The intellectual work on the *Comparative Siouan Dictionary* is relatively complete, and now we have a picture of Proto-Siouan phonology and grammar. The following is our Proto-Siouan phoneme inventory with a number of explanatory comments:

<table>
<thead>
<tr>
<th>labial</th>
<th>dental</th>
<th>palatal</th>
<th>velar</th>
<th>glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOPS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preaspirates:</td>
<td>hp</td>
<td>ht</td>
<td>hk</td>
<td></td>
</tr>
<tr>
<td>Postaspirates:</td>
<td>ph</td>
<td>th</td>
<td>kh</td>
<td></td>
</tr>
<tr>
<td>Glottals:</td>
<td>p?</td>
<td>t?</td>
<td>k?</td>
<td>?</td>
</tr>
<tr>
<td>Plain:</td>
<td>p</td>
<td>t</td>
<td>k</td>
<td></td>
</tr>
</tbody>
</table>

| FRICATIVES |        |        |        |        |
|voiceless: | s | ʃ | x | h |
|glottal: | s? | ʃ? | x? |

| RESONANTS |        |        |        |
|sonorant: | w | r | y |
|obstruent: | W | R | |

| VOWELS |        |        |        |        |
|oral vowels: | i | u | e | o |
| nasal vowels: | ɨ | Ɂ |

| ACCENT: | /'\ (high vs, non-high) & (possibly /"\ falling) |
| VOWEL LENGTH: | /\ (±long) |

**Preaspirated Voiceless Stops.** We treat these as units because they incorporate a laryngeal feature that has attached itself to the stop, and because speakers today treat the reflexes of the series as single units for purposes of syllabification and segmentability. However, in pre-Proto-Siouan it is possible that there was no preaspirated series. The preaspirates pretty clearly arose as regular allophonic variants of plain voiceless stops preceding an accented vowel. This was pointed out by Dick Carter for OfO in 1984. Even so, we have a number of lexical sets where it appears to be necessary to reconstruct plain voiceless stops in this environment also. Therefore, by the Proto-Siouan period the distinction between plain and preaspirated stops had apparently been phonemicized as shown by the following cognate sets:
The reflexes of the preaspirates are post-aspirated [ph, th, kh] today in Ofo, Chiwere, Winnebago and Dakotan but preaspirated or secondarily geminated in Dhegiha. Ofo and Tutelo (and probably Biloxi) on the one hand, and Chiwere, Winnebago and Dakotan on the other however have independently motivated rules that move the aspiration from the left to the right of a stop.

**POSTASPIRATED STOPS:** It may not be necessary to reconstruct postaspirated stops for PSi., at least not for native morphemes. There are a number of lexical sets in which they are found, and their reflexes unquestionably contrast in some subgroups with the preaspirates (thus the necessity for reconstructing both series). But the postaspirates generally originate from two distinct sources. (1) they arise morphophonemically when prefixes that have undergone vowel syncope are placed before roots that begin with /h/. So *w+h > ph; *r+h > th; *k+h > kh. The verb 'say' is a good example, with the *w+h > ph still productive in the first person singular:

<table>
<thead>
<tr>
<th>PSi</th>
<th>MA</th>
<th>DA</th>
<th>PN</th>
<th>KS</th>
<th>QU</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>e- _he.</em></td>
<td>é- _he(-re)</td>
<td>é- _yá</td>
<td>e</td>
<td>e</td>
<td>(i ye)</td>
</tr>
<tr>
<td>e w hé.*</td>
<td>e p éš</td>
<td>e p há</td>
<td>e p he</td>
<td>e p hé</td>
<td>i p hé</td>
</tr>
</tbody>
</table>

The postaspirates also occur underlingly in a small set of words that often also show abnormal accentuation patterns or other strange features strongly reminiscent of what one would expect from borrowings. Their status as borrowings is hard to prove however, since the loanwords would be perhaps 3000 years old and sources for them cannot be located, at least not yet. In any event there are not very many postaspirated sets, but we have included them in our inventory anyway. They are discussed in some detail in Rankin (1994:208). A few examples:
GLOTTALIZED STOPS. We presently reconstruct glottalized stops and fricatives as distinct series, but we have some qualms. Historically, glottalized consonants can only occur in accented syllables. Their reflexes are phonetically ejectives in the Mississippi Valley Siouan languages: Dakotan, Chiwere, Winnebago and Dhegiha. In the North however they have interestingly different reflexes. In Mandan and Hidatsa the sequences that in Mississippi Valley are C?V, are instead CV?.

This means that in one or the other of these groups the glottal portion, [?], of the consonants has shifted. There is evidence that Crow had glottalization corresponding with that found in Hidatsa at an earlier time but lost it. The southeastern group of Siouan languages (Ohio Valley Siouan) was transcribed for the most part by amateur linguists who did not usually write glottal stops, so they do not contribute much to this issue. In addition, the glottalized fricatives do not seem to exist independently outside of Mississippi Valley Siouan.

Rankin (1987) shows that in several Siouan languages (primarily Dhegiha) long vowels typically have falling pitch. And this falling pitch automatically but variably generates a syllable-final glottal stop. If PSI had had phonemically independent falling pitch accent in addition to the high pitch that we now reconstruct, the glottalized stops and fricatives could have arisen as an allophonic feature of falling pitch. If this is true, then the modern Hidatsa and Mandan pattern with the glottal stop appearing as a syllable coda would be the older pattern, and the migration of the glottal from the coda and its attachment to the stop or fricative onset, as in Mississippi Valley Siouan, would be innovative. Crow vocalizes the glottal stop as vowel length.

To illustrate, consider the verb 'give':
stage I  
stage II ku?  Hidatsa/Mandan/pre-Crow
stage III kú· k?u  *?ku
  Mod. Missp. Ohio
  Crow Valley Valley
In stage I the vowel of *give* has phonemic falling pitch. In stage II that falling pitch generates a syllable-final glottal stop via well-understood phonetic processes. In stage III Crow vocalizes the glottal stop as vowel length, while Mississippi Valley Siouan shifts the glottal, attaching it following the syllable onset. Ohio Valley Siouan seems to attach it preceding the syllable onset, as the glottal stop apparently surfaces as a vocoid before the syllable onset in two of those languages. This results in the following cognate set (the reflex of the glottal element is highlighted in each language):

<table>
<thead>
<tr>
<th>CV?</th>
<th>C?V</th>
<th>?CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR ku*</td>
<td>LA k?u</td>
<td>BI k u</td>
</tr>
<tr>
<td>HI ku?</td>
<td>CH k?u</td>
<td>OF akhu</td>
</tr>
<tr>
<td></td>
<td>WI k?u</td>
<td></td>
</tr>
<tr>
<td>MA ku?</td>
<td>OP ?i</td>
<td></td>
</tr>
<tr>
<td></td>
<td>KS k?u</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OS k?u</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QU k?i</td>
<td></td>
</tr>
</tbody>
</table>

Obviously at the moment reconstructing /falling pitch/ would only be a notational variant on writing glottalization. So we have stuck with what is really there and continue to reconstruct glottalization as a distinctive feature for Proto-Siouan syllables.

But typology and areal linguistics may ultimately support the falling pitch argument. Languages with pitch accent systems tend to have a phonemic falling pitch in addition to simple high pitch. Yet we reconstruct PSI with only high pitch at the moment (with the proviso that sequences of two vowels can have dynamic pitch in Hidatsa, Crow and probably Mandan). Aareally, in North America east of the Rockies it is especially true that systems with high pitch also have falling pitch. This includes the Iroquoian, Muskogean and Tanoan families just off the top of my head. Reconstructing both high pitch and falling pitch (the latter to account for glottalization) would bring Proto-Siouan into line with many other language families typologically and areally, and would also bring it more into line with its sister language, Catawba, which lacks any trace of glottalized consonants.

**Fricatives:** In Crow fricatives tend strongly to have voiced allophones intervocalically. In the Mississippi Valley subgroup this distribution has been complicated, and we are faced with the clear necessity of having voiced fricative phonemes ź ź γ. The steps by which voiced and voiceless fricatives came to contrast have been obscured by analogical change, dialect borrowing and the like. PSI clearly had voiceless fricatives but probably not voiced ones.³ (The glottalized fricatives are only found in Mississippi Valley Siouan and are covered above under the discussion of glottalization.)
**RESONANTS:** *W* and *R* in the phoneme inventory are not symbols for voiceless resonants. They instead represent sound correspondence sets in which several languages have obstruentized, as opposed to the expected resonant, reflexes. So while *w* usually has the reflex [w] or [m] in most of the daughter languages and *r* usually surfaces as [r, l, n, ñ, y] etc., *W* has reflexes like [w, b, mb, p] in some languages while *R* has reflexes like [r, l, d, nd, t].

There is compelling evidence that *W* usually represents a secondary development from geminated *w+w* (across a morpheme boundary) or, in a few instances, a laryngeal plus *w*. Most examples come from roots with initial *w* that had a collapsed animate or inanimate prefix, *wi- or wa-.*

The source(s) of *R* is/are not so clear, although it is probably secondary and probably represents an old cluster too—perhaps of *r* with a laryngeal. There are a number of instances in the comparative database in which *r* has reflexes like *R* when it enters into a consonant cluster such as *wr, sr, ñr* and a few instances of *R* show an adjacent glottal stop in Mandan.

**NASALS:** Note that no nasal consonants are listed. It is clearly necessary to reconstruct nasal vowels in PSi, but it appears all nasal consonants can be derived from sequences of an oral resonant followed by a nasal vowel. So most frequently *wY > my* and *rY > ny.* Nasal resonants have been phonologized in several languages through loss of vowel nasality and through introduction of new *w’s* and *r’s* preceding nasal vowels via prefixation processes. We have had some qualms about this analysis, but the distribution of oral/nasal resonants vis-a-vis nasal vowels is still preserved today in languages like Mandan, and full complementarity is still present in Crow and Hidatsa also. This leaves Proto-Siouan typologically strange, but universals were made to be broken.

**VOWELS:** Most Siouan languages have both long and short vowels, although most field workers steadfastly ignored length for over a century. It seems probable that, like preaspiration, vowel length and accent were semi predictable in PSi. It appears that the second syllable vowel received the accent. Note that there now seem to be a number of Proto-Siouan suprasegmental and laryngeal features associated with accent.

a. The second syllable was accented.

b. The accented vowel was generally lengthened. There are very few confirmed second-syllable short vowels in the database.

c. The syllable-initial stop received preaspiration, i.e., Carter's Law.

d. If we are right, an accented syllable with falling
pitch got glottalization (losing falling pitch in the process).

None of these is 100% predictable, i.e., we have some exceptions in our reconstructed database to all of these rules. But, they are very strong and clear tendencies that suggest that, at one time, all these laryngeal features were related via accent.

If we remove the features of PSi phonology that now appear to have been conditioned, we arrive at an altogether different phonological inventory for pre-proto-Siouan. Let us finish here by suggesting that this possible pre-proto-Siouan inventory may have been considerably simpler. Perhaps it was something like:

Stops: p t k ?
Fricatives: s š x h
Resonants: w r y
Same 5 vowels: i, e, a, o, u (plus/minus length).
Same 3 nasal vowels: ñ, ñ, ñ (maybe long or short).

Probably pitch accent (N.B. Catawba accent doesn’t seem to be the same general iambic sort as Siouan).

This is essentially the PSi inventory minus (a) the secondary or rule-generated formations like pre-aspiration, glottalization (?), obstruentized resonants and (b) the probable loanwords which can have initial syllable long vowels and accent and postaspirated stops. This inventory turns out to be quite close to that of the distantly related Catawba.

Turning briefly to typology, grammar and syntax, Proto-Siouan was a mildly agglutinating language of moderate complexity showing minor kinds of incorporation that usually amount to little more than compounding. It was also active/stative in alignment, head-marking and syntactically SOV. Verbs were the primary inflected category and they were marked for person, number, aspect, mode, instrument and certain other categories. Many of the modern languages have evidentials, quotatives and numerous gender-sensitive particles, but many of these are not cognate from subgroup to subgroup and their status in PSi is uncertain.

The rather long and involved verb prefix template that can be constructed synchronically for most Siouan languages disintegrates diachronically (Rankin, to appear). The Dakotan prefix order is rather typical of what is found in the rest of Siouan and is in some respects actually more elaborate. It is used here only slightly simplified for illustrative purposes. There is not space to discuss every aspect of it, especially an extensive inventory of enclitics that appear following the verb root. These signal the tense, aspect and modal categories. The template:
Let us examine several of these categories in more detail and from a diachronic perspective.

The third plural animate patient prefix, wichá-, is innovated in Dakotan alone from wicháša or wichášta 'man' and was not Proto-Siouan (Rankin 1996). This eliminates one prefix position.

The dual inclusive agent/patient prefix, yk-, (in some languages *wąk-) represents a late grammaticalization or reanalysis in two Siouan subgroups of *wą·ke (possibly earlier *wa·ʔąke) the Proto-Siouan noun meaning 'man, person' (Rankin 1996). If yk- is a true innovation and not a reanalysis of some earlier pronominal, this would eliminate a second prefix position.

There is fairly good evidence that the three so-called locative prefixes, a- 'on, at', o- 'in', i- 'toward', as well as the prefix of instrument, i-, were in fact accented long vowels in Proto-Siouan or pre-Proto-Siouan and so probably distinct roots or proclitics, not prefixes, but there is little else that can be said about them at the moment.

The first and second person agent and patient prefixes have their own internal ordering conventions (as is often the case with pronominals), but in the proto-language the 1st and 2nd person patient markers preceded agent marking, were syntactically distinct, and probably proclitics, as they did not participate in contemporary accentual phenomena, including concomitant vowel lengthening (when accented). Nor did these patient markers ever undergo the initial syllable vowel syncope when not accented that affected real Proto-Siouan prefixes. The agent prefixes did undergo vowel syncope. This appears to eliminate the patient prefix position in the Proto-Siouan or pre-Proto-Siouan verb complex.

Also proclitics or, more likely, distinct verbs in Proto-Siouan were the well known instrumental prefixes (by pulling, by pushing, by foot, by striking, etc.), that seem virtually to characterize the Siouan verb.

Like the patient person markers, the instrumentals also fail to undergo the expected phonological processes associated with prefixes (including contextual aspiration, syncope or lengthening). In fact, the instrumentals behave as if they were distinct verb roots. And this analysis of the instrumental prefixes as verbs in serial construction is historically confirmed in Catawban, where the Siouan instrumental prefixes are found as distinct, conjugated verb roots, only sometimes used instrumentally (Siebert 1945; v. also Shea 1984 and Voorhis 1984, 1992).
Even in present-day Siouan these instrumentals, when they are present, remain the conjugated elements: the agent prefixes precede and fuse with the instrumental rather than the verb root in these cases. So we must eliminate yet another prefix position, that of the instrumentals.

Lastly, Koontz (1996) suggests that even the reflexive and reciprocal prefixal morphology of most Siouan languages was deverbal (from a comitative verb 'to be with'). If this is confirmed we must eliminate one last prefix position.

Tense, aspect and mode enclitics generally are not cognate across Siouan and much innovation has occurred in these categories. There is not space to deal with them here.

As we see, moving backward in time, the Proto-Siouan verb morphology template has so shrunk that apparently the only set of present day verb prefixes that is reconstructible as such (i.e., as real prefixes) is the pronominal set: first and second person agent and dative-possessive. So while the reconstruction of Proto-Siouan has strengthened the already demonstrated relationship of Siouan with Catawban (probably at a time depth of 4000+ yrs. B.P.), it has also revealed an actually decreased lexical cohesion in verbs.

PSi nouns were inflected primarily for possession. There are first, second and third person prefixes for inalienably possessed nouns, but not for the dual-inclusive. Alienably possessed nouns attach the possessor prefixes to a special possessive base, *-hta. Kin terms and external body parts were inalienable. Some internal body parts and basically all other nouns were alienables. A single definite article with the shape *kj may be reconstructible. Number was unmarked on nouns and ambiguously marked on verbs, where it could pluralize any or all of the nominal arguments or the action or intensity of the verb itself.

The set of positional verbs, rā·k- 'sit', hā·k- 'stand' and wū·k- 'lie', served to classify nouns by shape/position (Rankin 1977), while older prefixes (shared with Catawba and possibly Yuchi) classified nouns as human, animate or inanimate (Rankin forthcoming). The prefix *ko- marked humans (including indefinitely possessed kinterms), wi- marked the class of animals, some foodstuffs and weather-related phenomena, while wa- seems to have marked all other categories.
Virtually all of the Siouan languages have basically OV syntax. With this comes the expected dependent/head pairings of constituents lower than sentence level that typologists expect: subordinate clause/main clause, adverb/verb, verb/auxiliary, postpositions, etc. Adjectives follow their head noun. Since these patterns are so general in Siouan it would be very hard to imagine that PSi was not also consistently SOV.

NOTES

(1) This highly condensed presentation of Proto-Siouan phonology and grammar is a product of the decade or more of intensive research that underlies the forthcoming Comparative Siouan Dictionary of which the authors are senior editors. The dictionary project was sponsored by NEH (RT-21062-89; RT-21238-91) and the University of Colorado's Center for the Study of the Native Languages of the Plains and Southwest. David S. Rood was the principal investigator.

The authors also owe a great deal to numerous discussions held with John E. Koontz, David S. Rood and other participants in the 1984 Comparative Siouan Workshop held at the University of Colorado under sponsorship of NSF (BNS 8406236) and NEH (RD 20477-84). These included prominently Fr. Randolph Graczyk, Willem de Reuse, Pat Shaw and Paul Voorhis.

(2) Standard abbreviations for the Siouan languages are: PSi Proto-Siouan, CR Crow, HI Bidatsa, MA Mandan, DA Dakotan, CH Chiywere, WI Winnebago, OP Omaha-Ponca, OM Omaha, PN Ponca, KS Kansa, OS Osage, QU Quapaw, BI Biloxi, OF Ofo, TU Tutelo, CA Catawba.

(3) In Mandan the reflexes of *s and *š have become exactly reversed, a sound change that is basically impossible without an intermediate step of some kind. It is possible that *s > c (= [ts], as in Hidatsa) and that then *š > s and then *c > š.

(4) The chief exception is sequences of Proto-Siouan /*wYh-*/ which occurs in a few roots, notably 'flint, chert' and 'woman, female'. Here the oral resonant is preserved, e.g., in Dakota. H may be a conditioning factor; there is at least a correlation.

(5) In addition to the nominal prefixes, wa- and wi- described above, the agent prefixes *wa- '1st person' and *ya- '2nd person' also underwent systematic truncation in most if not all of Siouan. The same is true of *ki- 'dative/possessive'. The resultant consonantal allomorphs of the pronominal prefixes include 1st sg. b-, m-, p- and 2nd sg. ŕ-, ř- and are described in Rankin 1988. Siouanists still have much work to do if we are to understand all of the effects of initial syllable syncope and subsequent analogical restoration of "regular" pronominal allomorphs (the latter especially in Dakotan).

(6) The first four sets were noted by Siebert (1945); the last two are possible additions based on two recent essays into Catawba lexicography: Shea (1984) and Voorhis (1992).
(7) The phonological fusion of the pronominals with the instrumentals is important here, as it shows that the relationship of the two elements is old. I have ignored for the purposes of this paper the innovated set of so-called outer instrumentals. These are most often ordered just before the dual inclusive marker in the template.
REFERENCES


