THE MORPHOLOGIZATION OF ALGONQUIAN CONSONANT MUTATION

Ives Goddard, Smithsonian Institution

It is becoming evident to an increasing number of linguists that attempts to generalize about the nature of synchronic phonological rule systems or to typologize patterns of diachronic phonological change face a fundamental difficulty: it is not clear how precisely a principled distinction is to be made between rules which are general enough to be taken as phonological rules and rules of segment alternation that are so restricted in scope as to be better considered morphological processes. The Algonquian mutation rule is of interest in this connection because although it begins in the protolanguage (PA) as a transparent phonological rule, its history in the respective descendant languages shows a recurring pattern--with differing details--of confinement to certain grammatical categories or morphological environments. The patterns of morphologically influenced change that can be observed provide important evidence for the demarcation between the phonological rules and the morphological rules in each successive synchronic system. For example, if it is assumed that rules whose effects are disturbed by analogical change are not being treated as purely phonological rules by the analogizing speakers, then the Algonquian mutation rule, which has generally been treated as a phonological rule in the respective languages (Bloomfield 1962:81; Kaye 1974), can be shown not to be a phonological rule in any of them.

1. The PA mutation rule replaced *t by *č and *θ by *š before any *i(·) or *y; otherwise all *Cy and *Cw sequences occurred except **čw and **hy. *š occurred freely, *č unexplainable by mutation only in the clusters *čk and *čp (> Menomini ck, cp), in *čap(o·nk)- 'splash', and perhaps as replacement of *t in diminutive consonant symbolism. The categories affected by mutation were: (a) transitive animate (TA) verbs in *θ before *i: *na·θ- 'go to get', *na·ši 'fetch him'; cf. *mi·li 'give to him', *po·ni 'put him down' (only the TA paradigms included endings that constituted an environment for the rule; no TA stems ended in *t). (b) Inanimate nouns (in *t and *θ) before *-i 'inanimate singular', perhaps *-iliw 'obviative possessor', and derivational suffixes: *-xka·t 'leg' in *nexka·či 'my leg', *nexka·tali (pl.)(also *ni·piči 'my tooth', *nesiči 'my foot'; others in *t?); *-i·waθ 'pack' in *ni·waši 'my pack', *ni·waθali 'my packs'(and derivatives; also *ni·ši 'my head', *o·ši 'canoe'[and derivs.],*nečya·ši 'my nose (of animal?)', *wa·ši 'hole, burrow', *wi·ʔši 'lodge (e.g. of beaver)', *ni·θeʔši 'my (single) hair', *wexkoši 'its nose, beak (certain animals?)', *neXkenši 'my forehead', *mehši 'piece of (fire)wood'; others in *θ?). Animate nouns would have taken the same obviative possessor and derivational suffixes but had no mutation in inflection; no noun stems ended in *š. (c) Conjunct order endings in *t before mode signs *-i 'aorist', *-ye 'injunctive', *-ili 'iterative'(and participial endings *-i, *-ili, *-iki, *-ihi): *pya·te 'if (*-e) he (*-t) comes', *pya·či 'that he

comes', *pya·čye 'let him come'. (d) In derivation before connective *-i- (*taθ- 'there' in *tašim- 'speak to (him) there'), particle final *-i (*eθ- 'thus' in *eši 'thus (preverbal particle)'), and a few other morphemes (*me?θ- 'big' in *me?θekiθ- 'be big (anim.)', *me?šya·- 'be big (inan.)').

2. The history of the mutation rule in the descendant Algonquian languages involves restriction or extension of the alternations exemplified in (1), but if any language still has the rule as a synchronic phonological rule it should be phonologically conservative Fox. Indeed, Kaye (1974:143) has claimed that this is the case and that [č] is not a phoneme in Fox but is everywhere a product of the mutation rule. The relevant historical changes in Fox are as follows: (1) *θ and *l fall together to what may be written *L, and mutation to *š is extended to old *l; then *L > n, *?L and *hL > s, and *nL > t. (2) *y drops after č or š and between consonant and i(·). (3) *w drops between *t and *i(·), resulting in ti(·) sequences. (4) *iyi contracts to -i (and -i·-?), and stems in *-Ciy are reshaped to -Cy (subject to 2.2). The resulting alternations are as follows (cf. 1.a-d): (a) TA verb stems in -n, -s, and -t mutate these to -š before i, except stems in -(e)n 'by hand, grasp': na·ši 'fetch him' (old *θ), mi·ši 'give to him' (old *l), neši 'kill him' (old *?l), but po·hkoni 'break him' (old *n); for stems in intermediate *nL, see Goddard 1973. (The failure of the mutation to be extended to stems with the final -(e)n, in Fox and in several other languages, may be understood as a function of the saliency of this morpheme, both semantically--its concrete meaning contrasts with the more abstract function of many of the finals with mutating n--and morphologically--it is the only TA final with a homophonous TI partner, used with inanimate objects.) (b) Two inanimate nouns show t replaced by č before -i: nehka·či 'my foot', ni·piči 'my tooth'.(Fox **nesiči 'my foot' is a conjecture of Bloomfield's that does not, in fact, exist; Goddard 1973a:741.) Other nouns show retained -ti; these are either stems in -ty (from *-twiy by 2.3 and 2.4) or assimilated loans in -t: očiti 'pope's nose'(pl. očitye·ni [Bur. Am. Ethn., Ann. Rep. 40:210, l. 42]), še·ti 'shirt' (pl. še·tani [Voorhis 1971:65 and personal communication]). Old stems in *θ are restructured to š (owi·ši 'head', pl. owi·šani) or šy (ohkeši·ki 'on his forehead', with locative -eki and ye → i·). 1/ (c) The conjunct has, for example, pya·te (subjunctive), pya·či (aorist), pya·če (injunctive) and t → č before the i of the iterative and participial endings. Injunctive -če cannot be derived synchronically from -t-ye, because there is no surface -ye anywhere and because -če is also the ending for inanimate stems (II) and consonant-final AI (animate-subject) stems, which otherwise have -k rather than -t as third-person suffix; this suggests strongly that -če is synchronically a unit portmanteau morpheme. (d) In derivation mutation is in part generalized and in part restricted. It is universal for t (if not from *tw) and n (if from *θ) before particle final -i and connective -i-: kwaya·ši 'already, fixedly' (: kwaya·n- < *kwaya·θ-), kehči 'big' (: keht- < *ke?t-), išihčike·- 'do thus' (: išiht(o·)- 'do (it) thus'); and it seems well preserved for s from *?θ or *hθ: neši 'alone' (: nes-, as in

nesapi- 'sit alone', from *ne?θ-). There may be no definite examples of generalization to old *l (because many common roots show doublets with both *θ and *l), but a case of non-generalization is pi·ni 'clean' (< *pi·l-). Before other elements the patterns are more complex. The s/š alternation is sometimes levelled: o·si- 'have a father', made without mutation from o·sani 'his father' although this is PA*o·hθali; Kickapoo has mesekin- 'be big (anim.)' with s (: Fox š) taken over from mesaa- 'be big (inan.)' (: Fox meša·-), instead of the expected meθ- (: Fox mes-) from PA *me?θ-. Similarly where *w has been lost by 2.3: nekoti 'one' retains unmutated t and extends it to new forms, as in the AI verb nekoti- 'be one (anim.)' (cf. ni·ši- 'be two (anim.)', without -w-, beside ni·šwi 'two'); PA *-wike·- 'dwell, act on dwelling' causes no mutation in frozen forms (pi·tike·- 'enter (in general)' and pi·tike 'inside (in general)', from PA *pi·ntwike·- 'enter a house' and a related particle; kehtika·ni 'field, garden', which no longer has the etymological meaning 'big dwelling') but does mutate in more productive formations (wi·čike·m- 'live with'; ašike·- [Kickapoo osikee-] 'build a house', with root an- [K. on-] from PA *wel- or *weθ-). That the sequence ti cannot be taken as synchronically underlying twi without invoking a rule of morphologically restricted application is shown by the occurrence of restored or retained twi in surface sequences where -w- is the third-person independent-order suffix (we·wenetwi 'it is good') and some other cases of (unexplained) retained twi (mi·twiya 'poplar, cottonwood', nemi·twi·wi 'I am a cottonwood' [Siebert 1967:31; Jones 1907:128.6]; cf. Kickapoo miitwia). Before -ya·-, an II verb final, mutation of t to č (and dropping of y by 2.2) persists: me·meta·ča·hiwi 'it is rather enjoyable' (with reduplication and diminutive -hi; cf. meta·t- in meta·tehtaw- 'hear (him) with pleasure'. But other forms show uncertainty in recovering morpheme-initial y synchronically: -ye·wi·- 'make plans' appears in we·pye·wi·- 'begin plans' and in mya·še·wi·- 'err' (since this has mya·n- 'poorly', from PA *mya·θ-), but the y is not recoverable in ki·še·wi·- 'finish plans' (ki·š- 'finish'; 2.2) and is absent in ki·ši-ča·ke·wi·- 'finish one's preparations' (ča·k- 'all'; kye· is an occurring sequence).

There are also types of mutation before vowels other than i(·). One set of forms of this type arose historically from the loss of the particle final -i of preverbs before stem-initial vowels in certain combinations (cf. Bloomfield in IJAL 3:231-2): išawi- 'behave so, fare so' (presumably from *iši-awi-, with root in- from PA *eθ- 'thus, so'); wi·čawiw- 'be married to' (presumably from *wi·či-awiw-). This treatment contrasts with the usual one, by which the final vowels of phonological words (including preverbs) may optionally be elided but are present in deliberate speech and are written in native syllabic texts (Bloomfield 1925:220; Voorhis 1971:63-64). A second type of mutation involves replacement of t by s before certain elements beginning with a· or e (Bloomfield 1925:225); this is historically unconnected with the mutation of *t and *θ before *i(·) and *y and has not been a phonologically transparent rule within the reconstructible history of Algonquian. Examples are osa·pam- 'see (him) from (there)' (ot- 'from (there)'

plus -a·pam- 'see (him)' (contrast ota·pan- 'be dawn from (there)', with -a·pan- 'be dawn', in the changed-conjunct form we·ta·paki 'where the dawn is from, east') and pi·sehk- 'put (it) on' (pi·t- 'into' plus -ehk- 'act on by general body motion'). Similar to this is the replacement of TA stem-final n (from *θ) by s before the middle reflexive -o (the only suffix beginning with o that follows these stems): a·kwaso- 'be piled up', beside a·kwan- 'pile (it, anim.) up' (cf. a·čimo- 'tell a story', beside a·čim- 'tell about (him)'). (These replacements of *θ and *t by *s are also reflected in the other languages, a fact which should be borne in mind below in judging the opacity of their mutation rules.)

Finally, it must be understood in considering Fox mutation that even if some occurrences of č were accounted for by phonological rule, there are others which cannot be without violating otherwise exceptionless sequence-constraint rules. For example, the roots čak- 'small' and čahkw- 'short' and the particles čačatapi 'in regular succession' and čačawi·hi 'sometimes(...sometimes...)' cannot be set up as having underlying (or phonemic) tya, because Cya- is an impossible sequence in Fox. The semantics of these forms and the existence of mečemo·ka beside metemo·ha, both meaning 'old woman'(NB: Cye- is also impossible in Fox), might suggest that a rule of diminutive consonant symbolism was once at work here, replacing t by č, but no such rule is productive in Fox.

It is seen, then, that mutation is far from being a transparent phonological rule in Fox. Although ni, si, ti, ny, and ty are all occurring sequences, certain cases of n and s and certain cases of t are replaced by š and č,respectively, before certain morphemes, most of which begin with i(·) and some of which begin with y in other combinations; the same replacement occurs before certain other morphemes that begin with neither i(·) nor y. Most of the evidence for the alternations is found in the derivation of stems, some is found within ending complexes, but there is a minimal amount in the variation of stems before inflectional endings, across what is presumably the most active and transparent boundary in the language. Furthermore, in noun inflection t alternates with č in only two nouns (beside a larger number which do not show mutation) and in verb inflection the mutation of t is š in both stems that have -t. And in stem derivation the alternations associated with mutation must be considered part of a set of alternations, including t and n to s in certain combinations, which cannot in any non-arbitrary way be sorted out into automatic phonological rules. The Fox mutation rule (or rules), then, is associated with certain classes of morphemes, certain specific morphemes, and the marking of certain grammatical categories. It has become morphologized and can in no obvious sense be considered a phonological rule of the type exemplified by the mutation rule of Proto-Algonquian.

3. In Plains Cree the PA mutation rule has become even less transparent than in Fox. The relevant historical changes are as follows: (1) *θ and *t fall together to t. (2) *e and *i fall together to i. (3) *y drops after all consonants. (4) Final vowels are lost, except in disyllabic words. (5) *š and *s fall together

to s. The resulting alternations are: (a) TA verbs in -t mutate the -t to -s before two morphemes beginning with i (-i 'imperative singular on third person', usually Ø by 3.4; -i 'first-person object'), but not before others beginning with i (-it(i) 'second-person object', -ikw [and variants] 'inverse object', -im 'obviative object', -iht 'third-person passive'). (b) Inanimate nouns generalize stem-final t (from *t and *θ), even when the singular ending -i is retained after monosyllabic roots (3.4), with one or two exceptions in some dialects. Lacombe (1874) shows niska·t 'my leg', mi·wat 'pack', wa·ti 'hole in the ground, den', wi·sti 'beaver or muskrat lodge', mihti 'piece of firewood', all with generalized t, and o·si 'canoe' (pl. o·sa) with generalized s. Wolfart (1973:29-30) has the same forms except that the alternation is still found in the one word ni·was 'my sacred pack' (pl. ni·wata). Forms in Faries (1938:397) suggest that some dialects, as in Montagnais, retain the alternation in 'canoe' as well: o·tihk 'in the canoe'. (c) In verbal ending complexes the mutation of t to č (here written c) is found in conjunct pronominal endings before the mode sign -ih of the subjunctive and iterative (< PA *-ili, iterative) and before the animate third-person pluralizer -ik (< PA *-iki, anim. pl. participle). The only other ending occurring in this position is the pluralizer -wa·w, which replaces -ik before -ih. (d) Stem derivation is the only part of the grammar where both types of inherited mutation can occur, and it is significant that here historically incorrect forms have arisen: kwaya·ci 'ready', particle from the root kwaya·t- with c instead of historically expected s (cf. Fox kwaya·ši, 2.d). The old alternations of *θ with *s and *t with *s before certain elements, described above for Fox, are continued as an alternation of t with s. It would seem very difficult to make a case for the mutation rule or any part of it being a phonological rule in Cree.

4. In Ojibwa the phonological changes resemble in part those of Fox and in part those of Cree: (1) *θ and *l are reflected as in Fox, becoming n with generalization of mutation to old *l; however, intermediate-stage *?L and *hL give ss and *nL gives n (*?š and *hš give šš; *nš stays as nš). (2) *e and *i fall together to i. (3) *y drops following a consonant, after an earlier change of postconsonantal *ye· to i· (except after š). (4) Final vowels are lost except in words consisting of two short-vowel syllables. (5) *w drops between *t and *i(·). The resulting alternations are: (a) in TA verb-stems n mutates to š (except in stems with -in 'by hand')and ss mutates to šš: mi·š 'give to him' (mi·n-), nišši 'kill him' (niss-; -i retained by 4.4); stems in *nL show mutation to š rather than to historically expected nš: wi·š (in some dialects reduplicated as wa·wi·š) 'name him' (wi·n- < *wi·nl-). (Baraga [1878:195] has also wa·wi·nši, probably a retention of the expected form with the extension of the suffix -i, which is the regular treatment for TA stems ending in a true consonant cluster; by the same token in his alternant form na·nš the second n must be nonphonemic.) (b) Inanimate nouns generalize stem-final t, in those with *t, but š or šš in those with *θ: nikka·t 'my leg'; ni·waš 'my pack' (pl. adds -an); wi·šš 'beaver or muskrat lodge'

(pl. -an); ninča·š 'my nose' (in some dialects only oča·š 'its (animal's) nose'); wa·š 'cave, burrow' (the last two also have the dialect variants oca·nš and wa·nš, with apparent blending of the two stem variants). Only mišši 'piece of (fire)wood' (pl. missan) retains the alternation. A new formation on wa·š is wa·šikke·- 'make a burrow' (Cuoq 1886:415), beside inherited wa·nikke·- 'dig' (< *wa·θehke·- 'make a hole'). (c) In the conjunct endings 4.4 would have resulted in alternation between -č (from aorist *-či) and -t (from subjunctive *-te and participial *-ta), but this has everywhere been levelled out, in most dialects to -t, in others to -č: ikkitot (Baraga), ikkitoč (Cuoq), 'if he says (so)'. The t to č mutation is retained before the iterative -in and the participial -in, -ik, and (for the dialects that have it) -iʔ; the preterite suffix -ipan does not cause mutation. (d) In stem derivation many traces of mutation are found. To account for why t sometimes mutates to č before i and sometimes does not in Odawa (the Manitoulin Island dialect of Central Ojibwa), Kaye and Piggott (1973) presented an analysis that includes manipulations of rule ordering, such as the treatment of some cases of -i- as inserted by epenthesis after the application of the mutation rule, and the postulation of a phonological cycle; even so they were left with admittedly unexplained exceptions: po·kiti- 'to break wind' beside the applicative po·kičin- 'break wind on'.

5. The phonological changes in Menomini are reminiscent of those of Fox and Ojibwa but involve additional complexities, especially in the vowels: (1) *θ and *l are reflected as in Fox and Ojibwa, becoming n with generalization of mutation to *l; *θ and *l as second members of clusters also become n. (2) *i becomes e. (3) *e gives ɛ or e, depending on complex conditioning rules, and the resulting alternations between ɛ and e have in some cases been leveled to e; in some cases of e from *e the conditioning is not clear. Lengthened *e (produced by a rule that lengthens certain vowels) is regularly ɛ·, but e· appears in some morphemes as a new analogical lengthening of the e-reflex of *e. (4) Final vowels are lost, except in nouns and verb forms of two short-vowel syllables, which added -h: ehkuah 'louse' (< *ehkwa), ekuah 'he (obv.) says so to him' (< *ekwa).Final syllables are lost in short particles, but this is probably a secondary development. (5) Postconsonantal *yi and *wi fall together to i, and postconsonantal *yi·, *ye·, *wi·, and *we· fall together to i·. (6) *š and *s fall together to s. The resulting alternations are: (a) TA stems in -n (except with -ɛn ~ -en 'by hand') show mutation to s before endings with initial e from *i. Endings which do not cause mutation show three or four patterns, reflecting different degrees of analogical leveling: (i) Treated as ɛ and appearing as ɛ when not excluded by rule: na·nɛhkon 'fetch him (pl.)'. (ii) Treated by all rules as ɛ (e.g. non-mutating, lengthening to ɛ·) but appearing as e when unaffected by rule; these Bloomfield writes in their base forms with the special symbol E: -Ek in nɛʔnek 'it kills him', nena·tomekɛ·m 'I am called'. (iii) Treated as ɛ by all rules except lengthening, but lengthening to e·; the one example is written with the special symbol æ: -æh(t) in ene·h 'when he is told so, called so' (con-

trast -et in ese·t 'when he says so to me', with mutation). However, this morpheme also "occasionally" has lengthening to ɛ· (enɛ·h), and in one of the morphemes with E (-En) the lengthened vowel "often appears as e·, especially in the combination Eh-k 'he--thee'": nɛ·tomɛ·hken, nɛ·tome·hken 'whenever he says so to you (sg.)' (Bloomfield 1962:182-4). It is clear, then, that not even setting up two highly artificial additional abstract phonological units is enough to account for the variety of existing patterns by phonological rules alone. (b) Inanimate nouns generalize t (nɛhka·t 'my leg') but keep mutated s in the four surviving *θ-stems that have the relevant forms: we·s 'head', o·s 'canoe' (and derivatives), necias 'my nose', ne·was 'my pack'. However, although the inherited plurals with n are attested for all four stems (we·nan '(animal) heads', o·nan 'canoes', mecianan '(human) noses', ne·wanan 'my packs'), forms with analogical s are also found, and the attested patterns are slightly different for each: we·san 'heads', we·neh and we·seh 'on his head' (locative -Eh), we·nowawan and we·sowawan 'their heads', newe·nem (possessed-theme suffix -ɛm) 'my animal head'; keto·senaw 'our (inc.) canoe', oto·sowaw 'their canoe', nemɛ·hno·sem and nemɛ·hno·nem 'my raft'; ocianowawan 'their noses' (Bloomfield 1962:118, 122, 124; 1975; an apparently regularized presentation is in Bloomfield 1939:108-9). Bloomfield (1962:82) suggested that the unsuffixed singular forms could be described as having "a basic final -e," dropped in word-final position by a later rule, but not only is there no morphological justification for such a segment, its postulation would not account for the attested occurrences of s in these stems. The facts can only be described by listing. (c) In the conjunct endings there is mutation of t to c (<*č) before the iterative suffix -en and as a relic in -a·cen 'he--him/them (obv.)', in which the -en is no longer synchonically analyzable as the participial obviative *-ili. (d) There are many traces of mutation in derivation, but the effects of sound change on the vowels have often left the conditioning unclear and Bloomfield had to set up doublets and special abstract symbols to preserve the automaticity of his phonological rules: pi·tehkama·w 'he comes a-smoking' and wana·cehkama·w 'he is profligate in his smoking' demand finals of the shape -Ehkama· and -hkama· (preceded by connective -e-), respectively. Ad hoc solutions are also required to account for why the noun final -y and the secondary verb finals -e and -e·we do not cause mutation in new formations, while mutation is extended to occur before -wɛ·p- 'throw': wi·kopa·skemotyan 'basswood-bark bags'; owe·matew 'he has a brother' (o(w)-e·mat-e-); owe·ne·wew 'he is headlike, headed' (o(w)-e·n-e·we-, with mutating n); ka·hcwɛ·penɛw 'he flings him with a shove'.

6. In Shawnee (1) *θ falls together with *l to l, but the mutation is not generalized to old PA *l; *ʔl and *ʔθ give ʔθ, also without generalization of the mutation. (2) Some cases of *e become i. Otherwise the phonology is like Fox. (a) Some TA verb stems in l and ʔθ replace these by š and ʔš, respectively, before endings beginning with i: na·ši 'fetch him' (~na·l- <*na·θ-), but

mi·li 'give to him' (< *mi·l-); kwšiwe 'he fears' (~ kwθ- <*kwe?θ-), but nθiwe 'he kills' (< *ne?l-) (first syllables show short vowel dropped before ? and cluster simplification). (b) In noun inflection some alternations remain (wi·ši '(his) head', ni·leki 'on my head'), but others are eliminated by reshaping (wi·šiwali 'heads'). (In Shawnee and in the remaining languages to be discussed mutation in ending complexes and in derivation shows no new or striking patterns and will not be systematically treated.)

7. In Miami-Illinois (1) *θ falls together with *l to l (dialectally r), but the mutation is not generalized to old *l; *?θ and *?l give ss, with mutation to šš partly generalized; *nl and *nθ give nt, with mutation to nš generalized in the attested examples. (2) Some instances of *e are reflected as i in the available (premodern) record. (3) Postconsonantal *ye· gives i·, but *Cya· remains. (a) The different degrees of the extension of mutation to old *l are shown by the following: (Illinois) kimiri 'you (sg.) give to me'; nessi 'kill him' but kinešši 'you (sg.) kill me'; nonši 'nurse him' (~ nont- <*no·nl-). (b) Nouns level out all alternations, mostly to l or t: missoli 'boat', wali 'hole', awipiti 'tooth'; but wiwaši 'saddle' has generalized š. These nouns are Miami; both Illinois and Miami forms are normalized from sources that do not indicate vowel length.

8. In Delaware (1) *θ and *l fall together to l, and it is the non-mutation of old *l that is generalized to stems originally with *θ. (a) As a result there is no mutation in the inflection of verb stems. (b) Nouns have also completely eliminated the original pattern of mutation, restoring t or l in the singular and before derivational suffixes. (c) Mutation before the old participial endings is found, and Munsee now treats a few old participles as nouns: mé·ne·t 'a drunk', pl. mè·né·či·k; but that this mutation is an unproductive fossil is shown by its absence in new derivatives: nə̆mè·né·ti 'I am (a) drunk'. (d) In derivation there is almost complete elimination of š as the mutation of l: lĭ 'thus, there' (root əl- from *eθ-; cf. PA *eši). Mutation of t has spread to (Munsee) pì·nčí·ke·w 'he enters', a concatenation of PA date (see 2 above), but not to xwàtí·ka·n 'Big House (ceremonial structure)', a new formation containing a root for 'big' that is unique to Munsee (xwat-). Only a handful of frozen forms attest to the former existence of *θ-mutation: šĭ́·nsəw 'he is named so' (< PA *ešinsowa, with *eθ- 'thus, so'), è·ntə̆šé·lənk 'where the crowd is' (< *tašye·θ-, with *taθ- 'there'), ma·š 'like' (< *mya·θ-).

9. In Arapaho (1) *θ and *č fall together to θ. (2) *š splits to x and s, depending on the vowel environment. (3) Non-postconsonantal *l, *w, and *y fall together with *n to n. (4) *i and *o fall together to *i, which then splits to i and u; long counterparts do the same. (5) Final vowels drop, even in short-vowel disyllables. (6) Postconsonantal *w and *y fall together to *y, which drops with traces. (For details and examples see Goddard 1974.) (a) TA stems mutate final θ to x ~ s (although θi [from *či] is a common sequence in Arapaho). (b) In nouns the mutation of stem-final θ to x ~ s and t to θ is not only retained in the

inanimates, it is extended to the animates as well, and it occurs in all nouns of the appropriate shape in the singular and before all endings beginning with i (only one of which goes back to a suffix with PA *i): bé?is 'nose', pl. be?íθó (< PA *mexkoši, *mexkoθali, inan.); wó?oθ 'leg', pl. wo?óóto (< PA *mexka·či, *mexka·tali, inan.); čóóx 'Comanche', pl. čóóθo? (< PA *pwa·θa 'enemy', anim.; singular reshaped, pl. with PA *-aki); mutation before suffix: hi?óóθin 'his (obv.) leg' (-in 'obv. possessor' < PA *-iliwi). It seems more reasonable to take the mutation in noun singulars as a morphological process marking that category than as the result of a phonological rule (conditioned by a deleted final -i), since the spread of such a process from the inanimate to the animate is much more likely than the replacement of animate singular -a by inanimate singular -i, which is the unmotivated and unlikely innovation that would have to be assumed if the mutation rule were to be taken as still strictly phonological in Arapaho.

10. This survey should make it clear that the mutation rule of Algonquian, which was an automatic and transparent phonological rule in the protolanguage, has become decidedly less transparent, less automatic, and more restricted in all of the descendant languages. In some cases it can be shown that the rule has taken on specific morphological functions, and in all languages it has become restricted in various ways, certain parts appearing only in certain forms or categories. My own feeling is that it has ceased to be a phonological rule, in any useful sense of the term, in all the languages. In any event I hope to have given a usable survey of the range of data that must be accounted for in any attempt to argue that the mutation rule of the respective languages is more similar to the mutation rule of Proto-Algonquian than it is to the class of rules of morphological process that is coming increasingly to be recognized as a component of language.

NOTES

1/ Closely related Kickapoo has an example of leveling to n (meθooni 'boat') and a single retention of *?θ (> θ) ~ *?š (> s): niinesi, pl. niineθani 'my hair'.

2/ Kickapoo has pyeečapi- 'arrive in a vehicle', with this type of mutation before -api 'sit'; cf. neθapi- 'stay home': F. nesapi-.

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