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The Phonological Reconstruction of Tangut through Examination of Phonological Alternations

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The study of phonological alternations in Tangut is a field which has not yet been well explored. This paper presents 27 sets of phonological alternations (consisting of 96 pairs of examples) and tries to interpret them in terms of regular morphological and syntactical processes. These phonological alternations are accordingly classified in three categories, each connected with a rule in Tangut morphology and syntax. Since these alternations are viewed as morphological and syntactic phenomena, which are supposed to be rule-governed, they can be used as criteria for evaluating different phonetic reconstructions.

Various reconstructions of the Tangut language which have been put forward up to now are tested to see whether they can reveal regularities in Tangut Grammar.

At the end of the paper, a revision of the reconstruction of some rhymes is offered, purporting to explain all the related facts: foreign transcriptions, the order of rhymes in the rhyme dictionary, morphological and syntactic rules. The paper also purposes to provide a basis for a comparative study in the Sino-Tibetan linguistics and tries to offer an explanation how the complicated Tangut vowel system can evolve out of a simple vowel system of the Sino-Tibetan common language.

1. Introduction

Ever since the discovery of Tangut materials at the beginning of this century, attempts have been made to reconstruct the phonology of the Tangut language. Studies made by Sofronov and Kyčanov (1963), Nishida (1964), Hashimoto (1965), Sofronov (1968) and Huang (1983) can be counted among those aiming at giving a systematic reconstrution. The first three appeared one after another within three years. Taking into consideration the time needed for study and publication, it can be assumed that these studies were all made independently of each other, and no mutual influence has

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been traced in these works. It would therefore be interesting to compare their reconstructions and see how these authors, based on practically the same data and following similar methods, arrived at quite different conclusions.

These three studies have the following characteristics in common:

a. The reconstructions of finals are all based on the overall rhymes. As is generally known, Tangut has two tones, the level tone contains 97 rhymes, whereas the rising tone contains 86 rhymes. Research in the correspondences between the two tones was started by Hashimoto (1963) and was later furthered by other scholars. In the above-mentioned works, Hashimoto (1965) assumed 98 rhymes, Sofronov and Kyčanov (1963) 105 rhymes, and Nishida (1964) 100 rhymes (Nishida excluded the last two rhymes of the level tone on the grounds that the data is too scanty to draw any conclusions).

b. The assignment of sound values is mainly based on Chinese and Tibetan transcriptions.

c. All three authors investigated the principles governing the arrangement of rhymes in the rhyme dictionary before they started to do reconstruction. All assumed that the rhymes which are placed together form rhyme groups (*She* 攝) and began with the work of grouping them. But the number of rhyme groups they arrived at differ greatly from each other: Sofronov and Kyčanov (1963:76) got 15 groups, Nishida (1964:67) 22, and Hashimoto (1965:118)32.

The most significant divergence in reconstructions lies in the assignment of sound values. Nishida (1964) distinguishes between lax and tense vowels as well as retroflex and non-retroflex vowels, whereas Hashimoto (1965) assumes a difference in vowel length. The reconstruction of Sofronov and Kyčanov (1963) is characterized by their adoption of diacritical marks indicating fine phonetic distinctions. They claim that rhymes are arranged on cyclic principle and distinguish 4 cycles of rhymes: a big cycle and three small cycles. Different views on the sound structure of Tangut and

the arrangement of rhymes in the rhyme dictionary together with the difference in the assignment of sound values to individual rhymes have led to quite divergent reconstructions by the authors mentioned above.

Sofronov (1968) presents an improved system on the former studies. He contends that the transcription data on which reconstruction is based represent the Tangut language on the last decade of the 12th century and that the vowel system of Tangut at that time already deviated from the earlier system represented in the Tangut rhyme dictionary *Wen-hai*[1]. In his rhyme table[2] he reconstructs the finals for both the *Wen-hai* period and for the 12th century. However, in the index of Tangut characters at the end of the book[3], he only gives the reconstruction for the latter period. This is the reason why different rhymes in the *Wen-hai* are sometimes assigned the same sound values in his reconstruction.

The reconstruction of Huang (1983)[4], which comes last, differs from the others in that he does not base his reconstruction on the overall rhymes, but recontructs only words belonging to the level tone, for which *fan-ch'ieh* materials are available. Huang (1983) does not seem to care about the problem of the arrangement of rhymes. He relies exclusively on transcription data and assigns a sound or sounds to each chain of final spellers as he regards appropriate. He does not follow the principle of one vowel for one rhyme, which has been tacitly assumed by other investigators for the obvious reason that in order for different words to rhyme with one another, they must have the same vowel.

All the above studies seem to suffer from a common shortcoming, namely they have not taken into consideration the relationship among rhymes, reflected in the phonetic compounds of the Tangut characters and phonological alternations. The reason for this shortcoming is that it is

1 Sofronov 1968, Vol. I, pp. 89-90.
2 *Ibid.*, pp. 136-138.
3 *Ibid.*, Vol. II, pp. 276-403.
4 Shi Jin-bo *et al*, 1983, pp. 65-134.

difficult, if not impossible, to study phonetic compounds of Tangut characters and phonological alternations among rhymes without previously establishing a reconstruction system.

However, this is not necessarily a vicious circle. Theoretically, the study of phonetic compounds and phonological alternations can be conducted on the basis of systematic correspondence between classes of initial and finals, which can be deduced through the study of *fan-ch'ieh*. Once the sound relationship has been established, we can use it to test whether a reconstruction is adequate or not. The sound relationship can thus be used as criteria for evaluating different reconstructions.

Hitherto the study of Tangut phonetic compounds has not been systematically carried out and the study of phonological alternations is just in a preliminary stage. In this paper I will present 27 sets of phonological alternations (consisting of 96 pairs of examples) and try to interpret them in terms of regular morphological and syntactic processes. Since these alternations are rule-governed, they are used as criteria for evaluating different reconstructions and as a basis for improving them.

2. Phonological Alternations in Tangut

The reconstructed forms cited in this study are based on Sofronov (1968: II, 276-403) with some partial revisions proposed in Gong (1981a, 1981b, 1981c). Wherever the reconstructions of individual words are different from that of the table of reconstructions cited in Sofronov (1968: I, 136-138), I have made corrections in accordance with the latter. Each Tangut character is followed by Sofronov's reconstructions with numeral 1 and 2 indicating level and rising tone respectively. The number in brackets prefixed with S. refers to Sofronov's index number. Following that, the number prefixed with R refers to the overall rhyme number. This number is followed by the number indicating tones (1 for level tone and 2 for rising tone) and the number indicating the rhyme number in that tone. All the

examples cited in this study are numbered throughout. The lower case alphabet each designates a different correspondence.

2.1 Alternations between lax vowels

a. Alternation between R10 $\begin{bmatrix}1.10\\2.9\end{bmatrix}$ i̭e and R53 $\begin{bmatrix}1.51\\2.44\end{bmatrix}$ i̭o

1. [Tangut] vi̭e^{1} (S. 2413 R10 1.10) to do, to act, to make
   [Tangut] vi̭o^{1} (S. 3666 R53 1.51) to do, to act, to make

2. [Tangut] vi̭e^{1} (S. 2409 R10 1.10) to send out, to employ, to use
   [Tangut] vi̭o^{1} (S. 2411 R53 1.51) to send out, to employ, to use

3. [Tangut] dzɪ̭e^{1} (S. 0524 R10 1.10) to eat
   [Tangut] dzɪ̭o^{1} (S. 0479 R53 1.51) to eat

Sofronov does not give the reconstruction for [Tangut], nor does he indicate to which rhyme it belongs. In the rhyme dictionary *Wen-hai*, it is given the spelling [Tangut] dzɪ̭e^{1} (S. 0524 1.10) [Tangut] tsɪ̭o^{1} (S. 2527 1.51), giving the reconstruction dzɪ̭o^{1} (1.51).

4. [Tangut] ži̭e^{2} (S. 5467 R10 2.9) to trade, to sell
   [Tangut] ži̭o^{2} (S. 1049 R53 2.44) to trade, to sell

For the first character above, Sofronov reconstructs ži̭ə without indicating its rhyme affiliation. This reconstruction seems to be based on the Chinese transcription 日識[5] in the *Chang-chung-chu* (344), with the first character transcribing the Tangut initial and the second the Tangut final. Since the Chinese character 識 is also used in transcribing Tangut [Tangut] śi̭e^{2}, which belongs to rhyme 2.9, I feel that the character [Tangut] should also belong to the same rhyme. Sofronov's reconstruction ži̭ə is accordingly corrected as ži̭e^{2}. As for the second character [Tangut], Sofronov's original reconstruction

5 In the *Chang-chung-chu* copied by Lo Fu-ch'eng, the Chinese transcription is erroneously written as 識. This error has been taken over in Nersky (1960:I, 386) as well as in Nishida (1964; I, 220). The photographed edition in Kwanten (1982;222, 259) shows the original transcription to be 日識.

žəɯ is here corrected as ži̯o^{2} to make it consistent with his reconstruction for rhyme 2.44 in the table.

b. Alternation between R11 〔1.11–2.10〕 i and R53 〔1.51–2.44〕 i̯o

5. [Tangut] phi^{1} (S. 0447 R11 1.11) to cause, to make

   [Tangut] phɪ̯o^{2} (S. 0529 R54 2.44) to cause, to make

6. [Tangut] mi^{1} (S. 2062 R11 1.11) to hear

   [Tangut] mɪ̯o^{1} (S. 2015 R11 1.51) to hear

7. [Tangut] mi^{1} (S. 0490 R11 1.11) to feed

   [Tangut] mɪ̯o^{1} (S. 0482 R53 1.51) to feed

8. [Tangut] mi^{2} (S. 3760 R11 2.10) to understand, to know

   [Tangut] mɪ̯o^{2} (S. 3770 R53 2.44) to understand, to know

9. [Tangut] ti^{1} (S. 5226 R11 2.10) to leave (behind)

   [Tangut] tɪ̯o^{2} (S. 5766 R53 2.44) to leave (behind)

Sofronov does not give his reconstruction for [Tangut], but only indicates its rhyme affiliation to be 2.44 and its initial category to be dentals. Here it is reconstructed as tɪ̯o^{2} on the basis of the phonological alternation. This reconstruction fits all the known data.

10. [Tangut] gwi^{2} (S. 1940 R11 2.10) to wear, to put on (clothes)

    [Tangut] gi̯o^{2} (S. 3616 R53 2.44) to wear, to put on (clothes)

11. [Tangut] sɪ̯wi^{1} (S. 4189 R11 1.11) to be poor, to be exhausted, to come to an end

    [Tangut] sɪ̯wo^{2} (S. 1110 R53 2.44) to be poor, to be exhausted, to come to an end

c. Alternation between R36 [1.35 / 2.32] i̯ei and R53 [1.51 / 2.44] i̯o

12. [Tangut] dźi̯ei^{2} (S. 5753 R36 2.32) to have

    [Tangut] dźi̯o^{2} (S. 4920 R53 2.44) to have

13. 蘞 tśhi̯ei¹ (S. 0690 R36 1.35) to take away, to carry off
    
    tśhi̯o² (S. 0308 R53 2.44) to take away, to carry off

14. 蘕 tśhi̯ei¹ (S. 1783 R36 1.35) to walk
    
    tśhi̯o¹ (S. 0874 R53 1.51) to walk

15. 蘻 tśhi̯ei¹ (S. 0205 R36 1.35) to raise, to elevate
    
    tśhi̯o¹ (S. 0728 R53 1.51) to raise, to elevate

d. Alternation between R37 $\begin{bmatrix}1.36\\2.33\end{bmatrix}$ ɪn and R53 $\begin{bmatrix}1.51\\2.44\end{bmatrix}$ i̯o

16. nɪn² (S. 1607 R37 2.33) in former days, in old times
    
    nɪ̯wo² (S. 4612 R53 2.44) in former days, in old times

17. nɪn² (S. 0441 R37 2.33) words
    
    nɪ̯wo² (S. 4630 R53 2.44) words

18. sɪn² (S. 1272 R37 2.33) to know; knowledge
    
    sɪ̯o² (S. 0063 R53 2.44) to know; knowledge

19. swɪn¹ (S. 4733 R37 1.36) to grind, to whet
    
    sɪ̯wo² (S. 4452 R53 2.44) to grind, to whet

e. Alternation between R3 $\begin{bmatrix}1.3\\2.3\end{bmatrix}$ i̯u and R53 $\begin{bmatrix}1.51\\2.44\end{bmatrix}$ i̯o

20.  si̯u¹ (S. 1967 R3 1.3) to carry in the bosom
    to store up, to hoard
    
    sɪ̯o¹ (S. 1969 R53 1.51) to carry in the bosom
    to store up, to hoard

21. pi̯u² (S. 0993 R3 2.3) to burn, to destroy
    by fire, to roast

    pɪ̯o¹ (S. 5503 R53 1.51) to burn, to destroy
    by fire, to roast

22. [illegible] pi̭u^{2} (S. 5502 R3 2.3) family name

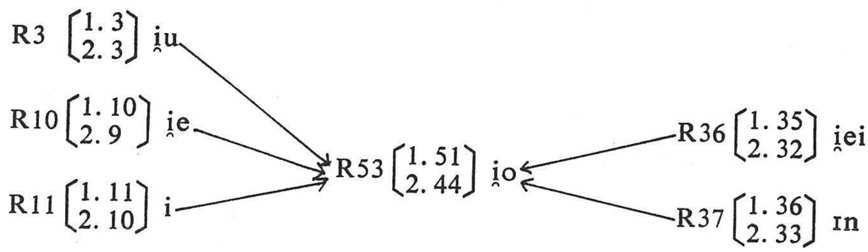
[illegible] pɪ̭o^{1} (S. 5503 R53 1.51) to burn (a phonetic compound containing the phonetic [illegible] pi̭u^{2})

23. [illegible] khi̭u^{2} (S. 0734 R3 2.3) name of a tree

[illegible] ki̭o^{2}(khi̭o^{2}) (S. 5780 R53 2.44) a phonetic compound containing the phonetic [illegible] khi̭u^{2}

On the basis of the above alternations (from *a* to *e*), we can illustrate the relationship of the rhymes as follows:

Figure 1



In the figure 1 above, the alternation between R10, R11, R36, R37 on the one hand and R53 on the other reflects inflection of the verbs (see the discussion 3.5 below). As for the alternation between R3 and R53, we do not quite understand its nature. However, owing to the existence of two phonetic compounds, we assume that their finals must be very similar.

2.2 Alternations between tense vowels

f. Alternation between R70 [1.67 / 2.60] i̭ẹi and R75 [1.72 / 2.64] i̭ọn

24. [illegible] vi̭ẹi^{2} (S. 4996 R70 2.60) to understand, to learn, to be able to

[illegible] vi̭ọn^{2} (S. 0376 R75 2.64) to understand, to learn, to be able to

25. [illegible] tɪ̭ẹi^{1} (S. 0542 R70 1.67) to feed, to give to drink

[illegible] tɪ̭ọn^{1} (S. 1382 R75 1.72) to feed, to give to drink

26.	tɪ̭ẹi^1	(S. 2779 R70 1.67)	to put, to place
	tɪ̭ọn^1	(S. 2802 R75 1.72)	to put, to place
27.	tɪ̭ẹi^1	(S. 1981 R70 1.67)	to brew, to ferment
	tɪ̭ọn^1	(S. 1982 R75 1.72)	to brew, to ferment
28.	tɪ̭ẹi^1	(S. 0235 R70 1.67)	to pray, to sacrifice
	tɪ̭ọn^1	(S. 0213 R75 1.72)	to pray, to sacrifice
29.	dɪ̭ẹi^2	(S. 4561 R70 2.60)	to repair, to put in order, to cure
	dɪ̭ọn^2	(S. 1270 R75 2.64)	to repair, to put in order, to build
	dɪ̭ọn^2	(S. 1588 R75 2.64)	to repair, to put in order, to build
30.	gi̭wẹi^1	(S. 3792 R70 1.67)	to make to wear, to clothe (v. t.)
	gi̭ọn^1	(S. 4451 R75 1.72)	to make to wear, to clothe (v. t.)
31.	tśi̭ẹi^2	(S. 5204 R70 2.60)	to load, to carry
	tśi̭ọn^2	(S. 0269 R75 2.64)	to load 'to carry
32.	lɪ̭ẹi^2	(S. 5618 R70 2.60)	to unite, to join
	lɪ̭ọn^2	(S. 4511 R75 2.64)	to unite, to join
33.	lhi̭ẹi^2	(S. 2661 R70 2.60)	to destroy, to break
	lhi̭ọn^2	(S. 2760 R75 2.64)	to destroy, to break
34.	lhi̭ẹi^2	(S. 1099 R70 2.60)	to manufacture felt
	lhi̭ọn^2	(S. 2689 R75 2.64)	to manufacture felt

In Sofronov (1968) the first characters of Nos. 33 and 34 are reconstructed as lhi̯ə with no indication of their rhyme. In the *T'ung-yin* dictionary, they are listed as homonyms together with which is transcribed 力。 in the *Chang-chung-chu* (083). From this transcription it can be inferred that these characters must have been contained in the *Wen-hai-tsa-lei* (All the characters with the initial lh- are contained in this dictionary. The Chinese transcription 力。 implies that the transcribed Tangut character has the initial

1h). Because of the incompleteness of this dictionary, we do not possess their *fan-ch'ieh* data now. These characters are listed here on the basis of phonological alternations.

g. Alternation between R64 $\begin{bmatrix}1.61\\2.54\end{bmatrix}$ i̭e and R75 $\begin{bmatrix}1.72\\2.64\end{bmatrix}$ i̭ọn

35.  dɪ̭ẹ^{1} (S. 0131 R64 1.61) to grieve, to lament

 dɪ̭ọn^{1} (S. 0097 R75 1.72) to grieve, to lament

36.  tśi̭ẹ^{1} (S. 4609 R64 1.61) to follow, to let others ro take away

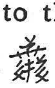
 tśi̭ọn^{1} (S. 1033 R75 1.72) to follow, to let others co take away

37.  zɪ̭ẹ^{1} (S. 4724 R64 1.61) time; when

 zɪ̭ọn^{2} (S. 2612 R75 2.64) time; when

38.  gɪ̭ẹ^{1} (S. 2582 R64 1.61) to cut, to cut with scissors

 gi̭ọn^{2} (S. 1534 R75 2.64) to cut, to cut with scissors

Sofronov does not give a reconstruction for the second character of No. 38, because it belongs to the rising tone, for which no *fan-ch'ieh* materials are available. The reconstruction for the words of the rising tone is based mainly on the first edition of the *T'ung-yin*, where words with the same initials and finals are placed together in a homophone group irrespective of tones. So we can learn the pronunciation of the rising tone words from the level tone words. But unfortunately, the character  gi̭ọn^{2} is an "isolated character" for which no homophones exist. For this word there are no transcription materials either. We know only that its initial belongs to velar category and its final to the rhyme 2.64. The reconstruction here is based on its alternation with  gɪ̭ẹ^{1} (1.61).

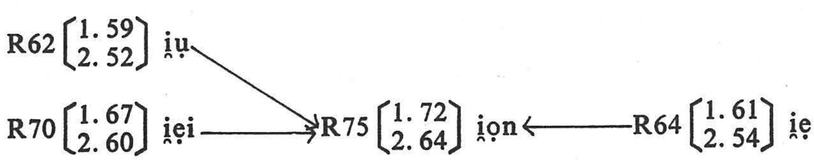
h. Alternation between R62 $\begin{bmatrix}1.59\\2.52\end{bmatrix}$ i̭u̯ and R75 $\begin{bmatrix}1.72\\2.64\end{bmatrix}$ i̭ọn

39. di̯ụ^{1} (S. 4564 R62 1.59) to grieve, to lament
    di̯ọn^{1} (S. 0097 R75 1.72) to grieve, to lament
40. lhi̯ụ^{2} (S. 5569 R62 2.52) to get, to acquire, to reach
    lhi̯ọn^{2} (S. 5054 R75 2.64) to get, to acquire, to reach
41. ni̯ụ^{2} (S. 2040 R62 2.52) to suckle, to nurse, to foster
    ni̯ọn^{2} (S. 0219 R75 2.64) to suckle, to nurse, to foster

Sofronov does not give a reconstruction of the two characters in No. 41. We know only that their finals belong to rhymes 2.52 and 2.64 respectively and that their initials belong to the dental category. They are here reconstructed as ni̯ụ^{2} and ni̯ọn^{2} on the basis of their alternations with ni̯u^{2} (2.3) "to suck". For the alternation between R3 and R62, see *j* below.

The alternations *f*, *g*, and *h* discussed in this section run parallel with the alternations *a*, *b*, *c*, *d*, and *e* discussed earlier. Their relations can be illustrated as follows:

Figure 2



2.3 Alternations between lax and tense vowels

i. Alternation between R53 [1.51 2.44] i̯o and R75 [1.72 2.64] i̯ọn

42. gi̯o^{2} (S. 3616 R53 2.44) to wear clothes
    gi̯ọn^{1} (S. 4451 R75 1.72) to make to wear clothes
43. si̯o^{1} (S. 5003 R53 1.51) long and slender (a phonetic compound)
    si̯ọn^{1} (S. 2690 R75 1.72) agriculture (a phonetic compound)

44.  dźi̭o² (S. 4920 R53 2.44) to have

 dźi̭ọn² (S. 0783 R75 2.64) ink (a phonetic compound containing the abbreviated form of the above character)

Although there is only one example (No. 42) for the alternation between lax and tense vowels, the function of this alternation is very clear, namely to form causative verbs. Examples Nos. 43 and 44 are phonetic compounds. They show that there is phonetic similarity between R53 and R75.

We will now take a look at various reconstructions hitherto proposed and see whether they can reflect phonetic similarity between these rhymes.

	Sofronov Kyčanov (1963)	Nishida (1964)	Hashimoto (1965)	Sofronov (1968)	Huang (1983)
R53	i̭ʌ	ĭɔɦ	jowN	i̭o	iõ, ĭõ, iɔ̃
R75	i̭or	ĭọ̃	əwN jəwN	i̭ọn	ian

Sofronov's R53 〔1.51–2.44〕 i̭o corresponds to Nishida's overall rhyme No. 52 〔1.51–2.44〕 ĭɔɦ and Hashimoto's M52 〔1.52–2.44〕 jowN. Sofronov's R75 〔1.72–2.64〕 i̭ọn corresponds to Nishida's No. 73 〔1.72–2.64〕 ĭọ̃ and Hashimoto's M72 〔1.71–2.64〕 əwN and M73 〔1.72–2.65〕 jəwN. Huang (1983) does not refer to the correspondences between level tone rhymes and rising tone rhymes, but only reconstructs the level tone rhyme. Reference to his reconstruction is based on his reconstruction for the level tone. Throughout this study Sofronov's overall rhyme numbers are used, but reconstructions are different authors'.

From the above table, it can be readily seen that Sofronov's (1968) reconstructions fit the data best. However, in the present study I propose to revise Sofronov's -i̭ọn as -i̭ọ, so that the alternation between R53 and R75 turns out to be -i̭o~i̭ọ (see §3.4 below), which is an alternation

between lax and tense vowels. According to this revision, the non-causative form ( gi̯o² "to wear clothes") would be represented by a lax vowel, whereas the causative form ( gi̯o̤¹ "to make to wear clothes") would be represented by a tense vowel. The same pattern of alternations can also be observed in the following alternation.

j. Alternation between R3 $\begin{bmatrix}1.3\\2.3\end{bmatrix}$ i̯u and R62 $\begin{bmatrix}1.59\\2.52\end{bmatrix}$ i̯ṳ

45. ni̯u² (S. 0473 R3 2.3) to suck the breast
 ni̯ṳ² (S. 2040 R62 2.52) to suckle, to nurse

46. gi̯u² (S. 2338 R3 2.3) to suffer, to work hard
 gi̯ṳ² (S. 2337 R62 2.52) to suffer, to work hard

47. di̯u¹ (S. 1354 R3 1.3) to complain, to accuse
 di̯ṳ¹ (S. 4564 R62 1.59) to lament, to grieve

48. di̯u¹ (S. 4918 R3 1.3) to have, there is
 di̯ṳ¹ (S. 4917 R62 1.59) family name (phonetic compound containing the abbreviated form of the above character)

Example No. 45 is clearly concerned with the formation of causative verb. No. 48 involves the use of phonetic compound. In addition to these, there are two things worthy of our notice: First,  tsi̯ṳ¹ (S. 4516 1.59), which belongs to R62, has  diu¹ (S. 4918 1.3), which belongs to R3, as its final speller. Secondly, in rhyme 1.59 (R62) there is a character which is formed on the *fan-ch'ieh* principle, as follows:

49.  bi̯ṳ¹ (S. 4823 R62 1.59) a character used in transcription, composed of bi̯ə 1.69+ pi̯u 2.3

 pi̯u² (S. 5502 R3 2.3) family name

These phenomena show that R3 and R62 must be similar in sound. If we now check the various reconstructions to see whether they can satisfy the condition of phonetic similarity, we can evaluate their merits and demerits (only in so far as the reconstructions of these two rhymes are concerned).

	Sofronov Kyčanov (1963)	Nishida (1964)	Hashimoto (1965)	Sofronov (1968)	Huang (1983)
R 3	Y	ĭuɦ	ju	i̭u	io, iɔ
R62	i̭ʷu	ĭụ	joɯ	i̭ụ̭	ïɯ, iuo

From this table, there will be no doubt that Sofronov's reconstructions can best explain all the data.

k. Alternation between R11 $\begin{bmatrix}1.11\\2.10\end{bmatrix}$ i and R70 $\begin{bmatrix}1.67\\2.60\end{bmatrix}$ i̭ẹi

50. [illegible] bi¹ (S. 3592 R11 1.11) low, below, down
[illegible] bi² (S. 3591 R11 2.10) low, below, down
[illegible] bɪ̭ẹi¹ (S. 5019 R70 1.67) to lower, to bend

51. [illegible] thi¹ (S. 0510 R11 1.11) to drink
[illegible] tɪ̭ẹi¹ (S. 0542 R70 1.67) to feed, to give, to drink

52. [illegible] gwi¹ (S. 1940 R11 2.10) to wear, to put on clothes
[illegible] gi̭wẹi¹ (S. 3792 R70 1.67) to make to wear, to clothe (v. t.)

53. [illegible] bi² (S. 0475 R11 2.10) bird song; to sing
[illegible] (bɪ̭ẹi) (S. 1795 R70 2.60) to incite, to instigate (a phonetic compound)

Nos. 50, 51, and 52 are clear cases of causative formation. The lax vowel represents the non-causative form, whereas the tense vowel represents

the causative form. No. 53 involves the use of a phonetic compound. This example shows that there is a phonetic similarity between R11 and R70.

Here again we can check the various reconstructions to see whether they can account for the phonological alternation as well as the phonetic compound.

	Sofronov Kyčanov (1963)	Nishida (1964)	Hashimoto (1965)	Sofronov (1968)	Huang (1983)
R11	i	-iɦ, -ʷiɦ	ɪ	i	ĩ, uĩ, iĩ
R70	i̯b̂l⊢	i̯, ʷi̯	jäj	i̯e̯i	ïɛ, ïə

Obviously, none of the above reconstructions is satisfactory. On the analogy of causative formation discussed above in *i* and *j*, I propose to reconstruct the final in R11 and R70 as i and i̯ respectively.

1. Alternation between R37 $\begin{bmatrix}1.36\\2.33\end{bmatrix}$ ɪn and R64 $\begin{bmatrix}1.61\\2.54\end{bmatrix}$ i̯e̯

54. [illegible] bɪn^2 (S. 1039 R37 2.33) high
    [illegible] bɪ̯e̯^{1} (S. 1232 R64 1.61) to heighten, to elevate, to promote
55. [illegible] sɪn^2 (S. 1272 R37 2.33) knowledge; to know
    [illegible] sɪ̯e̯^{2} (S. 4496 R64 2.54) knowledge, wisdom
56. [illegible] phɪn^1 (S. 3533 R37 1.36) to avoid (phonetic compound, containing the character below)
    [illegible] phɪ̯e̯^{1} (S. 1497 R64 1.61) to incline, to lean to one side
57. [illegible] bɪn^2 (S. 1234 R37 2.33) name of a diagram (phonetic compound, containing the character below)
    [illegible] bɪ̯e̯^{1} (S. 1233 R64 1.61) rich person

58. [Tangut graph] thɪn^{1} (S. 5270 R37 1.36) wilderness, desert

[Tangut graph] tɪ̭ẹ^{1} (S. 5269 R64 1.61) he (phonetic compound, containing the abbreviated form of the above character)

Nos. 54 and 55 are cases of phonological alternations. In No. 54 we have a contrast between the non-causative and the causative. Nos. 56, 57, and 58 are examples of phonetic compounds. In addition to this, there is a special phenomenon worthy of our notice, namely the graph [Tangut graph] lɪn^{1} (S. 2073 R37 1.36) is used as the final speller in spelling [Tangut graph] tši̭ẹ^{1} (S. 4609 R64 1.61) and 3 other homophonous graphs. This is to show that R37, for which Sofronov reconstructs -ɪn, and R64, for which Sofronov reconstructs -i̭ẹ, must have similar finals. Apparently, Sofronov's reconstruction here does not fit the data. The reconstructions of the other scholars for these two rhymes are as follows:

	Sofronov Kyčanov (1963)	Nishida (1964)	Hashimoto (1965)	Huang (1983)
R37	ɪ	-eɦ	jÄjN	iɛ
R64	i̭ɛ ⊢	-ɛ̣	je	iə̃, ïẽ

This table suggests that none of these reconstructions are appropriate. Since R37 -ɪn alternates also with R11 -i (see *o* below), and R64 -i̭ẹ alternates also with R70 -i̭ẹi (see *x* below), a reconstruction must take all these relations into consideration. (This paper proposes to reconstruct R37 as -ij and R64 as -i̭j. Their reconstructions will be discussed from various viewpoints in later sections.)

m. Alternation between R36 $\begin{bmatrix}1.35\\2.32\end{bmatrix}$ i̭ẹi and R64 $\begin{bmatrix}1.61\\2.54\end{bmatrix}$ i̭ẹ

59. [Tangut graph] lhi̭wei^{1} (S. 4761 R36 1.35) crooked, bent

[Tangut graph] lhi̭we^{1} (S. 1148 R64 1.61) to make crooked, to bend

60. [Tangut] dźi̯ei^1 (S. 2942 R36 1.35) action
[Tangut] dźi̯ẹ^1 (S. 2977 R64 1.61) to act, to go

For the first character of No. 59 [Tangut], Sofronov reconstructs lhi̯we without specifying its rhyme. However, since the character is spelled with the final speller [Tangut] (S. 4619 1.35), we can be sure that it belongs to the rhyme 1.35 too and accordingly revise the reconstruction as lhi̯wei^1. In No. 59 we have a contrast between the non-causative and the causative, whereas in No. 60 we have a contrast between a noun and a verb.

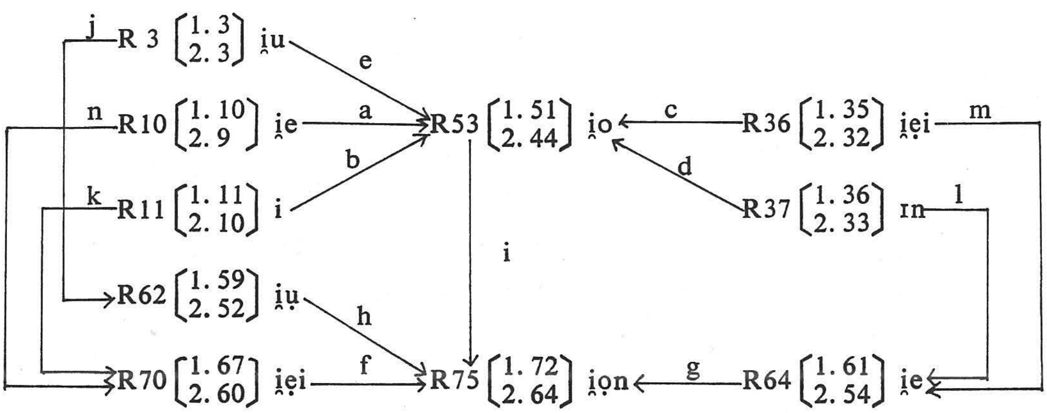
n. Alternation between R10 $\begin{bmatrix}1.10\\2.9\end{bmatrix}$ i̯e and R70 $\begin{bmatrix}1.67\\2.60\end{bmatrix}$ i̯ẹi

61. [Tangut] vi̯e^1 (S. 2409 R10 1.10) to use, to send (phonetic compound, containing the abbreviated form of the character below)
[Tangut] vi̯ẹi^1 (S. 2600 R70 1.67) ax

No example of phonological alternations has been discovered between R10 and R70. No. 61 is a case of phonetic compounds.

The evidence of phonological alternations together with phonetic compounds in *k–n* above shows that the tense final corresponding to the lax finals of R36 and R37 is R64. If we bring figure 1 and figure 2 together, we see their relationship as follows:

Figure 3



3. The Phonological Reconstruction of Tangut through Examination of Phonological Alternations

3.1 Different Reconstructions Examined in the Light of Phonological Alternations

In the light of the above discussion it is clear that some phonological alternations in Tangut form a complex system, which reflects rules of Tangut morphology and syntax. If we assume that the morphology and syntax of a language are rule-governed, we can check different reconstructions and see whether they reveal the regularity in morphology and syntax. We can thus evaluate their merits and demerits and propose appropriate revisions. Below, I have listed the reconstructions of Sofronov and Kyčanov (1963), Nishida (1964), Hashimoto (1965), and Huang (1983) for the rhymes given in Figure 3 above, so that we can pass our judgment as to their adequacy. Since Sofronov's (1968) reconstruction is already represented in Figure 3 above, it will not be repeated below.

Sofronov and Kyčanov (1963)

R 3 $\begin{bmatrix}1.3\\2.3\end{bmatrix}$ Y

R10 $\begin{bmatrix}1.10\\2.9\end{bmatrix}$ i̯e

R11 $\begin{bmatrix}1.11\\2.10\end{bmatrix}$ i

R53 $\begin{bmatrix}1.51\\2.44\end{bmatrix}$ i̯ʌ

R36 $\begin{bmatrix}1.35\\2.32\end{bmatrix}$ i̯ɜ

R37 $\begin{bmatrix}1.36\\2.33\end{bmatrix}$ ɪ

R62 $\begin{bmatrix}1.59\\2.52\end{bmatrix}$ i̯^{w}u

R70 $\begin{bmatrix}1.67\\2.60\end{bmatrix}$ i̯b̂l⊢

R75 $\begin{bmatrix}1.72\\2.64\end{bmatrix}$ i̯o⊢

R64 $\begin{bmatrix}1.61\\2.54\end{bmatrix}$ i̯ɛ⊢

The above reconstruction does not reveal any regularity. Five years after publication of this work, Sofronov published another reconstruction which is dramatically different from the first.

Nishida (1964)

R 3 [1.3 / 2.3] ĭuɦ		
R10 [1.10 / 2.9] i	R53 [1.51 / 2.44] ĭɔɦ	R36 [1.35 / 2.32] ɛɦ
R11 [1.11 / 2.10] iɦ		R37 [1.36 / 2.33] eɦ
R62 [1.59 / 2.52] ĭụ		
R70 [1.67 / 2.60] ị	R75 [1.72 / 2.64] ĭộ	R64 [1.61 / 2.54] ẹ

As was mentioned above in the previous section, Sofronov sets up 105 overall rhymes, whereas Nishida sets up only 100. The rhyme numbers used by them do not always correspond. For the convenience of comparison, Sofronov's rhyme numbers are retained above, but with Nishida's reconstruction. The relations of rhyme numbers between Sofronov and Nishida (shown in the brackets) are as follows (only those numbers that do not agree in both are given); R53 (52), R62 (60), R64 (62), R70 (68), R75 (73). From the above table it is clear that Nishida's system reveals more regularity than that of Sofronov and Kyčanov's (1963).

Hashimoto (1965)

R 3 [1.3 / 2.3] ju		
R10 [1.10 / 2.9] jɐj	R53 [1.51 / 2.44] jowN	R36 [1.35 / 2.32] jäjN
R11 [1.11 / 2.10] ɪ		R37 [1.36 / 2.33] jÄjN
R62 [1.59 / 2.52] jow		
R70 [1.67 / 2.69] jäj jewN	R75 [1.72 / 2.64] jəwN əwN	R64 [1.61 / 2.54] je

Hashimoto (1965) sets up 98 overall rhymes (prefixed with M.) Sofronov's R75 corresponds to his M72 (1.72–2.64) əwN and M73 (1.72–2.65) jəwN.

In Hashimoto's system, short vowels and long vowels are represented by upper case and lower case letters respectively.

Huang (1983)

R 3 $\begin{bmatrix}1.3\\2.3\end{bmatrix}$ io, iɔ

R10 $\begin{bmatrix}1.10\\2.10\end{bmatrix}$ i, ii

R11 $\begin{bmatrix}1.11\\2.10\end{bmatrix}$ ĩ, uĩ, iĩ

R53 $\begin{bmatrix}1.51\\2.44\end{bmatrix}$ iõ, ïõ, iɔ̃

R36 $\begin{bmatrix}1.35\\2.32\end{bmatrix}$ ɛ

R37 $\begin{bmatrix}1.36\\2.33\end{bmatrix}$ iɛ̃

R62 $\begin{bmatrix}1.59\\2.52\end{bmatrix}$ ïɯ, iuo

R70 $\begin{bmatrix}1.67\\2.60\end{bmatrix}$ ïɛ, ïə

R75 $\begin{bmatrix}1.72\\2.64\end{bmatrix}$ ian

R64 $\begin{bmatrix}1.61\\2.54\end{bmatrix}$ iə̃, ïɛ̃

In the above table, we find that many rhymes have two or three different sounds. This is because Huang (1983) does not follow the principle of one nuclear vowel for one rhyme. Where Huang reconstructs different vowels on the basis of difference in the chains of final spellers, the other scholars assume the difference to be with the medials.

3.2 Phonemic Analysis of Tangut Rhymes

The Tangut rhyme dictionary *Wen-hai* is composed on the model of the Chinese rhyme book *Kuang-yun*. A consultation of the *Kuang-yun* can therefore be sometimes of help to the understanding of the nature of the *Wen-hai*. The *Kuang-yun* has 206 rhymes. Its system of finals is generally regarded as too complex to represent a real language. However, the 206 rhymes are divided into 4 tones. The departing tone, which contains the most numerous rhymes, contains only 60 rhymes. Among them there are cases where words having the same nuclear vowels but different medials are classified into different rhymes. The level tone of the *Wen-hai* has 97 rhymes. It is natural to assume that there must also be cases where words having the same nuclear vowels, but different medials are divided between

two rhymes. This has been taken into due consideration in the various reconstructions. However, there is evidence that the *Wen-hai* goes even further, namely the words with the same nuclear vowel and the same final are classified as two rhymes, according to the difference in initials. In this section we will discuss those rhymes which alternate with R53, namely R10 and R11 on the one hand and R36 and R37 on the other.

3.2.1 The finals in R10 and R11

The first thing which draws our attention here is the fact that the characters [illegible] vi̭ẹ^{1} and [illegible] xi̭we^{1} of the rhyme 1.10 (R10) use the character [illegible] pi^{1} of the rhyme 1.11 (R11) as their final speller. Although this is already known to the scholars (Nishida 1982: 33, Huang 1983: 90), no explanation seems to have been offered. It may have been merely regarded as slips due to the phonetic similarity between the two rhymes. However, one could equally well take it as evidence that R10 and R11 have the same vowel.

The second thing to be noted is that, with some exceptions, the vowel of R10 is in complementary distribution with that of R11 in relation to the initials. [6]

	Bilabial	Labiodental	Dental	Palatal	Velar
R10	−	+	−	+	+
R11	+	−	+	−	+

	Dentalsibilant	Palatoalveolar	Guttural	Lateral and fricative
R10	−	+	+	+
R11	+	−	+	+

6 Cf. Nishida 1982, pp. 33, 937.

The few exceptions occur in three groups of initials, namely velar, guttural and lateral and fricative. They are:

	Velar	Guttural	Lateral and fricative
R10	ki̭e No. 116	·i̭e No. 17	lɪ̭e No. 177 ži̭e isolated character
R11	ki No. 116	·i No. 17	lwi isolated character zi No. 15

A further investigation into the matter brings the following facts to light:

3.2.1.1 Characters, which form contrast in the *Wen-hai*, occur as homophones in the first edition of the *T'ung-yin*. For instance: ki̭e (R10) and ki (R11), which belong to different rhymes in the *Wen-hai*, occur in the same homophone group (No. 116) in the *T'ung-yin;* ·i̭e (R10) and ·i (R11), which belong to different rhymes in the *Wen-hai*, occur in the same homophone group (No. 17) in the *T'ung-yin*. They are treated as different sounds only later in the revised edition of the *T'ung-yin*.

3.2.1.2 The character ki̭e (R10) is composed of its initial speller kɪ and final speller ·i̭e. It may be noted that this method of character formation is in general only used in spelling foreign sounds, which do not belong to the sound system of Tangut. Thus the character ki̭e is, according to the *Wen-hai*, "used in sūtra and dhāranī". ·i̭e is, according to Nevsky (1960:I, 519), used for the third syllable in 優婆夷 (a vulgar form of sanskrit upāsikā)[7] and the second syllable in 阿逸多. The

7 It must be noted that most of the Tangut transcriptions of Sanskrit words are based on Chinese transcriptions, not on original Sanskrit sources.

character •i̯e (R10) has in itself the meaning "many". However, in this sense it is synonymous with •i (R11). As a matter of fact, velars occur overwhelmingly in R11. In the rhyme 1.11 (R11) in the *Wen-hai*, there are one character for ki, three characters for khi, six characters for gi, and no character for ŋi, whereas in the rhyme 1.10 (R10) there is exceptionally one character for ki̯e, beside this, there are no characters for khi̯e, gi̯e, and ŋi̯e. Gutturals occur generally speaking in R11. Thus in the rhyme 1.11 (R11) in the *Wen-hai*, there are six characters for •i, whereas in the rhyme 1.10 (R10), there is exceptionally only one character for •i̯e sound.

3.2.1.3 The character ẑi̯e^{1} (S. 0052 1.10) of R10 and the character zi^{1} (S. 4359 1.11) of R11 are reconstructed as ẑi̯e^{1} (R10) and ẑi^{1} (R11) respectively by Sofronov. It would seem that this is a case of contrast in finals between R10 and R11. However, as far as the initial is concerned, I have demonstrated elsewhere (Gong 1981:17-36) on the basis of evidence from *fan-ch'ieh* and transcriptions, that in these cases actually two distinctive initials ẑ- and z- are involved. According to my analysis, (R10) should be represented as ẑi̯e, whereas (R11) should be represented as zi, so that no contrast in finals exists. It now appears that my reconstruction is further supported by the fact that the character ẑi̯e^{1}, like the other characters with initials of the same place of articulation such as tŝ-, tŝh-, and ŝ-, occurs in R10, whereas the character zi^{1}, like the other characters with initials of the same place of articulation such as ts-, tsh-, and s-, occurs in R11.

From the above discussion, it is clear that the vowels of R10 and R11 are in complementary distribution, and since there is phonetic similarity between the two rhymes, as can be seen from the transcription materials, there will be no difficulty in regarding the two vowels as belonging to the same phoneme. Since this is the basic vowel, I follow the majority of the researchers in taking the vowel to be -i. However, in order to avoid confusion in the subsequent discussion, I will keep using the reconstruction

of Sofronov, and put my proposal of revision in the brackets.

3.2.2 The finals in R36 and R37

As far as the vowels of R36 and R37 are concerned, there are quite divergent reconstructions. As to the distinction between the vowels of these two rhymes, scholars' opinion disagree sharply. Nishida sees difference in the nuclear vowels (R36 ɛɦ~R37 eh). Hashimoto takes the difference to consist in the vowel length (R36 jäjN~R37 jÄjN). Huang sees a difference in medial as well as in the nasalization of the nuclear vowel (R36 ɛ~R37 iɛ̃). Sofronov reconstructs quite different sounds for them (R36 i̯ei~R37 ɪn). It seems that decisive evidence is needed to solve this thorny problem. Before we discuss this problem, let us take a look at the distribution of initials in these two rhymes.

	Bilabial	Labiodental	Dental	Palatal	Velar
R36	−	+	−	−	−
R37	+	−	+	−	+

	Dentalsibilant	Palatoalveolar	Guttural	Lateral and fricative
R36	−	+	−	−
R37	+	+	+	+

From the above table, it can be seen that the vowels in R36 and R37 are in complimentary distribution with each other with one exception, namely in the palatoalveolar group, where we have the following contrast:

R36 dźi̯ei[1] 1.35 (廢、廢、癈)

R37 dźɪn[1] 1.36 (廢)

In rhyme R36 there is only one character [Tangut character] having dźɪn^{1} sound. This character occurs as an isolated character in the *T'ung-yin* (41A5), where it is explained as [Tangut character] dźi̯e^{2} (S. 5075 R84 2.72) [Tangut character] lɪn^{1} (S. 2073 R37 1.36). Since the character [Tangut character] is composed of the abbreviated forms of [Tangut character] and [Tangut character], it is clear that we are dealing with a *fan-ch'ieh* character. As mentioned above, the characters formed on the *fan-ch'ieh* principle are generally used to transcribe Sanskrit words. This character should therefore be regarded as exceptional. Thus the vowels of R36 and R37 have no real contrast even under the initial dź-. The three characters with initial dź- occur, like the other initials of the same place of articulation in R36.

Note that the distribution of initials in R36 and R37 is completely in parallel with that in R10 and R11. The only exception is that characters with initial l- occur in the former case in R37, whereas in the latter case they are distributed in R10 and R11, depending on whether the syllable is k'ai-k'ou or ho-k'ou. This inconsistency in treatment is responsible for the seemingly exceptional correspondence in the example q72 below as well as for the contrast of dźi̯ei^{1} (R36) and dźɪn^{1} (R37) discussed above. For, if the rhyme book had placed the characters with l- initial in R36 instead of R37, then [Tangut character] would have been reconstructed as li̯ei^{1} instead of lɪn^{1}, accordingly [Tangut character] would have been reconstructed as dźi̯ei^{1} instead of dźɪn^{1}. At this point, [Tangut character] dźɪn^{1} (R37) would have become homophonous with the three characters reconstructed as dźi̯ei (R36). If the two can still not be regarded as homonyms, the reason should be that [Tangut character] is only used to transcribe Sanskrit words and has accordingly a special reading. Such kind of sound does not properly belong to the Tangut sound system, and can be excluded from the frame of our reconstruction.

On the basis of the complementary distribution of vowels between R36 and R37 and the phonetic similarity of the vowels as reflected in transcriptions, we can regard them as belonging to one and the same phoneme. According to the discussion in §3.2.1 and §3.2.2, Figure 1 now looks as

follows:

Figure 4

$$\left.\begin{array}{l} R10\begin{bmatrix}1.10\\2.9\end{bmatrix}\ \underset{\wedge}{i}e \\[2ex] R11\begin{bmatrix}1.11\\2.10\end{bmatrix}\ i \end{array}\right\}(i) \longrightarrow R53\begin{bmatrix}1.51\\2.44\end{bmatrix}\ \underset{\wedge}{i}o \longleftarrow \left\{\begin{array}{l} R36\begin{bmatrix}1.35\\2.32\end{bmatrix}\ \underset{\wedge}{i}ei \\[2ex] R37\begin{bmatrix}1.36\\2.33\end{bmatrix}\ \text{ɪn} \end{array}\right. \quad (?)$$

3.3 Phonetic Interpretation of Phonological Alternations

In the above section we have treated the vowels of R36 and R37 as belonging to the same phoneme. In this section we will further discuss their sound value. Sofronov reconstructs i̯ei and ɪn respectively for R36 and R37. According to this reconstruction the difference consists not only in nuclear vowel but also in the presence and absence of nasal ending. I have elsewhere (Gong 1981:691, 721-722) argued that the final of R37 did not have -n ending, on the basis of evidence from Chinese loanwords as well as the following cognates between Tangut and Burmese:

	Tangut (R37)		Written Burmese	
red	[Tangut character] nɪn^1	1.36	နီ ni	tone A
near	[Tangut character] nɪn^1	1.36	နီး ni	tone C
to know	[Tangut character] sɪn^2	2.37	သိ si	tone B

I have argued that written Burmese is a language which preserves -m, -n, and -ŋ endings. If the Burmese words cited above do not have any nasal ending, they probably never had, and neither did their cognates in Tangut.

As a matter of fact, there is evidence that Tangut in the 11th century never had any nasal ending, and that the words with nasal endings are mainly loanwords, but this will go beyond the scope of the present paper. Since this paper deals with the problem of reconstruction from the angle of phonological alternations, we will have to confine ourselves within this scope.

First of all, it must be noted that there are phonological alternations between R11 and R37, R10 and R36, and R10 and R37.

Examples are as follows:

o. Alternation between R11 $\begin{bmatrix}1.11\\2.10\end{bmatrix}$ i and R37 $\begin{bmatrix}1.36\\2.33\end{bmatrix}$ ɪn

62. phi^{1} (S. 2494 R11 1.11) senior, supreme, above
    phɪn^{1} (S. 1318 R37 1.36) senior, supreme, above

63. di^{2} (S. 4155 R11 2.10) to drink
    dɪn^{2} (S. 4154 R37 2.33) to drink

64. di^{2} (S. 0461 R11 2.10) ever
    dɪn^{2} (S. 5817 R37 2.33) ever

65. ni^{2} (S. 3605 R11 2.10) to hear
    nɪn^{2} (S. 1835 R37 2.33) to hear

66. niwi^{2} (S. 0493 R11 2.10) throat; to swallow
    nwɪn^{1} (S. 0651 R37 1.36) throat, gullet

67. khi^{1} (S. 0277 R11 1.11) to dry, to make dry
    khɪn^{1} (S. 3491 R37 1.36) to dry, to make dry

68. khi^{2} (S. 0667 R11 2.10) to cut
    khɪn^{1} (S. 2607 R37 1.36) to cut

69. tsi^{2} (S. 3761 R11 2.10) to know, to understand
    tsɪn^{2} (S. 3606 R37 2.33) to know, to understand

70. pi^{1} (S. 3450 R11 1.11) broad
    bɪn^{2} (S. 1234 R37 2.33) name of a diagram (phonetic compound)

p. Alternation between R10 $\begin{bmatrix}1.10\\2.9\end{bmatrix}$ i̯e and R36 $\begin{bmatrix}1.35\\2.32\end{bmatrix}$ i̯ei

71. ŝi̭we^{2} (S. 5382 R10 2.9) to need, to use

ŝi̭wei^{2} (S. 4190 R36 2.32) to need, to use

q. Alternation between R10 $\begin{bmatrix}1.10\\2.9\end{bmatrix}$ i̭e and R37 $\begin{bmatrix}1.36\\2.33\end{bmatrix}$ ɪn

72. li̭e^{2} (S. 1838 R10 2.9) to see, to gaze at

lɪn^{2} (S. 0195 R37 2.33) to see, to gaze at

If we follow the scheme in figure 3, R10 corresponds with R36, whereas R11 corresponds with R37, there should not be a case of crossing correspondence between R10 and R37. But, as mentioned above, this is caused by the classification of characters with initial l- into R37 instead of R36. According to the new scheme represented in figure 4, the difficulty will be eliminated, for R10 and R11 would have now the same final and the finals in R36 and R37 would be identical too. Thus the alternations in *o, p,* and *q* turn out to be all belonging to the same alternation. Now that we have assumed that the final in R10 and R11 is -i, the next step is to discover what the final in R36 and R37 should be. From the viewpoint of order of rhymes in the rhyme book and phonological structure of Tangut syllables, the best answer seems to be -ij.

In the first place, let us take a look at the order of rhymes in the rhyme book. In discussing the vowels of Tangut, Sofronov (1968: I, 115) remarks, "In the big cycle there are two sound types composed of diphthongs. The first sound type including rhymes 34-43, is composed of diphthongs ending in -i, and the second sound type including rhymes 44-49, is composed of diphthongs ending in -ɯ". The following are Sofronov's reconstructions for R34-R43 (Each rhyme has two pronunciations, the former represents the *Wen-hai* period, whereas the latter 12th century.):

R34 (1.33-2.30) ai>ei

R35 (1.34-2.31) âi>êi

R36 (1.35-2.32) i̭ai>i̭ei

R37 (1.36-2.33) ɪn>ɪn
R38 (1.37-2.34) ai+c>ai
R39 (1.38) âi+c>âi
R40 (1.39-2.35) i̯ai+c>i̯e
R41 (1.40) ai+c>ai
R42 (1.41-2.36) ai+c>âi
R43 (1.42-2.37) i̯ai+c>i̯e

As we can see from the above table, Sofronov does not reconstruct a diphthong ending in -i for R37, but a monophthong -ɪ ending in -n. In discussing diphthongs, Sofronov (1968:1, 125) remarks: "We find diphthongs ending in -i in rhyme groups 34-36, 38-40, 41-43 of the big cycle.....". Here he excludes R37 from the series. The question is: if we assume that the order of rhymes follows some principle, how does it happen that a series of diphthongs ending in -i is interrupted by a heterogeneous sound. Obviously, of the two conflicting assumptions of Sofronov, the first one is preferable to the second.

From the viewpoint of syllable structure, the ending -i can be regarded as the reflex of some kind of final consont (such as -d) in the proto Sino-Tibetan, whereas -ɯ can be regarded as the reflex of -g. This is a key to explain how the complicated Tangut vowel system evolved out of the simple vowel system of the Sino-Tibetan common language. On the basis of phonological alternations, we can establish relationship between rhymes as follows:

R 8 $\begin{bmatrix}1.8\\2.7\end{bmatrix}$ e ——— R34 $\begin{bmatrix}1.33\\2.30\end{bmatrix}$ ei

R 9 $\begin{bmatrix}1.9\\2.8\end{bmatrix}$ ê ——— R35 $\begin{bmatrix}1.34\\2.31\end{bmatrix}$ êi

R10 $\begin{bmatrix}1.10\\2.9\end{bmatrix}$ i̯e ——— R36 $\begin{bmatrix}1.35\\2.32\end{bmatrix}$ i̯ei

R11 $\begin{bmatrix}1.11\\2.10\end{bmatrix}$ i ——— R37 $\begin{bmatrix}1.36\\2.33\end{bmatrix}$ ɪn

(R12 $\begin{bmatrix}1.12\\2.11\end{bmatrix}$ e ——— R38 $\begin{bmatrix}1.37\\2.34\end{bmatrix}$ ai)

R13 〔1.13〕 ê ——— R39 〔1.38〕 âi

R14 $\begin{bmatrix}1.14\\2.12\end{bmatrix}$ i̭e ——— R40 $\begin{bmatrix}1.39\\2.35\end{bmatrix}$ i̭e

Among the above alternations, the relations between R10 and R36 and R11 and R37 have already been discussed above in *o*, *p*, and *q*. As for the relation between R12 and R38, no examples have been discovered. Their relations have been merely inferred from their positions in the series. The rest of the alternations are listed below.

r. Alternation between R8 $\begin{bmatrix}1.8\\2.7\end{bmatrix}$ e and R34 $\begin{bmatrix}1.33\\2.30\end{bmatrix}$ ei

73.		twe[1]	(S. 5156 R8 1.8)	to have many
		twei[1]	(S. 5157 R34 1.33)	to have many

s. Alternation between R9 $\begin{bmatrix}1.9\\2.8\end{bmatrix}$ ê and R35 $\begin{bmatrix}1.34\\2.31\end{bmatrix}$ êi

74.		kê[1]	(S. 2222 R9 1.9)	to curse
		kêi[1]	(S. 1884 R35 1.34)	to curse
75.		kwê[1]	(S. 0605 R9 1.9)	cold
		khêi[1]	(S. 1328 R35 1.34)	cold
76.		śwê[2]	(S. 1023 R9 2.8)	to pursue, to chase
		śêi[1]	(S. 1836 R35 1.34)	to lead
77.		phê[1]	(S. 3914 R9 1.9)	family name (phonetic compound)
		bêi[1]	(S. 3913 R35 1.34)	family name

t. Alternation between R13 〔1.13〕 ê and R39 〔1.38〕 âi

78.		śê[1]	(S. 4485 R13 1.13)	to collect
		śâi[1]	(S. 5057 R39 1.38)	to collect

u. Alternation between R14 $\begin{bmatrix}1.14\\2.12\end{bmatrix}$ i̯e and R40 $\begin{bmatrix}1.39\\2.35\end{bmatrix}$ i̯e

79.  tshɪ̯e² (S. 3053 R14 2.12) to say, to speak
 tshɪ̯e² (S. 2545 R40 2.35) to say, to speak
 tshɪ̯e¹ (S. 2777 R40 1.39) to say, to speak

80.  lɪ̯e² (S. 2265 R14 2.12) to wait, to stay
 lɪ̯e² (S. 2266 R40 2.35) to wait, to stay
 lɪ̯e¹ (S. 3497 R40 1.39) to wait, to stay

81.  dzɪ̯e² (S. 0561 R14 2.12) to teach
 dzɪ̯e² (S. 4859 R40 2.35) to teach
 dzɪ̯e² (S. 4858 R40 2.35) teacher

82. mɪ̯e² (S. 5298 R14 2.12) to govern, to foster
 mɪ̯e¹ (S. 3419 R40 1.39) to foster

If we assume that the pairs of cognates in No. 62–No. 82 have originated through attaching the suffix -i to the basic forms, we can then have a principled account of the morphology of Tangut, since the morphology of a language is, like its phonology and syntax, rule-governed. To discover the rules governing morphology will no doubt contribute to the reconstruction of a language.

Now we will take a look at different reconstructions hitherto offered and see whether they can reveal any regularity in the morphology.

	Sofronov Kyčanov	Nishida	Hashimoto	Sofronov	Huang
R 8 ~R34	e ~ 3	ɪ ~ ɛ	ɛj ~ ÄjN	e ~ ei	ɔi, oi ~ əi
R 9 ~R35	e′ ~ 3′	ɪe ~ iɛ	ei ~ äjN	ê ~ êi	ï, ïï, ui ~ əĩ, ɛĩ, eĩ
R10~R36	i̯e ~ i̯3	i ~ ɛɦ	jɛj ~ jäjN	i̯e ~ i̯ei	i, ii ~ ɛ
R11~R37	i ~ ɪ	iɦ ~ eɦ	ɪ ~ jÄjN	i ~ ɪn	ĩ, uĩ, iĩ ~ iɛ̃
R12~R38	E ~ ɜ̌	ʷɪɦ ~ e	i ~ AjN	e ~ ai	ïr ~ ɑi
R13~R39	E′ ~ 3′	ʷɪɦ ~ e(ʸ)?	ij ~ jajN	ê ~ âi	ïe ~ ɑĩ
R14~R40	i̯E ~ ĭ	ɪɦ ~ ĭeɦ	jɪ ~ jAjN	i̯e ~ i̯e	ie, iẽ ~ ïã

In Nishida's reconstruction, these alternations are reflected as lowering of vowels. In Hashimoto's reconstruction they are reflected mainly as -N suffixation. In Huang's reconstruction no regularity has been observed.

Since in the rhyme book the rhymes are not arranged at random, but generally speaking follow some kind of principle, it is clear that, in the reconstruction of finals, the order of rhymes should be taken into consideration. However, this alone is not adequate, the evidence of phonetic compounds and phonological alternations should play an active role, for these two data need explanation in terms of more precise reconstruction.

3.4 Phonological Alternations and the Cyclic Order of Rhymes

Sofronov and Kyčanov (1963:77) classify Tangut rhymes into four cycles: a big cycle and three small cycles. Sofronov (1968: I, 115) notes that they are called cycles, because in each cycle the nuclear vowels change from vowel type U to vowel type O. This view can be substantiated by

the study of phonological alternations. The phonological alternations shown in figure 1 and figure 2 belong to the big cycle and the first small cycle respectively. In addition to this, we can also find the same kind of alternations in the second small cycle.

Figure 5

The Big Cycle (R1~R60)

R 3 $\begin{bmatrix}1.3\\2.3\end{bmatrix}$ Y>i̯u ↘

R10 $\begin{bmatrix}1.10\\2.9\end{bmatrix}$ i̯e>i̯e (=i) ⟶ R53 $\begin{bmatrix}1.51\\2.44\end{bmatrix}$ i̯o>i̯o ⟵ R36 $\begin{bmatrix}1.35\\2.32\end{bmatrix}$ i̯ai>i̯ei (=ij)

R11 $\begin{bmatrix}1.11\\2.10\end{bmatrix}$ i>i

R37 $\begin{bmatrix}1.36\\2.33\end{bmatrix}$ ɪn>ɪn

The First Small Cycle (R61~R76)

R62 $\begin{bmatrix}1.59\\2.52\end{bmatrix}$ i̯ụ>i̯ụ ↘

R70 $\begin{bmatrix}1.67\\2.60\end{bmatrix}$ i̯ạ>i̯ẹi ⟶ R75 $\begin{bmatrix}1.72\\2.64\end{bmatrix}$ i̯ọn ⟵ R64 $\begin{bmatrix}1.61\\2.54\end{bmatrix}$?>i̯ẹ

The Second Small Cycle (R77~R98)

R81 $\begin{bmatrix}1.76\\2.80\end{bmatrix}$ i̯ụ>i̯ụ ↘

R84 $\begin{bmatrix}1.79\\2.72\end{bmatrix}$ i̯ẹ+c>i̯ẹ ⟶ R96 $\begin{bmatrix}1.90\\2.81\end{bmatrix}$ i̯ụo>i̯ụo ⟵ R79 $\begin{bmatrix}1.74\\2.68\end{bmatrix}$?>i̯ẹ

The above scheme of the second small cycle is based on the following correspondences:

v. Alternation between R81 $\begin{bmatrix}1.76\\2.70\end{bmatrix}$ i̯ụ and R96 $\begin{bmatrix}1.90\\2.81\end{bmatrix}$ i̯ụo

83.  ri̯ụ² (S. 2735 R81 2.70) to brew, to ferment

 ri̯ụo² (S. 5561 R96 2.81) to brew, to ferment.

w. Alternation between R84 $\begin{bmatrix}1.79\\2.72\end{bmatrix}$ i̯ẹ and R96 $\begin{bmatrix}1.90\\2.81\end{bmatrix}$ i̯ụo

84. ri̭ẹ[1] (S. 4911 R84 1.79) to attain, to obtain, to acquire

ri̭u̯o[2] (S. 0221 R96 1.90) to attain, to obtain, to acquire

85. ri̭ẹ[2] (S. 0309 R84 2.72) to attain, to obtain, to acquire

ri̭u̯o[2] (S. 0176 R96 2.81) to attain, to obtain, to acquire

86. ri̭ẹ[2] (S. 2657 R84 2.72) to forbid, to prohibit, to restrain, to oppress

ri̭u̯o[2] (S. 2660 R96 2.81) to forbid, to prohibit, to restrain, to oppress

Although examples of alternation between R79 and R96 have not been discovered, we can be sure that the relation between R84 and R79 is parallel with that between R10, R11 and R36, R37, or with that between R70 and R64. The alternation between R10, R11 and R36, R37 has already been discussed above in *o, p,* and *q*. The following are the alternation between R70 and R64 and the alternation between R84 and R79.

x. Alternation between R70 $\begin{bmatrix}1.67\\2.60\end{bmatrix}$ i̭ẹi and R64 $\begin{bmatrix}1.61\\2.54\end{bmatrix}$ i̭ẹ

87. tɪ̭ẹi[1] (S. 2655 R70 1.67) to take away, to decrease

tɪ̭ẹ[1] (S. 0310 R64 1.61) to take away, to decrease

88. tɪ̭ẹi[2] (S. 5603 R70 2.60) to nurse

tɪ̭ẹ[2] (S. 5602 R64 2.54) to nurse

89. dzɪ̭ẹi[1] (S. 2220 R70 1.67) to cross, to ferry

dzɪ̭ẹ[1] (S. 4475 R64 1.61) to cross, to ferry

y. Alternation between R84 $\begin{bmatrix}1.79\\2.72\end{bmatrix}$ i̭ẹ and R79 $\begin{bmatrix}1.74\\2.68\end{bmatrix}$ i̭ẹ

90. ·i̭ẹ[2] (S. 1618 R84 2.72) to kill

·i̭ẹ[2] (S. 5387 R79 2.68) to kill

91. ri̭ẹ[2] (S. 4829 R84 2.72) to measure, to weigh

ri̭ẹ[2] (S. 2674 R79 2.68) to measure, to weigh

92. [Tangut character] vi̯ẹ^{2} (S. 4519 R84 2.72) to embrace, to hug
[Tangut character] vi̯ẹ^{2} (S. 1563 R79 2.68) to embrace, to hug

93. [Tangut character] ri̯ẹ^{2} (S. 5729 R84 2.72) sword
[Tangut character] ri̯ẹ^{1} (S. 1276 R79 1.74) sharp

In the third small cycle there are only seven rhymes. The characters contained in these rhymes are very few. No alternations of the nature shown in figure 5 have been discovered. In spite of this we can still be sure that R101 corresponds to R70 as well as to R84.

z_1. Alternation between R70 $\begin{bmatrix}1.67\\2.60\end{bmatrix}$ i̯ẹi and R101 $\begin{bmatrix}1.93\\2.86\end{bmatrix}$ ɪ̣

94. [Tangut character] ·i̯ẹi^{2} (S. 2786 R70 2.60) to stretch, to lengthen
[Tangut character] ·ɪ̣^{2} (S. 2785 R101 2.86) to stretch, to lengthen

95. [Tangut character] li̯ẹi^{1} (S. 1731 R70 1.67) to rub
[Tangut character] lɪ̣^{1} (S. 1546 R101 1.93) to rub

z_2. Alternation between R84 $\begin{bmatrix}1.79\\2.72\end{bmatrix}$ i̯ẹ and R101 $\begin{bmatrix}1.93\\2.86\end{bmatrix}$ ɪ̣

96. [Tangut character] tsɪ̯ẹ^{1} (S. 3643 R84 1.79) to choose
[Tangut character] tsɪ̣^{1} (S. 2724 R101 1.93) to choose

From the figure 5 above, it can be seen that Sofronov reconstructs i̯ụ for R62 as well as for R81, i̯ẹ for R64, R79, and R84 as well. Since these are all different rhymes in the *Wen-hai*, there must be some difference. However, as mentioned already, Sofronov intends to reconstruct the language of the end of the 12th century. He does not make clear as to how these rhymes were distinguistished in the *Wen-hai* period. For instance, he does not reconstruct R64, R79 and R101 for the *Wen-hai* period. For R62 and R81 he reconstructs the same sound.

In order to solve the problem as to how these rhymes were distinguished in the *Wen-hai* period, we face first of all with the problem what the

distinguishing features of each cycle were. The fact of the matter is that the existing data cannot offer any clue to the solution of this problem.

Sofronov reconstructs tense vowels for finals in all the three small cycles, so that the same tense vowel such as i̯e̯ occurs repeatedly in the first small cycle (R64), the second small cycle (R79) and the third small cycle (R100). Nishida assumes that there are distinctions between lax and tense vowels as well as retroflex and non-retroflex vowels, though he does not use the term "cycle". In 1964 he divided the finals into four classes according as whether the vowels are tense or lax, retroflex or non-retroflex, but in 1980 (p. 95) he classified the finals (excluding the last four rhymes of level tone) into the following three groups:

1. Rhyme group 1 - Rhyme group 9 (R1 - R58)
   ordinary vowels, such as: i, u, a, ɑ etc.
2. Rhyme group 10 - Rhyme group 16 (R59 - R75)
   tense vowels, such as: i̯, u̯, a̯, ɑ̯ etc.
3. Rhyme group 17 - Rhyme group 22 (R76 - R98)
   retroflex vowels, such as: ir, ur, ar, ɑr etc.

Nishida did not elaborate, on what ground he had made such an assumption. But since he was familier with different branches of Sino-Tibetan languages, he might have got the idea from some closely related language.

According to Sun (1981:30), the northern Ch'iang dialect (the Ma-uo dialect) distinguished between long and short vowels as well as between retroflex and non-retroflex vowels. With a purpose to determine whether the retroflex vowel in the Ma-uo corresponds to the third group reconstructed with -r by Nishida, I have made a comprative study of the cognates. However, the result is quite discouraging. The retroflex vowels in the Ma-uo do not correspond with vowels of a special cycles, but correspond with

vowels of all cycles except the last one, where no cognates have been discovered. It must be pointed out that for the reconstruction of retroflex vowels (or vowels with -r ending), neither internal nor comparative evidence is available. If I now, following Nishida in writing vowels with -r ending, it is only for the purpose of keeping distinction among different rhymes.

On the basis of phonological alternations, the rhymes discussed above are reconstructed as follows:

1.	R3	i̯u	R53	i̯o	R36, R37	ij
	R10, R11	i				
2.	R62	i̯u̯	R75	i̯o̯	R64	i̯j
	R70	i̯				
3.	R81	i̯ur	R96	i̯or	R79	ijr
	R84	ir				
4.	R101	i̯r				

3.5 Overall Interpretation of Phonological Alternations

The phonological alternations discussed above can be classified into the following three groups:

1. The suffix -o is attached to the nuclear vowel

R10, R11	-i	R53	-i̯o
R36, R37	-ij	R53	-i̯o
R70	-i̯	R75	-i̯o̯
R84	-ir	R96	-i̯or

2. Alternation between lax and tense vowels

R3	-i̯u	R62	-i̯u̯
R10, R11	-i	R70	-i̯
R53	-i̯o	R75	-i̯o̯
R36, R37	-ij	R64	-i̯j

3. The suffix -j is attached to the nuclear vowel

R10, R11	-i	R36, R37	-ij
R70	-ị	R64	-ịj
R84	-ir	R79	-ijr

3.5.1 The -o suffixation to the nuclear vowel is connected with a syntactic rule in Tangut. According to Kepping (1976:224-225) the gramatical function of the suffixed form is to show agreement with the subject of the action. The following are examples cited from Nevsky (1960).

a. mi¹ ⟶ mịo¹ hear

ŋa² thɪ² dạ² mi¹

I this word hear =I hear this word.

thɪ² su² mịo¹ ŋa²

this like hear I =Thus I hear.

b. dzi̭e¹ (dzi¹) ⟶ dzịo¹ eat

thi¹ dzi̭e¹ (dzi¹)

drink eat

vịə² dzio¹ ŋa²

prefix eat I =I have already eaten.

Cf. Ch'iang (Sun 1981: 102)

dʒl ˧ eat

ŋa ˥ dʒɑ ˩˧

I eat =I shall eat.

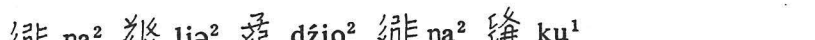
tha ˥ lə ˥ dʒlu ˥˩

he eat =He will eat.

c. dźi̭ei² (dźij²) ⟶ dźi̭o² have

gọ¹ gi² tị² dźi̭ei² (dźij²)

gentleman good manners have=Gentleman have good manners.



I treasure have I If =If I have treasure

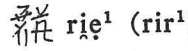
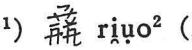
Cf. Ch'iang (Sun 1981: 123)

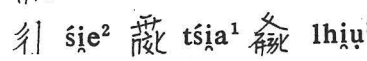
ʒl ㅓ have

ʒɑ ㅅ have (first person, singular, future tense)

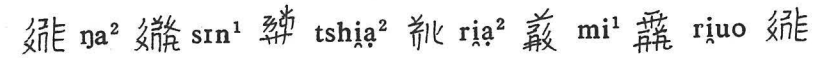
ʒlu ㅅ nə have (Second person, singular, future tense)

ʒlu ㅅ have (third person, singular, future tense)

d.  (rir[1])  (rior[2]) attain, acquire



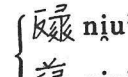
sacred way reach attain =attain the sacred way

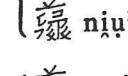


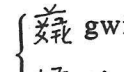
I now suddenly hear acquire I

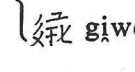
=I suddenly hear now.

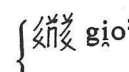
3.5.2 Alternation between lax and tense vowels. Since this alternation has the function of forming causative verbs, it belongs to the morphology of Tangut.

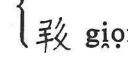
a.  to suck

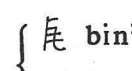
 to suckle, to nurse

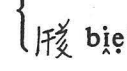
b.  to wear clothes

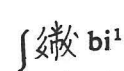
 to make to wear clothes

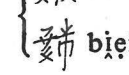
c.  to wear clothes

 to make to wear clothes

d.  high

 to heighten, to elevate, to promote

e.  low, below, down

 to lower, to bend

f. { lhi̭wei^{1} (lhwij^{1}) crooked, bent
 lhi̭wẹ^{1} (lhwịj^{1}) to make crooked }

Compare the same kind of alternation in Tsai-wa[8]. The diacritical mark under vowels represents tense vowels.

ɲi˩ exist	ŋaʔ˥ enough	tsuŋ˩ sit
ɲi̭˩ make exist	ŋa̭ʔ˥ make enough	tsṷŋ˩ let sit
na˩ mad	nu˩ tame	
na̭˩ make mad	nṷ˩ to tame (v. t.)	

Although the above pairs of words are not cognate with any of the Tangut words cited above, the rule of word formation and its function are similar in both languages.

Some cognates of the above pairs in written Tibetan and the Ma-uo dialect can be cited to show that the difference of vowels between the big cycle (including R3 and R11) and the first small cycle (including R62 and R70) seem to go back to the difference in itial.

	Tangut	Written Tibetan	the Ma-uo dialect
to suck	ni̭u^{2} (R3)	nu	
to suckle	ni̭ụ^{2} (R62)	(b)snun, nud	
to wear clothes	gwi^{1} (R11)	gon	gu[9]
to make to wear clothes	gwị^{1} (R70)	bskon	rguə

3.5.3 The -j suffixaton to the nuclear vowel

8 Dai 1958, p. 35.
9 Sun 1981, p. 193.

From the contrastive study with the Ch'iang dialect, we can suppose that the third alternations listed in §3.5 above may have originated in the suffix -i. In the Ch'iang dialect there is a suffix -i, which is used in the sentence describing an objective situation or a natural phenomenon to show the beginning or continuation of an actioon. For example[10]:

ma˩	ʐi˥	ə˅˩	dʐa˩	i˩ !	It begins to rain!
rain	prefix	fall	suffix		

In Tangut writing system, this kind of syntactic or morphological device may have been concealed in graphs. Take the above case for example, if the suffix -i and the root form of a verb are written as a single character, we will have dʐa and dʐai as two separate characters. Since the suffix -i can be combined with different verbs, we will have many characters with the same meaning alternating between the presence and absence of -i. Whether this supposition is true or not must be checked against data in the study of texts.

4. Concluding Remarks

The study of phonological alternations in Tangut is a field which has not yet been well explored. This paper presents 27 sets of phonological alternations (consisting of 96 pairs of examples) and tries to interpret them in terms of regular morphological and syntactic processes. These phonological alternations are classified into three categories, each connected with a rule in Tangut morphology and syntax. Since these alternations are viewed as morphological and syntactic phenomena, which are supposed to be rule-governed, they are used as criteria for evaluating different phonetic reconstructions.

Various reconstructions of the Tangut language which have been hitherto proposed are tested to see whether they can reflect these morphological and syntactic regularities in Tangut Grammar.

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10 *Ibid.*, p. 57.

At the end of the paper, a revision of the reconstruction of some rhymes is offered, purporting to explain various related facts: foreign transcriptions, the order of rhymes in the rhyme dictionary, and morphological and syntactic rules.

In order that the discussion would lead to a correct conclusion, this paper has also made use of evidence from phonetic compounds, *fan-ch'ieh* data, phonetic analysis, and comparison with related languages, in addition to phonological alternations.

The study of phonological alternations can not only help to solve problems of reconstruction, but also contribute to the solution of some semantic problems. In the present state of Tangut study, the meanings of many characters still remain obscure. The decipherment of them depends largely on the *Wen-hai* and the *T'ung-yin* dictionaries. The study of phonological alternations would help to clarify many uncertainties, fix the meanings of words, and finally lead to the establishment of word families. The following are examples of word families in Tangut, discovered during the study of alternations.

R3	1.3		di̭u^1	to complain, to accuse
R62	1.59		di̭ụ^1	to grieve, to lament
R75	1.72		dɪ̭ọn^1 (=di̭ọ)	to grieve, to lament
R64	1.61		dɪ̭ẹ^1 (=di̭)	to grieve, to lament
R3	2.3		ni̭u^2	to suck the breast
R62	2.52		ni̭ụ^2	to suckle, to nurse, to foster
R75	2.64		ni̭ọn^2 (=ni̭ọ^2)	to suckle, to nurse, to foster
R11	1.11		thi^1	to drink
R70	1.67		tɪ̭ẹi^1 (=tị^1)	to feed, to give to drink
R70	1.67		tɪ̭ẹi^1 (=tị^1)	to drink

R70 2.60  tɪ̭ẹi^2 (=tị^2) to nurse, to give to drink

R64 2.54  tɪ̭ẹ^2 (=tịj^2) to nurse, to give to drink

R75 1.72  tɪ̭ọn^1 (=tị̭ọ^1) to feed, to give to drink

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摘　　要

西夏語音韻轉換的研究是一個尚未開墾的研究領域，本文提出二十七種（共九十

六對）西夏語音韻轉換的例子，並對這些不同類的轉換給予統一的音韻解釋，把它們歸納成三個類型，與西夏語法與構詞法連結起來加以綜合的解釋，依照本文提出的看法，這些轉換現象代表嚴整的西夏語法與構詞法規律。本文藉這些音韻轉換現象，檢驗各家磲音是否能反映西夏語法與構詞法的規則性。最後並對討論中涉及的各韻提出作者的磲音。本文的磲音不但力求與已知的對音資料及韻書中韻的排列原則符合，還力求能解釋這些轉換現象所代表的語法與構詞法的規律，使西夏語與同族其他語言的關係顯現出來。本文的磲音另外一個目標是希望能解釋複雜的西夏韻母系統如何從簡單的漢藏語共同祖語演化出來。

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