THE CONSONANTAL SYSTEM OF OLD CHINESE

by E. G. PULLEYBLANK

SIGNS AND ABBREVIATIONS

K. Karlgren's "Ancient Chinese" (as in KARLGREN 1957)
K. Karlgren's "Archaic Chinese" (as in KARLGREN 1957)
M. Middle Chinese (as here reconstructed)
  * reconstructed forms earlier than Middle Chinese

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CHOU Fa-kao 1948(2): "Ch'ieh-yün yü chih in-tu chi ch'i liu-pien 切韻之音韻及其變", CYXY 13 (1948) pp. 119-52 ("A reconstruction of the finals /u/ and /y/ in Ancient Chinese and their later development").
CHOU Tsu-mo 1957: Han-yü ku-yün lun-tzen chi 漢語苦音論文字.
In investigating the functions and mutual relationships of grammatical particles in Classical Chinese, I became increasingly convinced that further progress must depend on a better foundation of phonology. At the same time I was studying the history of the early relationships between the Chinese and their Inner Asian neighbours. Here too it became apparent that there was a great need for a more adequate reconstruction of sound values in order to interpret correctly the Chinese transcriptions of foreign words. From these two points of view I have been led to a re-examination of the basis of the work of Karlgren and others. In particular I have attempted to check the results of internal reconstruction by the external evidence of transcriptions of foreign words from the earliest period at which they become available. In the result I have been able to make some progress towards a new reconstruction for Old Chinese which will be both internally consistent and in agreement with the external evidence.

I have been encouraged to find that many of the modifications to Karlgren’s system which I have been led to propose are points which have already been suggested by other scholars and further by my success in

* The continuation of “Studies in Early Chinese Grammar, Part I”, Asia Major 8 (1961) has been postponed until the results of my phonological researches have been published.
making the picture essentially simpler and more coherent rather than more complex. Many uncertainties remain and many points of detail remain to be worked out but I think that a stage has been reached at which it may be worthwhile to present my ideas to my fellow-workers in the hope of receiving their criticisms and help in trying to solve the many difficult problems that are left.

What is presented here is first a revised and phonemicized system for the Ch’ieh-yün rhyme dictionary, representing the stage of the language denominated Ancient Chinese by Karlgren but which I prefer, following Chinese usage, to call Middle Chinese. Many of the emendations proposed incorporate corrections made by Lo Ch’ang-p’ei, Tung T’ung-ho, Li Jung, Tōdō Akiyasu and other scholars but the system as a whole is new. Following this I present my conclusions about the consonantal system of Old Chinese. During the course of the discussion it will be necessary to refer to the vowel system as well and I include in tabular form an outline of my proposals for the whole phonemic structure but I shall not give here an account of the detailed working out of the development of the Ch’ieh-yün rhymes from Old Chinese.

Karlgren believed the Ch’ieh-yün, completed in A.D. 601, to be based on the current speech of the Sui capital Ch’ang-an. This is quite untenable both on historical and linguistic grounds. None of the editors came from the Ch’ang-an region and it would be most unlikely for them to have adopted the dialect of the new, outlying capital in preference to those of the centres of culture in the east and south. It is clear from their preface that they intended to represent an ideal cultivated speech which should avoid regional faults but it also seems clear that their main basis was the speech of the educated classes of the lower Yangtze region (see Lo 1931). That the standard at the beginning of the seventh century was not that of Ch’ang-an is evident from the marked change in the system of transcribing Sanskrit sounds that becomes apparent from the end of the seventh century onward when the Ch’ang-an dialect did become the standard. The same characteristics are also found in Japanese Kan-on readings as compared to the earlier Go-on, which, pace Karlgren, is much closer to the Ch’ieh-yün, and in the transcriptions of Chinese in Tibetan, Brahmi and Uigur script from the ninth and tenth centuries found in Central Asia. The differences in sound values are too profound and appear too suddenly to be merely the result of sound change over a space of less than 100 years. Moreover in the sound glosses of Hui-lin (ninth century) which were based on the Ch’ang-an standard we find features of the Ch’ieh-yün system which differed from current northwestern speech stigmatized as "southern" or "Wu".*

* Chou Fa-kao 1948 (4) supports Karlgren’s view that the Ch’ieh-yün is based on the speech of Ch’ang-an and argues against some of the points made here but I remain unconvinced.

The theory that the Ch’ieh-yün is simply an artificial construct and not based on any form of living speech is equally unacceptable. The great number of alternative readings of characters that are included is no doubt partly the result of drawing on dialect forms but the categories themselves turn out in almost every case to be phonologically meaningful in terms of the subsequent development of the language or its earlier history. It may be that no one dialect in A.D. 600 retained all the distinctions made by the Ch’ieh-yün but we may feel reasonably sure that all the distinctions were to be found currently in some variety of cultivated speech.

It is more difficult to decide what one means by Old Chinese. Karlgren regarded his Archaic system as that of the Shih-ching, which he took to be the dialect of Ch’ang-an ca. 700 B.C., that is the lineal ancestor of his Ancient Chinese. In fact one leans even more on the structure of the characters than on the rhymes and though there is a general correspondence between the phonological categories indicated by the two sorts of material there is by no means perfect agreement. But from what place and what point in time do the hsieh-sheng series come? The great watershed, the point, if any, to which one should look for a systematic standardization of the script is of course the Chi’in script reform at the end of the third century B.C., but the process of building up the characters had been going on for a thousand years and more before that.

For the time being one can only be somewhat vague about what one means by Old Chinese. One can only try to make as coherent and consistent a system as possible that will account for a rational historical process for the evidence of earlier and later times and then check it by whatever external evidence we can find. This is what gives the Han period its special importance, since it is the first time that we get any body of transcriptions. Before then we are in a closed world, with only comparison with cognate languages widely separated from Chinese in time to help us.

I should like to express my appreciation to Professor Sir Harold Bailey for his helpful advice on many points.

The Ch’ieh-yün System

The system outlined below is used in place of Karlgren’s Ancient Chinese as a basis for the reconstruction of Old Chinese. It will be termed Middle Chinese and words spelt in it will be prefixed with the letter M. Many of the modifications of Karlgren’s system have already been suggested by others and I have felt it unnecessary in such cases to go fully into all the arguments.

**A. Initials**

Laryngals:  $h\, \tilde{e}$

Velars:  $k\, kh\, g\, \eta$

Palatals:  $c\, ch\, j\, \epsilon\, s\, (\tilde{z})\, y$
Dentals: t th d ₄ n l

Supradentals: tʰ th d̪ ₄ s z

Labials: p ph b̪ m

1 Karlgren's distinction between yodized and unyodized velar and labial initials is non-phonemic and is therefore disregarded, as is largely done by Karlgren himself in his later works. See Chao 1941, Li Jung 1952, pp. 100–105.


3 My ħi- = Karlgren's ji-. On the phonemic identity of Karlgren's y- and j- see Ku 1932, Chao 1941, Lo Ch'ang-p'ei 1951, Li Jung 1952, p. 105. At a later stage of the language than that represented by the Ch'ieh-yün ħ- > j- and became phonemically linked with initial y-. That is, we have an initial 0 followed by the two varieties of medial semiflowl. This hypothesis will account for the placing of ħi- in the Yün-ching and later rhyme tables, where it does not occupy the same column as h- but is placed together with y-, the one occupying Division III, the other Division IV, of the same column. Initial y- in its turn had ceased to be regarded as a consonantal phoneme and had become identified fully with the medial semiflowl y-. (On the distinction between medial -j- and -y- see below.) (See also Tödæ 1957, p. 163.)

4 There is some evidence for the presence of aspiration in association with the voiced stops and affricates in transcriptions from Sanskrit of the eighth century (Maspero 1920). Earlier, Chinese voiced stops and affricates were used for Sanskrit unaspirated voiced consonants and special devices were used when it was felt necessary to indicate Sanskrit voiced aspiration. In any case there is no phonemic distinction in Chinese between aspirated and nonaspirated voiced stops and the mark of aspiration included in Karlgren's transcription is superfluous. It has been plausibly suggested that the Chinese voiced stops and affricates should be analysed as clusters of the unaspirated stops and affricates with the voiced laryngal h—g=kh, d̪=ts̪, etc.—an analysis which is widely applicable to the voiced consonants of the modern Wu dialects (Martin 1953, Bodman 1954, p. 23). The aspiration of the Chinese voiced consonants, if present, was probably much weaker than that found in Indian languages. As far as transcriptions are concerned the presence of voicing is in general much more important than aspiration and it will be most convenient to use the symbols for voiced consonants.

Whether or not we regard the Middle Chinese voiced consonants as aspirated, it does not of course authorize us to suppose, as Karlgren does, that at an earlier stage there were contrasted aspirated and non-aspirated voiced consonants as in Sanskrit. A threefold contrast among stops between unvoiced, aspirated, and voiced (with or without aspiration) is widespread in the East Asian linguistic area but such a fourfold contrast does not appear to exist at all.

5 I write e, ch, instead of Karlgren's ts, ts'.

6 n = Karlgren's ṇ. The value of this phoneme in pre-T'ang and early T'ang transcriptions indicates a simple palatal nasal. In the dialect of Ch'ang-an during the T'ang period the nasal initials all developed a homorganic closure and became partially denasalized: n- > ȵ-, n- > ȵd-, n- > ȵl-, m- > mb- and n- > ṇl-. This is shown by their use in transcriptions from the beginning of the seventh century onward to represent Sanskrit unaspirated voiced plosives and is also reflected in Kan-on and the transcriptions of Chinese in Brahmī, Tibetan and Uigur script. Traces of the newer usage can be found, according to Mizutani 1957, already at the beginning of the seventh century but the older usage whereby the nasals represented Sanskrit nasals remained predominant until the beginning of the eighth century. Last to be affected were syllables with nasal finals, so that for example M. ȵian is still used for Sanskrit ṇa when ȃ M. ȵia is used for ja. Denasalization of m- to mb- etc., is still found in some dialects of southern Shansi and is reflected in T'ang Min (Forrest 1948, p. 166). Denasalization of ʰa- was much more widespread. In all northern dialects and some central ones the nasal element has been completely lost resulting, for example, in Pekingese in the voiced retroflex fricative written j- in the Wade system and t- in the new official romanization.

7 M. j=K. ž, M. ž=K. d̪. The fan-ch'ieh of the Ch'ieh-yün distinguishes two initials which are arranged in the rhyme tables in such a way as to imply a voiced palatal affricate (=Karlgren's d̪) and a voiced palatal fricative (=Karlgren's ž). Chou Tsu-mo has noted however that in earlier fan-ch'ieh represented by the Yü-p'ien and the Chung-tien shih-ten the two initials are not distinguished and that where other dictionaries keep the distinction they do not agree among themselves or with the Ch'ieh-yün as to the distribution (Chou Tsu-mo 1957 [1947], p. 146). There is no distinction in treatment between the two initials in modern dialects. In southern dialects they have mostly both become fricatives. In Mandarin the same has happened in oblique tones and before certain endings in level tone; otherwise both initials are represented by affricates. There is therefore some doubt as to how far the distinction made in the Ch'ieh-yün can be regarded as phonemic. When we turn to transcription values we find that to postulate an affricate j- for the second initial is more satisfactory than Karlgren's ž-. It regularly represents Sanskrit j up to and through the seventh century. (For examples see Li Jung 1952, tables opposite p. 165, Mizutani 1957, pp. 348f.) Among Thai languages with early borrowings from Chinese, Dï represents
and Bailey (1946) has shown that it had this value in transcribing 悍 from icional and ial in Central Asian Prakrit. In Sino-Vietnamese it is represented by ɣ which seems to indicate the persistence of friction in some dialect as late as the tenth century. Basing himself on Sino-Vietnamese Nagel (1942) transcribed this initial as ɣ by which he meant some kind of dental fricative. In the Ch'ieh-yün system however it must be regarded as a frictionless palatal continuant. On the placing of this initial in the rhyme tables see (7) above.

8 Lo Ch'ang-p'i (1931) showed that these initials, which Karlgen reconstructs as palatal stops and palatal ʰ, were regularly used for transcribing Indian cerebrels. Karlgen (1954, p. 226) does not represent Lo's view correctly by saying that he proposed to reconstruct retroflex stops in Division II, and palatal stops in Division III. On the contrary Lo demonstrated clearly that these initials were used for Indian cerebrels before rhymes of both types and he reconstructed retroflex stops in both cases. He only said that in some dialects the medial ʸ of Division III had later palatalized these initials (not in Peking where according to Lo the present retroflex affricates can be explained by a direct development ti-> t-> ts→).

The principal reason why scholars have been slow to accept Lo's findings is no doubt that in the rhyme tables these initials seem to be the yodized complements of the pure dentals, which would be phonetically incompatible with their being supradentals. On this however see below.

9 In a very small number of words the Ch'ieh-yün appears to distinguish a voiced fricative supradental from the voiced affricate (see Li Jung 1932, p. 87). The only common character affected is 敵 M. ชำ (Karlgen's value ชำ follows the Kwang-yün which lacks this distinction). This word shows a fricative initial in all modern dialects except Cantonese, where it is read حتياجات, but in this respect it does not differ from words with initial ชำ in the same rhyme: ชำ M. ชำ, ชำ M. ชำ, which have lost their affrication in all dialects including Cantonese (Karlgen 1916, pp. 406-8). There would scarcely seem to be sufficient evidence to set up a distinct phoneme ชำ were it not for the fact that such a value would fit the transcription value of the character 敵. It occurs in the T'ang period in a Turkish title 敵 which appears to be the same as  miglior in the Orkhon inscriptions. (The same title is found earlier among the Juan-juan.) Pelliot devoted a short article to the problem created by this transcription (Pelliot 1929). He noted the alternative reading M. ชำ (=-K. g'ī) and suggested somewhat tentatively that this might be compared to cases where a Turkish or other foreign vocalic initial is represented by the initial which Karlgen transcribed as γ but which we have interpreted as ʰ, the medial -r- being disregarded. This is clearly unsatisfactory since, while a voiced laryngal fricative might well be used to represent a vocalic opening, the same is hardly true of a velar stop. If instead we read the character as M. ชำ, we have M. ชำ-klən which could represent ʰzin for ʰkin in the
same way that 室點蜜 M. ɕi-t-tem\-myt, or 捷帝米 M. ɕi-t-tei\-mei\ represent Ištami (Stembis) or 選可什 M. yu\-kha\-hän represents iga\-yön (see Liu Mau-ts'ai 1958, p. 499). Normally one would expect to find Middle Chinese -t used to represent medial or final -r and this appears in another transcription 乙斥 M. ɕi-t-kien. The value of final -t in the T'ang period was however probably not a true r but rather an interdental fricative -ʃ. A retroflex fricative ㅈ would probably have seemed a better equivalent to a foreign r, when available; but it was a very uncommon phoneme (On писание see also Hamilton 1955, p. 98.)

The same character 俟 appears in another title 俟利 (or 候利) M. ɕi\-li\-ji\ (or liet\)-psiat which is usually identified with Turkish eltabir but the phonetic equivalence is not exact and the identification seems to me somewhat doubtful.

Because of this possible corroboration for a special value for the initial 俟 I shall follow the distinction of the Ch'ieh-yün and write 俟. (See also p. 129 below.)

B. Medial semivowels

Palatal: i (= й)/y

Labial: w

1 Karlsgren's "vocalic i", regarded as characteristic of Division IV of the rhyme tables, is eliminated. The "pure" Division IV rhymes in which it was used: K. -iei, -ien, -iem, -iep, -iæ, -iep, -iep, -ieg—all have the head vowel ə which does not occur in Division I. For the Ch'ieh-yün system these rhymes must be amended to ei, en, em, etc., which is their value in pre-T'ang and early T'ang transcriptions. The yodization of these rhymes which made them fall together with yei, yen, etc. (K. -jäi, -jän) in the fan-ch'ieh of Hui-lin (eighteenth century) and led to their placing in Division IV of the rhyme tables was a development subsequent to the Ch'ieh-yün. Tödö calls these rhymes "false Division IV" (Lu Chih-wei 1939, Li Jung 1952, p. 107, Tödö 1957, p. 300, Weneck 1957 III, p. 66).

2 The theory of two types of medial -i-, a retracted -i- and a close, fronded -i-, was advanced by Ariaaka 1944 (1937-39) and Kono 1939 (see also Lu Chih-wei 1947) to account for the distinction, ignored in Karlsgren's system, between words in certain rhymes with laryngeal, velar and labial initials separated by their fan-ch'ieh spellings and placed in Divisions III and IV respectively in the rhyme tables. The distinction is an important one, for it gave rise in various ways to divergent treatment of words in the two Divisions in Go-on, Sino-Korean, Sino-Vietnamese and modern Chinese dialects. Nagel 1942 and Tung T'ung-ho 1948 and 1948(2) treat the distinction as part of the rhyme. This is unsatisfactory, however, since it violates the essential principle of a rhyming dictionary. The authors of the Ch'ieh-yün have even been accused of being over-subtle in their

distinctions between rhymes. It seems unlikely that they would have placed together under the same rhyme words which they distinguished by the rhyme. Those who have proposed the theory of contrasted medial semivowels have regarded it as an original part of the phonological system reaching back into the Old Chinese period. A theory to the contrary which seeks to explain the origin of the difference will be presented below.

The distinction between Division III and Division IV in the same rhyme is found only after laryngeal, velar and labial initials and only in rhymes with close front head vowels (e and i). Elsewhere the distinction may be regarded as neutralized and I write simply ɻ. Where the distinction is found I mark only the close variety of medial by writing ɻy- instead of ɻ. When it appears in contrast to ɻy-, ɻ is to be interpreted as ɻ- and could be so marked if desired.

3 It is unnecessary to distinguish two types of labial semivowel, u and w. See Chao Yuanren 1940.

After labial initials there is no contrastive distinction between words with medial -w- and words without, and I follow Li Jung in suppressing it in transcription — pan, maan instead of Karlgren's puän, mweng, etc. (see Chao Yuanren 1940, Li Jung 1952, pp. 123 ff.). Except before close front vowels the initial labial tended to impart a labialization to the syllable as a whole which resulted in its being classed as ho-k'ou and developing as such, but this can be regarded as implicit in the initial and need not be separately indicated in transcription. Li Jung retains the medial after labial initials in rhymes -uai (-wai), -uan (-wan), -juan (-jwan), i.e. where the Ch'ieh-yün sets up separate ho-k'ou rhymes. I regard these rhymes as capable of alternate phonemic interpretations—either as having head vowel u, o or as having head vowel a preceded by semivowel -w-. This leads to alternative spellings—kuan/kwen, mijuan/mjen, etc. (further discussed on pp. 81-2 below). In the case of rhymes -ai, an -uai (-wai) there are some words with labial initials in the former as well as the latter but Li Jung has demonstrated that they are variant forms of words appearing under -uai (-wai). The uncertainty about their placing in the dictionary shows a vacillation in interpretation as between p(w)ai and puai rather than a genuine phonological distinction.

C. Rhymes

1. Arranged according to the grouping of the rhyme tables: "Pure"

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<th>Class</th>
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**Table: The Consonantal System of Old Chinese**

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<th>Class</th>
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<td>魂 jin/yin¹⁴</td>
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<td>u</td>
<td>尤 iu</td>
<td>(微 iuai)</td>
<td>文 ian</td>
<td>東 iang (jwæn)</td>
<td>(尤 iu)</td>
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**N.B.** In the tables level tone rhymes are considered to include the corresponding rising and departing tones (except in the case of rhymes a, iæg, iæi, iæi/yei which only occur in the departing tone). The entering tone rhymes (i.e. rhymes in -k, -t, -p) are likewise considered to be implied by the corresponding rhymes with nasal finals—

N. B. In the tables level tone rhymes are considered to include the corresponding rising and departing tones (except in the case of rhymes a, iæg, iæi, iæi/yei which only occur in the departing tone). The entering tone rhymes (i.e. rhymes in -k, -t, -p) are likewise considered to be implied by the corresponding rhymes with nasal finals—at by an, etc. Ho-k'ou forms are listed only where they form separate rhymes in the Ch'i-ch'üan, otherwise they are included under the corresponding k'ai-k'ou—kwan under an, iæg, iæg under jæg, etc. The additional ho-k'ou rhymes of the Kuang-yin are placed in square brackets, e.g. [wæn]. Round brackets are used to indicate alternative spellings of the same rhyme, or alternative positions of the same rhyme in the table, or, in the case of (jæg) and (jia), theoretical Division III rhymes which are only doubtfully represented.

The level tone is not marked. Rising tone (shang-sheng) and departing tone (chü-sheng) are marked as follows: ka⁴, ka⁵.

1. an, iæg = K. uong, iæng. I follow Li Jung 1952, p. 134, in suppressing the medial -u-, -w-. Karlgren’s principal reason for inserting the medial was the designation of these rhymes as ho-k'ou in Sung rhyme tables and he found support for this also in the modern Wen-chou forms. The distinction k'ai-k'ou/ho-k'ou cannot, however, be mechanically reduced to the absence or presence of a labial semivowel. There is evidence that a rounded head vowel could itself lead to the designation ho-k'ou—note the designation of rhyme 哥 a as ho-k'ou in the Yün-ch'ing, which can only indicate that the back a had already become rounded in this dialect, as it has in modern Peking: ko < M. ka. Moreover, in the Yün-ch'ing rhymes 多 环 are-
of this distinction, the Kan-on reading of 生 is confirmed in ancient sources and is not a mere theoretical construct from the fan-ch‘ieh (Wenck III, p. 370).

The following arguments favour identifying the vowel in an, ian, ean, eak in many modern dialects, as compared to an, at, aen, aet and am, ap, aam, aep. Whereas the latter, like rhyme a and the rhymes with the mid-front vowel ae, developed a palatal glide which led to the palatalization of velar initials, the former were mostly retracted and fell together with rhymes an, ak. There are exceptions to this however which show an as having a front vowel compared to a. (a) Wen-chou maintains a distinction systematically:

坑 M. khaŋ, Wen. k‘a: 起 M. khan, Wen. k‘ang


(N.B. In this dialect words in ean with labial initials are distinguished from corresponding words in an: 猛 M. man, Wen. m'ai, 起 M. maŋ, Wen. ming (falling together with M. myen, men). In most dialects an and ean have completely fallen together.)

(b) In Northern dialects, and also in Wu, after labrygal initials -an shows the same palatalization as an, -a:

行 M. haŋ, Pek. hsing, Sh. hıang: 言 M. han, Pek. heng, Sh. hang.

It was noted by Chao, 1941, that rhyme iaŋ behaves in modern dialects as if it came from an, i.e. it causes palatization of velars. If an and ean really had the same vowel -a: in common, how can we account for this difference in their later history? The answer probably lies in the pressure exerted by the diphthong an as it tended to become monophthongized. In order to maintain the distinction between an and an, the latter would have tended to be displaced upwards towards an. When an and ean fell together, therefore, it was in the direction of the latter and in the majority of cases the tendency continued until an, ean and an had all fallen together. Rhymes an, ean and am, aam also fell together but, there being no pressure from an au diphthong, they fell together in the direction of an, am.

The consonantal system of Old Chinese
is to be identified phonemically with e=K. ie (on the suppression of “vocalic i”, see p. 70 above). They are associated in the Ch‘ieh-yüin and the rhyme tables as closely as of an, ən and ən, ən, etc. and they have largely fallen together in modern dialects, a process initiated by the breaking of -e to -ye- in the eighth century T‘ang dialect.

Almost all words with laryngal, velar and labial initials in rhymes 清 fall in Division IV in the rhyme tables and must therefore be written with the close medial yen, yek, not jen, jek. That this placing is not arbitrary is shown by the treatment of labial initials in Sino-Vietnamese (where labials followed by the close front medial become dentals); e.g. 脶 M. byek, S.-V. tit, 名 M. myen, S.-V. zu. It is also shown for velar and palatal initials by the fact that Sino-Korean always has -iong and does not show the contrast of ṭ M. khien S.-K. kan: 這 M. khyen, S.-K. kian. There are a very few words with labial initials placed in Division III in the Yün-ching of which the principal one is 見 M. pjeck, S.-V. bit. The placing of this word in various dictionaries is not constant. The T‘ang-yüin followed by Li Jung, makes it pijak (Li Jung 1952, p. 61, n. 7). We may in fact regard rhymes jen, jek as taking the place of jen, jek. Conversely, there are no rhymes jen, jat in the Ch‘ieh-yüin, their places being taken by the jen, jet subdivisions of rhymes jen/yen, jet/yet. A plausible interpretation of the situation in Hui-lin, where jen and yen are separated, falling together with M. jen and M. en respectively, is that this represents, not a development from the Ch‘ieh-yüin, but a separate dialect in which there was a rhyme jen, parallel to jen, instead of jen.

6 en = K. ieng. This is the Division II rhyme which corresponds in origin both to en and to ən. The vowel in this rhyme has already been identified with that of the corresponding -i, -m, and -n rhymes by Tung T‘ung-ho, Li Jung and Tōdō, who write ə or e. In writing it as a diphthong en I wish to symbolize it as consisting of a (=characteristic vowel of Division II) + ə. That it had a diphthongal pronunciation is suggested by the following considerations: (a) Sino-Korean writes rhymes 種 as -ánd, -āk. In modern Korean pronunciation this is a monophthong ə but the same spelling is used for rhyme 種 which we have good reason to suppose was an -i diphthong in Chinese.Rhymes an, ak are also normally spelt -ánd, -āk in Korean. This is probably due to the fact that by that time an and ən had fallen together in the direction of the latter (see (4) above). A difficulty is that the spelling -āk also occurs to some extent for ak (but not -ād for ən). This may be because rhymes ən, ak were already beginning to coalesce. (b) The analogy of the diphthongal rhymes an, auk which are the Division II rhymes corresponding to un, uk and ən, ək. This will be discussed further in connection with the theory of the development of Division II rhymes from Old Chinese to Middle Chinese.

The Go-on spellings of rhymes an, ak and ən, ək have the so-called yōn, that is they insert a syllable -ya- after the initial, e.g. kyō (spelt ki-ya-u), hyaku. This might seem to suggest a falling diphthong. One is reminded, however, of the way in which Modern Japanese often represents the low front “a” in English loan words, e.g.: hyabetsu “cabbage”, gyangaku “gang”. The matter is complicated by the fact that the same spellings appear for rhymes en, ek and yen, yek. The medial -y- in the latter pair is insufficient to explain the -ya- in Japanese because (a) we do normally find medial -i-/y- so represented in Go-on, (b) the yodization of the vowel -e- which made it fall together with -ya- is a later phenomenon (c) the Japanese head vowel -a- is still unexplained. It seems likely that the real explanation is that in the Wu dialect the vowel of en, yen was a very open [e] close to a. The same yōn appears sporadically in rhyme a. One must still account in some way for its non-appearance in rhymes an, am, but this applies to any alternative theory. The question is bound up with that of the value of Manyōgana े, which appears in these rhymes, and also in rhyme a. I hope to return to this on a later occasion. (For an interesting example of an ancient reading kyamu see (31) below.) For a discussion coming to somewhat different conclusions see Wenck III 1957, § 749.

There is no rhyme to be reconstructed with head vowel i before velar endings to correspond to jin/yin. As far as the Ch‘ieh-yüin is concerned, and certainly in the rhyme tables, it seems clear that rhymes 淳戟 are to be phonemically associated with en, ek, with a retracted central head vowel. For rhyme -jek we find evidence for this in early Buddhist transcriptions, e.g. 闡域 M. jhi-AYWAK = Jvaka (on the reading of the first character see p. 124 below), where Chinese ə corresponds to the swhā of Sanskrit. The same is true of the much earlier transcription (second century B.C.) 安息 M. an-AYWAK = ArYA (Parthia). In the same way we find yonized ə in 緬 M. sok=Saka, 仏 M. han=Ganges. On the other hand we have, also in an early Buddhist transcription (late second century A.D.) 拗隠 M. kouyek = Sanskrit kaśiṣika (with Middle Chinese y having the value ə, representing a Prakrit form with voicing of the medial sibilant, see p. 68 above). This would make it appear that the vowel was markedly closer and more frontal after palatal initials. Go-on readings of rhyme -jok show a similar differentiation according to the initial: Ō M. sijk, Go. soku, but 狭 M. sik, Go. tik. We find o readings (i.e. ə=od) after velars and laryngals (but 貓 M. jok, Go. tik, as well as 雞 M. jok, Go. oki) and after ts-, -s- (but with some readings shiki). After other initials we find -i, also 綰 M. jwak, Go. wiku, 畛 M. hjwak, Go. keki. This distribution shows a certain degree of resemblance to the kind of distribution between ə and i readings we find in rhyme jin/yin, where the ə is to be attributed to the retracted medial ə, rather than to a head vowel ə, but there is no trace in rhyme jok of a splitting of syllables with laryngal, velar and labial initials.
into Divisions III and IV, nor on the other hand do we find any trace in rhyme ˇjin/yin of Go-on readings with ASHBOARD after dental sibilants and affricates.

The Go-on representation of rhyme ˇjau is less complicated. We find ˛a (={0=Ä+a} after laryngals and dental sibilants and affricates, otherwise ˇy. (Kan-on has ˇyo, ˇyoku throughout in both rhymes.) The presence of ˇy (yom) in the Go-on readings is noteworthy since medial ˇj is otherwise not generally reflected in Go-on. The supposition of a particularly strong medial ˇj before ˇan, ek, tending to become strengthened into ˇian, ˇak (cf. wan/uau, jwan/juan, etc., see (1) below) would account very well for the Go-on treatment of both finals.

In the development of Modern Chinese both ˇjan and ˇjak have been treated as front vowels, causing the palatalization of velar initials in Mandarin dialects and falling together with en, yen and ek, yek. They did not bring about dentiabialization (in contrast to ˇjai). Wenck’s interpretation of this in terms of a shift of medial -j- to -y- will not do, however, for Sino-Vietnamese does not change labial initials into dentals, as it regularly does before medial -y-. Instead we should probably regard it as a continuation of the strengthening of medial ˇj to become the head vowel, with the subsequent loss of the following ˇa. The absence of ˇa as head vowel before velar finals left a phonemic gap which would have encouraged the process.

Historically Middle Chinese ˇa probably came from an Old Chinese close front vowel i and the yodized ˇja from the corresponding long vowel i (see p. 99 below). The vowel i had already become retracted to a central ˇa in many contexts by the Han period. When the long vowel became yodized, the possibility was created for the head vowels of ˇan and ˇjan to become phonemically separated. The former remained a central vowel but the latter moved back to its original position as a close front vowel.

ˇjin/yim = Karlgren’s ˇjam. Again we have a choice between i and ˇa as head vowel. Unlike the situation in rhymes with velar finals however the rhyme tables do not indicate a close link with the historically corresponding Division I rhyme. Moreover we have here, at least after the glottal stop, a contrast between Division III and Division IV, which would lead us to regard the rhyme as analogous to ˇjin/yin, rather than ˇjan. Karlgren’s principal reason for preferring ˇjam was the Go-on readings in on that occur after velar and labial initials. As far as the velars are concerned the situation is precisely similar to that in ˇjin/yin where Division III words are read -on and Division IV words are read -in, the only difference being that Division IV words only occur here after the glottal stop: ˇM. ˇjin, Go. on, ˇM. yim, Go. in. After labial initials the situation is indeed different, for we have: ˇM. biin, Go. bin, but ˇM. pijim, Go. hon. It may be thought, however, that this represents a difference of nuance resulting from the fronting effect of the dental final rather than a phonemic difference in the head vowel, and that the representation of medial ˇj (i.e. ˇj) by Japanese ˇa (={0=Ä}) is more regularly carried through before labial endings than before dentals. Sporadic cases of Go-on readings in -on also occur in rhyme ˇjin after supradental sibilants. This can similarly be attributed to medial ˇj, representing lost medial-J- (see p. 112 below). What we never find in rhyme ˇjin/yin, in marked contrast to ˇjau, is readings with ˇa after pure dental finals, which could only be attributed to the quality of the head vowel.

ˇam = Karlgren’s ˇam. On the reinterpretation of Karlgren’s length distinctions in terms of vowel quality see Martin 1953, pp. 30 ff., Wenck III 1957, pp. 193 ff. In rhymes ˇam and ˇai, which fell together with ˇam, ˇai in the fan-ch’ieh of Hui-lin (ninth century), the head vowel was no doubt already closer to a in Ch’ieh-yin than that in ˇan, ˇen, etc. The vowel of ˇam especially must have been markedly lower in position since it is usually represented by ˇa in Japanese rather than ˇa which is typical of rhymes with a. (Rhyme ˇai on the other hand often has ˇa.) In a narrow transcription this would justify a separate symbol. There are good reasons historically to identify the vowel in ˇam with ˇa in the other rhymes however and no confusion is introduced by retaining it in transcription.

ˇam = K. ˇam. See (7).

The nature of the difference between these two rhymes is a difficult problem. In the Ch’ieh-yin they are very nearly but not quite in complementary distribution, ˇa having only laryngal and velar initials, ˇa having mainly labials with a few somewhat doubtful velars. In excluding dental and palatal initials they together seem to correspond to both rhyme 元 before dental finals and Division III of rhyme 庾 before velar finals. Karlgren, therefore, made the head vowel ˇa in both. Since ˇa is classed as ho-k’ou, he introduced medial -w- as the distinguishing feature between the two rhymes and wrote them -iom, -iwm respectively. This has been followed, not without misgivings, by most other investigators. To write medial -w- in rhyme ˇa, however, violates two principles: (a) that this semi-vowel never occurs distinctively before labial endings, (b) that it never occurs after labial initials. In any case, since we have departed from Karlgren in considering the vowels of 元 and 庾 as different (ˇam and ˇjan as against -iom, -iwm) we would be faced with the problem of writing ˇam or ˇjam even if we agreed to identify the main vowels of the two rhymes. There are analogies with both ˇam and ˇian.

A. Analogies of rhymes 元 羅 with ˇam.

(a) Dentiaabialization occurs in rhymes 元 and ˇam, but not in ˇjan.
(b) Go-on normally has -on in both rhyme 元 and rhyme ˇjan (but rhyme 羅 vacillates between -on and -en). This contrasts with -yo (-ya-u) in ˇian. In ju-sheng we find -echi for ˇjan in k’ai-k’ou, -uchchi or -echhi in ho-k’ou. Rhymes 元 and 羅 both have -5 (o-fu). For ˇjan on the other hand we find -yaku. One must however not overlook an ancient reading
hi-ya-mu for 前, one of the few words with velar initials in rhyme 元 (Wenk III 1957, p. 320).

(c) In the fan-ch'ih of Hui-lin rhyme 元 has fallen together with jem/yem; rhyme 元 jen falls together with M. jen (= jan, see (a) above) but remains distinct from -yem.

B. Analogies with jen.

(a) In the fan-ch'ih of Hui-lin rhyme 元 (in distinction from 前) has fallen together with the Division II rhymes -am/-æm, implying a head vowel æ (but the two words 元 前 are classed with am).

(b) The exceptional reading hi-ya-mu noted above also points to æ.

(c) Whereas rhyme jen comes exclusively from Old Chinese æ, hai-sheng connections show that 元, like 前, come from both $ and æ.

A fuller discussion of the problem must be left until the development of the rhymes from Old Chinese is considered. Provisionally I conclude as follows: the two rhymes probably originally represented a distinction jen~jen but the distinction has been obscured by the shift of all words with labial initials to jen due to the combined depressive effect of the labial initial and final (hence dentilabialization) and by the umlaut of both jen and jen towards jen after other initials. The versions of the Ch'ih-yün that we possess represent a stage at which the first process had been completed and the second was under way so that it does not give reliable guidance as to the original distribution. Hui-lin's system seems to represent a slightly different development in which the distinction between jen and jen was still to some extent retained after labials but both had gone over to jen after other initials (see pp. 133–114 below).

13 jen/yem = Karlgren's jen. See (a).

14 em = Karlgren's jen.

15 jen = Karlgren's jen. Chao Yuanren 1941 pointed out that this rhyme, and its corresponding ju-sheng, which both occur only in Division II after supraliteral initials, were in complementary distribution with rhyme 真 jin/yin (= K. jen). Most writers since, apart from Karlgren, have made no distinction in transcription. The phonetic difference which led to the setting up of a separate rhyme was no doubt a retraction of the main vowel from i towards æ under the influence of the retroflex initials. In Hui-lin's system rhyme 真 and also Division III of rhyme 真, i.e. jin (= jin) had mostly fallen together with jen. There are still a few words with retroflex affricates or s which Huang Ts'ui-po classes with yin. One of them is a word which appears in rhyme 真 but the other two appear in rhyme 真. Though it seems doubtful therefore whether there was any phonemic distinction, it will be convenient to write jen for rhyme 真 as opposed to jen.

This rhyme, being allophonic to jen, properly belongs in Division III,
concerned we have an indication in the fan-ch'ieh of Hui-lin of the sound change which probably led to the setting up of a new category. In Hui-lin we find that jwyt/ywyt had fallen together with jwot (jwot). This no doubt indicates a strengthening of the labial medial vowel and a retraction of the main vowel. Rhymes jwot and jwot/ywot are still kept separate but the latter is no longer the same as either yin or yin. (jwot had separated from yin and fallen together with jwot, see (1) above). The separation of yin and yin was not systematically achieved for in the Kuang-yin we still find some ho-kou words still left in rhyme yin.

On the mistake of identifying the vowel in this rhyme with that in 菽 jin, see (1) above. It is certainly correct historically to identify the vowel in an with a in 稲 an. We find words in this rhyme used to transcribe foreign a vowels even as late as Hsiian-tsang (seventh century), e.g. 恬 m. quit-myin-quin=Simingăn (Mizutani 1958, p. 62, cf. also pp. 52, 60, 64, etc.). The lack of words with dental, palatal or supradental initials in this rhyme, in contrast to rhyme 菽 jin, is the result of an early shift of jin to jen under the palatalizing effect of central initials. The same ultima later affected jen after laryngal and velar initials, so that in Hui-lin it falls together with jen (= jen, see p. 76 above), and Kan-on has -en. Huang Ts'ui-po regards words with labial initials as having also fallen together with similar words in jen in Hui-lin, but this is doubtful, since Kan-on reads them as an and they underwent dentilabialization in contrast to p'ien, etc. (Huang 1931, 6.152). Most modern dialects reflect the post-Ch'ieh-yin fronting of this rhyme after laryngal and velars but Fu-chou preserves a back vowel, as does Go-on: 建 M. kian, F. kiong, Go. kon, 元 M. jiwan, N. guan, Go. gan (=guan). Since early Japanese had two o phonemes—o being probably a rounded open back vowel, o a rounded central vowel (=o)—the Go-on readings in on are ambiguous. Wench III, 1957, p. 266, argues on rather slender grounds in favour of o which would point to a central vowel like Karlgren's v in this rhyme, but the use of 建 M. hiwan, 稲 M. hivat for Manyogana wo, wani, wato, vao, vatu (Wench II, 1954, p. 311) clearly points to o, since o (=o) and o (=o) were complementary to one another (Wench II, 1954, p. 314). It is quite possible that the back vowel in jen (probably originally long a, see below) had some degree of rounding which led to its being represented by Japanese o. We similarly find 方 M. piaq used for Manyogana ho (Wench II, 1954, p. 264).

The one piece of evidence that definitely favours Karlgren's reconstruction of a low central vowel o is the placing of rhyme yin in the Ch'ieh-yin, where it is not associated with an, but with 菽 an (wain) and扇 an, with which, according to the Kuang-yin, it was ‘rung-yung’. Moreover, the table of rhymes in the K'an-nu pu-ch'ieh Ch'ieh-yin notes that certain earlier dictionaries had combined it with an. This seems to represent a transition stage between an and the value jen (or jen), which is represented by Hui-lin's fan-ch'ieh in the ninth century and by Kan-on. Even if this means that it is strictly speaking an archaism in terms of the Ch'ieh-yin to write jen, no confusion is introduced thereby and it is historically more satisfactory.

20 jen/yan=K. j'an. See (13).
21 en=K. ien.
22 The appearance in the Kuang-yin, as opposed to the Ch'ieh-yin, of a special ho-kou rhyme 義 wa, separate from a, is probably due to a rounding of a to o which led to its designation as ho-kou (see (1) above). The same reason may plausibly be assigned for the separation of rhyme wan from an. It is interesting to note that words in ia are placed under wa, not a, in the Kuang-yin. This seems to prove that there was a recognizable difference in the head vowels and that the separation of the rhymes was not simply a matter of the medial -w-.

23 je/ye=K. -ie. My transcription agrees with that of Li Jung. Karlgren's transcription violates his own principles since it puts 'vocalic' i in Division III. The post-Ch'ieh-yin falling together of this rhyme with rhymes ji/yi, ia and iai into a single rhyme i does not require us to postulate a head vowel i in the Ch'ieh-yin.

24 ji/yi=K. -i. It is necessary to indicate the medial vowels i/y in transcription to take account of the Division III/IV contrast in this rhyme.

25 iai=K. iai. This modification was proposed by Chao Yuanren 1940.

26 ja=K. i. Karlgren does not mark any distinction between this rhyme and rhyme ji/yi. I follow Li Jung 1952. The central head vowel a is indicated by the Manyogana use of this rhyme to represent Japanese o (=o) or o (=o), a practice which is preserved in the customary sino-Japanese reading of M. kia as ko (see Wench III, pp. 154-6, 159). Li Jung's -ia is based on a theoretical parallel with rhyme ye (he writes -ie). In the latter the velar (or laryngal) final of Old Chinese has been lost without trace after the yodized (long) vowel. Cf. also rhyme 魚 jo.

27 ai and a both=Karlgren's -ai (he does not distinguish between these two rhymes); aai=K. ai. Li Jung writes: 侠 a, 競 a, 夹 ai. The distinction between aai and a, corresponds to that between aoan and an, or ao at ao; i.e. rhymes with ao are derived from Old Chinese vowels a < i and e, rhymes with a from Old Chinese a (see pp. 75, 76 above). Here we also have a third rhyme 佳, however. It is the Division II rhyme derived from Old Chinese e where an original laryngal final has been lost.

Rhyme 佳 aai, on the other hand, comes from both Old Chinese a < i and Old Chinese e where an original dental final has been lost, and also from Old Chinese a < i where an original laryngal has been lost. (In closed syllables Old Chinese i and e fall together in Division II giving aoan, aoa, aoan.)
evidence that 撙 and 魂 are corresponding Division I and Division III rhymes, while 享 stands by itself. Li Jung deduced from the evidence of transcriptions of Sanskrit that up until the beginning of T'ang the principal vowel in rhymes 撙 and 魂 was o and accordingly wrote o and io. If however we make these rhymes instead diphthongs ou, jou, we have an exact parallel to お, じゅ, assuming the vocalization of lost laryngeal finals after back vowels to -u as in おう, あう, etc. This allows us to regard 享 as jo, with a pure open o, and it is not necessary to do as Li Jung does and set up a new phoneme i found only in this rhyme. The historical difference between jo and jou is that the one comes from Old Chinese *ah (= K. *iug, *ego) while the other comes principally from Old Chinese *uh (= K. *ju, *yug). We may compare the disappearance of the laryngeal final without vocalization after the original long unrounded vowel to the development of rhyme やe < *ah (= K. *ieg).

For the Sino-Japanese values of these rhymes see Wenck III, p. 170 ff. The hypothesis of a diphthong ou in rhyme would seem to account better for the variation between -o and -u in Go-on and Mayogana in this rhyme than the arguments discussed by Wenck. Since Karlgren's splitting off of an -o class from the *ah (= K. *iug) class in Old Chinese is baseless, Wenck's arguments based on it are also baseless. I am not convinced by Wenck's rejection of Ono's explanation for the use of わ in Kan'on to represent ん M. *ou (= K. *wo). On Ono's showing the real opposition between the sounds represented in kana as わ and ɔ was originally between the back ɔ and the back ʊ and the Japanese might well have preferred to write わ (= ɔ) for Chinese *ou rather than ɔ (= ʊ = ɔ). The representation of our jou in Go-on is parallel to that of じゅ.

As far as our jo is concerned, the Japanese value ɔ (= ʊ) is quite satisfactory. During the T'ang period this rhyme became more fronted, so that in Tibetan and Brahmi transcriptions it often appears as -i. This is a similar umlaut to that which made jo change to I, but it was less extensive. す, *iou = K. しゅ; *iou = K. *iou; *iyo = K. *ju (Karlgren 1957). My transcription follows Li Jung except that I write *iou instead of his *ju to indicate that there was a difference in head vowel between *iou and *iyo and not merely in the medials.

Li Jung's emendation of iu to iu (= my) was based on transcriptions of Sanskrit in pre-T'ang and early T'ang from which he concluded that it was only during T'ang that u and iu became diphthongized to ɔ and *iou. This emendation has the further theoretical advantage that it makes an exact parallel with the corresponding -u and -k rhymes. M. u < *ou (= K. *iug, *iu). M. ju < *ui = K. *iog). An explanation of rhyme iu will be given below.

32 ιu = K. *iou. See (13).
33 ιa = K. *iou. See (14).
THE INITIALS OF OLD CHINESE

Initial g and h in Old Chinese

In Middle Chinese g occurs only before medial i/y. Karlsgren noted this, and also that his γ (= M. ḥ) never occurred in such a context. He further noted that there were many contacts in phonetic series between his γ and velar stops, including double readings with k-/-γ or k’/-γ which appeared to be examples of word derivation through voiceless/voiced contrast in the initial. He therefore postulated the development: g’ > γ, g’i > g’i. This left unaccounted for his initial ji (= M. ḣi) which also shows some contacts with velars. On the basis of a theory of the existence of un-aspirated voiced stops in Old Chinese, complementary to the aspirated voiced stops, he reconstructed gi > ji. He was unable to provide for initial g occurring otherwise than before medial i (and also before medial l, see p. 122 below), but he suggested that it might have fallen together with initial ŋ (Karlsgren 1954, pp. 275–6).

As we have seen, h and ḣ are parts of the same phoneme in early Middle Chinese. The apparent complementarity between h and gi therefore ceases to exist. Nevertheless the evidence that Middle Chinese h is at least sometimes closely related in origin to the velar stops is quite overwhelming. A solution which simply derived all Middle Chinese h from Old Chinese ḣ would be quite unacceptable. The answer must be as suggested by Li Fang-kuei, that Middle Chinese ḣ had two origins, coming partly from Old Chinese h and partly from Old Chinese g when not followed by yod (Bodman 1954, pp. 24–5).

We can find traces of this distinction in Go-on. Thus:

和 M. ḷwa, G. wa: 福 M. ḷwa, G. ga (spelt gu-wa)
霳 M. ḷwa, G. we: 福 M. ḷwa, G. ge
會 M. ḷwa, G. we: 樂 M. ḷwa, G. ge
懐 M. ḷwe, G. we: 樂 M. ḷwe, G. ge
鞋 M. hae, G. e (also ge): 植 M. hae, G. ge
種 M. ḷwak, G. wak: 植 M. ḷwak, G. gaku (spelt gu-wa-hu)
織 M. ḷwak, G. wak: 植 M. ḷwak, G. gaku (spelt gu-wa-hu)
虹 M. hvuq, G. u: 植 M. hvuq, G. gu

Almost all these examples are in ho-k’ou. The only exception is M. hae, G. e, which has a ho-k’ou word 主 M. kwei as phonetic and is probably a case of the loss of w before e (see p. 97 below). The rule would seem to be that Go-on makes a distinction between h < hw, which it represents by w, and hw < gw, which it represents by g, and that it extended this practice to ḣu- as well. Otherwise we find g for h of whatever origin. Unfortunately the rule is not completely reliable, for standard Go-on seems to have sometimes extended g to cases of Old Chinese hw. Thus the standard Go-on for 福丸 M. ḷ wan is gan (spelt gu-wan) though in both cases there is other evidence which makes it quite clear that the Old Chinese initial must have been h. The hsiêh-theng connections of both are with laryngals rather than velars (see Grammata Serica Recensa, nos. 163, 164). The Manyôgana use of 丸 for wa (Wenck, II, 1954, p. 309) and the non-standard Go-on readings woon for both (Wenck III, 1957, p. 250) indicate hw, as does the use of ḣ for Sanskrit -vān- in 雲提恒因 M. ʂie-kdei-hwan-yin = Sak(rö)devän(äm) In(dra) (T.224, ca. A.D. 180).

Li Fang-kuei noted the fact that modern colloquial Min dialects appear to preserve a distinction between two types of reflex of Middle Chinese h. Thus in Fu-chou dialect for example we find: 應 M. hou, F. u, 丸 M. ḷ wan, F. uong, 樂 M. ḷ wa, F. waak, F. wa, uak, 鞋 M. hae, F. a; but 應 M. hou, F. ku, 樂 M. ḷan, F. kang, 種 M. ḳu, F. kau. Many other examples could be supplied not only from Fu-chou but also from other Min dialects such as Amoy and Swatow. Unfortunately the evidence is not unambiguous for we have two colloquial readings in Fu-chou for 下 M. hâ, F. a and hâ; for 行 M. ḷan we have the colloquial Fu-chou reading kiaang but for the same character read M. ḷan there is the reading ong. The fact that in both these words we have Division II (a) vowels, pointing back to cluster initials (see below) may be of significance. It is clear however that until some explanation can be found for such cases, we must look on the Min evidence for distinguishing between Old Chinese g and h as rather uncertain.

In spite of the fact that Middle Chinese h (= K. γ) shows a large number of contacts with k in the Shih-ming, Bodman came to the somewhat surprising conclusion that it was already a spirant in the second century A.D. (Bodman 1954, p. 25). The evidence of Tai forms of the twelfth “earthly branch” 又 M. hâi < *γi < *gi indicates a stop rather than a fricative at the time of borrowing. The date is unknown but is unlikely to have been much earlier, if at all, than the Shih-ming. As we have seen, Go-on still preserved the distinction between g and h in ho-k’ou. In early Buddhist transcriptions we find M. h < g used for Sanskrit g, thus: 應 M. ḷan = Gangâ, 阿含 M. a-ḥam = ḷama (contrast the later transcriptions 善 M. gian-gja, 阿含 M. a-gia-mu). At the same early period we find ḷ < gw regularly used for Sanskrit v: and M. ḷ for va-, 起 M. ḷwat < *hwat for tat-, sad-, 會 M. ḷai < *hwas for ad-, etc. We also find h used for Sanskrit (voiced) ḣ as in 麥督勸 M. ma-hu-lâk = Mahoraga (T.224, ca. A.D. 180, see also Mizutani 1958 for further examples). A most interesting example is the use of 何 M. ḳa to represent the voiced aspiration of Sanskrit letters in a text dating from A.D. 286 (T.222, p. 195, see Li Jung 1952, table opposite p. 164), thus 抱 何 M. phie-ḥa = bha, 仰 何 M. kia-ḥa = gha. More commonly Sanskrit ḳ is represented by Chinese unvoiced h, as in 耳何 M. ma-ḥa = mā
probably because the Indian phoneme, though voiced, was a stronger aspiration than the Chinese.

Hsueh-sheng connections alone sometimes establish a high degree of probability as to whether Middle Chinese .mdl comes from Old Chinese .mdl or  . But this is by no means always the case since many series contain both velars and laryngals. The evidence of Min dialects, if it is to be relied upon, would also indicate that the same phonetic could be used for both .mdl and  . In the absence of external evidence of some kind therefore, uncertainty must remain in individual cases as to the correct Old Chinese reconstruction.

The transcription value of initial glottal stop

The glottal stop in Old Chinese was not a mere feature of vocalic ingress, like that of German, but a consonantal phoneme fully integrated into the series of laryngal initials. That it was recognized as being akin to the velars is shown by its alternation with velar stops in phonetic series, e.g.: 阿  , 可  , 哥  , 歌  , etc.; 說  ,  ,  ,  . This being so, it is not surprising that in addition to its normal use to represent foreign vocalic initials, we find it representing foreign velars, or rather, in all probability back-velars or uvulars. (Similar evidence for its use in its final position will be given in the continuation of this article.)

The name of a city state east of Khotan appears in the Han-shu as 托弥 M. *jou-mye (or 'ou-mye) < *wah- *me, but in the Hou Han-shu as 狐弥 M. kjou-mye < *koh- *me. Though the vowel of the first syllable occasions some difficulty, it is probably the same as the place known as Khema in the Kharosti documents from Lou-lan, where it is closely associated with Khotan (Burrow 1937, p. 86), and also as the city of Kham city of T'ang and the Kam Prefecture of the tenth century, both of which were in the neighbourhood of Khotan (Hamilton 1938, pp. 117-18). If we suppose that the original was something like *qma or *qwma, it could, I think, account for both Han dynasty forms *w and *k (with rounding of the word instead of -w-) as alternative ways of expressing a foreign uvular. The Kharosti  *-kh- in Khema may likewise not indicate aspiration but be an attempt to express the throaty quality of an uvular. There is unfortunately a difficulty about the reading since we sometimes find the graphically very similar M. han *< *ganb instead of 托. In Sung Yün (early sixth century) we even find 托彌 M. han *me (Lo-yang chiiek-lau chi chiao- chu, p. 265). Nevertheless there is I think, good reason for retaining the reading of the Han-shu. Yen Shih-ku glosses the character with 風 M. *ou (implying Old Chinese *wah) which clearly shows that his text had 托. (The only difference implied by this gloss as compared to the reading jou as found in the Kuo-yün is in the length of the vowel in Old Chinese.) The same character appears in a number of other transcriptions of Former Han date from the same region, similarly guaranteed by glosses. This is not absolute proof, since the same possibility of graphic corruption existed in all cases and the commentators could have based their readings on corrupt texts, but it does give on the presumption in favour of 托. Its use in transcriptions was presumably to provide a counterpart with glottal stop initial to 風 M. hjou which is rather common in Han transcriptions.

Though M. han might superficially seem to provide an easier alternation with 捕, since it probably began with a velar stop in the Han period, there are strong reasons against it: (1) the initial is voiced, unlike the later Chinese forms, (2) the final -ou ought not to be simply disregarded, (3) it has the departing tone—common transcription words in the Han period are predominantly in the level tone and words in other tones were only used for special purposes.

We find the same character in 托泥 M. *jou-nei (or 'ou-) < *wah- *ne(S), the capital of Shan-shan (Han-shu 96A). As K. Enoki has recently pointed out, this must be equivalent to the kuhani or khowani found in the Kharosti documents from Lou-lan (Enoki 1961, Burrow 1937, p. 84). It is unnecessary, however, as Enoki does, to adopt the reading 捕 in order to give a satisfactory phonetic equivalence. The reading M. *ou is given not only by Yen Shih-ku but also by an anonymous commentator quoted in T'ai- ping yu-lan 792.5a. Moreover the variant 托泥 M. hwan-nei (Pekingese huan, not han) quoted by Enoki from Hou Han-chi 15, seems closer to *wah- than to *ganb, as an attempt to render the hypothetical original behind kewani or khowani.

The possibility of a relationship between Chinese M. *jou-nei "saffron" and Persian karkam, suggested by Hirth but rejected by Lauffer (Lauffer 1919, p. 322) must be re-examined in the light of the possibility of initial glottal stop having a consonantal value in transcription, but the question is too complex to be gone into here.

Finally we have the title given to the consort of the Hsiung-nu rulers: 維氏 M. *at-ce (or *iet-) < *ez-teh (on the value of the second character, see p. 106 below). As I shall show, there is good reason to think that a number of Hsiung-nu titles later passed to the other nomadic empires of the steppe including the Turks and this word may well be the ancestral form of Turkish qatuq/katuq. This will be discussed further in the Appendix.

In at least one instance we apparently have the reverse situation to that which has just been discussed, namely Chinese k- appearing, instead of a glottal stop, for a foreign vocalic opening. This is in the standard Han dynasty name for the River Oxus: 捕 M. kjw. This is first found in Shih-chi 123 in the account of Chang Ch'ien's journey to the west. M. kjw should go back to Old Chinese *kwdz. The final dental was already disappearing after long by the end of the second century B.C. and we may conjecture
have to do with a Tokharian phoneme—the name of Dihistan is, of course, Iranian, but it probably came to the Chinese through a Tokharian intermediary at this period.

The transcription value of ROLS in Western Han

The use of Chinese ROLS to represent Sanskrit ROLS and ROLS has already been touched upon. In a number of transcriptions of the Western Han it appears to be used to represent a foreign voiced back-velar, or perhaps uvular, consonant, that as a voiced counterpart to initial glottal stop. An interesting example of this is in the name of Khotan 焉焉 M. 雲雲. This transcription, which first occurs in Shih-chi in the account of Chang Ch’ien’s journey, remained the standard Chinese name from that time onward. The earliest non-Chinese form of the word is Khotana, found in the Kharosthi documents at Lou-lan (ca. A.D. 300). Later we have the Brahmi spellings Hvataha, Hvama, representing the native Khotanese pronunciation. Though these spellings use the Indian ROLS (originally a voiced consonant), they ought, Professor Bailey tells me, to represent a voiceless aspiration in Khotanese. This is also implied in Hsuan-tsang’s spelling 洛那 M. 洛那-ROLS said to represent the local pronunciation in the seventh century A.D. Nevertheless there are indications pointing to an original voiced initial. The saneritized form 龍那, known through Hsuan-tsang’s 焉焉 and from Gatauma in a Khotanese document, has no doubt etymologizing (meaning “earth-test”!) but it must have had some basis in a native original. (Besides these forms cited by Pelliot, we have Gaituma-desa in a Sanskrit text from Khotan—see Bailey 1938 p. 541). The Tibetan forms with voiced initial 龍-ROLS, 龍-ROLS or 龍-ROLS, might be based on Middle Chinese M. ROLS as Pelliot suggests, in which case they do not give independent evidence about the original form of the word. I fear the same may be true of the Altaic forms which Pelliot discusses at length and in any case I cannot agree that the Chinese are likely to have first heard the name through an Altaic intermediary. I agree however in general terms with his conclusion that the native original must have been something like 龍那. The initial was probably not a stop but a spirant. (See Pelliot 1958, “Cotan.”)

The same character appears in a number of Hsiung-nu words. Two of these will be discussed in the Appendix; 龍于 M. 逐逐-ROLS and 龍于 M. 龍-ROLS from ROLS and ROLS, in which it is proposed to see the ancestral forms of Turkish targa/tarxan and qagan/qazan. Though we have no direct knowledge of Hsiung-nu phonology it may be conjectured that the underlying forms were something like ROLS or ROLS and ROLS or ROLS.

It has been suggested on the basis of Tai loan words that Chinese, like Tai, may have originally had a separate series of uvular consonants:
q, zh, G, in addition to the velars (Haudricourt 1954). There seems to be no basis for distinguishing such a series within Chinese and if I am right in thinking that the glottal stop was sometimes used as a substitute for foreign uvulars in the Han period, this would seem to be positive evidence against there having been uvulars in Chinese.

The velar nasals η, ηh

The initial η of Middle Chinese may be projected back unchanged into the OC. period. In addition we need to reconstruct for Old Chinese a contrasting aspirated phoneme ηh. This is an extension of the proposal made by Tung T'ung-ho to reconstruct voiceless m to account for alternation between m and h (K. x- ) in *sih-sheng series which Karlgren explained in terms of the cluster *mn-. Aspirated nasals and liquids are typical of Tai languages—also Miao-Yao (Downer 1961). Even if we accept the prevailing opinion that Tai should no longer be regarded as cognate to Chinese, it is clear that there is much in common between the phonological systems of the two groups (including the tonal systems). This is not in itself evidence for the existence of aspirated nasal in Chinese but it will encourage us to adopt a solution on these lines if it suggests itself on other grounds.

The postulate of ηh will account for the frequent cases where η and h alternate in phonetic series:

<table>
<thead>
<tr>
<th>MC. ηjie</th>
<th>MC. ηjie</th>
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<tbody>
<tr>
<td>MC. ηwa:</td>
<td>ervative MC. hwa</td>
</tr>
<tr>
<td>雄 ηwa, 焉 MC. ηwe: 雄 MC. hiwe (but note also 爲 hiwe, giving the possibility of original h—)</td>
<td></td>
</tr>
<tr>
<td>午 MC. ηou; 許 MC. hou; hjo</td>
<td></td>
</tr>
<tr>
<td>雄 ηjan: 許 MC. hian</td>
<td></td>
</tr>
<tr>
<td>猶 M. jio: 彼 M. hai (also read qia)</td>
<td></td>
</tr>
<tr>
<td>猶 M. jue: 嚴 M. beu</td>
<td></td>
</tr>
<tr>
<td>虞 M. jiek: 許 M. hjak</td>
<td></td>
</tr>
<tr>
<td>堤 M. jok: M. hjok</td>
<td></td>
</tr>
<tr>
<td>猶 M. gek: 彼 M. hek</td>
<td></td>
</tr>
<tr>
<td>艾 M. tai, ηiai: 計艾 M. hai</td>
<td></td>
</tr>
<tr>
<td>伐 M. ijet: hjet</td>
<td></td>
</tr>
<tr>
<td>陁 M. ηim: 厭 ηim</td>
<td></td>
</tr>
</tbody>
</table>

S. Yakhontov has recently proposed a different solution for this phenomenon (Yakhontov 1960). He regards a prefixed s- as responsible for the development of h—both from original m- and from η-: *mn- > ηh, *mn- > h-. The existence of clusters of the type *ηh- is proved by the Tai borrowings of the seventh of the twelve branches 午 MC. gου (Li Fang-kuei 1945). As Li Fang-kuei points out the Thai forms imply a voiced initial cluster ηηh rather than ηn-. One might therefore suppose a development: ηη > ηh, ηη > h—with a contrast between s- and ηh- rather than between η- and ηh-. There is however considerable doubt as to the existence in Old Chinese of z as an independent phoneme (see p. 126 below) and it is better to make the contrast depend phonemically on the second part of the cluster: ηη (pronounced ηη): ηh.

Initial η in transcriptions

In transcriptions of the Middle T'ang onwards we find η- used for foreign η-. This is to be explained by the fact that in the standard dialect of that time it had, in common with the other nasals, developed a homorganic closure, becoming ηη-. In earlier periods it appears rather rarely. Examples where the foreign original can be identified are even less common. There is however some evidence that it was used in the Han period to represent foreign initial η-. At that time the Middle Chinese initial η- had not yet developed out of the palatalization of s- (see p. 114 ff. below). Moreover the medial semivowel i/y, so ubiquitous in MC., was only beginning to appear through the breaking of the original long vowels, otherwise one might have expected ji- or hj- to be used for foreign η-. In the circumstances the velar nasal continuant η seems to have been the closest that could be got to a foreign palatal continuant.

Among the few available examples, one has already been noted by Pelliot: 彼波 留 MC. ηiap-pa-la—*Yapala, for Yavana. (Pelliot 1933, p. 95, 1934, p. 26.) This occurs in Sung Yün's account of his western journey in the early sixth century as the old name for Gandhāra and is repeated in the Pei-shih without its final syllable. Pelliot cites a number of references in Buddhist scriptures to the country of Yeh-po or Yeh-p'o, spelt 葉波 (姥) M. yeip-pa, -pa. One of them is the San-mi-ti pu lun (T.1649, vol. XXXII, p. 470a). In it a variant (not noted by Pelliot) is recorded: 彼彼 ηiap-pie'. This must be an ancient transcription which has been replaced in other texts by the more modern and usual one. It shows that Sung Yün was not making up a new transcription but quoting a name that was known to him from sacred texts. The antiquity of the variant transcription in the San-mi-ti pu lun is shown not only by the first character but also by the second, M. pie' < *pâh, since it indicates a stage at which this character was still appropriate to transcribe an a vowel. This work is attributed to an anonymous translator of the Eastern Chin, but, even if this is correct, the transcription itself may be older.

Pelliot cited this example apropos of the famous and controversial name Yüeh-chih 月氏 M. niwat-cje, pointing out that the initial η- was unlikely to have represented a foreign η-, as has generally been assumed, before the middle T'ang period. Pelliot did not himself make any proposal as to the true equivalent of the name but his argument greatly strengthens the case for one of the many proposals that have been made, namely that of the 'Štati found on the north side of the upper Yaxaters in Ptolemy. The initial
of the second syllable would have been still unpalatalized *t- at the beginning of the Han dynasty when the Yueh-chih first appear. The labial element in the Chinese transcription remains unexplained. The true initial may have been the yw- found in some Tokharian words (=I.P. חי) which could not have been exactly represented in any other way in Greek. The question as to whether the *t'hr are the same as the *Ahtri or Asiani, as has often been stated, must be left aside for the moment. The equation seems highly probable on historical grounds.

Another place where we may have Chinese *n- for foreign *y- is in two early transcriptions that seem to represent some form of the name Yaxartes. The first is the 美国 (or 羲) M. ιακο- (or λακ-) ηιωταηιοκ (or θαυκ) land (地) said in Han-shu 96A to be the summer territory of the rulers of K'ang-chü, where they had their capital 美国 (or 羲). The first two syllables would point back to Old Chinese *ηιακο- (or ιειακο)-ηιωτα. The final syllable should give either *ηιακο- < ηιικ (see pp. 120, 121 below), depending on the variant adopted. The second seems more probable. The aspirated nasal may well have already changed to *k- at this period and we could then regard the syllable as simply indicating an Iranian adjectival form in -k. There is much uncertainty as to the true Iranian original of Yaxartes but spellings such as Ὠροντις, and Araxates (Herrmann, article “Yaxartes” in Pauly-Wissowa) point to the existence of forms with *r- in the first syllable. Marquart wished to reconstruct an original *Rōsa-arta > Yaxart or *Raxarta (Marquart 1928, p. 16, 1931, p. 35, Minorsky 1937, pp. 210-11). The Chinese *ηιακο-ηιωτα shows no sign of a sibilant. In the Shih-ming the character 越 M. ηιωτα is glossed with 越 M. ηικ (see pp. 131 below), which suggests the possibility of a sibilant: *ηιωτα. Such a cluster must have been lost by the end of the second century A.D., when we find the character regularly used for Sanskrit -vat-, -vad-, but it could nevertheless have existed two centuries earlier. On the other hand the hsieh-sheng series of 越 shows only ηω and ηω. If the Chinese form never had a sibilant, it might point to a form like *Yrша(т)а.

The second transcription is 西河旧事 M. ηια-ιαγε- (also read khye-, khye-) tei appears in the Shui-ching chu, ch. 2. The first reference to it, which seems to be taken from the anonymous Hsi-ho chiu-shuh 西河舊事 says, “The [Yellow] River 河水 and the M. ηια-ιαγε- River both flow into the Lei-chu 雷池 M. Ιουei-cioh Sea (=the Aral Sea)”. The [Yellow] River, the course of which has been described in the immediately preceding passage, seems clearly to mean the Oxus. It is called Ho-shui, [Yellow] River, because of the idea that the Yellow River had its source in the Pamirs and flowed in both directions (the eastward branch being first the Tarim, which was thought to go underground from Lap Nor until it emerged as the Yellow River proper). On the basis of this passage we can very plausibly identify the M. ηια-ιαγε- with the Yaxartes. The issue is confused by further passages in the Shui-ching chu partly quoted from the Shih-chih hsi-yü chi which make this river flow from the Central Himalaya to Khotan, north of Gandhara and finally into the Aral Sea. This is obviously fantastic geography however. As Petech remarks, it seems to combine the Khotan-darya and the Amu-darya (Oxus), linking them also somehow with the Ghorband-Panjshir-Kabul system. Petech could make nothing of the name. (Petech 1950, p. 57.) It seems to me highly probable that it represents some form of the name Yaxartes.

The transcription shows a good resemblance, at least as far as its consonantism is concerned, to the earlier *ηιακο-ηιωτα. (It should be further noted that the readings of 越, in which the close medial -y- (Division IV) follows a velar stop without causing palatalization, may imply Old Chinese *gοεη > *gεη > *gεη > gye (or *κθ- > *κθ- > *κθ- > *κθ-)—see p. 119 below. In this case we should have a representation in the transcription of the Iranian ʃ.)

A possible case of initial *ŋ may be found in 敷侯 M. ηιηp- (or ʃεηp-) ηου, a title of nobility among the Wu-sun, Yueh-chih and K'ang-chü peoples (Han-shu 60.0510.1, 94.8.0656.0, 96b.0657.2, 96b.0658.4, 70.0536.1). This is no doubt the title yηγu later used by the Turks but, like many of their titles, not of Turkish origin. It is found in the form ʃεη-pa- or coins of Kūjula kadhphises, later as ΛΑΠΝ on a coin of an unknown ruler in Afghanistan (Marquart 1901, pp. 204 and 208; H. W. Bailey 1938, p. 136, who, however, proposes an Iranian etymology; Ghirshman 1948, p. 50). Pelliot, who accepted this identification, noted that the initial ʃ in Chinese was troublesome (Pelliot 1944, p. 167). If we restore a Han dynasty value *ŋbēŋp-goh, we can associate it with examples of η for foreign y. Initial η occurs in the same phonetic series in the word 骡 M. ηap. The reading in ʃ can be explained as a palatalization: *ŋbē > *ŋbη > *ŋbη > *ŋbη (see p. 110 below). The vocalism requires to be further discussed but must be left for the present.

The use of an aspirated nasal rather than the ordinary voiced nasal may indicate an initial devicing in the original language, a phenomenon which might well be expected in the Tokharian speech area. (This will be discussed further apropos of the Wu-sun language in the Appendix to this article.)

Labio-laryngals and labio-velars

Although in Middle Chinese the phoneme w must be regarded as part of the system of medial semivowels, its distribution is far from complete. There is no contrast between syllables with and without -w- after labial initials and after palatal and dental initials such a contrast exists only in a
restricted number of rhymes. Where one finds -wa-, -wə- (-ua), etc., after
dental (including sibilant and affricate) and palatal initials of dental origin
in Middle Chinese, it is to be attributed partly to the breaking of back
vowels before dental finals: -un > -uan (-wan), -on > -uan, etc., partly
to the loss of labial elements in the initial. It is only after velar and laryngeal
initials that one finds a systematic contrast between syllables with and
without -w-. As far as Old Chinese is concerned it is best to regard -w-
not as a medial semivowel but as a function of the initial, so that we can set up
contrasting series of labialized and unlabialized velars and laryngals.

Even after velars and laryngals we do not find -w- in front of rounded
vowels or with dental finals (including -a diphthongs) in Middle Chinese.
This accords with the general tendency to make labialization a feature of
the syllable as a whole, so that two discrete labial elements are seldom
found co-existing in the same syllable. The incompatibility of w in the
initial and rounded vowels seems to have prevailed already in Old Chinese
but there is some reason to think that syllables such as *hwaṃ may have
existed and been eliminated by the same dissimilatory process that affected
words like 華, M. piŋ which once had final -m (see p. 105 below).

The distribution of ꙰ and ꙱

The distribution of ꙰ is restricted in one noteworthy respect.
Whereas ꙱ occurs in Middle Chinese before both yodized and unyodized
endings, ꙰ occurs only before unyodized endings, except when a labial final
or a rounded vowel makes ꙱ impossible. There are only two exceptions to
this rule, in the grammatical particles 爾 M. |iɔ and 爾 M. ʃiən. According
to the theory outlined below the yodized vowels of Middle Chinese
developed out of original long vowels. We can account for the distribution of
 ;;^ if we suppose that before long unrounded vowels ꙰ became
spontaneously labialized to ꙱ in Old Chinese. This is a process which
would be easily understandable phonetically, especially if we suppose that
the laryngals had uvular allomorph. As evidence that this process actually
took place we may note the forms of the directional particle: 于 M. ʃiou
< *hwə, but 于 M. jio < *ja, also 于 M. hou < *heh (not *hwəh
because of hsieh-sheng relationships with 于 M. lou, or M. qa). These
words are probably related to 在 M. ʃiən< *hwən, "to go", which in turn seems to be connected with 行 M. ʃau "to walk", or act", in
M. ʃauq "row".

The persistence of the exceptional forms 爾 and 爾 may
perhaps be explained by their being grammatical particles. Demiéville has
shown that exceptional phonetic development found in grammatical
particles in Modern Mandarin can in many cases be accounted for by the
persistence of pronunciations closer to older forms than would be allowed
for by normal phonetic change, e.g.: 他 M. ʃau, strictly speaking read t'au in
Modern Pekingesen in its classical meaning of "other" but read t'au as the
colloquial pronoun "he, she, it"; 你 P. nje "you", no doubt a by-form of the
classical 爾 M. ʃiən< *ne, which regularly gives P. erh. (See Demiéville 1950). A similar tendency may have inhibited the change ꙰ > ꙱ in
the two cases under discussion. In the case of 爾 the existence of the
related word written with the same character M. ꙱ or ꙱ "where"
may have been an additional analogical factor preventing the normal
phonetic development. The archaic particle 爾 M. ʃiən< *hwən is
probably a doublet of 爾, showing the normal development.

The current editions of the Shuo-ween do not say that 爾 M. ʃiən as phonetic but Hsū Ch'ieh (tenth century) quoted a "vulgar
text" which did (Shuo-ween chieh-teen hsi-chuan t'ung-shih 15). Moreover
積 M. ʃiən appears in the Shuo-ween as 爾, being said to have ꙰ abbreviated
as phonetic. This suggests, even if it does not prove, that 爾 and 爾 were phonetically related. M. ꙱ points back to *-ə. It will be shown below
that 爾 goes back to *hwən. We may now further suppose that
*hwən goes back to an earlier ꙱. Alternation between final -ə and -n
is very common and we see that the two words can very easily belong to the
same phonetic series. 爾 M. ʃiə is so written, with ꙰ as phonetic, in
the current editions of the Shuo-ween but a number of early quotations have ꙰ instead (Shuo-ween chieh-teen ku-lin, p. 628). It is likely that this is
correct, M. ʃiə being derived from an earlier ꙱—see p. 100 below.

The labialization of ꙰ before long unrounded vowels must have
occurred quite early in the Old Chinese period, or even before it. At a much
later date there was a tendency, pointed out by Tung T'ung-ho (1948, p. 64)
for the loss of -w- after velars and laryngals (and also y < ꙰) before the
close front vowel e. This accounts for such double readings as 爾 M. ʃwən
or ʃen (the latter reading, not found in the Kuang-yiün, is the basis of the
current Pekingesen pronunciation ʃiən), 爾 M. ʃwən, or ʃen, 役 M. ywek,
P. ʃi, 役 M. yweŋ, 役 M. ying. In other cases a medial -w- already lost in
Middle Chinese is indicated by hsieng-sheng connections: 爾 M. ʃeŋ, 役
M. ʃen, but 爾 M. ʃwe, 役 M. yweŋ, etc.

Labio-laryngals and labio-velars with labials in hsieng-sheng series

The postulate of labio-velars and labio-laryngals in Old Chinese with
-w- as a function of the initial will allow us to take into account certain
hsieng-sheng connections indicated by the Shuo-ween which are normally
regarded as too remote. Thus:

variants: 爾 M. ʃiwe < *hwəd, said to be phonetic in 役 M. ōe < *bae.

variants: 爾 M. kwən, kwən, said to be phonetic in 役 M. meŋ.

variants: 爾 M. kwən, phonetic in the small seal form 役 M. miŋ.

variants: 爾 M. baan, phonetic in 役 M. kiən, which is phonetic in 役
M. kiən, etc.
There are a number of reasons for thinking that the palatal semifinal in its two varieties 4/y did not exist as a part of the original phonemic structure of the language but was a development between Old Chinese and Middle Chinese. We have noted above the use of 4p to represent foreign y-, showing that Chinese had no better equivalent: contrast the use of hw- to represent foreign w- or w-. Conversely Chinese syllables with M. 4 are often found representing foreign words with vocalic initials where there is no reason to expect a y-, e.g.: 禹 for M. jen (or -jen) - the native name of Karshah; 烏 for M. jen - the name of a bird; 再 for M. jen - the name of a bird (compare the form Abazan found in Phyl and note the alternative transcription 月 for M. hao in Han shu 70.534.3; 夏 for M. jen - the name of a bird). We find Middle Chinese medial 4 disregarded in many transcriptions when it occurs in other positions (see pp. 88-90, 123-5 etc., for examples).

If we wish to regard medial 4/-y as an innovation, we must of course postulate some pre-existing feature of the language that gave rise to it. It has been suggested that in some cases it arose from the loss of medial -i- but, as we shall see, medial -i- had quite other reflexes. The hypothesis which I now put forward is that Old Chinese originally had a system of short and long vowels which was transformed by the yodizing of the long vowels. This process did not happen all at once. Indeed the same tendency continued to work in Northern Chinese after the Chi'sh-yin period. Yodization must have begun to occur in the case of words with dental initials before, or concurrently with, their palatalization, which seems to have been going on through the Han period (p. 108-9 below). By the end of the second century A.D. we find velars also palatalizing in certain circumstances (p. 106). By the time of the Chi'sh-yin all the Old Chinese long vowels had been affected (at least in the standard language—some dialects may have been more conservative). In the T'ang period there was a further spontaneous yodization before the vowel e, so that rhymes ei, en, ec, etc., fell together with yei, yen, yem (p. 76). Still later the same thing occurred in Northern Chinese before vowel a so that M. ka becomes Peking chia.

Direct evidence for a length distinction in Old Chinese is not very easy to find. If it still existed in the period of the early Buddhist transcriptions, we might expect it to be reflected in the transcription of Indian long and short vowels. I have not so far been able to find any significant correlation here. The question is complicated and obscured however by the qualitative difference between Indian long and short a—the more fronted long a is usually represented by Chinese ja or a, the short schwa a is often represented by Chinese a in the early period—and by the probability that allophonic differences existed in the Chinese vowels, apart from yodization or
length, which would have influenced the choice of transcription equivalents. Moreover, palatalization was already well under way by this time, and for this and other reasons certain initials did not exist before certain endings. Transcriptions of earlier periods can hardly provide systematic evidence for the representation of foreign long and short vowels but the distinction which I propose seems consistent with what evidence there is. Thus, in the name of Khotan M. .orange-den we should expect that the vowel of the first syllable was longer than the second. Though the Brahmi does not write long ə in Hvasu, we should expect this vowel to have been longer than the shwa of the second syllable which ultimately disappeared in the later form Hvasu.

Whether or not medial yod developed out of an earlier length distinction, it evidently developed a closer variety before the front vowels i and e than before other vowels. Velar initials were palatalized by this close y but were unaffected by more open i. Dental stops, on the other hand, were palatalized by both i and y.

This will account immediately for cases like: 支 M. cje < *kye < *kēh; 晰 M. ci' < *k'yī < *kēh; 耳 M. ăe < *néh; 十 M. ăl < *gēp or *gīp (= “to” (note Tibeto-Burman cognates such as Mikir kēp, Chēpāng gīb-zho; the alternative spelling 拾 with phonetic 合 M. hōp also indicates a velar initial (cf. Wang Ching-ju 1931)). It is less immediately obvious how to account for cases where the Old Chinese rhyme group indicates a back vowel. It should however be noted that the rhyme 育, the yodized reflex of the Old Chinese auh (= K. ăog) is a “divided” rhyme, ieu/yeu and that from the uh (= K. ăog) group we have, besides rhyme 兎 ju (= K. ju) in Division III, rhyme 耳 yiu (= K. iōu) in Division IV. There are also two yodized rhymes (besides the Division II rhyme au common to both groups) derived partly from each group, namely au and eu (= K. āu, ieu). Hsin-sheng connections show clearly that the palatalized velars belong predominantly with rhymes eu, yeu, iu rather than with au, ieu, ju. Thus:

剎 M. cjeu, keu

澃 M. i̯e, keu, 匆 M. keu, 母 M. gyeu (contrast 贻 M. kau, 拜 M. hjeu)

收 M. ău: 斗 M. kyi (also given a reading M. kji), 告 M. keu, 布 M. chju: 柳 M. khjiu (but note also 柳 M. kau, 稻 M. khju')

Karlgren accounted for rhyme ieu by means of “vocalic i” projected back into the Archaic period. Thus, in his transcription: *iog, *iog > ãu; *iog, *iog > ieu. He ignored the distinction between ieu and yeu and in the first edition of Grammatica Serica also ignored the distinction between rhymes ju and yiu. In the revised edition he derives yiu, which he writes ıeu, from *ıog, as opposed to *ıog.

Having eliminated “vocalic i” from the Middle Chinese system, we must either reintroduce it into Old Chinese or find some alternative explanation for the radical fronting of au and u in these rhymes. My proposal is to posit eau, eu, with corresponding long forms ăau, āu.

There is also transcription evidence in favour of reconstructing at least the short forms. We may note the use of 輸 M. deu in the name of the Yuē-chih ruler who sent an embassy to China in A.D. 230, who must be the same as the TAOZHŌ, TAOZH, Vassudeva, known from coins. The same character is used to represent the Prakrites form of Sanskrit deva or dvipa in certain Buddhist transcriptions (Lévi 1936, p. 79, Petech 1950, p. 7, Pelliot 1932, pp. 181-4). Alternatively we find 輸 M. deu in the same sense (Petech 1950, p. 32). This same character occurs much earlier in the name of a far western country mentioned in the Han-shu, 輸 支 M. deu-cje. This would go back to *đēu-kēh and there is good reason to think the k would still not have been palatalized in the Former Han period. Herrmann and Fujita have independently identified the name with the city near present Bushire known to the Greeks as Tawri, later Tāwārgān. (Herrmann 1938 (1922), Fujita 1923.) Though the voicing of the initial (and probably also its spirant quality at this period) still requires explanation, there are good grounds for thinking this identification is correct. If so, the Chinese -eu is equivalent to the Greek ὥ.

Also in Han-shu 96A is mentioned a country 捷 M. phuk-deu < *phok-śeauh lying north of Wu-i-shan-li (= Alexandria, Arachosia) and east of Chi-pin (= Kashmir). It must be the same as 輸 M. phuk-deu < *phok-śat of Hou Han-shu 118, a country lying between Kao-fu (Kabul) and Chi-pin which Kujula Kadphises conquered after achieving the hegemony of the Yuē-chih. Both names must represent a Prakrite form of Pujaśalavi, Greek Πυξαλατη, the present Charasada. The use of M. ā (< *ā-) for foreign -l- will be discussed and further illustrated below. Here we are concerned rather with the vocalism. We have evidently two alternative attempts to render the Indian -lavan (in a Prakrite -lāst-?). The first renders the dipthong but leaves the final -l unrecorded. The second represents the final -l at the expense of the dipthong.

The hypothesis of short eau and eu does not differ very much from Karlgren’s iō and iō (apart from the differences in the second elements which are not here under discussion)—except that to suppose a more open initial element in the dipthong, e instead of i, seems to fit better the transcription values and avoids the difficulty of distinguishing between the effect of i and i. To propose long diphthongs as well is a new departure. Unfortunately I am not able to quote any evidence from transcriptions in support of it but from a theoretical point of view it seems quite satisfactory, enabling us to account for the divergent development of words which originally rhymed:

*auh > M. au, *ēauh > M. ieu (from an earlier *iōu?), *ēauh > M. eu,
If we reconstruct ean, ëän, we can account thereby for cases of palatalization of velars which we find associated with this group as showing the effect of the closer variety of yod developing before e, thus: "*M. chie, < *k'ieš, "*D. chje, "*M. chje, "*M. deu < *seu, No separate reflex of *seuk can be distinguished, it probably fell together with *uk giving M. juk, cf. *M. šįuk (< *seuk).

Besides io, iə, Karlgren reconstructed ia before dental finals: iæn, iat, iad—to account for cases in which words in M. en, et, eæk (=K. ien, iet, ien) developed out of the a rhyme classes of the Shih-ching. Tung T'ung-ho has shown that by taking into account also Division II rhymes and the distinction between Division III and Division IV in rhymes yen/yen, et/yet, iei/iæi, one can in fact distinguish between two types of hsieh-sheng series: (a) those which have rhymes en, aæn, yen (ian after dental and palatal initials, which do not distinguish ien/yen); (b) those which have rhymes an, an, ian, ien. There is only a very limited interchange between the two types. Similar distinctions can be made in the corresponding -t and -d rhyme classes. A possible solution to this, analogous to that proposed for the back vowels, is to reconstruct diphthongs ea, ëa; thus: an > an but ean > en; ëan > ian (after laryngal, velar and labial initials) or ien but eän > yen.

There are difficulties with this solution. One is that there are several cases of words in en or et (and the corresponding yodidized rhymes) which fall in group (a) which have variants in eg or ek, or where the same phonetic is used for both words in eg and en or ek and et (or the corresponding yodidized rhymes). For example: "*M. met (K. miet < *miat), "*M. mek “cover”, "*M. men “hidden”: "*M. men, men “dark, hidden”, "M. mek “cover”, cf. "*M. men, men “shut the eyes”; "*M. giwēn, hwan, cf. "*M. ĭwēn, "*M. hywen; "*M. kén, "*M. ṭen, "*M. pën, "*M. bën (the hsieh-sheng connections are indicated by the Shuo-ên, though not admitted by Karlgren); "*M. ĭen, ĭen; "*M. tsehen, "*M. tšen. This type of phenomenon is probably to be explained by the forward assimilation of back finals after front vowels in some dialects. (See Pulleyblank 1960, pp. 61–5 where examples of the fronting of -k to -t are discussed—cases of -ę < -ą are perhaps even more numerous.) We might suppose that the vowel would remain unchanged, so that en > ean but there is reason to think that e was in any case more open before velar finals than before dentals and if this were so we might instead have eŋ > ean. An alternative solution would be to reconstruct a more open e as well as a close e, but in view of the occasional hsieh-sheng contacts between group (a) and group (b) and the fact that they appear to form a single rhyme class in the Shih-ching, the solution in terms of ea, ëa seems preferable.
not account for the existence of words in -jo with palatal initials that have velar or laryngeal connections, e.g.: 

- M. chjo = 處 M. hou. In both cases, however, the series have complex initials and the explanation for the appearance of palatals may lie elsewhere than simply in the palatalization of velars. The same is probably true of 区 M. chjou = 處 M. hou. It seems worth remarking that all the cases of palatalization of velars or laryngals noted in rhymes ian, iek (< *stk), iu, ou yield only M. ch- or s-, never c- or j- or h-. This can hardly be accidental and may indicate that the palatalization is here also of a different origin from that found in rhymes with e or i as head vowel.

It remains to consider one further case that appears to indicate palatalization of velars, namely in rhyme ian: 畫 M. cian, 承 M. jian; 畫, 畫 M. kian. The head vowel in Middle Chinese ian and jian is reconstructed as a in Old Chinese by Karlgren. There is good reason to think, however, that both before velar and before dental endings it goes back originally to a close front vowel i. It is this that accounts for the forward assimilation of -η to -an that we find in this example. (Examples of assimilation of -k to -t after close front vowels were discussed in Asia Major 1960, pp. 63–4; cases of -η > -an in similar circumstances are perhaps even more numerous, see p. 102 above.) No palatals occur before rhymes ian, iat and we may, therefore, suppose that after back initials in, it had already become retracted to an, 5t before the breaking of the long vowels that gave rise to medial yod. In rhyme iu however this would appear not to have been the case, so that when the yod appeared it was close -y- which palatalized k- and g- to c- and j-.

There does not seem to be any evidence of similar palatalization of velars or laryngals in rhymes iak, iao. In the latter we find: 蝴 M. cja, 媼 M. kia, ya. This hsiian-seng series also contains initials z- and s-, however, which suggests that a more complex explanation is necessary than the palatalization of velars by medial -y-.

In order to make complete the theory of the palatalization of velar initials and h in front of medial -y- (h was not affected, h did not occur before long vowels) we must explain (a) the appearance of the retracted medial -j- (= *t-) as well as -y- before e and i rhymes, (b) the occasional occurrence of unpalatalized velars before -y-, giving rise to the split in the rhyme tables between Division III and Division IV. The first point is partly to be accounted for by the merging of originally separate rhymes: je < *ʔj and ye < *ʔe; jẹu < (*jẹu <) ʔaʔh and yeu < ʔaʔh—partly by the loss of medial -t- before originally long vowels. An explanation of (b) will be offered below.

The consonantal system of old Chinese

The palatalization of velars was sufficiently late that there are many traces of unpalatalized forms even in post-Han transcriptions. The character 支 M. cja < *kẹh occurs with the value k in a number of transcriptions in the account of Japan in the San-kuo chih, in particular in * 支 M. yit-cja = 1ki, the island off the coast of Kyushu. (The San-kuo chih text
reads 大 but Liang-shu 54 has the correct form—Tsunoda and Goodrich 1951, p. 17, Naka 1915, p. 304.) The use of for hi² in Manyogana is probably the survival of an early tradition rather than an abbreviation for M. gyé, gié¹, as supposed by Wencck (Weck II 1954, p. 57). The probable value of in M. deu-eje Taorí (7) has been noted above. From the same phonetic series we also find M. eje with the value of a velar in 阿枝遙丘 M. ‘eje-híwai (for 遡 M. dat (?)) -tu in the Chi’s fo fu ng-hsing-tau shing (T. 4), given as the name of the father of the former Buddha Krakkuchanda where the corresponding Pali has Aggiatadā = Skt. Agnidatta. A very similar transcription occurs in the same text for the name of the father of Kāśyapa Buddha, 阿枝遙邪 M. ‘eje-dat-yà. Here the Pali has Brahmadatta but the Chinese form is evidently based on a text which repeated Agnidatta or had some very similar name (cf. Akanuma, pp. 237-292).

The use of 萃 M. ejin and 枪 M. cje in a number of Buddhist transcriptions with a value k—may be a similar survival of unpalatalized *k—but we cannot be quite sure since alternative readings M. kyén and kye¹ are also found in the Chi’s hūn; but these may be no more than ghosts preserved in learned tradition to account for the transcription values. The current readings in Pekingese, chen and chih,² derive from Middle Chinese dialects and this seems to be true in other dialects as well. According to a story told to account for the alternative readings of 萃, this character originally was pronounced like 萃 M. kén. When Sun Ch’üan became emperor of the state of Wu in the Three Kingdoms period (third century A.D.) the sound became taboo, since his father’s name was 萃, and was changed to 萃 (Chi lei pien B, p. 62). How reliable this story is or just what it means in terms of the third century pronunciation of the word is difficult to say. It seems unlikely that a temporary taboo in one part of China could have led to a permanent change in the pronunciation of a word throughout the whole of China. A possible explanation would be that in the current southern dialect *k- had not yet been palatalized but that elsewhere c- had already developed so that a more northern pronunciation *ejin for the character could be substituted for *kyén, regarded as too close to *kén.

The substitution of 大 for 汝 in the name Yüeh-chih in the Later Han period must be given consideration. The character 汝 is normally read M. jje¹ and, apart from this transcription, it is read M. cje only in 萃氏 M. ‘at-cje, the title of the consort of the Hsiung-nu rulers, and 马氏 M. ‘ou-cje, the name of a place in Kansu which is no doubt also a transcription. (In Later Han it was called 马枝.) Since we have 萃, 马 M. gyé, it might be thought that this series also was velar in origin and that we should reconstruct 汝 as M. jje¹ < *gê¹, cje < *kêh. This would certainly be wrong however since in Han dynasty quotations from the Shu-ching and

other texts in archaic style 汝 occurs as a variant of 汝, which is certainly a dental series (Han-shu 28B, p. 2847.3, Hou Han-shu 87, p. 10823.4). M. gyé is in fact equivalent to 汝, jji¹, a word with a very diverse phonetic series according to the Shuo-chen 遼 M. gií, 狸 M. níí, 視 M. jji¹ and also 乗 M. náí, 马 M. leí. It will be suggested below that words like M. gyé with unpalatalized velar initial followed by close -i-, reflect old clusters with -ê-, so this dental medial element is probably what accounts for the connection of 汝 to 汝. Whether read voiced or unvoiced, 汝 no doubt had a dental stop initial in its various transcription values in Former Han. The most probable explanation for its replacement by 大 or 枪 in Later Han is that the palatalization of the dental stops had made it no longer suitable to express the foreign sound. If the foreign phoneme had been a simple dental stop, we should expect to find a syllable like M. tei used. The fact that we find M. cje < *kye suggests that it may have been, rather, a palatal stop that was intended. This can however be no more than conjecture. In any case the substitutions seem to confirm the later palatalization of velars than of dentals.

### Dental stops

To explain the intimate relationship which kshéh-sheng series show between the three series of Middle Chinese initials which he reconstructed as t, t', d'; t', d; t', s'; s', z² Karlgren supposed that the second had developed out of the first, mainly under the palatalizing influence of the following -i- but also in front of various Middle Chinese vowels—a, a, e, e (which were however considered to have caused retroflexion of the sibilant series!). The palatal affricates he derived from a series of palatal stops in Old Chinese, occurring only before -i-. According to our reinterpretation Karlgren’s palatal stops in “Ancient Chinese” were supradentals. It is natural therefore to suppose that it is the palatal affricates that are the counterpart of the pure dental stops when followed by -i- and to look for a different origin for the supradentals.

The idea that the supradental series is in complementary distribution to the dental series and, in the same way, that the palatal affricates are complementary to the dental affricates was encouraged by the arrangement of the rhyme tables, where we have in corresponding columns:

<table>
<thead>
<tr>
<th>Division</th>
<th>t</th>
<th>ts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division I</td>
<td>t</td>
<td>ts</td>
</tr>
<tr>
<td>Division II</td>
<td>t</td>
<td>ts</td>
</tr>
<tr>
<td>Division III</td>
<td>t</td>
<td>c</td>
</tr>
<tr>
<td>Division IV</td>
<td>t</td>
<td>ts</td>
</tr>
</tbody>
</table>

This arrangement is however highly misleading in regard to the origins of the various series. If we rearrange the initials strictly in accordance vertically with their original relationships as revealed in kshéh-sheng series and
lon-gu and thus it is a reasonable guess that the initial was *s- as it is a common representation for the initial of Sanskrit words in early Buddhist inscriptions (1954, p. 279). Unfortunately this is an unconvincing argument, for the underlying Prakrit probably had a palatal, like Pali jhāna. The same would apply to other cases like 阿难. *a-you-jja= Aydınə or 迦摩延 M. kia-cjen-yen= Kātyāyana.

Earlier evidence of unpalatalized d and t for Middle Chinese j and c occur, if I am right, in the Huaiung-nu titles 禄_DELETE_千 M. jen-hiou < *dān-hwa and 閒氏 M. at-cje < *at-tēh (giving the later Turkish targaν/tarxan and qatun/qatun, etc.—see Appendix) and in 月氏 M. njwāt-cje < *njwāt-tēh= *ntrdion(?)

Indirect evidence of the absence of the later palatalts in the Chinese of the Han period is provided by the use of the dental affricates for foreign palatals. Unfortunately Chinese dental affricates where spellings in Indian alphabets have palatals in names from the Northern and Eastern Tarim basin are equivocal, e.g. 蛇兹 M. kiu-tṣa= Kuça, 且未 M. tšia- (= or tṣa-) mat= Calmadana. Pelliot regarded the Chinese spellings as evidence of the presence of dental affricates in the native names and this gains support from the continued use of dental affricates even after Chinese palatals were being used for Indian palatalts (Pelliot 1923, p. 205). Thus we have later transcriptions such as: 丘慈 M. kiu-dzio, 屈天 M. kiu-t-zi for Kuça (showing voicing of the medial consonant) and 且末 M. tsa/-MAT= Calmadana (in Sung yün, early sixth century, see Chavannes 1903, p. 391). A similar doubt applies to a word like 畚子 M. ši-tṣa- "lion", which must be derived from Tokh. A. šišak, B. šešak (final to be discussed later), and to the name 丘就 M. kiu-dzio-kjak (for 劫 M. kjak?—see Pelliot 1914, p. 401)= Kujula kaudphes. At least one clear case seems to be provided however by the name 子合 M. tiša-še < *ša-gop (Han-shu g6A) a country in the Pamirs which must undoubtedly be the same as that called 即具 by M. cjuou-cjiou-poa by Sung yün (Chavannes 1993, p. 397), and 破句 by M. cjak-ku-kja by Hsüan-tsang (possibly from a sanscritized form).

As against this we have the name Shan-shan 視善 M. jenʻ (or 視 jien, jienʻ) which has been plausibly identified by Hamilton with modern Charchan < *Jarijan (Hamilton 1958, p. 121). The name Shan-shan appears as a substitute for the earlier Lou-lan in the first century B.C. If the foreign original had indeed palatalts at this period, we must suppose that the Chinese palatalts were already beginning to develop, perhaps in an intermediate stage *di. There are too many uncertainties, however, for this to provide a firm argument.

So far as it goes the evidence seems to be against supposing that the dental stops had yet been palatalized in the Former Han period. Further evidence will be given below to show that the dental fricatives and nasals were also not palatalized until even later.

**Palatalization of dental stops**

The theory of the development of the yodizied finals of Middle Chinese out of an earlier opposition between long and short vowels has been developed already in connection with the palatalization of velars. The effect on the dental series was much more extensive because palatalization occurred before -j- as well as -y-, that is before all Old Chinese long vowels, not only i and e. Out of the three Old Chinese stops, t, th, d, this produced Middle Chinese c, ch, j.

To align the palatal affricates in this way directly to the dental stops is a more satisfactory solution to the hsieng-sheng relationships than Karlgren’s of two freely alternating but distinct series of stops separated by place of articulation. It is true that we have a certain degree of alternation between laryngals and velars but to nothing like the extent that we find between Karlgren’s dental and palatal stops.

Palatalization of dental stops was not only more extensive than that of velars. It was also earlier. We find Middle Chinese palatalts used for Indian palatalts from at least the end of the second century A.D. onwards. Nevertheless there are clear indications that it had not yet occurred at the beginning of Han.

Pelliot long ago quoted 天竺 M. then-cjuk=Hinduka, India, and 倍刺户 M. cjak-tshaat-tişь-la=Takṣasīlā (1914, p. 412). This is unfortunately less satisfactory evidence than one could wish because त जक has another reading M. tok which Pelliot did not take into account. It is however normally read M. cjak in the sense of ‘India’ (see Kuang-yùn) and the old tradition may well be correct. The fact that it appears in the Hou Han shu puts it not later than ce A.D. 120, when P’an yung wrote his account of the Western Regions (Chavannes 1907). The transcription of the name of Takṣasīlā is not found before it appears in Buddhist texts.

Karlgren quotes 唐 M. jien < *dān (= K. z Jain < *dijan) for Sanskrit dhyāna as evidence that the initial was still a stop in early Buddhist transcriptions (1954, p. 279). Unfortunately this is an unsound argument, for the underlying Prakrit probably had a palatal, like Pali jhāna. The same would apply to other cases like 阿難. *a-you-jja= Aydınə or 迦摩延 M. kia-cjen-yen= Kātyāyana.
Retroflexion and loss of medial -l-

Evidence from hsiieh-sheng connections for clusters containing -l- has been noted for a very long time and Karlgren reconstructs many such in his Archaic Chinese. In his system there is however no recognition of any connection between the reconstruction of a lost medial -l- and the vocalism of Middle Chinese. This seems inherently improbable—one would expect a medial -l- not to simply disappear but to become vocalized in some way, as has happened for example in Italian *fiore* < Latin *florem*. There have indeed been attempts to associate some of the medial -l- of Middle Chinese with the loss of -l- but no good correlation can be made with the other evidence for clusters.

Recently S. Yakhontov (1960) has put forward another idea which must certainly be correct, that is, that the peculiar set of vowels classed together in Division II of the rhyme tables—which, in my Ch‘ieh-yün transcription, I characterize by the vowel a and the diphthongs ae, ao, au—are the reflex of lost -l-. I had independently come to the same conclusion before I learned of Yakhontov’s paper. The evidence in favour of it may be summarized as follows:

(a) Initial -l- is very rare before Division II vowels—only three cases can be found among words included in the Shuo-wen, namely 紳 M. laŋ, 混 M. lauk, 彈 M. laom.

(b) On the other hand, words with Division II vocalism are common after other initials in hsiieh-sheng series where there is evidence of clusters, for example:

- 紳 M. liu : 紳 M. kau, 嗹 M. hau
- 混 M. luk : 混 M. pauk
- 役 M. liwen : 役 M. man, 役 M. shwan, 改 ˈwan
- 閘 M. lam : 閘 M. kaon
- 濱 M. laom : 濱 M. kam
- 聲 M. liuŋ : 聲 M. kaug, haug
- 役 M. lek, kask
- 濱 M. lek, gauk
- 役 M. ljoŋ, maug
- 濱 M. lok : 濱 M. kak

(c) The Middle Chinese supradental initials are characteristic of Division II but never found in Division I. Karlgren has already proposed a development sl > ʂ in a few cases on the basis of hsiieh-sheng connections, e.g.: 史 M. ʂja : 史 M. liə ; 牽 M. ʂjwit, liwit. This is phonetically a very probable development and should be generalized to include the supradental affricates and stops, and also the nasal ɲ. Hsiieh-sheng evidence is less clearly forthcoming but the following may be noted: 攸 M. lau : 攸 M. ʂau；爍 M. lau, ʂau, 紳 M. liin : 紳 M. ʂin ʂ M. diin. (Cases of ʈh- ˗ l- contacts are not included since they may be evidence of *tb- rather than *th-.)

(d) Yakhontov cites the following comparisons with Tibeto-Burman showing -r- or -l- cluster in cognates of Chinese words with Division II vocalism:

- 八 M. paat “eight” : Tibetan bryad
- 百 M. pak “hundred” : Tibetan brya
- 義 M. ma “horse” : Burmese marj
- 甲 M. kap “shell, armour” : Tibetan k‘rab “fish scale, armour”
- 江 M. kauŋ “river” : Tai khlong “canal”

With the exception of the last, which is less satisfactory than the other semantically and departs from the pattern of correspondence, which otherwise shows Chinese -l- as equivalent to Tibeto-Burman -r-, these comparisons seem very convincing.

We must make some exceptions to the general rule that Division II vocalism necessarily implies the loss of medial -l-. We have already suggested that rhyme -a may be derived, in part, from Old Chinese -eə. Apart from this it will be shown below that there is reason to think that Middle Chinese ʂ and tʂ, with appropriate Division II vocalism, developed also out of Old Chinese ʂh and ʂŋ (and skh ?).

Apart from these exceptions however the relation of Middle Chinese -a-vocalism to Old Chinese medial -l- may be confidently adopted as a highly probable hypothesis.

Yakhontov also considers the evidence for lost -l- where Middle Chinese has medial -ʐ- and concludes that “between the consonant and medial -ʐ- I disappeared completely without any after effects and the head vowel in most cases did not undergo any changes”. On the contrary the loss of medial -l- had effects on the yodized endings almost as far-reaching as its effects elsewhere. It was a major factor in leading to the differentiation between two varieties of medial -ʐ- before head vowels i and e, causing the retraction of -ʐ- to -i- after velar and labial initials. In some cases, of course, the opposition -l/-r- arose from the falling together of originally separate rhymes: 皮 M. bje < *bəŋ but 卑 M. pye < *pəŋ.

As examples of medial -l- before e or i in hsiieh-sheng series which indicate clusters the following may be cited:

- 役 M. liwen, liwen : 彭 M. pjen
- 紳 M. liwit : 紳 M. pjet
- 役 M. liin : 役 M. ɲin
- 紳 M. liip : ɶ M. khip
- 役 M. liim : 役 M. pjiim
- 役 M. liim, ʂ M. piim

Further evidence in favour of a connection between lost medial -l- and the retracted medial -ʐ- comes from the fact that words with supradental initials in the “split” rhymes tend to have Division III words as final spellers (if not other words with supradental initials or words with initial l-
which are common to all classes of initials). Conversely words with supradental initials occur as spellers for Division III words having velar and laryngal initials. This is not carried through with complete consistency but is a marked tendency. (It should be noted that Arisaka 1944 (1937-9) p. 350 ff. attempted to extend the -i/-y- contrast beyond the laryngal, velar and labial initials.) Thus we find:

(See Li Jung 1952, M. readings in all cases)

**Rhyme 反:** 晔 tshje, 晔 she spelt with 宜 nje
衰 tshiwe spelt with 至 nje

**Rhyme 紫:** 紫 she' spelt with 绦 khje'

**Rhyme 真:** 晔 she' spelt with 勘 jive'

(but 姊 tive', 讀 nive' spelt with 怪 yive'!)

**Rhyme 楚:** 楚 jiwi used to spell 祥 kiwi, 賜 khiwi, 賜 giwi

**Rhyme 官:** 齐 dii' spelt with 几 kii'

**Rhyme 質:** 齐 djiit spelt with 等 :iit

**Rhyme 銀:** 鈀 dijwen' spelt with 錦 mien'

**Rhyme 除:** 錦 dijwen' used to spell 圓 giwen'

**Rhyme 接:** 鍍 dijen' used to spell 稲 kiwen'

**Rhyme 鴨:** 鴨 dijen' spelt with 兆 kjen'

**Rhyme 稃:** 稃 dijen' spelt with 兆 kjen'

**Rhyme 賦:** 賦 tsjiit spelt with 腕 bjet

**Rhyme 稠:** 稠 siim' spelt with 南 kien'

**Rhyme 穀:** 糠 siim' spelt with 錦 kien'

(but rhyme 賦: 召 dien' used to spell 鎖 khyen', 稠 byeu as well as 腕 mjeu')

The only cases at all in which we find Division IV spellers used with supradentals or vice-versa are in those rhymes where the split is partly the result of the coalescence of distinct head vowels, i.e. ie < *aih and *ieh, ieu < *auh and *iâuh.

We may note further that in the fàn-ch'iéh system of Hui-lin where we find jen and yen of the Ch'iéh-yin separated as distinct final groups, the one falling together with jen, the other with en, words with supradental initials have followed Division III while words with palatal and dental sibilant initials have followed Division IV. Here again we see a correlation between supradental initials (which point to lost medial -i-) and the retracted medial -i- (= -i-).

On the whole Yakhontov seems to be right in saying that lost medial -i- did not affect the head vowel when medial -i- intervened. There is one important exception to this however, namely in rhyme -an, -jan (including

-ak, -jak). Here not only the Division II words but also the Division III words show evidence of -i- clusters in their hsieh-sheng relationships:

京 M. kian: 涼 M. lian

備 M. khjat: 備 M. lijak

命 M. miian: 命 M. lieg

Further examples can be added if one takes Division II vocalism as itself a sign of lost -i-:

丙 M. pian: 陳 M. kan

冊 M. kwan't: 明 M. miian: 備 M. maan (see p. 97 above)

永 M. hiwan: 永 M. hian: 服 M. maan (see p. 98 above)

榮 M. hiwan: 頃 M. 'aan, 晧 M. 'uan

Evidently rhyme jian is the yodized rhyme corresponding to both an and aan. We have already noted that it is complementary to yen, taking the place of a Division III rhyme ien.

It would not be enough to say however that when preceded by lost medial -i-, ian and yen became jian, for supradental initials, both stops and sibilants, occur before jian, and supradental stops (but not sibilants) appear before ien; e.g. 長 ijan, 長 tshian, 真 ien. We must evidently postulate a difference in treatment as between different classes of initial. In the case of velar, laryngal and labial initials we may suppose that the vocalization of -i- to -a- occurred before the yodizing of the long vowels, or that the yod was at any rate not sufficiently developed to prevent the -a-colouring from affecting the head vowel, so that: kian > kian > kian > kian; pián > paang > paang > piaan > pian. After dental initials on the other hand the -a-colouring did not extend itself (except after the sibilants before -en, cf. 生 M. iian < *iian, pp. 74 above and 128 below), perhaps because the -i-, instead of simply becoming vocalized, was absorbed into the preceding initials in the form of retroflexion and this process was not complete before the yodization of the long vowels.

If this interpretation of the development of rhyme jian is correct, we should expect to find some parallel in the case of -an and -en rhymes. In the case of -an, the yodized rhyme corresponding to an and aen must be taken to be ien, that is the Division III of rhyme ǐen, and there is no rhyme ian as far as the Ch'iéh-yin is concerned. The interpretation of this which will be advanced is that in the line of development which lies behind the Ch'iéh-yin there was an umlaut of an to ain after all dental initials, including l, whether medial or initial. It is possible however that the separation of Ch'iéh-yin -jen and -yen which we find in Hui-lin does not represent a development from the Ch'iéh-yin but an independent line of development in which there had been a separate rhyme ian which had coalesced in Hui-lin's time with ian.

We have already discussed the possibility that the Ch'iéh-yin rhymes ǐen and ǐian were originally differentiated as jian and ian. This would
imply a similar development to that of rhymes ʩ and ʨ. As far as words with labial initials are concerned we have rather good evidence for an initial cluster in K. Haudricourt quotes Common Tai *brum “all” as a loan from this Chinese word (Haudricourt 1954, p. 359). It is also phonetic in M. pjia “wind” which may be related to Tai lam “wind”. Note also 母 M. lam, and 簡 M. bjəm < bjəm used for Sanskrit brāhma- (Pelliot, T'oung-pao 25, 1928, p. 455). On the other hand there is also good evidence that 母 M. bjəm had no cluster, since it is used in the Wei-lieu in transcribing the first syllable of a place name in the Middle East which Pelliot has convincingly identified with Bambyeke (Pelliot 1921). Again 母 M. mjəm is used for Sanskrit vam (Höbiger, I, p. 50), so probably did not have a cluster. In the Ch'ieh-yūn all these words are lumped together but we have noted above Hui-lin shows traces of a discrimination among them. 母 M. mjəm, which is another writing for 母, and 簡 mjəm are placed by Huang Ts'ui-p'o 1931 in the -am group, while 簡 mjəm jäm is correctly placed as is 簡 with 母 as phonetic. Since already in the Ch'ieh-yūn the two rhymes had fallen together it is not surprising to find that the distinction in Hui-lin should not be fully carried through.

As far as the words with velar initials are concerned, it may be noted that one of the few words placed in rhyme group Kλ in the Ch'ieh-yūn is the kia M. kiaj/kiajm. Here the hsieh-sheng connection with the ljia would support the reconstruction of a cluster (Kari kgren writes kioj) and we have noted the ancient Japanese spelling ki-ya-mu which points to a vocality. The fact that the Kuo-yun adds a few words in rhyme group Kλ with supralateral stop or nasal initials and that conversely we find a few palatal initials in rhyme Tš added either in the Kuo-yun or the Chi-yun, though doubtful evidence for the Ch'ieh-yūn period, is at least consistent with the idea that the former was a lost medial -1- rhyme and the latter not.

The dental frications

Besides the palatal affricates and the supralateral stops, certain other Middle Chinese initials quite often show connections with dental stops. These include especially the palatal continuants y and s, and also z (occurring only before j and occasionally s). Thus we find series like:

移 M. ye: 多 M. ta, 妻 M. jja, 梦 M. dzje, etc.

但 M. sjen: 专 M. tan, 廷 M. tan' je, jjen, etc.

But there is another type of series in which continuants play the major part. For example:

余 M. ya, 首 M. szia, 侧 zio: 侧 M. dou, 除 M. dzio, 茶 M. dou, dzia, sio, 除 M. thou, dou.

于 M. yo, 去 M. zio, 好 M. sio, zio, 赛 M. ya, jio, 翼 M. yo, 知 M. zio, yo (note also 母 M. kio)
M. yak = Soyūkik in the Hou Han-shu (ca. A.D. 120) we find it for
Iranian ｡. Earlier still in 山 yaw = Alexandria in the Han shu it represents foreign ｡. The Tai forms of the tenth earthly branch 胡 M. ｡ are also of interest, namely: Ahom rāo, Lī kraw, Dīo thou (= ｡), Lāñān̄ l̄aw. An initial closely related to ｡ is also indicated by the
paronomastic definitions of this word in Han dynasty works by 老 M. ｡ and 胡 M. ｡ (Li Fang-kuei 1945, p. 340, Egerod 1957). The best
value to fit all this evidence seems to be a dental fricative ｡. This is phonetically
close to ｡. At the same time it is close enough to the dental stops that we
should not be surprised to find it occasionally appearing in dental stop
series. Another theoretical possibility would be 䔀, but this would be much
less satisfactory. It would be surprising to find the Chinese using their ｡ for
the 产业园 and their 产业园 for the 产业园 in transcribing Alexandria!

That 产业园 should be palatalized by a following -产业园 is of course quite
parallel to what happened to the dental stops and occasions no difficulty.
There is however no reason why it should not have occurred before
unvoiced (short) vowels as well. The peculiar distribution of the initials in the
series we have just examined suggests the answer. Initial 产业园 before
unvoiced endings seems to correspond to 产业园 before yodized endings.
We may therefore postulate the development: *产业园 > M. 产业园 *产业园 > *产业园 > M. 产业园.

The way is now clear to explain the origin of 产业园 and the occurrence of
产业园 in the series. Clearly 产业园 must have had an unvoiced counterpart 产业园 and
its development will be: *产业园 > M. 产业园, *产业园 > M. 产业园.

The occasional occurrence of 产业园- and 产业园-in these series suggests that
one should reconstruct *产业园 > M. 产业园, *产业园 > M. 产业园.

To find initials 产业园 and 产业园 in Old Chinese is perhaps unexpected in terms
of comparative Sino-Tibetan linguistics. On the other hand Tibeto-
Burman has two liquids, 产业园 and 产业园. There is good reason to think that our 产业园
corresponds to Tibeto-Burman 产业园 while Chinese 产业园 corresponds in the main to
Burman 产业园. In illustration of this one may propose the following word comparisons:

产业园 M. 产业园 "sheep" : Tib. 拉
产业园 M. 产业园 (<产业园 <产业园 <产业园) "road" : Tib. 产业园 "road"
产业园 M. 产业园 (<产业园) "leaf": Tib. 产业园 "leaf"
产业园 M. 产业园 "room", "allow": Tib. 产业园 "leisure, time"
产业园 M. 产业园 "easy, leisurely":
产业园 M. 产业园 "easily, loose, relaxed".

Similarly Chinese 象产业园 "iron", if derived from Old Chinese 象产业园 <产业园 (on the final see Asia Major 1960, p. 63, the phonetic is however 象产业园 M. 产业园), agrees perfectly with the Common Tai 象产业园. Tibetan 象产业园 "iron" is no doubt also cognate. Since 象产业园 in Tibetan gives 象产业园, 象产业园 here may be from 象产业园 (see Forrest 1961, p. 132).

As examples of Tibetan words with 象产业园 where Chinese has 产业园 we may cite:
产业园 "dragon": 象产业园 M. 象产业园 (<产业园, see below); 象产业园 M. 象产业园 (<产业园: see below): Tib. 象产业园 "draw", Burm. 象产业园;
产业园 M. 象产业园 (<产业园) "inferior": Tib. 象产业园 "fallen mass", Old Burm.
产业园 <产业园 "inferior", 象产业园 "degrade" (Benedict 1939, p. 216).

One might be tempted on the basis of this to change Old Chinese 象产业园 to 象产业园 and replace our 产业园 by 产业园. This would agree quite well for some of the transcription values but it would not agree very well with the way in which our 产业园 appears in phonetic series with dental stops. Moreover it would be exceedingly confusing, for one would not know at what precise stage one should metamorphose all 象产业园 into 象产业园. It seems best therefore to retain 象产业园 and 象产业园 for all stages of Old Chinese, leaving open the question whether they were earlier 象产业园, 象产业园.

产业园 >产业园

We occasionally find 象产业园 in the palatal continuant series, usually in
variant readings: 象产业园, 象产业园, 象产业园, 象产业园. This suggests that 象产业园 may have had a variant development to 象产业园 in some dialects. This hypothesis will account for the puzzling early transcriptions of the name of India: 象产业园 M. 象产业园 (Shih-chi 123) and 天竺 M. 象产业园 (or -tok) (Hou Han-
产业园 118). The existence of variant pronunciations of 天竺 has been noted by
several scholars. Bodman notes that in the Shih-产业园 Liu Hsi gives two
glosses for this character. He first glosses it with 象产业园 M. 象产业园, remarking
"the (word) heaven in Yu, Su, Yin and Chi is pronounced with the 'belly'
of the tongue". He then glosses it with 象产业园 M. 象产业园 and says, "in Ch'ing and Hsü the 'head' of the tongue is used to pronounce it". (Bodman 1954, p. 28.)
The explanation must be that the word was pronounced with initial 象产业园 (or perhaps a velar fricative 象产业园) in the regions named by Liu Hsi, that is in the
central area around the capital, and with initial 象产业园 farther east. The pronunciation with M. 象产业园 has been preserved in 象产业园 M. 象产业园, the name
given to Zoroastrianism in China which, as Albert Dien has shown, is
merely a special application of 天竺 "heaven" (Dien 1957). The character 天 is used in 天竺 M. 象产业园 (read: 象产业园-产业园) = Skt. Mahārdhika (Bailey 1949, p. 784). If we restore a Han dynasty pronunciation for 天竺 as 象产业园 象产业园 it gives a good equivalent for an Iranian Hinduka.

The earlier transcription M. 象产业园 is superficially easier but in fact
requires the same explanation. It will not do to regard it as based directly on
the Indian form Sindhu-, since the Chinese has a palatal, not a dental,
sibilant. M. 象产业园 implies an Old Chinese 象产业园 and we can therefore
postulate a Han dynasty pronunciation 象产业园 or 象产业园.

The supposition of Han dynasty pronunciations in 象产业园 will also
account nicely for a number of glosses in the Shih-ming in which Middle Chinese th or s are associated with h, kh or h, e.g.: 60 吕 M. khou:< 吕 M. thou< *8ah; 50 鳥 M. -ou: 務 M. sjo< *8ah; 61 懷 M. khou:< 勥 M. sja< (numbers as in Bodman 1954).

Clusters with s (8)

If *s is cognate to Tibetan t, we should expect to find it occurring in initial clusters with other consonants. One may note the following hsieh-sheng series which point to such clusters with velars:

唐 M. daq: 廃 M. khaq, (唐 M. kaaq)
羊 M. yoq: 廊 M. kioq, 羊 M. kioq
與 M. yoq: 廊 M. kioq
頰 M. yoq, zioq: 彼 M. kuq
邪 M. ya, zia: 腿 M. ya
窩 M. yeu: 窝 M. kau, 窝 M. kyeu, 窝 M. cjak < *k6k
倉 M. ya: 廊 M. kio, ya
異 M. ya, 巁 M. yak: 巁 M. kvi
築 M. yak, 梱 M. sjak: 梱 M. gauk, luk
谷 M. yok, kuk: 囗 M. yao
芩 M. yen: 產 M. khen (also 産 M. ejen)
美 M. yur: 久 M. kiu, 槱 M. gju
薰 M. yem: 產 M. kam, 藍 M. lam
體 M. dua: 拳 M. thuai, 頭 M. ywi: 頭 M. kwaq, 標 M. kwi
聴 M. nwaai: 聽 M. gwi

In these series the reflexes of Old Chinese *g are rare. We may suggest that the probable course of development was for -s- to disappear after k and kh but for g, weakening to h, to disappear before -s-, which gave M. d or y. Hence we shall reconstruct: *gsan > M. daq, *khian > M. khan (*kian > kaan), etc. It need not of course be assumed that the presence of medial -s- in some words of a phonetic series must imply its presence in all words. In some cases medial -s- as an alternative is indicated. In others there is every reason to think that there was no cluster. Thus 黃 M. kiaqi certainly did not have a cluster when it was used in M. kiaqi-siaq = Kušan (first century A.D.). In series where we have η alternating with y we also find reflexes of η, i.e. th and s. This probably indicates the developments: *gθ > *s > M. d, y; *ηθ (= ηθ) > *θ > M. th, s. Initial η survives, as in 勉 M. gauk, 聆 M. nwaai, when the medial element was -s-.

In the cases so far considered we have had Old Chinese back or central vowels, or, in the case of M. ya, yak, a vowel which had become retracted from *i to *a already by the time the clusters may be assumed to have simplifed. Alternation of M. y with velars is rare before the front vowels e and i and it seems that in this case the pattern of development was somewhat different. *g did not disappear, *-θ- left its trace before original long vowels in the forms of the close medial -y-, which did not however cause the palatalization of the preceding velar as did the medial -y- which had developed earlier by the breaking of the long vowel. This hypothesis will allow us to account for the fact that the Shuo-wen regards 千 M. thee < *θen as phonetic in 千 M. keq, 千 M. kyeq, gyeq, etc. We should expect an original *kθen to have given M. cieq. The actual development can be postulated as: *θen > M. keq, *kθen > *kyen > *kyen > M. kyeq. There is evidence of -l- clusters in the series also: 送 M. khaq < *kθen, 送 M. gian < *gien, etc. Bodman has already proposed a cluster in the word 千 M. kyeq, gyeq because of the Shih-ming gloss with 頭 M. ieq (Bodman 1954, p. 49).

We may similarly postulate -s- in:

聽 M. kyan < *kθen < *kyen, cf. 送 M. khaq < *kθen
蒙 M. kyi (phonetic said to be 頭 M. thust)
吉 M. kyiit, 語 M. kyiit (cf. the Shih-ming gloss of this word by

卒 M. kyeq, 細 M. gyeq, 細 M. kyeq
逢 M. kyen
企 M. khye-

and possibly also in the alternative readings with unpalatalized initials of 柴 M. cjeq, kyeq, 聽 M. cjen, kyen—if these are genuine Middle Chinese readings and not merely dictionary readings retained because of the use of these characters to represent Indian k.

If medial -s- disappeared without trace before short vowels, it is possible that it should be restored in some cases where the series indicates -l- clusters but the vocalism does not confirm them. Thus 危 M. kak “each” may be from *kθak. This would suggest an etymological relationship to 危 M. kio < *kθi “all”.

Medial -s- may play a part in the hsieh-sheng relationship: 巳 M. yeq: 陥 M. hiaq, 陥 M. giaq, 陖 M. sai, 陖 M. gaaq, etc., but this series is anomalous in several ways.

The clusters *nθ, *sθ, *θθ will be discussed below. It seems likely that there would also have been clusters of -s- with dental and labial stops and m.

The dental nasals

We have noted the existence in Middle Chinese of dental, palatal and retroflex nasals: n, ñ, n. Like the corresponding reflexes of the Old Chinese dental stops, we may derive them from a single dental nasal. We have evidence for the use of Middle Chinese ñ to represent foreign n in Han dynasty transcriptions such as:

若 栗 M. dia-liu “pomegranate”, cf. Sogdian n’khθ, *naraθa. The
easiest occurrence of the word seems to be in the Nan-tu fu of Chang Heng, ca. A.D. 100 (Wen-hsüan 4, p. 52). It also occurs as 様 in the Kuang-ya (Kuang-ya shu-cheng 10 B, p. 1340). The form shih-liu 石榴 is, no doubt, a graphic corruption. The longer form an-shih-liu 安石榴 must stand for *M. -na-nja-liu", with initial a- as in Western forms like Pahlavi anār. The vocalism of the final syllable presents further problems but these will be left aside for the present. (See Lauffer 1919, pp. 276-87.)

As in the cases of the other nasals, we shall postulate an aspirate *nh in Old Chinese. Its reflexes in Middle Chinese are the same as those of *ŋ and we may suppose that it became *ŋ at one stage in its development. *nh is revealed in hsieh-hsing series like the following:

<table>
<thead>
<tr>
<th>Old Chinese</th>
<th>Middle Chinese</th>
</tr>
</thead>
<tbody>
<tr>
<td>硘 M. thear</td>
<td>硇 M. niak</td>
</tr>
<tr>
<td>陙 M. thear</td>
<td>陯 M. nei, nei</td>
</tr>
<tr>
<td>隃 M. thag, ou</td>
<td>敗 M. nou</td>
</tr>
<tr>
<td>隃 M. than</td>
<td>陯 M. nan</td>
</tr>
<tr>
<td>隃 M. tham, nam</td>
<td></td>
</tr>
<tr>
<td>隃 M. thwa</td>
<td>陯 M. nwei</td>
</tr>
<tr>
<td>隃 M. song</td>
<td>陯 M. no, 陯 M. njaq</td>
</tr>
<tr>
<td>隃 M. stjo</td>
<td>如 M. njo</td>
</tr>
<tr>
<td>隃 M. sjep, nep</td>
<td>隃 M. njep</td>
</tr>
</tbody>
</table>

Corresponding to *ŋ < *nl we find th < *nwl in a few cases:

<table>
<thead>
<tr>
<th>Old Chinese</th>
<th>Middle Chinese</th>
</tr>
</thead>
<tbody>
<tr>
<td>硇 M. thia</td>
<td>硇 M. nja</td>
</tr>
<tr>
<td>隃 M. thia, njo (also stjo &lt; *snj, see below)</td>
<td></td>
</tr>
<tr>
<td>隃 M. thia, njo</td>
<td></td>
</tr>
</tbody>
</table>

The first member of the last example is the second earthy branch and we have Tai loans for it. They seem to imply Primitive Tai *pl- (Li Fangkuei 1945, p. 338). There is no trace of labials in the series however and we should like to reconstruct *nhl > *nl. Tai *pl- might perhaps represent *fl, as a substitution for *fl.

**Lateral**

The lateral initial l did not undergo palatalization after yod. Except where it disappeared entirely in the simplification of initial clusters, it seems to have been a stable phoneme from Old Chinese to Middle Chinese.

It is probable that we should also reconstruct an aspirate *th in Old Chinese, on the analogy of the aspirated nasals, to explain cases where l alternates only with th or th—though in some clusters cases are to be suspected even here:

<table>
<thead>
<tr>
<th>Old Chinese</th>
<th>Middle Chinese</th>
</tr>
</thead>
<tbody>
<tr>
<td>硇 M. thear, lei</td>
<td></td>
</tr>
<tr>
<td>硇 M. that, thar</td>
<td>硇 M. lat, 赖 M. lai</td>
</tr>
<tr>
<td>硇 M. thar, lju</td>
<td></td>
</tr>
<tr>
<td>硇 M. thar</td>
<td></td>
</tr>
</tbody>
</table>

A case of *th in a transcription may perhaps be recognized in the earlier form of the word for "camel", 罠 (駱) 践 M. thak-da < *thak-da (?) which appears in the second century B.C. but is replaced in Later Han by 駱 践 M. lak-da. The new transcription can be most easily explained
if we suppose that Chinese *th had changed to th and was therefore no longer appropriate to represent a foreign liquid. Unfortunately the original of the word is quite unknown—it may have been Hsiung-nu or Tokharian. The kshig-sheng series of neither 了 nor 之 show contacts with 了, but both contain retroflex stops, showing evidence of *l- clusters. (For the history of the forms see Schafer 1950.)

Clusters with *l-

The theory concerning the retroflexion of dental initials and the effect on the vocalism of the loss of medial *l- which has been developed above enables us to restore *l- clusters with considerable confidence in many cases. Certain problems remain however, especially when M. 1 is itself the surviving member of the cluster.

The most numerous clusters are those with velars and laryngals. In this case Karlgen supposed that medial *l- had been lost after all initials except his unaspirated g-. We have eliminated this phoneme from our system but in place of it we have 了 and it provides an attractively simple solution to suppose: *hl > L, *gl > L/了. There seems to be no insuperable obstacle to this. There are it is true cases where we might wish to suppose that *g, rather than *hL, had been lost before L in double readings like 鼎 M. giip, liip or 流 M. gyeu = 流 M. liu (Karlgen 1957, No. 106) i and b) or where there are readings of the same character in k and li that look like variation between voiced and unvoiced initial, e.g. 鼎 M. kjou' M. liou' (also lu). Such examples are few however and may be looked on as exceptional.

Another difficulty might seem to presented by the use of 鼎 M. lu < *hlo in Lou-lan = Krorayina. One must however remember the peculiarity already noted about transcriptions from that region, i.e. the use of Chinese laryngals to represent foreign back velars or uvulars (see p. 91 above). The native pronunciation of Krorayina may have had an uvular at the beginning which prevented it from being represented by Chinese *hl.

The same considerations may apply to 鼎市 M. lam-jji (Shih-chi 123), 鼎氏 M. kam-jje' (or cje) (Han-shu 96 A), 鼎氏 M. lam-jje' (or cje) (Hou Han-shu 118) the name of the capital first of Ta-hsia and then of the Yuez-chih in Bactria (cf. Haloun 1937, p. 259). The first syllable of this transcription must represent the same name later known as Khulm. Khulm is a large ancient site in the heart of Tokharestan east of Balkh, strategically situated on the crossroads between the east-west road and the north-south route between Transoxanand and the Hindukush. It is a natural place to have been made a capital city by the Yuez-chih. I hope to give a fuller discussion of this identification from the historical point of view elsewhere. It will suffice here to point out the variation between *hl- and *kl- to represent the foreign initial which was later an Iranian X-. Whether the name is originally Tokharian or Iranian, the Chinese probably first heard it through Tokharian, perhaps as *q-

It should be noted that *sw- did not disappear before *l- as is shown by cases like 鼎 M. hwak, 楠 M. hiwaj where the series clearly points to labiolar yngals rather than velars. This occasions no difficulty however. In the few cases where we find M. l- in ho-k'os rhymes showing contacts with velars, the medial *sw- can be explained in other ways than as a result of a labiovelar or labiolar yngal initial—either by the breaking of a rounded vowel before a dental ending or by *vl- (see below).

The time of the simplification of 1 clusters

A number of examples of clusters of velars or yngals + l from the Han period have been given already and more could be added. One may note 鼎 M. kask-kuan < *keik-kuan, equivalent to the slightly later 鼎 M. ken-kuan, an early form of the name Kirghiz (Shih-chi 110, p. 0245.1, Han-shu 94 A, p. 0396.1, cf. Han-shu shu-cheng). Examples may still be found in Buddhist transcriptions. The character 卍 M. kia is used for kalpa. It probably goes back to an original *kla. Because of the confusion of rhymes ja and ja the vocalism is here an unsatisfactory guide and there are no contacts with l in the kshig-sheng series. The supposition of medial *l- would however enable us to account for the presence of 鼎 M. piap < *plalp in the series. We probably have 卍 M. kia earlier in the transcription of Kujula kadhphises, if we accept Pelliot's emendation of the last syllable 卍 M. kia (1914, p. 401). Pelliot noted this as a transcription in which l was not represented by the Chinese. If we restore *kla we have *kla-h-zuul-kla which can represent a *kula(k)ap- by metathesis. The same character also occurs in 卍 M. jia-pa-yuk, jia-pa-yuk M. jia-pa-yuk-sa = Ska. karpasa, karpavka “cotton” (Pelliot 1959, pp. 440-1). Pelliot assumes that these transcriptions are based on Prakrit forms with kapp- but it is possible that Chinese *kla- represents karp- by metathesis. The form in -yuk seems to indicate *-zuk or *-zuk for -rik(a). The significance of the departing tone in M. pai will be discussed in connection with the finals.

Another transcription in which Pelliot noted that l- seemed to be ignored was 鼎 M. jia-du-kan = Śārdulakarṇa. Here again the syllable 鼎 M. kan implies *kl- which may stand for *ka(k)- by metathesis.

The character 卍 M. gi is something of a problem. Its vocalism should imply *gla. Yet it is used in 卍 M. jan-gi = *Argi where it should not have a cluster and also in the Hsiung-nu title Eck M. dou-gi which is, I believe, the ancestral form of Turkish tegin. It occurs also in early Buddhist transcriptions, sometimes with the value j-, as in 卍 M. gi-bwak = jhaka 比支陀 M. bij-gi-da = vijita (?) (T.202, trans.
ca. A.D. 425), 耶那 M. ジナ(1) = Jina. These transcriptions seem to point to a reading *M. jī < *gē which has not been preserved in dictionaries. One may note also that it is used for 嘉 M. jī(2) in the Shi-ching. We also find it however used for g- in 聖 M. ギャ(1) = Skt. garha- (T.224). A form like Pali gjī would not require us to suppose any gl- in the Chinese but in the Old Khotanese Suvarṇabhūsā we find gjiakūlā ggaru = Buddhist Sanskrit garhakuta- with -r- from a Prakrit (see Bailey 1949 p. 134). The best solution seems to be to posit two Old Chinese readings *gē and *gīlā, only the latter of which survived to Middle Chinese.

Clusters of labials ɣ and ɣ are also found. A possible early example is 虎 M. hou- phak < *h̥o- phaka "amber" (Han-shu 96 A, under Chi-pin, Kashmir). This may represent Greek *h̥o̥- phakoa "amber". The equation had been suggested by G. Jakob in 1889 but was rejected by Laue. Though the Greek word is only attested in latinized form in Pliny as a term used in Syria, the epithet "snatcher" is an appropriate one for amber and may well have been known in other Greek speaking regions. We should of course not be surprised to find evidence of Greek influence in north-west India in the first century B.C. (cf. Laue 1919, p. 523). A probable *hl cluster that has already been alluded to is 墨 M. bjam = Brahman (see 114 above). Another case in an early Buddhist transcription is 那 (read 那) M. pijn- na < *plān- na = Pāṇa- in Pāṇamaitrāyaniputra (T.224 p. 427B, see also T.2128 p. 361C).

Doubt has been thrown on the existence of ml clusters by the failure to show any trace of this in the Tai forms of M. maw (Li Fang-kuei 1945, p. 338—this may however have originally been *vml-, not *ml-). Though such clusters may have been simplified relatively early, one or two probable examples may be found. One is 都 M. tou- mjit < *u̥h- mlit the name given in Hou Han-shu 118 for the city governed by one of the five yahgu of the Yuezhi-chih. This must be a transcription of Tarmita, later Termes, situated north of the crossing of the Oxus and an important strategic point that the Yuezhi-chih would have been certain to occupy. One of the stages on the journey to Ta-ch’ìn, the Roman Orient, mentioned in the Hou Han-shu and the Wei-lüeh is 阿蔑 M. a- man. Hirth’s identification with Ecbatana is still often quoted but there is only the vaguest of phonetic resemblances and the suggestion of Miyazaki that it represents Armenia is much more likely. I hope to discuss this itinerary in detail elsewhere. (See Hirth 1885, Miyazaki 1939.) The transcription should go back to *u̥h- mlan and the -l- could represent the foreign -r-, once again by a metathesis. I do not know of any examples of ml in Buddhist transcriptions.

The cluster *sl is probably to be found in 聖 M. शल < *ślā = S(ukh)by “Sogdian” (?). This character was used as the surname for natives of Kesh who came to China. Kesh seems to have the main centre of the native kingdom of Sogdiana in the Han period and was probably the place meant by the various forms of that name that appear in Chinese in early times: 蘚 M. sou- ḍai(1) (one of the countries which sent an embassy along with An-hsi, Parthia, in ca. 110 B.C., Shi-hi 121; one of the petty kingdoms under K’ang-ch’u, Han-shu 96 A; capital of K’ang-ch’u, Chin-shu 97), 蘚 (read: 蕃) M. sjok- yacak (country mentioned in Hou Han-shu 118), 蕃 德 M. sjok- dak (country mentioned in Fei-shih 97). (See Marquardt 1901, pp. 303 ff., Barthold 1928, p. 134, Shiratori 1928, Pelliot 1938, p. 148.)

The use of this surname is, to be sure, only attested much later towards the end of the sixth century, but other “Sogdian surnames”, especially An 安 and K’ang 康, were being used already in the second century in the names of foreign monks and it is quite likely that 蕃 originated at the same period. (This name will be discussed further with regard to its final.)

Clear examples of clusters of dental stops ɣ and ɣ are not easy to find. A likely case seems to be 阿蹊 M. yin- dii < *i̥n- dii < *i̥n- dii = Indra, (T.224). Professor J. Brough informs me that dr remained in this word in Gandhari Prakrit.

At about the same period we find M. d < *d̥ used for foreign l in two transcriptions of Alexandria that appear in the Wei-lüeh 魏 遠遊 M. ou- dii- san=, 遠遊 M. d̥ḁn- san=, Earlier, *d̥ alone had been used for foreign l (see p. 116 above). By this time d̥ was becoming palatalized to z. It is not quite clear whether it had yet been hardened to l when not followed by yod. In any case the combination d̥ḁn may have been the best available means to express the peculiar quality of an Iranian l. (Presumably the name came through an Iranian intermediary.) (Hirth 1885, pp. 181, 190.)

There are clearly very good grounds for thinking that -l- clusters persisted at least up to the end of the second century A.D. This agrees with the evidence of the sound glosses in the Shi-ching, which might otherwise have been suspected of archaism. When the history of Buddhist transcriptions has been worked out in all its details we may be in a better position to say just when they finally disappeared.

1 as a derivational infix

The new reconstructions of -l- clusters now proposed give much support to Wulf’s theory of l as a morphological infix (Wulf 1934). There are very many words which are obviously cognate which turn out to be related through medial -l-. The question requires extensive treatment in relation to the other morphological devices such as variation between voiced and unvoiced initial, prefixed s- (see below) and the falling tone (i.e. suffixed -s, as will be shown in the treatment of the finals). Here only a few examples will be cited. In some cases the infix makes a transitive verb out of an intransitive or a causative out of a transitive:

致 M. qij < *tils "arrive" ; 致 M. tij < *tils "bring"
出 M. cjwt go "out" ; 出 M. tiwit "expel"
The sibilant series of initials

In Middle Chinese we find three dental affricates: ts, tsh, dz—and two fricatives: s, z. The voiced fricative z, however, occurs only before -j- and in hsieh-sheng series it does not freely alternate with the other sibilants. It is doubtful whether it existed as an independent phoneme in Old Chinese. In a few cases it appears to be a variant treatment of dz;—note double readings such as 慎 M. dzon, zja, 諷 M. dzja, zja (also tsa, tsja), 慈 M. dzha, zha, 慈 M. dzja, zja. Otherwise z is found almost exclusively in hsieh-sheng series of the ulary type.

We are left with a very few cases in which z alternates only with s—司 M. sja, 諷 M. zja, or occurs on its own without hsieh-sheng relatives, e.g. 哲 zji. In the case of 哲 "heir," the word is certainly cognate to 聰 M. zji “inherit.” Here the Shuo-wen gives 聰 M. dop as phonetic, which is in turn phonetic in 聰 M. cjep; so once again we have reason to connect z with s or t rather than the other sibilants.

If z did exist independently and was not merely a conditioned development of s or (more rarely) a variant of dz, we should expect to find a reflex of it before undyodized vowels but there is nothing which can be pointed to as probably representing this.

The fact that M. z is most frequently found in *s series suggests that it may originate from *s. We can postulate its development as follows: (1) when not followed by yod (from an original long vowel), *s > *z > *zd > M. d; (2) when followed by yod, *szi > *szg > zy = M. zj. Examples are very numerous, e.g. 象 M. zjan < *sən: “horse” 聰 M. daz < *(s)zən. 衋 M. zjan < *(g)zən: 羊 M. yan < *(g)zən.

"eye" (cf. Tibetan nla-ba “moon”). 夜 M. ya < *saks “night.”

貓, M. zja: 由 M. yu.

俗, M. szok: 谷 M. yok, kuk.

忦, M. zip (cf. Tibetan slob “learn”): 燈 M. yip.

似, M. zja: 以 M. yə.

If I am right in reconstructing M. zj in as *sən, it is likely that 砒 M. yi-zj < *(s)zən, the city in the territory of Lou-lan where the Chinese established a garrison in 77 B.C., is a transcription of the name that lies behind the λοβξ of Ptolemy. A T’ang dynasty geographical text identifies 砒 with 七屯 M. tsjho-juan on the south side of Lap Nor (Haneda 1930). Enoki now proposes to emend 七屯 to M. yi-tu-juan in order to justify the identification with 砒 but this is unnecessary (Enoki 1961). M. tsjoh-juan can very well represent a later form of the word underlying *(s)zən, λοβξ. (The final *s of the first syllable can sometimes be ignored in transcriptions.) It is also no doubt the same as the place 趙-bo, 趙-zton, 趙-mto, 趙-tol, 趙-tos mentioned in Tibetan documents (Thomas 1951, pp. 150-4). The proposal to identify 七屯 with λοβξ has already been made by Herrmann 1938, p. 126. For another recent conjecture about the name see Hamilton 1958, p. 120. I now withdraw the proposal to take 七 as "seven" made in Ts‘oung-pao 1952, p. 352.

Another possible place where we may reconstruct *s is in 四 M. sii “four.” This does not superficially show much resemblance to the Tibeto-Burman forms of the numeral for which Benedict reconstructs a prototype *b-li (1948, p. 202, cf. Wang Ching-ju 1931). In the phonetic series however one finds 砶 M. thii and 砶 M. hii, both of which can point to *s = Tibeto-Burman *li. Moreover the alternative graph for the numeral "four" 麗 has as its phonetic 砨 M. dai, yi < *sits, *sits. We can therefore reconstruct 研 M. sii < *sits. (In order to account still better for the Tibeto-Burman comparison one might conjecture further that *sits came from an earlier *fis (p. *fis). M. thii ~ hii could then indicate *f —see below.)

Retroflexion of sibilant initials

Though the sibilant initials did not undergo palatalization between Old Chinese and Middle Chinese, they did undergo retroflexion under the influence of medial -l-, like the other dental consonants. We find hsieh-sheng...
contacts between 1 and the Middle Chinese retroflex sibilants in such cases as the following:

史 M. lij< - 史 S. sii<, 使 M. sii<, sii<

六 M. liuk: 六 M. tshik, tshik, tshik, dziuk

其 M. lu, liu: 其 S. siju<, yauk

亖 M. liou<: 亖 M. tshijou< (cf. 初 tshou < *tshih)

各 M. liou: 歌 M. sije, 荷 M. sse<, sje<

率 M. liwu, sjiwu, sjiwu,

林 M. liim: 林 S. sijim

Before certain short vowels retroflexion apparently did not take place:

林 M. liip, 拉 M. lap: 林 M. sap

数 M. su<: 数 siju<, siju<, yauk, 彼 M. liou, cf. 彼 su<, siju<

Benedict 1948, p. 199, has proposed to see Chinese ʂ as coming from *št and cites in evidence: Tibeto-Burman *stik “louse”, 西 M. šit “louse”; Tibeto-Burman *string “be born”, 生 M. sjan. The comparisons are very convincing but they probably mean that one must derive Tibeto-Burman *št from a dental *št. Transcription evidence in favour of *št > M. ʂ has been cited above.

If *št still existed in the second century A.D., we must assume a different origin for M. ʂ in some cases; for we find it in transcriptions of an earlier period where there is no possibility of an ʂ or an ʃ, e.g.: .gnu M. saap in M. ou-yak-saan-lije = Alexandria (p. 160 above), 西 M. sjeu in M. kjuiw<, sjian = Kushan (Han-shu 96A), 师 M. ši in M. sji-tšao “lion” = Town. seke, štik “lion” (see p. 109) and in M. ši-ši = Neseh (see p. 120). A clue as to the probable origin of M. ʐ in these cases is provided by a few series where we find it alternating with laryngals or velars, especially ʂ.

要 M. şa<, ʂai<: 要 M. ha<, ha<

所 M. šo<: 所 M. hou<, 所 M. kou<

足 M. ša<, ši<

略 M. šauk, 略 M. šak, sou<: 略 M. šak, 略 M. šjak

虚 M. saan<: 虚 M. njeu<, 虚 M. naan

The most likely explanation seems to be in terms of a combination of ʂ + h (or s + h < ṣh). As we shall see below, there is good reason to think that ʂ functioned as a prefix which could precede other types of initials. Phonetically, the development seems very plausible—we may compare the retroflexion of ʂ after k in Indian ky.

In order to account for the Tai loans of the cyclical character 午 M. ʂou<, which point to an earlier *əŋ- (Li Fang-kuei 1945), we must suppose that, before əŋ, ʂ first became voiced and then disappeared: *əŋ > *əŋ > ʂ. It probably similarly disappeared before *g in M. hou < *sga< “door” (cf. Tibetan sgo “door”) and presumably also before *k in M. kou < *skah. The two values of ʂ probably come from *əŋ- and *əŋh-. On the other hand it is not to be assumed that because one word in a series had prefixed *s we have to reconstruct this in the whole series. Thus 謝 M. hou<, hio< must, on our theory, imply *ŋh, not *ŋh, and when 所 M. sio< is used for these words (Karlsgren 1957, 91a–c) it presumably implies that *s- was treated as a movable prefix. It should be further noted that as a place name 謝 M. hio< is alternatively written 林, with, however, the same pronunciation. The phonetic is in this case 謝 M. mjou < *m̥ah and there is no trace of initial *s in the series. This must be an example of a phonetic in *m, with *mh in the series, used for a word in *gh, since *m̥ah would give M. hjou<, with labialization of the vowel (cf. 謝 M. hjou<, etc.).

In series of this kind we also quite frequently find M. tʃ- e.g.:

鍾 M. tʃhan<: 鍾 ʂan<

楚 M. tʃιo<: 此 M. ʂio<, ʂa<

驃 M. tʃh̥an<: 驃 M. h̥an

呂 M. tʃik (< *tʃi, used in transcribing Akṣobhya, Hōbōgin, p. 39): 爾 M. njim

and we should probably also associate with this type of series cases in which ʂ and tʃh alternate with each other or with s but without other initials of the sibilant series:

義 M. ʂai<, sast: 剎 M. tʃhaat, 撃 M. sat

義 M. tjio<: 剎 M. tʃh̥io

Noting the frequent alternation of h and hh in phonetic series, one might suppose that tʃh in these series was from *skh. The difficulty with this from a theoretical point of view is that in many cases it seems to imply an alteration *skh ~ *ṣh rather than *skh ~ *š. I therefore adopt this solution only provisionally, and with reserve.

It is noteworthy that the retroflex sibilants appear to have had the same effect on the vocalism whether they were derived from *št, *tʃh or from *ṣh, *ṣh, *skh. This is not at all surprising. What is more difficult to explain is the appearance of Division II vocalism in some, but not all, cases where ʂ appears to have been lost before ʂ, ʂ. We cannot very well attribute this to initial *ʂ, since, in the one case where we have clear evidence of a *ṣ cluster, the sibilant had no effect on the vocalism, i.e. 午 *ṣa< > M. ʂou<, like 爾 *ṣah > M. ʂou. It seems likely that we must sometimes postulate more complex clusters such as *ṣi-, *ṣi-, etc. We may particularly note in this connection the following phonetic series, in which we get most of the few cases of the anomalous initial ʂ in the Ch'ien-yin:

矣 M. hia<, 俟 M. zia< (also ʂia<, ʂia<), 傘 M. gai<, zia<, 俟 M. ʂai<, 俟 M. hia<, 俟 M. ʂia< (not in the Shuo-men).

The phonetic is here said to be 巴 M. yu< < *ṣu< (< *h̥u<). This might justify us in reconstructing 矢 as M. hia< < *h̥ia-, with ʂ irregularly
preserved, and postulating 見 *shii > *shîä > zîâ (or gia-, or hîo-). Note also 晦 M. zîâ < *svîâ (?) (see below). The possibility of reconstructing 見 as "shîā" raises interesting possibilities of connecting it with the Mandarin perfective particle 了. Lack of parallel cases or comparative evidence must however make the reconstruction of this series still very conjectural.

The clusters *ŋō, *ŋō

For 見 M. zîâ, yâ we should probably reconstruct *ŋō- or *ŋō-. The presence of *ŋ is confirmed by the fact that M. zîâ "slanting, perverse" is the same word as 斜 and the character is used as a loan for 見 M. zîâ (Karlgren 1957, No. 478). The series of 見 is a typical *ŋ series (see above) but the Shîā-ming gloss 見 M. zîâ: 見 M. zîâ again suggests the possibility of *ŋō (Bodman 1954, p. 61). Further, 見 M. yō "I" may be cognate to 見 M. nōu "I". It would however carry us too far afield to pursue these suggestions further at this time.

To reconstruct *ŋō- does not help to explain the difference in vocalism between *zîâ- and *zîâ. We have suggested above the hypothesis of a diphthong *ea/â to account for this, i.e.: *ŋōâ > M. zîâ-, *ŋōââ > M. zîâ. On this basis we should probably reconstruct 見 M. yâ "tooth" as *(s)geâi, rather than *(s)yiâ, though an alternation in the series between -a- and -i- would also be possible. (The hsiē-sheng derivatives have both M. y- < *ŋō- and M. z- < *ŋō-, so, though they may suggest, they certainly do not prove, the presence of *ŋ. See Simon 1956 for a companion with Tibetan so "tooth".)

The following series seems to show an alternation between *ŋ and *ŋh: 敦, 暝 M. nûie; 敦, 彌 M. sût < *huyê < *nhê.

We must however account for the failure of ny to palatalize to n. A solution in terms of *nh (see p. 118 above) seems excluded, since *ŋh- or *ŋhâ- should give M. yâ. The answer is probably that we have *ŋh ~ *ŋh. The initial bilabial prevented palatalization of ŋ, but not of *nh. The presence of prefixed s- is indicated for the series by other words: 見 M. sût < *nhâêt "familiar", 見 M. sût "garment next to the body", both cognate to 見 M. ngîêt, etc. (see p. 120 above). It is no doubt *s- that provides the link between M. g, s < *ŋh, *ŋh and M. s < *nh. We find M. ŋ < *n < *n (i) in 見 M. ngêt "hot", cognate to 煅 M. nîen "burn".

Clusters of s + labiodentals

We have noted above that in circumstances that gave rise to the close medial semivowel -y-, *hw gave rise to M. yw, falling together with the same phonemic combination deriving from *h. We might therefore expect that in similar circumstances *shw, if such a combination existed in Old Chinese, would give rise to M. zîw, corresponding to M. zî < *sh. We do in fact find M. zî occurring in labio-velar series before the close front vowels, thus:

箋 M. zîwen, hwen: 捕 M. ywen, 哺 M. wên

箋 M. zîwen "complete cycle, ten days"; 餅 M. yîn "even, all round", 的 M. hwen, etc.

(The Shên-toen does not state that 哪 is phonetic in箋 but the hwen form there quoted implies it. The two words are no doubt cognate.)

箋 M. zîwi: 欄 M. hwei

箋 M. zîwen, zîwi: 墜 M. hwei

箋 M. zîm: 閻 M. yem < *hwêm (?), see p. 105 above and also p. 140 below

箋 M. zîwen: 捕 M. zîwen, hwan, gywen, 捕 M. hywen, 捕 M. hwen

简 M. zîwen (The phonetic here is 简 M. hîwan. In order to account for the e vowel in the derivatives we may postulate *eun-/œn-.)

We also sometimes find initial s in series of this kind:

简 M. sjîwî: 血 M. hwet, 捕 M. hiwâk

简 M. sjîwîn, 捕 M. hwen, sjîwîn

简 M. sjîwê:

The close relation between these s- initials and *hw seems clear. It implies that *shw did not fuse to sw, like *sh > s. Instead a was lost before short, unyodized, vowels but remained at the expense of the following h before yod: e.g. 血 M. hwet < *shîwît (< s-k ) "blood" (cf. Sino-Tibetan *-shewi "blood", reconstructed by Benedict 1948, p. 198), but 捕 M. sjîwît < *shîwît. This differs from what we supposed happened in the case of *s that yielded M. s before both yodized and unyodized vowels. Moreover, since hw was not subject to palatalization before -y-, we cannot explain it simply by analogy with *shwy > *zhwy- > zywy- = M. zîw-by the side of *hwâ- > M. yw. The following case would indicate indeed that the change *shw > M. sjîw- was not confined to situations which gave rise to medial -y-:

简 M. sjîwen: 節 M. hwen, 節 M. hîwan

(Karlgren 1957, No. 164, doubts the reading sjîwen but this is confirmed by the use of this character for "war," e.g. 聞晝 "-hweï-sjîwen = ahbësvara-, Hâbôgîrin, p. 9.)

Clusters of s + dentals

Hsiê-sheng contacts between s and n are commoner than between s and ŋ. E.g.:

简 M. sjîu: 築 M. nîu

简 M. sjîug: 車 M. nîug

简 M. sjîou: 車 M. nîou

简 M. sjîo, nîo, nîo, nîo: 如 M. nîo
M. hou is confined to the meaning "large Altius" and may be disregarded. M. shen can theoretically go back to either *ga* or *ha*. The latter is the more probable in view of the use of the character in the meaning "why", where the word it represents is evidently related to M. ba < *ha "what". (For the use of the latter character to represent Iranian voiced aspiration, see p. 87 above.) The probability that it did not have a stop initial in Chinese is not however an insuperable obstacle to its representing Iranian *g*, since it is very likely to have come by way of Sogdian, in which the voiced stop would have regularly become a fricative *γ*. Unfortunately the word itself does not appear to be attested in Sogdian.

The alternative spelling  is of great interest for there is no other evidence of the presence of *n* in the phonetic series: ,  and . We should perhaps reconstruct . (According to the Shuo-wen, ง M. yo < *8a. (< *δi ?), see pp. 119, 129 above) is phonetic.

The series of  is unusal in that we have contacts between M. y < *nδ (?) and the dental affricates. There are  contacts between  and the affricates, particularly sh, which may help to explain this. Thus M. shen "thousand" appears, in its Archaic form, to have  as phonetic and is in turn phonetic in 年 (陳) M. ney "year". (信 M. sian probably also has  as phonetic, though this is not recognized by the Shuo-wen.) These words probably originally ended in *γ, cf. Tibetian-Burman *ning "year" reconstructed by Benedict 1948, p. 200, and  which no doubt has  as phonetic. On analogy with the hypothetical *sgh > sh we can reconstruct *sth > M. tsh. This will allow us to compare M. shen "thousand" with Tibetan ston "thousand" (< st'om ?). The difference in vocalism still remains to be explained.

We again find an alternation between sh and n in:

\[ \text{M. tshin} \text{ “order, second” ; M. ni “two”} \]

The words are no doubt cognate and one is led to ask, as in the case of the relationship between tsh < *gsh and s < *gs, (see p. 129 above) whether the aspirated affricate has not in fact developed out of an aspirated nasal under some as yet undetermined circumstances. We also find  and  in the series. If M. tsh in this series comes from *stsh, we must suppose also *st > M. ts, *sd > M. dz. This seems quite a likely phonetic change at a time when all clusters were being simplified, for it replaces clusters with unitary phonemes made up of the same elements already existing in the phonological system. In  the form  is Gandahastin (T.224. p. 470) I can cite one case in which Chinese ts (or dz) stands for Indian *st-. This is to be sure not conclusive, since in the absence of *t, we can well imagine that *t could be used for it by metathesis.

Returning to M. tshin, we may now reconstruct the initial as *sgh (for *snh ?). The problem of accounting for the relation between  and is precisely analogous to that of γ-γ-γ.
The hypothesis *st > ts, etc., could account for cases like the following in which, contrary to the usual strict separation between dental affricate series and dental stop series, we find the same phonetic used for both types:

\[ \text{七 M. tshet “seven” < *sthit: 吱 M. chjit < *sthit (here again *sth- may be for *stnh-, cf. Burmese nnt, Bârâ mnt “seven” and other similar forms involving n-or Nh-, but also Kanauri stũ, Wang Ching-ju 1931).} \]

\[ \text{齒 M. dzusi: 倆 M. cjiwi} \]

\[ \text{全 M. dzjwen: 軒 M. jiwé, tshjwen} \]

\[ \text{才 M. dzai, " M. tsai: 恆 M. tai} \]

\[ \text{ Cf. also 鼻 M. yù < *dù: 鼻 M. dzjú < *sdûh, 治 M. tsjù < *stû.} \]

Buddhist transcriptions of Viṅgaṇu might be expected to show *sn if it still existed. Though the sibilant was lost in Central Indian forms like Pali Vehnu, this was not true of Central Asian Prakrit to judge by the form Viṅgaṇu- found in Khbotanese proper names. (See Bailey 1942, p. 922, 1954, p. 23 l. 3, p. 33 l. 25, p. 63 l. 1, p. 70 l. 13.) We find: 檻 (or 鼻) M. byi-ju, 梳 (or 足) 總 M. hiwai-ju, 衝 M. hiwai-ju (besides others in which the sibilant is explicitly represented, see Höögörin, p. 67).

It is noteworthy that in no case do we find a falling tone word in -tu in the first syllable which could represent a sibilant at this period (see Bailey 1947, this matter will be treated further in connection with the finals). If the sibilant is represented at all, it must be in M. niu. Since we have 慕 M. aju in the series, we may suppose for 總 and 衝 an original *sn- giving *sp- or *st-.

Labial stops

There are rather few indications that the labial stops underwent phonetic change before Old and Middle Chinese. The fact that we have Division II endings and both Division III and Division IV in the "split" rhymes after p, ph, b indicates that -l- clusters existed and were simplified by the loss of -l- in every case. It seems likely that medial -l- also existed after labial stops and was similarly lost. The vocalism might possibly help in certain cases to reconstruct them but this will be left for further discussion. We may provisionally note the following cases in which, if we suppose that medial -l-/bl- is the link joining series with velar and labial initials, we should need to reconstruct *s- after labials:

\[ \text{使 M. byen, 檻 M. kan < *klaŋ, pyen (see Karlgren 1957, no. 745 f.), 餐 M. kæŋ (phonetic said to be 丙 M. pian < *plæŋ)} \]

\[ \text{校 M. pyen, 进 M. paœng: 介 M. ken, 形 M. téng} \]

\[ \text{妃 M. phuài, phúi, 配 M. phúai, 见 M. bi < *bl-: 己 M. klaŋ (配 "match" is etymologically related to 丕 M. pyit "mate" which has} \]

入 M. paat < *plet or *plet as phonetic and may therefore have *pē-.

There is every reason to think that there would also have been -s- clusters with labial stops. Positive indications of this are few. Presumably in most cases s- disappeared without trace. We may however note:

\[ \text{罪 M. dzuai < "crime, guilt": 非 M. píé < "is not", "wrong". We might suppose in order to explain this: M. dzuai < *sdwaś < *sb- (by assimilation of *b to the preceding dental consonant). This word is also written 華 in which 自 M. dzjí appears to play the phonetic role (though this is not stated in the Shuo-yen). This has a very diverse phonetic series: 顕 M. byí, 饵 M. kíí < *s(k)laŋ < *-ps (?) "and" (cf. 及 M. kííp < *s(k)laŋ "and"—the phonetic series has 路, 路, etc., M. kúp, 見 M. ñé < *s(ñ)laŋ "and"—the same word and so are 蜃 M. ñé "post"—for s- in the latter series see p. 130). 篤 M. zjíap < *s³ap, 必 M. sják < *s³ (< ?), etc. This would seem to justify very well a reconstruction M. dzjí < *sb-, or even better *sb³- in view of the frequent appearance of medial -s/-l- in the series. The latter alternative would provide stronger grounds for expecting the assimilation to *sd- and should perhaps be preferred for that reason also. If *sb- always gave M. dz we should expect to find more examples. On this hypothesis we should reconstruct 稽 as M. dzuai < *sb³aś and 華 M. tszúai would be *sb³aś. 自 is said to be the drawing of a nose and is no doubt etymologically related to 鼻 M. byí "nose" < *b³aś (< *-ps) (phonetic in 鼻 M. phíí < *phi-) and perhaps to Tibetan sbrid-pa "sneeze" (Simon 1929, p. 174).} \]

Labial nasals

The labial nasal ma, also mostly remained unaltered from Old Chinese to Middle Chinese. In hsieh-sheng series it occasionally has contacts with the stops but is more often kept separate. It does, however, frequently show contacts with b. To account for this Karlgren reconstructed the cluster *xm. Tung T'ung-ho 1948, pp. 13-14, proposed instead a voiceless m. As in the case of the other nasals l, I wish to propose an aspirate mh. This corresponds to Haudricourt's reconstruction for Common Tai. As far as the phonological system is concerned, it is certainly preferable to associate the unvoiced nasals with the aspirates rather than with the unaspirated surda.

The following are likely to be examples of *mh:

\[ \text{荒 M. hwâng < 亡 M. mjaŋ} \]

\[ \text{怪 M. huái: 帝 M. muaí} \]

\[ \text{穗 M. lijë: 露 M. mjë} \]

\[ \text{僣 M. hwáng < 常 M. mjaŋ, 暗 M. mua} \]

\[ \text{微 M. lijë: 微 M. mjë} \]

\[ \text{忽 M. huät: 觀 M. mjñat} \]

\[ \text{昏 M. huan: 昏 M. myin, 昏 M. mua} \]
In spite of the fact that 梯 M. suan- has contacts with labiovelarvylals rather than with M. m, it also probably goes back to *smh- rather than *shw-. In the Shu-kung it is used to gloss 梯 M. suan < *mbox6. (Bodman 1954, p. 62).

On analogy with *ŋəl > M. y and *nəl > M. y (see pp. 120–21, 130 above) we might expect to find *məl also giving M. y. This would account for the following series:

顧 M. maŋ*, myn*; 顧 M. yuŋ, 經 M. zheng

Note that M. maŋ* implies *mliŋ*, so that we apparently have an alternation of *ml ~ *məl.

Labial fricatives

In addition to his other unaspirated voiced stops Karlsgren proposed unaspirated b in a few cases in order to account for contacts between labials and other initials:

栳 M. yuwi, 坡 M. ljiw, 坡 M. pij

經 M. iwan, 坡 M. liwen, 坡 M. man, 坡 M. pjen

臨 M. liim, 坡 M. phim*

茵 M. liim*, pij

On analogy with *bl > M. I we should like to reinterpret Karlsgren's ǝ disappearing before -i as a labial fricative, ǝ or v. There are comparatively few other cases in which labial stops interchange with l in phonetic series. Since p, ph and b all occur before Division II vowels and in Division III of "split" rhymes, we may assume that the clusters *pl, *phl, *bl all lost their medial element before both yodized and unyodized endings, so that we should not expect to find many traces of contact with l in stop series. There are however many hsiieh-sheng contacts between m and 1. Since m also occurs before Division II and "split" Division III endings, we have to suppose that *ml also gave M. m. Contacts between m and l might therefore be explained by alternation between *ml and *vl or *ml and *l. There is reason to think that this is not the whole story however. We may note the following case in which the same character has alternative readings:

顧 M. liŋ "dragon" (cf. Tibetan hbruŋ), maŋ (in the sense of "motley", see Karlsgren 1957, No. 1193)

This would be more understandable if we could reconstruct *vlŋ > M. liŋ, *vlŋ > M. maŋ rather than suppose that a word properly read *vlŋ was used for *mlŋ. There is other support for the idea that *vl could yield M. m before unyodized endings. Thus:

顧 M. m, lsi, liŋ "yak" (the first two readings representing alternative developments of *vl cf. Tibetan hbru-mo "female yak")
In all these cases we find M. m before Division II endings alternating with I before yod.

If a phoneme *v existed in Old Chinese we should expect it to have occurred not only in combination with I. Its normal development would appear to have been M. m. Cf. 蛻 M. mao < *vuh (?) : 록 M. mao < *viu, 畢 M. liu < *vilu. Other examples will be given below.

There are also *hih-thing relationships which seem to point to an unvoiced counterpart to *v. Thus we have 蛻 M. thoq < *thoq < *fdog (?) and 蛻 M. thiak, thiuk, hjuk < *flik (?). The last example, indicating h and th as alternative developments from *flk, enables us to suggest an explanation for this alternation in 蛻 M. thiuk, hjuk, thiuk, hjuk < *flik, *fliks (?). 退出 M. thio may likewise be for *flah, cf. 庐 M. pio < plah. In this case 庐 M. lio is probably from *vlah. 退出 M. lio, etc. may be on the other hand be from *hil-.

Just as we sometimes find th alternating with h, thi with s < sb or sfr, and thi with s < *anh, so we sometimes find ph instead of the usual reflexes of *f, e.g.:

稽 M. phau < *phluh
派 M. phae : 蛻 M. maak < *vlek, 蛻 M. mek < *vek, 永 M. hjawg < *hwlen.

It is uncertain whether we should regard this as an alternation between *ph and *f or should regard *ph as a variant development of *f.

It would appear that, unlike the labial stops and m, mh, the labial fricatives did not always lead to the labialization of the vowel—note M. lio, thi < *vlah, *flah in contrast to M. pio < *plah and the variation between *thiak and *thiuk from *flik. Hence 黑 M. haik, 永 M. hai probably represent *fik, *fi rather than *mh; so also, 蛻 M. hia < *fi (or *fih). (Likewise 蛻 M. hai may come from *vhi, with h < *v rather than m < *v as an exceptional development in front of o < *i.)

Besides *f > h as in these examples we find quite another probable reflex of *f in the following series:

囂 M. hioq, 蠟 M. tsuq (cf. 稱 M. tsauq, 傳 M. swa)

There would at first sight seem to be no reason to reconstruct labial initials in this puzzling series. There is however a character 娃, meaning a kind of headdress for a horse, which is used in Buddhist terminology as a transcription of the Sanskrit syllable vam (Hōbōgūrīn, pp. 5, 50). It does not appear in the Kuang-yin. In the K'ang-hsi Dictionary it is read M. tsuq but in Hou Han-shu 90A the character 娃 occurs without the metal radical in the same sense and the commentator gives it a reading which implies M. mjām, as well as the alternative reading M. tsuq. The reading M. mjām is evidently what lies behind the Buddhist transcription value. We may further note that the synonymous 艋 has only the reading M. mjām (see p. 114 above). We may note further that in the above series ts only occurs before unyodized -uq and there are no cases of tsh- or dz-; h on the contrary occurs only before yod. The obvious inference is that ts here represents the unyodized counterpart of h and that we should reconstruct: *f > M. ts, *fi > M. hi. There is one other case in which M. ts alternates with labials: 服 M. tsanq "bury": 服務 M. mapq (according to the Shuo-wen 莫 *mak has the same phonetic, cf. 彭 M. maoq "tomb"). The change *f > ts is less surprising than it might at first appear. As far as the change in the manner of articulation is concerned we may compare it to what happened to *θ. There the fricative was replaced by an aspirated stop before the short vowel, here by an unaspirated affricate; the difference probably indicates a weaker pronunciation of *f than of *θ in Old Chinese. As regards the change in place of articulation we may recall, in the opposite direction, the development of labials in certain modern dialects out of Middle Chinese affricates (Forrest 1948, pp. 207–8). The change *f > M. ts seems only to have taken place before the vowels *o and *a.

In support of the hypothesis of labials in this series we may note the probable connection of 豳 M. hioq "breast" with Tibetan brian (Simon 1929, p. 172). This would indicate *θ- rather than *f — probably 囡 should be reconstructed as *fog and the subseries of 豳 (賀賀) was distinguished by the presence of medial -l-. We have noted above that *f could give either *h or *th. This reconstruction is further supported by the probable equation of the name of the Hsiung-nu 休奴 M. hioq-nou < *fog-nah with the Φωονον of Apollodorus (Haloun 1937, p. 306, n. 1). As Haloun says, "Die sachliche Identität ist m. E. unabweisbar." This equation does not exclude the possibility of connecting the name of the Hsiung-nu with the Hūna of India and the Χυνων, Ουνων, of western writers as it has sometimes been thought. There is reason to think that there may have been a simplification of the initial in the Hsiung-nu language pari passu with the simplification in Chinese, and perhaps under similar influence, that of neighbouring Altaic languages in which initial clusters were excluded. Haloun perspicaciously thought that the 伽樓帝 Σκάον of Ptolemy might represent a more recent linguistic stage of the name Φωονον. We might further compare the name Γαρνατος which appears in Ptolemy for a people occupying the Hsiung-nu territory in Mongolia. The 伽樓帝 Σκάον, placed in Transoxania, would represent a western offshoot, possibly the remnants of Chih-chih's following who set themselves up on the Talas River around 50 B.C. (Dubs 1957, p. 6 ff.).

This view is greatly strengthened by the earlier and later transcriptions of the clan name of the Hsiung-nu ruler: 擎稽 M. liwen-tei < *vlen-(or *vloν)-teh (Hou Han-shu 944, p. 505.4) and 送連 題 M. hio-lien-dei (Hou Han-shu 119, p. 909.7.1). The later transcription would indicate that
the original labial fricative in Hsiung-nu had become a laryngeal or velar fricative. Presumably this is indicated also by Greek ψ-. A still later loss of ψ- would give us the Sogdian ψw of the early fourth-century letters (Henning 1943, p. 615).

The initials M. tsh and ʂ which we also find in the series of ʐ must be compared with the same initials in series with M. h < * ph and M. h (see p. 129 above). We might expect *sf to give M. ʂ, and on analogy with the hypothetical *skh > M. tsh, should then reconstruct *sp̞h > M. tsh. This does not seem an entirely happy solution and it may be that we must find some other way of accounting for the alternation between ʂ and tsh in both cases.

We should expect *v and *f to have occurred in front of *s as well as *l. This is probably the best way to account for 拉 M. ywít (< *vśūt ʂ) as phonetic in 拉 M. liwít < *vlūt. We may also find it in the following:

粵 M. phen, phyen < *phēn, phēn, 拉 M. yen < *vēn, 魏 M. heq < *fēq, 魏 M. thien < fēq (phonetic is T. M. teg).

何 M. yit < *vōt, 肂 M. suat, set < *sōt < *fōt = *fōt (l), 肄 M. hit, bjat < *fōt

四 M. sī < *svōt < *svō (f-s see p. 127 above)

In some cases where we find the reflexes of *s in series with labial initials before labial finals it may, however, be the result of dissimilation. Thus:

聲 M. dawnm < *dawm < *vem, 拉 M. ham < *hwm, 肆 M. yem < *hwam (see p. 105 above).

Other cases where it seemed possible to reconstruct *f, *v are the following:

(1) 拉 M. phaŋ < *phlaŋ (or an alternative development of *fāŋ ?a"big", "have sexual intercourse", ( = >(), hauŋ < *fāŋ "penetrate", hiŋ < *fāŋ (?) "sacrificial offering, feast". It is possible that the last reading here is from *fāŋ, in spite of the fact that we expect -ŋ after laryngal, velar and labial initials = l. *fiaŋ does not in fact occur in Middle Chinese. We have noted that the retroflex initials from original *-iaŋ also have -iaŋ, rather than -iaŋ, and *f, having affinities with *s, may have done the same. If we reconstruct *f here we must also do so in 拉 M. haiŋ "feast, enjoy" which is the same word; hence also in ʂ and 肉 M. hiaŋ "fragrance" and 醒, 向 M. hiaŋ "facing" and the other words of these series. An obstacle is 肉 M. khiaŋ "minister" but, in view of the other cases where medial -l- links labial and velar initials, an alternate *f ~ *khaŋ seems not out of the question. In support of this reconstruction one might compare M. haiŋ "fragrance" and 肉 M. phiaŋ "fragrant"; also 肉 M. haiŋ "echo" with Tibetan brag "echo" (for Chinese *a = Tibetan br compare *fōng ~ braŋ "breast", etc.). 肉 M. ēiaŋ and the alternative readings of

In the Old Chinese phonological system one can probably regard *w in the labiolaryngals and labiovelars as phonemically identifiable with *v, with which it is in complementary distribution. The elimination of *v/*w from the phonemic system between Old Chinese and Middle Chinese was accompanied by the change in the role of *w from being part of the system of initial consonants to being a semivowel.

### Phonemic units proposed for Old Chinese

#### I. Initials

<table>
<thead>
<tr>
<th>Laryngals</th>
<th>Velars</th>
<th>Labiarayngals</th>
<th>Labiovelars</th>
<th>Dentals</th>
<th>Sibilants</th>
<th>Labials</th>
</tr>
</thead>
<tbody>
<tr>
<td>·</td>
<td>k</td>
<td>kw</td>
<td>kw</td>
<td>t</td>
<td>ts</td>
<td>p</td>
</tr>
<tr>
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<td>th</td>
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<td>ph</td>
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<td>gw</td>
<td>gw</td>
<td>d</td>
<td>dz</td>
<td>b</td>
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<td>ŋ</td>
<td>ghw</td>
<td>ghw</td>
<td>nh</td>
<td>s</td>
<td>mh</td>
</tr>
<tr>
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<td>u</td>
<td>nhw</td>
<td>nhw</td>
<td>n</td>
<td></td>
<td>m</td>
</tr>
<tr>
<td>ŋ</td>
<td>η</td>
<td>nηw</td>
<td>nηw</td>
<td>η</td>
<td></td>
<td>f</td>
</tr>
</tbody>
</table>

#### II. Initial clusters

(1) -l- following initials of all types.

(2) -s- following velars, u, and labials.

(3) -s- preceding initials of all types.

#### III. Vowels

(a) Simple: i, ɨ; e, ɛ; a, ə; o, ɔ; u, ü. (b) Dipthongs: ea, eə; au, əu; eu, ɛu. (c) Triphthongs: eai, ɛai.
I reconstruct five cardinal vowels, long and short, corresponding to the five recognized Shih-ching rhyme classes in -ŋ. These vowels also occurred before the velar stop -k and the laryngeal finals. In general terms the correspondences to Karlgren’s Archaic system are as follows: i, I = a, o; e, ē = iɛ, iɛ; a, ā = ą, ā; o, ō = u, ju; u, ū = ū, ē. The high front vowels i, I had already been centralized to ā, ē before the Han period in many contexts and I have so written them when Han transcription values are in question. The same five vowels are assumed to have originally existed before dental finals also but already in the Shih-ching o, ō had become wa, ʁwa, rhyming with a, ā; and u, ū had become wa, ʁwa, rhyming with a, ā. Before labial finals the same fronting and unrounding occurred but, since the labial semi-vowel was excluded by a labial final in the same syllable, the confusion with the original unrounded vowels was more complete. Both *um and *om fell together with M. um < *im; *um gave M. jim; *ʊm fell together with *ım.

Instead of Karlgren’s open o, jo I reconstruct the diphthongs au, āu. They occurred before -k and the laryngeal finals but not -ŋ (like the other diphthongs and triphthongs in -u and unlike the simple vowels). For the e-diphthongs and triphthongs see pp. 100 ff. above.

Many developments conditioned by special contexts must of course be accounted for in a full discussion of the evolution of the Old Chinese vowel system to Middle Chinese.

IV. Final consonants

Laryngals

<table>
<thead>
<tr>
<th></th>
<th>(h)</th>
<th>ħ</th>
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Velars

| k | ñ |

Dentals

| t | n | ʒ |

Sibilant

| s |

Labials

| p | m | (v ?) |

Final glottal stop is reconstructed where Middle Chinese had the rising tone. It could occur alone (replacing ħ in the level tone) or after the nasals and ʒ, but not the stops. Final -s could occur after any other final. After -ŋ, -n, -m it had probably already become -h by the Han period, and laryngals + s were replaced by -h. *-ks became *-h also, but may have gone through a stage as a velar fricative *-x. *-ts and *-ps > *-ts probably became simplified to *-s in the Han period, if not before, but this final sibilant remained until a very late date. The history of *-s in the Han period is not yet clear to me. *-s and *-h were ultimately responsible for the development of the falling tone in Middle Chinese. This theory of the origin of the tones follows the suggestion of A. Haudricourt 1954 (1) and (3). Detailed evidence and argument in favour of it will be given in the continuation of this article.

Outline of the development of the initials from Old to Middle Chinese

I. Laryngals and labiaryngals—unchanged except:

(a) h (but not hw) + -y > ś.
(b) hw + -y > ɣw.
(c) exceptionally, · (w) > k(w), h(w) > kh(w) (?).
(d) · (w)l, h(w)l > · (w), h(w); hl > l (exceptionally, ē); hwl > ēw.
(e) s + · (w) > · (w); s + h > ɣ (exceptionally tɛh ?); s + hw > hw (before short vowels); s + jw > jw (before long vowels); s + ē > ē (but, shē > ⿀jı ?); s + ēw > ēw (before short vowels and medial -j-); > zjw (before medial -y-).

II. Velars and labiovelars—unchanged except:

(a) g, kw > k, hw before short (unyodized) vowels.
(b) ēh > h, treated like original h.
(c) k, kw, g, ŋ, ŋh + -y > c, ḷ, j, j, ś; (but *sgy > gy ?).
(d) -j- was lost after all these initials, but changed -y- to -j- and prevented palatalization.

(e) kš, kšh > k, kh; kōy, khōy > ky, khy, without palatalization of the velars.

(f) gō > d/ɣ (before open and back vowels), ēh/gy (before i/ɛ, e/ŋ).
(g) skh > tɛh, tɛh (?).

III. Dental stops—unchanged except:

(a) t, th, d > c, ḷ, j, before all long (yodized) vowels.
(b) ti, thl, dl > t, th, d.
(c) st, sth, sd > ts, tsb, dz (?) .
(d) stl, sthl, sdl > ts, tsb, dz (?) .

IV. Dental nasals—unchanged except:

(a) nh > th before short vowels.
(b) n, nh > ŋ, ś before long (yodized) vowels.
(c) nž, nthl > ŋ, th.
(d) nō > y before long vowels, (> n before short vowels ?).

(e) sn > n, snh > s (exceptionally tɛh ?).

V. Laterals—unchanged except:

(a) lh > th, th.
(b) -j- lost after all consonants except h (but not hw) and v (before long vowels); it caused the retroflexion of preceding dental initials.

VI. Dental fricatives:

(a) Before short vowels d > d, ð > th.
(b) Before long (yodized) vowels d > y (exceptionally ẑ), ð > ś.
(c) sl, slh > d, th.
(d) sō > d (before short vowels), > zj (before long vowels); sθ > s.
VII. Sibilant affricates—unchanged except:
   (a) tsh, tshl, dzl > ts, tsh, dz.

VIII. s—unchanged except in combination with other consonants (q.v.);
   sl > š.

IX. Labial stops—unchanged except sb̩ > zd > dz (?) ; sph̩ > tah (?) .

X. Labial nasals:
   (a) m unchanged, except m̥i/m̥i > y (‡).
   (b) Before Old Chinese unrounded vowels, m̥h > hw; sm̥h > sw.
   (c) Before Old Chinese rounded vowels, m̥h > h/š; sm̥h > sh > š
      (exceptionally t̥h (?) .

XI. Labial fricatives—w > m, f > h except:
   (a) before long vowels vl > l.
   (b) before *i > a, exceptionally v > ū (?) .
   (c) before short a, o, f > ts.
   (d) f̩ > th, or h (exceptionally ph before short vowels?).
   (e) v̩ > ə > d/y; f̩ > s̩ > š (?) .

A continuation of this article, in which the final consonants of Old Chinese will
be discussed in detail, will appear in the next number of this journal.