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THE CONCEPT OF GEOLINGUISTIC CONSERVATISM IN NA-DENE PREHISTORY

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1.0. INTRODUCTION[1]

These papers are the first forum on the implications of the Dene-Yeniseian language stock, and in this article I attempt to engage scholars and intellectuals of varying backgrounds and in several disciplines. I have had the privilege of working with of many of the foremost Alaska Athabascan intellectuals for over 35 years. On many occasions I have heard elders state that Athabascan people have lived in Alaska for more than 10,000 years. Perhaps few of these Athabascan elders would be able to parse the technical articles in this collection, but we are certain that many of their descendents will be among the first readers of these articles. At the February 2008 Dene-Yeniseic Symposium the implications of the geography of the proposed Dene-Yenisiean language stock were one topic of discussion. Johanna Nichols commented that the amount of evidence for Dene-Yeniseian is too large to have the antiquity of more than 10,000 years that is implied for an eastward land-based movement of the Na-Dene branch through Beringia. Nichols added that perhaps unless it can be shown that the Na-Dene and Yeniseian languages have changed at a much slower rate than most languages do.

In this paper I assess the geography, relationships, and estimates of time depth for the tightly-knit Athabascan language family vs. the Eyak and Tlingit branches of Na-Dene. I offer two proposals. I present in section 2 the Athabascan Geolinguistic Conservatism Hypothesis (AGCH) that integrates several concepts in support of the antiquity of common Dene-Yeniseian (at 14,000 years ago or older). I suggest that linguistic closeness within Athabascan languages derives from a combination of typological and morphological properties of the Athabascan verb, as well as a multifaceted Athabascan territorial ethos that is embedded in the core elements of Athabascan geographic naming. Strong congruencies in numerous rare and highly marked Athabascan grammatical traits that are in distant languages of the family certainly demand further attention for their implications for theories of language change. Also interconnected is the Athabascan territorial ethos that has promoted functional travel, networking with other Athabascans, and strategic land use. Thus, I suggest that the Athabascan family is a very interesting example of a cohesive and homogenous language family that tends to resist change. In section 3 I offer a model of eight stages of Na-Dene moves and expansions within North America that span a time frame of 12,000 to 13,000 years. In section 4 I offer a range of support for both proposals from linguistic, archaeological, ethnological, and human biological sources. I am suggesting that the interval for Proto-Na-Dene was fairly short; that Eyak and Tlingit branched from Proto-Athabascan at early dates (prior to 10,000 to 8000 BP); and there has been long-term presence of Athabascan peoples in the Northwest portion of the extended Northern Athabascan language area. The

[1] I would like to thank several persons who have made comments on earlier drafts of this paper: Adeline Kari, Johanna Nichols, Siri Tuttle, Ben Potter, Michael Fortescue, Edward Vajda, William Workman, Sharon Hargus, and Willem de Reuse.

strong signal that is being assembled for an ancient Dene-Yeniseian language stock is due to a combination of reasons: linguistic, environmental, resource procurement, and population movements.

2.0. THE ATHABASCAN GEOLINGUISTIC CONSERVATISM HYPOTHESIS

Refer back to Map D, the reference map for the North American distributions of the Na-Dene languages and the surrounding unrelated languages Haida, Tsimshianic, Eskimo-Aleut, and Algonkian. The Athabascan language family, with an estimated collective territory at the times of early historic contact at over 1,500,000 square miles, is the largest area of occupation for an indigenous language family in North America. Map D lists 53 named Athabascan languages. There were even two incipient Athabascan language groups during the 15th to 18th centuries in the Northern Plains and in Northern Mexico (see footnote 6). Some named groups can be treated as dialects of an adjacent group, especially in Pacific Coast Athabascan. A key question in formulating hypotheses about earlier common Dene-Yeniseian is how the divergent Eyak and Tlingit languages, as binary branches of the Na-Dene language stock, are related to the Athabascan languages, which are closely knit, homogeneous but geographically so very widespread.

Three striking themes about the Na-Dene language stock are: (1) the unique typological profile of the languages, which feature elaborate verb complexes with strings of rigidly ordered prefixes before a verb root that is also followed by a set of suffixes; (2) the sheer size of the Athabascan language area, with most languages having shared boundaries with other members; and (3) the homogeneity within Athabascan. Fortescue (1998:214) generalizes about the large Athabascan family: "It has often been said that Athabaskan languages are exceptionally conservative, spreading their influence wherever they have come in contact with other languages but not being affected much in turn by them (although their speakers have been highly adaptable culturally . . .). The family is certainly highly distinctive and more homogenous than say Salishan." This latter theme—Athabascan linguistic homogeneity and how it can be characterized and evaluated—offers many avenues for future research into the prehistory that is prompted by Dene-Yeniseian. A concept of geolinguistic conservatism (or perhaps geolinguistic endurance) should be part of the discussion on Dene-Yeniseian.[2]

I have researched and assembled place names in 10 of the 11 Alaska Athabascan languages. Since I first documented place names in the early 1970s with Dena'ina speakers Shem Pete and Peter Kalifornsky, I have been making many of the same generalizations about recurrent patterns in Athabascan geographic names. I have noted the patterning of multilingual Athabascan place naming: across language boundaries the same place names are used for mutually known features. Athabascan place names are analyzable and functional and facilitate foot or boat travel. Athabascan speakers use names with considerable care. The place names in the oldest historic sources are usually known by expert speakers. Elaborate riverine directional terms pervade both the naming and the use of the landscape (Kari 1989a, Kari and Fall 2003, Kari 2008, Kari 2010). Among all documented Athabascan languages, the geographic particularism that is reflected in sets of place names is fascinating and obviously has played a central role in how Athabascan came to be the largest Native language family in territory in North America.

In Figure 1 a synopsis of the Athabascan Geolinguistic Conservatism Hypothesis is presented in flowchart format. The AGCH suggests that linguistic closeness within Athabascan languages derives from the rare morphological properties of the Athabascan verb as well as the multifaceted Athabascan territorial ethos that is embedded in the core elements of geographic naming. These geographic elements have promoted

[2] The term *geolinguistic* seems to convey the generalizations I convey with this hypothesis—that both the language structure and a territorial ethos have contributed to the conservatism—the retention of lexemes, grammatical affixes, and highly complex word formation processes. As far as I know, "geolinguistic" has not been employed in historical-comparative linguistic terminology. I use "geolinguistic" in a distinctly different way than the term "geolinguistics" as defined in glossaries of linguistic terms, which appears to be a cover term for various subfields of dialectology. "We call geolinguistics the study of all the variation linked to the social and geographical roots of language users" (Ducrot and Todorov 1979:57).

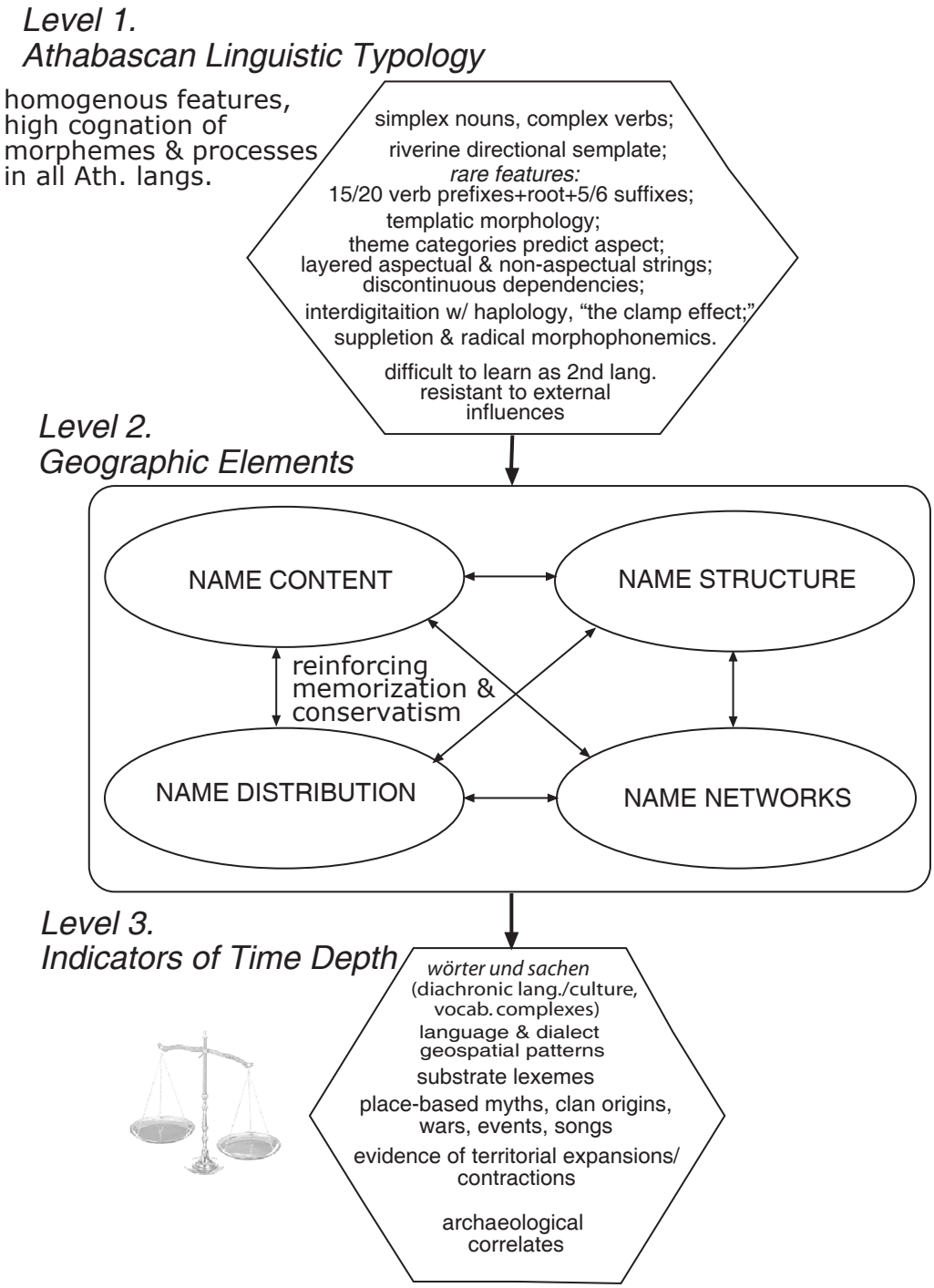

Figure 1. Athabascan geolinguistic conservation hypothesis

functional travel, strategic land use, networking, multilingualism, and high levels of intelligibility with other Athabascans. As was noted by Sapir (1921:209), "The Athabaskan languages of America are spoken by peoples that have astonishingly varied cultural contacts, yet nowhere do we find that an Athabaskan dialect has borrowed at all freely from a neighboring language." No Athabascan language has been impacted by convergence with a neighboring language. It is highly unusual for an Athabascan language to have an inflectable verb that has been borrowed.[3] Many dimensions of Athabascan linguistic homogeneity can be identified, however, most of these features remain unstudied in the comparative Athabascan literature.

As I developed and analyzed several geographic name corpora in several languages: Dena'ina (Kari and Fall 2003), Upper Tanana (Kari 1997) and most extensively Ahtna (Kari 2008, 2010), I noted four conspicuous elements—shown in Level 2 of Figure 1—that can explain a great deal about the structure, the content, the distribution, and the transmission of Ahtna geography. The interconnected arrows indicate that these elements are self-reinforcing: *name content*, *name structure, name distribution,* and *name networks.* These geographic elements promote the strong similarities and the memorization of place names in distant Athabascan languages. *Level 1* represents various unique linguistic features of the typological profile of Athabascan languages that seem to have an overarching contribution to linguistic conservatism within the family. Shown in *Level 3* with a graphic of a scale are what I call *Indicators of Time Depth.*

The AGCH prompts a reevaluation of the positions of Tlingit, Eyak, and Athabascan. An early entry into North America by Na-Dene is quite plausible if not probable (Potter, this volume). The assumption that the Athabascan language family based on linguistic evidence has shallow time depth or is a young family has not been well argued and is fraught with contradictions; see section 4.1. The well-researched sites in the Tanana River Valley are about 13,800 cal BP (section 4.6; Potter, this volume). In a core area of Central Alaska, Athabascan bands have been well established for at least 6000 years and it is possible they were there 11,000 to 14,000 years ago. The earliest Athabascans may not be directly ancestral to speakers of contemporary languages such as Upper Tanana and Gwich'in, but it seems likely that there was an early Athabascan presence in much of Central Alaska.

2.1. Level 1: Athabascan linguistic typology

The Athabascan languages have a grammatical dichotomy between simplex nouns and postpositions and complex verbs. Athabascan geographic names contain a mixture of these elements. There is extensive use of basic nouns and postpositions, many of which are monosyllabic and are not subject to much derivation and modification. In sharp contrast, Athabascan verb structure consists of 15 or more rigidly ordered prefix positions or zones of similar prefixes before a root, followed by sets of suffixes. Athabascan is often cited as being among the most elaborate prefixing languages in the world. Keren Rice's (2000) impressive survey of morpheme order in the Athabascan verb complex is the most complete source on similarities and variations in the verb complexes in various Athabascan languages.

The processes whereby words are formed in Athabascan languages have received some study but the most complete accounts have attracted little discussion. I have outlined a multidimensional stacking templatic model of Athabaskan verb formation (Kari 1989b, 1990:38–59, 1992) that can account for complex layerings of discontinuous dependencies, while recognizing both the well-motivated and arbitrary areas of the linear template of the verb complex. Fortescue (1992) has offered a similar model of word formation in Koyukon from a functional perspective. My most extensive discussions of the Athabascan verb and of word formation have drawn upon Ahtna examples (Kari 1979, 1989b, 1992). Some key concepts are:

(a) The lexicon integrates all roots, all grammatical morphemes, and loan words. Derivational strings are also treated as lexical units.
(b) The verb complex must be fully specified for the affix inventory and prefix and suffix ordering. Affix positions and zones of sub-positions can be specified. Dialects of Athabascan languages can have distinct verb complexes.

[3] A rare exception is Upper Tanana *lisüü* 'money' (from French *l'argent*), becoming a inflectable verb: *hoksüü* 'I am a spendthrift, throwing money around'.

(c) Verb themes and verb theme categories play a key role. Theme categories are diagnostic of the simplest (zero) derivations and the primary aspects. Extended derivation can be partially accounted for by identifying theme formation strings.

Verb themes can have hundreds of derived forms that are altered by layered, interdigitated derivations. The derivations usually are in "strings," most of which involve discontinuous dependent morphemes. These derivations apply in layers and affect predicate formation (transitivity, valence), and can also alter the path and ground of verbs ('into water', 'upward'). There is widespread haplology and numerous radical morphophonemic alternations with special internal boundary conditions.

Kari (1992) is the most complete presentation of this model of *stacking templatic word formation*. In a conservative language like Ahtna, there are prodigious verb paradigms for inflection and virtually every prefix, suffix and layered derivation in verbs can be discerned. To make this model work in a fully mechanical way, the inventory and order for all affixes in Ahtna and Koyukon must be specified. For Ahtna this is 27 ordered sub-positions in 11 prefix positions or zones and 4 suffix positions after the verb root (Kari 1990:41–42, 1992). The Koyukon verb complex is treated with 31 ordered subpositions in 11 positions or zones and 5 suffix positions after the verb root (Jetté and Jones 2000:758–759). There is a large battery of aspects and super-aspects (momentaneous, conclusive, customary, semelfactive, and many others), and inflection (tense and negativity). Aspects are marked by arrays of stem suffixes and verb stem sets. Koyukon has the richest array of aspects with 16 aspects and 5 super-aspects (Jetté and Jones 2000).

This model of word formation has been applied to several Athabascan lexicons (Ahtna, Koyukon, Dena'ina, Lower Tanana). The model can handle the various levels of abstraction, from the specification of forms for underlying verb derivatives, to the most productive sets of derivatives for a theme, to the array of verb themes that may be associated with one root. The batteries of discontinuous strings have status as lexical entries, and these can be specified for their "look ahead" features as in Ahtna (Kari 1990:635–649) and Koyukon (Jetté and Jones 2000:767–776). Furthermore, and a point of emphasis for the AGCH, the main features of verb derivation and the processes of word formation are quite homogenous, as we can see in the best-researched Athabascan languages such as Carrier, Navajo, Slave, Ahtna, and Koyukon.

The Athabascan languages are strikingly homogenous in the degree to which there is retention of many of the most highly marked features of Athabascan grammar. Some features that are highly similar are:

(a) Strong similarities in the verb prefix complexes, in prefix ordering and prefix/suffix inventories. Rice (2000) is an excellent demonstration of the details of verb prefix complexes in all of the better documented languages.
(b) The most common ones, strings of 3, 4, and 5 prefixes plus sets of 4 suffixes, are ubiquitous; i.e., are in all of the languages. See Table 3 and discussion. Comparisons of batteries of aspectual derivational strings in various languages have not been researched extensively.
(c) The core of the aspect system when properly investigated, is retained in all the languages. Navajo has an average aspect system, whereas Koyukon has elaborated the system considerably.
(d) There is strong retention of the most common verb themes, the identical underlying forms with classifier, thematic prefixes, and theme categorization. This can be seen in dictionaries of Ahtna (Kari 1990), Koyukon (Jetté and Jones 2000), and Navajo (Young and Morgan 1992).
(e) For whatever reasons, many of the most suppletive sets of verb stems are retained in virtually all Athabascan languages that have been well documented. Krauss and Leer (1981:143) note that Koyukon, Gwich'in, Navajo, Chipewyan, and Hupa have retained the highly suppletive array of verb stems with the commonly used proverbs, transitive 'do so to O, affect O' and intransitive, 'occur, happen'. The facts surrounding this suppletive set are discussed by Leer (1987:128 and Young and Morgan 1992:682. Consider in Table 1 these two verb themes in Ahtna and Navajo Kari

1990:426–427, Young and Morgan 1992:682).[4]

Table 1. Extreme verb stem suppletion in Ahtna and Navajo

Ahtna

	imperfective	*perfective*	*inceptive*	*future*	*customary*
'do to O' O+0+laak	laex	laak	le'	liił	ł+'iis
'occur, happen' 0/D+yaak	naex	dyaak	ne'	niił	t'iis

Navajo

	imperfective	*perfective*	*inceptive*	*future*	*customary*
'do to O' á#O+0+laa	lééh	laa	le'	líił	ł+'įįh
'occur, happen' 0/D+dzaa	nééh	dzaa	ne'	níił	t'įįh

How can these languages manage to retain such a disparate set of stem alternations? Why has no Athabascan language managed to level out and simply these alternations? (Furthermore, two cognate roots in Eyak *leh* and Tlingit *nii* do not participate in suppletive stem sets; Jeff Leer, p.c.)

The Athabascan *riverine directional system* is the organizational intersection between the geography, the lexicon, and the grammar. The directionals consist of nine roots, have a prefix-root+suffix structure (like the verb complex in miniature) and typically occur in over 60 forms (Leer 1989, Kari 1990:633, 2008:22–24, 2010:129–40). The directionals are highly congruent throughout the contiguous Northern Athabascan languages and are also in Pacific Coast Athabascan (Leer 1989). The riverine directionals in Athabascan languages are what Levinson (2003:90) terms an "intermediate absolute landmark" frame of reference. Most Athabascan language groups (other than Apachean) are oriented to the major rivers, and these rivers can have totally different geographic axes, such as the Copper River (which flows in an arc north to south) vs. the Tanana River (which flows east to west). The riverine element in Ahtna and Northern Athabascan is so pervasive that it constitutes an organizing "semplate" or semantic template in terms of the semantic theory of Levinson and Burenhult (2009). Riverine elements in Northern Athabascan are found in lexical sets in several form classes such as the outer (disjunct) verb prefixes, the noun lexicon (e.g. parts of houses, or boats and especially place names), and postpositions. Directionals are used in indoor and outdoor settings. In narratives about travel the cross-cutting riverine semplate is intricately orchestrated in directionals, many nouns, place names, verbal derivations for space and path, and so forth. The overriding influence of the directionals is researchable through the study of texts as well as through studies of gesture and body language. See Kari 2010 for discussion of Ahtna directionals and their use in narratives about foot travel.

There are also striking sociolinguistic patterns among Athabascans. Since Athabascan is very difficult to learn as a second language, there has been asymmetrical bilingualism between Athabascans and non-

[4] In the Ahtna practical orthography *c :: k, c ':: k'*, and *g :: gg* are the front vs. back velar series. As in most other Athabascan practical orthographies, Ahtna plain stops are written as *d, dl, dz, g, gg,* but when in word-final position these are written as *t, tl, ts, c, k.* Underlyingly these remain *d, dl, dz, g, gg.* The *e-* is the schwa vowel which has the quality of [ɛ] epsilon. Other symbols, for glottalized consonants and affricates are typical of other Athabascan practical orthographies such as Navajo; see Appendix A. Other conventions are + affix boundary and # for disjunct boundary. The symbol º is for a sonorant closed root that zeroes out the perfective suffix *n* (Kari 1979).

Athabascan neighbors (such as Eskimo groups in Alaska and Canada, and Puebloan groups in the Southwest). As Sapir noted (1921:209) Athabascan languages tend not to borrow from other languages either in vocabulary or grammar, nor do they influence neighboring languages much. Recently Campbell and Poser (2008:322) cited Navajo and Apache as examples of languages that have resided in an area (in this region, say, for 500 to 700 years) with little affects of contact from neighbors. Since it has been nearly 90 years since Sapir's generalization and there are several very well-documented Athabascan languages, this Athabascan propensity to resist borrowings and not be significantly influenced by neighboring languages is even more noteworthy.

Thus Level 1 in Figure 1 makes reference to a suite of factors: the Athabascan verb has a rare and complicated structure, elaborate patterns of word formation, and many of the more complex features are retained throughout the family. Various sociolinguistic patterns seem to be interconnected as well. Also, as I discuss in section 4.3, it appears that while many specific elements of the verb complexes of Eyak and Tlingit are cognate with Athabascan, several of the most elaborate and distinctive processes in the Athabascan verb are not shared with Eyak or Tlingit.

2.2. Level 2: Introduction to geographic elements

Athabascan speakers or academics who have basic knowledge of vocabulary and grammar for one Athabascan language often remark about similarities in place names in other Athabascan languages. I have long pondered whether these tendencies to name geographic features in similar ways in different environmental settings may signal important trends in the prehistory of the Athabascan language family.

The initial idea for the AGCH was Level 2 of Figure 1: arrows are drawn between the components—(1) name content, (2) name structure, (3) name distribution, and (4) name networks—to emphasize that these are mutually reinforcing elements that tend to be similar in neighboring as well as distant Athabascan languages. Functionality, redundancy and the memorization of geographic knowledge are paramount, especially as we examine specific features of these four elements. I refer here to Kari (2008), a drainage-based place names corpus of 2208 Ahtna place names. The Ahtna language in Southcentral Alaska is an area of about 35,000 square miles. The core elements of Ahtna geographic knowledge are summarized in the introduction to Kari 2008. While we cannot delve into the details, we typically find very similar place names in other Athabascan languages even when in very different environmental settings such as Hupa in Northern California or Navajo in the Southwest. Often we find that place names from those languages can be adjusted to have Ahtna pronunciations and are then meaningful or plausible as Ahtna place names.

2.2.1. *Name content*

Athabascan place names serve as signs. Name content is nearly always analyzable and informative. For the Ahtna place names it is striking that 89% of the names are fully analyzable and 98% are partially to fully analyzable. Kari 2008:13–14 has details on these calculations. This degree of purity is typical of Athabascan languages and is a dramatic demonstration of the Athabascan territorial ethos. The place names in Ahtna and in the better documented Athabascan languages use high frequency simplex nouns (e.g. water, rock, soil, colors, common flora) and common postpositions such as 'among', 'under', 'upon', 'within', etc. Several extension verb themes that have virtually identical underlying structures in distinct languages are very common in Ahtna place name lists. Generally speaking, the content of the place names refers to natural history or to traditional activities. In Ahtna the names that are opaque and unanalyzable still conform to canonical structure. There are very few non-Athabascan elements in large corpora of place names other than a few loan word place names. This strong aversion to using other languages or preexisting place names is indicative of a very robust territorial ethos. Johanna Nichols (p.c.) has suggested that on a worldwide basis this degree of purity in Athabascan onomastics is highly unusual.

2.2.2. *Name structure*

There is regular structure to Athabascan place names. The more common patterns are binomials: (a) noun or verb+generic term; (b) noun plus postposition, and (c) nominalized verbs that feature a group of common extension verb themes such as 'current flows,' 'linear object extends', or the common stative-classificatory verbs. Also there is a clear *generative geography capacity* to the Ahtna geographic system (Kari 2008:24–26). A specific noun or verb can combine with one or two basic generic nouns to form bi- or trinomial place names. Ahtna employs 22 generic terms for various water, land, and cultural features, and these recurrent terms provide a highly informative classification to the landscape. These sets or clusters of names can be easily memorized. The riverine directional system also promotes memorization and the generative capacity of Northern Athabascan geography. The directionals are flexible and three-dimensional and can be applied at any level of scale. When we state that the structure in Athabascan geographical names is similar, we mean that it is *similar in all of its complexity*.

It is instructive to illustrate the derivational potential of the Ahtna verb with some place names that contain the same root grouped into verb themes. Table 2 has three groups of Ahtna place names with the root *'aa⁰* glossed as 'linear extends', a root that is common in all of the Athabascan languages and that is prevalent in place names. As noted earlier in section 2.1, the analysis of verb themes is the key organizing principle in Athabascan lexicography. We detect the distinct structures of the verb themes by their commonalities and differences (grouped here in a, b, and c). Table 1 illustrates many recurrent themes in word formation and name content and structure that make geographic names in Athabascan so fascinating. Every underlying prefix and suffix can be isolated and shown in underlying form. Strong speakers of Ahtna can offer fine-grained translations for batches of place names, such as in Table 2.[5]

Table 2. Some Ahtna place names with 'aa⁰ 'linear extends'
N= noun, # = disjunct boundary, + affix boundary, ñ = perfect = underlying sonorant; G = gender (noun classification), M/A = mode-aspect, CL classifier

place name	*morphological analysis*	*meaning*
(a) G+O+'aa⁰ 'linear feature extends' (Kari 1990:75)		
Tsic Beni'aayi	tsic b+e#n+ñ+0+'aa⁰+yi N 3s-against-M/A-ROOT-NOM	'the one caribou fence extends against'
Ndez'aay Bene'	n#d+z+0+'aa⁰+yi ben+e' DIST-G-M/A-CL-ROOT-NOM N-POSS	'lake of one that is jagged'
Nay'dini'aa Na'	na#c'+d+n+ñ+0+'aa⁰ na' across-INDF-G-M/A-CL-ROOT N	'stream of the one that extends across (log bridge)'
Nic'akuni'aa Na'	ni+c'a#ko+n+ñ+0+'aa⁰ na' from shore-AREA-M/A-CL-ROOT N	'stream of area extending out from shore'
Ts'abaeli Nic'ani'aa	ts'abaeli ni+c'a#n+ñ+0+'aa⁰ N from shore-AREA-M/A-CL-ROOT	'spruce extends out from shore'
Tahwghi'aayi	ta#ko+gh+ñ+0+'aa⁰ +yi into water-AREA-M/A-CL-ROOT-NOM	'area that extends into water'
Ts'inahwnet'aaden	ts'i+na#ko+n+e+D+'aa⁰+den from-back-AREA-G-M/A-CL-ROOT-NOM	'place of area-object extends back out'

Table 2 continued on following page

[5] As far as I know, Ahtna is the only Athabascan language that has a verb theme that corresponds to: *ł+*'aa⁰ 'water moves, flows slowly'. It is common and seems to contrast in force with the ubiquitous Athabascan verb theme *0+len* 'current flows'. Dena'ina or Koyukon have many place names that are similar or exactly like those in a and b, but none like those in c.

Table 2 continued

(b) inc#G+0+'aa⁰ 'incorporate extends' (Kari 1990:76)

Ketsitne'aay	ko+e+tsi#d+n+e+0+'aa⁰+yi AREA-against-head-G-M/A-CL-ROOT-NOM	'head that is against a place'
Tats'esghi'aaden	ta+ts'es#gh+ñ+0+'aa⁰+den into water-rock-M/A-CL-ROOT-NOM	'place of rock extending into water'
Tats'abaelghi'aaden	ta+ts'abael#gh+ñ+0+'aa⁰+den into water-spruce-M/A-CL-ROOT-NOM	'place of spruce extending into water'
Nay'dliisdini'aaden	na+c'edliis#d+n+ñ+0+'aa⁰+den across-song-G-M/A-CL-ROOT-NOM	'place where song extends across'
Natsede'aayi	na+tse#d+e+0+'aa⁰+yi across-head-G-M/A-CL-ROOT-NOM	'rock that extends across'

(c) ɬ+'aa⁰ 'water moves, flows slowly' (Kari 1990:77)

Deyighił'aaden	de+yii#gh+ñ+ɬ+'aa⁰+den inside-M/A-CL-ROOT-NOM	'place current flows inside'
Tak'a's Naghił'aa Na'	tak'a's na#gh+ñ+ɬ+'aa⁰ na' s.w. down-M/A-CL-ROOT NOM	'stream where spring water flows down'
Tak'a's Kaghił'aade	tak'a's ka#gh+ñ+ɬ+'aa⁰+den s.w. up-M/A-CL-ROOT-NOM	'place where spring water flows up'
Natu' Kaghił'aaden	natu' ka#gh+ñ+ɬ+'aa⁰+den salt w. up-M/A-CL-ROOT-NOM	'place where salt water flows up'
Niłt'anta'il'aaden	nił+t'a+ta#n+ñ+ɬ+'aa⁰+den backforth-water-M/A-CL-ROOT-NOM	'place where water sloshes back and forth'
Unatadił'aayi	b+na+ta#i+ɬ+'aa⁰+yi 3rd-back-water-M/A-CL-ROOT-NOM	'one that water moves up to it'
Unatadeł'aade	b+na+ta#d+z+ɬ+'aa⁰+den 3rd-back-water-M/A-CL-ROOT-NOM	'place that water flows back to it'

In Ahtna geographic names nominalized verbs often have suffixes *(y)i* 'the one that' or *den* 'at specific place'. Multiple string-like derivations apply that give the verbs paths such as 'into the water', 'off from shore', 'downward'. The Ahtna derivational strings, such as *na# n* neu. 'across' or as *ta# gh* neu. 'into water' are each sets of three prefixes and a group of four possible suffixes. Five or six types of inflectional patterns for tense/mode/negativity occur in the CV(C) syllable that precedes the final stem syllable. These TAM inflectional patterns in Ahtna and other Athabascan languages also are discontinuous strings that are realized with many radical morphophonemic alternations in the pre-stem syllable and in the final stem. When these various strings apply to a verb theme, they interdigitate between or merge with (via morphological haplology) preceding layers of morphemes.

Distinct Athabascan languages may differ in details of affix inventory and affix ordering (i.e. have different variations of a verb complex template). They have different degrees of elaboration for inflection and aspect, and they have different batteries of predicates. Nevertheless, the similarities and overall homogeneity of both the abstract verb themes and the processes that generate derived verbs in distant languages are very striking. We repeatedly find elaborate features that are similar in Athabascan distant languages such as suppletive alternations in the pre-stem syllables, suppletive ablaut in verb stems, and "look ahead" strings with three, four, and more morphemes.

Stacking templatic word formation can track both the horizontal dimension of the morpheme inventory of the verb complex and the vertical dimension of the layered derivations. For the most derivationally complex place name in Table 2, *Niłt'anta'il'aaden* 'place where water flows back and forth', we can specify

nine levels from the abstract root *'aa⁰* to the surface verb form. The derivation assumes there is the fully specified template of all Ahtna affix positions. We can distinguish the separate layered derivations although ordering among some of these still is uncertain. In Table 3 we can look at a couple of the mid-level layered derivations for this one verb.

Table 3. Partial stacking templatic derivation for *Niłt'anta'il'aaden*

	input	*output* (bold italics = added material)
1	ta 'water' + theme ɬ+'aa° →	ta#ɬ+'aa°
2	niɬ+t'a+ta#n+ñ+D+(stem)+suffixes 'back & forth' →	***niɬ+t'a***+ta#***n+ñ+D***+ɬ+'aa°+***n***
3	n 'distributive' →	niɬ+t'a+ta+***n***#n+ñ+D+ɬ+'aa°+n

The most striking event is a six-part *aspectual derivational string* that means 'back and forth': *niɬ+t'a#(n+ñ)+D+suffixes*. This string of prefixes and suffixes interdigitates with preceding the layers of morphemes. Such strings apply like multipronged clamps that grip several pieces of wood.

Significantly for the AGCH, many strings that apply to verb themes are often the same in other Athabascan languages. We have coined a Ahtna term for this process of clamping, as suggested by Markle Pete, *u'eł tay'tesdedzi*, which is the Ahtna term for a 'clamp, vice', literally 'with it something is twisted closed' (Kari and Tuttle 2009). The "clamp-effect" is a key factor. If we can pinpoint just why it is that all Athabascan language have elaborate string-like derivations that are often identical or highly similar, we can offer *u'eł tay'tesdedzi* or the "clamp-effect" as a key factor.

2.2.3. *Name distribution*

To date there have been no studies of the distributional properties of a large set of place names in any Athabascan language, and many interesting issues in Athabascan place name distribution remain unexplored. For expedience, in the GIS mapping of 2,208 Ahtna place names, all places have been treated as points. However, if the names are carefully plotted as points versus lines or as large and small polygons, we can show how remarkably comprehensive the naming system is for the Ahtna language area. For Ahtna there is thorough coverage of features along the main stem of the Copper River. There are about 450 named features along the main stem of the Copper River—streams, stream mouths, clearings and flats, and nearby bluffs and hills. Almost every sizable side stream of the Copper River has a documented Ahtna place name. All the larger tributaries have full nomenclature for their side streams. Streams have a single name for the whole drainage, while main features such as lakes usually group with the main name. The order of these tributaries is the key to the organization of the geography, and the riverine directionals provide have an overriding frame of reference. Also areas of hindrance that are difficult to access have fewer names, such as sections of the Copper River on the Wrangell Mountains side of the Copper River.

In Alaska Athabascan a principle of economy and memorizability works against the excessive proliferation of names. The Ahtna do not have high density, large-scale naming for rocks, sloughs, or specific eddies on the Copper River. Another issue in name density and distribution is the coarse-grained effect of the names whereby a name for a hill or ridge is an informal polygon of the outer contours of the feature. Also in Alaska we find combinations of riverine directionals with basic place names that result in pairs and triplets of named features, such as 'downriver swift current bluff' and 'upriver swift current bluff' that can be easily recognized. Also in Alaska several Athabascan languages can compound a stream name with the 'uplands' term (in Ahtna this is *ngge'*) which forms a name for an entire drainage system.

In the diverse environments of the extended Athabascan language area, there are various factors that impact name distribution, a topic that some day may receive in-depth research. The Pacific Coast

Athabascan languages are 14 small language or dialect areas on a north-south axis (see Map D) that average only 650 square miles. The PCA languages or dialects maintained these small territories along sections of larger streams with shared boundaries perhaps on one or two borders with other Athabascan languages (Baumhoff 1958). In contrast, the seven Apachean languages are in a general north-south axis in the high desert and plains of the Southwest averaging over 22,000 square miles.[6]

Note that the riverine directional organizing basis found in Northern and Pacific Coast Athabascan is absent in Apachean. Instead Apachean appears to have an oronymic organizing principle, whereby intervisible mountains are paramount. Both the Pacific Coast and Apachean migrations were of a magnitude and significance that remain underappreciated in North American ethnography and are important for understanding Na-Dene as well as Dene-Yeniseian prehistory.

2.2.4. *Name networks*

Northern Athabaskan geography has been a web of interconnected place names networks. The Athabascan territorial ethos is best seen through what I call the *networking effect.* Athabascans have maintained boundaries with neighbors who also speak Athabascan languages. Even though only several Northern Athabascan place name inventories are documented in fairly full detail, the larger regional network patterns can be inferred for many aboriginal Athabascan territories. With these shared Athabascan language boundaries came bi- and multilingualism and intermarriage between Athabascan speakers. Generally we can refer to overlap in Athabascan band territories and land use, ties of kinship and clan, and fairly amicable histories. The able-bodied Athabascan men would serve as emissaries between settlement areas, and would know two and three band territories. In the first half of the 20th century the most-well-traveled Ahtna speakers ranged into six other language areas where they would know some of the geographic names: Dena'ina, Lower Tanana, Middle Tanana, Tanacross, and Upper Tanana as well as Eyak (Kari 2008:5–6).

There are numerous concrete indications that extensive regional networking and travel prowess are reflected in features of Athabascan geographic names:

(a) The same set of place names extends across Northern Athabascan language boundaries (with only rare but interesting exceptions). Speakers who are not acquainted share the same name for mutually known features. This is constantly reinforced by the place name corpora; i.e., names with similar structural, semantic and distributional properties are interlinked from language area to language area across huge and continuous bioregions (Kari 1989).

(b) There are numerous ways we can demonstrate that Athabascan trail systems in Interior Alaska are ancient and that interregional travel was routine throughout Athabascan prehistory. The redundancy in the use of Ahtna place names in narratives, field notes, early historic maps, and Ahtna-drawn sketch maps is demonstrated throughout Kari 2010. The reiteration of sequences of place names strongly confirms specific trails and routes and the overt functionality of the memorized names. Various early historic maps offer insights into Athabascan territoriality and travel abilities. The Wrangell map of 1839 (eastern portion, discussed in Kari and Fall 2003:85–87) has about 20 recognizable place names and several northerly trail routes that emanate from Upper Cook Inlet for distances of 300 or more miles. This one map demonstrates the scale at which Athabascan experts knew Southcentral Alaska in the early 19th century.

(c) The most impressive demonstration of Athabascan travel skills and geographic knowledge is in the genre that I refer to as "elite travel narratives" (Kari 1986, Kari 2004, Kari and Fall 2003, Kari 2010). In the most detailed travel narratives we see the orchestration of all of the spatial and orientational features of these languages. Numerous issues deserve further study: the ways in which salient places are selected and ordered; the use of riverine directionals before and after a place name to triangulate to locations in relation to the named place; and the use of features of

[6] Some scholars have even suggested that as of the 15th century a continuous, thinly populated Southern Athabascan territory could have been as large or larger than that of the historic Northern Athabascans (Forbes 1960:xii–xiii).

verbal morphology along with other spatial markers in relation to the place names.

(d) There are several *region-marking traits* in the geographic names. Most notable are the seven mutually exclusive hydronyms in Northern Athbabascan, Figure 2 (from Kari 1996a).

The *hydronymic districts* are the most overt and salient pattern communicated by Northern Athabascan geographic naming. For example, in eight western Alaska Athabascan languages (including Ahtna) the term **na'* is used in streams, whereas in four eastern Alaska Athabascan languages **niq'ə* (lit. 'on the upstream') is used. Several languages even have primary versus secondary hydronyms which have a "street vs. avenue" effect on stream names. In Lower Tanana and Tanacross we find that **na'* vs. **niq'ə* are used in reversed ways (Kari 1996a). In Gwich'in there is a primary hydronym, *njik,* and a secondary hydronym, *k'ǫǫ.* Although we need to expand upon the hydronymic data, this general distribution of Northern Athabascan hydronyms is valid. Among Pacific Coast Athabascan languages there are also indications of some alternations in hydronyms (Baumhoff 1958). The hydronymic districts predate language differentiation, they are overt markers of both the structure and conservatism of the place names. It is plausible and arguable that many names descend from the initial phases of Athabascan radiations and expansions. Patterned hydronyms are just one of several signs of the dynamic of Athabascan territoriality that has reinforced linguistic conservatism. Both Vajda and Nichols (p.c.) have remarked that this patterning in the Northern Athabascan hydronyms is unusual and significant.

An important research project would be to lay out in detail the recurrent patterns in the toponymic systems of Yeniseian, Tlingit, Eyak, and Athabascan. Werner (2002:35–67) is a compilation of the Yeniseian place names corpus. Vajda notes (p.c.) that there is little or no verbal derivation in Yeniseian place names. Also Vajda (this volume) has proposed that Athabascan **deˑšʳ (-deˑžʳe')* 'river, sandbar', the dominant stream term in six east Canadian languages, may be cognate with the reconstructed Yeniseian hydronym **jēˑs* 'river'. This implies that **deˑšʳ* served as a vanguard hydronym when Athabascan people first occupied the Canadian Shield.

(e) In addition to the striking patterns for 'stream', other patterns in Athabascan toponymic generic terms deserve closer examination. There is a conspicuous patterning in generic terms for 'mountain' in Central and Southcentral Alaska (Kari 1996b). The Ahtna term *dghelaayi* 'mountain' is shared with Dena'ina, Upper Kuskokwim, and Deg Hit'an. This has been innovated to mean 'mountain' from the Tanana Valley Athabascan place name for 'Alaska Range'. Proto-Athabascan **yəs* 'ridge' vs. **dzəł* 'mountain' also may have significant patterning in some Northern Athabascan languages. Also in Northern Athabascan there is a marked contrast in the use of PA 'water' when it is appears in hydronyms. In five western Canadian languages (such as Southern Tutchone and Kaska) **-tu'* means 'river', but in six Canadian languages east of the Mackenzie River (such as Hare, Slave, Dogrib, and Chipewyan) **-tu'* applies to large lakes. On the other hand, 21 other Northern Athabascan languages use **wən* for 'lake'.

(f) Comparison of inventories in Alaska Athabascan place name networks indicate some other salient and recurrent features. Overt boundary-marking place names have been detected in Alaska (in Koyukon, Dena'ina, Ahtna, Lower Tanana, Tanacross). There are some ensembles of similar names for features, a topic that deserves more attention. Frequently we find several names that are related with a lithic, vegetation, or anatomical theme. Also there is some place name duplication that sometimes is overt and distinctive. For example, in the Ahtna language area Klutina Lake and Tazlina Lake are two large L-shaped glacial lakes with streams that drain from the west into the Copper River. It is salient and noticeable that the first sizable north-side bluffs on each river have the same name (*Ts'inahwnet'aaden* 'linear object that protrudes back out'), *and* that the two ridges at the south-side right-angled points on both lakes have the same name (*Tahwghi'aayi* 'one that extends into water') (Kari 2010:49).

(g) The social ties between Athabascan language groups can be traced through kinship systems, clan

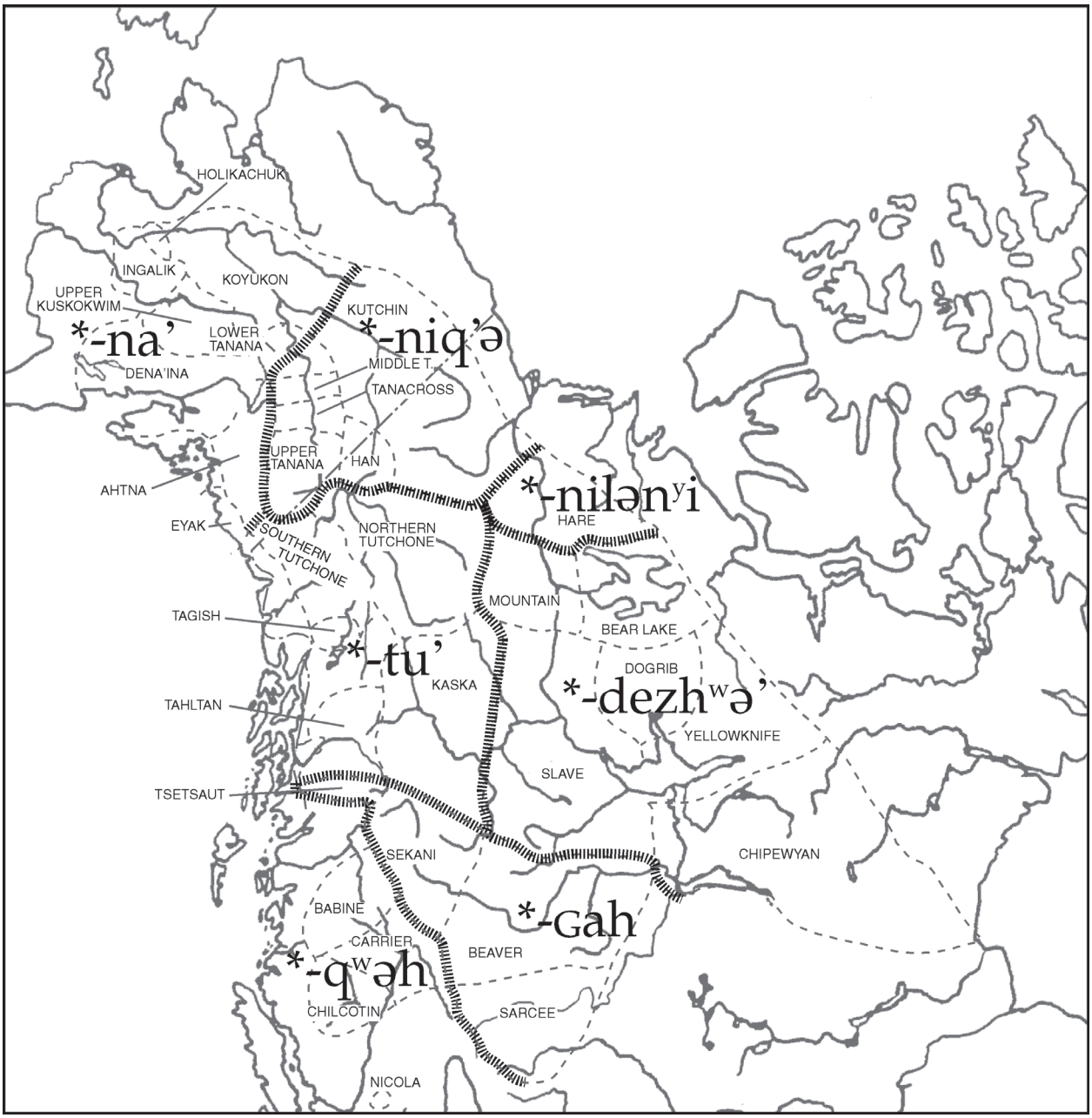

Figure 2. Northern Athabascan hydronymic districts (from Kari 1996a)

systems, as well as ethnonymy. Athabascan ethnonyms have served as a small-scale or macro-regional index system, and they depict a general awareness of distant Athabascan territories in aboriginal times. There is repetition among some ethnonyms as seen in glosses such as 'the dwellers of the lakes', 'the headwaters people,' 'the downriver people', 'the dwellers of the uplands', 'the mountain people.'

2.2.5 *Level 3, Indicators of time-depth*

In Figure 1 at Level 3 with an image of a scale are *Indicators of Time-Depth.* In the tradition of Sapir 1916, ("Time Perspective in Aboriginal American Culture: A Study in Method,") and Sapir 1936 (his classic demonstration of the northern origin of the Navajo), when there is extensive lexical, narrative, and

ethnographic documentation for a group of Athabascan languages, it is possible to compile pieces of evidence about a language's approximate time-depth of occupation in a general region. Diebold's 1987 article is a survey of numerous "linguistic ways to prehistory." His synopsis (ibid:34–38) of the venerable *Wörter-und-Sachen* ('words and things') methods developed by mainly German linguists in the 19th century reminds us of the potential of diachronic lexical semantics in hypotheses about linguistic prehistory. In the future for Na-Dene as well as Dene-Yeniesian *Wörter-und-Sachen* methods will be relevant; see sections 4.2 and 4.7.

The methods set forth by Sapir (ibid.) and by Diebold (ibid.) are perfectively valid in the 21st century. However, these methods require large amounts of in-depth language-based information. The assembly of factual information can include: (a) dialect differentiation; (b) well-researched lexicons; vocabulary complexes can be analyzed for areal patterns for seriation in meanings for material culture, biota, or social structure; (c) the presence of *isolated archaisms,* words apparently in no other Athabascan languages; (d) the prevalence of words that may be a substrate from one or more extinct languages; (e) geographic loci of clan-origin narratives or accounts of altercations or battles; or (f) religious or sacred associations with the landscape. The evaluation of such sources may indicate that a language group has annexed or taken over territory from other peoples or has expanded and/or contracted over time. It is also possible to engage in discussions about the archaeological records for regions of Athabascan territory. The archaeological research fostered by Jack Ives (2003) is opening up multifaceted lines of evidence about the phases and the likely locations of Athabascan emigration from the Northern Plains to the Southwest.

For some language areas, like Dena'ina or Ahtna, for which there is good coverage on Athabascan vocabulary and a large body of narratives, strong inferences can be drawn about relative time-depth, directionality of movement, or of non-movement. It is possible to model a sequence of movements of the Dena'ina into the Cook Inlet Basin from west of the southern Alaska Range (Kari 1988, 1996b; Kari and Fall 2003:10–14, 144–48; Boraas 2007). Cook Inlet Basin is likely the only part of Alaska where Athabascans have expanded into lands that were previously occupied by non-Athabascans. However, for the Copper River Basin and the Ahtna language area a strong case can be made for long-term occupation without the presence of any other non-Athabascans (Kari and Tuttle 2005).

To recapitulate, with the Athabascan Geolinguistic Conservatism Hypothesis I suggest that a distinctive Athabascan territorial ethos is reflected in the similar, functional, and memorizable place names networks that we find in diverse parts of the large Athabascan language area. The more extensive lists of Athabascan place names are striking for their analyzability and purity. A common set of geographic names extends across language boundaries. Hydronym patterns indicate that geographic names have been used to mark large regions. There are many ideological similarities among Athabascans such as an aversion to using place names from other languages. These geographical traits are intertwined with some rare and highly marked features of Athabascan language structure that have contributed a strong "drift" (Sapir 1921) toward the retention of many fine details of the Athabascan verb complex and processes of word formation. The root and affix inventories in the well-documented languages are quite similar. *U'eł tay'tesdedzi* (the clamp-effect), indeed may be a key factor in the promotion of homogeneity in Athabascan verbal grammar. Many multimorphemic discontinuous strings are shared throughout the family. Interconnected as well are Athabascan sociolinguistic phenomena such as asymmetrical bilingualism and the lack of convergence impacts of neighboring languages. The recognition that the Athabascan languages are extraordinarily homogenous and have had long-term occupancy in large portions of Northern Athabascan are prerequisite for interpreting the strong signal that is being assembled for an ancient Dene-Yeniseian language stock.

3.0. A MODEL OF NA-DENE MOVES AND EXPANSIONS IN NORTH AMERICA

In this section I offer some new proposals about the branchings and expansions of Na-Dene in North America, the main point being that the clear-cut binary branchings within Na-Dene, that of Eyak and Tlingit, occurred closer to 10,000 years ago rather than frequently cited but unsubstantiated estimated dates of 3500 to 4500 years.

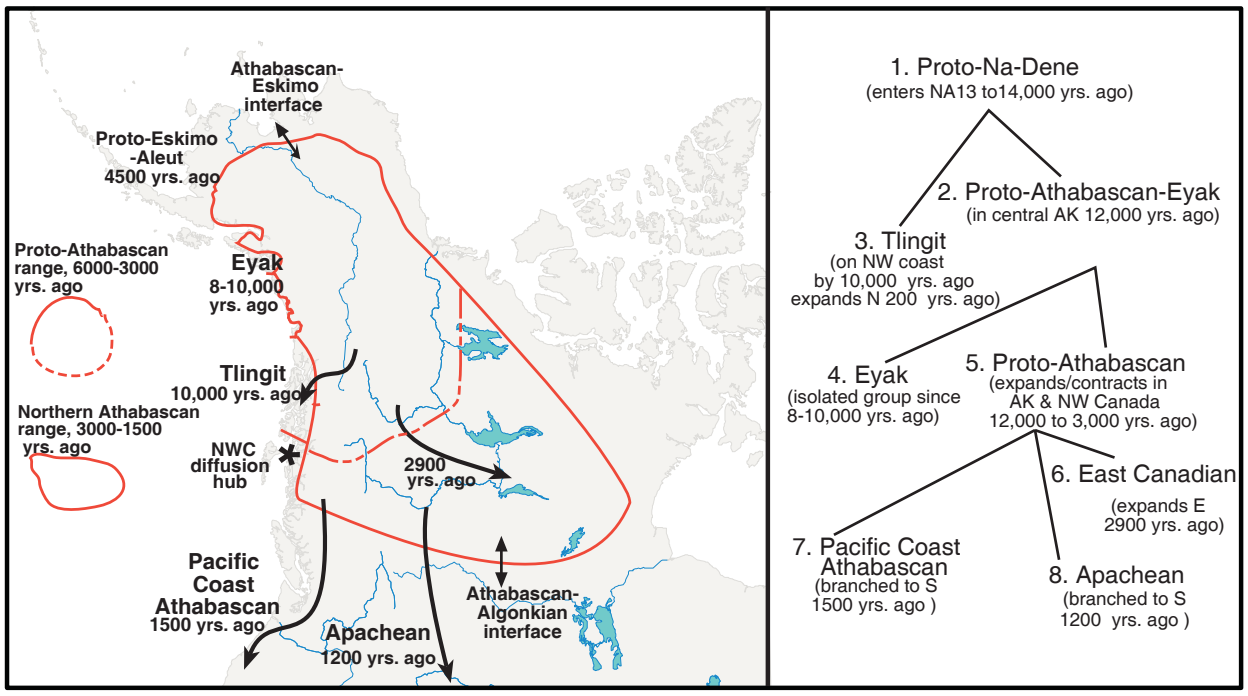

Figure 3. A model of Na-Dene moves and expansions

The 1998 book by Michael Fortescue, *Language Relations across Bering Strait: Reappraising the Archaeological and Linguistic Evidence,* was a major influence on Edward Vajda's work on the Dene-Yeniseian hypothesis. As noted in Kari and Potter (this volume), in a brief aside Fortescue (ibid.:214–217) assembled a concise summary of similarities between Ket and Na-Dene, but he did not present Ket or Na-Dene data, nor does he claim there is an historical relationship. Fortescue also presents several maps that model early Eurasian and Beringian language movements and distributions. He places pre-Na-Dene in western Beringia at 13,000 years ago and in Central Alaska at 11,000 years ago (ibid.:253 and Map 2). With the evidence being assembled for the Dene-Yenisiean language stock, the time frame presented in Fortescue 1998 for the entry of Na-Dene into Beringia and Alaska seems plausible and has served as input for Figure 3.

Figure 3 postulates the North American moves, branchings and expansions of Tlingit, Eyak, and Athabascan in a chronology of eight stages that spans 13,000 or more years. The first event is hedged at 13,000 to 14,000 BP: the position and earliest entry for Proto-Na-Dene, although it is not possible to be very precise about this time or location. At this early time interval numerous other language groups would also be entering the New World. The routes and dates of the last two branchings—(7) Pacific Coast Athabascan and (8) Apachean—are known fairly certainly. The sixth stage, an eastward expansion toward Hudson Bay of Canadian Athabascan languages such as Chipewyan and Dogrib, is reflected archaeologically in the Taltleilei Tradition and is datable at about 2900 cal BP (Gordon 1996; Potter, this volume).

I am suggesting that the period for Proto-Na-Dene at Level 1 was brief; perhaps for a millennium or so. The distinctions between Levels 2, 3, and 4 are uncontroversial as a relative chronology, given the degree of linguistic separation between Athabascan, Eyak, and Tlingit, and I am not making associations with these early levels and specific archaeological traditions. I suggest that by 12,000 years ago at Level 2 there was an established early Athabascan presence in Central Alaska that also included the Eyak. This stage in writings by Krauss and Leer has been called PAE, or Proto-Athabascan-Eyak, which is represented by a larger core of reconstructable vocabulary and grammatical features than there is for PND. This model postulates that Tlingit had a relatively brief period of association with common Na-Dene. Perhaps early Tlingit was never in Central Alaska. Tlingit has long been part of the ancient multilingual diffusion corridor (symbolized as *) along the Northwest Coast, first being based to the south of its contemporary language area in a rainy coastal

estuary environment. As for the Eyak, at Level 4 I suggest that a small Eyak band became separated from the rest of Athabascans at an early date. It is possible that Eyak's separation had something to do with one of the breachings of glacial Lake Ahtna. Recently, the first major breaching of Lake Ahtna has been dated "at 10,740 cal BP date at Canyon Lake on the upper Gulkana River, a major event that led to significant lowering of Lake Atna (if not complete recession from the Copper Basin" (Shimer p.c., 2009; Jangala 2004).

At Level 5 in Figure 3 with a red solid/dashed perimeter, I suggest beginning 12,000 years ago and continuing until through 3000 years ago there was a large and continuous Proto-Athabascan occupation from Northwest Alaska to portions of western Canada. By 6000 years Proto-Athabascan becomes identifiable in the Northern Archaic Tradition. Prior to the arrival of Eskimo populations about 4500 years ago, the extended Proto-Athabascan language area had many cycles of centrifugal and centripetal expansion and contraction and with small band popluations and little or no competition for resources from non-Athabascans. As of about 4500 years ago there has been a slow upstream territorial expansion by Eskmo groups in western Alaska. In terms of the AGCH from Proto-Athabascan through to the huge Northern Athabascan language area (32 languages with 1,400,000 square miles of territory at contact) reflects very-long-term range expansion in the Subarctic of Northwest North America.

Figure 3 encompasses additional information:

(a) the most likely area of the onset of gene-transmission between Na-Dene and Eskimo peoples (Scott and O'Rourke, this volume) since about 4500 years ago.
(b) The area where Proto-Eskimo-Aleut is posited to have been located at about 4500 years (Dumond and Bland 1995; Potter, this volume).
(c) The Northwest Coast diffusion hub where some unknown and extinct languages were present. The area of Southeast Alaska and British Columbia) seems to be the interface of Athabascans and Northwest Coast groups reflected in what Turner calls the Greater Northwest Coast dentition pattern (see section 4.4; Turner 1985; Scott and Turner 2008).
(d) The interface area between Northern Athabascan and Algonkian must be a long-term point of contact due to the spread of the Albumin-Naskapi blood allele (see section 4.5; Scott and Turner 2008; Scott and O'Rourke, this volume; and Berezkin, this volume).

4.0. NA-DENE PREHISTORY IN VIEW OF DENE-YENISEIAN

In this section I review a few sources that offer support for both the AGCH and the model of Na-Dene expansion that I have outlined. There are some rather unique and perhaps unprecedented reasons that such strong signals of this transcontinental Dene-Yeniseian language stock have survived.

The coastal Na-Dene languages Eyak and Tlingit are at the north end of the Northwest Coast linguistic area. The major hub for diffusions in this linguistic area has been at the interface of Tlingit, Haida, and the Tsimshianic languages. Sherzer (1976) and Campbell (1997:335–37) have summaries of the Northwest Coast linguistic area. Krauss and Leer (1981:155–166) present some of the phonological and lexical convergences for Tlingit, Haida, and Tsimshianic that took place around this hub. Haida is now abundantly well documented (Enrico 2005). And in spite of Enrico's 2004 extensive presentation of possible cognates or diffusions between Haida and Tlingit-Eyak-Athabascan, Vajda and others still find no evidence that connects Haida genetically with Dene-Yeniseian.

I suggest that Tlingit and Eyak are old binary branchings from Proto-Na-Dene. Perhaps both branchings took place by 10,000 BP. Whenever and however Tlingit first reached the hub area at the British Columbia/Alaska border, it must have been a participant in what archaeologists Ames and Maschner (1999:67) refer to as the Paleomarine Tradition or Northwest Coast Archaic Period (12,500–6400 BP). Contributing prehistoric themes along the Northwest Coast diffusion corridor are social stratification, boat travel between population centers, very limited foot travel, warfare, and enslavement.

Leer (1991) has offered insights into the linguistically complex history of Tlingit contacts with unknown

extinct languages, and with surrounding Athabascans, and within Tlingit dialects. However, the homogeneity within modern Tlingit dialects does not translate into support for Leer's highly improbable estimated dates for the consolidation of Tlingit on the Northwest Coast, at only 500-1000 years BP (Leer 1991:83).

The contiguous Northern Athabascan language area is over 1.4 million square miles with 32 languages in the early historic period, 25 of which are north of 60 degrees latitude. All but one share boundaries in several directions with one or more Athabascan languages. In terms of the AGCH and my suggested model of ND prehistory, Northern Athabascan has continuously occupied large portions of this area. In support of this I have offered several ethnogeographic, linguistic, archaeological, sociolinguistic, and human biological arguments.

4.1. Some consequences of the Na-Dene "short chronology model"

The often cited estimated "dates of divergence for Na-Dene languages" are 2400 ±500 years for Athabascan, and 3400 ±500 years between Athabascan and Eyak and about 4500 years for Tlingit (Krauss 1973:950, 1980:11–13). Krauss has stated that such dates were based both on the Swadesh lexico-statistical formula and on comparisons with other datable but unspecified historical language splits. Concerning lexicostatistics and Na-Dene, Krauss 1973:950–953 is a thorough review of the sources from the 1950s and 1960s. Krauss (1973:50) states, "Eyak is in fact lexico-statistically equidistant to all Athapaskan, e.g. both Navajo and Ahtna (the closest Athapaskan neighbor to Eyak) show virtually the same percentage, 33%, with Eyak on the Swadesh-Hoijer 100-word list." Note that Kaufman and Golla (2000) have estimated (without any explanation) a time depth for Na-Dene at 3500 years, a 23% reduction in the time frame!

The most often cited statement on a location for proto-Na-Dene is, "It seems most likely that the Proto-Athapaskan homeland was in eastern interior Alaska, the upper drainage of the Yukon River, and northern British Columbia, or some part of this area," (Krauss and Golla 1981:68). In over 40 years no specific ancillary support (linguistic or otherwise) has been offered for this Proto-Na-Dene homeland area other than this area is (sort of) near the area of great divergence in the branches. Frequently this chronology has been invoked by some archaeologists and linguists to deny *any* associations between contemporary Athabascan peoples and archaeological sites or traditions.[7] The short Na-Dene chronology and the claim that Athabascans had some sudden emergence and expansion in the past 2500 years implies that unknown language groups were present for over 10,000 years in the archaeological records for Northwest North America. Potter (this volume) notes that for the general area of eastern Alaska-Yukon–northern British Columbia between 4500 and 1000 years ago there is no archaeological evidence of population expansion or replacement.

Lacking support beyond relativistic comparisons, the model of the rapid expansion of Proto-Athabascan from a small district into the large Northern Athabacscan language area is chimerical. The degrees of separation between both grammar and lexicon within Na-Dene have never been discussed or evaluated. There is much greater time depth for the separations of the two branches Eyak and Tlingit from Athabascan. The Dene-Yeniseian language stock renders the short Na-Dene chronology obsolete.

4.2. Lexical research and Dene-Yeniseian

In recent papers my colleague at the Alaska Native Language Center, Jeff Leer (2008, this volume), cites an important source for the study of Na-Dene and Athabascan prehistory, his Comparative Athabascan Lexicon (CAL, Leer 1996). The CAL has developed for over 20 years as a handwritten draft of over 3000 pages. The CAL is organized alphabetically by Athabascan roots and morphemes, it cites comparative data, and it has some reconstructions. Previously Leer published Athabascan reconstructions in an appendix in Young and Morgan 1987:264–301 and *in passim* in Young and Morgan 1992. The individual *CAL* entries are very

[7] Popular publications abound with statements such as one in a 1990 photo essay in *National Geographic* by Reynolds and Doll (1990:44): "Athapaskan Indians like Ellen have trapped, fished and hunted in north-central Alaska for at least 2,500 years." The implication is that it is not possible nor prudent for a scholar to trace Athabascan languages and peoples any further back in time.

interesting and invite further inquiry. We anticipate that the field of Athabascan and Na-Dene prehistory will benefit greatly once there is a readership for Leer's CAL.

At this time figures on the cognate relationships within Na-Dene cannot be readily calculated. In general, when we leaf through Leer's CAL, for a given root or morpheme there often is an array of lexical cognates within Athabascan and only a few matches for Eyak or Tlingit. The CAL does not track other cognation patterns for stems that are only in Eyak or are only in Tlingit or that are only between Eyak-Tlingit. We can also cite the lexical purity of the better documented Northern Athabascan languages (see also section 4.4). In contrast, both Tlingit and Eyak have large amounts of non-sourced lexicon. However, these non-cognate morphemes have not been part of Leer's CAL project. The non-sourced lexical strata reflect and confirm long periods of time that Eyak and Tlingit have spent on the Northwest Coast diffusion corridor. With the demonstration of Dene-Yeniseian these non-cognate potential substrata roots and morphemes for both Eyak and Tlingit take on added importance.

Proto-Athabascan was a remarkably uniform proto-language and will be reflected in perhaps 1,300 to 1,500 cognate roots and morphemes and many reconstructable lexemes. Many pairs of Alaska Athabascan languages share 80–90% of their root-morpheme inventories (e.g. Koyukon and Lower Tanana or Ahtna and Dena'ina). In 1965 Krauss estimated that about 40% of the Eyak noun and verb stems had Athabascan cognates. Krauss's unpublished 1981 Eyak Morpheme List contains 1189 morphemes. My rough count turned up 397 Eyak morphemes with Athabascan cognates or 33% of the total. However, percentage estimates based on matches of roots and morpheme headwords can exaggerate the degree of closeness between Eyak and Athabascan. There are intriguing items in Eyak that are not in Athabascan or Tlingit (for instance, 45 of 75 Eyak broken stems listed in Krauss and Leer 1981:93–97). When I researched fish lexicon scattered throughout the Eyak Dictionary (Krauss 1970), I listed over 80 terms for fish, shellfish, and fish anatomy. The bulk of the Eyak fish lexicon is marine oriented, and most of those fish and shellfish are not found in any Athabascan language other than Dena'ina. Also, the exact meanings of many of the Eyak fish and shellfish terms cannot be determined. Three fish anatomical terms are cognate between Athabascan and Eyak: 'fish meat', 'roe', and 'scales.' There are about nine shared species with nearby Ahtna or with other Athabascan languages (Kari 2002). Although numerous Eyak fish terms employ roots and morphemes that are cognate with items in Athabascan, beyond the three mentioned anatomical terms I found no other cognate fish terms between Eyak and other Athabascan languages.

Semantic reconstructions within Na-Dene remain at a nascent stage. Proto meanings for PA, PAE, or Na-Dene have never been critically evaluated. With the advent of Dene-Yeniseian, biogeographical issues will be an important subject for future research. Among the signature cognates for Dene-Yeniseian, two that are telling us something about the DY paleo-environment are the term for 'birch, birchbark'. Ket *qɯ'j* and Athabascan **q'əxʸ;* and Ket *tii* 'canoe' PY *tiχ* 'canoe, vessel' PA *tšʳi·xʸ* 'birchbark canoe'. For peoples of the circum-Subarctic birch is the most economically important tree. Birch is not a prominent tree in the coastal Eyak and Tlingit language areas, and this term, ** q'əxʸ,* is not present in Eyak or Tlingit. A key point summarized by Vajda (this volume) is that of the more than 90 DY cognates assembled so far, much of the shared lexicon is between Yeniseian and Northern Athabascan and reflects the subarctic boreal forest (or taiga) environment: biota, technology, and skill sets. (Note that such discussions of diachronic lexical semantics of trees, implements, and environments are 19th-century *Wörter-und-Sachen* techniques, Diebold 1987.)

4.3. Some grammatical questions for Dene-Yeniseian

Edward Vajda's current reconstruction of the proto-Yeniseian verb and his first thoughts about a common Dene-Yenisieian verb serve as fodder for cross-linguistic discussions about the historical development of prefixing verb complexes and templatic morphologies. Considering what Vajda has put together so far, the pieces of the Yeniseian verb that match most closely with Na-Dene are the inner verb prefixes: three qualifier prefixes, six TAM prefixes and suffixes, and three or four pronominal prefixes. The valence-changing and predicate forming classifier system is not in Yeniseian, though there are elements that may be precursors

to the ND system. Vajda's suggestion that the common DY instrumental suffix, **ł*, was the precursor to the *ł* classifier that forms causative and transitive predicates is promising. Also the Yeniseian verb has very few suffixes, but there are two Yeniseian prefixes that Vajda suggests may have become ND verb suffixes. One of the most spectacular shared archaisms in Dene-Yeniseian, found in only two languages, Kott and Eyak, is the 'action nominal derivation' (described in section 2.3, Vajda, this volume). This derivation is an intricate formula: **s+verb root+n*. This must reflect a long-standing Dene-Yeniseian propensity to employ discontinuous strings in the verb complex.

One basic question is whether the verb in Proto-Yeniseian was more like Proto-Na-Dene or more like Proto-Athabascan-(Eyak). For the Ket verb complex, Vajda (2001, 2004) are the most extensive statements. If Tlingit separated very early and has had a long-term presence on the Northwest Coast, and if Eyak became separated from Athabascan perhaps due to the breeching of Lake Ahtna, we can expect to find some major disjunctions in the linguistic evolution between the three branches of Na-Dene.

For future discussions for Na-Dene, we need to have explicit demonstrations of how Eyak and Tlingit verbal word formation and extended derivation compare and contrast with those of Athabascan. While I do not have command of the subtleties of Eyak and Tlingit word formation, it appears that numerous Athabascan grammatical and word formation processes are very distinct from those of in Eyak and Tlingit or from those of Ket. Outlined here are some elaborate processes that are highly complex and very uniform within the Athabascan family, but that are absent or weakly present in Eyak or Tlingit. These disjunctions are further evidence of the long-term separation of Eyak and Tlingit from Athabascan.

(a) Athabascan verb theme categories can be defined based upon the aspects found in their simplest derived forms (Kari 1979). The basic telic/non-telic dichotomy between the *s-* and *gh-* perfectives is robustly cognate in all Athabascan languages. For example, the basic aspectual contrasts in the perfective forms of 'kill sg.' versus 'kill pl.', 'make sg.' versus 'make pl.', or in 'freeze' (with s-conclusive) vs. 'eat' (with gh-durative) are always maintained in Athabascan languages. The most common telic and nontelic verb themes are everywhere among Athabascan. Just how is telic/nontelic expressed in Yeniseian, Eyak, and Tlingit? Are there any cognate telic/non-telic pairs of verb themes for DY?

(b) The elaborate classificatory verb system is highly similar in all Athabascan languages. Typically there are four sets of about nine or ten verb themes: neuter intransitives 'be in position', active transitives 'handle type of object', active intransitives 'object drops, moves', and active transitives 'throw object'. These sets of classificatory verbs remain intact very consistently in all of the well-documented Athabascan languages. This is another mark of conservatism within Athabascan. On the other hand, Ket, Eyak, and Tlingit do not have sets of classificatory verbs, although they each have some verb roots that are cognate with those of Athabascan. How did this robust set of classificatory verbs develop for Athabascan, and what are the vestigial elements of this system in Tlingit, Eyak, and Yeniseian?

(c) For comparative Dene-Yeniseian, it will be interesting to see how a copious model of word formation might apply across the four branches of the language stock. The left-most disjunct prefix section to the Athabascan verb complex is lacking in Eyak and Tlingit. The disjunct prefixes play a major role in the derivational capacity and the "look ahead" choice of TAM prefixes in Athabascan verbs. Eyak and Tlingit do not make as extensive use of affix strings with discontinuous dependencies as do the Athabascan languages. Only the Athabascan languages have elaborate aspectual distinctions based upon stem suffixation formulae. Also few two or three-part strings have been shown to be cognate among Tlingit, Eyak, and Athabascan. One example of a cognate string is the two-part progressive string: Eyak *G +stem+ł* and the Athabascan *gh+stem+ł*. This string is not used in Tlingit. When we assemble sizable lists of derivational strings, for example between Navajo, Ahtna and Koyukon, it is very noticeable that many of the more common three-, four-, and five-part strings are identical. They share perhaps a disjunct prefix, sometimes

> a qualifier prefix plus an option of four sets of tense-mode prefixes, a set of verb suffixes that indicate aspect *and* the same meaning. This is perhaps the most striking measure of Athabascan linguistic conservatism. How can a battery of such highly marked aspectual derivations strings, be so similar in distant members of the family? We have suggested that this extreme degree of conservatism has something to do with the most highly marked "event" in the derivational history of Athabascan verbs, that we term *u'eł tay'tesdedzi* "the clamp effect" (Kari and Tuttle 2009). This orchestration of layered discontinuous derivations is one of the most striking indicators of homogeneity with Athabascan.

While numerous pieces of the verbs in Yeniseian and Na-Dene clearly are cognate, over a great span of time distinct verbal templates and word formation processes have evolved for all branches. Also for the hypothesis that Yeniseian represents a westward back-migration from Beringia or Alaska (Fortescue, this volume), the reconstructed Yeniseian verb would have devolved to have lost verb suffixes or the elaborate Na-Dene classifiers. However, it is more likely that the Proto-Yeniseian verb was a precursor to the Na-Dene verb.

4.4. Sociolinguistic issues within Na-Dene

For the Proto-Athabascans, the Subarctic of North America appears to have been a large "mega-patch" and cul-de-sac which the Northern Athabascans pioneered, expanded into, and retained with little competition for resources from non-Athabascans. We must recognize that Athabascan society (both ancient and modern) has been very egalitarian. There are many indications of long-term Athabascan isolation with widely dispersed bands of very small populations. There were no intensive contacts and convergences with other languages. There is evidence of levels of substrata vocabulary in only a few of the well-documented Northern Athabascan languages (see footnote 9). If there were prior occupations by other languages in the Northern Subarctic, they must have been very early and transitory. The extended Northern Athabascan territory may be one of the world's most impressive examples of a large array of languages sustaining long-term equilibrium (*sensu* Dixon 1996) as pedestrian foragers that kept expanding and contracting its extended range and without showing major effects of diffusion from neighbors.

These long-term shared language boundaries among the Northern Athabascan languages resulted in regional kin networks, multilingualism, and a chain of dialect complexes with extensive cross-cutting wave-like diffusions of phonological features and lexicon. Many of the recognized Athabascan language boundaries are arbitrary and oversimplify the patterns of intelligibility and diffusion (see Krauss 1973:943.) Recently Krauss (2005:118) wrote, "Athabaskan 'languages,' I repeat, are really parts of a dynamic complex of more or less constant interaction and influences." Population changes and range expansions and contractions have also contributed to homogeneity. There are no obvious clear-cut branched sub-groupings among Northern Athabascan. The networking effect that is reflected in the Athabascan geographic names is one measure of inter-Athabascan diffusions and linguistic homogeneity.

Athabascan linguistic homogeneity is best viewed as a byproduct of long-term equilibrium of Northern Athabascan in the North American Subarctic. Therefore I suggest rather strongly that the region cannot be treated as a "spread zone" as if it were analogous to Central Eurasia. Thus I disagree with Nichols (1997:379): "Na-Dene, the northernmost stock save Eskimo-Aleut, has been interpreted as the next-to-last entrant to the Americas, but on the evidence of linguistic geography, Na-Dene is not the latest pre- Eskimo entrant but merely the most recent subarctic spread. In any event, a shallow family like Athabaskan with a wide range in a spread zone can be assumed to have replaced earlier languages." Nichols must have been assuming that with an estimated short chronology for Na-Dene of about 4500 years, Na-Dene would have had a late entry into the New World (say at 5000 to 6000 years ago).

The circum–Pacific Rim was a route for ancient colonizations in both coastal Asia and coastal North and South America. The primacy of the coastal route of entry in North America has been promoted by Nichols (1990, 1997, 1998) through her tracking of historical markers (linguistic features that are of low frequency

worldwide, that are persistent in families where they are found, and that are not readily diffused). Nichols's emphasis on the coastal route has independent corroboration in the archaeological summaries by Dixon (2001) and Goebel et al. (2008). The model of Na-Dene moves that I propose points to the dramatic contrasts in the historical linguistic profiles between the Northwest Coast and the Interior Subarctic: (a) there have been very few diffusions or convergences in the Interior Subartic; and (b) there are widespread and long-term convergences and diffusions on the Northwest Coast where the Na-Dene branches Tlingit and Eyak have been situated among some early and unknown language groups. Furthermore on the Aleutian Islands, there was a major language amalgamation of an unknown prior population with Aleut. As much as 40% of the Aleut vocabulary is *not* correlatable with Eskimo vocabulary (Steven Jacobson, Michael Fortescue, p.c., 1998:217).[8]

Thus the Athabascan occupation of the North American Subarctic is unusual for its small populations, very large language areas, great foot travel prowess, egalitarianism, and degree of sociolinguistic isolation. This is reflected in asymmetrical bilingualism at boundary areas due to the complexity of learning an Athabascan language. There are very few traces of prior populations, and the languages have been unaffected by earlier occupations or by convergence with non-Athabascan neighbors, even though (as indicated in Figure 3) there had to have been intermarriage and gene-flow at several points on the perimeter of Northern Athabascan. In contiguous Northern Athabascan I am aware of only a few regional pockets with evidence of extinct substratal languages.[9]

4.5. Human biology and the early distribution of Northern Athabascan

Physical anthropology provides further evidence for the early range of Proto-Athabascan, as in Figure 3, Level 5. Three sub-regions of contiguous Northern Athabascan, symbolized as ⇔ in Figure 3, appear to be areas of long-term contact and gene flow between neighboring peoples. Scott and O'Rourke (this volume) explain how dentition, blood group, and genetics of Na-Dene and Eskimo-Aleut groups are closer to one another than either is to other North and South American native populations. The general region of western and northwestern Alaska was the earliest interface of Athabascan-Eskimo gene flow.

Scott and Turner (2008) summarize the physical anthropological intermediacy of Na-Dene with what they term the Greater Northwest Coast Indians. Turner (1985), Greenberg et al. (1986), and Scott and Turner (1997), using dentition analysis from dozens of populations and thousands of individuals, describe the intermediacy in dentition between interior Alaska Athabascans and what they term Greater Northwest Coast populations. Scott and Turner (1997:278) place special importance on the incidence of three-rooted lower first molars in Northwest North America.

Scott and Turner in a recent paper (2008:62–63) summarize distribution of the blood mutation called the Albumin-Naskapi allele. The highest frequencies of this well-researched blood allele are between Northern and Southern Athabascans and Algonkians. But Albumin-Naskapi is *virtually absent* in a large sample of Tlingit and Haida, and it is rare or absent in Eskimo and Aleut groups. This allele developed and spread as a mutation long ago ("more than 6,000 years ago," Richard Scott, p.c.). This blood group distribution also gives strong support for the early separation of Tlingit from the rest of Athabascan.

While I cannot absorb the details of the more ancient scenarios for human population movements

[8] Fortescue (1998:217) writes: "Aleut would seem to represent an example—rare in language families that lack any great depth of historical documentation—of how languages may develop via abrupt 'saccades' or cascades of linked adjustments between periods of relatively slow change." Yuri Berezkin recently (2009) has discerned exotic substrata myth motifs shared between Aleut and Kodiak Island Alutiiq that must predate Eskimo occupations of Southwest Alaska.

[9] About two millennia ago Dena'ina annexed Cook Inlet Basin, and bearers of the Kachemak archaeological tradition became extinct on the Kenai Peninsula about 1,500 years ago (Boraas 2007). The only linguistic trace is a tiny set of words (no more than five, Kari 2007). Babine-Witsuwit'en on upper Skeena River has a very interesting early contact history, suggesting that they have been even farther west toward the coast and may have absorbed or had contact with unknown languages as well as with expanding Gitksan people (Hargus 2007, Rigsby and Kari 1987).

in Scott and Turner 1997, there is a confluence of evidence that points toward a large contiguous Proto-Athabascan area with disparate points of contact and gene-flow. As depicted in Figure 3, the *most recent contact* at about 4500 years is in the Northwest Arctic/Sub-arctic interface with Eskimo groups. Much earlier contacts took place in the Western Subarctic with Northwest Coast groups and in the Eastern Subactic with early Algonkian groups.[10] To reiterate, this happened without major convergence impacts and changes on the proximate Athabascan languages. Richard Scott (p.c.) writes, "Athabascans are more than willing to share their genes and culture with adjacent groups while retaining their linguistic distinctness."

4.6. Some archaeological issues

Over the past four decades there have been impressive developments in the archaeological literature for Central Alaska. There are two concentrated site districts in the Tanana River Basin; the Nenana River area sites (Dry Creek, Walker Road and others); and to the east, the Shaw Creek sites (Broken Mammoth, Mead, and Swan Point) and then the Gerstle River Quarry and Little John sites. Potter (2008a:181) summarizes: "The archaeology of central Alaska, defined here as the Tanana, Susitna and Copper River basins, encompasses an important record. This region is arguably the longest continuously inhabited area in the Western Hemisphere" (though not necessarily by the same people, Potter, p.c.). The Dyuktai lithic complex of Eastern Siberia, with its signature microblades, has been seen as highly similar to some early Alaska lithic complexes (Dikov 1979). A typical generalization via Goebel et al. (2008:1498) is that "artifacts at the earliest well-dated site in Alaska, Swan Point on the middle Tanana River, appear to document the dispersal of microblade producing humans from Siberia to Beringia during the late glacial." Furthermore, Potter (2008b:414) notes that "microblade technology is present throughout the entire span of human occupation in the study area until around 1000 years ago."

One significant point by Don Dumond during the Dene-Yeniseic Symposium discussion period (also Dumond 1969; Dumond and Bland 1995; Potter, this volume) is that whereas there was widespread eastward movement between Asia and Alaska from 14,000 to 11,000 years ago before the breaching of the Bering Land Bridge, there is no evidence of any major population moving into Alaska from Siberia during the interval of 10,000 to 5000 years ago. Most scholars, as summarized by Potter (this volume), connect the earliest bearers of the Arctic Small Tool tradition in Alaska, who date from 5400 to 1000 cal BP, to Paleo-Eskimo. Several millennia prior to this time (about 8000 years ago) there was a non-Eskimo population on the Aleutians that became amalgamated as Eskimo-Aleut, as suggested by Fortescue (1998:180, 217).

Before the influx of Eskimo population into Alaska, and identifiable at 6000 years ago there is widespread evidence of inland hunters subsumed in the "Northern Archaic" archaeological tradition (see esp. Potter, this volume, Figures 3 and 4). The Northern Archaic sites have no cultural influences from the Siberian Neolithic that can be traced to pre-Maritime early Eskimo-Aleut sites. Dumond (1969) suggested that Northern Archaic represented "non-coastal Na-Dene" [i.e., early Athabascan] population that ranged far south of Alaska 6000 or more years ago. Dumond's 1969 paper was cited by Turner (1985), who suggested that rare shared dental traits between Na-Dene and Northwest Coast groups derived from long-term associations. In recent years more archaeologists are associating the Northern Archaic Tradition with a large mobile Alaska Athabascan population, one that extended far into northwest and southwest Alaska. A recent set of articles in *Arctic Anthropology* (Vol. 45.2, 2008) draws together 30 years of information on Northern Archaic sites. Potter's (2008a, 2008b) intersite statistical summaries for 181 sites and 272 occupations in three large drainages (the Tanana, Copper, and Susitna Rivers) are especially authoritative. Potter (2008b:419, this volume) notes, "While there is some ambiguity, I suspect that the recent time frame of the transition between these cultural traditions [Northern Archaic and Athabascan] indicates a continuity of Athabascan populations from at least the beginning of the Northern Archaic Tradition [~6000 cal BP]." Furthermore, the dramatic contrasts between economic and technological resources of the

[10] Further evidence for early Algonkian-Athabascan contacts derives from Yuri Berezkin's (2003, this volume) continuing studies of myth motifs on a worldwide basis. He notes that "late diffusion of ideas across the Subarctic does not seem plausible while a common substratum is."

Northwest Coast as compared with the Subarctic have been evidenced in the archaeological records for 6000 years or more.[11]

There has been debate about the timing of the opening of the Ice-Free Corridor. Dixon (2001) states it was not available until 13,000 cal BP. Goebel et al. (2008) places these dates between 13,500 and 14,000 cal BP. Yesner (2001, Yesner et al. 2004) has suggested that the earliest levels on the Tanana River sites were a transient colonizing population, but that the second levels at about 12,000 cal BP were an established interconnected population. If, as my Na-Dene expansion model in Figure 3 suggests, by 12,000 years ago Athabascans were positioned at the northern end of the Ice-Free Corridor, then it seems likely that only during the first 1500 or so years prior to that time as this corridor first opened, that it would have been used by transient groups. Subsequent to the occupation of early Athabascan bands on the Tanana River Valley, it seems likely that there would have been little use of the midcontinental corridor by non-Athabascans. As Potter notes (this volume), there may be various factors that have affected Athabascan population shifts. I do not claim that the contemporary Athabascan languages have stayed continuously in the areas of early archaeological districts. Thus, the North American Subarctic contrasted sharply with the Northeast Asia spread zone and the diverse language contacts that took place along the Northwest Coast of North America.

4.7. Some linguistic-archaeological-ethnographic correlations

The discovery of Dene-Yeniseian will bring the actual content of languages into discussions of nothern prehistory. Various Na-Dene lexical sources are germane to hypotheses about DY economic activities, ecology, and settlement patterns. I often note that the rich older Athabascan ethnological literature as well as more recent lexicographic sources are not being used in Northern prehistory syntheses.

Numerous vocabulary complexes that are similar among Northern Athabascan reflect the many adaptive strategies and skills of ancient peoples. As noted in section 1, the best inventories of Athabascan geographic names are truly spectacular for the regular features that promote orienteering. The Proto-Athabascan vocabulary for flora and fauna match well with the faunal inventories in Interior Alaska sites. In Yesner 1996:264, with the exception of the extinct elk and bison, 21 of 23 faunal items have well-established terms in all of the Alaska Athabascan languages. Even today some Alaska Athabascans have the foresight and the skill to save bones and hooves for broth. Among both ancient and modern Athabascans there has been extensive knowledge and use of lithics. There are various terms for usable stones (though we may have to guess at some referents). There are numerous place names that refer to lithic sources in the Alaska Athabascan place name inventories. There are some tools, such as stone scrapers ("chithos" < PA **k'izəghi* lit. 'something that scrapes'), with great antiquity in Alaska that continue to be used by Athabascans. Athabascans have great skills at butchering, and the anatomical lexicon is fine grained (see Kari 2007). Also, a very high percentage of anatomical terms is retained throughout Athabascan languages. Bone and antler implements (needles, awls, spear heads, skin scrapers) were made until recent times. Studies of language and materials items in this vein use *Wörter-und-Sachen* techniques.[12]

In his classic material culture study of snowshoes and ski devices, D. S. Davidson (1937) concluded that the "highly perfected snowshoe" with two-piece frame and advanced traits had been invented at a single

[11] The process of range extension and contraction has been a normal part of Northern Archaic and Athabascan prehistory. One striking example is the well-preserved complex of stone drive lines and tent rings at Aigik Lake in a treeless area in the southern Brooks Range summarized in Wilson and Rasic 2008. Fifty-five tent rings were being used during a 500- to 700-year period from 5600 to 4900 cal BP. Wilson and Rasic estimate that recurrent use of this site complex averaged one visit every 40 years. This would mean that experience about the site was transmitted into directions to the site over two to four generations. This is certainly in keeping with what we know about the band range and travel skills of Koyukon and Gwich'in bands.

[12] There is some irony that Diebold (1987) advocates the use of the 19th-century *Wörter-und-Sachen* techniques, which "made ethnographers and archaeologists out of researchers who might otherwise have remained dialectologists and lexicographers. . . . Some studies eerily adumbrate some of the contemporary concerns of ethnoarchaeology!"

point in time within the extended Northern Athabascan language area. "All the advanced traits of the frame snowshoe seem to have originated in North America and of these the Athabascans probably contributed almost the entire list" (op. cit.:159). Among Davidson's profound generalizations: "The snowshoe, one of the most important aboriginal inventions in the northern hemisphere, has contributed directly or indirectly to the great expansion of northern peoples and has encouraged man to invade and reside permanently in many inland regions which had previously discouraged occupation" (op. cit.:157). Proto-Athabascan has a rich complex of snowshoe vocabulary. For the Koyukon snowshoe (Jetté and Jones 2000:67–69) there are terms for the toe-hole area, broad (toe-hole) rectangular webbing, fine hexagonal webbing, foot harness, types of cross-braces and frames, and frame webbing holes. There are also special verb themes for installing rectangular vs. hexagonal webbing. The snowshoe has been a major factor in the long-term maintenance of the large Northern Athabascan territories and thus is pertinent to the AGCH.[13] The snowshoe should be regarded as *the* emblem of Athabascan prehistory.

E. James Dixon (2001:284) made this observation about Interior Alaska obsidian and trade networks:

> Trace element analysis indicates that obsidian from the Wrangell Mountains occurs in the lowest levels at Broken Mammoth and Walker Road sites. Obsidian from the Batza Tena [on the upper Koyukuk River] on the south side of the Brooks Range also occurs in Tanana Valley Nenana complex sites. These discoveries demonstrate that a widespread trade network was already in place in interior Alaska probably as early as ca. 11,700 BP.

With more than 11,000 Alaska Athabascan place names now on record, we know that very comprehensive Athabascan trail networks extended throughout western, central and eastern Alaska. The distances involved for the transport of upper Koyukuk River obsidian noted by Dixon are nearly 500 miles (to the middle Nenana River) and over 600 miles (to the upper Tanana River). By inference it seems to me that the advanced snowshoe had to be used in such travel feats. Also I think it is likely that some Athabascan place names descend from the earliest times of Athabascan occupation. Two such place names may be: Koyukon *Bæts'ə Tənə* 'obsidian trail,' the famous obsidian source on the Koyukuk River (Clark and Clark 1993); and the name for the Tanana River Valley in Lower Tanana, *Tenæ Don'æ* 'trail upstream.'

The Northern Athabascans have had every means necessary to reside above 58° north, taking full advantage of winter travel, large game behavior, and food preservation in the cold Subarctic. The primary materials on Athabascan ethnography and lexicon should be considered in hypothesis building about the early sites in Alaska and Siberia as well as for a wide range of questions about Dene-Yeniseian prehistory.

5.0. CONCLUSIONS

In this paper I have offered proposals that linguistic conservatism and delayed language change have contributed to the assembly of considerable numbers of cognate roots and morphemes for Dene-Yeniseian. Also I have cited a wide variety of sources to promote data integration and inter-disciplinary discussions. Here is a list of some of the major points:

- There is ample evidence to recognize Dene-Yeniseian as a proven language stock.
- Almost all movement into Alaska from Siberia was prior to the flooding of the Bering platform, prior to 10,000 years ago, and there was a hiatus in eastward movements into Alaska for the next 5000 years.
- The older sites on the Tanana Valley had settled populations by 12,000 years ago. The Northern Archaic archaeological tradition in Northwest North America has continuity with contemporary Athabascan and spans more than 6000 years.

[13] Vajda and I have contemplated the similarity between Ket 'skis' *asl* and Proto-Athabascan *'aˈxʸ* 'snowshoes'. Evans (2010:124) has made note of this as well.

- Numerous Athabascan vocabulary complexes (anatomy, flora, birds, lithics, landscape) attest to long-term adaptation and intersect with much archaeological evidence in the areas that have some of the oldest sites in Alaska.
- There are well-researched human biological traits that imply early interaction at the northwest, southwest and southeast edges of the extended Proto-Athabascan language area.
- The large territory of the Athabascan languages in North America (over 1.5 million square miles) is reflected in features of Athabascan geographic names and spatial orientation. There are fine-grained similarities in place names content and structure in dispersed languages. The Northern Athabascan hydronymic districts that mark both place name structure and regional identity must be very ancient. The Northern and Pacific Coast languages have a pervasive riverine directional orientation system. These systems reflect a robust territoriality and travel prowess.
- Shared language boundaries throughout Northern Athabascan have promoted homogeneity within the extended language area. It is likely that large sub-areas were depopulated and then repopulated by small Athabasacan bands. The sociolinguistic situation of the Athabascans in the isolation of the North American Subarctic contrasts sharply with that of the Northwest Coast where Tlingit and Eyak have been in a diffusion corridor with layers of coastal transients.
- Athabascan word formation evolved in several unique ways that appear to have promoted linguistic homogeneity and conservatism. Highly complex templatic word formation with the layering of conditionally dependent look-ahead strings is highly similar in all well documented Athabascan languages. We think that the clamp effect plays a role in preserving the content of look-ahead strings in distinct Athabascan languages. As shown in Table 1, even the details of the most suppletive verb stem variation are retained in the distant languages.
- A model of Na-Dene expansions, as suggested in Figure 3, with early North American branchings of Tlingit and Eyak is a plausible time frame that is supported by various strands of evidence.

Recognizing that the Athabascan languages as a language family in which language change has been on a unique and slower time table than most language families contributes to our understanding of how such a strong historical linguistic signal for Dene-Yeniseian is being assembled.

The best material culture study for any Athabascan language in over 50 years is the still unpublished MA thesis by Thomas O'Brien (1997, to appear), "Athabaskan Implements from the Skin House Days as Related by Reverend David Salmon." In May 2007, the distinguished Gwich'in elder David Salmon of Chalkytsik, then 96 years old and now deceased, commanded the attention of several hundred people assembled for the ground-breaking ceremony for the Morris Thompson Cultural Center in Fairbanks when he said something like, "The Athabascan people have had more than 10,000 years to learn how to live on this land." The Dene-Yeniseian language stock is in fact direct confirmation that a population much more ancient than 10,000 years is ancestral to Athabascan and to Na-Dene peoples. As Edward Vajda has written, the Dene-Yeniseian language connection "can wield a power vast enough to reunite entire continents." Due to Dene-Yeniseian we anticipate that there will be much greater interaction between the disciplines and subfields of linguistics, archaeology, ecology, and human biology. More significantly, the intellectual traditions that are embedded in these languages, such as the great knowledge base on tools that David Salmon shared throughout Alaska and in O'Brien's thesis, are going to attract much more attention and respect as ideas that have been passed down to us from very ancient times.

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