

## **CORRELATING PALAEO-SIBERIAN LANGUAGES AND POPULATIONS: RECENT ADVANCES IN THE URALO-SIBERIAN HYPOTHESIS**

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### **Introduction**

Since the publication of Fortescue (1998), in which I presented a synoptic model for the origin and present distribution of languages across the Eurasian Arctic – the so-called Uralo-Siberian hypothesis<sup>1</sup> – a number of new facts and ideas within linguistics, archaeology and population genetics have come to light that necessitate adjustments to that model and to the overall picture of prehistoric population movements among ‘Palaeo-Siberians’. These newer sources include Irina Nikolaeva’s (2006) historical dictionary of Yukagir, my comparative dictionary of Chukotko-Kamchatkan (Fortescue 2005a) and my subsequent investigation of the relationship between Chukotko-Kamchatkan and Nivkh (Fortescue 2011a), also the work of Edward Vajda and colleagues indicative of a genetic link between the Yenisseian and Na-Dene languages (Kari & Potter 2010).

As regards the relationship of Chukotko-Kamchatkan (CK) and Nivkh (the latter not included in Uralo-Siberian in Fortescue 1998), it has become clearer that CK is not linked to Uralo-Siberian (U-S) in a straightforward way – what CK and Nivkh have in common morphologically and lexically is (by and large) not the same as what CK and Eskimo do. This appears to be true in physical genetic terms as well as linguistically. On the other hand, no further convincing evidence has emerged to suggest that either Ket or Nivkh belong directly to U-S. So the traditional term ‘Palaeo-Siberian’ (or ‘Palaeo-Asiatic’) is best seen today as covering at least three separate stocks (all still tentative): Yukagir-Eskimo-Aleut (the U-S cluster), Nivkh-Chukotko-Kamchatkan, and Dene-Yenisseian. They are typologically quite distinct as regards their essential morphology, respectively suffixing-only, noun-incorporating, and discontinuous templatic. Of course the first two of these stocks may be related at a still deeper (and less linguistically accessible) level. See for instance Kortlandt (2004), who proposes, based on certain inflectional endings, that Nivkh is related to U-S within a still larger ‘Indo-Uralic’ entity similar to Greenberg’s ‘Eurasianic’. At all events, most potential cognates within the separate groupings (and between Yukagir and Uralic for that matter) – do not look like candidates for culturally motivated loans, but refer to basic lexical concepts. I would still maintain that the best way to look at the relationship between the so-called Palaeo-Siberian languages is as a ‘mesh’ with several overlapping sub-groups (‘areas’ if you will), within which

only part or parts can lead back directly to a distinct proto-language shared with Uralic.

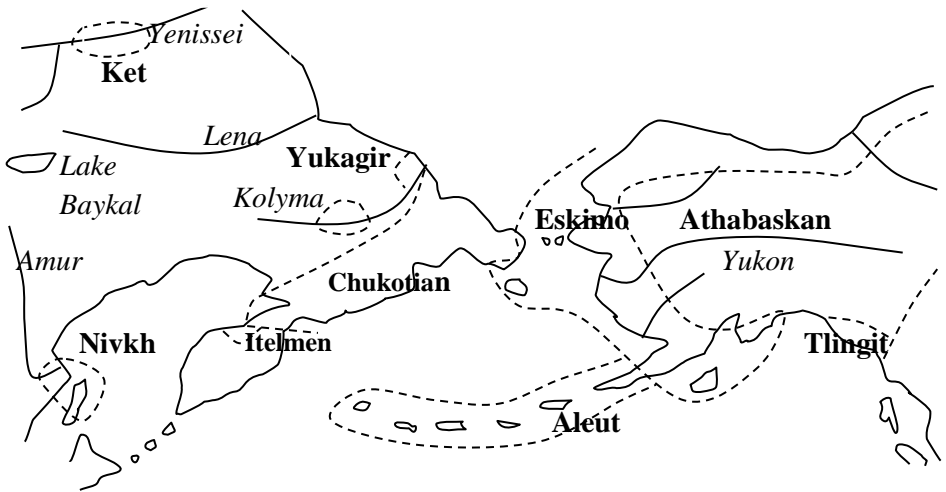
Little new of a lexical nature has been unearthed as regards the westernmost link to Uralic since my book appeared, although as regards the morphology Seefloth (2000) has presented a comparison of Samoyedic and Yupik personal possessive and verbal paradigms in the spirit of the U-S hypothesis. He claims on this basis (op. cit.: 167) that the relationship here may be more straightforward than the correlation of these morphemes in Samoyedic and the innovative Ob-Ugrian languages within Uralic itself – something of an exaggeration no doubt, though the morphological parallels are striking. Further arguments have also been presented by Janhunen (2009) and Häkkinen (2012) for the eastern, Siberian homeland of the Uralic languages (close to the Sayan region), as proposed in Fortescue (1998). This is based on the particularly archaic nature of the Samoyedic branch of the family (a claim consistent with the Uralo-Siberian hypothesis) plus the evidence of early loans into Yukagir.<sup>2</sup> Janhunen further accepts the possibility that Yukagir is a ‘para-Uralic’ language, with a common source in Pre-Proto-Uralic, earlier than Proto-Uralic, which he tentatively dates to around 5,000 years ago (op. cit.: 68). Puszta (2004) goes further and suggests a broad Uralic-Palaeo-Siberian mesh of languages all the way across northern Eurasia.

The first section of my paper will focus on the Yukagir-Eskaleut connection considered independently of the broader Uralic link (a purely heuristic decision). Thereafter I shall investigate the light that new, more fine-grained mtDNA studies have cast upon population movements in the Siberian and North American Arctic in general. Figure 1 indicates the distribution of the relevant language groups today.

### **The Yukagir-Eskaleut relationship**

The core of the argument for a genetic link between Yukagir and Eskimo-Aleut (EA) lies in the morphology, which is treated in some detail in Fortescue (1998: 109ff.). Amongst the most striking points are the following:

	<i>Yukagir</i>	<i>Eskimo</i>
Verbal inflections:	trans. 1s <i>-ŋ<sup>3</sup></i> 3pl <i>-ŋi</i>	1s <i>-ŋa</i> (Al. <i>-ŋ</i> ) 3s/pl <i>-ŋi<sup>4</sup></i>



**Figure 1:** Contemporary ‘Palaeo-Siberian’, Eskimo-Aleut and Na-Dene languages

Nominal inflections:	3 poss. <i>*-ntə<sup>5</sup></i>	3s rel. poss. <i>-n<sup>6</sup></i>
	vialis <i>*-(n)kən</i>	vial. <i>-kun/kən</i>
	abl. <i>*-(n)kət</i>	<i>-(m/n)əγ<sup>7</sup></i>
	all. <i>-(ŋi)n<sup>7</sup></i>	<i>-(m/n)un</i> (Al. <i>-ŋus/-ŋun</i> )
	adv. loc./lative <i>-nə<sup>8</sup></i>	loc. <i>-ni</i>

Note that most oblique case endings on nouns in both Yukagir and EA consist of a genitive ‘co-affix’ (Yukagir *\*-n*, cognate with Uralic *\*-n*, and EA relative singular *-m*) plus the actual case ending (the *-n-* in Yukagir is the same as in the 3 poss. ending above). The EA genitive/relative singular *\*-m*, ubiquitous in its nominal and verbal inflectional systems, may have had a counterpart in Yukagir later lost (as opposed to final *-m < \*-mə* in verbal paradigms). The genitive case of possessor nominals in possessive phrases in Yukagir is thus zero today. Compare also Eskimo 1pl possessive (and verbal object) inflection *-vut*, Al. *-mas* with Yukagir 1pl pronoun *mit* and Eskimo 2pl *-ði/-ci* with Yukagir *tit* (cf. PU 1st person *\*mV*, 2nd person *\*tV*).

Yukagir shares with EA and Samoyedic (also Ugric) transitive verbal paradigms for 3<sup>rd</sup> person object (extended later in EA to all person objects). Intransitive verbal paradigms are based on active participial forms plus person/number markers in both EA and Yukagir (also Uralic). The Yukagir

‘object focus’ paradigm probably contains the cognate of the EA 3<sup>rd</sup> person suffix *-(ŋ)a*, which also functions as object marker in transitive paradigms, namely *-m(ə)lə*, where the *-mə* is a nominalizing affix with passive participial function (perhaps cognate with Inuit *-va-/-pa-* of the transitive indicative paradigm) and *-lə* corresponds to Proto-Uralic 3s *\*-sä*.<sup>9</sup> So Yukagir *-mələ* could correspond directly to the Inuit Eskimo 3s/3s transitive indicative inflection *-vaal/-paa*. The Yukagir OF construction as in *kudedə-mlə* can be glossed either as ‘s.th. killed by him’ or ‘he killed it’ (cf. Nikolaeva 1988: 149), parallel with the Eskimo ergative construction, as in West Greenlandic *tuqut-(t)a-a* (kill-PASS.PART-3s). This is the source of the clausal construction in *piniartu-p tuttu tuqup-paa* (hunter-REL reindeer kill-3s/3s.INDIC) ‘the hunter killed the reindeer’. The basic transitive clause distinction in Eskimo is between a nominative/ accusative type for indefinite object (absolute subject plus instrumental object NP) and an ergative one for definite objects (relative case subject plus absolute object). In Yukagir an overt object in the main or ‘predicate-focus’ construction (with 3<sup>rd</sup> person subject) is in the accusative if definite, otherwise in the instrumental (the latter like in Eskimo), whereas an object in the OF construction usually takes a special ‘predicative’ focal marker (unlike in Eskimo).<sup>10</sup>

The distribution of focal markers in Yukagir is at all events ergatively based, so there is some reason to believe that ergativity may have been an original feature in Yukagir as well as in EA (Fortescue 1998: 114) – at least its OF transitive construction would be a good source for it. If there once was a distinct ergative/genitive ending in *\*-m* lost in Yukagir, then the subject in the OF construction could originally have taken it and its loss could have precipitated the emergence of the focus-marking system of the language (both in the verbal paradigm distinction and in its nominal focus marking). There is also a subject-focus (intransitive) verbal paradigm in *-l* for all persons/number of subject, which corresponds to the EA ‘contemporative’ mood in *-lu(ni)*, which has both subordinate and coordinate uses but which precisely indicates ‘same subject’ as the superordinate/ coordinate main verb.

In general, there is a Uralic-like cast to both Yukagir and EA, quite different from the basic clausal profiles of CK, Nivkh and Ket. These all belong to the incorporating rather than affixing type of polysynthesis. Although Chukotian languages display ergativity this is not based historically on passive participles and may in fact be due to Eskimo influence (cf. Fortescue 1997). Yukagir and Samoyedic can be said to represent a pre-polysynthetic stage out of which full-blown polysynthesis of the suffixing-only type could have developed, both containing, for example, a number of lexically heavy verbalizing suffixes of the Eskimoan type (some indeed perhaps cognate).

Some of the better candidates for lexical cognates in Yukagir and Eskimo from Fortescue (1998) are given below, now with the (Proto-)Yukagir forms

supplied by Nikolaeva (2006) – Kol. is Kolyma, Tun Tundra, PS Proto-Samoyedic, and PU Proto-Uralic. The (Proto-)Eskimo forms are from Fortescue et al. (2010) – PI is Proto-Inuit, PY Proto-Yupik, Al. Aleut, Sir. Sirenik(ski), and NSY Naukan(ski) Siberian Yupik. ‘:’ indicates vowel length and a following apostrophe indicates a palatal consonant. Yukagir ‘j’ is the same as Eskimo-Aleut ‘y’ (a purely orthographic difference).

<i>(Proto-)Yukagir</i>	<i>Proto-Eskimo</i>
<i>aka</i> : ‘elder brother’	PI <i>akkak</i> ‘uncle’
<i>a:l</i> ‘below’ (also <i>ar-</i> ‘bottom, sole’)	<i>alu(R)</i> ‘sole’ (and <i>atə-</i> ‘below’)
<i>amlə-</i> ‘swallow’	<i>ama(C)</i> ‘suckle’
<i>an-</i> ‘speak’	<i>anəR-</i> ‘breathe (out)’ (and <i>anə-</i> ‘go out’ – cf. also Al. <i>anRi-</i> ‘breathe, voice, soul’)
<i>aŋa</i> ‘mouth’	<i>aŋ-va-</i> ‘open’
<i>carqə-</i> ‘bent’	<i>caqə-</i> ‘turn, move away’
<i>ci:daya</i> ‘ground squirrel’	<i>cikdiy</i> ‘(ground) squirrel’
<i>cowinə</i> ‘spear (and <i>coyo-</i> ‘cut’)	<i>caviy</i> ‘knife’
<i>ey-</i> ‘walk, go’	<i>əyləR-</i> ‘move, travel’ <sup>11</sup>
<i>em-</i> ‘dark’	Al. <i>amax</i> ‘night’
<i>emä</i> ‘mother’	PY <i>əma</i> ‘grandmother’
<i>enc’-</i> ‘live’	<i>ət-</i> ‘be (at, thus)’
<i>epel’ə-</i> ‘dirty, soil’ <sup>12</sup>	<i>əpəR</i> ‘dirt’
Kol. <i>ew-/emp-</i> ‘virgin snow’	<i>apun</i> ‘snow on ground’, <i>apə-</i> ‘become covered with snow’
<i>əl-</i> ‘not’ (and <i>əl’l’ə</i> ‘no’)	<i>-(ŋ)it-/-(ŋ)il-</i> ‘negative, not have’ <sup>13</sup>
<i>iŋc’ə</i> ‘sinew, thread’	PI <i>iŋaluk</i> ‘intestine’
<i>iw-</i> ‘suck (breast)’ <sup>14</sup>	<i>əməR-</i> ‘drink, water’
<i>jam-</i> ‘upper reaches, source (of river)’ <sup>15</sup>	<i>imaR</i> ‘sea, contents’
<i>jeŋkilə</i> ‘fire’	<i>əkə-</i> ‘burn’ (and <i>ək-nəR</i> ‘fire’, Al. <i>ikla-X</i> ‘firewood’)
<i>jew-</i> ‘bump into’	<i>apuR-</i> ‘knock against’
<i>ke:je</i> ‘before, in front’	<i>kayəmə(t)-</i> ‘push forward’ <sup>16</sup>
<i>kewe-</i> ‘go away’	<i>kivə-</i> ‘sink’
<i>kiye-</i> ‘prick, stab’ <sup>17</sup>	<i>kəyə-</i> ‘bite’, PI <i>kəyaq-</i> ‘notch’
<i>kin</i> ‘who’ <sup>18</sup>	<i>ki-na</i> ‘who’
<i>kit-</i> ‘end, reach’	<i>kətə-</i> ‘area in front or towards water’ (and <i>kət-</i> <i>vaR-</i> ‘move in that direction’)
<i>l’ə-</i> ‘be’ (and <i>l’ī</i> ‘have’)	<i>-li-</i> ‘become’, <i>-ləy</i> ‘provided with, having’

*ləy-* ‘eat’<sup>19</sup>

*li:pə* ‘snow shovel’<sup>20</sup>

*ma:lə-* ‘both’

*mel-* ‘breast’

*n'e:-* ‘call, tell’

*n'iyk-* (or *n'iy-*) ‘bend, stoop’<sup>21</sup>

*n'o:-* ‘weave’

*n'oɣ-* (or *n'oŋk-*) ‘string’

*-n'ə-* ‘have, get’

*n'öm-* ‘press, squeeze’

*n'oqo-* ‘be torn off, come free’

*oŋ-* ‘put on, wear’

*öŋkə-* ‘stand’ (and Kol.

*ögöte-* ‘put’)

*öw-* ‘be’ (Kol. (*ŋ*)*o:-*, and

*ŋōlā* ‘become’)<sup>22</sup>

*para-* ‘origin, bottom’

*poj-* ‘white’

*puyö* ‘heat, sun’

*puke-* ‘swell’

*pultə-* ‘be pierced, holed’

*punkə* ‘hummock’

*qa-* ‘what, when, where, how, when’ (and *qam-* ‘how many’)<sup>23</sup>

*qar* ‘skin, cover’

*qon-* ‘go about, nomadise’,

Tun. *qan-dej-* ‘accompany’<sup>24</sup>

*ta-* ‘that’<sup>25</sup>

*talqə-* ‘shelter’

Kol. *töw-/tömp-* ‘cover,

close’, *tobul* ‘skin’

*u:-* ‘roast, fry’

*ule-* ‘fill’

*iya-* ‘swallow’

*ipu-n* ‘oar’, *ipuy-* ‘lever up’

*malRuy* ‘two’ (and *maliy-* ‘follow’)

*məluɣ-* ‘suck, breast’

*nəpə* ‘sound, voice’ (and PY *nəpuy-* ‘speak, make noise’)

*n'əka-* ‘feel inferior’

*nuvə-/n'uvə-* ‘thread’

*nəyaR/n'əyaR* ‘snare’ (and *nəyuRluR* ‘loop’)

*-nəɣ-* ‘get’

*nəməR-/n'əməR-* ‘wrap around’ (and PI *nəmnuiq-* ‘be squeezed’)

*nuqət-* ‘pull/hold back’ (and *nuqəaR*

‘detachable throwing board for harpoon’)

*uŋəR-* ‘lace up’

*əkə-* ‘get or put in’

*-ŋu-* (and *-ŋuR-* ‘become’)

*paðə-* ‘opening, entrance’

*puyur* ‘smoke’ (and PI *puyurəq* ‘frost smoke’)

*puqla* ‘heat, hot water’

*puyə-* ‘come to surface’ (and PI *pu(y)uq* ‘bag, poke’)

*putu(-)* ‘hole, make a hole’

*pəŋuR* ‘mound, hillock’

PI *qanuq*, PY *qayu(q)* ‘how’, *qəŋa* ‘when’ (and *qavcit* ‘how many’, Al. *qana-* ‘which, where’, *qanayaam* ‘when’)

*qaðə-* ‘top or surface of s.th.’, *qa-liR* ‘covering’

*qani-* ‘accompany part of way’

*ta-* ‘that’ (anaphoric/deictic prefix)

*talu(-)* ‘screen, cover’

*tupəR* ‘tent’

*uyu-* ‘be cooked, heated up’

*ulə-vkaR-* ‘fill, be full’ (and *ulə-* ‘be a flood’, Al. *ulRi-* ‘overflow’)

<i>um-</i> ‘close, shut’	<i>uməy-</i> ‘close, cover’
<i>wa:l’</i> ‘near’, Tun. <i>wal’be</i>	<i>ila</i> ‘part, relative’
‘friend’, <i>wal’yare</i>	
half, opponent <sup>26</sup>	

The relevant sound correspondences (other than one-to-one) suggested in Fortescue (1998) for a wider array of potential cognates are:

<i>Yuka.</i>	<i>PE</i>
*l/l’	Ø-/l-
*-nt	-t-/n <sup>27</sup>
*-nc’-	-t-
*-ŋk-	-k-
*-mp-	-p-
*w	Ø-/v-
*j	Ø-/y-
*-ɣ-	-ɣ-/R- (and -k-/q-) <sup>28</sup>
*-r-	-l/ð-

There is some evidence of a palatal series in Proto-Eskimo (PE) as in Yukagir, namely in the correspondence between Sirenik /y/ – /n/ elsewhere – and Yukagir /n’/.

As regards vowels, Yukagir /o/ and /u/ (<\*/ü/) correspond to PE /u/; Yukagir /ö/ varies with /e/ and /u/, and PE schwa may correspond to a full Yukagir vowel; Yukagir /e/ and /i/ correspond to PE /i/ but /e/ sometimes to PE /a/, like Yukagir /a/. Yukagir schwa is found only in final position of certain bisyllabic stems and in suffixes. Residual vowel harmony (from Proto-Yukagir) complicates the picture.

It should be pointed out that Yukagir lacks some of the elements that seem to link EA directly with Proto-Uralic and Proto-Samoyedic (apart from the *-m* accusative and/or relative discussed above, and the dearth of personal possessor affixes). These include in particular the plural marker *\*-t* and the dual marker *\*-k* on nouns (as opposed to zero singular-marking). Nevertheless, it is possible that Yukagir is more closely related to Samoyedic than to Uralic as a whole. That Uralic somehow represents a blend of an eastern (Samoyedic) and a western (Finno-Ugric) proto-language – the result of the meeting of a Siberian and a European population – has been suggested in the past (and is implicit in Pusztay’s model mentioned above), although Janhunen (op. cit.) sees no reason for this. Whatever the case, it seems to me that the exact relationship of Yukagir to Uralic needs to be viewed within the wider Uralo-Siberian ‘stock’, which was

envisaged in Fortescue (1998) as a far-flung ‘mesh’, the result of repeated episodes of language interaction over a long period of time.

### **A new scenario for correlating genes and languages around Bering Strait**

In my 1998 book I suggested that distinct languages may have arrived at the Bering Strait in several waves, resulting in successive overlaps or mixtures – producing in effect a ‘mesh’ with roots in very ancient times within Siberia. At the time, potentially corroborating evidence from mtDNA studies were promising but confusing and only the most general statements could be made. Most effort seemed to be spent amongst New World geneticists in arguing for a multiple as opposed to a single population movement into the New World (the latter view is still widely held). Sorting out the relationship between ethnolinguistic groups and mitochondrial lineages was rendered open to multiple interpretations, given the reality that any given contemporary linguistic community is almost always made up of individuals displaying more than one distinct haplogroup affiliations. The most that could be stated with reasonable certainty was that the most likely place in the Old World where the particular combination of haplogroups found in the New World (A2, B2, C1, D1, 2 and 3 and now also X2a – cf. Tamm et al. 2007) could have originated was in Mongolia or the Altai/Sayan area of central Asia, where it was assumed the ancestors of all New World populations ultimately came from (cf. Merriwether et al. 1996).

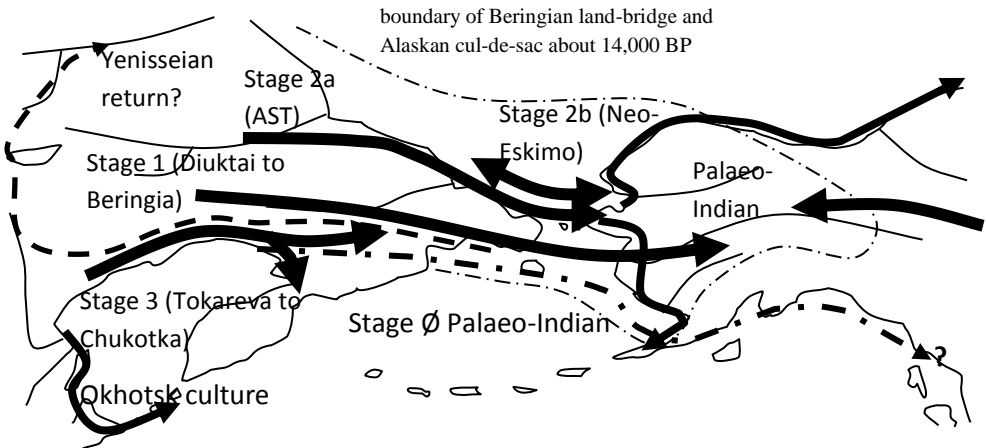
If there was a single founding event in which the pioneers entering the New World already bore an array of mitochondrial lineages, what hope was there of relating individual groups dispersing within the Americas to particular elements of that array? Greenberg’s alternative, linguistically based theory of a threefold migration into the new World (‘Amerindian’, Na Dene, and Eskimo-Aleut – cf. Greenberg et al. 1986) could be accepted or rejected, according as to how the genetic data was interpreted. Today there is much more data available, and the notion of a single entry into the New World is becoming questioned more and more often. Although Greenberg’s model has largely been rejected by the linguistic community (especially as regards the lumping together of all ‘Amerindians’), the three-wave model has, it appears, had something of a comeback among geneticists. However, what is emerging in a new consensus between linguistics, population genetics and archaeology is not exactly a vindication of Greenberg’s over-simplified model.

Although the overall picture remains somewhat confusing, it begins to be possible to construct more detailed models based on successive waves of entry – see in particular Reich et al. (2012), who argue that there were three waves of gene flow between Asia and the New World corresponding roughly to the First Americans, the Na-Dene, and the Eskimos (as Greenberg et al.’s model suggests). The divergence from Greenberg’s model lies in what is believed to

have happened when successive waves met and interacted. Thus the authors state that Eskimo-Aleuts (the third wave) have 57% of their genes from the first wave, and Chipewyan Athabaskans (the second) have 90%. They furthermore interpret the recent DNA analysis of a hair preserved from a 'Palaeo-Eskimo' Saqqaq man of Greenland as pointing towards the same intermediate entry into the New World as that associated with the Na-Dene (cf. Gilbert et al. 2008).

With the general caveat that no one population is ever homogenous as regards its mtDNA profile – and thus that language and genetic makeup can never be strictly equated – I would suggest that the events sketched below for the late Pleistocene and ensuing Holocene could explain much of the variation found today (schematically portrayed in Figure 2). I will simply be associating the bearers of particular proto-languages with particular combinations of mtDNA lineages entering the circum-Beringian region. Crucial for this 'bird's eye view' is the notion of the admixture of successive waves of people – and languages – arriving from Asia. The scenario is consistent with the scenario presented by Tamm et al. (2007), whereby a population wave bearing lineage D2a is seen as entering North America perhaps 4-5 thousand years ago (equatable with the Arctic Small Tool people), i.e. later than the initial entry of pioneers into the New World. Thereafter followed a subsequent back-migration to the west bearing a returning flow of A2a genes (shared by Eskimos, Chukchis and Athabaskans). They also propose a much earlier (and more speculative) back-migration bringing C1a genes back to central Asia (and Japan) from Alaska.<sup>29</sup> Volodko et al. (2008) see two original founding waves, one with a focus in the Amur region (whence C1 and D1 and D2 were brought, about 11.8 thousand years ago), and one, still earlier, in the Sayan/Altai region of central Asia (whence D3a, now widely distributed in northern Asia, started to spread about 25-30 thousand years ago). Both groups of researchers see the A2 lineage as developing *in situ* in Beringia later than the founding wave(s), probably during a long period when the way beyond into America was blocked (starting around 16.2 +/- 2.1 thousand years ago acc. Volodko et al.: 1095). They further date the emergence of A2a out of A2 to 4.7 +/- 1.9 thousand years ago in isolated southern Alaskan/NW coast enclaves, and A2b later, about 2.6 +/- 1.4 thousand years ago.

*Stage 1.* Following the initial entry of ‘Palaeo-Indians’ into Beringia and beyond (let us call it ‘Stage Ø’ since the focus of this paper is on later stages),<sup>31</sup> a ‘Palaeoarctic’ population related to the Diuktai culture of the Lena/Aldan valleys of around 16 to 12 thousand years ago and typified by a combination of mainly D and A haplogroups (from central Siberian roots), entered Beringia, eventually to develop into the Na-Dene of the interior – A2 is almost fixed among northern Athabaskans today. Eventually they came into contact with ‘Palaeo-Indian’ groups ancestral to, amongst others, Algonquian speakers (typified by predominant A haplogroups).<sup>32</sup> This may have occurred either within the Alaskan interior or on the adjacent Canadian Shield some 12 thousand years ago once the inland corridor south had opened. Note the ‘Albumin Naskapi’ mutation (Scott &



**Figure 2:** Early circum-Beringian population movements

Stage Ø: ca. 16 - 14,000 BP?

Stage 1: ca. 14,000 - 12,000 BP

Stage 2a: ca. 6,000 - 5,000 BP (spreading to Greenland and the Alaskan Peninsula)

Stage 2b: ca. 2,000 BP (Thule expansion to Greenland 1,000 BP, Punuk briefly back to Kamchatkan isthmus by 500 BP)

Stage 3: ca. 3,500 - 1,500 BP (moving onto Chukotkan peninsula still later)

Okhotsk culture: ca. 1,500 - 700 BP

Yeniseian return: ca. 3,000 BP?

Ymiakhtakh (Yukagir?) culture, spreading from the Baykal region, was already in place over much of northern Siberia by 4,000 BP

O'Rourke 2010: 129) that is found only in Algonquian and Athabaskan populations (and some immediately adjacent groups).

A somewhat different scenario is suggested by Achilli et al. (2013), in which the Na-Dene represent a mixing of an intermediate wave of entry into the New World, through the ice-free corridor in the early stages of the Holocene<sup>33</sup> which brought X2a and C4c lineages – attested predominantly among Algonquians, but also Wakashan, Salish and other adjacent northern populations – plus a much later input to the Na-Dene gene pool of A2a from Alaska (along with D2a1), associated with the Palaeo-Eskimos.

*Stage 2a.* Newcomers bearing the Arctic Small Tool ('Palaeo-Eskimo') tradition – probably with roots in the Bel'kachi culture of interior Siberia about 6000 years ago<sup>34</sup> – arrived in Alaska around 5,000 years ago, well after the flooding of the land bridge (cf. Powers & Jordan 1990). Being already partially adapted to coastal life, these people expanded rapidly along the Arctic coasts both south and east, as far as the Aleutian islands and Greenland respectively. They would have been responsible for the spread of a predominant new haplotype D2a1, as found in the Saqqaq individual mentioned above, also in Sirenik Eskimos and in Commander Island Aleuts (Volodko et al., op. cit: 1093).<sup>35</sup> As Ives (2010: 327) argues, there is reason to believe that the interface between the AST and Northern Archaic (probably Athabaskan) populations was permeable, which supports the 'admixture' model. He dates the D2a1-bearing entry at around 4 to 5 thousand years ago, i.e. falling together with the appearance of the AST people around the Bering Strait.<sup>36</sup> There is no need to assume that the AST people spoke anything other than proto-Eskimo (*pace* Dumond 2010, who very tentatively suggests equating the AST people with ancestral Na-Dene speakers). There would have been gradual interaction and mingling with more numerous Athabaskans from the interior, resulting eventually in the modern Eskimos, characterised by predominant A2a (the Beringian 'trademark' lineage), like their Athabaskan neighbours.<sup>37</sup> Conversely, D2a1 would have been absorbed to some extent by the Athabaskans (and carried south much later by Apacheans). Aleuts display somewhat less A2, perhaps just a matter of sheer isolation, although there may well have been some substratum population involved with whom they merged on the Alaskan peninsula (perhaps related to Northwest Coast populations like the Wakashans or Haida, also bearers of predominant A2 plus some D2 lineages – Merriwether et al. 1996: 208).<sup>38</sup>

*Stage 2b.* Eskimo groups bearing the A2a lineage could then have spread back to Chukotka, perhaps in late Norton times, when Neo-Eskimo cultural developments burgeoned around Bering Strait, culminating in the Birnik-Thule phase in northeast Chukotka. This expanded in turn back into northern Alaska and then rapidly east towards Greenland, thus explaining the high proportion of A2a amongst the modern Inuit. At this time or a little later, in connection with the Penuk whaling culture of St Lawrence Island around 900 years ago, Eskimo

groups also expanded back to the west along the coasts of Chukotka, reaching in the southwest as far as the Kamchatkan peninsula (Fortescue 2005b; for Eskimo-Aleut migrations in general see Fortescue 2013).

*Stage 3.* At about the same time as the Punuk expansion a Chukotko-Kamchatkan population was moving towards the Bering Strait from the coast of the Okhotsk Sea, interacting with the Eskimos in both warfare and trade as they approached the Chukotkan peninsula. The cultural, physical and linguistic results of that meeting are still discernible today. By the time they reached the interior of Chukotka they were practicing reindeer herding, learnt from nomadic neighbours, Evenks and Evens. The Chukotians would have brought new 'Siberian' C lineages (C4b2 and 5a) with them from the Okhotsk coastal region, also a G1 component, especially prevalent amongst Itelmens, but also found among the Yukagir and the Tungusic Even and indeed the Nivkh, further to the south at the mouth of the Amur.<sup>39</sup> This may well reflect the merging of an interior population like the Yukagir and a coastal Amuric group moving northwards – see the discussion in Schurr et al. (1999: 32-33) and also Fortescue (2011a) as regards the Tokareva culture of the Okhotsk Sea coast of some 3,500 years ago, preceding the Old Koryak phase (cf. Lebedintsev 1998: 298). This development would subsequently have been obscured by the Neo-Eskimo A2 gene flow back from America. Note that the Chukchi have a much higher percentage of A2 and D2 than the linguistically closely related Koryak further south (Schurr et al. 1999:14), reflecting their mingling with the modern Eskimo (in whom A2 is the major lineage).

*Further developments within northeast Siberia.* The Yukagir, who once covered a vast area of northern Siberia from the Taymyr peninsula to the Bering Sea and south as far as Lake Baykal, have mixed with or been absorbed by various more recent populations and languages, but a core is probably equatable with the Ymiakhtakh culture of about 4 thousand years ago – cf. Fedoseeva (1980). The 'core' Yukagir display typical Siberian C2 and 3 (now renamed C4 and 5) and also D2 and D3 lineages (Volodko et al. 2008: 1097). These same lineages are also discernible amongst the Nganasan, who represent a Uralicised Yukagir population (the original Tavgi). The D3 lineage here is of particular relevance for the Uralo-Siberian hypothesis since it is also found among Eskimos (Naukan and North American Neo-Eskimo) and Chukchi (D3a2a).<sup>40</sup> It is found among Uralic Samoyeds, including the Nganasan and southern Samoyedic groups that have shifted to Turkic – Tuvans and Tubulars from the Sayan region (cf. Starikovskaya et al. 2005: 82). Both the D lineages could have been brought across together to Alaska (Gisele Horvat, pers. comm.), and thus be relatable to the AST arrival (associated most strongly with D2a1). The age of the sub-cluster of D3a2a that contributed to the formation of the modern Eskimos and Chukchis is estimated by Volodko et al. at 6.4 +/- 2.9 thousand years, i.e. within the range of the arrival of the AST people in Alaska (op. cit.: 1097). The type of D3 found

amongst Yukagirs is D3a1 and 2, and according to Volodko et al. (op. cit.: 1094) the D3a2a haplogroup converges at about 11.1 +/- 4.3 thousand years ago, in conjunction with an Upper Palaeolithic dispersal initiated northwards from the Altai-Sayan region. This corresponds nicely with the scenario in Fortescue (1998: 184) for the origin of the AST in the Sumnagin Mesolithic (out of which both the Bel'kachi and Ymiakhtakh stages probably arose), somewhere not far from Lake Baykal, although the time of hypothetical common Uralo-Siberian being spoken in that region might have been somewhat earlier than the 6,000 years ago suggested.

There is also some genetic data for the Yukagirs which could reflect a common gene pool with eastern Uralic speakers, e.g. the strong presence of Y-chromosome haplogroup N. mtDNA haplogroup G1 points towards Chukchi to the east rather. However, 'Beringian' A2 is quite lacking except in the mixed Chuvantsi-Chukchi population (Volodko et al. 2008: 1087). The Samoyedic (Uralic) Selkup also display A2a from further east (not found in the Yukagir but found also amongst Tungusic Evenks – Ives op. cit.: 327), the Beringian type mentioned above as reflecting Tamm et al.'s proposed back-migration.<sup>41</sup>

As for the Yenisseian Kets, still further west, they seem to have been largely absorbed by more widespread Siberian neighbours (including the Uralic Selkups). They display a mixture of Siberian lineages (including A1, from which Beringian A2 developed at a very ancient stage, and some C and D lineages) and others more typical of further west in northern Europe. Attempts to find a common mtDNA link with the Na-Dene of North America have as yet produced no positive results, though there are specific links to the neighbouring Selkups.<sup>42</sup> It is conceivable that a small group of Na-Dene speakers remaining on the Siberian side of Beringia as the land bridge was gradually swamped migrated further west, eventually reaching the Baykal-Angara region, probably following a riverine route.<sup>43</sup> In fact the Ket also share with the Selkup an unusual conflation of meanings for terms meaning 'towards/away from the water' and 'towards/away from the fire', which points back in the direction of the Nivkh of the lower Amur and the coastal Tungus (Evenks and Evens) of the Okhotsk coast, who display the same conflation. Could this not reflect the route this group took? Recall the A2a link back from the Selkups to the Evenks and beyond to Alaska mentioned above. One of the tribes heading into the Sayan region west of Lake Baykal and the upper reaches of the Yenissei could have been these remnant Na-Dene speakers, now mixing with other peoples of the region – in particular with the southern Samoyeds, including the Selkup. The Sayan, note, is a quintessential 'refugium' area, with movement south blocked by a formidable mountain range. Compare the layering of populations that Janhunen (2009: 72) describes for this relatively small area: an early Indo-European layer (Tocharian?), then a Samoyedic one (the Tagar culture), followed by a Yenisseian one (the Tashtyk culture?).<sup>44</sup> Both the Samoyeds and the Yenisseians

were ultimately ousted northwards (if not absorbed) by Turkic speakers from further south (perhaps initiated by the turmoil of Hunnic times).

That this group may have wandered so far from the vicinity of the Bering Strait, across territory by no means devoid of other small tribes, is by no means impossible, especially if they adapted early on to a riverine way of life (which typifies them today), unlike surrounding peoples. Compare the wanderings of those 'other' Na-Dene, the Apacheans, who reached almost as far on the American side as the Yenisseians may have done on the Asian side (cf. Ives 2010: 329-331). Their genetic profile (displaying B haplogroups unknown in Alaska) is quite different from that of their Alaskan cousins – and reflects that of the surrounding people they have mixed with, like the Hopi. However, the jury is still out as to whether there ever was such a thing as a Yenisseian return. The alternative (a very early migration – over 10,000 years ago – of the Na-Dene from a Siberian source common with the Yenisseians) presupposes a remarkably slow evolution of the two language families, which is not impossible of course.

Beyond the period we are interested in, other groups moved north towards the Arctic within Siberia – migratory Tungus reindeer herders and Yakut cattle breeders in the Lena valley, soon followed everywhere by Russian colonists – disturbing the tell-tale distribution of languages and genes spreading out in 'Palaeo-Siberian' times from south central Siberia towards the north and east.

### Summary

An overall scenario of overlapping waves of new arrivals from the Old World into the New (at least three, complicated by back movements) is thus by no means improbable. It suggests the admixture of genes as successive populations met, newcomers mixing with groups from preceding waves that for one reason or another had chosen to stop, perhaps hindered from further movement east. Each wave would bring its own language with it, which would either be maintained or gradually relinquished in the process. This would be reflected most directly in the mtDNA profile of speakers of the languages concerned rather than in any profound mixing of the languages themselves.<sup>45</sup> The emerging picture is at least consistent with the scenario for the introduction of successive languages sketched in Fortescue (1998), although it is *a priori* unlikely that the genetic and the linguistic picture will match exactly. There are plentiful signs of linguistic contact around Chukotka and the Bering Strait in the form of loan-words and even certain structural influences between the languages concerned (cf. for example Fortescue 2005b on the Chukchi-Eskimo interface). But there remain certain important questions: thus why is there little if any evidence (until very recent times) of language contact between Eskimo-Aleut and Athabaskan? If the respective populations mixed, as the genetic scenario has it, we would surely expect at least some linguistic reflex. Yet these language families appear to be quite distinct from one another in structure and lexicon.

I suggest that there are two major factors at play here: one is the sheer time depth of these events, but a more important factor is language shift. For one reason or another, one language may come to dominate over another even as two populations mix and intermarry, and this may lead to the spread of a language across population boundaries. Thus it is perfectly conceivable that a sizeable number of early Na-Dene groups (bearing predominantly A2 mtDNA genes) switched to Eskimo-Aleut in the vicinity of the Bering Strait when AST newcomers from Asia (bearing D2a genes) arrived, already partially adapted to coastal hunting and bringing technological advances (apparently including the bow and arrow) with them. They would clearly have the advantage if people from the interior were drawn to the coasts, for instance during a period of deteriorating subsistence conditions inland.

In fact there are known instances of groups of Alaskan Athabaskans shifting to different varieties of Eskimo (on the Kobuk and lower Yukon respectively), although these are relatively recent. Burch et al. (1999) discuss the case of Koyukon Athabaskans shifting to Kobuk Inupiaq on the upper Kobuk River. This process (probably in mid 19<sup>th</sup> century) was peaceful, rapid and apparently went almost unnoticed by the people concerned after a generation or so following a prolonged period of bilingualism. Possible triggering factors included the crash of the wild caribou population at the time and the shift of a large portion of the Koyukon population east towards the Yukon with changing trade opportunities, leaving those who remained behind more isolated and reliant on trade links to the coast via their Inupiaq neighbours. The authors point to the fact that the Inupiaq Eskimos and Athabaskan Indians of north Alaska in general have more in common genetically than the former do with other Eskimo groups in southwest Alaska and Siberia. This they explain (under the rubric of 'ethnogenesis') in terms of assimilation and language shift. There are, on the other hand, no attested cases of Eskimo groups switching to Athabaskan.

One final point: the spread of genetic lineages involves individuals, and is thus more prone to admixture than languages spoken by whole communities. Greater variation in the gene pool than in languages can be expected where populations meet and merge, despite the fact that languages change and 'mutate' in their own way faster than genes. Language shift of the kind envisaged above obviously does not result in abrupt population replacement, but may displace the boundaries between languages across boundaries between genetic populations. Just as two populations sharing much genetically can speak quite unrelated languages, so can populations that speak related languages have little in common genetically. This appears to be true, for instance, of the more peripheral members of the far-flung Uralo-Siberian mesh of languages.

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### *Notes*

1. In turn based on the Eskimo-Uralic hypothesis first mooted by Rask (1818) and summarised by Bergsland (1959). Collinder (1940) represents seminal work on the (probable) relationship of Yukagir to Uralic, considerably broadened by Nikolaeva (1988).
2. Häkkinen proposes two layers of loans from Uralic to Yukagir, the earliest with Proto-Uralic \*/s/ corresponding to Ø, the second with it corresponding to /l/ in Yukagir (via East Uralic \*/l/). The correspondence of vowels is more direct in the second layer.
3. i.e. 1s subject of the main transitive paradigm in Tundra Yukagir (dropped in Kolyma). The Eskimo equivalent is for the subject in the intransitive indicative.
4. i.e. 3<sup>rd</sup> person singular possessor, plural possessum, also 3pl object in certain moods. The /ŋ/ is prothetic in both families – compare Proto-Uralic (PU) \*-i- (Samoyedic \*-j-) in similar possessed or oblique case plural inflections.
5. 3<sup>rd</sup> person possessor before case endings – -n- before consonant, -d-/ Chuvan -nd- before vowel (cf. Samoyedic 3sg genitive -nta).
6. Ingredient in relative case 3s -(ŋ)an, 3pl. -(ŋ)ata, built on 3s possessive suffix -(ŋ)a, in which the nasal is prothetic.
7. Probably from \*-(m)kən (as in the ablative of demonstrative adverbials).
8. Nikolaeva compares to Proto-Samoyedic locative and ablative \*-kV-nV (PU \*-nV), where V is a vowel dependent on vowel harmony conditions and -kV- is a general locative/lative found also in the prolative \*-kV-tV (PU \*-tV) – compare the Yukagir vialis and ablative forms above (Nikolaeva: inaugural professorial speech, SOAS 2012).
9. Note that U-S \*/s/ corresponds to EA Ø and to Yukagir /l/ or Ø acc. Nikolaeva (1988: 116). The /ŋ/ in Eskimo -(ŋ)a is epenthetic. Further discussion in Fortescue (1998: 112-113).
10. Both paradigms involve an element -mə, but with different portmanteau combinations with person markers. This is either the result of two distinct nominalising (participial) morphemes having fallen together or of the passive participial \*-mə of the OF paradigm having been transferred subsequently to the predicate-focus paradigm. Note the suggestive parallel between the Yukagir and Eskimo instrumental markers here: Tundra -lak, Kolyma lə- < \*-ləŋ, vs. Eskimo (Yupik) -nək/-nəŋ, perhaps < \*(n)səŋ (with genitive co-affix in the latter).
11. cf. -ləR ‘quickly’.
12. -l’ə is a nominaliser.
13. The /ŋ/ is epenthetic (not present in Aleut).
14. Uralic \*ime-.
15. And PS jām ‘sea, big river’.
16. And perhaps Al. kað- ‘before, in front’.
17. And PS kiə ‘hole’, kiətu- ‘perforate’.

18. Proto-Uralic *ki-/ke-*. The *-n(a)* is a singulative ending found on pronominals in PU and demonstratives in EA.
19. PU *seye-/sewe-*.
20. Proto-Uralic *leppV* ‘blade, shovel’, PS *lapV* ‘oar, row’.
21. And PS *nëkə-/nikə* ‘bow, nod’.
22. May be affixed, in which case the /ŋ/ is epenthetic – uniquely so with this morpheme and related forms in Yukagir. The /ŋ/ in Eskimo is also epenthetic – compare the Aleut cognate, stem *a-* (Attuan *u-*).
23. And various Samoyedic forms such as Nganasan *kanğə*, Enets *kune* ‘when’, Nenets *xan’ana* ‘where’, and Nganasan *kunie* ‘which’, *kanəmtua* ‘how much’. All from PU *ku-/ko-*.
24. And PS *kanə-* ‘go (off)’.
25. And Nenets (Samoyedic) *takī*, which suggests the source of the EA pronominal morphemes in *\*tək-*, Aleut *t(x)-*, in Eskimo affixed only (see Fortescue 1998: 97-98).
26. PU *welje* ‘brother, friend’, PS *wəj* ‘half’.
27. And *-t-* may alternate with *-l-* (e.g. in negative *-(ŋ)it-/-(ŋ)il-*).
28. /R/ or /q/ next to a back vowel.
29. C1a is not present in Eskimos or Chukchis or northern Athabaskans or even Nivkhs, so this is not particularly relevant to the present context. Starikovskaya et al. (2005) doubt that it represented a back-migration to as opposed to a migration from the Amur valley region.
30. Note, however, that they still assume the presence of Eskimo-Aleuts on the southern shore of Beringia, unlike in my model.
31. Probably via ice-free coastal enclaves rather than the inland ice corridor, which would apparently not have opened sufficiently early to allow for the presence of man at the Monte Verde site in Chile of at least 12,500 years ago (cf. Meltzer 2009: 121-130). Whether or not this represents a single entry to the New World is not important here, but there is some evidence that haplogroup B – hardly attested at all in the extreme north of either Siberia or America – might have been introduced this way, along with other lineages predominant in the New World, as a separate coastal entry before the population ‘blocked’ in inland Beringia could expand southwards (cf. Schurr et al. 1999: 35).
32. Specifically A4 and A5 according to the newer terminology.
33. i.e. intermediate between the earliest migration along the North Pacific coast bearing (amongst other founding haplogroups) the B2 haplogroup absent in northernmost North America, and the later one associated with the Arctic Small Tool people.
34. This developed from earlier mesolithic Sumnagin roots. Note that the present scenario clashes with the ‘single entry’ model to the New World which puts the ancestors of the Eskimos in place on the southern coast of Beringia already.
35. Note that this supports the idea that the now extinct Sirenik language was spoken by an original Asian Eskimo group that did not return from Alaska (as Chaplino/St. Lawrence Siberian Eskimo did).
36. He also argues for a back-migration into Siberia of A2-bearing peoples, and for the AST event as an intermediate entry into the New World between the Palaeo-Indian and modern Inuit (with successive admixture of waves).

37. There is a difference in precise haplogroup mutations, however, A2a being shared by Eskimos and Na-Dene (and Selkup!), but A2b shared only by Eskimo and Chukchi, acc. Volodko et al. (2008: 1087). Scott & O'Rourke (op. cit.: 128) further point out a specific A2 site loss typifying Na-Dene but not Eskimos (or other Amerindians, including Haida). There are also Y chromosome differences (see the note below).
38. Raff et al. (2010) conclude from the varying percentages of D2 in human remains from sites reflecting different ages of occupation on the Alaskan Peninsula that there is evidence in support of the idea of a movement of Neo-Aleuts (related directly to the Eskimos) moving out onto the Aleutian archipelago about 1000 years ago, replacing some earlier population. Moreover, they have found unexpected traces of lineage B2 in remains from a site some 800 years old, a lineage found in Wakashans to the south (but not elsewhere in the American or Asian Arctic – op. cit.: 686). This too is suggestive of a mixing of populations if not an actual Wakashan substratum in the region.
39. The Nivkh also show a large Y haplogroup component, perhaps from more recent Tungusic encroachments, but note that both Y and G are also prevalent among the Ainu – from the Okhotsk Culture input to the Ainu? (There are other, unrelated clusters pointing towards the earlier Jomon component in the Ainu population – Schurr 1999: 30).
40. There has been some confusion around the naming conventions of the various D lineages in America and Asia. North American D2 is now seen as part of Asian D4e lineage and D3 part of the Asian D4b. Thus the Asian D4b1 is the equivalent of D3 found in both Yukagir and Eskimo individuals (Gisele Horvat, pers. comm.). For Eskimo D3 see Helgason et al. (2006).
41. And Selkup, Ket and Koryak all share A8 (new A4h). Selkup and Yukagir both also display haplotype C1 according to Merriwether et al. (op. cit.: 208) – this is classed mainly as C4 today (Horvat, pers. comm.).
42. For instance, both share a high percentage of Y chromosome haplotype 1C (pre-2002 nomenclature, now Q – cf. Scott & O'Rourke 2010: 131).
43. They display a typical 'riverine' orientation system, with 'upriver/downriver' terms for 'north/south', etc. (Fortescue 2011b: 99-100). Apparently their words for 'towards the water' and 'away from the water' may once have referred to the smaller tributaries of the Yenisei that they moved on before settling permanently along the Yenisei – for which they have specific upriver and downriver terms (Pevnov & Urmančieva 2010).
44. Which was followed by the Tsepan culture further down the Yenisei. This represents the first clear sign of Yeniseians in the region some 2,500 to 3,000 years ago. Somewhat before this would be a linguistically realistic time depth for the splitting of the Yeniseians from the Na-Dene. Perhaps the arrival of the AST people around Bering Strait some 5,000 years ago precipitated their western movement.
45. Y-chromosome data, although reflecting more widely spaced mutations (on the paternal side), may also be relevant here. A single haplogroup Q is found throughout the Americas (including the Eskimo and Na-Dene), as well as in high proportion amongst the Chukotians, the Sayan Turks (on a Yeniseian substratum), and above all the Kets and Selkups, as mentioned above. Equally intriguing, a second haplogroup C found amongst the Kets and more generally in central Asia and the Russian Far East – including the Nivkh, the Evenks and Evens, and the Koryak – is largely confined on the American side to Athabaskans (Zegura et al. 2004).

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