寄    Gyokuhen 玉篇    hansetsu  
 反切    hanshion 半齒音    hanzetsuon 半舌音    heisei 平声    Inkyo 韻鏡  
 insei 陰声    jisei 次清    josei 上声    kang 江    kai 開    kaigo 開合  
 kan 干    Kango Onzu 漢吳音図    ken 姦    Ko Ei 江永    Koin 広韻  
 Koin 洪韻    koon 喉音    kwa 戈    kwa 果    kwa 過    kwak 郭  
 kwang 光    kwang 廣    kwang 珰    kyosei 去声    Monno 文雄  
 monpo 門法    Mu Shin 無識    naiten 内転    nyusei 入声    Ongaku  
 Benbi 音学弁微    Onin Nichigetsuto 音韻日月灯    rak 洛    rang 郎  
 rang 朗    rang 浪    rei 黎    rei 禮    rei 麗    ret 捩    sei 清  
 sei 塞    seidaku 清濁    seishion 正齒音    sek 塞    setsu 摂    Setsuin  
 切韻    Sha Rei Un 謝靈運    shichion 七音    Shichionryaku 七音略  
 shinon 唇音    Shinpan 信範    shion 齒音    Shisei Toshi 四声等子  
 sung 送    shitoon 齒頭音    shoin 小韻    Shuon 守溫    Shuon Zankan 守溫  
 殘卷    ta 大    Teisei Inkyo 訂正韻鏡    Tei Sho 鄭樵    tet 哲  
 testu 哲    t'ien 天    tit 窒    tiung 中    to 等    Toin 唐韻    tung  
 東    tung 董    tung 凍    tung 通    uk 屋    yosei 陽声    zetsujoon 舌  
 上音    zetsuon 舌音    zetsuonshi 舌音齒    zettoon 舌頭音