Relative Chronology
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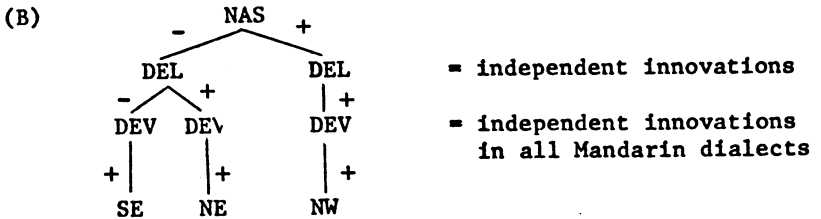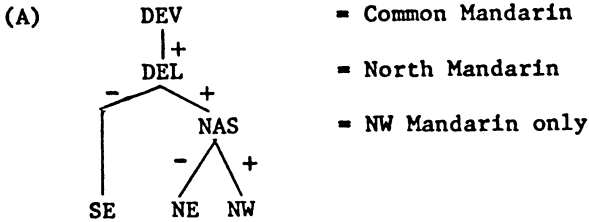
RELATIVE CHRONOLOGY

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1. Introduction[1]

Traditionally, three procedures have been used to establish the
relative chronology of linguistic changes with special reference
to phonology: (a) the dating of phonological innovatipns on the
basis of philological evidence. Thus Richter 1934 segmented the
history of French from Classical Latin to Gallo-Romance (late 8th
c.) into 170 successive shifts. (b) a logical inference of the
historical sequence of phonetic laws required to derive modern
reflexes from proto-forms. This time-honored technique[2] has been
refined by the concept of the linear ordering of phonological rules
developed in the generative school. Halle (1962:347) made explicit
the theoretical .foundation underlying the method of projecting
synchronically motivated rule order onto the dimension of relative
chronology. Chafe 1967 best exemplifies such an approach: from
the morphophonemic alternations still prevailing in Caddo, he in-
ferred at least 11 time depths among the 67 rules needed. Finally,
(c) the method referred to as 'latitudinal reconstruction' in Chen
1973, which consists in a projection from the horizontal plane of
geographical distribution onto the vertical axis of time depth.
The rationale can best be made clear by an example. Consider, for
instance, three major phonological chances -- devoicing (DEV),
final stop deletion (DEL), and nasalization (NAS) -- which gave
rise to the diversification of three Mandarin subgroups, namely
Northwestern (NW), Northeastern (NE), and Southeastern (SE). The
hypothetical situation can be schematized roughly in the following
way ('+' = application of the relevant change):

(1)	NAS	DEL	DEV	Mandarin
	+	+	+	NW
		+	+	NE
			+	SE

Given these facts, one could hypothesize two (among others) gene-
tic trees (A) and (B):

(A)
```
              DEV
               |+
              DEL              ■ Common Mandarin
           -  /  \ +
                 NAS           ■ North Mandarin
               - / \ +
          SE   NE   NW         ■ NW Mandarin only
```

(B)
```
                 -   NAS   +
                  /       \
            DEL              DEL
          - / \ +            |+
        DEV   DEV            DEV      ■ independent innovations
        +|    |+            |+
                                      ■ independent innovations
        SE    NE            NW           in all Mandarin dialects
```

In terms of branches, nodes and pluses/minuses, (A) is obviously
simpler than (B). The formal simplicity reflects the fact that the
monogenetic hypothesis (A) makes the least number of (fortuitous)
coincidences and independent innovations by positing that, e.g.
DEV happened only once, namely early in Common Mandarin, rather
than assuming that it was duplicated in each of the dialects. The
rationale behind the latitudinal reconstruction of relative chro-
nology is basically the same as the hierarchy of distinctive fea-
tures that yields the simplest feature tree. For an early example
of the application of 'latitudinal reconstruction', the reader is
referred to Bremer 1894; and for further discussion, cf. Chen 1973.

     In the following sections I will compare these methods of
reconstructing relative chronology, using as a case study the api-
calization process that is observable in a large number of contem-
porary dialects of China. It will become obvious in the ensuing dis-
cussion that each of the approaches has inherent limitations and
that all three are complementary to each other.

     Before we proceed further, it would be well to clarify a few
concepts and symbols. An apical vowel /ɿ/ typically has its origin
in a high, especially front, vowel, and can be regarded as an homor-
ganic vocalic release of the syllable-initial sibilant.[3] A sibilant,
as the term is used here, is defined as a dental, alveolar, retroflex,
alveopalatal or (pre)palatal affricate or fricative; in short, sibi-
lant denotes the class of sounds specified as [+strident, -grave] in
Jakobsonian terms. The phoneme /ɿ/ has two contextually determined
allophones: a dental [ɿ] after a dental sibilant, and a retroflex [ʅ]
after a retroflex sibilant. In the discussion that follows I will
ignore this distributional fact.

     Here are some of the symbols commonly used in the Chinese
linguistic literature:

/t̂, t̂', d̂; tś, tś', dź, ś, ź/ = (pre)palatals
/tš, tš', dž; š, ž/ = alveopalatals
/ṭ, ṭ', ḍ; tṣ, tṣ', dẓ, ṣ, ẓ/ = retroflexes (supradentals)
Aspiration is marked by ['']; and all digraphs (ts, dz...) represent
unitary symbols. The starred forms represent Middle Chinese (here-
after MC) reconstructions.

2. Internal reconstruction à la generative grammar

Let us begin with Wen-zhou, a Wú dialect spoken in Zhé-jiang (an
eastern coastal province of China). Consider the following corres-
pondences:

(2)   MC   Wen-zhou   Gloss
        *tsi   tsï̈   'to nourish'
        *ṣi   sï̈   'teacher'
        *tśi   tsï̈   'branch'
        *t̂i   tsï̈   'to know'
        *ki   tsï̈   'self'
        *kiai   tsï̈   'chicken'
        *xi   sï̈   'hope'

Oversimplifying the matter somewhat, one may capture the historical
changes by positing simple rules such as:

(3)   I-UMLAUT: iai > iei > i
        SOFT: t̂, t̂', d̂ > tś, tś'
        PAL: k, k', g > tś, tś' ⎫
                     x, ɣ   > ś   ⎬/ ___ i
        APIC: i > ï / sibilant ___ #   ⎭
        RET: palatals > retroflexes except before i, y
        DENT: retroflexes > dentals

(SOFT = softening; PAL = palatalization; APIC = apicalization; RET =
retroflexion; DENT = dentalization). Both I-UMLAUT and SOFT stand
in a feeding order to APIC by either creating more inputs (i̲'s), or
more suitable environments (sibilants). Thus:

(4)   *tśi   *t̂i   *ki   *kiai   MC
         -       -   -   ki   I-UMLAUT
         -       tśi   -   -   SOFT
         -       -   tśi   tśi   PAL
        tśï̈   tśï̈   tśï̈   tśï̈   APIC
        tṣï̈   tṣï̈   tṣï̈   tṣï̈   RET
        tsï̈   tsï̈   tsï̈   tsï̈   DENT

The ordering relations postulated in a 'standard' account such as
that of (4) suggest that, firstly, apicalization happened only once
and, secondly, at a fairly recent date in Wen-zhou. Both of these
conclusions -- based solely on internal reconstruction à la gene-
rative grammar -- will be shown to be implausible in the light of
other methods of reconstruction.
        One of the notable facts about Wen-zhou is the absence of
the contrast between dental and retroflex sibilants, a shibboleth
of 'correct' speech prevailing in the Northern Mandarin provinces.
This neutralization of the dental/retroflex contrast (of a fairly

recent origin) has obscured an important phase in the development
of Wen-zhou. To illustrate this point, let us look at Lán-zhou, a
NW Mandarin dialect. Lán-zhou has maintained a curious contrast:
whereas the original MC palatal sibilants have become dentalized,
the secondary palatal sibilants derived from MC palatal stops (via
SOFT, see above) remained retroflex. Thus MC *tśi > Lán-zhou /tsí/;
but MC *ťi > /tśí/ > /tṣí/. The Lán-zhou correspondences require
the following derivation:

(5)   'branch'   'to know'   Gloss
          *tśi   *ťi   MC
          tśї   -   APIC-1
          tṣї   -   RET-1
          tsї   -   DENT-1
          -           tśi   SOFT
          -           tśї   APIC-2
          -           tṣї   RET-2
          tsї   tṣї   == Lán-zhou (to which DENT-2
                                      is not applicable)

The only difference between Lán-zhou and Wen-zhou is that the lat-
ter further underwent DENT-2, thereby obliterating the /tṣї/ vs.
/tsї/ contrast still maintained in the former. A full justification
of derivation (5) can be found elsewhere (Chen 1975a,b). The impor-
tant thing to notice is the recurrence of APIC at least at two dif-
ferent points in the history of Lán-zhou.

   But, in the generative tradition, according to which each
language (or dialect) is considered as a self-contained, homoge-
neous system in isolation, the evidence from Lán-zhou is irrelevant
to Wen-zhou. One of the basic assumptions underlying latitudinal
reconstruction, on the other hand, is precisely the concept of 'max-
imal dialect coverage': phonological rules and their ordering pos-
tulated should account for the largest number of related linguistic
systems possible. According to this view, Wen-zhou is but a further
step ahead of Lán-zhou in the relevant aspects.

   Apicalization in Wen-zhou illustrates one crucial problem in
the current practice of equating relative chronology with the order
of application of the rules which successively convert protoforms
into modern reflexes ad instar of synchronic description (cf. Halle
1962). Chafe (1967:129) already anticipated this fundamental defi-
ciency, as he observed: "the synchronic ordering minimizes the de-
grees of depth, maintaining only as much depth as is necessary, while
historically the number of intervening stages was at a maximum."
The internal evidence as provided by Wen-zhou points to one single
instance of APIC occurring at the end of the derivation; cross-
dialectal evidence, on the other hand, suggests a very early ins-
tance of APIC and its recurrence at the end.

3. Latitudinal reconstruction

The validity of latitudinal reconstruction is predicated on the assumption that comparative data are relevant to the reconstruction of the history of one particular dialect. With reservations to be noted below, one can hardly doubt the soundness of this assumption. An areal study of apicalization among the contemporary Chinese dialects offers a striking example of the usefulness and the well-foundedness of this approach.

For the vast majority of cases, the rule of APIC is exactly as formulated in (3): a syllable final /i/ becomes /ɨ/ when preceded by a sibilant. Now, there are three sources of /i/: /I_1/ from MC *-i; /I_2/ from MC *-iai; and /I_3/ from MC *-iəC (where -C stands for a final stop). Likewise, the sibilant (S) has three origins: /S_1/ is the original MC sibilant; /S_2/ comes from MC palatal stops; and /S_3/ is derived from MC velar stops and fricatives via PAL. The scope of APIC varies from dialect to dialect, and can be defined in terms of the historical sources of /i/ (input) and /S/ (environment). Figure 1 is a synoptic view of four chosen dialects.

Figure 1 is interpreted as follows: the most restricted (and therefore, most primitive) form of APIC, confined to syllable types consisting of /S_1+I_1/, is still observable in Huáng-xiàn, a Northern Mandarin dialect spoken in the Shan-dong province. Thus whereas MC *tśi 'branch' > Huáng-xiàn /tśɨ/, both MC *ti 'to know' and *ki 'foundation' retain a palatal vowel, becoming both /tśi/.

Jin-huá, a Wú dialect, also spoken in the Zhé-jiang province, shows a slightly more advanced stage of APIC. Here the scope of APIC may be defined as /$S_{1,2}$+$I_{1,2}$/. Thus not only MC *tśi 'branch' and *ti 'to know' > Jin-huá /tsɨ/; but also *tśiai 'regulation' and *diai 'stoppage' > /tsɨ/.

Peking and Wen-zhou both show pervasive influence of APIC. In Peking, any pre-modern i from any of the three aforementioned historical sources (i.e. /$I_{1,2,3}$/) constitute an appropriate input to APIC; on the other hand, only /$S_{1,2}$/ (but not /S_3/) serve as appropriate environment for the rule. Thus *tśi, *tśiai and *tśiək 'to weave' all became /tśɨ/; but whereas *ti > Peking /tsɨ/, *ki 'foundation' > /tśi/.

The Peking situation is reversed in Wen-zhou: all /$S_{1,2,3}$/ are appropriate environments for APIC, but only /$I_{1,2}$/ are the right input. Thus *tśi, *ti, *ki all became /tsɨ/; but while *ki, *kiai 'chicken' > Wen-zhou /tsɨ/, *kiək 'attack' > /tśiai/.

Figure 1 simply superimposes the varying scopes of APIC operative in these dialects; by projecting the individual frames in succession, one gets a motion picture of the gradual expansions of the domain of APIC from Huáng-xiàn to Jin-huá, then on either in the direction of Peking or of Wen-zhou. It is clear that APIC must have grown by successive stages if only because the other processes fed new inputs into APIC on instalments, so to speak. This dynamic picture obtained from latitudinal reconstruction allows us to recover certain intermediate phases of Wen-zhou not otherwise reconstructible purely from the internal evidence available in this

dialect. A more realistic diachronic picture of APIC in Wen-zhou
can be schematized as follows:

$$(6) \quad *ts\acute{i} \quad *\hat{t}i \quad *ki \quad *kiai \quad MC$$

tś\acute{i}	-	-	-	APIC-1
-	tśi	-	-	SOFT
-	tś\acute{i}	-	-	APIC-2
-	-	-	ki	I-UMLAUT
-	-	tśi	tśi	PAL
-	-	tś\"i	tś\"i	APIC-3
tś\"i	tś\"i	tś\"i	tś\"i	other rules

as in Huáng-xiàn } APIC-1, SOFT
as in Jin-huá } APIC-2, I-UMLAUT
— as in Peking (PAL)
as in Wen-zhou } APIC-3, other rules

Notice that we can infer from the comparative dialectological data
a sequence of events as (6) for the same reason that we can deduce
tree (A) from the comparative evidence given in (1). To make the
rationale more explicit, let us define the three occurrences of
APIC:
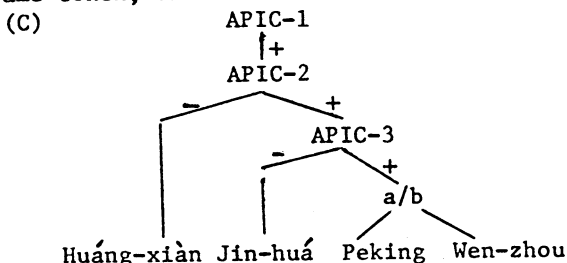
APIC-1 applies to $/S_1+I_1/$
APIC-2 applies to $/S_2+I_2/$
APIC-3 (a) applies to $/S_3+I_{1,2}/$
APIC-3 (b) applies to $/S_{1,2}+I_3/$

Having defined APIC-1,2,3a/b, we can construct a matrix (7) like
(1):

(7) APIC-3b	APIC-3a	APIC-2	APIC-1	
+		+	+	Wen-zhou
	+	+	+	Peking
		+	+	Jin-huá
			+	Huáng-xiàn

By the same token, one can construct tree (C):

(C)

APIC-1
|+
APIC-2
−   +
APIC-3
−   +
a/b

Huáng-xiàn   Jin-huá   Peking   Wen-zhou

According to (C), Wen-zhou and Peking represent more advanced cases
of Jin-Huá, which in turn developed from the Huáng-xiàn prototype.
(C) is the simplest tree, covering the largest number of dialects;
but it is by no means the only possible tree. One could, for ins-
tance, hypothesize that APIC developed independently in Huáng-xiàn,
after this dialect split off from the Wú subgroup (represented here
by Jin-huá and Wen-zhou). This complicates the tree somewhat; but
is a perfectly conceivable turn of events.
        This observation brings out the fundamental weakness of
latitudinal reconstruction: it is based on an exclusively 'tree'
model of linguistic diversification, and ignores other modes of
linguistic evolution, such as areal convergence (owing, e.g. to
continued contact among speech communities after the initial split)

Figure 1

	I_3		I_2	I_1		

Huáng-xiàn S_1

Jin-huá

Peking S_2

Wen-zhou S_3

Figure 2

	I_3		I_2	I_1		

Modern Peking 1962

ZYYY 1324 S_1

Trigault's romanization 1626 S_2

Modern Wen-zhou 1962 S_3

and independent innovations (motivated, e.g., by universal tenden-
cies). The simplicity argument underlying latitudinal reconstruc-
tion is weakened by the possibility not only of 'wave'-like propa-
gation of linguistic changes (areal convergence) but also of the
'mushrooming' effect of similar but independent developments in non-
contiguous speech communities.

4. Philological 'Einfühlung'

Derivation (6) is, then, a plausible schematization of the evolu-
tion of apicalization in Wen-zhou, but not a compelling conclusion
based on comparative evidence alone. Fortunately, philological re-
cords, which abound in a cultural tradition like the Chinese, pro-
vide independent validation of the inference expressed as (6) or,
equivalently, tree (C). The first unambiguous evidence of APIC is
given in Zhong-yuán Yin-yùn (hereafter ZYYY, dated at 1324). This
rime book set up a separate category labeled 'zhi-si' (/-ï/) in
contrast to 'qí-wei' (/-i/). The striking thing is that it classed
/S_1+I_1/ words under /-ï/, but /S_2+I_1/ as well as /S_1+I_2/ words under
/-i/ category. Thus MC *tśi 'branch' > ZYYY /tśï/, but *ťi 'to know'
> ZYYY /tśi/. I_2 (from *iai) and I_3 (from *iəC) were grouped under
/-i/, regardless of the initial ($S_{1,2,3}$). ZYYY, then, represents the
most primitive form of APIC as found in Huang-xian. The stage rea-
ched by ZYYY is as follows:

$$
\begin{array}{ccc|c}
(8) & I_3 & I_2 & I_1 \\
\hline
- & - & \boxed{+} & S_1 \\
- & - & - & S_2 \\
- & - & - & S_3 \\
\end{array}
$$

(where '+' = application of APIC; '-' = non-application)
    The next document giving clues to APIC is the earliest
transcriptions of Chinese by means of a Western alphabet. The first
romanization of Chinese was devised by the late 16th c. Jesuit mis-
sionaries Matteo Ricci (in China from 1583 to 1610) and others, and
improved upon by Nicolas Trigault in Xi-rú Ěr-mù-zi, a systematic
treatise of Chinese phonology published in 1626. In contrast to ZYYY,
both *tśi 'branch' and *ťi 'to know' were now transcribed as chi
/tśï/, and both *tś'i 'owl' and *ť'i 'foolish' were recorded as
'chi /tś'ï/. This means that APIC now extended to both S_1 and S_2
when followed by I_1. Furthermore, APIC affected I_2 as well as I_1.
Thus *źiai 'oath' and *śiai 'earth' were transcribed as xi /śï/.
Trigault employed a special symbol ė for *iəC. The phonetic value
of this symbol is uncertain; at any rate, it had not yet merged with
the apical vowel, written i (or ü after dental sibilants). The situ-
ation as attested by Xi-rú Ěr-mù-zi can be summed up in the follow-
ing chart:

(9)

$$\begin{array}{ccc|c} I_3 & I_2 & I_1 & \\ \hline - & + & + & S_1 \\ - & + & + & S_2 \\ - & - & - & S_3 \end{array}$$

It becomes obvious immediately that Trigault's romanization resembles the Jin-huá situation, and represents an intermediate phase between ZYYY and modern Peking. With regard to apicalization, the modern pronunciation of Peking differs from the 17th c. Northern Mandarin reflected in Trigault's romanization only in one aspect, namely the further expansion of APIC to I_3 preceded by nondental sibilants. If we compare Trigault's transcriptions with Wen-zhou, on the other hand, the difference consists in the extension of APIC not to I_3 but to S_3. Simplifying somewhat the matter (by ignoring the distinction between dental and nondental sibilants -- which behave differently in the matter of apicalization), the diachronic profile of APIC can be constructed by superimposing the three successive 'frames' defining the scope of APIC at three different points in time: 1324 (ZYYY), 1626 (romanization) and the 1962 survey of Peking and Wen-zhou undertaken by the University of Peking. The resulting composite picture is <u>Figure 2</u>.

The point by point match between <u>Figure 1</u> and <u>Figure 2</u> demonstrates in a rather dramatic way the basic well-foundedness of the assumptions underlying latitudinal reconstruction.

However, the method of philological 'Einfühlung' (cf.Malkiel 1968:102) presents certain heuristic problems of its own. The not uncommon uncertainties surrounding the dates, provenience, and the historical background in general of ancient documents are often compounded by the difficulties of interpretation. The process of apicalization itself provides an excellent example in this regard. As I mentioned above, ZYYY offers the first certain proof of APIC-1; we can safely conclude that APIC-1 must have taken place at least before 1324. More specifically, some would venture to place APIC-1 at late 12th or early 13th c., based on the formal rearrangements of the rime dictionary Qiè-yùn Zhǐ-zhǎng-tu (dated at 1176-1023). APIC-2 and APIC-3 came even later, between 1324-1626 and after 1626 respectively. SOFT, on the other hand, apparently had a much earlier beginning. Throughout the Sino-Tibetan transcriptions of the 8-9th centuries, which represent the earliest phonetic records of Chinese in any alphabetic script, both palatal stops /ĉ, ĉ', d̂/ and palatal affricates /tś, tś', dź/ were transcribed without distinction as <u>c</u>, <u>c'</u>, <u>j</u> , interpreted as /tš, tš', dž/. In summary, the existing philological records suggest the following chronology:

(10)　　SOFT: 8-9th c.
　　　　APIC-1: late 12th c. or, conservatively, 14th c.
　　　　APIC-2,3: after 1324

The internal evidence from Lán-zhou, on the other hand, requires that APIC-1 preceded SOFT (see derivation (6)); for if SOFT were applied before APIC-1 (and RET-1 and DENT-1), it would oblite-

rate the contrast between *tśi and *t̂i, and the derivation would result in erroneous output, as illustrated in (11):

(11)   'branch'   'to know'   Gloss
         *tśi   *t̂i   MC
          -          tśi   SOFT
         tś̩i   tś̩i   APIC-1
         tṣ̩i   tṣ̩i   RET-1
         tṣ̩i   tśi*   DENT

/tśi*/ for 'to know' would be indistinguishable from /tśi/ for 'branch', whereas in fact Lán-zhou maintains the retroflex vs. dental contrast: /tśi/ 'branch' vs. /tṣi/ 'to know'.

Faced with the paradox of conflicting chronologies, one established on documentary evidence, the other inferred from internal systematic correspondences, I have attempted to re-interpret the documentary evidence. The Sino-Tibetan transcriptions referred to in the preceding paragraph still consistently represented MC *-i with i. This fact has led linguists to regard the 9th c. as the terminus post quem of APIC-1. I will argue, instead, that this fact need not be construed as an argumentum ex silentio for the absence of an apical vowel. Notice that APIC began as a transparently context-sensitive rule (i.e. with the context that determined the split still observable in the phonetic output -- cf. Kiparsky 1972): MC *-i > ï /sibilant ___ #. The emergence of the apical vowel /ï/ merely created a complementary distribution in the sound pattern of the 8th and 9th c. Chinese, since the new crop of secondary /i/ (= $I_{2,3}$) had not yet evolved from MC *-iVi and *-iəC, but were still symbolized distinctively as -ei and iC respectively. The co-occurrence relations (indicated by '+') during this phase of Late MC may be represented as follows:

(12)
	-ï	-i	-ei	-iC	-V
sibilant	+	-	+	+	+
other init.	-	+	+	+	+

Given this distributional pattern, a new symbol for the apical vowel was not necessary. All that was needed was a simple interpretive rule: syllable-final /i/ = [ï] after sibilants; = [i] elsewhere. The Sino-Tibetan manuscripts merely reflected this (morpho-)phonemic principle of parsimony, according to which new symbols are used only where ambiguity or unpredictability may arise. The absence, therefor, of a specific symbol for the apical vowel in the Sino-Tibetan transcriptions of the 8-9th c. does not necessarily mean the absence of an apical vowel in the phonological system of the time.

This negative argument presented above is strengthened by a positive one. Traditional Chinese pronouncing dictionaries employ a peculiar system of 'spelling' called 'fǎn-qiè'. 'Fǎn-qiè' is an analytic phonetic notation by breaking the syllable into the 'initial' (i.e. the initial consonant) and the 'final' (all the rest); the two components of the syllable are then 'spelled' out separately by two characters, the first alliterating with the initial, the second riming with the final of the lexical item in question. E.g.

/fan/ would be phonetically specified by means of /fu/ + /lan/ or similar characters; that is, /fan/ = /f(-u) + (l-)an/, where the elements that do not enter into the phonetic definition enclosed in parentheses. Suppose we let S stand for sibilants, as before, and K for all other consonant types. According to this formula, a syllable like /Si/ can, in principle, be defined either as (a) /S(-X) + (S-)i/ or (b) /S(-X) + (K-)i/, with either S or K in the second 'spelling' character, since neither S nor K in the second character enters into the definition. Curiously enough, however, /Si/-type syllables were uniformly defined as (a) rather than (b) in Hui-lín's Yí-qiè Jing Yin-yì (810 A.D.), a glossary of Buddhist texts. This self-imposed restriction in the choice of characters serving as phonetic 'spellers' can be explained if we posit two allophones: /i₁/ (= [ɿ]) after sibilants, and /i₂/ (= [i]) else-where (i.e. = APIC-1). Given this contextually determined value of /i₁/ vs. /i₂/, it becomes obvious why (b) is not a viable defi-nition of the intended /Si/-type syllables, since the definiens would be phonetically /Si₂/ (= [Si]), while the intended definitum is /Si₁/ (= [Sɿ]). This fact, first noticed by Chou (1948[1968]:164), lends considerable support to my interpretation of the 'ambi-valent' nature of the symbol i in the Sino-Tibetan manuscripts.

If my interpretation of the relevant philological documents is substantially correct, one must revise the date of APIC-1 up-wards, at least to 810 A.D., probably even earlier. The resultant revised chronology (13) is now compatible with the internally mo-tivated diachronic order of rules reflected in the derivation of (6):

(13) APIC-1: 8-9th c., at least before 810
SOFT: also 8-9th c.
APIC-2,3: after 1324

5. Conclusion

It has become patently clear that none of the three methods examined here is self-sufficient for the purpose of reconstructing relative chronology -- and hence for the purpose of recovering linguistic histories in general. Each has its own inherent inadequacies. This fact calls for a healthy dosage of skepticism regarding the conclu-sions arrived at by any one method. On the other hand, the evidence derived from each procedure can serve as an independent validation (or disconfirmation) of each other. In view of their individual li-mitations and mutual complementarity, historical linguistics can only benefit from a closer interdisciplinary approach than has been cus-tomary, an approach that combines the strengths of the internal re-construction à la generative grammar, philology, and dialectology.

Footnotes

[1] The present article is based on two substantially longer manuscripts (Chen 1975a,b), in which the issues raised here are more fully developed. The gist of this paper was presented at the First Berkeley Linguistic Society on February 15, 1975.
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[2] Stolz 1894, for instance, argued on the basis of such attested Latin forms as <u>ornus</u> < *<u>osinus</u>, that rhotacism must have preceded syncope. The reason is obvious, for if the chronology of events were reversed, *osinus would have become <u>osnus</u> (by syncope), to which rhotacism could no longer apply, as <u>s</u> no longer occurred intervocalically.

[3] For a broader survey of the phenomenon of apicalization, the reader is referred to Baron 1974, where some even more advanced cases of apicalization are discussed.

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