Phonological Alternations in Tangut

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The Tangut dictionaries *Wen-hai* (the Ocean of Characters), *Wen-hai Tsa-lei* (the Ocean of Characters, Mixed Classes), and *T'ung-yin* (the Homophones) are important sources of information on the Tangut language. The purpose of this paper is (1) to list the etymologically related words from these dictionaries and (2) to describe the types of sound alternations, using Sofronov's reconstruction. These alternations are discussed under four headings: initials, medials, finals, and tones. Altogether 289 examples are given in this paper.

I. Introduction

The Tangut dictionaries *Wen-hai* 文海 (the Ocean of Characters, abbreviated WH), *Wen-hai Tsa-lei* 文海雜類 (the Ocean of Characters, Mixed Classes, abbreviated WHTL), and *T'ung-yin* 同音 (the Homophones, abbreviated TY) are important sources of information on the Tangut language. They constitute the main parts of the so-called "internal sources" (Sofronov and Kyčanov 1963: 12–31) in contrast to the transcription materials, which are called "external sources" (*Ibid.*, 4–12), in the reconstruction of the Tangut phonology and serve as the basis of the phonological framework in the reconstructions of Nishida (1964, 1981) and Sofronov (1968).

In the decipherment of the Tangut characters these dictionaries also play a very important role, for they provide us with the information on the meanings of Tangut words. It goes without saying that bilingual texts such as the *Chang-chung-chu* 掌中珠 (the Pearl in the Palm, abbreviated CCC) and Tangut translations of Chinese classics and Buddhist texts are the sources of the most direct and clearest information on the meanings of Tangut characters. However, it must be noted that not all the Tangut words appear in these texts. As matters now stand, more than half of the words in the Tangut dictionaries cannot be found in the texts which have been studied up to the present. Thus in order to determine the meanings of these

words, we must rely exclusively on the glosses of the dictionaries.

From the viewpoint of searching for the linguistic intuition of the Tangut people, these dictionaries are also invaluable, for they tell us which words are regarded as synonyms by the native speakers. The words which appear to be synonymous in foreign translations can happen to be totally different in the eyes of native speakers. A study on cognates in a language cannot be successfully conducted in disregard of the linguistic intuition of the native speakers. For these reasons I have based the present study mainly on the glosses of these dictionaries. I have also consulted a Russian translation (Kepping et al. 1969) of the glosses of the WH and the WHTL. As this translation numbers the entries rather than printing the Tangut characters, I have had to compare it with the original in order to discover what Tangut character is being discussed in each entry. Then I have used Sofronov's (1968) reconstruction[1] to see whether the synonymous words are also phonetically related. Most of the TY glosses are contained in the Small Tangut Dictionary of Nishida (1966: II, 303-507). Since he has given the reconstruction of his own in his dictionary, we can see at a glance, whether the words are phonetically similar or not. The TY glosses are composed of various sorts of explanations, such as synonyms, antonyms, and compounds In order to know which is the case, they must be checked against the WH glosses or bilingual texts (Nishida 1980: 60-120).

The Tangut language has a very complex vowel system, as can be inferred from the numerousness of the finals. According to the WH, there are 97 rimes in the level tone and 86 rimes in the rising tone. That is to say, the level tone rimes and rising tone rimes are numbered separately. However, as not all rimes have both tones, the numbering system of the two tones does not match up. In all, there are 105 different rimes (Sofronov 1968: I, 136-138) (hereafter referred to as the overall rime number). In

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1 Except for some initials, for which I have proposed minor revisions (see Gong 1981a: 1-16; 1981b: 17-38).

other words, the phonological system of the WH distinguishes at least 105 different finals (if we assume that one rime represents one final. But as a matter of fact, one rime is sometimes composed of more than one final, e. g. -a and -wa constitute a rime). Sofronov, who aims at the reconstruction of the language of a later stage than the WH (Sofronov 1968: I, 136, Note 2), does not differentiate all the 105 rimes. As a result, different rimes are sometimes reconstructed as the same[2]. Since the present study attempts to describe the systematic correspondences among different rimes, I have indicated the overall rime number (R) that each Tangut character belongs to. Then I have given the number in the Tangut system: the first numeral indicates the tone—1 for level and 2 for rising, and the second numeral indicates the rime according to its sequence in that tone. Both are taken from Sofronov (1968).

II. Alternation of Initials

The Alternation of Initials is a very common phenomenon in the Sino-Tibetan languages. According to Karlgren (1933: 100-107) the initial consonants with the same or nearly the same places of articulation interchange freely in the formation of words from one and the same stem in Archaic Chinese. In Tangut, a similar phenomenon can be observed. Following are the examples I have collected, which I have divided into two types. For each Tangut character, I have given the index number of Sofronov's List (abbreviated S.) in order to make identification easier. In citing the WH and the WHTL, I have given the sequence number (preceded by W.). In citing the TY, I have indicated the page and line, following Nishida's practice in his Dictionary. The examples below are arranged according to the order of the overall rime number.

A. Alternation between voiced consonants and voiceless aspirated

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2 For examples: R. 1, R. 4, and R. 5 are all reconstructed -u; R. 10, R. 40, and R. 43 all as ie; R. 38 and R. 41 both as -ai.

consonants

1. 荦 bi̯u² (S. 2165 R. 3 2. 3) bull, ox

    羘 phi̯u¹ (S. 2159 R. 3 1. 3) bull, ox

    The WH gloss (W. 101) explains 羘 phi̯u¹ as 荦 bi̯u², which is used in translating Chinese word 牛 'ox', as in 野牛 'wild ox' (Nevsky 1960: II, 213) and 白牛 'white ox' (Nevsky 1960: I, 523). Since there does not seem to be any difference in meaning between these two words, we are probably dealing here with a doublet. 羘 phi̯u¹ may be a dialect word of 荦 bi̯u².

2. 縦 bê² (S. 3828 R. 9 2. 8) to release, to open

    数 phê² (S. 2804 R. 9 2. 8) to release, to open, to untie

    In the TY (6A2), 縦 bê² is glossed 敠 lheɯ² (縦敠 bê²-lheɯ², to free, to release), which in its turn is glossed 数 phê² (数敠 phê²-lheɯ², to free, to release) (48A2), thus connecting 縦 bê² with 数 phê². According to the WH (W. 3039), the character 敠 lheɯ² is composed of 数 phê² and is synonymous with 縦 bê². Here again the two characters 縦 bê² and 数 phê² are brought into connection. Judging from the examples cited in Nevsky (1960: II, 68, 371), the distinction between the two seems to consist in the intransitiveness (the former) and transitiveness (the latter) of the verbs.

3. 骸 dźi̯we¹ (S. 3012 R. 10 1. 10³) be clean, be pure, melt, (v. i.)

    骴 tśhi̯we¹ (S. 3011 R. 10 1. 10) make clean, to purify, melt,

    (v. t.)

    The WH gloss explains the first word 骸 dźi̯we¹ as 'be clean'

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3 Sofronov (1968: II, 344) erroneously places the word 骸 dźi̯we¹ in the rime 1. 67. Nishida (1982: III–112) has corrected it to rime 1. 10. Sofronov reconstructs both 骸 and 骴 as *k'ai-k'ou* words (i. e syllables without medial -w-). However, evidence from Chinese transcriptions of Tangut characters show the presence of medial -w- in both words.

(𗧀𗒹 gi¹ we², see W. 2702) and the second word 𗧀𗬱 tśhi̯we¹ as 'make clean' (𗧀𗒹𗬱 gi¹ we² phi¹, see W. 341). This is a clear indication that the second word is the causative form of the first. Nishida (1982: 112) translates the former as 'melt, v. i.' (tokeru) and the latter as 'melt, v. t.' (tokasu). His translation correctly reflects the original distinction in Tangut.

4. 𗁈 di² (S. 4155 R. 11 2. 10) to drink
   𗋽 thi¹ (S. 0510 R. 11 1. 11) to drink

   In the WH (W. 370), 𗋽 thi¹ is equated with 𗁈 di². The former is clearly a transitive verb, as can be seen from the expression 𗋽𗋽•o² thi¹ "to drink wine" (CCC 323). For the latter no texts are available.

5. 𗇁 gi¹ (S. 2557 R. 11 1. 11) fall, lose by oneself
   𗇲 khi¹ (S. 1994 R. 11 1. 11) let fall, cause to lose

   The WH gloss explains the first word as 'lose by oneself' (𗇁 𗴿•ɪn¹ li̯wu¹, see W. 384) and the second as 'cause to lose' (𗴿𗬱 li̯wu¹ phi¹, see W. 379), thus clearly indicates the second word to be the causative form of the first.

6. 𗋐 gi¹ (S. 2551 R. 11 1. 11) knife, sword, weapon
   𗋑 khi¹ (S. 2668 R. 11 1. 11) knife, sword, weapon

   The WH gloss (W. 378) explains 𗋑 khi¹ as 𗋐 gi¹. The compound 𗋒 𗋑 thɪn¹ khi¹ is used to translate Tibetan spu-gri 'razor, knife' (Nevsky 1960: II, 383). It seems that Tangut 𗋐 gi¹ 'knife' is etymologically cognate with Tibetan gri 'knife' and that 𗋑 khi¹ 'knife' is a dialect variant of 𗋐 gi¹. (For a derived word, see infra No. 197).

7. 𗲆 bâ¹ (S. 0811 R. 18 1. 18) split, explode
   𗲇 phâ¹ (S. 3822 R. 18 1. 18) split, divide in two

In the TY (9A4), 緂 phâ[1] is glossed 薪 bâ[1], thus the two words are treated as synonymous. However, no texts are available for the study of their usage.

8. 撥 ba[2]　(S. 0664 R. 20　2. 17) end, cut off[4]

   緩 pha[1]　(S. 3465 R. 20　1. 20) cut off

In the TY each word of the above pair appears as the explanatory word for the other. From the following examples it can be clearly seen that the opposition is between intransitive and transitive or between noncausative and causative.

命撥 kha[1] ba[2] (literally: life ends) die, used in translating Chinese 命終 (Nevsky 1960: I, 381) and 死 (Sun-tzŭ 17B-4b-5).

命緩將 kha[1] pha[1] vie[1] (literally: life cut do) take another's life, kill, used in translating Chinese 斷汝命 (Nevsky 1960: II, 390). The expression appears in W. 748 as a synonym of 薩 sa[1] 'kill'. It must be noted that this pair alternates also in tone.

9. 絎 ba[1]　(S. 3191 R. 24　1. 23) discontinue, cease

   詽 pha[1]　(S. 4651 R. 24　1. 23) take off, remove, stop (v. t.)

According to Sofronov (1968: I, 137), R. 24 (1. 23-2. 21) is reconstructed -i̯aɯ and thus is distinguished from the final of the first pair (R. 20　1. 20-2. 17), which is reconstructed -a. However, in Sofronov's Index (1968: II, 276-403), almost all characters belonging to this rime are reconstructed -a, so that this pair appears to be homophonous with the first pair. It must be noted that they are phonetically different in the WH system. The translation materials quoted in Nevsky (1960: I, 416; I, 562) show that 絎 ba[1] is used intransitively, whereas 詽 pha[1] is used transitively.

10. 緩 bə[1]　(S. 3679 R. 28　1. 27) to throw away, do not value

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4 撥 ba[2] is sometimes also used transitively (see Nevsky 1960: I, 381).

憷 phə² (S. 1480 R. 28 2. 25) to lavish, to waste, do not value

WH gloss (W. 892) equates 燚 bə¹ with 憷 phə². The former appears as the first element in the compound 燚 鎏 bə¹-dźi̯o¹ "to throw away", written also as 燚 鎏 bə¹-dźi̯o¹ in Buddhist classics (Nevsky 1960: II, 115) and Sun-tzu (Kepping 1979: 434, No. 827). The latter can be analysed as composed of 憷 mi¹ "not" and 骇 wê¹ "to value, to love".

11. 復 li̯ə¹   (S. 4552 R. 30 1. 29) fall, lose

復 lhi̯ə¹ ⁵ (S. 3136 R. 100 1. 92) let fall, cause to lose

The TY glosses (54A7, 55A1) and the WH gloss (W. 2836) regard the pair as synonyms. The WH glosses (W. 1007 and W. 2836) also explain 復 li̯ə¹ as 嘉 敊 ·ɪn¹ li̯wu¹ 'lose by oneself' and 復 lhi̯ə¹ as 復 敊 祇 li̯ə¹ li̯wu¹ phi¹ 'cause to lose', thus regarding them as a noncausative/causative pair. This pair is synonymous with the pair No. 5. In the WH glosses the two pairs are used to explain each other. Note that this pair also alternates in laryngealization of the vowel.

12. 煲 gwɪ¹   (S. 2364 R. 31 1. 30) to separate, to split,

                                 to part (v. i.)

耗 khwɪ¹ (S. 4795 R. 31 1. 30) to separate, to split (v. t.)

The WH gloss (W. 1098) explains 煲 gwɪ¹, 耗 khwɪ¹, and 煷 kwɪ¹ as synonyms (For alternation between aspirated and unaspirated voiceless consonants, see infra No. 29-45). 耗 khwɪ¹ is

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5 Sofronov (1968: II, 347) has not given a reconstruction for this word. It is reconstructed lhi̯ə¹ here on the basis of *fan-ch'ieh* spelling in WHTL 群 lhi̯u¹ 庸 tsi̯ə¹. The word 復 lhi̯ə¹ belongs to R. 100 (1.92-2.85). For this rime, Sofronov (1968: I, 138) assigns the sound value –i̯e. However, in the index of reconstructed words (1968: II, 279-403), he reconstructed –i̯e for some words and i̯ə for some other words. It seems that –i̯ə would be preferable to –i̯e, since R. 100 is the glottalized counterpart of R. 30, for which –i̯ə has been reconstructed.

used as a transitive verb in the sense of 'to cut, to separate' (Nevsky 1960: I, 585). 𣸣 gwɪ[1] appears in the compound 𩇢𣸣 gɪe̤[1] gwɪ[1] 'shooting star', which means perhaps literally 'star parting'. If that is the case, it is used intransitively and the contrast is intransitive/transitive.

13. 𣏾 bei[1]   (S. 1661 R. 34 1. 33) to bind, to tie up

   𢏕· phei[1]   (S. 1470 R. 34 1. 33) to bind, to tie up

The correlation of this pair is confirmed by the glossary of the TY (7B4, where 𢏕· is erroneously written as 𢏕) and the WH (W. 1213 and W. 1204). The function of the alternation cannot be determined. The first word also alternates with the rising tone. (cf. infra No. 246)

14. 𭂆 dʑi̤ei[1]   (S. 2942 R. 36 1. 35) to walk, to go on foot

   𧨡 tśhi̤ei[1]   (S. 1783 R. 36 1. 35) to walk, to go on foot

The WH gloss (W. 2718) explains 𭂆 dʑi̤ei[1] as 𩁿𧨡 bi[2] tśhi̤ei[1], to go on foot. 𧨡 tśhi̤ei[1] may be a transitive verb taking a cognate object.

15. 𥹆 lei[2]   (S. 1674 R. 34 2. 30) to change, to transform,
                                to become

   𥻁 lhei[2]   (S. 5477 R. 34 2. 30) to make change, to translate

The WH gloss (W. 3060) explains 𥻁 lhei[2] "to change, to transform" as 𥹆𥼒 lei[2] -phi[1] "make change, cause to change", thus regarding the above two words as a noncausative/causative pair.

16. 𧢾 gɪn[1]   (S. 5266 R. 37 1. 36) (become dry)

   𢌞 khɪn[1]   (S. 3491 R. 37 1. 36) make dry, to dry

The WH (W. 380 𣕊 khi[1]) regards these two words as synonyms. The second word 𢌞 khɪn[1] appears in Tangut translation of the Mencius (KK 1966, p. 106, L. 5), where it is used in translating

the Chinese word 暴 'to dry in the sun'. For the first word 祝 gin^1, no text is available. The meaning 'become dry' is here tentatively given in order to explain the synonymity of the pair and the voiced and voiceless alternation. (For the alternation between 緂 $khin^1$ and 丽 khi^1, see infra No. 193).

17. 荔 gie^1 (S. 5554 R. 40 1. 39) play, jump, be delighted

    糉 $khie^1$ (S. 2441 R. 40 1. 39) play, jump

Both words are glossed with 祝 $\cdot u^2$ 'to play' in the TY. The first word is explained in the WH (W. 1357) as 絆弭 $nie^1 \, li^2$ 'be delighted at heart', whereas the second word is used transitively in the expression 訛絆糉 $\cdot o^1 \, nie^1 \, khie^1$ "amuse the heart" in the Tangut translation of Chinese Lei Lin.

18. 菽 bai^1 (S. 1944 R. 41 1. 40) wide, broad

    纐 $phai^1$ (S. 4014 R. 41 1. 40) wide, broad

Both the TY (9A4) and the WH (W. 1369 and W. 1372) regard them as synonymous. However, no texts are available for the study of their usage.

19. 杨 $d\acute{z}io^1$ (S. 1591 R. 50 1. 48) to pierce, to bore a hole

    纺 $d\acute{z}io^2$ (S. 3991 R. 50 2. ?) a hole (This is a rising tone word corresponding to 1. 48. cf. infra No. 217)

刻杨 $t\hat{s}hio^1$ (S. 2703 R. 50 1. 48) to pierce, to bore a hole

The TY (37B1) glosses 杨 $d\acute{z}io^1$ with 刻杨 $t\hat{s}hio^1$, which is used in translating the Chinese word 鑽 as in 鑽穴隙 'bore a hole' in Mencius (KK 1966, p. 116, L. 6). For 杨 $d\acute{z}io^1$ no text is available. However, there is a homophonous word 纺 $d\acute{z}io^2$ (with a different tone) which means 'hole'. It is highly probable that the pair 杨 $d\acute{z}io^1$ and 刻杨 $t\hat{s}hio^1$ is an intransitive/transitive contrast (For another cognate 杨 $t\hat{s}io^1$, see infra No. 40).

20. 䫌 bịo² (S. 2889 R. 53 2.44) to be clear, to be distinct

   �ㅂ phịo² (S. 0487 R. 53 2.44) to distinguish

   In the Tangut translation of the Chinese Lei Lin as well as Sun Tzu, 㖓 phịo² forms a compound with 乾 kạ², and is used as a transitive verb.

21. 㧊 dzịo¹ (S. 1680 R. 53 1.51) to grip the throat, to strangle

   㧊 tshịo¹ (S. 1679 R. 53 1.51) to grip the throat, to strangle

   The WH glosses (W. 2673 and W. 1616) regard the pair as synonyms. No texts are available for the study of their usage.

22. 乾 dźịon¹ (S. 2613 R. 58 1.56) to separate, to disperse

   㢟 tśhịon¹ (S. 3677 R. 58 1.56) to separate, to disperse

   Both words are glossed with 乾 ka² 'to separate' in the TY. The WH glosses (W. 2700 and W. 1723) and texts cited in Nevsky (II, 104 and II, 636) show that they form compounds like 乾乾 dźịon¹ ka² and 㢟乾 tśhịon¹ ka². Both mean 'to separate'. It is not known whether there is any difference between the pair when each word is used alone.

23. 能 lịei¹ (S. 2481 R. 70 1.67) to enter, to fall (for another type of alternation, cf. infra No. 74)

   能 lhịei¹ (S. 0803 R. 70 1.67) to enter, to fall

24. 㸇 dwə̣² (S. 0580 R. 90 2.76) to burn, to blaze

   㼝 thwə̣¹ (S. 0554 R. 90 1.84) to burn, to cause to blaze

   The WH gloss (W. 2431) equates 㼝 thwə̣¹ with 㸇 dwə̣² and at the same time also explains 㼝 thwə̣¹ as 㜺祇 dźịa¹ phi¹ 'cause to blaze'. From this explanation it is easily seen that 㼝 thwə̣¹ is the causative form of 㸇 dwə̣². Note that this pair also alternates in tone (cf. infra No. 211).

25. 刑刂 dzi̯ə̭¹ (S.0328 R.92 1.86) to cut

刑忄 tshi̯ə̭¹ (S.0330 R.92 1.86) to cut

Both words are glossed 絣 tshon¹ 'to cut' in the TY (33A3, 34B1).
It is not known whether there is any difference in usage.

From the above discussion it is clear that the alternation between voiced consonants and voiceless aspirated consonants falls into two groups: one with the grammatical function of transitive/intransitive or causative/noncausative opposition and the other without this function. There are cases where it is difficult to judge, but discovery of their usage in a text will no doubt help to clarify them. The first group reflects a common Tibeto-Burman morphological process, as can been seen from the following comparison with written Tibetan (WT) and written Burmese (WB).

		intransitive		transitive
WB	ကျ	kya'	'fall'	ချ khya' 'throw down'
WT	འགྱེལ	'gyel	'fall'	སྒྱེལ sgyel 'throw down'
Tangut	荊	gi¹	'fall'	彼 khi¹ 'let fall'
WB	ကွ	kwa	'become separate, go apart'	ခွ khwa 'separate, part'
	ကွဲ	kwây	'be divided, split	ခွဲ khwây 'divide, split'
WT	འགྱེ	'gye	'be divided'	
Tangut	後	gwɪ¹	'separate, split'	稚 khwɪ¹ 'separate, split'
WB	လန်း	lâñ	'fall from an erect posture	လှန်း lhâñ 'throw down from an erect posture'
	လဲ	lây	'fall down from an erect posture'	လှဲ hlây 'throw down from an erect posture'
Tangut	復	li̯ə¹	'fall, lose'	後 lhi̯ə¹ 'let fall, cause to fall'

The second group reflects the sound change that caused voiced obstruents

to become voiceless and aspirated. This change occurred in the Chinese dialect of the 12th century in the area adjacent to or within the Hsi-hsia empire (Gong 1981: 47-57) and might have affected some areas where Tangut was spoken. Following are Chinese loanwords into Tangut showing this sound change.

26. 敍 dza[1] (S.1250 R.17 1.17) mixed, from Anc. Ch. 雜 dzập。[6]

   祥 tsha[1] (S.1248 R.17 1.17) mixed

27. 虎 gi̯on[1] (S.1060 R.58 1.56) strong, from Anc. Ch. 強。gi̯ang

   穖 khi̯on[1] (S.0374 R.58 1.56) strong

28. 頌 zi̯wan[2] (S.3045 R.27 2.24) revolve, from Anc. Ch. 旋。zi̯wän

   菔 si̯wan[2] (S.0937 R.27 2.24) revolve

B. Alternation between unaspirated and aspirated voiceless consonants

29. 頚 ku[1] (S.2664 R.5 1.5) dig, carve

   麵 khu[2] (S.2684 R.5 2.5) dig, carve

30. 扱 kê[2] (S.0610 R.9 2.8) hate, dislike

   扱 khê[1] (S.0607 R.9 1.9) hate, dislike

31. 稗 ka[1] (S.5241 R.17 1.17) center, middle

   柿 kha[1] (S.1738 R.17 1.17) in, middle

32. 鞒 kâ[1] (S.3023 R.18 1.18) firm, secure

   許 khâ[2] (S.4627 R.18 2.15) firm, secure, sincere

33. 潵 tsa[1] (S.5505 R.20 1.20) hot (for other types of alternation, see infra Nos. 55 and 67)

   �糸 tsha[1] (S.5499 R.20 1.20) hot

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6 For a discussion of Chinese loanwords in Tangut, see Gong 1981d. The examples in Nos. 26, 27, and 28 are to be found in Gong 1981d, Nos. 93, 98, 78, 80, 109, and 111 respectively.

34. 濋 kwɪ¹ (S. 2366 R. 31 1. 30) cut off, separate

　　 秠 khwɪ¹ (S. 4795 R. 31 1. 30) cut off, separate (cf. supra No. 12)

35. 蘛 tśi̯wə¹ (S. 2028 R. 33 1. 32) to turn sour

　　 緉 tśhi̯wə̣² (S. 3911 R. 92 2. 77) vinegar

36. 菝 tśi̯ei² (S. 0689 R. 36 2. 32) take away, carry off

　　 薕 tśhi̯ei¹ (S. 0690 R. 36 1. 35) take away, carry off

37. 緉 pɪn¹ (S. 3085 R. 37 1. 36) beat

　　 緉 phɪn¹ (S. 3546 R. 37 1. 36) beat

38. 菝 tʅe¹ (S. 4495 R. 43 1. 42) clever, wise, bright

　　 菝 thʅe¹ (S. 1158 R. 43 1. 42) clever, wise, bright

39. 罌 kêɯ¹ (S. 5271 R. 45 1. 44) collapse, crumble down

　　 緉 khêɯ¹ (S. 2796 R. 45 1. 44) destroy, pull down

40. 緉 tśi̯o¹ (S. 2206 R. 50 1. 48) to pierce

　　 緉 tśhi̯o¹ (S. 2703 R. 50 1. 48) to pierce, to bore a hole (cf. supra No. 19 and infra No. 217)

41. 緉 kô² (S. 4440 R. 52 2. 43) hate, dislike

　　 緉 khô¹ (S. 4443 R. 52 1. 50) hate, dislike

42. 緉 tśi̯uo¹ (S. 3582 R. 59 1. 57) to steal, to rob

　　 緉 tśhi̯uo¹ (S. 1727 R. 59 1. 57) to steal, to rob

43. 緉 pʅu² (S. 4074 R. 62 2. 52) cap, crown, to cover over

　　 緉 phʅu¹ (S. 1667 R. 7 1. 7) to cover over

44. 緉 pʅei¹ (S. 2662 R. 70 1. 67) to aim at, to intend, to discuss, to consult

　　 緉 phi¹ (S. 5539 R. 11 1. 11) aim, intention, plan, mind, wishes

45. 㪍 pə¹   (S. 1555 R. 90 1. 84) to clean, to brush off the dust

    㪍 phə¹   (S. 2747 R. 90 1. 84) to clean, to brush off the dust

Nos. 29, 30, 32, 35, 36, 41, and 43 are accompanied by tone change. Nos. 35, 43, and 44 also show alternation in the glottalization of vowel (For this alternation, see infra pp. 805-811). The function of this alternation has not been determined. Note the parallel examples in Archaic Chinese:

飈   pjiagw   whirl-wind

飄   phjiagw   whirl-wind

半   pan   divide in half, half

判   phan   divide

廣   kwang   wide, broad

曠   khwang   wide

III. Alternation of Medials

A. Alternation between the presence and absence of medial -i-

46. 㥚 tu¹   (S. 3392 R. 1 1. 1)   foolish, silly, stupid

    㥚 ti̯u¹   (S. 2814 R. 3 1. 3)   foolish, silly, stupid

47. 㪍 thu¹   (S. 4813 R. 1 2. 1)   to release, to drive away, to abandon

    㪍 thi̯u²   (S. 3556 R. 3 2. 3)   to release, to drive away, to abandon

48. 㪍 tshu¹   (S. 2553 R. 1 1. 1) a shovel

    㪍 tshi̯u¹   (S. 2552 R. 3 1. 3) a shovel

49. 㪍 dzu¹   (S. 4394 R. 1 1. 1) to love, to like

    㪍 dzi̯u¹   (S. 2010 R. 2 1. 2) to love, to like

50. 𘜊 du¹ (S. 2745 R. 4 1.4) to push down

   𘜋 diu¹ (S. 2707 R. 3 1.3) to push down

51. 𗰱 lhu¹ (S. 2712 R. 4 1.4) to increase, to add

   𗱦 lhi̯u¹ (S. 4643 R. 3 1.3) to increase, to add

52. 𘀆 du¹ (S. 2410 R. 5 1.5) to accumulate, to store up

   𘀇 di̯u¹ (S. 2418 R. 7 1.7) to accumulate, to store up

53. 𗌋 dzu² (S. 4021 R. 5 2.5) to stand, to erect, to plant

   𗌌 dzi̯u² (S. 2757 R. 7 2.6) to stand, to erect, to plant

54. 𗁩 lu¹ (S. 3981 R. 5 1.5) to dig

   𗁪 li̯u¹ (S. 2502 R. 7 1.7) to dig

55. 𘋊 tsa¹ (S. 5505 R. 20 1.20) hot

   𗟲 tsi̯a¹ ⁷ (S. 3089 R. 19 1.19) hot (cf. supra No. 33 and infra No. 67)

56. 𗢤 tswɪ¹ (S. 4931 R. 31 1.30) to knead with the fingers

   𘉑 tsi̯wɪ¹ (S. 1608 R. 31 1.30) to knead with the fingers

57. 𗧛 tu̱¹ (S. 3292 R. 61 1.58) nets for catching birds and beasts

   𗋭 ti̯u̱¹ (S. 0558 R. 62 1.59) nets for catching birds and beasts

58. 𗖰 ku̱² (S. ? R. 61 2.51) ice

   𘃒 ki̯u̱¹ (S. 0602 R. 62 1.59) cold

59. 𗎮 lwu̱¹ ⁸ (S. 2036 R. 61 1.58) to mix

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7 Sofronov (1968) has not reconstructed for this word. However, the *fan-ch'ieh* spelling 𗌋 tsi² (2.20) 𗱦 li̯a¹ (1.19) in WHTL indicates the reading tsi̯a¹ (1.19). The character is erroneously placed in the WHTL (W. 2691), where the words with initial dz– are placed.

8 Sofronov reconstructs ldu̱¹, revised here as lwu̱¹ on the basis of *fan-ch'ieh* spelling in WH. For a discussion of this word, see p. 810.

羅 lɪwu̥¹ (S.4576 R.62 1.59) to mix

60. 㾕 be̥i² (S.0483 R.68 2.58) to incite, to instigate

巂 bɪe̥i² (S.1795 R.70 2.60) to incite, to instigate, to advise, to blow

61. 繏 ru̥o² (S.3860 R.95 2.80) to collect, to gather

藩 rɪu̥o² (S.0985 R.96 2.81) to collect, to gather

In the above examples Sofronov has reconstructed two kinds of –i–, namely i̥ and ɪ̥. But there does not seem to be any phonological opposition between them. In the above alternation, no semantic difference can be observed. This type of alternation also exists in Archaic Chinese. The following examples are given by Karlgren (1940:458, 302–303):

若 *nâk 'say yes' : same character *ńi̯ak 'agree'

趣 *ts'i̯u 'to run' : same character *ts'u 'to cause to run'

卬 *ngâng 'high' : 仰 *ngi̯ang 'to lift the face'

雜 dz'əp 'various kinds brought together, mixed' : 集 *dzi̯əp 'collect'

B. Alternation between the presence and absence of medial –w–

62. 徦 ·i̥u¹ (S.3142 R.2 1.2) ghost, demon, devil

魋 ·i̥wu¹ (S.4466 R.2 1.2) bring an evil

63. 緩 ɣê¹ (S.3409 R.9 1.9) strength, force, power

剗 ɣwê¹ (S.2761 R.9 1.9) strength, influence, power

64. 觲 si¹ (S.4192 R.11 1.11) to be poor, to be exhausted, to come to an end

觬 sɪ̥wi¹ (S.4189 R.11 1.11) to be poor, to be exhausted, to come to an end

65. 絳 dzi¹ (S.3779 R.11 1.11) a state of abstraction, meditation,

without anxiety and hindrance

嶧 dzı̣wi¹ (S. 4111 R. 11 1. 11) cause the mind to be in the state
of abstraction

66. 嶧 dzi¹ (S. 4102 R. 11 1. 11) to become thin

鞲 dzɪwi¹ (S. 5214 R. 11 1. 11) to become thin

67. 羝 tsha¹ (S. 5499 R. 20 1. 20) hot

豯 tshwa¹ (S. 5498 R. 20 1. 20) to make hot, to heat (cf. supra
Nos. 33 and 55)

68. 蕥 ṣ̌i̯ə¹ (S. 1052 R. 30 1. 29) go, reach, enter

蒆 ṣ̌i̯wə¹ (S. 1957 R. 30 1. 29) go, reach, enter

69. 薐 khei¹ (S. 0729 R. 34 1. 33) to prosper, to flourish;
abundance

鞲 khwei¹ (S. 4845 R. 34 1. 33) to prosper, to flourish, to grow

70. 蕥 sei¹ (S. 1855 R. 34 1. 33) pure, clear, clean

蕋 swei¹ (S. 1857 R. 34 1. 33) pure, clear, clean (cf, infra No.
156)

71. 斱 dź̌i̯ei² (S. 0601 R. 36 2. 32) cold

譤 dź̌i̯wei¹ (S. 5497 R. 36 1. 35) to make cold

72. 珗 nɪn¹ (S. 1205 R. 37 1. 36) red

繝 nwɪn¹ (S. 4032 R. 37 1. 36) turn red, to blush;
coagulation of the blood

73. 禠 tho² (S. 2996 R. 51 2. 42) sole of shoe

禫 thwo¹ (S. 2998 R. 51 1. 49) to sole

74. 龙 lɪẹi¹ (S. 2481 R. 70 1. 67) to enter, to fall

芲 lhɪẹi¹ (S. 0803 R. 70 1. 67) to enter, to fall

蕹 lwẹi¹ (S. 0900 R. 70 1. 67) to enter, to fall

75. 牖 kḭe² (S. 0311 R. 101 2. 86) to steal; a thief
    镼 kwḭe¹ (S. 1726 R. 100 1. 92) to steal; a thief

Nos. 62, 65, 67, 71, 72, and 73 clearly show a morphological process of forming verbs from adjectives or nouns. However, this kind of derivation seems to be an innovation in Tangut. Nos. 67, 68, and 72 have cognates in WT or WB, but no alternation has been observed.

67. 張 tsha¹ hot WT ཚ་ tsha hot
68. 菲 śịə¹ go WT གཤེགས་ gśegs go
72. 絖 nɪn¹ red WB နီ ni red

Karlgren (1933: 91, 1940: 458) gives a very interesting example of this type of alternation in Chinese.

熱 *ńḭat 'hot': 爇 ńịwat 'to burn'

But such examples are exceptional. Generally speaking, the medial −w− does not alternate with −ϕ− in a phonetic series. It is even doubted that the medial −w− existed as an independent phoneme in Archaic Chinese. Li (1971: 16) assumes that there was no such phoneme in the archaic stage.

IV. Alternation of Finals

Systematic correspondences have been found to exist in large numbers between various rimes. Alternation of finals thus presents a very complicated picture. Owing to the scantiness of texts available to me, the interpretation of these alternations offers much difficulty. The following classification is only tentative.

A. Alternations which are syntactically conditioned
   a. Alternation between R. 10 (−ịe) and R. 53 (−ịo)
   76. 移 vịe¹ (S. 2413 R. 10 1. 10) to do, to act, to make
       絣 vịo¹ (S. 3666 R. 53 1. 51) to do, to act, to make

77. 𦧶 vi̯e¹ (S. 2409 R. 10 1. 10) to send out, to employ, to use

   𦨁 vi̯o¹ (S. 2411 R. 53 1. 51) to send out, to employ, to use

78. 𦜜 dzi̯e¹ (S. 0524 R. 10 1. 10) to eat

   𦙭 dzi̯o¹ (S. 0479 R. 53 1. 51) to eat

b. Alternation between R. 11 (–i) and R. 53 (–i̯o)

79. 𦘔 phi¹ (S. 0447 R. 11 1. 11) to cause, to make

   𦙷 phi̯o² (S. 0529 R. 53 2. 44) to cause, to make

80. 𦥯 mi¹ (S. 2062 R. 11 1. 11) to hear

   𦦙 mi̯o¹ (S. 2015 R. 53 1. 51) to hear

81. 𦐅 mi¹ (S. 0490 R. 11 1. 11) to feed

   𦛂 mi̯o¹ (S. 0482 R. 53 1. 51) to feed

82. 𦒾 mi² (S. 3760 R. 11 2. 10) to understand, to know

   𦓤 mi̯o² (S. 3770 R. 53 2. 44) to understand, to know

83. 𦔱 ti² (S. 5226 R. 11 2. 10) to leave (behind)

   𦕜 ti̯o² (S. 5766 R. 53 2. 44) to leave (behind)

84. 𦗀 gwi² (S. 1940 R. 11 2. 10) to wear, to put on (clothes)

                          (For other cognate words,
                          see infra Nos. 94 and 198)

   𦘯 gi̯o² (S. 3616 R. 53 2. 44) to wear, to put on (clothes)

85. 𦙡 si̯wi¹ (S. 4189 R. 11 1. 11) to be poor, to be exhausted,
                          to come to an end

   𦚌 si̯wo² (S. 1110 R. 53 2. 44) to be poor, to be exhausted,
                          to come to an end

c. Alternation between R. 36 (–i̯ei) and R. 53 (–i̯o)

86. 𦛣 tśhi̯ei¹ (S. 0690 R. 36 1. 35) to take away, to carry off

𦩾 tśhi̯o² (S. 0308 R. 53 2.44) to take away, to carry off

87. 繿 dźi̯ei² (S. 5753 R. 36 2.32) to have

蒆 dźi̯o² (S. 4920 R. 53 2.44) to have

d. Alternation between R. 70 (-i̯ei) and R. 75 (-i̯on)

88. 藕 vi̯ei² (S. 4996 R. 70 2.60) to understand, to learn,
to be able to

鞦 vi̯on² (S. 0376 R. 75 2.64) to understand, to learn,
to be able to

89. 𦜕 ti̯ei¹ (S. 0542 R. 70 1.67) to feed, to give to drink

𥥍 ti̯on¹ (S. 1382 R. 75 1.72) to feed, to give to drink

90. 𦙫 ti̯ei¹ (S. 2779 R. 70 1.67) to put, to place

𦯔 ti̯on¹ (S. 2802 R. 75 1.72) to put, to place

91. 蘊 ti̯ei¹ (S. 1981 R. 70 1.67) to brew, to ferment

蘝 ti̯on¹ (S. 1982 R. 75 1.72) to brew, to ferment

92. 龘 ti̯ei¹ (S. 0235 R. 70 1.67) to pray, to sacrifice

龘 ti̯on¹ (S. 0213 R. 75 1.72) to pray, to sacrifice

93. 𦧄 di̯ei² (S. 4561 R. 70 2.60) to repair, to put in order,
to cure

牖 di̯on² (S. 1270 R. 75 2.64) to repair, to put in order,
to build

𦝹 di̯on² (S. 1588 R. 75 2.64) to repair, to put in order,
to build

94. 緅 gi̯wei¹ (S. 3792 R. 70 1.67) to make to wear,
to clothe (v. t.)

𦏿 gi̯on¹ (S. 4451 R. 75 1.72) to make to wear, to clothe
(v. t.) (cf. supra No. 84 and
infra No. 198)

e. Alternation between R. 83 (–ê) and R. 84 (–iẹ) with R. 96 (–i̯u̯o).

95. 蔽 wê¹ (S. 5312 R. 83 1. 78) to value, to love

蔽 vi̯u̯o¹ (S. 5316 R. 96 1. 90) to value, to love

96. 蔽 ri̯ẹ¹ (S. 4911 R. 84 1. 79) to attain, to obtain, to acquire

蔽 ri̯u̯o¹ (S. 0221 R. 96 1. 90) to attain, to obtain, to acquire

97. 蔽 ri̯ẹ² (S. 0309 R. 84 2. 72) to attain, to obtain, to acquire

蔽 ri̯u̯o² (S. 0176 R. 96 2. 81) to attain, to obtain, to acquire

98. 蔽 ri̯ẹ² (S. 2657 R. 84 2. 72) to forbid, to prohibit,
to restrain, to oppress

蔽 ri̯u̯o² (S. 2660 R. 96 2. 81) to forbid, to prohibit,
to restrain, to oppress

Note that the examples cited above fall into 3 groups: a, b, and c show alternation with R. 53, d shows alternation with R. 75, and e shows alternation with R. 96. In the first group, we see non-glottalized vowels alternate with non-glottalized vowels. In the second and third groups, we see glottalized (represented by a dot under the vowel) vowels alternate with glottalized vowels. There is a correspondence between the glottalized vowels and non-glottalized vowels. Compare the following pairs of verbs:

84. 蔽 gwi² (R. 11) to wear   94. 蔽 gi̯wẹi¹ (R. 70) make to wear

蔽 gi̯o² (R. 53) to wear   蔽 gi̯ọn¹ (R. 75) make to wear

No. 94 is the causative form of No. 84. It will be shown in the next section that the alternation between them is that of non-glottalized vowel with glottalized vowel. The vowels themselves must be the same. Thus the vowel in R. 70 must be –i̯ and not –i̯ẹi as Sofronov has reconstructed (Nishida 1964: 60 has reconstructed –i̯ for this rime, and he is no doubt right here). The vowel in R. 75 must be i̯ọ (Nishida 1964: 62 reconstructs –ĭõ. I have elsewhere (Gong 1981: 700, 721–722) argued that there is no nasal final in Tangut). Thus No. 84 and No. 94 must be:

84. 巍 gwi² (R. 11) to wear   94. 絥 gwi̧¹ (R. 70) make to wear

     緻 gi̧o² (R. 53) to wear   羏 gi̧o¹ (R. 75) make to wear

After this revision, the phonological alternation between R. 11 (-i) and R. 53 (-i̧o) is perfectly paralleled by the alternation between R. 70 (now reconstructed -i̧) and R. 75 (now reconstructed -i̧o). The phonological rule operating here becomes quite transparent. Since the words taking part in these two alternations are quite numerous, they must be taken as the starting point in studying other types of alternation.

As far as the function of these alternations is concerned, Nishida (1976: 11–12, 18; 1977: 258–259) has successfully shown that the different verb forms (he calls the first word in the pair A-form and the second B-form) of Nos. 76, 77, 79, 80, 89, 96, and 97 have different distribution patterns. He points out that the B-form is often followed by personal suffixes, such as 縋 ŋa² 'I, me' and 脆 na² 'you'. This is a very important observation, which has led him to think of the existence of verb inflexion in the Tangut language (Nishida 1982: 125). Owing to unsufficient study of Tangut texts, I do not know whether all the other verbs cited above behave in the same way. But since we are dealing here with systematic correspondences between various rimes, we expect the same phonological rule to apply to all the words in the same rimes.

     f. Alternation between R. 14 (-i̧e) and R. 40 (-i̧e)

99. 嶘 tshi̧e² (S. 3053 R. 14 2. 12) to say, to speak

     嶁 tshi̧e² (S. 2545 R. 40 2. 35) to say, to speak

     嶃 tshi̧e¹ (S. 2777 R. 40 1. 39) to say, to speak

100. 徺 li̧e² (S. 2265 R. 14 2. 12) to wait, to stay

     徉 li̧e² (S. 2266 R. 40 2. 35) to wait, to stay

     緻 li̧e¹ (S. 3497 R. 40 1. 39) to wait, to stay

101. 蹤 dzi̧e² (S. 0561 R. 14 2. 12) to teach

敽 dzi̯e² (S. 4859 R. 40 2. 35) to teach

誃 dzi̯e² (S. 4858 R. 40 2. 35) teacher

102. 菽 mi̯e² (S. 5298 R. 14 2. 12) to govern, to foster

頌 mi̯e¹ (S. 3419 R. 40 1. 39) to foster

g. Alternation between R. 10 (-i̯e) and R. 30 (-i̯ə)

103. 薕 śi̯e² (S. 1020 R. 10 2. 9) to go, to reach

薤 śi̯ə¹ (S. 1052 R. 30 1. 29) to go, to reach, to enter

104. 綐 li̯e² (S. 3356 R. 10 2. 9) to agree

敠 li̯ə² (S. 2208 R. 30 2. 27) to agree

Sofronov reconstructs one and the same final (-i̯e) for R. 10, R. 14, and R. 40. As a result, the alternation between R. 14 and R. 40 (see above f.) has become obscure in his reconstruction system. Nishida (1964: I, 45, 53) reconstructs -ifi for R. 14 and -ǐefi for R. 40. For R. 10 he (*Ibid.*, 44) reconstructs -i and for R. 30 (*Ibid.*, 50) he reconstructs -ifi. Thus, for Nishida the alternation f. would be -ifi~-ǐefi and the alternation g. would be -i~-ifi. Here we see how the phonological interpretation of the sound alternation depends on the reconstruction. Nishida (1977: III, 258-259) refers to No. 99 � tshi̯e² 'to say' and No. 103 薕 śi̯ə¹ 'to go' as B-form, thus regarding the alternation as syntactically conditioned. It is not known whether the same distinction is applicable to Nos. 100, 101, 102, and 104 as well. Further study on the usage, based on texts, would give the answer to this problem.

B. Alternations which are morphologically conditioned

a. Alternation between non-glottalized and glottalized vowels

Many of the examples I have assembled here have been mentioned by Nishida in various places[9] in his numerous works. Since alternation of this

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9 For examples, Nos. 105, 117, and 118 have been mentioned in Nishida (1976: 12), Nos. 124 and 127 in Nishida (1977: III, 270) and No. 111 in Nishida (1981: II, 17).

type cannot be found in a fixed place in Tangut dictionaries, it is not to be expected that the following examples are exhaustive. Persistent research in the sound and meaning of Tangut words will bring more interesting examples to light.

105. 絻 lwu¹ (S. 4179 R. 1 1.1) to get mixed

猵 lwụ¹ (S. 2036 R. 61 1.58) to mix

106. 骰 dźị̣u¹ (S. 4370 R. 2 1.2) to deceive, to cheat, to play false

骰 dźị̣u² (S. 4368 R. 62 2.52) to deceive, to cheat, to play false

107. 幞 dị̣u¹ (S. 1354 R. 3 1.3) to complain, to accuse at law

釖 dị̣u¹ (S. 4564 R. 62 1.59) to complain, to grieve

108. 礛 nị̣u² (S. 0473 R. 3 2.3) to suck the breast (=S. 0541)

蘫 nị̣u² (S. 2040 R. 62 2.52) to suckle

109. 骹 gị̣u² (S. 2338 R. 3 2.3) suffering, hardship

骹 gị̣u² (S. 2337 R. 62 2.52) to suffer, to, work hard

110. 緣 ɤị̣u¹ (S. 5712 R. 3 1.3) smoke (n.)

蘮 kị̣u¹ (S. 1013 R. 81 1.76) to smoke (v.)

111. 骹 ku¹ (S. 1719 R. 4 1.4) loose, to loosen (v. i.)

緻 kụ¹ (S. 3580 R. 61 1.58) to loosen (v. t.), to release

112. 骹 phị̣u¹ (S. 1667 R. 7 1.7) to cover over

砊 pị̣u² (S. 4074 R. 62 2.52) cap, crown, to cover over

113. 祇 vị̣e¹ (S. 2409 R. 10 1.10) to send out, to employ, to use

庽 vị̣e² (S. 2926 R. 64 2.54) to send out, to dispatch

114. 髓 lị̣e¹ (S. 4361 R. 10 1.10) to prosper, to flourish

骹 lị̣e¹ (S. 4791 R. 64 1.61) to prosper, to flourish

115. 馥 lhi²   (S. 4340 R. 11   2. 10) son, child;

                        to give birth to a child

      猍 lįe¹   (S. 1081 R. 64   1. 61) son, child;

                        to give birth to a child

116. 豣 phi¹   (S. 5539 R. 11   1. 11) aim, intention, plan, mind,

                        wishes

      豻 pįei¹   (S. 2662 R. 70   1. 67) to aim at, to intend, to discuss,

                        to consult

117. 繳 bi¹   (S. 3592 R. 11   1. 11) low, below, down, inferior

      綿 bi²   (S. 3591 R. 11   2. 10) low, below, down, inferior

      磩 bɿ¹   (S. 0501 R. 31   1. 30) low, below, bottom

      蒜 bįei¹   (S. 5019 R. 70   1. 67) to lower, to bend, to hang down

118. 磞 thi¹   (S. 0510 R. 11   1. 11) to drink

      皉 tįei¹   (S. 0542 R. 70   1. 67) to give to drink

119. 蘂 gwi²   (S. 1940 R. 11   2. 10) to wear, to put on (clothes)

      絀 giwęi¹ (S. 3792 R. 70   1. 67) to make to wear,

                        to colthe (v. t.)

120. 胀 mįe¹   (S. 1257 R. 14   1. 14) house, palace, temple

      綈 mįe²   (S. 3559 R. 79   2. 68) temple, shrine

      綵 mįe²   (S. 3446 R. 79   2. 68) palace, dwelling

121. 靴 mįe²   (S. 5298 R. 14   2. 12) to regulate, to govern; abundant

      禰 mįe¹   (S. 0120 R. 79   1. 74) to regulate; flourishing,

                        exuberant

122. 嫭 nįe²   (S. 2297 R. 14   2. 12) nose

      嫲 nįe²¹⁰ (S. 4780 R. 79   2. 68) face

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10 S. 4760 嫲 ni and S. 4780 嫲 nįe² are presumably the same word. The first
    is correct in character and the second is correct in sound.

123. 朥 kịe¹ (S. 1275 R. 14 1. 14) to sharpen, to grind

     犇 kịe¹ (S. 1267 R. 84 1. 79) sharp, bravery, strong, fierce

124. 兹 ka¹ (S. 5389 R. 17 1. 17) equal, even, same

     鏊 kạ² (S. 5390 R. 66 2. 56) to make equal, to make even,
     to level, to flatten

     �班 kạ² (S. 4830 R. 66 2. 56) to make even, to weigh in the
     balance (on the scales)

125. 翃 khwa¹ (S. 5491 R. 17 1. 17) far, distant

     穄 khwạ¹ (S. 1226 R. 66 1. 63) keep away from,
     keep at a distance

126. 憪 la¹ (S. 1451 R. 17 1. 17) truth, sincerity, honesty;
     falsehood, lie

     龏 lạ¹ (S. 4367 R. 66 1. 63) falsehood, lie

127. 麗 ka² (S. 4535 R. 17 2. 14) to separate, to leave

     歡 kạ² (S. 1034 R. 85 2. 73) to separate, to distinguish

128. 窘 xa² (S. 3065 R. 17 2. 14) to open the mouth

     叚 xạ¹ (S. 0278 R. 85 1. 80) to open the mouth

129. 歋 za¹ (S. 4860 R. 17 1. 17) red face

     蔬 zạ¹ (S. 2075 R. 85 1. 80) red face ancester

130. 徶 khâ² (S. 2215 R. 18 2. 15) demon, devil, ghost

     璇 khậ¹ (S. 4222 R. 86 1. 81) demon, devil, ghost

131. 紽 pə¹ (S. 5803 R. 28 1. 27) a lamb, a kid

     舷 pə¹ (S. 1754 R. 90 1. 84) a lamb, a kid

132. 猺 mə² (S. 4312 R. 28 2. 25) a spring, a fountain, the source

     忦 mə² (S. 1462 R. 28 2. 25) to be born,
     to come into the world

薩 mə² (S. 4484 R. 90 2. 76) the origin, the source, the root

In the first edition of the TY, all the three characters are placed in the same homophone group, suggesting that R. 28 had the same final as R. 90. For the semantic association between "to be born" and "the source"

cf. 覆 lhi² (S. 5000 R. 11 2. 10) to be born, to come into the world

綴覆 lhi² (S. 3870 R. 11 2. 10) the source

133. 㐱 bɿ¹ (S. 0494 R. 31 1. 30) high

   㞋 bɿn² (S. 1309 R. 37 2. 33) high

   胲 bịe¹ (S. 1232 R. 64 1. 61) to heighten, to elevate, to promote

134. 蔎 sɿ² (S. 2058 R. 31 2. 28) to know; knowledge

   橇 sɿn² (S. 1272 R. 37 2. 33) to know; knowledge

   骹 sịe² (S. 4496 R. 64 2. 54) knowledge, wisdom

135. 㧑 khịə¹ (S. 0636 R. 33 1. 32) fear

   蒜 kịə¹ (S. 4417 R. 72 1. 69) fear

For the first word (S. 0636) Sofronov reconstructs kịə¹. However, the *fan-ch'ie* spelling (蘿 khịu¹ 骹 lịə¹) gives the reading khịə¹. Chinese transcriptions 肯 and 尅 also points to a voiceless aspirated initial. For the second word (S. 4417) Sofronov reconstructs khịə¹. However, the *fan-ch'ie* spelling (㫰 kịu¹ 綻 tịə¹) gives the reading kịə¹.

136. 蒳 tśịwə¹ (S. 2028 R. 33 1. 32) to turn sour

   緉 tśhịwə² (S. 3911 R. 92 2. 77) vinegar

137. 縱 gịo² (S. 3616 R. 53 2. 44) to wear, to put on (clothes)

   骹 gịon¹ (S. 4451 R. 75 1. 72) to make to wear, to clothe (v. t.)

The most important thing to be noted in this type of alternation is

that the pairs cited above show a contrast in the presence or absence of glottalization, while the vowels themselves remain unchanged. This principle can be used to test whether a reconstruction is consistent in terms of internal structure. However, this is not to exclude the possibility that sound changes might have caused irregularity in morphological rules, but to emphasize that in absence of evidence, we would rather assume that no sound changes have destroyed regularity.

The pairs in the above list show that the glottalized vowels and non-glottalized vowels remain unchanged, except in Nos. 115, 117, 118, 119, 133, 134, and 137, where $-i$ becomes $-i̯ei$, $-i̯o$ becomes $-i̯on$, and $-ɪ$ becomes $-ɪ̯e$. It must be noted that in Sofronov's reconstruction, there is no $-i̯$, so we can easily assume that his i̯ei (R. 70) is actually $-i̯$, as Nishida has reconstructed. I have already pointed out in the preceding section (see pp. 803-804 above), that No. 137 gi̯on¹ must be revised as gi̯o¹. For Nos. 133 and 134, I would assume $-ɪ̯e$ (R. 64) to be $-ɪ$ in correspondence with $-ɪ$ (R. 31).

Minor alternation of Sofronov's reconstruction includes:

105. 𤳏 originally reconstructed zwu¹, corrected here as lwu¹ according to *fan-ch'ieh* 譩䣛 lɪe¹ tshwu¹ → lwu¹. 雍 originally reconstructed ldu̧¹, corrected as lwu̧¹ according to *fan-ch'ieh* 甈䋷 lei¹ twu̧¹ → lwu̧¹. The revised reconstruction of 𤳏 lwu¹ and 雍 lwu̧¹ stand now in close connection with 雍 lɪwu̧¹. All the three words together with 雍 lwu̧² (S. 2038 R. 61 2.51) form a word family meaning 'to mix'.

136. 絒 originally reconstructed tśhi̧ə², corrected here as tśhi̧wə¹, based on the Chinese transcription 出, which is a *ho-k'ou* 合口 word containing a medial $-u-$ in Anci Chinese.

As far as the function of this alternation is c cerned, we can see in many pairs cited above that transitive verbs are formed from intransitive verbs, causative verbs are formed from non-causative verbs, and verbs are

formed from other syntactic categories. However, there are cases which baffle us completely. There does not seem to be any grammatical distinction between the pairs in Nos. 106, 114, 115, 120, 121, 126, 128, 130, 131 and 135 (For the triples in Nos. 133 and 134, see p. 820). Nos. 112, 118, and 136 show alternation in the aspiration of initial consonants without any observable regularity in grammatical distinction. The pairs in Nos. 122 and 123 may look strange, but they follow the alternation pattern, and the connection in meaning may not be so farfetched. The study of Tangut morphology is just at the beginning. Many problems still await solution.

b. Alternation between R. 38 (-ai) and R. 54 (-oɯ)

138. 魷 phai¹ (S. 2881 R. 38 1.37) to cover over, to conceal

魷 phoɯ¹ (S. 1073 R. 54 1.52) to cover over, to conceal

139. 庍 thai¹ (S. 1508 R. 38 1.37) opponent, enemy; to meet; to shake

纙 thoɯ¹ (S. 3382 R. 54 1.52) opponent, enemy; to meet; to shake

140. 魷 nai² (S. 1721 R. 38 2.34) to deposit, to entrust to

靫 noɯ² (S. 1720 R. 54 2.45) to deposit, to entrust to

141. 疏 nai² (S. 4617 R. 38 2.34) to point out, to indicate

刻 noɯ¹ (S. 2622 R. 54 1.52) finger

142. 緩 nai² (S. 2759 R. 38 2.34) to make soft

緩 noɯ¹ (S. 5601 R. 54 1.52) soft, weak

143. 魷 dzai² (S. 4106 R. 38 2.34) to ride (a horse)

魷 dzoɯ² (S. 4419 R. 54 2.45)[11] to ride (a horse)

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11 Sofronov gives the rime number as 2.42. Actually the *fan-ch'ieh final* in WHTL is 緩· thoɯ² (S. 3181 2.45). The word is to be found in the WHTL (W. 2937).

144. 㑶 lai² (S.4064 R.38 2.34) to rely on, to depend on

舼 loɯ¹ (S.2535 R.54 1.52) to rely on, to depend on

c. Alternation between R.14 (-ịe) and R.55 (-ịoɯ)

145. 藗 vịe¹ (S.0260 R.14 1.14) to exchange, to trade

藗 vịoɯ¹ (S.0259 R.55 1.53) to exchange, to trade

146. 㺢 dịe¹ (S.2741 R.14 1.14) to divide

㺢 dịoɯ¹ (S.0522 R.55 1.53) to divide

147. 訛 gịe¹ (S.4685 R.14 1.14) to bite, to peck

殥 gịoɯ¹ (S.5544 R.55 1.53) to bite, to peck

Sofronov's reconstruction for 訛 is ngịwe¹ (gịwe¹ in my notation). Since this is a loanword from Chinese 齧 ŋiet。>ŋgiet。 "to bite" (Gong 1981d: 723), gịe¹ would be a more probable reading. The revised reconstruction of this word is also in conformity with the whole alternation pattern in this group.

148. 㺢 śịe¹ (S.5016 R.14 1.14) to butcher

㺢 śịoɯ¹ [12] (S.0530 R.55 1.53) to butcher

149. 藗 lịe² (S.2081 R.14 2.12)[13] to put on trousers

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[12] Sofronov's reconstruction is śịwoɯ¹. It is here corrected as śịoɯ¹ based on *fan-ch'ieh spelling* 訛 śịe¹ (S.4676 1.14) 殥 gịoɯ¹ (S.5544 1.53) in WH. Note that between the medials -ị- and -ị- there is no phonological opposition. They are regarded as identical in this paper.

[13] Sofronov has not given a reconstruction for this word. In the TY this character is placed in the same group as 㺢, for which Sofronov reconstructs żịe¹ (S. 4755). The reconstruction is not satisfactory since this character (㺢) appears in the CCC (246) with the Chinese transcription 力 lịək, so that the correct reconstruction must be lịe¹, instead of żịe¹ (In Gong 1981b: 26 I proposed the sound value 'lhịe', now it seems 'lịe¹' is more correct). In the WH, 㺢 lịe¹ is a word, which stands alone. That is to say, there is no other words with the same sound. In writing this paper I have been using the first edition of the TY, in which words with the same initials and finals are grouped together regardless of the tone. This means 㺢 lịe¹ and 藗 lịe² must be different in tone. It is interesting to note that the former means 'trousers' and the latter means 'to put on trousers'. The difference in syntactic categories is signaled in language by tone and in script by the additon of the graphical element 丷 . Compare Nos. 198 and 209.

絎 lįoɯ² (S.2124 R.55 2.46) to put on trousers (cf. infra
No. 199)

d. Alternation between R. 7 (-įu) and R. 55 (-įoɯ)

150. 䘸 dįu² (S.0666 R.7 2.6) to stab, to pierce

  荔 dįoɯ¹ (S.2693 R.55 1.53) to stab, to pierce

151. 纜 khįu² (S.3379 R.7 2.6) to look, to watch

  厰 khįoɯ² (S.1028 R.55 2.46) to look, to watch

152. 薇 lįu¹ (S.1003 R.7 1.7) to gamble, to risk

  薤 lįoɯ¹ (S.1005 R.55 1.53) to gamble, to risk

153. 蓶 lįu² (S.4877 R.7 2.6) bed-clothes, bedding, mattress

  蘫 lįu² (S.4880 R.7 2.6) bed-clothes, bedding, mattress

  蠱 lįoɯ² ¹⁴(S.4413 R.55 2.46) bed-clothes, bedding, mattress

e. Alternation between R. 34 (-ei) and R. 56 (-on)

154. 牝 dzwei¹ (S.2333 R.34 1.33) sin, crime, from Anc. Ch. 罪
°dzuậi

  羼 ¹⁵ dzwon¹ (S.? R.56 1.54) sin, crime = W. 2610

155. 縡 swei¹ (S.2751 R.34 1.33) small pieces, from Anc. Ch. 碎
suậi°

  䔾 son¹ (S.1039 R.56 1.54) small pieces

156. 薝 swei¹ (S.1857 R.34 1.33) pure, clear, clean (cf. supra No.
70)

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14 Sofronov has not given a reconstruction for this word. The word belongs
to 2.46, which has the final -įoɯ. The word belongs to the IX group in
the TY, so it must have an initial like l-, r-, z-, and ź-. The initial is
assumed to be l- on the basis of the alternation.
15 The character 羼 is not found in Sofronov's index. It is contained in the
WH (W. 2610). The sound value dzwon¹ is given here after Sofronov's
reconstruction of the homophonous words in the WH.

𦀗 son[1]　(S. 0831 R. 56　1. 54)　pure, clear, clean, fresh

f. Alternation between R. 42 (–ai) and R. 57 (–ôn)

157. 盉 nâi[1]　(S. 2619 R. 42　1. 41)　muddy, turbid, unclean

　　 孟 nâi[2]　(S. 4536 R. 42　2. 36)　mucus, phlegm, dirt

　　 𦁅 nôn[1]　(S. 2620 R. 57　1. 55)　dirt, turbid, unclean

158. 雞 tśhâi[1]　(S. 4981 R. 42　1. 4!)　to tie, to bind

　　 毚 tśhwôn[1]　(S. 4980 R. 57　1. 55)　to tie, to bind; a knot, a tie

The most important thing to be noted in the alternations of this group (alternations b, c, d, e, and f) is that the second parties taking part in the alternations form a continuous series, namely R. 54, R. 55, R. 56, and R. 57. These four rimes constitute what Nishida (1964: I, 55–57) calls "The Ninth Rime Category" 韻類第九攝, for which he reconstructs the main vowels –o and –ɔ (see Nishida 1981: 125, in his system these four rimes are reconstructed –ɔw, –ow, –oN, and –ĭoN respectively). However, it is not the similarity of the vowels alone that leads me to think there are some common characteristics in these alternations. The pairs in this group often form binomes, as can be seen from the following examples:

　　c. 145. 薮薮 vi̭e[1] – vi̭oɯ[1] (W. 1640) (W. 466)

　　　 146. 㺵㺵 di̭e[1] – di̭oɯ[1] (W. 1645)

　　　 147. 蚍蝺 gi̭e[1] – gi̭oɯ[1] (W. 474, 1641)

　　e. 154. 震鯂 dzwon[1] – dzwei[1] (W. 2689, 2610, 2388)

　　　 155. 𦀗𦀗 [16] son[1] – swei[1] (W. 1679)

　　　 156. 𦀗𦀗 son[1] – swei[1] (W. 1677)

　　f. 157. 𦁅盉 nôn[1] – nâi[1] (W. 1701, 1384)

　　　 158. 毚雞 tśhwôn[1] – tśhâi[1] (W. 1708)

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16 The second character is not very distinct in the facsimile. I take it to be 𦀗 swei[1] (S. 2751)

This phenomenon strongly suggests that a certain sort of word-formation process was at work, which derived one of the pair from the other. The decisive evidence for this interpretation can be found in Nos. 154 and 155, where Chinese loanwords are involved. As I have indicated elsewhere (Gong 1981: 725) Tangut 秅 dzwei[1] is an early Chinese loanword, which had been borrowed into Tangut before the sound change dz- > tsh- occurred in a north-western Chinese dialect around the end of the 12th century (Gong 1981: 47-57). 𗆉 swei[1] is borrowed from Chinese 碎 suậi°, though we do not know whether it is likewise an early loan. On the basis of these two loanwords, it is easy to infer that 𗥔 dzwon[1] and 𗥔 son[1] are derived from 秅 dzwei[1] and 𗆉 swei[1] according to a certain phonological rule. It seems that the same or similar derivational process has happened to groups b, c, d, and f, (for example, in No. 147 gịoɯ is derived from gịe, which is a Chinese loanword from 齧 ŋiet°.) bringing many pairs of words into existence. Between the base words and derived words there is no doubt some phonetic mechanism. The description of this mechanism in terms of strict phonological rules is at present still premature, for as stated above, how we interpret the phonological alternations depends largely on what reconstruction system we adopt as the basis. On the other hand, a correct interpretation of these alternations can be expected to contribute to the improvement of the reconstructions.

C. Alternations which are phonologically conditioned

One of the most intriguing phenomena in Tangut is the multiple alternations involving R. 11 (-i), R. 31 (-ɿ), and R. 37 (in). The most conspicuous example is to be found in the Tangut words designating negation.

159. 𗝓 mi[1]   (S. 1491 R. 11 1. 11) not

   𗟲 mɿ[1]   (S. 2530 R. 31 1. 30) not

   𗴺 mɪn[1]   (S. 3510 R. 37 1. 36) not

   𗫨 mɪn[2]   (S. 0375 R. 37 2. 33) not, not yet

Nishida (1982: 114–118) has briefly explained the usage of the first three words. From the data cited in Nevsky's Tangut dictionary and Nishida's Tangut-Chinese Vocabulary (Nishida 1977: III, 63–254), it can be seen that all the four words are different in their usage. It is impossible to identify any two words as being the same.

As far as the alternation of this sort is concerned, no other words have been found to alternate in a triple way. The words I have assembled fall in the following three groups:

a. Alternation between R. 11 (-i) and R. 31 (-ɪ)

160. 甤 phi² (S.4886 R.11 2.10) to discard, to abandon

    鑺 phɪ¹ (S.2791 R.31 1.30) to discard, to abandon

161. 繳 bi¹ (S.3592 R.11 1.11) low, below, down, inferior

    绨 bi² (S.3591 R.11 2.10) low, below, down, inferior

    碲 bɪ¹ (S.0501 R.31 1.30) low, below, bottom

162. 祇 bi² (S.2976 R.11 2.10) full; to overflow

    祇 bɪ¹ (S.0336 R.31 1.30) full; to overflow

163. 紦 mi² (S.3760 R.11 2.10) silent

    絺 mɪ² (S.2544 R.31 2.28) silent

164. 彶 mi² (S.3316 R.11 2.10) Tangut

    彶 mɪ² (S.3536 R.31 2.28) Tangut

165. 訹 thi² (S.2822 R.11 2.10) tail, end

    蘢 thɪ² (S.4898 R.31 2.28) tail, end, hips

    紑 thɪ¹ (S.4801 R.31 1.30) tail, end

166. 荒 ni² (S.2104 R.11 2.10) indicator of collective plurality
                                    (Kepping 1979: 437 No. 892)

    鞍 nɪ² (S.4820 R.31 2.28) indicator of plural number

(Kepping et al 1969, II, 75 No. 3832)

167. 綫 kwi¹ (S. 5746 R. 11 1.11) name of a bird

綫 kwɪ¹ (S. 5707 R. 31 1.30) name of a bird

168. 綫 gi² (S. 1131 R. 11 2.10) son, child

綫 gɪ¹ (S. 3884 R. 31 1.30) son, child

169. 綫 gi² (S. 2485 R. 11 2.10) one

綫 gɪ² (S. 4601 R. 31 2.28) one

170. 綫 tshi¹ (S. 4773 R. 11 1.11) to want, to wish, to love;

important, necessary

綫 tshɪ¹ (S. 2129 R. 31 1.30) to love, to like

171. 綫 si² (S. 3144 R. 11 2.10) to die

綫 sɪ¹ (S. 5480 R. 31 1.30) to die

172. 綫 si¹ (S. 0881 R. 11 1.11) tree, wood

綫 sɪ¹ (S. 0849 R. 31 1.30) tree, plant

173. 綫 lhi² (S. 5001 R. 11 2.10) calm, quiet, slow

綫 lhɪ¹ (S. 3347 R. 31 1.30) calm, quiet, slow

174. 綫 lhi² (S. 0406 R. 11 2.10) name of an insect

綫 lhɪ¹ (S. 3375 R. 31 1.30) name of an insect

175. 綫 lhi² (S. 5000 R. 11 2.10) to give birth to,

to bear (a child)

綫 lhɪ¹ (S. 3826 R. 31 1.30) to give birth to,

to bear (a child)

176. 綫 lhi² (S. 4340 R. 11 2.10) child, son

綫 lhɪ¹ (S. 4342 R. 31 1.30) grandchild, grandson

b. Alternation between R. 31 (-ɪ) and R. 37 (-ɪn)

177. [字] pɪ^1 (S. 5568 R. 31 1.30) father
    [字] pɪn^2 (S. 5571 R. 37 2.33) father

178. [字] bɪ^1 (S. 0494 R. 31 1.30) high
    [字] bɪn^2 (S. 1309 R. 37 2.33) high

179. [字] mɪ^1 (S. 2518 R. 31 1.30) mother
    [字] mɪn^2 (S. 5657 R. 37 2.33) mother

180. [字] tɪ^1 (S. 2704 R. 31 1.30) one, if
    [字] tɪn^1 (S. 2071 R. 37 1.36) if, either... or...

181. [字] dɪ^1 (S. 4116 R. 31 1.30) illness, sickness, to be ill
    [字] dɪn^1 (S. 4546 R. 37 1.36) illness, sickness, to be ill

182. [字] nɪ^1 (S. 5081 R. 31 1.30) near; relatives
    [字] nɪn^1 (S. 1235 R. 37 1.36) near; relatives

183. [字] khɪ^1 (S. 2989 R. 31 1.30) foot
    [字] khɪn^1 (S. 4717 R. 37 1.36) foot

184. [字] khɪ^1 (S. 1878 R. 31 1.30) relatives, descendants, offsprings
    [字] khɪn^1 (S. 2083 R. 37 1.36) relatives

185. [字] gɪ^2 (S. 4052 R. 31 2.28) stream, valley
    [字] gɪn^1 (S. 4053 R. 37 1.36) stream, valley

186. [字] tsʵwɪ^1 (S. 1608 R. 31 1.30) to knead with the fingers
    [字] tswɪ^1 (S. 4931 R. 31 1.30) to knead with the fingers
    [字] tswɪn^1 (S. 4928 R. 37 1.36) to knead with the fingers

187. [字] tshɪ^1 (S. 1387 R. 31 1.30) black goat

恍 tshɪ¹ (S. 1386 R. 31 1. 30) goat

恍 tshɪn² (S. 1384 R. 37 2. 33) goat, kid

188. 莪 sɪ² (S. 2058 R. 31 2. 28) to know; knowledge

穰 sɪn² (S. 1272 R. 37 2. 33) to know; knowledge

189. 鼥 ·ɪ¹ (S. 5020 R. 31 1. 30) broad, wide

醨 ·ɪn² (S. 5106 R. 37 2. 33) broad, wide

c. Alternation between R. 11 (–i) and R. 37 (–ɪn)

190. 颫 di² (S. 4155 R. 11 2. 10) to drink

颭 dɪn² (S. 4154 R. 37 2. 33) to drink

191. 颩 di² (S. 0461 R. 11 2. 10) ever

縱 dɪn² (S. 5817 R. 37 2. 33) ever

192. 縅 ni² (S. 3605 R. 11 2. 10) to hear

巖 nɪn² (S. 1835 R. 37 2. 33) to hear

193. 扁 khi¹ (S. 0277 R. 11 1. 11) to dry, to make dry

緻 khɪn¹ (S. 3491 R. 37 1. 36) to dry, to make dry

(cf. supra No. 16)

194. 搙 khi² (S. 0667 R. 11 2. 10) to cut

嶽 khɪn¹ (S. 2607 R. 37 1. 36) to cut

195. 縱 tsi² (S. 3761 R. 11 2. 10) to know, to understand

縱 tsɪn² (S. 3606 R. 37 2. 33) to know, to understand

We are now faced with a difficult task of exploring the nature of these alternations. The first problem to be solved is: Which one of the pair represents the original base form and which one represents the derived form. Fortunately, the clue to the solution is provided by the alternations we have studied under IV B (pp. 807 and 809), where we see that R. 11 (–i) alternates

with R. 70 (Sofronov's i̯ei, now revised as –i̯) and R. 31 (–ɪ) alternates with R. 64 (Sofronov's i̯e, now revised as –ɪ̯). Accordingly, if there is any alternation which involves R. 11 or R. 31, we can judge what the base form is according to whether they alternate simultaneously with R. 70 (–i̯) or R. 64 (–ɪ̯). Now it can be shown that one pair (No. 161) in group a. alternates with R. 70 and two pairs (Nos. 178 and 188) in group b. alternates with R. 64.

Group a. No. 161 㣲 bi¹ (R. 11) low   絲 bi̯¹ (R. 70) to lower

    綈 bi² (R. 11) low

    碲 bɪ¹ (R. 31) low

Group b. No. 178 眦 bɪ¹ (R. 31) high   胲 bɪ̯¹ (R. 64) to heighten

    尾 bɪn² (R. 37) high

No. 188 菣 sɪ² (R. 31) knowledge   � sɪ̯² (R. 64) knowledge

    攢 sɪn² (R. 37) knowledge

According to this phonological evidence, we can claim that in group a., where R. 11 (–i̯) alternates with R. 31 (–ɪ), the former is the base form and in group b., where R. 31 (–ɪ) alternates with R. 37 (–ɪn), the former is the base form too. In group c. (on p. 819), where R. 11 (–i̯) alternates with R. 37 (–ɪn), we assume the latter to be the base form, so that the three groups are clearly distinguished, The direction of these phonological changes can be formulated as follows:

Group a. R. 11 (–i̯) → R. 31 (–ɪ)

Group b. R. 31 (–ɪ) → R. 37 (–ɪn)

Group c. R. 37 (–ɪn) → R. 11 (–i̯)

There must be some phonological or morphological environment present in the language, so that the speaker will know which rule is to be applied and the hearer will know which rule has been applied. Otherwise it would be difficult to distinguish between the word 眦 bɪ¹ 'high' and 碲 bɪ¹ 'low', since they are homonyms in Tangut. The words 'high' and 'low' are different

in their base forms. It is a phonological rule which has caused the word 'low' to become homophonous with the base form of the word 'high'.

V. Alternation of Tones

In Tangut there are two tones, a level tone and a rising tone. Occasionally tones are found to have the function of distinguishing syntactic categories in words related in meaning and otherwise homophonous as is the case in Chinese. However, it must be noted that in the majority of cases where this occurs, it is difficult to tell what kind of role the tone has played in differentiating the words. Following are examples of words showing this kind of relationship. They are classified into three groups according to their relations with syntactic categories.

A. Level tone representing nouns and rising tone representing verbs

196. 兂 zu¹ (S. 1663 R. 1 1. 1) rope, cord

緱 zu² (S. 3534 R. 1 2. 1) bind with a rope

197. 鋶 khi¹ (S. 2668 R. 11 1. 11) knife, sword

揣 khi² (S. 0667 R. 11 2. 10) to cut (cf. supra No. 6)

198. 羕 gwi¹ (S. 5018 R. 11 1. 11) fur clothes, fur coat

蓏 gwi² (S. 1940 R. 11 2. 10) to put on clothes, to wear

(cf. supra Nos. 84 and 94)

199. 玀 lie¹ (S. 4755 R. 14 1. 14) trousers

蘿 lie² (S. 2081 R. 14 2. 12) to put on trousers

(cf. supra No. 149)

200. 敠 khwa¹ (S. 4488 R. 17 1. 17) an enclosure, a garden

緼 khwa² (S. 4050 R. 17 2. 14) to enclose, to surround

201. 鞾 sa¹ (S. 4839 R. 17 1. 17) a cord, a string of coins

綷 sa² (S. 1428 R. 17 2. 14) to tie, to bind, to connect

202. 纙 tŝêi¹ (S. 3387 R. 35 1. 34) cap, hat, ceremonial cap

藏 tŝêi² (S. 0209 R. 35 2. 31) to wear a cap

203. 飛 dźịei¹ (S. 1056 R. 36 1. 35) coldness, coolness; cold

櫩 dźịei² (S. 0601 R. 36 2. 32) become cold

204. 骰 dzai¹ (S. 5208 R. 38 1. 37) horseman

騾 dzai² (S. 4106 R. 38 2. 34) to ride a horse

205. 薂 sịwo¹ (S. 0784 R. 53 1. 51) whetstone, inkslab

鞉 sịwo² (S. 4452 R. 53 2. 44) to whet, to grind, to rub ink

206. 鞋 wạ¹ (S. 2695 R. 66 1. 63) shoulders

雕 wạ² (S. 4129 R. 66 2. 56) to carry on shoulder

鞋 wạ² (S. 0946 R. 66 2. 56) to carry on shoulder

207. 縱 kịạ¹ (S. 4639 R. 67 1. 64) song

縍 kịạ² (S. 3902 R. 67 2. 57) to sing

208. 疬 bẹi¹ (S. 2562 R. 68 1. 65) lance, spear

疬 bẹi² (S. 2932 R. 68 2. 58) to pierce, to bore a hole

However, there is also a verb form represented by the level tone, viz. 疬 bẹi¹ (S. 1368 R. 68 1. 65) to pierce, to bore a hole, to go through.

209. 鞋 zịẹi¹ (S. 3063 R. 70 1. 67) leather shoes, boots

鞋 zịẹi² (S. 2072 R. 70 2. 60) to put on shoes

210. 懂 ·ịạ¹ (S. 1515 R. 87 1. 82) daughter-in-law

懓 ·ịạ² (S. 1516 R. 87 2. 74) to marry (into a family)

211. 鞌 dwẹ¹ (S. 0579 R. 90 1. 84) a burn

鞌 dwẹ² (S. 0580 R. 90 2. 76) to burn, to blaze

(cf. supra No. 24)

212. 縱 tśi̯u̯o¹ (S. 4256 R. 96 1. 90) mud, mire

      縱 tśi̯u̯o² (S. 4258 R. 96 2. 81) to plaster, to paste

B. Level tone representing verbs and rising tone representing nouns

213. 籠 si̯u¹ (S. 1967 R. 3 1. 3)   to keep in a box or in a
                                 wardrobe

      籭 si̯u² (S. 1966 R. 3 2. 3)   a box, a wardrobe

214. 礀 me¹ (S. 0520 R. 12 1. 12) to be fragrant, aromatic

      蘺 me² (S. 3684 R. 12 2. 11) a fragrance, aroma

215. 縱 śi̯waɯ¹ (S. 3656 R. 21 1. 21) to tie a girth to a saddle

      縱 śi̯waɯ² (S. 5367 R. 21 2. 18) girth

216. 益 nâi¹ (S. 2619 R. 42 1. 41) to be unclean

      益 nâi² (S. 4536 R. 42 2. 36) dirt, mucus

217. 縱 dźi̯o¹ (S. 1591 R. 50 1. 48) to pierce, to bore a hole

      縱 dźi̯o² (S. 3991 R. 50 2. ?) a hole (This is a rising tone
                                 word corresponding to 1. 48. cf.
                                 supra Nos. 19 and 40).

218. 襤 thwo¹ (S. 2998 R. 51 1. 49) to sole

      襤 tho² (S. 2996 R. 51 2. 42) the sole of the boot

219. 斋 gi̯u¹ (S. 1120 R. 62 1. 59) to support; a pillar, a post

      蘺 gi̯u² (S. 0859 R. 62 2. 52) a pillar, a post

220. 茫 tɪa¹ · (S. 2748 R. 67 1. 64) to decorate, to ornament

      縱 tɪa̤² (S. 2782 R. 67 2. 57) decoration, ornament

221. 縱 tɪei¹ (S. 2779 R. 70 1. 67) to put, to place

      縱 tɪei² (S. 2778 R. 70 2. 60) a place

222. 礀 we̤¹ (S. 1241 R. 82 1. 77) to decorate, to adorn,

to ornament

顳 we² (S. 0425 R. 82 2. 71) decoration, adornment,

ornament

223. 縱 ŋəɯ¹ (S. 3618 R. 93 1. 87) to count

骸 ŋəɯ² (S. 4915 R. 93 2. 78) a number

224. 嶐 tśi̯u̯o¹ (S. 1887 R. 96 1. 90) to make dirty, to disgrace

縱 tśi̯u̯o² (S. 3786 R. 96 2. 81) dirt

At first sight it might seem strange that groups A and B are exactly opposite. In group A nouns are signaled by the level tone, whereas in group B, they are signaled by the rising tone. For verbs the reverse is the case. However, it must be noted that in Chinese there is a similar phenomenon. Compare the Tangut words with their Chinese counterparts (Ancient Chinese tones are marked by figures):

198.	蕤	gwi¹	fur clothes	衣	·ẹi¹	clothes
	巍	gwi²	to put on clothes		·ẹi³	to put on clothes
202.	緂	tśêi¹	cap	冠	kuân¹	a cap
	霰	tśêi²	wear cap		kuân³	to cap
204.	嶽	dzai¹	horseman	騎	gji̯ẹ¹	to ride
	羝	dzai²	to ride		gji̯ẹ³	horseman
205.	𥪰	si̯wo¹	inkslab	研	ŋien¹	to grind
	𥵝	si̯wo²	to rub ink, to grind	硯	ŋien³	inkslab

In the first two Chinese examples, level tones represent nouns, whereas departing tones represent verbs. In the last two examples, the reverse is the case.

C. Tone alternation without clear relation to syntactic categories

225. 緱 gu¹ (S. 3844 R. 1 1. 1) to coordinate

縄 gu² (S. 3529 R. 1 2. 1) together

226. 羝 tshịwu¹ (S. 5415 R. 3 1. 3) blue

新 tshịwu² (S. 5406 R. 3 2. 3) blue

227. 肜 ŋwu¹ (S. 0451 R. 5 1. 5) language, speech

荒 ŋwu¹ (S. 2002 R. 5 1. 5) language, speech

謝 ŋwu¹ (S. 4633 R. 5 1. 5) to say, to speak

訶 ŋwu² (S. 4597 R. 5 2. 5)[17] language

228. 媾 vịe¹ (S. 3715 R. 10 1. 10) host, guest

繇 vịe² (S. 3854 R. 10 2. 9) host

229. 覗 tŝhịe¹ (S. 3110 R. 10 1. 10) the root, the origin

舵 tŝhịe² (S. 3109 R. 10 2. 9) the root, the origin

230. 緻 bi¹ (S. 3592 R. 11 1. 11) low, below, down, inferior

狨 bi² (S. 3591 R. 11 2. 10) low, below, down, inferior

231. 緩 gwi¹ (S. 3845 R. 11 1. 11) word, sentence, language

緩 gwi² (S. 3815 R. 11 2. 10) word, sentence, language

232. 緱 si¹ (S. 4192 R. 11 1. 11) to come to an end,

to be exhausted

佯 si² (S. 3144 R. 11 2. 10) to die

233. 蕭 phịe¹ (S. 1035 R. 14 1. 14) send on an errand

蕤 phịe² (S. 1037 R. 14 2. 12) go on an errand

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17 Sofronov reconstructs ngu¹ (ŋu¹ in my notation) and gives 1. 10 as its rime
number. However, the character is contained in the rime 2. 5 in the WH
(W. 3249). In the TY, it is placed in the same group with the rime 1. 5 for
which Sofronov reconstructs ngwu¹ (ŋwu¹ in my notation).
It is placed immediately after 肜 ŋwu¹ "language, speech" and is annotated
繹能 "the same meaning (as the preceding character)". In the WH "Chinese
language" is sometimes rendered as " 緻肜 " (as in WH 862) and sometimes
as " 緻訶 " (as in WH 1333), showing that 肜 and 訶 are alternative forms.

234. 潃 la¹   (S. 4659 R. 17   1. 17) to weave
     燚 la²   (S. 3886 R. 17   2. 14) to weave

235. 愞 la¹   (S. 1451 R. 17   1. 17) truth, sincerity, honesty
     恍 la²   (S. 1449 R. 17   2. 14) truth

236. 粄 la¹   (S. 1748 R. 17   1. 17) small
     蒳 la²   (S. 0873 R. 17   2. 14) small

237. 罷 tha¹   (S. 4310 R. 20   1. 20) that, it
     耗 tha²   (S. 5423 R. 20   2. 17) that, it
     靴 tha²   (S. 5432 R. 20   2. 17) that, it

238. 稣 ni̯aɯ¹ (S. 4479 R. 21   1. 21) black
     緅 ni̯aɯ¹ (S. 4269 R. 21   1. 21) mud, sediment
     緂 ni̯aɯ² (S. 3186 R. 21   2. 18)[18] excrement, dung

239. 脒 gaɯ¹   (S. 0339 R. 22   1. 22) to become thin
     霶 gaɯ²   (S. 5189 R. 22   2. 19) thin

240. 帗 ma¹   (S. 1376 R. 24   1. 23) big
     靴 ma²   (S. 0968 R. 24   2. 21) big

241. 旅 bə¹   (S. 2034 R. 28   1. 27) worm, insect; cotton
     夐 bə²   (S. 5789 R. 28   2. 25) worm, insect

242. 脵 lə¹   (S. 0272 R. 28   1. 27) to cover over, to hide from view
     綏 lə²   (S. 4047 R. 28   2. 25) to cover over, to hide from view

243. 稱 thɿ¹   (S. 4801 R. 31   1. 30) tail, end
     蘁 thɿ²   (S. 4898 R. 31   2. 28) tail, end, the hips

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18 Sofronov reconstructs ni̯e and indicates the rime number to be 2. 12.
   However the character is contained in the rime 2. 18 in the WH (W. 3648).
   The sound value ni̯aɯ is given here according to Sofronov's reconstruction
   for R. 21 as -i̯aɯ (Sofronov 1968: I, 136).

244. 𗂯 swɪ¹ (S. 4638 R. 31 1. 30) who

    𗂭 swɪ² (S. 4593 R. 31 2. 28) who

245. 𗋽 ·ɪ¹ (S. 5050 R. 31 1. 30) to say that, to call

    𗋿 ·ɪ² (S. 4979 R. 31 2. 28) to say that, to call

246. 𗎩 bei¹ (S. 1661 R. 34 1. 33) to bind, to tie up

                                      (cf. supra No. 13)

    𗎪 bei² (S. 2775 R. 34 2. 30) to bind, to tie up

247. 𗂮 kêi¹ (S. 0353 R. 35 1. 34) compel to come

    𗂰 kêi² (S. 0345 R. 35 2. 31) compel to come

248. 𗣼 vi̯ei¹ (S. 0170 R. 36 1. 35) there is/are

    𗤂 vi̯ei² (S. 1567 R. 36 2. 32) there is/are

249. 𗤌 mɪn¹ (S. 3510 R. 37 1. 36) no, not

    𗤍 mɪn² (S. 0375 R. 37 2. 33) not, not yet

250. 𗤎 nɪn¹ (S. 1872 R. 37 1. 36) tail, end

    𗤏 nɪn² (S. 2380 R. 37 2. 33) tail, end

    𗤐 nɪn² (S. 2370 R. 37 2. 33) tail, end

251. 𗤑 sɪn¹ (S. 0187 R. 37 1. 36) disposition, temper

    𗤒 sɪn² (S. 1272 R. 37 2. 33) affection, feelings, knowledge

252. 𗤓 lɪn¹ (S. 4817 R. 37 1. 36) ashamed, shy

    𗤔 lɪn² (S. 4818 R. 37 2. 33) ashamed, shy

253. 𗤕 mi̯e¹ (S. 2375 R. 40 1. 39) tail, end, the lower part

    𗤖 mi̯e² (S. 0288 R. 40 2. 35) end, back, the lower part

254. 𗤗 tshi̯e¹ (S. 2777 R. 40 1. 39) to stay, to speak

    𗤘 tshi̯e² (S. 2545 R. 40 2. 35) to stay, to speak

255. 𗤙 li̯e¹ (S. 3497 R. 40 1. 39) to stay, to wait awhile

    𗤚 li̯e² (S. 2266 R. 40 2. 35) to stay, to wait awhile

256. 順 dzįe¹ (S. 1360 R. 43 1. 42) adultery, copulation

剴 dzįe² (S. 0585 R. 43 2. 37) adultery, copulation

257. 彶 leɯ¹ (S. 1075 R. 44 1. 43) one

綨 leɯ¹ (S. 3603 R. 44 1. 43) only

舵 leɯ² (S. 5087 R. 44 2. 38) same, one and the same

258. 酕 do¹ (S. 1100 R. 51 1. 49) poison

皺 do² (S. 3225 R. 51 2. 42) poison

259. 憢 kô¹ (S. 1432 R. 52 1. 50) compel to come

菣 kô² (S. 1929 R. 52 2. 43) compel to come

260. 懝 lwon¹ (S. 1415 R. 56 1. 54) to be lazy, to be slow

懕 lwon² (S. 1411 R. 56 2. 47) to be lazy, to be slow

261. 豵 tśôn¹ (S. 5547 R. 57 1. 55) to assemble, to amass

纙 tśôn² (S. 3892 R. 57 2. 48) many

262. 秡 śįwon¹ (S. 5411 R. 58 1. 56) to shoot, to discharge,
to send forth

譈 śįwon² (S. 4662 R. 58 2. 49) to shoot, to discharge,
to send forth

263. 舠 twụ¹ (S. 1827 R. 61 1. 58) straight, upright, direct

葋 twụ² (S. 1826 R. 61 2. 51) direct

264. 薢 lwụ¹ (S. 2036 R. 61 1. 58) to mix

藞 lwụ² (S. 2038 R. 61 2. 51) to mix

265. 滲 zįe̱¹ (S. 1566 R. 64 1. 61) to hinder, to stop,
to hit the target

毿 zįe̱² (S. 2810 R. 64 2. 54) to hinder, to stop, to collect tax

266. 縋 tị¹ (S. 2705 R. 65 1. 62) to close up, to stop up

絈 tị² (S. 2730 R. 65 2. 55) to close up, to stop up

267. 憁 laꞵ¹ (S. 1485 R. 66 1. 63) thick, dense

    懤 laꞵ² (S. 1486 R. 66 2. 56) thick, dense

268. 剎 thɪə̣¹ (S. 3520 R. 72 1. 69) to roll up, to curl up[19]

    秅 thɪə̣² (S. 4807 R. 72 2. 61) to roll up, to curl up[19]

269. 舵 ·wọn¹ (S. 2350 R. 74 1. 71) round, yard, enclosure, hall,

                              college

    菈 ·wọn² (S. 0792 R. 74 2. 63) garden, orchard

270. 嫒 ·i̯ụ¹ (S. 4292 R. 81 1. 76) to feed, to rear, to take care

    孇 ·i̯ụ² (S. 4293 R. 81 2. 70) to feed, to rear, to take care

271. 虪 reꞵ¹ (S. 5017 R. 82 1. 77) a string, a chord

    翩 reꞵ² (S. 5114 R. 82 2. 71) a long and narrow object

272. 羺 riɛ̣¹ (S. 4911 R. 84 1. 79) to attain, to obtain, to acquire

    嗙 riɛ̣² (S. 0309 R. 84 2. 72) to attain, to obtain, to acquire

273. 瑞 żaꞵ¹ (S. 0639 R. 85 1. 80) ashamed, shy

    粍 żaꞵ² (S. 1770 R. 85 2. 73) ashamed, shy

274. 蹴 dwə̣¹ (S. 0373 R. 90 1. 84) enemy, to strike, to fight

    聑 dwə̣² (S. 0323 R. 90 2. 76) enemy, opponent, to meet

275. 縱 nə̣¹ (S. 5093 R. 90 1. 84) yellow

    姦 nə̣² (S. 5079 R. 90 2. 76) yellow

276. 詂 ŋwə̣¹ (S. 5407 R. 90 1. 84) blue

    皖 ŋwə̣² (S. 0459 R. 90 2. 76) blue

277. 姃 ·i̯ə̣¹ (S. 3415 R. 92 1. 86) to ask

    甄 ·i̯ə̣² (S. 4999 R. 92 2. 77) to ask

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19 As nouns, both words refer to a soft whitish cloth, woven from a cocoon-like fruit, and brought from 高昌 Karakhodjo.

278. 𘓺 ri̯u¹ (S.0221 R.96 1.90) to attain, to obtain, to acquire

𘓺 ri̯u² (S.0176 R.96 2.81) to attain, to obtain, to acquire

279. 𗂼 kha¹ (S.1738 R.17 1.17) in, middle = W.570

kha² (S.1738 R.17 2.14) in, middle = W.3548

280. 𗇕 kwaɯ¹ (S.2474 R.22 1.22) earthenware basin = W.792

kwaɯ² (S.2474 R.22 2.19) earthenware basin = W.3666

281. 𗟦 bêi¹ (S.3913 R.35 1.34) family name = W.1238

bêi² (S.3913 R.35 2.31) family name = W.3949

282. 𗾿 dɪn¹ (S.4545 R.37 1.36) to rob, to steal = W.5104

dɪn² (S.4545 R.37 2.33) to rob, to steal = W.4021

283. 𘀗 lɪ̯e¹ (S.1381 R.64 1.61) to come, to arrive = W.1906

lɪ̯e² (S.1381 R.64 2.54) to come, to arrive = W.4592

284. 𗤗 do̯n¹ (S.0068 R.74 1.71) sister = W.2184

dôn² (S.0068 R.57 2.48) sister = W.4445

A glance at the list and one will find that there are many basic words involved in tone alternation. This is a very conspicuous thing and needs an explanation. In a study of Chinese loanwords in Tangut, the following words are found to have both tones in Tangut:

285. 𗬫 li̯on¹ (S.2559 R.58 1.56) dragon, from Anc. Ch.

龍 ₀li̯wong

𗖉 li̯on² (S.0704 R.58 2.49) dragon, in 'dragon cypress flower' 龍栢花

286. 𘄷 xan¹ (S.1761 R.25 1.24) Chinese, from Anc. Ch. 漢 xân°

𗣼 xan² (S.2639 R.25 2.22) Han dynasty, from Anc. Ch. 漢 xân°

287. 𘄂 tśi̯e¹ (S.5572 R.10 1.10) to arrive, from Anc. Ch. 至 tśi°

兹 tśi̯e² (S.0151 R.10 2.9) the winter solstice, from Anc.
Ch. 至 tśi° as in 多至

288. 𗀈 lwɪ¹ (S.4271 R.31 1.30) tear＝W. 1122, from Anc. Ch.
淚 ljwi°

lwɪ² (S.4271 R.31 2.28) tear＝W. 3877, from Anc. Ch.
淚 ljwi°

Since no regular correspondence in tone has been found between Chinese
and its loanwords in Tangut, it is impossible to decide, on the basis of the
Chinese source, which tone is the base form and which tome is the derived
form. However there are some instances where a tone difference may be
interpreted as reflecting a difference in usage (alone or in combination).
The Tangut word for 'sink' is dɪ̯ei¹, which is in level tone. But in a
semantic borrowing from Chinese word 沈香 'heavy incense, lignaloes'
(literally: sink fragrance) it is rendered as dɪ̯ei², which is in rising tone.
The tone has changed from 'level' to 'rising'.

289. 𗤘 dɪ̯ei¹ (S.4289 R.70 1.67) to sink
𗤄 dɪ̯ei² (S.0925 R.70 2.60) 'to sink' as a translation
loanword

Similarly, if we take the Chinese loanwords 𗦳 lɪ̯on¹ 'dragon' and 𗤥
tśi̯e¹ 'arrive', which are both in level tone, as basic forms, we can observe
the same phenomenon of tone change, causing the level tone to become
rising tone in compound words 𗤄𗦳𗤥 lɪ̯on² pê¹ vi̯a¹ 'dragon cypress flower'
(from Anc. Ch. 龍栢 ₒlɪwong pɐkₒ) and 𗀈兹 toɳ¹ tśi̯e² 'winter solstice'
(from Anc. Ch. 多至 ₒtuong tśi°).

basic tone (level)	derived tone (rising)
𗤘 dɪ̯ei¹ ·········→	𗤄 dɪ̯ei²
𗦳 lɪ̯on¹ ·········→	𗤄 lɪ̯on²
𗤥 tśi̯e¹ ·········→	兹 tśi̯e²

This explanation of tone change is highly hypothetical and we do not know whether it can be applied to other cases or not.

VI. Concluding Remarks

Tangut is an ancient language spoken in the northwestern area of China around the 11th century. It is a dead language, and is preserved in a writing system which took Chinese characters as its model. In this writing system each morpheme is represented by an independent character, and as a result, certain important characteristics of the language have been concealed. For if there is a word which is derived from another word in accordance with a morphological rule in the language, this fact would be in no way revealed in the script. It is through the reconstruction of the sound system and a careful study of the related words that morphological or phonological processes in the language are brought to light. In this paper I have studied phonological alternations in Tangut, based on systematic correspondences between initials, medials, finals, and tones. I have discovered variors sorts of correspondences and have tried to interpret them in terms of phonological rules. Where it is impossible to state the alternations in phonetic terms due to the disagreement in different systems of reconstruction, I have stated the case in terms of rime categories. I have not always been successful in discovering the conditioning factors in the alternations. It is hoped that further study of their usage in texts will help to clarify them.

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摘　　要

西夏字書文海、文海雜類與同音是研究西夏語的重要資料。作者撰寫本論文的目的是（一）根據這些字書探索西夏語的同源詞（二）使用蘇聯索孚洛諾夫（M. V. Sofronov）的擬音描述這些同源詞音韻轉換的型式。

本文探討西夏語的音韻轉換，共分四個項目：聲母、介音、韻母、及聲調。舉了二百八十九組音韻轉換的例子。