

# Supplement: A translation of the *ménfǎ* rules

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This appendix translates the *ménfǎ* rules in *Zhízhǐ yù yàoshi ménfǎ* 直指玉鑰匙門法 ‘Straight-to-the-point jade-key doorway-laws’ written by *Zhēnkōng* 真空, an essay published in 1516. The digital version of this document is downloadable at the online database of UC Berkeley Library (<https://digicoll.lib.berkeley.edu/record/73473>).

Every rule are formatted as follows. The original text is given first, accompanied by its English translation and a formal representation adopting symbols developed from the current essay. Some more logical operators are also used, which are listed in (1).

(1) Logical notations:

- a.  $A \in B$  –  $A$  belongs to  $B$ .
- b.  $A \wedge B$  –  $A$  and  $B$ .
- c.  $A \Rightarrow B$  – If  $A$ , then  $B$ .
- d.  $G_{x,y}$  – shorthand for  $G_x$  and  $G_y$ .
- e. Braces are used for easier reading.

1. *Yīnhé* 音和

- 音和者，謂：見、溪、群、疑此四母下字爲切，隨四等韻去，皆是“音和”。故曰：“切時若用見溪群，四等音和隨韻臻。”
- ‘Phonic harmony’ refers to the situation where the upper speller [=  $\sigma_1$ ] has a character kernel *jiàn*, *qī*, *qún* or *yí* and the result [in  $\sigma_0$ ] follows one of the four grades of the lower speller [=  $\sigma_2$ ]. Thus it [= the mnemonic] goes that ‘if molars are used in *fǎnqiè*, “phonic harmony” towards Grade-IV will be achieved along with the rhyme.’
- $\{\overline{R}_1 \in \text{molars}\} \wedge \{R_2 \in G_1\} \Rightarrow \{\overline{R}_0 \in \text{molars} \wedge R_0 \in G_1\}$   
&  
 $\{\overline{R}_1 \in \text{molars}\} \wedge \{R_2 \in G_2\} \Rightarrow \{\overline{R}_0 \in \text{molars} \wedge R_0 \in G_2\}$   
&  
 $\{\overline{R}_1 \in \text{molars}\} \wedge \{R_2 \in G_3\} \Rightarrow \{\overline{R}_0 \in \text{molars} \wedge R_0 \in G_3\}$   
&  
 $\{\overline{R}_1 \in \text{molars}\} \wedge \{R_2 \in G_4\} \Rightarrow \{\overline{R}_0 \in \text{molars} \wedge R_0 \in G_4\}$

## 2. Lèigé 類隔

- 類隔者，謂：端、透、定、泥一、四爲切，韻逢二、三便切知等字；知、徹、澄、孃二、三爲切，韻逢一、四却切端等字。故曰：“一四端泥三二知，相乘類隔已明之。”
- ‘Genetic segregation’ refers to the situation where *duān, tòu, dìng and ní* [in  $\sigma_1$ ], combined with Grade-I or Grade-IV, become *zhī, chè, chéng and niáng* [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-II or Grade-III; or the situation where *zhī, chè, chéng or niáng* [in  $\sigma_1$ ], combined with Grade-II or Grade-III, become *duān, tòu, dìng and ní* [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-I or Grade-IV. Thus it [= the mnemonic] goes that ‘for linguals capita of Grade-I or Grade-IV and linguals upper of Grade-III or Grade-II, driving towards each other, their “genetic segregation” can be manifested.’
- $\{\bar{R}_1 \in \text{linguals capita} \wedge R_1 \in G_{1,4}\} \wedge \{R_2 \in G_{2,3}\} \Rightarrow \{\bar{R}_0 \in \text{linguals upper}\}$   
&  
 $\{\bar{R}_1 \in \text{linguals upper} \wedge R_1 \in G_{2,3}\} \wedge \{R_2 \in G_{1,4}\} \Rightarrow \{\bar{R}_0 \in \text{linguals capita}\}$

## 3. Kēqiè 窠切

- 窠切者，謂：知、徹、澄、孃第二爲切（謂知等第二，即四等中第三也），韻逢精、清、從、心、邪、曉、匣、影、喻第四，並切第二。故曰：“知逢影喻精邪四，窠切憑三有定基。”
- ‘Nest cutting’ refers to the situation where *zhī, chè, chéng and niáng* [in  $\sigma_1$ ], combined with their second grade (that is, Grade-III within the four grades), are combined with the second grade [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-IV following *jīng, qīng, cóng, xīn, xié, xiǎo, xiá, yǐng* or *yù*. Thus it [= the mnemonic] goes that ‘when linguals meet *yù* and incisials capita of Grade-IV, “nest cutting” towards Grade-III becomes well-grounded.’
- $\{\bar{R}_1 \in \text{linguals upper} \wedge R_1 \in G_3\} \wedge \{\bar{R}_2 \in \text{incisials capita or gutturals} \wedge R_2 \in G_4\} \Rightarrow \{R_0 \in G_3\}$

## 4. Qīngzhòng jiāohù 輕重交互

- 輕重交互者，謂：幫、滂、並、明一、二、三、四爲切，韻逢有非等處，第三便切輕唇字；非、敷、奉、微第三爲切，韻逢一、二、四，却切重唇字。故曰：“輕見重形須切重，重逢輕等必歸輕。”
- ‘Interaction between light labials and heavy labials’ refers to the situation where *bāng, pāng, bìng, míng* [in  $\sigma_1$ ], combined with Grade-I, Grade-II, Grade-III and Grade-IV, become light labials [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-III following *fēi, fū, fèng* or *wéi*; or the situation when *fēi, fū, fèng* or *wéi* [in  $\sigma_1$ ], combined with Grade-III, become heavy labials [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-I, Grade-II or Grade-IV. Thus it [= the mnemonic] goes that ‘when the light meets the heavy, the heavy shall be chosen, whereas everything goes to the light when the heavy encounters the light.’
- $\{\bar{R}_1 \in \text{heavy labials} \wedge R_1 \in G_{1,2,3,4}\} \wedge \{\bar{R}_2 \in \text{light labials} \wedge R_2 \in G_3\} \Rightarrow \{\bar{R}_0 \in \text{light labials}\}$   
&  
 $\{\bar{R}_1 \in \text{light labials} \wedge R_1 \in G_3\} \wedge \{\bar{R}_2 \in G_{1,2,4}\} \Rightarrow \{\bar{R}_0 \in \text{heavy labials}\}$

## 5. Zhènjiù 振救

- 振救者，謂：精、清、從、心、邪等一等爲切，韻逢諸母第三，並切第四，是“四二振救”；精、清、從、心、邪第二爲切（謂精等中爲第二，即等中爲第四也），韻逢諸母第三，亦切第二。故曰：“三四還歸四名振，切一韻三四二陳。”
- ‘Rescue’ refers to the situation where *jīng, qīng, cóng, xīn and xié* [in  $\sigma_1$ ], combined with Grade-I, are combined with Grade-IV [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-III following any character kernel; this is the ‘rescue’ of Grade-IV, or the second grade. *Jīng, qīng, cóng, xīn and xié* [in  $\sigma_1$ ], combined with their second grade (that is, Grade-IV within the four grades), are still combined with Grade-II [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-III following any character kernel. Thus it [= the mnemonic] goes that ‘the return of Grade-III and Grade-IV “rescues” the name of Grade-IV, where combining Grade-I with Grade-III gives an arrangement of Grade-IV, or the second grade.’
- $\{\bar{R}_1 \in \text{incisials capita} \wedge R_1 \in G_1\} \wedge \{R_2 \in G_3\} \Rightarrow \{R_0 \in G_4\}$   
&  
 $\{\bar{R}_1 \in \text{incisials capita} \wedge R_1 \in G_4\} \wedge \{R_2 \in G_3\} \Rightarrow \{R_0 \in G_4\}$

#### 6. Zhèngyīn píngqiè 正音憑切

- 正音憑切者，謂：照、穿、床、審、禪第一等爲切（即第四等中第二也），韻逢諸母第三，並切照一，是“正音憑切三”；韻逢諸母第四，亦切照一，是“正音憑切四”。故曰：“逢三遇四盡歸初，正音憑切成規訓。”
- ‘Reliant cutting of incisials proper’ refers to the situation where *zhào, chuān, chuáng, shěn and shàn* [in  $\sigma_1$ ], combined with their first grade (that is, Grade-II within the four grades), are still combined with their first grade [in  $\sigma_0$ ] when the rhyme is Grade-III [in  $\sigma_2$ ] following any character kernel; this is ‘reliant cutting of incisials proper’ under Grade-III. Those character kernels [in  $\sigma_1$ ] are still combined with their first grade [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-IV following any character kernel; this is ‘reliant cutting of incisials proper’ under Grade-IV. Thus it [= the mnemonic] goes that ‘when Grade-III or Grade-IV is encountered, everything goes back to the upper speller, by which “reliant cutting of incisials proper” becomes a canon.’
- $\{\bar{R}_1 \in \text{incisials proper} \wedge R_1 \in G_2\} \wedge \{R_2 \in G_3\} \Rightarrow \{\bar{R}_0 \in \text{incisials proper} \wedge R_0 \in G_2\}$   
&  
 $\{\bar{R}_1 \in \text{incisials proper} \wedge R_1 \in G_2\} \wedge \{R_2 \in G_4\} \Rightarrow \{\bar{R}_0 \in \text{incisials proper} \wedge R_0 \in G_2\}$

#### 7. Jīng-zhào hùnyòng 精照互用

- 精照互用者，謂：精、清、從、心、邪第二等爲切（謂精等爲二，即等中第四也），韻逢諸母第二，並切照一等字，是“四二精照互用”；照、穿、床、審、禪第一等爲切（即等中第二也），韻逢諸母第一，却切精一等字，是“精照互用”。精、清、從、心、邪第一等爲切，韻逢諸母第二，並切照一等字，亦是“精照互用”。故曰：“四二相違互用呼，照初却見四等中。”
- ‘Mutual use of incisials capita and incisials proper’ refers to the situation where *jīng, qīng, cóng, xīn and xié* [in  $\sigma_1$ ], combined with their second grade (that is, Grade-IV within the four grades), are combined with the first grade [in  $\sigma_0$ ] of *zhào, chuān, chuáng, shěn and shàn* when the rhyme [in  $\sigma_2$ ] is Grade-II following any character kernel; this is ‘mutual use of incisials capita and incisials proper’ under Grade-IV, or

the second grade. Zhào, chuān, chuáng, shěn and shàn [in  $\sigma_1$ ], combined with their first grade (that is, Grade-II within the four grades), are combined with the first grade [in  $\sigma_0$ ] of jīng, qīng, cóng, xīn and xié when the rhyme [in  $\sigma_2$ ] is Grade-I following any character kernel; this is a case of ‘mutual use of incisials capita and incisials proper’. Jīng, qīng, cóng, xīn and xié [in  $\sigma_1$ ], combined with Grade-I, are combined with the first grade [in  $\sigma_0$ ] of zhào, chuān, chuáng, shěn and shàn when the rhyme [in  $\sigma_2$ ] is Grade-II following any character kernel; this is also a case of ‘mutual use of incisials capita and incisials proper’. Thus it [= the mnemonic] goes that “mutual use” is the case where Grade-IV (or the second grade) deviates and where incisials proper should be attested in the four grades.’

- $\{\bar{R}_1 \in \text{incisials capita} \wedge R_1 \in G_4\} \wedge \{R_2 \in G_2\} \Rightarrow \{\bar{R}_0 \in \text{incisials proper} \wedge R_0 \in G_2\}$   
&  
 $\{\bar{R}_1 \in \text{incisials proper} \wedge R_1 \in G_2\} \wedge \{R_2 \in G_1\} \Rightarrow \{\bar{R}_0 \in \text{incisials capita} \wedge R_0 \in G_1\}$   
&  
 $\{\bar{R}_1 \in \text{incisials capita} \wedge R_1 \in G_1\} \wedge \{R_2 \in G_2\} \Rightarrow \{\bar{R}_0 \in \text{incisials proper} \wedge R_0 \in G_2\}$

#### 8. Jìyùn píngqiè 寄韻憑切

- 寄韻憑切者，謂照、穿、床、審、禪第二等爲切（謂照等爲第二，即四等中第三也），韻逢諸母一、四，並切照二。故曰：“照二若逢一四中，只從寄韻三中論。”
- ‘Reliant cutting of dependent rhymes’ refers to the situation where zhào, chuān, chuáng, shěn and shàn [in  $\sigma_1$ ], combined with their second grade (that is, Grade-III within the four grades), are still combined with their second grade [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-I or Grade-IV. Thus it [= the mnemonic] goes that ‘if incisials proper of the Grade-II encounters Grade-I or Grade-IV, it is just “depending rhyme” towards Grade-III that is to be told.’
- $\{\bar{R}_1 \in \text{incisials proper} \wedge R_1 \in G_3\} \wedge \{R_2 \in G_{1,4}\} \Rightarrow \{R_0 \in G_3\}$

#### 9. Yùxià píngqiè 喻下憑切

- 喻下憑切者，謂：單喻母下第三爲切，韻逢諸母第四，並切第三，是“喻下憑切覆”；喻母第四爲切，韻逢諸母第三，並切第四，是“喻下憑切仰”。故曰：“喻母復從三四談，若逢仰覆但憑切。”
- ‘Reliant cutting below yù’ refers to the situation where the single yù [in  $\sigma_1$ ], combined with Grade-III, is still combined with Grade-III [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-IV following any character kernel; this is the lowered version of ‘reliant cutting below yù’. Yù [in  $\sigma_1$ ], combined with Grade-IV, is still combined with Grade-IV [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-III following any character kernel; this is the raised version of ‘reliant cutting below yù’. Thus it [= the mnemonic] goes that ‘the character kernel yù goes with its Grade-III or Grade-IV as well — with such raising and lowering, this is just “reliant cutting”.’
- $\{\bar{R}_1 \in \text{yù} \wedge R_1 \in G_3\} \wedge \{R_2 \in G_4\} \Rightarrow \{R_0 \in G_3\}$   
&  
 $\{\bar{R}_1 \in \text{yù} \wedge R_1 \in G_4\} \wedge \{R_2 \in G_3\} \Rightarrow \{R_0 \in G_4\}$

#### 10. Rìjì píngqiè 日寄憑切

- 日寄憑切者，謂：日字母下第三爲切，韻逢一、二、四，並切第三。故曰：“日止憑三寄韻歌。”
- ‘Reliant cutting of dependent rì’ refers to the situation where the character kernel rì [in  $\sigma_1$ ], combined with Grade-III, is combined with Grade-III [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-I, Grade-II or Grade-IV. Thus it [= the mnemonic] goes that ‘that rì stops by Grade-III is sung as “dependent rhyme”.’
- $\{\bar{R}_1 \in \text{rì} \wedge R_1 \in G_3\} \wedge \{R_2 \in G_{1,2,4}\} \Rightarrow \{R_0 \in G_3\}$

#### 11. Tōngguǎng 通廣

- 通廣者，謂見、溪、群、疑、幫、滂、並、明、非、敷、奉、微、曉、匣、影此一十五母爲切，知、徹、澄、孃、照、穿、床、審、禪、來、日第三等，並切第四。故曰：“來日舌三并照二，通廣必取四爲真。”
- ‘Expansion’ refers to the situation where jiàn, qī, qún, yí, bāng, pāng, bìng, míng, fēi, fū, fèng, wéi, xiǎo, xiá and yǐng [in  $\sigma_1$ ], being fifteen in total, are combined with Grade-IV [in  $\sigma_1$  and in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-III following character kernels zhī, chè, chéng, niáng, zhào, chuān, chuáng, shěn, shàn, lái and rì. Thus it [= the mnemonic] goes that “‘expansion’ must be true when lái, rì and linguals of Grade-III, along with incisials proper of Grade-II, give a result of Grade-IV.’
- $\{\bar{R}_1 \in \text{labials, molars or gutturals without yù}\} \wedge \{\bar{R}_2 \in \text{linguals upper, incisials proper or linguo-incisials} \wedge R_2 \in G_3\} \Rightarrow \{R_0 \in G_4\}$

#### 12. Júxiá 侷狹

- 侷狹者，亦謂見、溪、群、疑、幫、滂、並、明、非、敷、奉、微、曉、匣、影此一十五母爲切，韻逢精、清、從、心、邪、喻母第四，並切第三。故曰：“精雙喻四爲其法，侷狹須歸三上親。”
- ‘Narrowing’ refers to the situation where jiàn, qī, qún, yí, bāng, pāng, bìng, míng, fēi, fū, fèng, wéi, xiǎo, xiá and yǐng [in  $\sigma_1$ ], being fifteen in total, are combined with Grade-III [in  $\sigma_1$  and in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-IV following character kernels jīng, qīng, cóng, xīn, xié or yù. Thus it [= the mnemonic] goes that ‘incisials capita and yù of Grade-IV being its law, “narrowing” should be ascribed to be dear with Grade-III.’
- $\{\bar{R}_1 \in \text{labials, molars or gutturals without yù} \wedge R_1 \in G_3\} \wedge \{\bar{R}_2 \in \text{incisials capita or yù} \wedge R_2 \in G_4\} \Rightarrow \{R_0 \in G_3\}$

#### 13. Nèiwài 內外

- 內外者，謂：見、溪、群、疑、端、透、定、泥、知、徹、澄、孃、幫、滂、並、明、非、敷、奉、微、曉、匣、影、喻、來、日此二十六母爲切，韻逢照、穿、床、審、禪第一等（即四等中第二也），內轉切三，外轉切二。故曰：“照類兩中一作韻，內三外二自明分。”
- ‘Inner-outer’ refers to the situation where jiàn, qī, qún, yí, duān, tòu, dìng, ní, zhī, chè, chéng, niáng, bāng, pāng, bìng, míng, fēi, fū, fèng, wéi, xiǎo, xiá, yǐng, yù, lái and rì [in  $\sigma_1$ ], being twenty-six in total, are combined with Grade-III in inner turns [in  $\sigma_0$ ] and with Grade-II in outer turns [in  $\sigma_0$ ] when the rhyme

[in  $\sigma_2$ ] is the first grade (that is, Grade-II within the four grades) of zhào, chuān, chuáng, shěn, shàn. Thus it [= the mnemonic] goes that ‘once the rhyme is made from the second grade of incisors proper, it is self-evident that those of “inner” turns take Grade-III and those of “outer” turns take Grade-II.”

- $\{\bar{R}_1 \in \text{molars, linguals, labials, gutturals or linguo-incisors}\} \wedge \{\bar{R}_2 \in \text{incisors proper} \wedge R_2 \in G_2\} \Rightarrow \{R_0 \in G_3\}$  in ‘inner turns’  
&  
 $\{\bar{R}_1 \in \text{molars, linguals, labials, gutturals or linguo-incisors}\} \wedge \{\bar{R}_2 \in \text{incisors proper} \wedge R_2 \in G_2\} \Rightarrow \{R_0 \in G_2\}$  in ‘outer turns’

#### 14. Má yùn bú dìng 麻韻不定

- 麻韻不定之切者，亦謂知、徹、澄、孃第二等爲切（謂知等爲第二，即四等中爲第三也），韻逢精、清、從、心、邪、曉、匣、影、喻第四，當切出第三知等字，今稽開合俱無，却切第二端等字（謂端等爲第二，即等中第四也）。故曰：“韻逢影喻精雙四，知二無時端二陳。”
- ‘Undetermined cutting of the rhyme má’ also refers to the situation where zhī, chè, chéng or niáng [in  $\sigma_1$ ], combined with the second grade (that is, Grade-III within the four grades), should give zhī, chè, chéng or niáng and Grade-III [in  $\sigma_0$ ] when the rhyme is Grade-IV [in  $\sigma_2$ ] following jīng, qīng, cóng, xīn, xié, xiǎo, xiá, yǐng or yù; nevertheless, not being open nor closed, in reality it gives duān, tòu, dìng or ní and the second grade (that is, Grade-IV within the four grades). Thus it [= the mnemonic] goes that ‘when the rhyme is Grade-IV following gutturals or incisors capita, giving another Grade-IV, if there is no the second grade of zhī, chè, chéng or niáng, then there will be the second grade of duān, tòu, dìng or ní.’
- When  $R_0$  belongs to má:  
 $\{\bar{R}_1 \in \text{linguals upper} \wedge R_1 \in G_3\} \wedge \{\bar{R}_2 \in \text{incisors capita or gutturals} \wedge R_2 \in G_4\} \Rightarrow \{\bar{R}_0 \in \text{linguals capita} \wedge R_0 \in G_4\}$

#### 15. Qián sān hòu yī 前三後一

- 前三後一者，謂非、敷、奉、微第三等爲切，韻逢諸母第一，並切第三輕唇音字，是前三門；幫、滂、並、明第一等爲切，韻逢諸母第三，却切第一等重唇音字，是後一門。唯許通、流二攝所矧。先人澄鑑論云：“隨鄉談無以憑焉，逐韻體而堪爲定矣。”故曰：“重遇前三隨重體，輕逢後一就輕聲。”
- ‘The first three and the last one’ refers to the situation where fēi, fū, fèng and wéi of Grade-III [in  $\sigma_1$ ] give light labials generally combining with Grade-III [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-I following any character kernel; this is the ‘first three’ part of the gate. And the situation where the bāng, pāng, bìng and míng of Grade-I [in  $\sigma_1$ ] give heavy labials generally combining with Grade-I [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-III following any character kernel; this is the ‘last one’ part of the gate. The gate is allowed only in the regimens of tōng and liú. A previous scholar, Chéngkān, said that ‘the rural speech does not suffice to distinguish it; it can be settled merely from the style of the rhymes.’ Thus it [= the mnemonic] goes that ‘the heavy encounters “the first three” and follows the heavy style, whereas the light meets “the last one” and takes the light sounds.’

- When  $R_0$  belongs to the regimens of *tōng* or *liú*:

$$\{\bar{R}_1 \in \text{light labials} \wedge R_1 \in G_3\} \wedge \{R_2 \in G_1\} \Rightarrow \{\bar{R}_0 \in \text{light labials} \wedge R_1 \in G_3\}$$

&

$$\{\bar{R}_1 \in \text{heavy labials} \wedge R_1 \in G_1\} \wedge \{R_2 \in G_3\} \Rightarrow \{\bar{R}_0 \in \text{heavy labials} \wedge R_1 \in G_1\}$$

#### 16. Jìzhèng yīnhé 寄正音和

- 三二精照寄正音和者，謂照、穿、床、審、禪第二等爲切（謂照等中爲第二，即四等中第三也），韻逢諸母第二，並切照一等字（謂照等中爲第一，即四等中第二也）。故曰：“切三韻二不離初，精照昭然真可信。”（或曰：斯精照者僞也。荅云：精謂精而不雜，照謂照而不參，故所謂精照也，曷言僞焉？）
- ‘Reliant phonic harmony of incisials capita and incisials proper in Grade-III and Grade-II’ refers to the situation where zhào, chuān, chuáng, shěn and shàn [in  $\sigma_1$ ], combined with the second grade (that is, Grade-III within the four grades), gives incisials proper and the first grade (that is, Grade-II within the four grade) [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-II. Thus it [= the mnemonic] goes that ‘being properly combined with “Grade-III” and rhyming with “Grade-II”, the manifested “incisials capita and incisials proper” are truly believable.’ (Someone said that it is wrong to regard it as a case of [the mutual use of] incisials capita and incisials proper, yet here is my reply: as the incisials capita are only themselves with purity, and so are the incisials proper, it is all right to attribute the whole matter as relevant to that gate; how could it be untrue, then?)
- $\{\bar{R}_1 \in \text{incisials proper} \wedge R_1 \in G_3\} \wedge \{R_2 \in G_2\} \Rightarrow \{\bar{R}_0 \in \text{incisials proper} \wedge R_1 \in G_2\}$

#### 17. Jiùxíng 就形

- 就形門者，謂見、溪、群、疑、傍、滂、並、明、非、敷、奉、微、曉、匣、影、喻此一十六母，第三等爲切，韻逢諸母第一，宜切出第一等字，今詳前後俱無，却切第三。故曰：“開合果然無有字，就形必取第三函。”
- The gate of ‘the shape follower’ refers to the situation where jiàn, qī, qún, yí, bāng, pāng, bìng, míng, fēi, fū, fèng, wéi, xiǎo, xiá, yǐng and yù [in  $\sigma_1$ ], being sixteen in total and combined with Grade-III, should be combined with Grade-I [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-I following any character kernel; nevertheless Grade-III [in  $\sigma_0$ ] is found instead, where [the gate of] the first [three] and the last [one] is not involved. Thus it [= the mnemonic] goes that ‘it is indeed true that there is no character within the gate of “openness-closedness”, and “the shape follower” must include the third one.’
- $\{\bar{R}_1 \in \text{molars, labials or gutturals} \wedge R_1 \in G_3\} \wedge \{R_2 \in G_1\} \Rightarrow \{R_0 \in G_3\}$

#### 18. Chuànglì yīnhé 創立音和

- 創立音和者，謂見、溪、群、疑、幫、滂、並、明、曉、匣、影此一十一母爲切，韻逢侷狹攝內諸母第三，當切出第三等字，今詳推開合俱無，却切第四。故曰：“詳推本眼無斯字，創立須歸四上謀。”
- ‘The created phonic harmony’ refers to the situation where jiàn, qī, qún, yí, bāng, pāng, bìng, míng, xiǎo, xiá and yǐng [in  $\sigma_1$ ], being eleven in total, should be combined with Grade-III [in  $\sigma_0$ ] when the rhyme [in

$\sigma_2$ ] is Grade-III following any character kernel within the regimens involved in the gate of ‘narrowing’; nevertheless Grade-IV [in  $\sigma_0$ ] is found instead, where a thorough study shows that [the gate of] openness-closedness is not involved. Thus it [= the mnemonic] goes that ‘a thorough inference gives the conclusion that no such characters are attested here, and within “the created” gate Grade-IV must be aimed.’

- Within the same regimens as ‘narrowing’ involves:

$$\{\bar{R}_1 \in \text{molars, heavy labials or gutturals without yù}\} \wedge \{R_2 \in G_3\} \Rightarrow \{R_0 \in G_4\}$$

#### 19. Kāihé 開合

- 開合者，謂見、溪、群、疑乃至來、日共三十六母爲切，韻逢各母本排只是“音和”，本眼如無却切開合。故曰：“唯有‘開合’一門絕無憑據，直須於開合兩處韻中較訂始見分明。”
- ‘Openness-closedness’ refers to the situation where all the thirty-six character kernels [in  $\sigma_1$ ], ranging from jiàn, qī, qún and yí to lái and rì, present ‘phonic harmony’ [in  $\sigma_0$ ] when being combined with every rhyme, but this is attested only when the rhyme [in  $\sigma_2$ ] has switched its value of openness [in  $\sigma_0$ ]. Thus it [= the mnemonic] goes that ‘only the gateway of “openness-closedness” has no reliance at all and it becomes understandable only when one refers to the same rhyme in both “open” and “closed” tables.’
- Sometimes:  
 $\{R_2 \in C\} \Rightarrow \{R_0 \in O\}$   
 &  
 $\{R_0 \in O\} \Rightarrow \{R_2 \in C\}$

#### 20. Tōngguǎng júxiá 通廣侷狹

- 通廣侷狹者，謂：來母下第三等爲切，韻逢精、清、從、心、邪、喻母第四，並切第三。故曰：“廣通侷狹憑三等，四位相通理不訛。”
- ‘Expanded narrowing’ refers to the situation where the character kernel lái [in  $\sigma_1$ ], combined with Grade-III, is still combined with Grade-III [in  $\sigma_0$ ] when the rhyme [in  $\sigma_2$ ] is Grade-IV following character kernels jīng, qīng, cóng, xīn, xié or yù. Thus it [= the mnemonic] goes that “‘expanded narrowing’ towards Grade-III is formed through its reasonable transport with Grade-IV.’
- $\{\bar{R}_1 \in lái \wedge R_1 \in G_3\} \wedge \{\bar{R}_1 \in \text{insicials capita or yù} \wedge R_1 \in G_4\} \Rightarrow \{R_0 \in G_3\}$